

DATA SHEET

# vibro-meter®

## CVS 100 vibration switch



CVS 100  
(Ex version)



### KEY FEATURES AND BENEFITS

- From the vibro-meter® product line
- Available in standard versions and Ex versions certified for use in hazardous areas
- Vibration velocity measurement:  
velocity (Standard, Ex, M2, LC versions)  
displacement (M2 version)
- Velocity measurement ranges:  
10, 20 or 50 mm/s RMS (Standard, Ex versions)  
2, 5, 10, 20 or 50 mm/s RMS (M2, LC versions)
- Displacement measurement ranges:  
20, 50, 100, 200 or 500  $\mu\text{m}_{\text{PEAK}}$  (M2 version)
- Frequency response: 10 to 1 000 Hz
- Temperature range:  
–30 to 70°C (Standard, Ex versions)  
–20 to 70°C (M2, LC versions)
- 1 or 2 alarm/relay outputs:  
1 alarm/relay (LC version – “Alarm”)  
2 relays (Standard, Ex, M2 versions – “Alarm”  
and “Danger”)
- Normally energized (NE) – fail safe – relays with configurable set-points and time delays

### KEY FEATURES AND BENEFITS (continued)

- Analog output signal:  
4 to 20 mA (Standard, Ex, M2, LC versions)  
0 to 20 mA (M2 version)
- “Raw” output signal:  
100 mV/g (Standard, Ex versions)
- All-metal housing:  
aluminium (Standard, Ex, M2, LC versions) or  
stainless steel (Ex)
- Mounting orientation:  
any direction (Standard, Ex versions)  
horizontal or vertical (M2, LC versions)

### APPLICATIONS

- General-purpose vibration monitoring and protection for stand-alone machines in harsh industrial environments and/or hazardous areas
- Industry standard monitoring:  
DIN ISO 10816 Part 1-7 (Standard, Ex versions)  
VDI 2056 and ISO 2372 (M2, LC versions)



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## DESCRIPTION

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The CVS 100 vibration switch from Meggitt's vibro-meter® product line is a dedicated vibration monitoring and protection solution for stand-alone and auxiliary machinery, such as balance of plant (BOP) equipment, in harsh industrial environments and/or hazardous areas.

The CVS 100 integrates a vibration sensor, signal processing electronics and relays in a strong all-metal housing in order to provide a complete solution that is designed to be mounted directly onto main machine parts such as casings, foundations and/or pillow blocks. As such, it is ideal for the monitoring and protection of machinery such as fans, pumps, centrifuges, mills, gears, etc.

Different versions of the CVS 100 vibration switch are available as follows:

### CVS 100 (Standard and Ex)

The CVS 100 vibration switch is designed as a cost-effective solution for vibration monitoring and protection of stand-alone machinery. Two versions are available: Standard and Ex. Both versions measure velocity (mm/s), provide a 4 to 20 mA analog output signal and a 100 V/g "Raw" output signal, and two alarm/relay outputs. The main differences are that the Ex version is certified for use in hazardous areas and is also available in a stainless steel housing.

See **CVS 100 specifications starting on page 3** for detailed specifications on the Standard and Ex versions of the CVS 100.

### CVS 100 M2 and CVS 100 LC

The CVS 100 M2 and CVS 100 LC vibration switches are designed as a low-cost solution for vibration monitoring and protection of stand-alone machinery. The M2 version measures velocity (mm/s) or displacement ( $\mu\text{m}_{\text{PEAK}}$ ), provides a 4 to 20 mA or 0 to 20 mA analog output signal, and two alarm/relay outputs. The LC version measures velocity (mm/s), provides a 4 to 20 mA analog output signal, and features one alarm/relay output.

See **CVS 100 M2 and CVS 100 LC specifications starting on page 6** for detailed specifications on the M2 and LC versions of the CVS 100.

For all versions of the CVS 100, the signal from the vibration sensor passes through a band-pass filter and an amplifier, and optional integrator, in order to generate the measurement signal (velocity or displacement (M2 version only)).

This measurement signal is further processed in order to generate analog and "Raw" output signals. It is also compared against the alarm/relay threshold set-point(s) in order to active the output relays, as required.

Note: All CVS 100 vibration switch relays are normally energized (NE) – fail safe – relays, which support the "de-energize to trip principle" required in safety-related applications.

CVS 100 vibration switches are easily and fully user-configurable using DIP switches and rotary potentiometers on the printed circuit board (PCB) within the housing (see **CVS 100 layout on page 9**, **CVS 100 M2 layout on page 11** and **CVS 100 LC layout on page 13**).

The CVS 100 is available in standard versions for use in standard (non-hazardous) areas and Ex versions for installation in hazardous areas (potentially explosive atmospheres).

