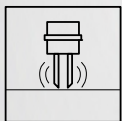


LVL-M2C

Vibration Level Switch

**ATEX, IEXEx
Ex ia IIC Ga/Gb**

Instruction Manual



With regard to the supply of products, the current issue of the following document is applicable:
The General Terms of Delivery for Products and Services of the Electrical Industry, published by the Central Association of the Electrical Industry (Zentralverband Elektrotechnik und Elektroindustrie (ZVEI) e.V.) in its most recent version as well as the supplementary clause: "Expanded reservation of proprietorship"

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Vibration Level Switch Vibracon LVL-M2C

Table of Contents

Associated Documentation	16
Supplementary Documentation	16
Manufacturer's Certificates	16
Manufacturer Address	16
Other Standards	16
Extended Order Code	17
Safety Instructions: General	19
Safety Instructions: Special Conditions	19
Safety Instructions: Installation	20
Temperature Tables	23
Connection Data	25

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1 Associated Documentation

This document is an integral part of the following documents:

- KA001620 (LVL-M2C)

The documents which are supplied and correspond to the device type apply.

2 Supplementary Documentation

Electrical explosion protection literature:

The literature can be found on the Internet at www.pepperl-fuchs.com.

3 Manufacturer's Certificates

EU Declaration of Conformity

The EU Declaration of Conformity can be found on the product detail page of the devices on the Internet at www.pepperl-fuchs.com.

Enter the order designation in the search field → Select the appropriate product → Open the product detail page → Open the **Approvals+Certificates** tab.

EU Type-Examination Certificate

Certificate number: KEMA 01 ATEX 1089 X

List of applied standards: see EU Declaration of Conformity

IEC Declaration of Conformity

Certificate number: IECEx DEK 16.0077X

Affixing the certificate number certifies conformity with the following standards (depending on the device version).

- IEC 60079-0:2017
- IEC 60079-11:2011
- IEC 60079-26:2021

4 Manufacturer Address

Pepperl+Fuchs Group
Lilienthalstraße 200, 68307 Mannheim, Germany

Internet: www.pepperl-fuchs.com

5 Other Standards

Among other things, the following standards shall be observed in their current version for proper installation:

- IEC/EN 60079-14: "Explosive atmospheres - Part 14: Electrical installations design, selection and erection"
- EN 1127-1: "Explosive atmospheres - Explosion prevention and protection - Part 1: Basic concepts and methodology"

6 Extended Order Code

The extended order code is indicated on the nameplate, which is affixed to the device in such a way that it is clearly visible. Additional information about the nameplate is provided in the associated manual.

Structure of the Extended Order Code

Device type		Basic specifications		Probe length
LVL-M2C	-	XXXXXX-XXXXXX-XX	.	XXXX

Table 1

X = Placeholder

At this position, an option (number or letter) selected from the specification is displayed instead of the placeholders.

Basic Specifications

The features that are absolutely essential for the device (mandatory features) are specified in the basic specifications. The number of positions depends on the number of features available. The selected option of a feature can consist of several positions.

Optional Specifications

The optional specifications describe additional features for the device (optional features). The number of positions depends on the number of features available.

More detailed information about the device is provided in the following tables.

These tables describe the individual positions and IDs in the extended order code which are relevant to hazardous locations.

Extended Order Code: Vibration Level Switch



Note

The following specifications reproduce an extract from the product structure and are used to assign:

- This documentation to the device (using the extended order code on the nameplate).
- The device options cited in the document.

