



Model Number

NBN40-L2-E2-V1-3G-3D

Features

- Sensor head bidirectional and rotatable
- 40 mm non-flush
- 3-wire DC
- Quick mounting bracket
- 4-way LED indicator
- ATEX-approval for zone 2 and zone 22

Accessories

MHW 01

Modular mounting bracket

MH 04-2681F

Mounting aid for VariKont, +U1+ and +U9*

Technical Data

General specifications

Switching function	Normally open (NO)
Output type	PNP
Rated operating distance	s_n 40 mm
Installation	non-flush
Output polarity	DC
Assured operating distance	s_a 0 ... 32.4 mm
Actual operating distance	s_r 36 ... 44 mm typ. 40 mm
Reduction factor r_{Al}	0.33
Reduction factor r_{Cu}	0.31
Reduction factor r_{304}	0.74
Reduction factor r_{Brass}	0.38

Nominal ratings

Operating voltage	U_B 10 ... 30 V DC
Switching frequency	f 0 ... 100 Hz
Hysteresis	H typ. 5 %
Reverse polarity protection	reverse polarity protected
Short-circuit protection	pulsing
Voltage drop	U_d ≤ 2 V
Operating current	I_L 0 ... 200 mA
Off-state current	I_r 0 ... 0.5 mA
No-load supply current	I_0 ≤ 20 mA
Time delay before availability	t_v 80 ms
Operating voltage indicator	LED, green
Switching state indicator	LED, yellow

Functional safety related parameters

MTTF _d	1350 a
Mission Time (T_M)	20 a
Diagnostic Coverage (DC)	0 %

Ambient conditions

Ambient temperature	-25 ... 85 °C (-13 ... 185 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)

Mechanical specifications

Connection type	Connector M12 x 1, 4-pin
Housing material	PA
Sensing face	PA
Degree of protection	IP69K
Mass	130 g

General information

Use in the hazardous area	see instruction manuals
Category	3G; 3D

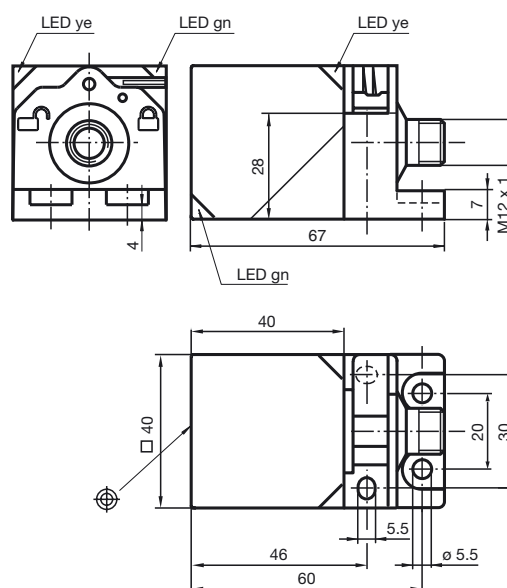
Compliance with standards and directives

Standard conformity	
Standards	EN 60947-5-2:2007 IEC 60947-5-2:2007

Approvals and certificates

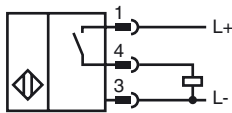
Protection class	II
Rated insulation voltage	U_i 253 V
Rated impulse withstand voltage	U_{imp} 4000 V
UL approval	cULus Listed, General Purpose
CSA approval	cCSAus Listed, General Purpose
CCC approval	CCC approval / marking not required for products rated ≤ 36 V

Dimensions

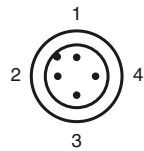




Electrical Connection



Pinout



Wire colors in accordance with EN 60947-5-2

1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

Equipment protection level Gc (nA)

Instruction

Device category 3G (nA)

Certificate of Compliance

CE marking

ATEX marking

Standards

General

Installation, commissioning

Maintenance

Special conditionsMaximum operating current I_L Maximum operating voltage U_{Bmax} Maximum permissible ambient temperature T_{Umax} at $U_{Bmax}=30\text{ V}$, $I_L=200\text{ mA}$ at $U_{Bmax}=30\text{ V}$, $I_L=100\text{ mA}$ at $U_{Bmax}=30\text{ V}$, $I_L=50\text{ mA}$ at $U_{Bmax}=30\text{ V}$, $I_L=25\text{ mA}$

Protection from mechanical danger

Protection from UV light

Protection against transients

Electrostatic charge

Material selection accessories

Plug connector

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist

PF 15CERT3754 X



II 3G Ex nA IIC T6 Gc

The Ex-related marking can also be printed on the enclosed label.

EN 60079-0:2012+A11:2013, EN 60079-15:2010

Ignition protection category "n"

Use is restricted to the following stated conditions

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The data stated in the data sheet are restricted by this operating instruction! The special conditions must be observed!

Laws and/or regulations and standards governing the use or intended usage goal must be observed. If the Ex-related marking is printed only on the supplied label, then this must be attached in the immediate vicinity of the sensor. The sticking surface for the label must be clean and free from grease. The attached label must be legible and indelible, including in the event of possible chemical corrosion.

