

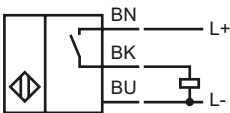
Model Number

NBB15-U1K-E2-3G-3D

Features

- 4 LEDs indicator for 360° visibility
- 15 mm embeddable

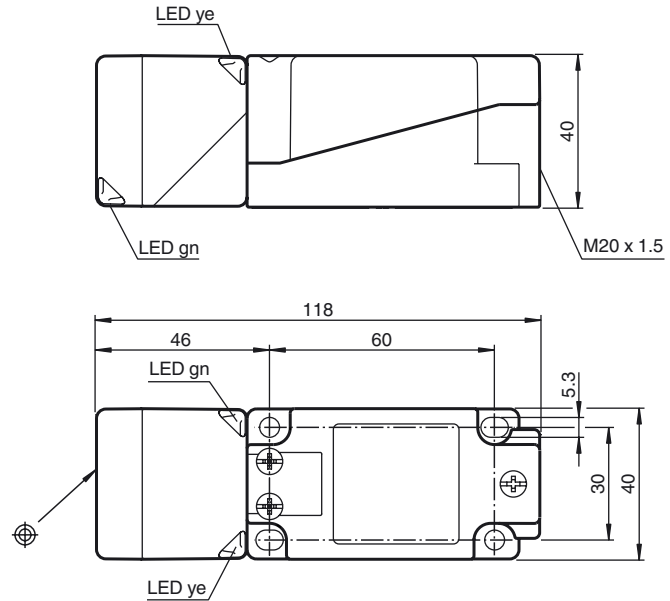
Connection



Accessories

MHW 01
Modular mounting bracket

Dimensions



Technical Data

General specifications

| | | |
|------------------------------|------------|----------------|
| Switching element function | PNP | NO |
| Rated operating distance | s_n | 15 mm |
| Installation | embeddable | |
| Output polarity | DC | |
| Assured operating distance | s_a | 0 ... 12.15 mm |
| Reduction factor r_{AI} | 0.33 | |
| Reduction factor r_{Cu} | 0.3 | |
| Reduction factor r_{303} | 0.74 | |
| Reduction factor r_{Brass} | 0.41 | |

Nominal ratings

| | | |
|-----------------------------------|----------------------------|---------------------------|
| Operating voltage | U_B | 10 ... 30 V |
| Switching frequency | f | 0 ... 200 Hz |
| Hysteresis | H | typ. 5 % |
| Reverse polarity protected | 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 typ. 0.01 mA |
| No-load supply current | I_0 | ≤ 20 mA |
| Operating voltage display | LED, green | |
| Indication of the switching state | LED, yellow | |

Ambient conditions

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

Mechanical specifications

| | |
|--------------------|---|
| Connection type | screw terminals |
| Core cross-section | up to 2.5 mm ² |
| Housing material | PA/metal |
| Sensing face | PA |
| Protection degree | IP68 / IP69K |
| Mass | 225 g |
| Note | Tightening torque: 1.8 Nm (housing) Tightening torque: 1.0 Nm (Screw terminal) |

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

| | |
|--------------|--|
| FM approval | hazardous (classified) location Nonincendive |
| UL approval | cULus Listed, General Purpose |
| CSA approval | cCSAus Listed, General Purpose |
| CCC approval | Products with a maximum operating voltage of ≤ 36 V do not bear a CCC marking because they do not require approval. |

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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

CE

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, $I_L=200$ mA

50 °C (122 °F)

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

53 °C (127.4 °F)

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

54 °C (129.2 °F)

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)

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.

Connections for external wire

Terminal connection: Minimum conductor cross-section: 0.5 mm², maximum conductor cross-section: 2.5 mm². The ends of the conductor must be provided with cable sleeves.



Lead insertion

The cable entry must be such, that no tension load or twist is applied to the cable

The protection category must be in accordance with EN 60529 and as stated in the data sheet.

The requirements of EN 60079-0 relating to the cable and lead entries are to be complied with.

ATEX 3D (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 |
| 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. 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. |
| 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_{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 $U_{Bmax}=30\text{ V}$, $I_L=200\text{ mA}$ | 50 °C (122 °F) |
| at $U_{Bmax}=30\text{ V}$, $I_L=100\text{ mA}$ | 53 °C (127.4 °F) |
| at $U_{Bmax}=30\text{ V}$, $I_L=50\text{ mA}$ | 54 °C (129.2 °F) |
| 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) |
| 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 | Sliding contact discharges must be avoided. |
| Connections for external wire | Terminal connection: Minimum conductor cross-section: 0.5 mm ² , maximum conductor cross-section: 2.5 mm ² . The ends of the conductor must be provided with cable sleeves. |
| Lead insertion | The cable entry must be such, that no tension load or twist is applied to the cable The protection category must be in accordance with EN 60529 and as stated in the data sheet. The requirements of EN 61241-0 relating to the cable and lead entries are to be complied with. The special characteristics of the ignition protection class "tD, method A" of the proximity switch must not be disregarded. |