Device type

LVL-M2C

Basic specifications

Probe version, probe length		
Position	Option	Description
LVL-M2C-XXX XX X-XXXXXX-XX.XXXXX	BK, CK, DK	with ECTFE coating

Temperature spacer, gastight spacer		
Position	Option	Description
LVL-M2C-XXXXXX X -XXXXXX-XX.XXXXX	A	without
	B	Temperature spacer
	C	Gastight spacer

Housing		
Position	Option	Description
LVL-M2C-XXXXXXX- XX XXXX-XX.XXXXX	AX	Aluminum housing
	EX	Stainless steel housing, hygienic version

Electrical connection		
Position	Option	Description
LVL-M2C-XXXXXXX-XX XX XX-XX.XXXXX	PA	FEL50A, PROFIBUS PA
	SI	FEL55, 8/16 mA, 11 V to 36 V DC
	N1	FEL56, NAMUR, L-H edge
	N2	FEL58, NAMUR with push button, H-L edge

Approval		
Position	Option	Description
LVL-M2C-XXXXXX-XXXXXX- XX .XXXXX	EI	ATEX II 1/2G Ex ia IIC T6...T1 Ga/Gb IECEX Ex ia IIC T6...T1 Ga/Gb

Table 2

Optional specifications

No options specific to hazardous locations are available.

7 Safety Instructions: General

- The device is intended to be used in explosive atmospheres as defined in the scope of IEC 60079-0 or equivalent national standards. If no potentially explosive atmospheres are present or if additional protective measures have been taken:
The device may be operated according to the manufacturer's specifications.
- Staff must meet the following conditions for mounting, electrical installation, commissioning and maintenance of the device:
 - Be suitably qualified for their role and the tasks they perform
 - Be trained in explosion protection
 - Be familiar with national regulations
- Install the device according to the manufacturer's instructions and national regulations.
- Do not operate the device outside the specified electrical, thermal and mechanical parameters.
- Only use the device in media to which the wetted materials have sufficient durability.
- Avoid electrostatic charging:
 - Of plastic surfaces (e. g. housing, sensor element, special varnishing, attached additional plates, ...)
 - Of isolated capacities (e. g. isolated metallic plates)
- Refer to the temperature tables for the relationship between the permitted ambient temperature for the sensor and/or transmitter, depending on the range of application and the temperature class.
- Modifications to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Pepperl+Fuchs.
- The probe is made of stainless steel or high corrosion-resistant alloy of thickness ≥ 1 mm.

8 Safety Instructions: Special Conditions

- Limitations of the maximum ambient temperature at the electronics housing may be required dependent on device configuration, process temperatures and temperature classification.
- Details of limitations: See section 10 for temperature tables.
- To avoid electrostatic charging: Do not rub surfaces with a dry cloth.
- In the event of additional or alternative special varnishing on the enclosure or other metal parts or for adhesive plates:
 - Observe the danger of electrostatic charging and discharge.
 - Do not install in the vicinity of processes (≤ 0.5 m) generating strong electrostatic charges.

Basic specification, feature Housing, option AX

Avoid sparks caused by impact and friction.

Device group IIC

- Sensors coated with non-conductive material can be used if avoiding electrostatic charging (e. g. through friction, cleaning, maintenance, strong medium flow).
- Marked with warning sign: **Avoid electrostatic charging.**

