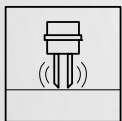


LVL-M*(H), LVL-M2C

Vibration Level Switch

**ATEX, IEXEx
Ex db 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"

Worldwide

Pepperl+Fuchs Group
Lilienthalstr. 200
68307 Mannheim
Germany
Phone: +49 621 776 - 0
E-mail: info@de.pepperl-fuchs.com

North American Headquarters

Pepperl+Fuchs Inc.
1600 Enterprise Parkway
Twinsburg, Ohio 44087
USA
Phone: +1 330 425-3555
E-mail: sales@us.pepperl-fuchs.com

Asia Headquarters

Pepperl+Fuchs Pte. Ltd.
P+F Building
18 Ayer Rajah Crescent
Singapore 139942
Phone: +65 6779-9091
E-mail: sales@sg.pepperl-fuchs.com
<https://www.pepperl-fuchs.com>

Vibration Level Switch Vibracon LVL-M*(H), LVL-M2C

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EN

1 Associated Documentation

This document is an integral part of the following documents:

- KA00143O (LVL-M1, LVL-M2)
- KA00144O (LVL-M1H, LVL-M2H)
- KA00162O (LVL-M2C)

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

2 Supplementary Documentation

Information for explosion protection:

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

3 Manufacturer's Certificates

EU Declaration of Conformity

The EU Declaration of Conformity is available 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: DEKRA 17 ATEX 0021 X

List of applied standards: see EU Declaration of Conformity

IEC Declaration of Conformity

Certificate number: IECEx DEK 17.0006X

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

- IEC 60079-0:2017
- IEC 60079-1:2014
- 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-M1	–	XXXXX-XXXXXX-XX		–
LVL-M1H	–	XXXXX-XXXXXX-XX		–
LVL-M2	–	XXXXX-XXXXXX-XX	.	XXXX
LVL-M2H	–	XXXXX-XXXXXX-XX	.	XXXX
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 types

LVL-M1, LVL-M1H, LVL-M2, LVL-M2H, LVL-M2C

Basic specifications

Probe version, probe length		
Position	Option	Description
LVL-M1-XXX XX -XXXXXX-XX	AA	Compact
	IA	Compact, with temperature spacer
	QA	Compact, with gastight spacer
LVL-M1H-XXX XX -XXXXXX-XX	AX	Compact
	IX	Compact, with temperature spacer
	QX	Compact, with gastight spacer
	XC	Compact, $R_a < 1.5 \mu\text{m}/59 \mu\text{inch}$
LVL-M2-XXX XX -XXXXXX-XX.XXXX	BB, CB, DB	1.4435/316L
	BE, CE, DE	2.4610/Alloy C4
	JB, KB, LB	1.4435/316L, with temperature spacer
	JE, KE, LE	2.4610/Alloy C4, with temperature spacer
	RB, SB, TB	1.4435/316L, with gastight spacer
	RE, SE, TE	2.4610/Alloy C4, with gastight spacer
LVL-M2H-XXX XX -XXXXXX-XX.XXXXX	BX, CX, DX	in mm/inch
	JX, KX, LX	in mm/inch, with temperature spacer
	RX, SX, TX	in mm/inch, with gastight spacer
	XC	in mm/inch, $R_a < 1.5 \mu\text{m}/59 \mu\text{inch}$
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-MX-XXXXX-XXXXXX-XX LVL-MXH-XXXXX-XXXXXX-XX.XXXXX LVL-M2C-XXXXXXXX-XXXXXX-XX.XXXXX	A1	Aluminum housing, IP66, thread M20
	A2	Aluminum housing, NEMA 4X, 3/4NPT
	A3	Aluminum housing, IP66, entry G1/2A

