Model Number

NBB15-U1K-E2-3G-3D

Features

- **Sensor head bidirectional and rotatable**
- **4 LEDs indicator for 360° visibility**
- **15 mm flush**

Accessories

MHW 01
Modular mounting bracket

Technical Data

General specifications		
Switching function		Normally open (NO)
Output type		PNP
Rated operating distance	s_n	15 mm
Installation		flush
Output polarity		DC
Assured operating distance	s_a	0 ... 12.15 mm
Actual operating distance	s_r	13.5 ... 16.5 mm typ. 15 mm
Reduction factor r_{Al}		0.33
Reduction factor r_{Cu}		0.3
Reduction factor r_{304}		0.74
Reduction factor r_{Brass}		0.41
Output type		3-wire
Nominal ratings		
Operating voltage	U_B	10 ... 30 V
Switching frequency	f	0 ... 200 Hz
Hysteresis	H	typ. 5 %
Reverse polarity protection		reverse polarity protected
Short-circuit protection		pulsing
Voltage drop	U_d	≤ 2 V
Voltage drop at I_L		
Voltage drop I_L = 1 mA, switching element on U_d		0.5 ... 2.3 V typ. 0.9 V
Voltage drop I_L = 10 mA, switching element on U_d		0.8 ... 2.2 V typ. 1.4 V
Voltage drop I_L = 20 mA, switching element on U_d		0.9 ... 2.3 V typ. 1.5 V
Voltage drop I_L = 50 mA, switching element on U_d		0.9 ... 2.5 V typ. 1.6 V
Voltage drop I_L = 100 mA, switching element on U_d		1 ... 2.6 V typ. 1.8 V
Voltage drop I_L = 200 mA, switching element on U_d		1.2 ... 2.8 V typ. 2 V
Design data		
Operating current	I_L	0 ... 200 mA
Off-state current	I_r	0 ... 0.5 mA typ. 0.01 mA
Off-state current T_U =40 °C, switching element off		≤ 100 µA
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		
$MTTF_d$		1242 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		0 %
Ambient conditions		
Ambient temperature		-25 ... 85 °C (-13 ... 185 °F)
Mechanical specifications		
Connection type		Connector plug M12 x 1 , 4-pin
Information for connection		A maximum of two conductors with the same core cross section may be mounted on one terminal connection! tightening torque 1.2 Nm + 10 %
Core cross-section		up to 2.5 mm^2
Minimum core cross-section		without wire end ferrule 0.5 mm^2 , with connector sleeves 0.34 mm^2
Maximum core cross-section		without wire end ferrule 2.5 mm^2 , with connector sleeves 1.5 mm^2
Housing material		PA
Sensing face		PA
Degree of protection		IP68 / IP69K
Mass		225 g
Note		Tightening torque: 1.8 Nm (housing)
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 EN 60947-5-2/A1:2012 IEC 60947-5-2:2007 IEC 60947-5-2 AMD 1:2012
Approvals and certificates		
FM approval		hazardous (classified) location Non-incendive
UL approval		cULus Listed, General Purpose
CCC approval		CCC approval / marking not required for products rated ≤36 V

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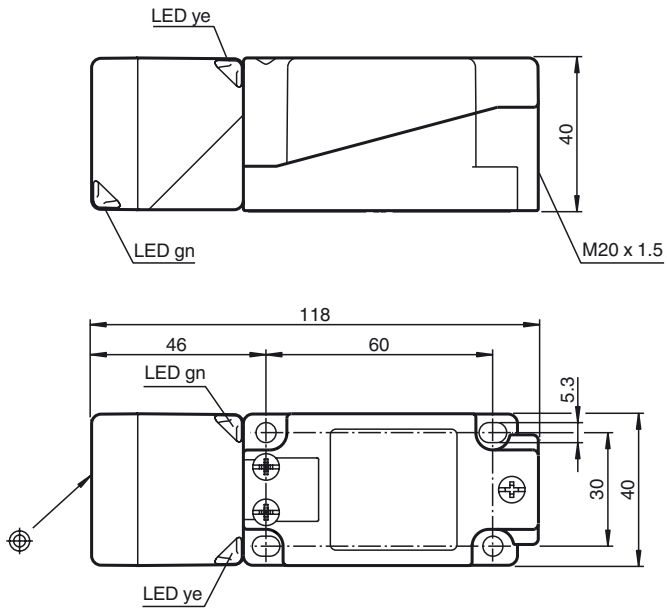
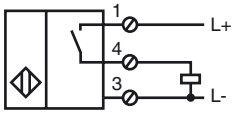
Dimensions



Electrical Connection



Equipment protection level Gc (nA)	
Certificate	PF 15CERT3754 X
CE marking	CE
ATEX marking	Ex II 3G Ex nA IIC T6 Gc The Ex-related marking can also be printed on the enclosed label.
Standards	EN 60079-0:2012+A11:2013, EN 60079-15:2010 Ignition protection category "n" Use is restricted to the following stated conditions
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} 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)
Equipment protection level Dc (tc)	
CE marking	CE
ATEX marking	Ex II 3D Ex tc IIIC T80°C Dc The Ex-related marking can also be printed on the enclosed label.
Standards	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.
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.
Special conditions	
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.

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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)

Equipment protection level Dc (tD)

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!

Special conditions

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)
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