



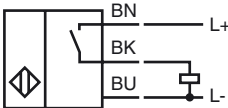
### Model Number

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

### Features

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

### Connection



### Accessories

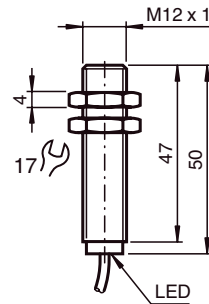
#### BF 12

Mounting flange, 12 mm

#### EXG-12

Quick mounting bracket with dead stop

### Dimensions



### Technical Data

#### General specifications

|                            |       |               |    |
|----------------------------|-------|---------------|----|
| Switching element function |       | PNP           | NO |
| Rated operating distance   | $s_n$ | 4 mm          |    |
| Installation               |       | flush         |    |
| Output polarity            |       | DC            |    |
| Assured operating distance | $s_a$ | 0 ... 3.24 mm |    |
| Reduction factor $r_{Al}$  |       | 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 protected        |       | 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 |
| No-load supply current            | $I_0$ | $\leq 15$ mA                           |
| Indication of the switching state |       | LED, yellow                            |

#### Functional safety related parameters

|                          |        |
|--------------------------|--------|
| MTTF <sub>d</sub>        | 1820 a |
| Mission Time ( $T_M$ )   | 20 a   |
| Diagnostic Coverage (DC) | 0 %    |

#### Ambient conditions

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

#### Mechanical specifications

|                    |                      |
|--------------------|----------------------|
| Connection type    | cable PVC , 2 m      |
| Cable version      | PBT                  |
| Core cross-section | 0.14 mm <sup>2</sup> |
| Housing material   | brass, nickel-plated |
| Sensing face       | PBT                  |
| Protection degree  | 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<br>IEC 60947-5-2:2007 |

#### Approvals and certificates

|              |  |
|--------------|--|
| UL approval  | cULus Listed, General Purpose  |
| CSA approval | cCSAus Listed, General Purpose   |
| CCC approval | Products with a maximum operating voltage of $\leq 36$ V do not bear a CCC marking because they do not require approval. |

**ATEX 3G (nA)**

Instruction

**Manual electrical apparatus for hazardous areas****Device category 3G (nA)**

Directive conformity

Standard conformity

for use in hazardous areas with gas, vapour and mist

94/9/EG

EN 60079-0:2006, EN 60079-15:2005


Ignition protection category "n"

Use is restricted to the following stated conditions

CE symbol



Ex-identification

 II 3G Ex nA IIC T6 X

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 observed!

Installation, Commissioning

Laws and/or regulations and standards governing the use or intended usage goal must be observed.

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 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  $U_B$  max is restricted to the values in the following list. Tolerances are not permissible.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  $U_{Bmax}=30$  V,  $I_L=150$  mA

45 °C (113 °F)

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

49 °C (120.2 °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 charging

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.

Protection of the connection cable

The connection cable must be prevented from being subjected to tension and torsional loading.

**ATEX 3D (tD)**

|  |   |
|--|---|
| Note   | <b>This instruction is only valid for products according to EN 61241-0:2006 and EN 61241-1:2004</b><br>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>                          | for use in hazardous areas with combustible dust  |
| Directive conformity                               | 94/9/EG   |
| Standard conformity                                | EN 61241-0:2006, EN 61241-1:2004  |
|  | Protection via housing "tD"   |
|  | Use is restricted to the following stated conditions  |
| CE symbol  |    |
| Ex-identification                                  |  II 3D Ex tD A22 IP67 T80°C X  |
| General  | The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual.<br>The maximum surface temperature has been determined in accordance with method A without a dust layer on the equipment.<br>The data stated in the data sheet are restricted by this operating instruction!<br>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.  |
| Maintenance  | No changes can be made to apparatus, which are operated in hazardous areas.<br>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.<br>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 $U_{Bmax}$ .<br>Information can be taken from the following list.  |
| at $U_{Bmax}=30\text{ V}$ , $I_L=150\text{ mA}$    | 45 °C (113 °F)  |
| at $U_{Bmax}=30\text{ V}$ , $I_L=100\text{ mA}$    | 49 °C (120.2 °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 charging                             | 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.  |
| Protection of the connection cable                 | The connection cable must be prevented from being subjected to tension and torsional loading.   |