For specific applications, contact your local Meggitt representative.

## CVS 100 SPECIFICATIONS

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Note: The CVS 100 vibration switch specifications in this section correspond to the CVS 100 versions of the product, that is, the Standard version (ordering option code A01) and the Ex version (ordering option code A02).

### General operation

Type of sensor	: Accelerometer
Type of amplifier	: AC amplifier with rectifier and filter
Vibration measurement range	: 10, 20 or 50 mm/s RMS. Note: Selectable via DIP switch (see <b>CVS 100 layout on page 9</b> ).
Frequency range	: 10 to 1 000 Hz (-3 dB)
Relay outputs	: See <b>Relays on page 3</b>
Analog output	
• Signal	: 4 to 20 mA current loop output, corresponding to the processed vibration measurement
• Load	: $\leq 500 \Omega$
Voltage output	
• Signal	: 100 mV/g output, corresponding to the "raw" vibration measurement
• Load	: $\geq 20 \text{ k}\Omega$

### Power supply

Voltage	: 24 V <sub>DC</sub> nominal (20 to 30 V <sub>DC</sub> )
Current	: < 50 mA

### Relays

Number	: 2 (K1 and K2)
Contacts	: 1 × COM, 1 × NC and 1 × NO contact per relay
Mode of operation	: Normally energized (NE) – fail safe
Type / function	: Non-latching
Threshold set-point (level detection)	: 10 to 100% of measurement range. Note: Selectable via rotary potentiometer (see <b>CVS 100 layout on page 9</b> ).
Time delay	: 1 or 5 seconds. Note: Selectable via DIP switch (see <b>CVS 100 layout on page 9</b> ).
Switching contact capacity	: UL 30VDC-1A / 65VDC-0,46A / 150VAC-0,46A



### Environmental

Temperature range	
• Operating	: -30 to 70°C (-22 to 158°F)
• Storage	: -40 to 80°C (-40 to 176°F)
Protection rating (according to IEC 60529)	: IP68


## CVS 100 SPECIFICATIONS *(continued)*

### Potentially explosive atmospheres

Available in Ex approved versions for use in hazardous areas

Type of protection Ex d: flameproof enclosure, Ex t: protection by enclosure ( <b>ordering option code A2</b> )		
Europe	EC type examination certificate	 II 2G/D (Zones 1, 2, 21, 22) Ex db IIC T6 Gb Ex tb IIIC T100°C Db EPS 22 ATEX 1 192 X
International	IECEX certificate of conformity	Ex db IIC T6 Gb Ex tb IIIC T100°C Db IECEX EPS 22.0034X
United Kingdom	UK type examination certificate	 II 2G/D Ex db IIC T6 Gb Ex tb IIIC T100°C Db EPS 22 UKEX 1 192 X

 For specific parameters of the mode of protection concerned and special conditions for safe use, refer to the Ex certificates that are available from Meggitt SA.

 For the most recent information on the Ex certifications that are applicable to this product, refer to the Ex product register (PL-1511) document that is available from Meggitt SA.

### Approvals

Conformity	: European Union (EU) declaration of conformity (CE marking)
Electromagnetic compatibility (EMC)	: EMC compliant (2014/30/EU): EN 61000-6-2:2005. EN 61326-1:2013.
Electrical safety	: EN 61010-1:2010 / A1:2019 / AC:2019-04
Environmental management	: RoHS compliant (2011/65/EU)
Hazardous areas	: Ex approved versions (see <b>Potentially explosive atmospheres on page 4</b> )

### LED indicators

Alarm	: Yellow LED. Note: This LED corresponds to the alarm relay (K1).
Danger	: Red LED. Note: This LED corresponds to the danger relay (K2).

### Physical

Housing material	
• Standard version (A01)	: Aluminium
• Ex version (A02)	: Aluminium or stainless steel (1.4404, SS 316)
Protective coating	: Epoxy paint
Color	: Gray (RAL 9006)

## CVS 100 SPECIFICATIONS *(continued)*

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Dimensions	: 111 × 100. See <b>CVS 100 drawings on page 8.</b>
Weight	
• Aluminium housing (ordering option code B01)	: 0.7 kg (1.5 lb) approx.
• Stainless steel housing (ordering option code B02)	: 1.6 kg (3.5 lb) approx.
Mounting	: M12 × 1.75, 15 mm deep. See <b>CVS 100 drawings on page 8.</b>
Mounting orientation	: Can be mounted in any direction (ordering option code E0), corresponding to any measurement direction
Cable connection	
• Standard version	: 1/2" NPT polyamide cable fitting (stuffing gland) with IP68 protecting rating
• Ex version	: 1/2" NPT brass cable fitting (stuffing gland) with IP66 protecting rating. Note: SIRA 06 ATEX 1188 X and SIRA 07 ATEX 4327 X.
Connector	
• Spring-terminal (ordering option code D01)	: 10 × spring-terminal contacts. (Type: SPTA 1,5/10-3,81.) Clamping range: 1.5 mm <sup>2</sup> nominal.
• Screw-terminal (ordering option code D02)	: 10 × screw-terminal contacts. Clamping range: 1.5 mm <sup>2</sup> nominal.