9 Safety Instructions: Installation

Basic specification, feature **Electrical connection**, options **SI, N1, N2**

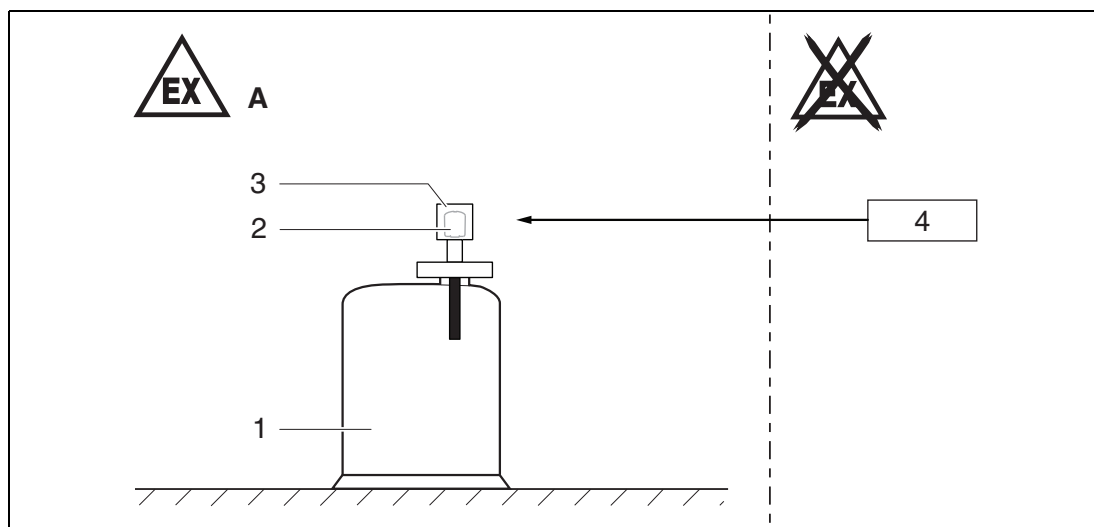


Figure 1

- A** Zone 1
- 1** Tank; Zone 0
- 2** Electronic insert
- 3** Housing
- 4** Basic specification, feature **Electrical connection**, options **SI, N1, N2**: associated intrinsically safe power supply units

Basic specification, feature Electrical connection, option PA

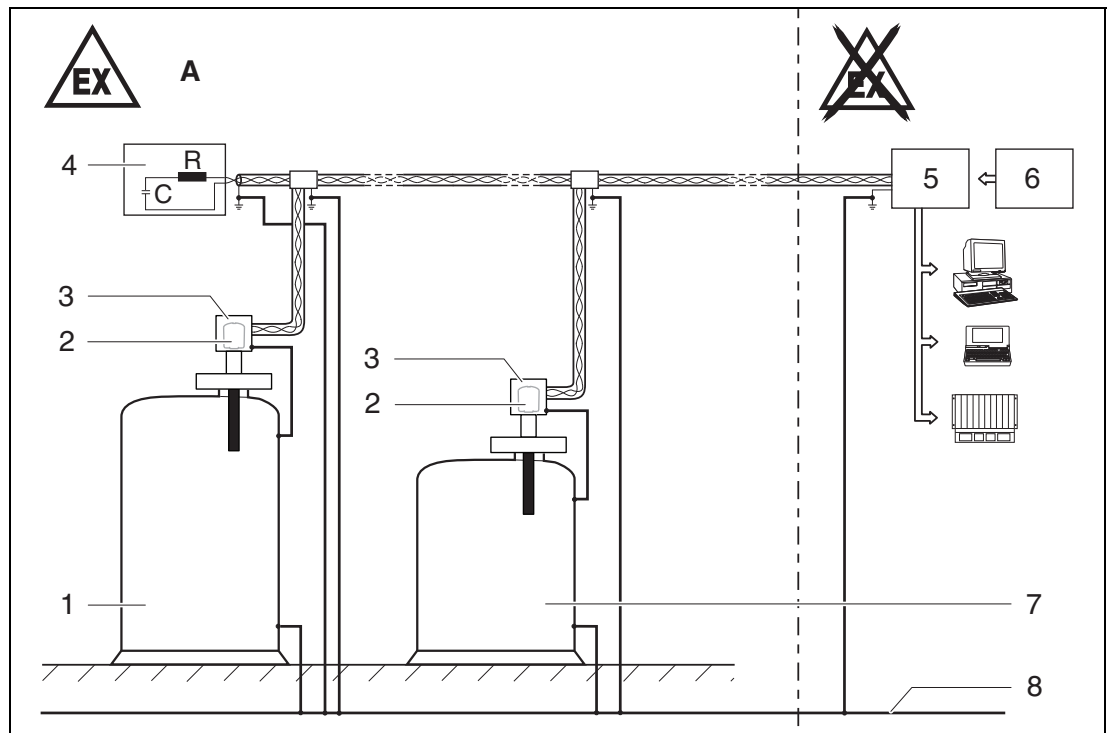


Figure 2

- A** Zone 1
- 1** Tank; Zone 0
- 2** Electronic insert
- 3** Housing
- 4** Permitted terminating resistor Ex ia IIC
- 5** Certified associated apparatus
- 6** Power supply
- 7** Tank; Zone 1
- 8** Potential equalization

