0102

Model Number

NBB15-U1K-N0

Features

- **Sensor head bidirectional and rotatable**
- **15 mm flush**

Accessories

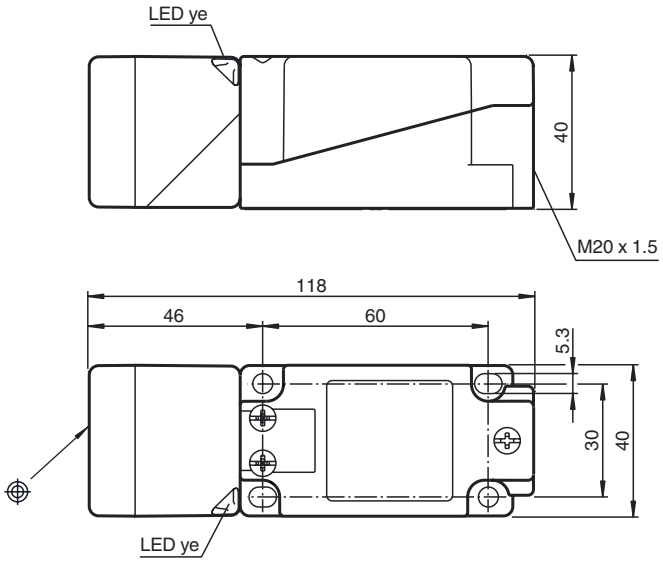
MHW 01
Modular mounting bracket

MH 04-2057B
Mounting aid for VariKont and +U1+

Technical Data

General specifications		
Switching element function		NAMUR, NC
Rated operating distance	s_n	15 mm
Installation		flush
Output polarity		NAMUR
Assured operating distance	s_a	0 ... 12.15 mm
Reduction factor r_{Al}		0.28
Reduction factor r_{Cu}		0.25
Reduction factor r_{304}		0.75
Nominal ratings		
Nominal voltage	U_o	8 V
Switching frequency	f	0 ... 400 Hz
Hysteresis	H	1 ... 15 typ. 5 %
Reverse polarity protection		reverse polarity protected
Short-circuit protection		yes
Current consumption		
Measuring plate not detected		≥ 3 mA
Measuring plate detected		≤ 1 mA
Switching state indicator		LED, yellow
Functional safety related parameters		
$MTTF_d$		1660 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		0 %
Ambient conditions		
Ambient temperature		-25 ... 100 °C (-13 ... 212 °F)
Storage temperature		-40 ... 100 °C (-40 ... 212 °F)
Mechanical specifications		
Connection type		screw terminals
Core cross-section		≤ 2.5 mm²
Housing material		PA
Sensing face		PA
Degree of protection		IP66 / 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		1G; 2G; 3G
Compliance with standards and directives		
Standard conformity		
NAMUR		EN 60947-5-6:2000 IEC 60947-5-6:1999
Electromagnetic compatibility		NE 21:2007
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 ≤36 V

Dimensions



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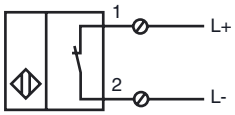
Electrical Connection



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ATEX 1G

Instruction	**Manual electrical apparatus for hazardous areas**
Device category 1G	for use in hazardous areas with gas, vapour and mist
EC-Type Examination Certificate	PTB 00 ATEX 2032 X
CE marking	CE 0102
ATEX marking	Ex II 1G Ex ia IIC T6…T1 Ga
Directive conformity	94/9/EG
Standards	EN 60079-0:2012, EN 60079-11:2012, EN 60079-26:2007 Ignition protection "Intrinsic safety" Use is restricted to the following stated conditions
Appropriate type	NBB15-U.K-N0...
Effective internal capacitance C_i	≤ 110 nF ; a cable length of 10 m is considered.
Effective internal inductance L_i	≤ 200 µH ; a cable length of 10 m is considered.
General	The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The EC-Type Examination Certificate has to be observed. The special conditions must be adhered to! Directive 94/9/EG and hence also EC-Type Examination Certificates apply in general only to the use of electrical apparatus under atmospheric conditions. The use in ambient temperatures of > 60 °C was tested with regard to hot surfaces by the mentioned certification authority. If the equipment is not used under atmospheric conditions, a reduction of the permissible minimum ignition energies may have to be taken into consideration.
Ambient temperature	The temperature ranges, according to temperature class, are given in the EC-Type Examination Certificate. Note: Use the temperature table for category 1 !!! The 20 % reduction in accordance with EN 1127-1:2007 has already been accounted for in the temperature table for category 1.
Installation, commissioning	Laws and/or regulations and standards governing the use or intended usage goal must be observed. The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety. The associated apparatus must satisfy the requirements of category ia. Due to the possible danger of ignition, which can arise due to faults and/or transient currents in the equipotential bonding system, galvanic isolation of the power supply and signal circuit is preferable. Associated apparatus without electrical isolation must only be used if the appropriate requirements of IEC 60079-14 are met.
Maintenance	No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

Special conditions

Protection from mechanical danger	When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.
Electrostatic charge	Additional requirements for gas group IIC. Information on electrostatic hazards can be found in the technical specification IEC/TS 60079-32-1. Avoid electrostatic charges that can cause electrostatic discharge when installing or operating the device.