## CVS 100 M2 AND CVS 100 LC SPECIFICATIONS

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Note: The CVS 100 vibration switch specifications in this section correspond to the CVS 100 M2 version (ordering option code A08) and the CVS 100 LC version (ordering option code A09) of the product.

### General operation

Type of sensor	: Velocity sensor
Type of amplifier	: AC amplifier with rectifier and filter. Note: For the CVS 100 M2 version (A08), there is also an integrator that is used to convert velocity to displacement.
Vibration measurement range	
• CVS 100 M2 version (A08)	: 2, 5, 10, 20 or 50 mm/s RMS (velocity) or 20, 50, 100, 200 or 500 $\mu\text{m}_{\text{PEAK}}$ (displacement). Note: Selectable via DIP switches (see <b>CVS 100 M2 layout on page 11</b> ).
• CVS 100 LC version (A09)	: 2, 5, 10, 20 or 50 mm/s RMS (velocity) only. Note: Selectable via DIP switch (see <b>CVS 100 LC layout on page 13</b> ).
Frequency range	: 10 to 1 000 Hz (–3 dB)
Relay outputs	: See <b>Relays on page 6</b>
Analog output	
• Signal	: 4 to 20 mA nominal current loop output, corresponding to the processed vibration measurement
• Load	: $\leq 500 \Omega$

Note: For the CVS 100 M2 version (A08), the analog output signal can be selected as either 4 to 20 mA or 0 to 20 mA via DIP switch, while for the CVS 100 LC version (A09), the analog output signal is 4 to 20 mA (and cannot be changed).

### Power supply

Voltage	: 24 $V_{\text{DC}}$ nominal (19.2 to 28.8 $V_{\text{DC}}$ approx.). Note: No galvanic separation.
Current	: <30 mA

### Relays

Number	
• CVS 100 M2 version (A08)	: 2 (K1 and K2)
• CVS 100 LC version (A09)	: 1 (K1)
Contacts	: 1 × COM, 1 × NC and 1 × NO contact per relay
Mode of operation	: Normally energized (NE) – fail safe
Type / function	: Non-latching
Threshold set-point (level detection)	: 5 to 100% of measurement range. Note: Selectable via rotary potentiometer (see <b>CVS 100 M2 layout on page 11</b> and <b>CVS 100 LC layout on page 13</b> ).
Time delay	: 1 or 5 seconds. Note: Selectable via DIP switch (see <b>CVS 100 M2 layout on page 11</b> and <b>CVS 100 LC layout on page 13</b> ).
Turn-on voltage (max.)	: 150 $V_{\text{DC}}$ / 125 $V_{\text{AC}}$
Switching current (max.)	: 1 A
Constant limited current (max.)	: 1 A
Breaking capacity (max.)	: 30 W / 60 VA

## CVS 100 M2 AND CVS 100 LC SPECIFICATIONS *(continued)*

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### Environmental

Temperature range

- Operating : -20 to 70°C (-4 to 158°F)
- Storage : -30 to 70°C (-22 to 158°F)

Protection rating : IP55  
(according to IEC 60529)

### Approvals

Conformity : European Union (EU) declaration of conformity (CE marking)  
EMC compliant (2014/30/EU): : EMC compliant (2014/30/EU):  
EN 61000-6-2:2005. EN 61000-6-2:2005.  
EN 61326-1:2013. EN 61326-1:2013.  
EN 61010-1:2010 / A1:2019 / AC:2019-04 : EN 61010-1:2010 / A1:2019 / AC:2019-04  
Environmental management : RoHS compliant (2011/65/EU)

### LED indicators

Alarm : Yellow LED.  
Note: This LED corresponds to the alarm relay (H1).  
Danger : Red LED.  
Note: This LED corresponds to the danger relay (H2).

Note: The CVS 100 M2 version (A08) has both alarm and danger LEDs, while the CVS 100 LC version (A09) has the alarm LED only.

