



### Model Number

NBB4-12GM50-E2-V1-3G-3D

### Features

- Increased operating distance
- 4 mm flush
- ATEX-approval for zone 2 and zone 22

### Accessories

#### BF 12

Mounting flange, 12 mm

#### EXG-12

Quick mounting bracket with dead stop

## Technical Data

### General specifications

Switching function		Normally open (NO)
Output type		PNP
Rated operating distance	$s_n$	4 mm
Installation		flush
Output polarity		DC
Assured operating distance	$s_a$	0 ... 3.24 mm
Reduction factor $r_{AI}$		0.45
Reduction factor $r_{Cu}$		0.35
Reduction factor $r_{304}$		0.7

### Nominal ratings

Operating voltage	$U_B$	10 ... 30 V DC
Switching frequency	$f$	0 ... 1000 Hz
Hysteresis	$H$	typ. 5 %
Reverse polarity protection		reverse polarity protected
Short-circuit protection		pulsing
Voltage drop	$U_d$	$\leq 3$ V
Operating current	$I_L$	0 ... 150 mA
Off-state current	$I_r$	0 ... 0.5 mA typ. 0.1 $\mu$ A at 25 °C
Off-state current $T_U = 40$ °C, switching element off		
No-load supply current	$I_0$	$\leq 15$ mA
Time delay before availability	$t_v$	$\leq 5$ ms
Switching state indicator		Multihole-LED, yellow

### Functional safety related parameters

MTTF <sub>d</sub>	1820 a
Mission Time (T <sub>M</sub> )	20 a
Diagnostic Coverage (DC)	0 %

### Ambient conditions

Ambient temperature	-25 ... 70 °C (-13 ... 158 °F)
---------------------	--------------------------------

### Mechanical specifications

Connection type	Connector M12 x 1, 4-pin
Cable version	PBT
Housing material	brass, nickel-plated
Sensing face	PBT
Degree of protection	IP67

### General information

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

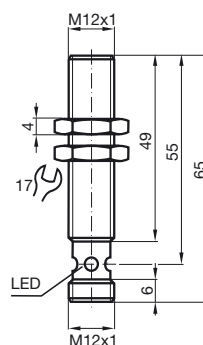
### Compliance with standards and directives

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

### Approvals and certificates

UL approval	cULus Listed, General Purpose
CSA approval	cCSAus Listed, General Purpose
CCC approval	CCC approval / marking not required for products rated $\leq 36$ 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 conditions**Maximum operating current  $I_L$ Maximum operating voltage  $U_{Bmax}$ Maximum permissible ambient temperature  $T_{Umax}$ at  $U_{Bmax}=30\text{ V}$ ,  $I_L=150\text{ mA}$ at  $U_{Bmax}=30\text{ V}$ ,  $I_L=100\text{ mA}$ at  $U_{Bmax}=30\text{ V}$ ,  $I_L=50\text{ mA}$ 

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

CE

Ex 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  $U_{Bmax}$  is restricted to the values in the following list. Tolerances are not permissible.

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

47 °C (116.6 °F)

51 °C (123.8 °F)

53 °C (127.4 °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 (tD)

Note	<b>This instruction is only valid for products according to EN 61241-0:2006 and EN 61241-1:2004</b> Note the ex-marking on the sensor or on the enclosed adhesive label
<b>Instruction</b>	<b>Manual electrical apparatus for hazardous areas</b>
<b>Device category 3D</b> CE marking	for use in hazardous areas with combustible dust CE
ATEX marking	⊕ II 3D Ex tD A22 IP67 T80°C X The Ex-significant identification is on the enclosed 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	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.
<b>Special conditions</b>	
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 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 $U_{Bmax}=30\text{ V}$ , $I_L=150\text{ mA}$	47 °C (116.6 °F)
at $U_{Bmax}=30\text{ V}$ , $I_L=100\text{ mA}$	51 °C (123.8 °F)
at $U_{Bmax}=30\text{ V}$ , $I_L=50\text{ mA}$	53 °C (127.4 °F)
Protection from mechanical danger	The sensor must not be exposed to <b>ANY FORM</b> 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 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.
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 conditions**Maximum operating current  $I_L$ Maximum operating voltage  $U_{Bmax}$ Maximum permissible ambient temperature  $T_{Umax}$ at  $U_{Bmax}=30\text{ V}$ ,  $I_L=150\text{ mA}$ at  $U_{Bmax}=30\text{ V}$ ,  $I_L=100\text{ mA}$ at  $U_{Bmax}=30\text{ V}$ ,  $I_L=50\text{ mA}$ 

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

Ex 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](http://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 background surface to which the adhesive label 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.

47 °C (116.6 °F)

51 °C (123.8 °F)

53 °C (127.4 °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. 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)