- Connect the device using suitable cable and wire entries of protection type **Intrinsic safety (Ex i)**.
- Continuous service temperature of the connecting cable: $\geq T_{amb} + 5 \text{ K}$.
- Perform the following to achieve the degree of protection IP66/67:
 - Screw the cover tight.
 - Mount the cable entry correctly.
- Seal unused entry glands with approved sealing plugs that correspond to the type of protection.
- Observe the pertinent guidelines when interconnecting intrinsically safe circuits.
- Connection of intrinsically safe PROFIBUS devices: 10 devices.
- Observe the maximum process conditions according to the manufacturer's documentation.
- At high medium temperatures, note flange pressure load capacity as a factor of temperature.

- Install the device to exclude any mechanical damage or friction during the application. Pay particular attention to flow conditions and tank fittings.
- Support extension tube of the device if a dynamic load is expected.

Intrinsic safety

- The device is only suitable for connection to certified, intrinsically safe equipment with explosion protection Ex ia.
- The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least 500 V_{rms}.

Potential equalization

- Integrate the device into the local potential equalization.
- Grounding the screen, see the following figure.

Basic specification, feature Electrical connection, option PA

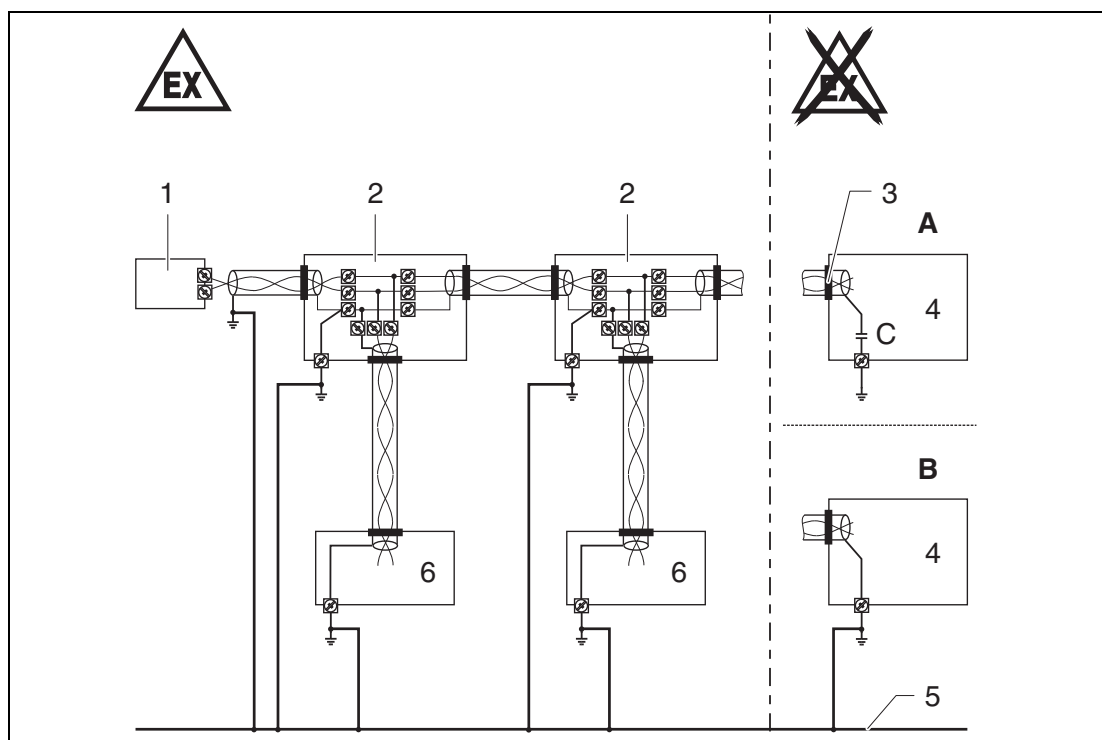


Figure 3

- A** Version 1:
Use small capacitors (e. g. 1 nF, 1500 V, dielectric strength, ceramic).
Total capacitance connected to the screen may not exceed 10 nF.
- B** Version 2
- 1** Terminating resistor
- 2** Distributor/terminal box
- 3** Screen insulated
- 4** Supply unit/segment coupler
- 5** Potential equalization (secured in high degree)
- 6** Field device

10 Temperature Tables

Description notes



Note

Unless otherwise indicated, the positions always refer to the basic specification.

Zone 0, Zone 1

- 1st column: basic specification, feature **Temperature spacer, gastight spacer**
- 2nd column: temperature classes T6 (85 °C) to T1 (450 °C)
- Column P1 to P5: position (temperature value) on the axes of the derating
 - T_{amb} : ambient temperature in °C
 - T_p : process temperature in °C