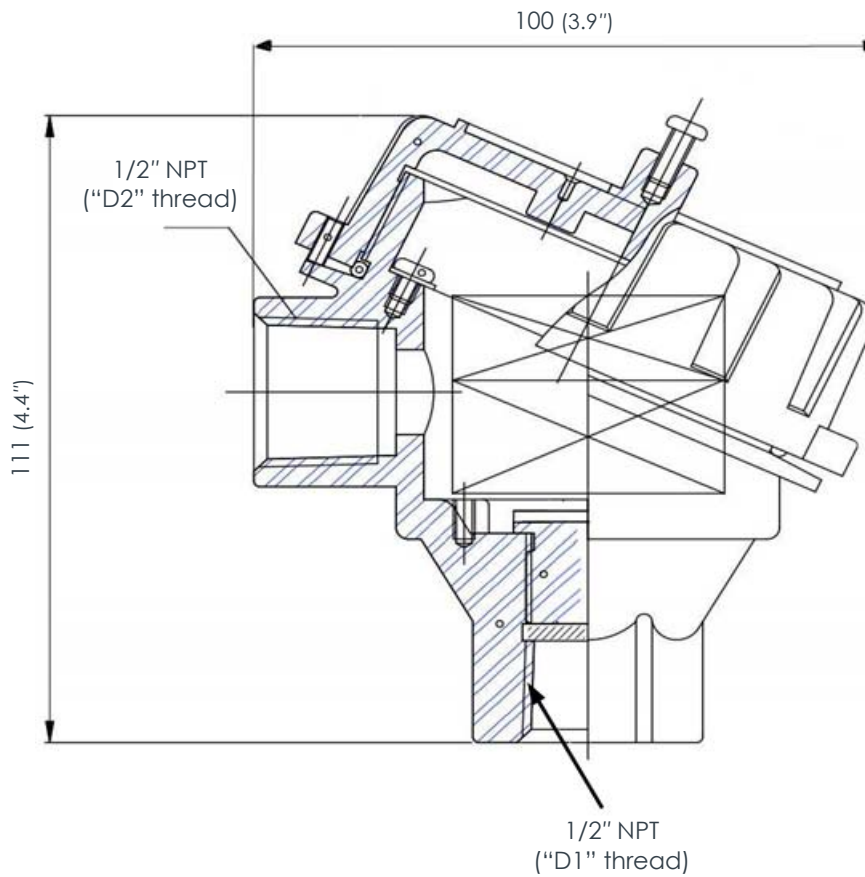
### Physical

Housing material : Aluminium alloy (ALSi12(Cu))  
Dimensions : 135 × 100.  
See **CVS 100 M2 drawings on page 10** and **CVS 100 LC drawings on page 12**.  
Weight : 0.62 kg (1.4 lb) approx.  
Mounting : M12 × 1.75, 15 mm deep.  
See **CVS 100 M2 drawings on page 10** and **CVS 100 LC drawings on page 12**.  
Mounting orientation : Horizontal (ordering option code E1) or vertical (ordering option code E2), corresponding to the measurement direction  
Cable connection : M12 × 1.5 cable fitting (stuffing gland)  
Connector :  
• CVS 100 M2 version (A08) : 9 × spring-terminal contacts.  
Clamping range: 1.5 mm<sup>2</sup> nominal.  
• CVS 100 LC version (A09) : 6 × spring-terminal contacts.  
Clamping range: 1.5 mm<sup>2</sup> nominal.

## CVS 100 DRAWINGS

Note: The CVS 100 vibration switch drawings in this section correspond to the CVS 100 versions of the product, that is, the Standard version (ordering option code A01) and the Ex version (ordering option code A02).

### CVS 100 mechanical drawing



#### Notes

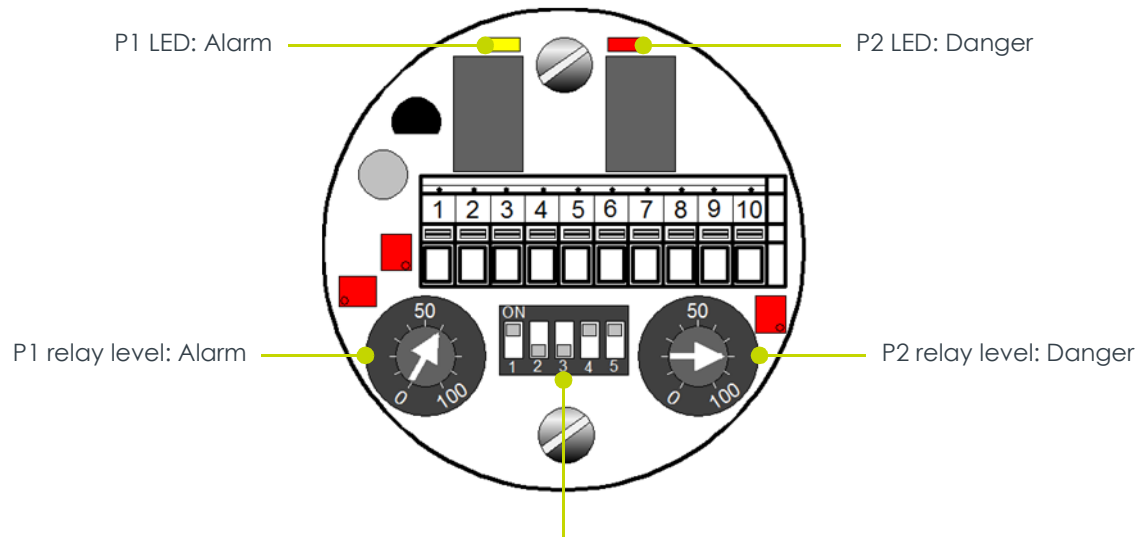
All dimensions in mm (in) unless otherwise stated.