Electrical output		
Position	Option	Description
LVL-MX-XXXXX-XXXXXX-XX LVL-MXH-XXXXX-XXXXXX-XX.XXXXX LVL-M2C-XXXXXXXX-XXXXXX-XX.XXXXX	PA	FEL50A, PROFIBUS PA
	AC	FEL51, contactless, 2-wire switch, 19 V to 253 V AC
	E5	FEL52, PNP 3-wire, 10 V to 55 V DC
	WA	FEL54, potential-free change-over contact, DPDT, 19 V to 253 V AC, 19 V to 55 V DC
	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-MX-XXXXX-XXXXXX-XX LVL-MXH-XXXXX-XXXXXX-XX.XXXXX	E3	ATEX II 1/2G Ex db IIC T6...T1 Ga/Gb IECEX Ex db IIC T6...T1 Ga/Gb
	EC	ATEX II 1/2G Ex db IIC T6...T1 Ga/Gb
LVL-M2C-XXXXXXXX-XXXXXX-XX.XXXXX	EG	ATEX II 1/2G Ex db IIB T6...T1 Ga/Gb IECEX Ex db IIB 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.
- Only open the device under one of the following conditions: 17 minutes have elapsed since the power supply was switched off.

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 11 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

- Covers with glass window only permitted for the following ambient temperatures:
 $-50\text{ °C} \leq T_{\text{amb}} \leq +70\text{ °C}$
- Avoid sparks caused by impact and friction.

Device group IIC

Device type LVL-M2C

- 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

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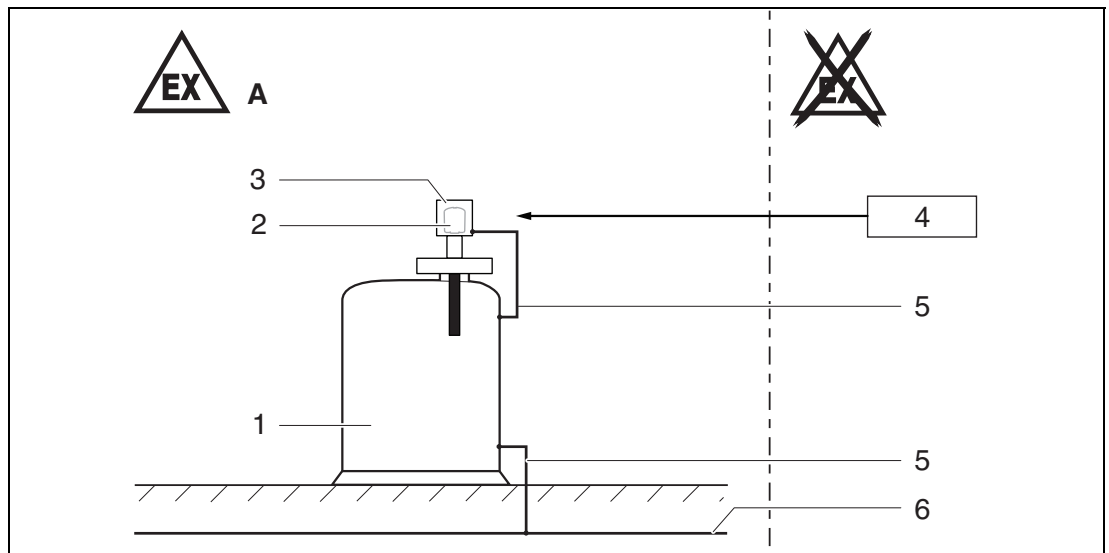


Figure 1

- A** Zone 1
1 Tank; Zone 0, Zone 1
2 Electronic insert
3 Housing
4 Supply device
5 Potential equalization line
6 Local potential equalization

- Before operation:
 - Screw in the cover all the way.
 - Tighten the securing clamp on the cover.
- In potentially explosive atmospheres:
 - Do not disconnect the electrical connection of the power supply circuit when energized.
 - Do not open the connection compartment cover and the electronics compartment cover when energized.
- Perform the following to achieve the degree of protection IP66/68:
 - Screw the cover tight.
 - Mount the cable entry correctly.
- 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.
- Only use certified cable entries suitable for the application. Observe national regulations and standards. Accordingly, the connection terminal does not include any ignition sources.
- Seal unused entry glands with approved sealing plugs that correspond to the type of protection. The plastic transport sealing plug does not meet this requirement and must therefore be replaced during installation.
- The built-in metallic sealing plug is examined and approved for explosion protection type Ex d with the device.
- When operating the transmitter housing at an ambient temperature under -20 °C, use appropriate cables and cable entries permitted for this application.
- When connecting through a conduit entry approved for this purpose, mount the associated sealing unit directly at the housing.