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ATEX 2G

Instruction	**Manual electrical apparatus for hazardous areas**
Device category 2G	for use in hazardous areas with gas, vapour and mist
EC-Type Examination Certificate	PTB 00 ATEX 2032 X
CE marking	CE 0102
ATEX marking	Ex II 1G Ex ia IIC T6…T1 Ga
Directive conformity	94/9/EG
Standards	EN 60079-0:2012, EN 60079-11:2012 Ignition protection "Intrinsic safety" Use is restricted to the following stated conditions
Appropriate type	NBB15-U.K-N0...
Effective internal capacitance C_i	≤ 110 nF ; a cable length of 10 m is considered.
Effective internal inductance L_i	≤ 200 µH ; a cable length of 10 m is considered.
General	The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The EC-Type Examination Certificate has to be observed. The special conditions must be adhered to! Directive 94/9/EG and hence also EC-Type Examination Certificates apply in general only to the use of electrical apparatus under atmospheric conditions. The use in ambient temperatures of > 60 °C was tested with regard to hot surfaces by the mentioned certification authority. If the equipment is not used under atmospheric conditions, a reduction of the permissible minimum ignition energies may have to be taken into consideration.
Ambient temperature	The temperature ranges, according to temperature class, are given in the EC-Type Examination Certificate.
Installation, commissioning	Laws and/or regulations and standards governing the use or intended usage goal must be observed. The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety.
Maintenance	No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

Special conditions

Protection from mechanical danger	When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.
Electrostatic charge	Additional requirements for gas group IIC. Avoid electrostatic charges that can cause electrostatic discharge when installing or operating the device. Information on electrostatic hazards can be found in the technical specification IEC/TS 60079-32-1.

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ATEX 3G (ic)

Instruction	**Manual electrical apparatus for hazardous areas**
Device category 3G (ic)	for use in hazardous areas with gas, vapour and mist
Certificate of Compliance	PF 13 CERT 2895 X
CE marking	CE
ATEX marking	Ex II 3G Ex ic IIC T6…T1 Gc
Directive conformity	94/9/EG
Standards	EN 60079-0:2012, EN 60079-11:2012 Ignition protection category "ic" Use is restricted to the following stated conditions
Effective internal capacitance C_i	≤ 110 nF ; a cable length of 10 m is considered.
Effective internal inductance L_i	≤ 200 µH ; A cable length of 10 m is considered.
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. The sensor must only be operated with energy-limited circuits, which satisfy the requirements of IEC 60079-11. The explosion group complies with the connected, supplying, power limiting circuit.
Maintenance	No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.
Special conditions	
for Pi=34 mW, Ii=25 mA, T6	73 °C (163.4 °F)
for Pi=34 mW, Ii=25 mA, T5	88 °C (190.4 °F)
for Pi=34 mW, Ii=25 mA, T4-T1	100 °C (212 °F)
for Pi=64 mW, Ii=25 mA, T6	66 °C (150.8 °F)
for Pi=64 mW, Ii=25 mA, T5	81 °C (177.8 °F)
for Pi=64 mW, Ii=25 mA, T4-T1	100 °C (212 °F)
for Pi=169 mW, Ii=52 mA, T6	45 °C (113 °F)
for Pi=169 mW, Ii=52 mA, T5	60 °C (140 °F)
for Pi=169 mW, Ii=52 mA, T4-T1	89 °C (192.2 °F)
for Pi=242 mW, Ii=76 mA, T6	30 °C (86 °F)
for Pi=242 mW, Ii=76 mA, T5	45 °C (113 °F)
for Pi=242 mW, Ii=76 mA, T4-T1	74 °C (165.2 °F)
Electrostatic charge	Additional requirements for gas group IIC. Avoid electrostatic charges that can cause electrostatic discharge when installing or operating the device. Information on electrostatic hazards can be found in the technical specification IEC/TS 60079-32-1.
Connection parts	The connection parts are to be installed, such that a minimum protection class of IP20 is achieved, in accordance with IEC 60529.

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