(For reference, the CVS 100 M2 and CVS 100 LC use a different housing with different dimensions.)



CVS 100 DRAWINGS (continued)

CVS 100 layout



S1, Vibration range/sensitivity and time delay:

S1-1, Alarm time delay: on = 1 s, off = 5 s.

S1-2, S1-3 and S1-4, Vibration range/sensitivity:

S1-2 on, S1-3 off, S1-4 off = 10 mm/s RMS.

S1-2 off, S1-3 on, S1-4 off = 20 mm/s RMS.

S1-2 off, S1-3 off, S1-4 on = 50 mm/s RMS.

S1-5, Danger time delay: on = 1 s, off = 5 s.

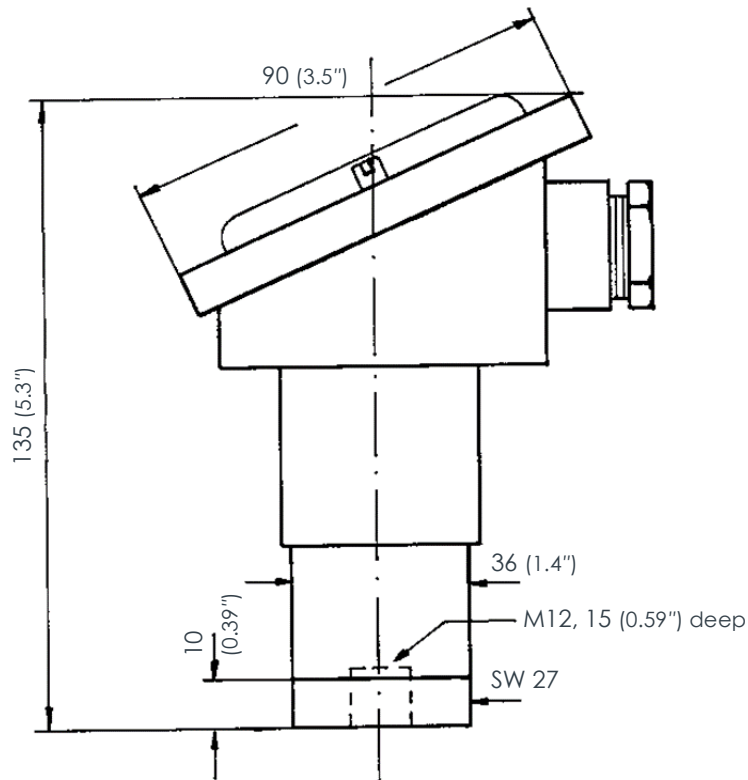
CVS 100 terminal assignment

1	PS	24 VDC	
2		0 VDC	
3	Relay K1	NC	┌
4		COM	
5		NO	
6	Relay K2	NC	┌
7		COM	
8		NO	
9	Analog output 4-20 mA		
10	RAW Signal 100 mV/g		

## CVS 100 M2 DRAWINGS

Note: The CVS 100 vibration switch drawings in this section correspond to the CVS 100 M2 version of the product (ordering option code A08).