Basic specification, feature Housing, option A3

Flameproof equipment with G threaded entry holes is not intended for new installations but only for replacement of equipment in existing installations. Application of this equipment shall comply with the local installation requirements.

Accessory high pressure sliding sleeve

The high pressure sliding sleeve can be used for a continuous setting of the switch point and is suited for zone division if mounted properly (see manual).

Potential equalization

Integrate the device into the local potential equalization.

10 Safety Instructions: Ex d Joints

- If required or if in doubt: ask manufacturer for specifications.
- Flameproof joints are not intended to be repaired.

11 Temperature Tables

Description notes



Note

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

General

- 1st line: basic specification, feature **Housing**
- 1st column:
 - LVL-M1, LVL-M1H, LVL-M2, LVL-M2H: basic specification, feature **Probe version, probe length**
 - LVL-M2C: basic specification, feature **Temperature spacer, gastight spacer**
- 2nd column: maximum load current
- 3rd 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

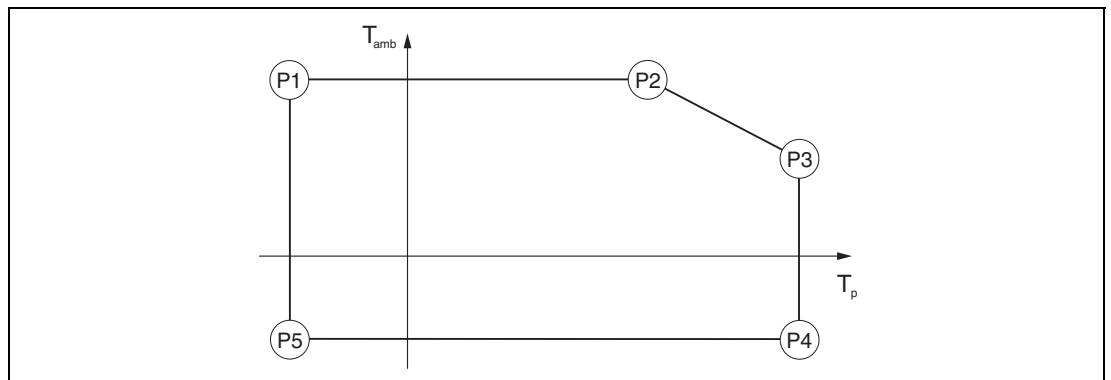


Figure 2

Zone 0, Zone 1

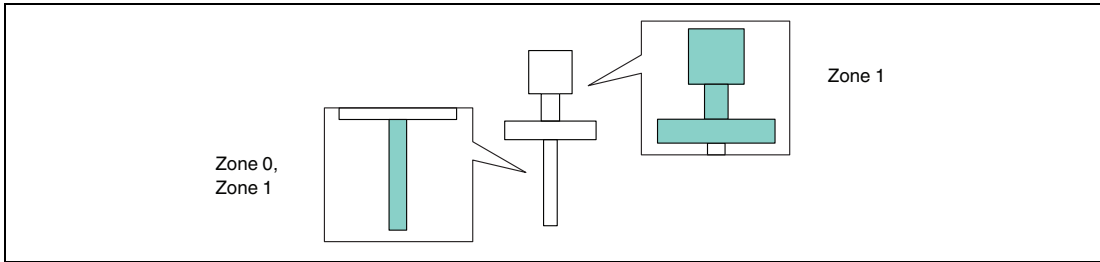


Figure 3

Device types LVL-M1, LVL-M1H, LVL-M2, LVL-M2H

Basic specification, feature **Electrical output**, option **AC**

AX			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}
LVL-M1, LVL-M1H: AX LVL-M2, LVL-M2H: BX, CX, DX	180 mA	T6	-50	58	70	58	75	55	75	-60	-50	-60
		T5	-50	70	70	70	90	55	90	-60	-50	-60
		T4	-50	70	70	70	125	40	125	-60	-50	-60
		T3...T1	-50	70	70	70	150	30	150	-60	-50	-60
LVL-M1, LVL-M1H: IX, QX LVL-M2, LVL-M2H: JX, KX, LX, RX, SX, TX	180 mA	T6	-50	60	70	60	75	60	75	-60	-50	-60
		T5	-50	70	70	70	90	65	90	-60	-50	-60
		T4	-50	70	70	70	125	65	125	-60	-50	-60
		T3...T1	-50	70	70	70	150	65	150	-60	-50	-60
	350 mA	T4	-50	70	70	70	125	55	125	-60	-50	-60
		T3...T1	-50	70	70	70	150	55	150	-60	-50	-60

Table 3

Basic specification, feature **Electrical output**, option **E5**

AX			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}
LVL-M1, LVL-M1H: AX LVL-M2, LVL-M2H: BX, CX, DX	350 mA	T6	-50	50	65	50	75	45	70	-60	-50	-60
		T5	-50	70	70	70	90	60	90	-60	-50	-60