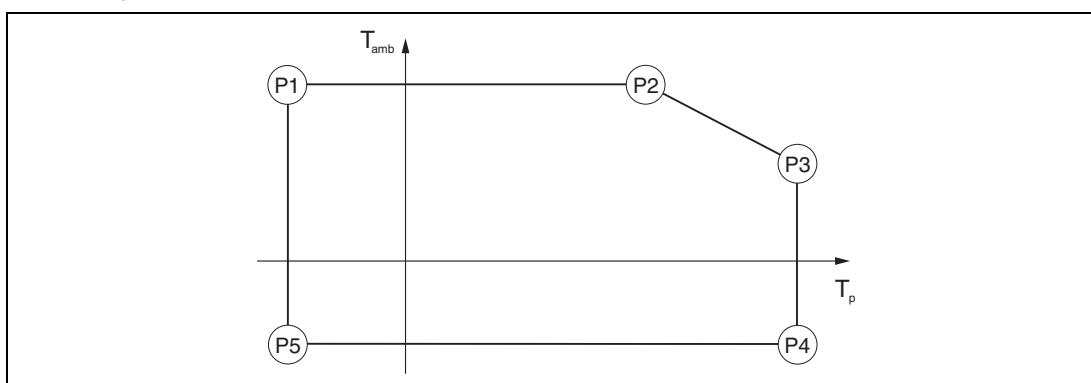


Figure 4

Zone 0, Zone 1

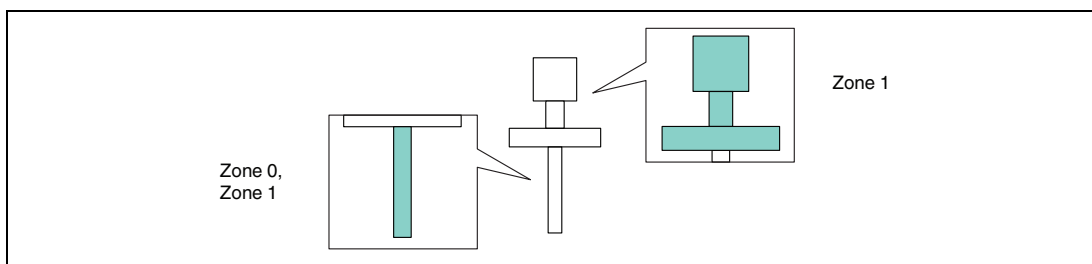


Figure 5

Basic specification, feature **Electrical connection**, option **PA, SI**

		P1		P2		P3		P4		P5	
		T_p	T_{amb}	T_p	T_{amb}	T_p	T_{amb}	T_p	T_{amb}	T_p	T_{amb}
A	T6	-50	55	55	55	75	45	75	-50 -40 ¹	-50	-50 -40 ¹
	T5...T1	-50	55	55	55	90	40	90	-50 -40 ¹	-50	-50 -40 ¹
B, C	T6	-50	55	65	55	75	50	75	-50 -40 ¹	-50	-50 -40 ¹
	T5	-50	55	65	55	90	50	90	-50 -40 ¹	-50	-50 -40 ¹
	T4	-50	55	65	55	120	50	120	-50 -40 ¹	-50	-50 -40 ¹
	T3...T1	-50	55	65	55	120	45	120	-50 -40 ¹	-50	-50 -40 ¹

¹ only in connection with basic specification, feature **Housing**, option **EX**

Table 3

Basic specification, feature **Electrical connection**, option **N1, N2**

		P1		P2		P3		P4		P5	
		T_p	T_{amb}	T_p	T_{amb}	T_p	T_{amb}	T_p	T_{amb}	T_p	T_{amb}
A	T6	-50	55	67	55	75	55	75	-50 -40 ¹	-50	-50 -40 ¹
	T5	-50	65	70	65	90	55	90	-50 -40 ¹	-50	-50 -40 ¹
	T4...T1	-50	65	70	65	130	40	130	-50 -40 ¹	-50	-50 -40 ¹
B, C	T6	-50	55	70	55	75	55	75	-50 -40 ¹	-50	-50 -40 ¹
	T5	-50	65	95	65	95	65	90	-50 -40 ¹	-50	-50 -40 ¹
	T4	-50	65	95	65	120	60	120	-50 -40 ¹	-50	-50 -40 ¹
	T3...T1	-50	65	95	65	120	60	120	-50 -40 ¹	-50	-50 -40 ¹

¹ only in connection with basic specification, feature **Housing**, option **EX**

Table 4

11 Connection Data

Basic specification, feature Electrical connection, option SI, N1, N2

Associated intrinsically safe power supply unit with max. electrical specifications below the characteristic values of the electronic inserts