### CVS 100 M2 mechanical drawing



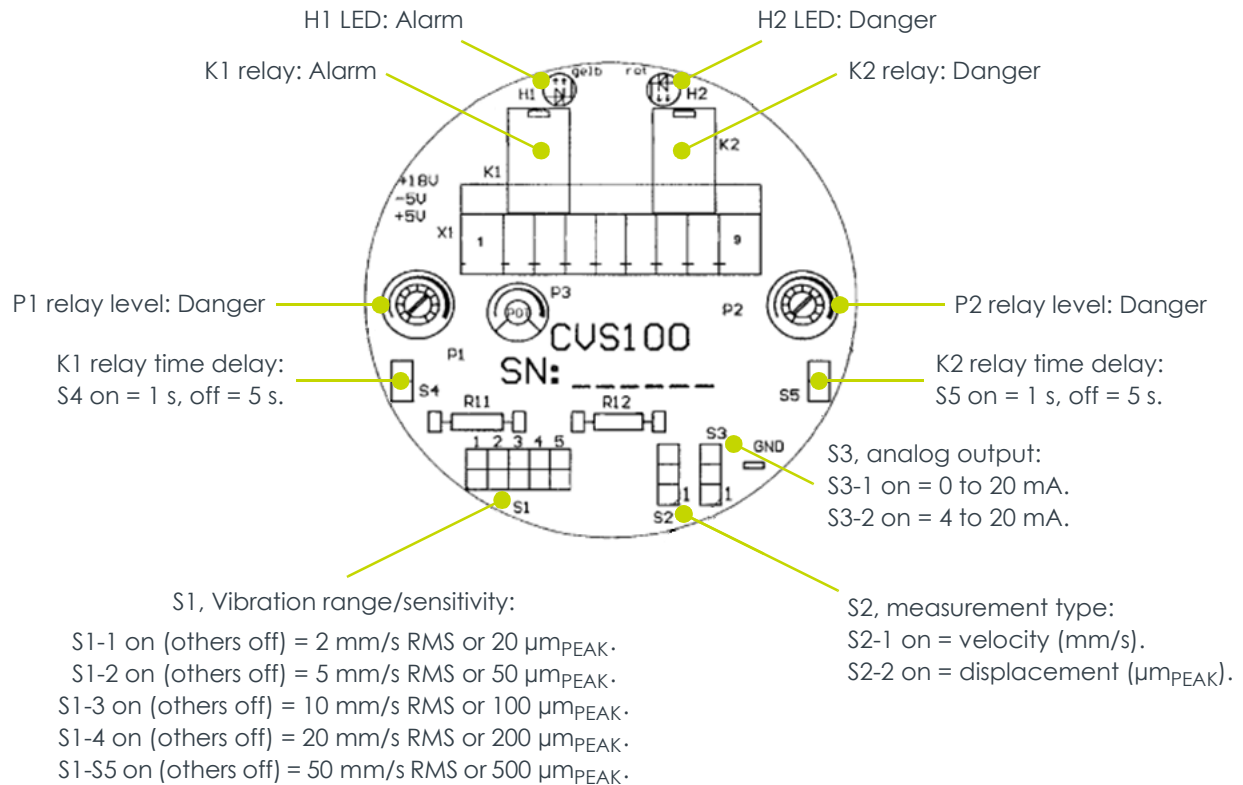
#### Notes

All dimensions in mm (in) unless otherwise stated.

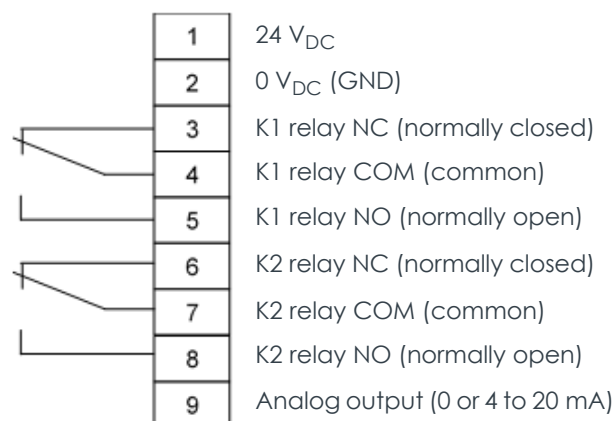
The CVS 100 M2 and CVS 100 LC use the same housing and so they have the same dimensions.  
(For reference, the CVS 100 uses a different housing with different dimensions.)

CVS 100 M2 DRAWINGS (continued)