No changes can be made to apparatus, which are operated in hazardous areas.

Repairs to these apparatus are not possible.

The maximum permissible load current must be restricted to the values given in the following list. High load currents and load short-circuits are not permitted.

The maximum permissible operating voltage U_B max is restricted to the values in the following list. Tolerances are not permissible.

dependant of the load current I_L and the max. operating voltage U_{Bmax}
Information can be taken from the following list.

48 °C (118.4 °F)

50 °C (122 °F)

51 °C (123.8 °F)

52 °C (125.6 °F)

The sensor must not be exposed to **ANY FORM** of mechanical danger.

The sensor and the connection cable must be protected from damaging UV-radiation. This can be achieved when the sensor is used in internal areas.

Ensure transient protection is provided and that the maximum value of the transient protection (140% of 85 V) is not exceeded.

Electrostatic charges must be avoided on the mechanical housing components. Dangerous electrostatic charges on the mechanical housing components can be avoided by incorporating these in the equipotential bonding.

When selecting accessories, ensure that the material allows the temperature of the enclosure to rise to up to 70 °C.

The plug connector must not be withdrawn under voltage. The proximity switch is identified as follows: "WARNING - DO NOT SEPARATE WHEN ENERGIZED". With the plug connector disconnected, soiling of the internal area must be prevented (i.e. the area that is inaccessible when the connector is inserted)

Equipment protection level Dc

Note	This instruction is only valid for products according to EN 50281-1-1, valid until 30-September-2008 Note the ex-marking on the sensor or on the enclosed adhesive label	
Instruction	Manual electrical apparatus for hazardous areas	
Device category 3D	for use in hazardous areas with non-conducting combustible dust	
CE marking		
ATEX marking	 II 3D IP69K T 107 °C (224.6 °F) X The Ex-significant identification is on the enclosed adhesive label	
Standards	EN 50281-1-1 Protection via housing Use is restricted to the following stated conditions	
General	The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The data stated in the data sheet are restricted by this operating instruction! The special conditions must be adhered to!	
Installation, commissioning	Laws and/or regulations and standards governing the use or intended usage goal must be observed. The adhesive label provided must be affixed in the immediate vicinity of the sensor! The surface to which the label is applied must be clean, flat and free from grease! The affixed adhesive label must be readable and durable, taking account of the possibility of chemical corrosion!	
Maintenance	No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.	
Special conditions		
Maximum operating voltage	U _{Bmax}	The maximum permissible operating voltage UBmax must be restricted to the values given in the following list. Tolerances are not permitted.
Maximum operating current	I _L	The maximum permissible load current must be restricted to the values given in the following list. High load currents and load short-circuits are not permitted.
Maximum heating (Temperature rise)		dependant of the load current I _L and the max. operating voltage U _{Bmax} Information can be taken from the following list. The maximum surface temperature at maximum ambient temperature is given in the Ex identification of the apparatus.
	at U _{Bmax} =30 V, I _L =200 mA	22 K
	at U _{Bmax} =30 V, I _L =100 mA	19 K
	at U _{Bmax} =30 V, I _L =50 mA	18 K
	at U _{Bmax} =30 V, I _L =25 mA	17 K
Protection from mechanical danger		The sensor must not be mechanically damaged.
Electrostatic charge		Electrostatic charges on the metal housing components must be avoided. Dangerous electrostatic charges on the metal housing components can be avoided by incorporating these components in the equipotential bonding. Sliding contact discharges must be avoided.
Plug connector		The plug connector must not be disconnected under voltage. The proximity switch is marked as follows: "DO NOT DISCONNECT UNDER VOLTAGE!" When the plug connector is disconnected the ingress of dirt into the inner areas (i.e. the areas, which are not accessible in the plugged-in condition) must be prevented. The plug connection can only be separated using a tool. This is achieved by using the locking protection V1-Clip (Mounting accessory from Pepperl + Fuchs).

Equipment protection level Dc (tD)

Note

This instruction is only valid for products according to EN 61241-0:2006 and EN 61241-1:2004

Note the ex-marking on the sensor or on the enclosed adhesive label

Instruction

Manual electrical apparatus for hazardous areas**Device category 3D**

for use in hazardous areas with combustible dust

CE marking



ATEX marking

Ⓔ II 3D Ex tD A22 IP67 T80°C X

The Ex-relevant identification may also be printed on the accompanying adhesive label.

Standards

EN 61241-0:2006, EN 61241-1:2004

Protection via housing "tD"

Use is restricted to the following stated conditions

General

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual.

The maximum surface temperature has been determined in accordance with method A without a dust layer on the equipment.

The data stated in the data sheet are restricted by this operating instruction!

The special conditions must be adhered to!

Installation, commissioning

The statutory requirements, directives and standards applicable to the intended use and application must be observed.

The adhesive label provided must be affixed in the immediate vicinity of the sensor! The surface to which the label is applied must be clean, flat and free from grease! The affixed adhesive label must be readable and durable, taking account of the possibility of chemical corrosion!

Maintenance

No changes can be made to apparatus, which are operated in hazardous areas.