		T4	-50	70	70	70	125	55	125	-60	-50	-60
		T3...T1	-50	70	70	70	150	45	150	-60	-50	-60
LVL-M1, LVL-M1H: IX, QX LVL-M2, LVL-M2H: JX, KX, LX, RX, SX, TX	350 mA	T6	-50	54	65	54	75	70	75	-60	-50	-60
		T5	-50	70	70	70	90	65	90	-60	-50	-60
		T4	-50	70	70	70	125	70	125	-60	-50	-60
		T3...T1	-50	70	70	70	150	70	150	-60	-50	-60

Table 4

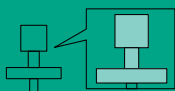
Basic specification, feature **Electrical output**, option **WA**

AX			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}
LVL-M1, LVL-M1H: AX LVL-M2, LVL-M2H: BX, CX, DX	2 A	T6	-50	52	52	52	75	40	75	-60	-50	-60
		T5	-50	67	67	67	90	55	90	-60	-50	-60
		T4	-50	70	70	70	125	47	125	-60	-50	-60
		T3...T1	-50	70	70	70	150	38	150	-60	-50	-60
LVL-M1, LVL-M1H: IX, QX LVL-M2, LVL-M2H: JX, KX, LX, RX, SX, TX	2 A	T6	-50	52	52	52	75	48	75	-60	-50	-60
		T5	-50	67	67	67	90	64	90	-60	-50	-60
		T4	-50	70	70	70	125	67	125	-60	-50	-60
		T3...T1	-50	70	70	70	150	65	150	-60	-50	-60
	4 A	T6	-50	40	43	40	65	40	75	-60	-50	-60
		T5	-50	54	58	54	90	54	90	-60	-50	-60
		T4	-50	63	63	63	125	58	125	-60	-50	-60
		T3...T1	-50	63	63	63	150	56	150	-60	-50	-60

Table 5

Basic specification, feature **Electrical output**, option **PA, SI, N1, N2**

AX



	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}
T6	-50	70	75	70	80	65	80	-60	-50	-60
T5	-50	70	70	70	95	70	95	-60	-50	-60
T4	-50	70	70	70	130	70	130	-60	-50	-60
T3...T1	-50	70	70	70	150	70	150	-60	-50	-60

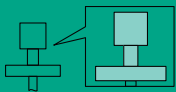
Table 6

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Device type LVL-M2C

Basic specification, feature **Electrical output**, option **AC**

AX

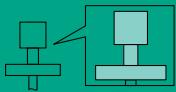


			P1		P2		P3		P4		P5	
			T _p	T _{amb}	T _p	T _{amb}	T _p	T _{amb}	T _p	T _{amb}	T _p	T _{amb}
LVL-M2C: A	180 mA	T6	-50	55	55	55	80	46	80	-60	-50	-60
		T5	-50	70	70	70	95	61	95	-60	-50	-60
		T4	-50	70	70	70	120	50	120	-60	-50	-60
		T3...T1	-50	70	70	70	120	42	120	-60	-50	-60
LVL-M2C: B, C	180 mA	T6	-50	55	55	55	80	53	80	-60	-50	-60
		T5	-50	70	70	70	95	68	95	-60	-50	-60
		T4	-50	70	94	70	120	67	120	-60	-50	-60
		T3...T1	-50	70	94	70	120	65	120	-60	-50	-60
	350 mA	T6	-50	37	49	37	80	34	80	-60	-50	-60
		T5	-50	52	64	52	95	49	95	-60	-50	-60
		T4	-50	69	69	69	120	64	120	-60	-50	-60
		T3...T1	-50	69	69	69	120	62	120	-60	-50	-60