CVS 100 M2 layout



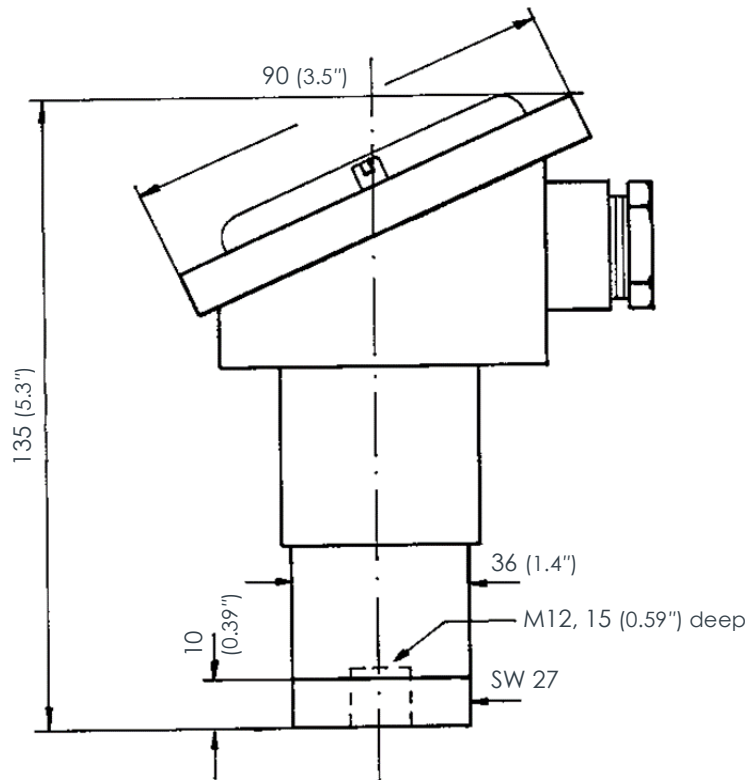
CVS 100 M2 terminal assignment



## CVS 100 LC DRAWINGS

Note: The CVS 100 vibration switch drawings in this section correspond to the CVS 100 LC version of the product (ordering option code A09).

### CVS 100 LC mechanical drawing



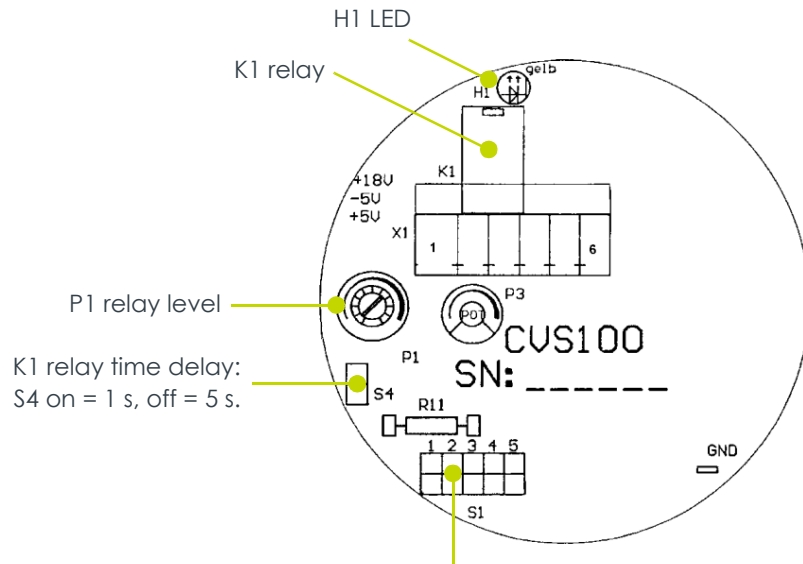
#### Notes

All dimensions in mm (in) unless otherwise stated.

The CVS 100 M2 and CVS 100 LC use the same housing and so they have the same dimensions.  
(For reference, the CVS 100 uses a different housing with different dimensions.)

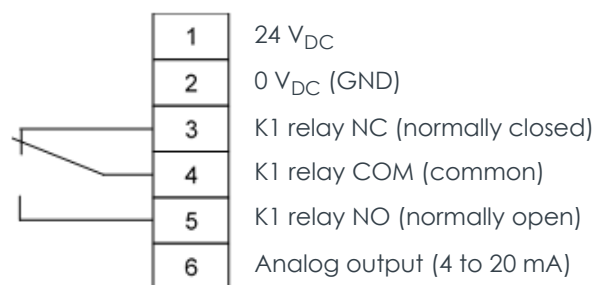
CVS 100 LC DRAWINGS (continued)

CVS 100 LC layout



S1, Vibration range/sensitivity:  
 S1-1 on (others off) = 2 mm/s RMS.  
 S1-2 on (others off) = 5 mm/s RMS.  
 S1-3 on (others off) = 10 mm/s RMS.  
 S1-4 on (others off) = 20 mm/s RMS.  
 S1-5 on (others off) = 50 mm/s RMS.