Electrical connection	Electronic insert	Supply
SI	FEL55	U_i = 36 V P_i = 1 W I_i = 100 mA C_i = 0 L_i = 0
N1	FEL56	U_i = 16 V P_i = 170 mW I_i = 52 mA C_i = 30 nF L_i = 0
N2	FEL58	U_i = 16 V P_i = 170 mW I_i = 52 mA C_i = 30 nF L_i = 0

Table 5

Basic specification, feature Electrical connection, option PA

Certified intrinsically safe fieldbus (PROFIBUS PA), in accordance with the FISCO model, with the following maximum values

Electrical connection	Electronic insert	Supply
PA	FEL50A	U_i = 17,5 V P_i = 5,5 W I_i = 500 mA C_i = 2,7 nF L_i = $\leq 10 \mu\text{H}$

Table 6

Certified intrinsically safe circuit with the following maximum values

Electrical connection	Electronic insert	Supply
PA	FEL50A	U_i = 24 V P_i = 1,2 W I_i = 250 mA C_i = 2,7 nF L_i = $\leq 10 \mu\text{H}$

Table 7

EN

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Explosion Protection

- Intrinsic Safety Barriers
- Signal Conditioners
- FieldConnex® Fieldbus
- Remote I/O Systems
- Electrical Ex Equipment
- Purge and Pressurization
- Industrial HMI
- Mobile Computing and Communications
- HART Interface Solutions
- Surge Protection
- Wireless Solutions
- Level Measurement

Industrial Sensors

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- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- Fieldbus Modules
- AS-Interface
- Identification Systems
- Displays and Signal Processing
- Connectivity

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