Table 7

Basic specification, feature **Electrical output**, option **E5**

AX

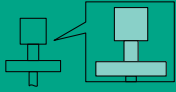


			P1		P2		P3		P4		P5	
			T _p	T _{amb}	T _p	T _{amb}	T _p	T _{amb}	T _p	T _{amb}	T _p	T _{amb}
LVL-M2C: A	350 mA	T6	-50	55	55	55	80	45	80	-60	-50	-60
		T5	-50	70	70	70	95	60	95	-60	-50	-60
		T4	-50	70	76	70	120	50	120	-60	-50	-60
		T3...T1	-50	70	76	70	120	42	120	-60	-50	-60
LVL-M2C: B, C	350 mA	T6	-50	55	55	55	80	52	80	-60	-50	-60
		T5	-50	70	70	70	95	67	95	-60	-50	-60
		T4	-50	70	94	70	120	67	120	-60	-50	-60
		T3...T1	-50	70	94	70	120	65	120	-60	-50	-60

Table 8

Basic specification, feature **Electrical output**, option **WA**

AX

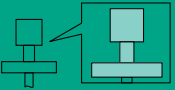


			P1		P2		P3		P4		P5	
			T _p	T _{amb}	T _p	T _{amb}	T _p	T _{amb}	T _p	T _{amb}	T _p	T _{amb}
LVL-M2C: A	2 A	T6	-50	52	52	52	80	40	80	-60	-50	-60
		T5	-50	67	67	67	95	55	95	-60	-50	-60
		T4	-50	70	77	70	120	70	120	-60	-50	-60
		T3...T1	-50	70	77	70	120	70	120	-60	-50	-60
LVL-M2C: B, C	2 A	T6	-50	52	52	52	80	49	80	-60	-50	-60
		T5	-50	67	67	67	95	63	95	-60	-50	-60
		T4	-50	70	100	70	120	67	120	-60	-50	-60
		T3...T1	-50	70	100	70	120	66	120	-60	-50	-60
	4 A	T6	-50	41	50	41	80	38	80	-60	-50	-60
		T5	-50	56	65	56	95	53	95	-60	-50	-60
		T4	-50	69	76	69	120	64	120	-60	-50	-60
		T3...T1	-50	69	76	69	120	63	120	-60	-50	-60

Table 9

Basic specification, feature **Electrical output**, option **PA, SI, N1, N2**

AX



	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}
T6	-50	70	75	70	80	65	80	-60	-50	-60
T5	-50	70	95	70	95	70	95	-60	-50	-60
T4	-50	70	130	70	120	70	120	-60	-50	-60
T3...T1	-50	70	150	70	120	70	120	-60	-50	-60

Table 10

12 Connection Data

Basic specification, feature Electrical output

Option	Supply circuit	Output
PA	for connection to a Fieldbus	PROFIBUS PA
AC	U = 19 V AC to 253 V AC, 50/60 Hz; max. 0.96 VA	max. 350 mA
E5	U = 10 V DC to 55 V DC; max. 0.83 W	PNP-Transistor; max. 350 mA
WA	U = 19 V AC to 253 V AC, 50/60 Hz or 19 V DC to 55 V DC; max. 1.3 W	2 potential free change-over contacts; 4 A Ex d
SI	U = 11 V DC to 36 V DC; max. 0.6 W	max. 22 mA
N1	U = 4 V DC to 12,5 V DC; max. 0.23 W	NAMUR; max. 3.5 mA
N2	U = 4 V DC to 12,5 V DC; max. 0.23 W	NAMUR; max. 3.5 mA

Table 11

EN

Your automation, our passion.

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

- Proximity Sensors
- 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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