CVS 100 LC terminal assignment

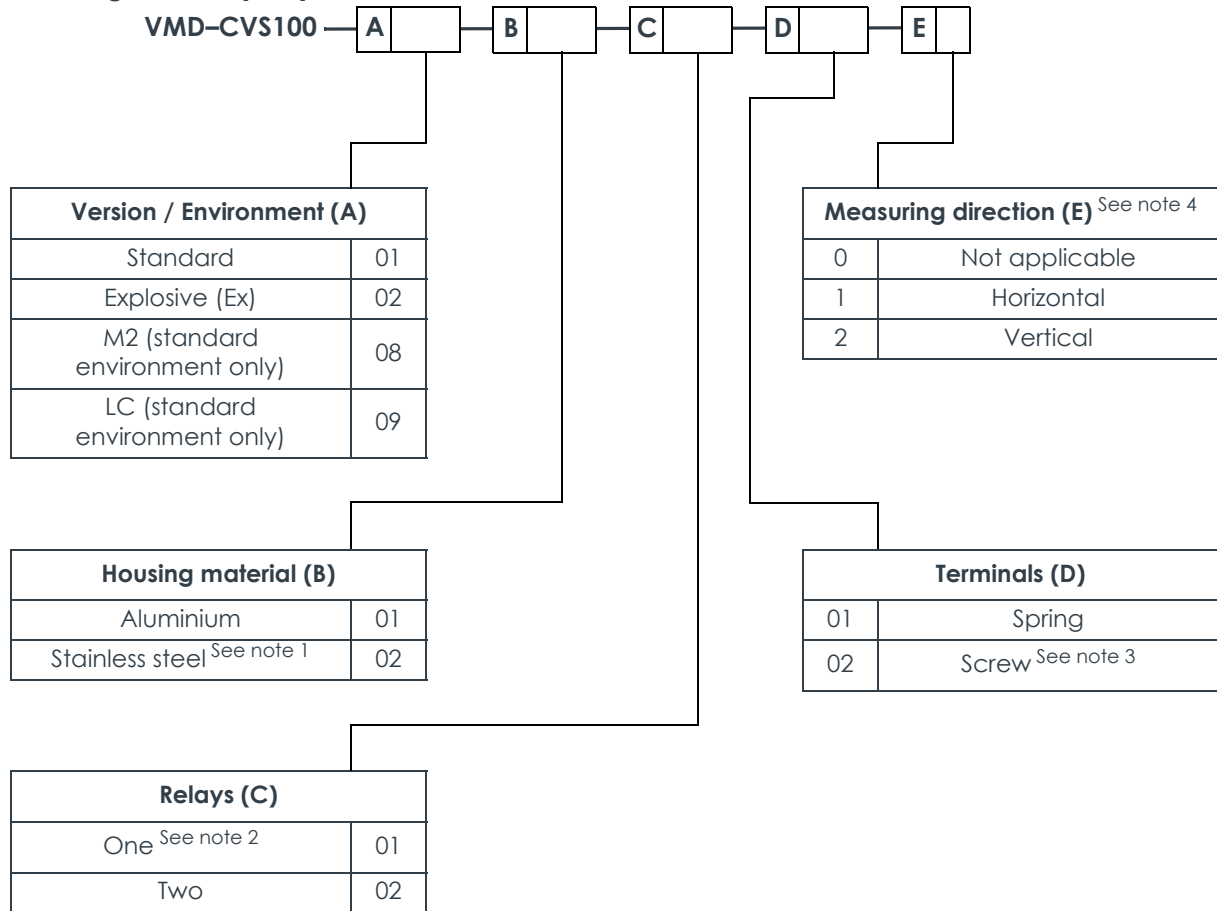


## ORDERING INFORMATION

To order, please specify the version(s) of the CVS 100 vibration switch required ...

Ordering number (PNR):

VMD-CVS100



### Notes

Other combinations of CVS 100 ordering option codes are available/possible.

The normalized versions of the CVS 100 that are readily available are listed on the following page.

1. A stainless steel housing (B02) is only available for the Ex (A02) version.
2. One output relay (C01) is only available for the LC (A09) version.
3. A screw-terminal connector (D02) is only available for the Standard (A01) and Ex (A02) versions.
4. Measuring direction is not applicable (E0) for the Standard (A01) and Ex (A02) versions, that is, these versions function in all directions and so can be freely installed with any mounting orientation.

## ORDERING INFORMATION *(continued)*

### Normalized Ex versions (for use in hazardous areas):

Type	Designation	Ordering number (PNR)
CVS 100	See Ordering number (PNR) on the previous page	VMD-CVS100-A02-B02-C02-D02-E0

### Normalized standard (non-Ex) versions:

Type	Designation	Ordering number (PNR)
CVS 100	See Ordering number (PNR) on the previous page	VMD-CVS100-A01-B01-C02-D01-E0
CVS 100	See Ordering number (PNR) on the previous page	VMD-CVS100-A08-B01-C02-D01-E1
CVS 100	See Ordering number (PNR) on the previous page	VMD-CVS100-A09-B01-C01-D01-E1
CVS 100	See Ordering number (PNR) on the previous page	VMD-CVS100-A09-B01-C01-D01-E2

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