Repairs to these apparatus are not possible.

Special conditionsMaximum operating current I_L

The maximum permissible load current must be restricted to the values given in the following list.

High load currents and load short-circuits are not permitted.

Maximum operating voltage U_{Bmax} The maximum permissible operating voltage U_{Bmax} must be restricted to the values given in the following list. Tolerances are not permitted.Maximum permissible ambient temperature T_{Umax} dependant of the load current I_L and the max. operating voltage U_{Bmax}
Information can be taken from the following list.at $U_{Bmax}=30\text{ V}$, $I_L=200\text{ mA}$

48 °C (118.4 °F)

at $U_{Bmax}=30\text{ V}$, $I_L=100\text{ mA}$

50 °C (122 °F)

at $U_{Bmax}=30\text{ V}$, $I_L=50\text{ mA}$

51 °C (123.8 °F)

at $U_{Bmax}=30\text{ V}$, $I_L=25\text{ mA}$

52 °C (125.6 °F)

Protection from mechanical danger

The sensor must not be exposed to **ANY FORM** of mechanical danger.

Protection from UV light

The sensor and the connection cable must be protected from damaging UV-radiation. This can be achieved when the sensor is used in internal areas.

Electrostatic charge

Electrostatic charges on the metal housing components must be avoided. Dangerous electrostatic charges on the metal housing components can be avoided by incorporating these components in the equipotential bonding.

Sliding contact discharges must be avoided.

Plug connector

The plug connector must not be withdrawn under voltage. The proximity switch is identified as follows: "WARNING - DO NOT SEPARATE WHEN ENERGIZED". With the plug connector disconnected, soiling of the internal area must be prevented. (i.e. the area that is inaccessible when the connector is inserted) The plug connection can only be separated using a tool. This is achieved by using the locking protection V1-Clip (Mounting accessory from Pepperl + Fuchs).

Equipment protection level Dc (tc)

Instruction

Device category 3D

Certificate of Compliance

CE marking

ATEX marking

Standards

General

Installation, commissioning

Maintenance

Special conditionsMaximum operating current I_L Maximum operating voltage U_{Bmax} Maximum permissible ambient temperature T_{Umax} at $U_{Bmax}=30\text{ V}$, $I_L=200\text{ mA}$ at $U_{Bmax}=30\text{ V}$, $I_L=100\text{ mA}$ at $U_{Bmax}=30\text{ V}$, $I_L=50\text{ mA}$ at $U_{Bmax}=30\text{ V}$, $I_L=25\text{ mA}$

Protection from mechanical danger

Protection from UV light

Electrostatic charge

Plug connector

Manual electrical apparatus for hazardous areas

for use in hazardous areas with combustible dust

PF 15CERT3774 X

CE

II 3D Ex tc IIIC T80°C Dc

The Ex-related marking can also be printed on the enclosed label.

EN 60079-0:2012+A11:2013, EN 60079-31:2014

Protection by enclosure "tc" Some of the information in this instruction manual is more specific than the information provided in the datasheet.

The corresponding datasheets, declarations of conformity, EC-type examination certificates, certifications, and control drawings, where applicable (see datasheets), form an integral part of this document. These documents can be found at www.pepperl-fuchs.com. The maximum surface temperature of the device was determined without a layer of dust on the apparatus. Some of the information in this instruction manual is more specific than the information provided in the datasheet.

Laws and/or regulations and standards governing the use or intended usage goal must be observed. If the Ex-relevant identification is printed exclusively on the adhesive label provided, this label must be affixed in the immediate vicinity of the sensor! The back-ground surface to which the adhesivelabel is to be applied must be clean and free from grease! The applied label must be durable and remain legible, with due consideration of the possibility of chemical corrosion!

No changes can be made to apparatus, which are operated in hazardous areas.

Repairs to these apparatus are not possible.

The maximum permissible load current must be restricted to the values given in the following list.

High load currents and load short-circuits are not permitted.

The maximum permissible operating voltage U_{Bmax} must be restricted to the values given in the following list. Tolerances are not permitted.

dependant of the load current I_L and the max. operating voltage U_{Bmax}
Information can be taken from the following list.

48 °C (118.4 °F)

50 °C (122 °F)

51 °C (123.8 °F)

52 °C (125.6 °F)

The sensor must not be exposed to **ANY FORM** of mechanical danger.

The sensor and the connection cable must be protected from damaging UV-radiation. This can be achieved when the sensor is used in internal areas.

Electrostatic charges must be avoided on the mechanical housing components. Dangerous electrostatic charges on the mechanical housing components can be avoided by incorporating these in the equipotential bonding. Avoid electrostatic charges that can cause electrostatic discharge when installing or operating the device. Information on electrostatic hazards can be found in the technical specification IEC/TS 60079-32-1. Do not attach the nameplate provided in areas where electrostatic charge can build up.

The plug connector must not be withdrawn under voltage. The proximity switch is identified as follows: "WARNING - DO NOT SEPARATE WHEN ENERGIZED". With the plug connector disconnected, soiling of the internal area must be prevented.(i.e. the area that is inaccessible when the connector is inserted)