

## Model Number

**NBB2-12GM60-A2-3G-3D**

## Features

- **2 mm flush**
- **ATEX-approval for zone 2 and zone 22**

## Accessories

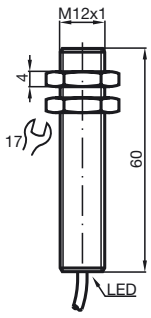
**BF 12**
Mounting flange, 12 mm

**EXG-12**
Quick mounting bracket with dead stop

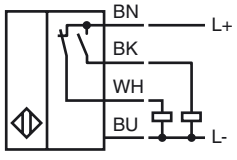
## Technical Data

| | | |
|---|---|---|
| **General specifications** | | |
| Switching function | | complementary |
| Output type | | PNP |
| Rated operating distance | $s_n$ | 2 mm |
| Installation | | flush |
| Output polarity | | DC |
| Assured operating distance | $s_a$ | 0 ... 1.62 mm |
| Reduction factor $r_{Al}$ | | 0.25 |
| Reduction factor $r_{Cu}$ | | 0.15 |
| Reduction factor $r_{304}$ | | 0.66 |
| **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 | $U_d$ | ≤ 3 V |
| Operating current | $I_L$ | 0 ... 200 mA |
| Off-state current | $I_r$ | 0 ... 0.5 mA typ. 0.1 µA at 25 °C |
| No-load supply current | $I_0$ | ≤ 20 mA |
| Switching state indicator | | LED, yellow |
| **Ambient conditions** | | |
| Ambient temperature | | -25 ... 70 °C (-13 ... 158 °F) |
| Storage temperature | | -40 ... 85 °C (-40 ... 185 °F) |
| **Mechanical specifications** | | |
| Connection type | | cable PVC , 2 m |
| Core cross-section | | 0.14 mm² |
| Housing material | | brass, nickel-plated |
| Sensing face | | PBT |
| Degree of protection | | IP67 |
| Cable | | |
| Bending radius | | > 10 x cable diameter |
| **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 | | CCC approval / marking not required for products rated ≤36 V |

## Dimensions




## Electrical Connection




Release date: 2016-11-07 10:12 Date of issue: 2016-11-07 211261_eng.xml

**Equipment protection level Gc (nA)**

| | |
|---|---|
| Instruction | **Manual electrical apparatus for hazardous areas** |
| **Device category 3G (nA)** | for use in hazardous areas with gas, vapour and mist |
| Certificate of Compliance | PF 15CERT3754 X |
| CE marking | CE |
| ATEX marking | Ex II 3G Ex nA IIC T6 Gc<br>The Ex-related marking can also be printed on the enclosed label. |
| Standards | EN 60079-0:2012+A11:2013, EN 60079-15:2010<br>Ignition protection category "n"<br>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.<br>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. 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. |
| 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 UB 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 $U_{Bmax}$<br>Information can be taken from the following list. |
| at $U_{Bmax}$=30 V, $I_L$=200 mA | 46 °C (114.8 °F) |
| at $U_{Bmax}$=30 V, $I_L$=100 mA | 51 °C (123.8 °F) |
| at $U_{Bmax}$=30 V, $I_L$=50 mA | 53 °C (127.4 °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. |
| Protection of the connection cable | The connection cable must be prevented from being subjected to tension and torsional loading. |
| Protection against transients | Ensure transient protection is provided and that the maximum value of the transient protection (140% of 85 V) is not exceeded. |
| 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. |
| Material selection accessories | When selecting accessories, ensure that the material allows the temperature of the enclosure to rise to up to 70 °C. |

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**Equipment protection level Dc (tc)**

| | |
|---|---|
| Instruction | **Manual electrical apparatus for hazardous areas** |
| **Device category 3D** | for use in hazardous areas with combustible dust |
| Certificate of Compliance | PF 15CERT3774 X |
| CE marking | CE |
| ATEX marking | Ex II 3D Ex tc IIIC T80°C Dc<br>The Ex-related marking can also be printed on the enclosed label. |
| Standards | EN 60079-0:2012+A11:2013, EN 60079-31:2014<br>Protection by enclosure "tc" Some of the information in this instruction manual is more specific than the information provided in the datasheet. |
| General | 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. |
| Installation, commissioning | 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 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! |
| 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.<br>High load currents and load short-circuits are not permitted. |
| 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 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 V, $I_L$=200 mA | 46 °C (114.8 °F) |
| at $U_{Bmax}$=30 V, $I_L$=100 mA | 51 °C (123.8 °F) |
| at $U_{Bmax}$=30 V, $I_L$=50 mA | 53 °C (127.4 °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. |
| Protection of the connection cable | The connection cable must be prevented from being subjected to tension and torsional loading. |
| 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. Do not attach the nameplate provided in areas where electrostatic charge can build up. |

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