



Model Number

NCB20-L2-N0-V1

Features

- Sensor head bidirectional and rotatable
- 20 mm flush
- Quick mounting bracket
- Usable up to SIL 2 acc. to IEC 61508

Accessories

V1-G-N-2M-PUR

Female cordset, M12, 2-pin, NAMUR, PUR cable

V1-W-N-2M-PUR

Female cordset, M12, 2-pin, NAMUR, PUR cable

MHW 01

Modular mounting bracket

Technical Data

General specifications

Switching function	Normally closed (NC)
Output type	NAMUR
Rated operating distance	s_n 20 mm
Installation	flush
Assured operating distance	s_a 0 ... 16.2 mm
Actual operating distance	s_r 18 ... 22 mm
Reduction factor r_{AI}	0.33
Reduction factor r_{CU}	0.31
Reduction factor r_{304}	0.74

Nominal ratings

Nominal voltage	U_o	8.2 V (R_i approx. 1 k Ω)
Switching frequency	f	0 ... 300 Hz
Hysteresis	H	typ. 5 %
Reverse polarity protection		reverse polarity protected
Short-circuit protection		yes
Current consumption		
Measuring plate not detected		≥ 2.2 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	Connector plug M12 x 1, 4-pin
Housing material	PA
Sensing face	PA
Degree of protection	IP66 / IP69K
Mass	130 g

General information

Use in the hazardous area	see instruction manuals
Category	1G; 2G; 3G; 3D

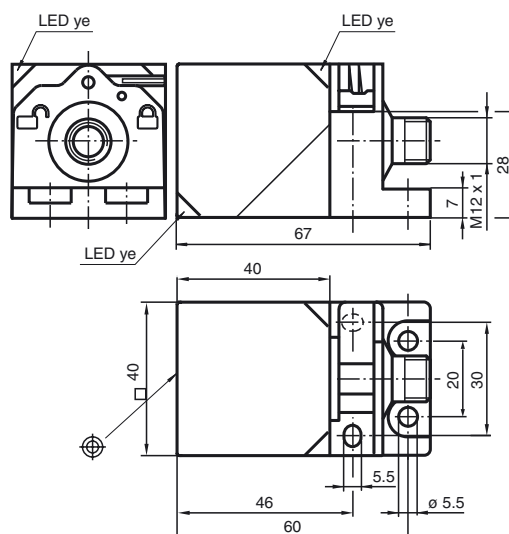
Compliance with standards and directives

Standard conformity	
NAMUR	EN 60947-5-6:2000 IEC 60947-5-6:1999
Standards	EN 60947-5-2:2007 EN 60947-5-2/A1:2012 IEC 60947-5-2:2007 IEC 60947-5-2 AMD 1:2012

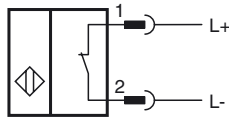
Approvals and certificates

EAC conformity	TR CU 012/2011
Protection class	II
Rated insulation voltage	U_i 253 V
Rated impulse withstand voltage	U_{imp} 4000 V
UL approval	
Ordinary Location	E87056
Hazardous Location	E501628
Control drawing	116-0451
CCC approval	CCC approval / marking not required for products rated ≤ 36 V

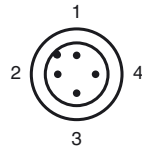
Dimensions



Electrical Connection



Pinout



Wire colors in accordance with EN 60947-5-6

1	BN	(brown)
2	BU	(blue)

Equipment protection level Ga

CE marking	CE 0102	
ATEX marking	II 1G Ex ia IIC T6...T1 Ga The Ex-related marking can also be printed on the enclosed label.	
Standards	EN 60079-0:2012+A11:2013 EN 60079-11:2012 Ignition protection "Intrinsic safety" Use is restricted to the following stated conditions	
Appropriate type	NCB20-L2-N0...	
Effective internal capacitance	C_i	$\leq 110 \text{ nF}$; a cable length of 10 m is considered.
Effective internal inductance	L_i	$\leq 200 \text{ }\mu\text{H}$; a cable length of 10 m is considered.
Ambient temperature	Details of the correlation between the type of circuit connected, the maximum permissible ambient temperature, the temperature class, and the effective internal reactance values can be found on the EC-type examination certificate. Note: Use the temperature table for category 1 !!! The 20 % reduction in accordance with EN 1127-1 has already been applied to the temperature table for category 1.	

Equipment protection level Gb

CE marking	CE 0102	
ATEX marking	II 1G Ex ia IIC T6...T1 Ga The Ex-related marking can also be printed on the enclosed label.	
Standards	EN 60079-0:2012+A11:2013, EN 60079-11:2012 Ignition protection "Intrinsic safety" Use is restricted to the following stated conditions	
Appropriate type	NCB20-L2-N0...	
Effective internal capacitance	C_i	$\leq 110 \text{ nF}$; a cable length of 10 m is considered.
Effective internal inductance	L_i	$\leq 200 \text{ }\mu\text{H}$; a cable length of 10 m is considered.
Maximum permissible ambient temperature T_{amb}	Details of the correlation between the type of circuit connected, the maximum permissible ambient temperature, the temperature class, and the effective internal reactance values can be found on the EC-type examination certificate.	

Release date: 2019-05-22 11:07 Date of issue: 2019-05-22 182705_eng.xml

Equipment protection level Gc (ic)

Certificate	PF 13 CERT 2895 X
CE marking	CE

ATEX marking	⊕ II 3G Ex ic IIC T6...T1 Gc The Ex-related marking can also be printed on the enclosed label.
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 μ H ; A cable length of 10 m is considered.

Special conditions

for $P_i=34$ mW, $I_i=25$ mA, T6	66 °C (150.8 °F)
for $P_i=34$ mW, $I_i=25$ mA, T5	81 °C (177.8 °F)
for $P_i=34$ mW, $I_i=25$ mA, T4-T1	100 °C (212 °F)
for $P_i=64$ mW, $I_i=25$ mA, T6	66 °C (150.8 °F)
for $P_i=64$ mW, $I_i=25$ mA, T5	81 °C (177.8 °F)
for $P_i=64$ mW, $I_i=25$ mA, T4-T1	100 °C (212 °F)
for $P_i=169$ mW, $I_i=52$ mA, T6	45 °C (113 °F)
for $P_i=169$ mW, $I_i=52$ mA, T5	60 °C (140 °F)
for $P_i=169$ mW, $I_i=52$ mA, T4-T1	89 °C (192.2 °F)
for $P_i=242$ mW, $I_i=76$ mA, T6	30 °C (86 °F)
for $P_i=242$ mW, $I_i=76$ mA, T5	45 °C (113 °F)
for $P_i=242$ mW, $I_i=76$ mA, T4-T1	74 °C (165.2 °F)

Equipment protection level Gc (nL)

Standard conformity	EN 60079-15:2005 Ignition protection category "n" 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 μ H ; 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! The ATEX Directive applies only to the use of apparatus under atmospheric conditions. If you use the device outside atmospheric conditions, consider that the permissible safety parameters should be reduced.
---------	--

Special conditions

for $P_i=34$ mW, $I_i=25$ mA, T6	66 °C (150.8 °F)
for $P_i=34$ mW, $I_i=25$ mA, T5	81 °C (177.8 °F)
for $P_i=34$ mW, $I_i=25$ mA, T4-T1	100 °C (212 °F)
for $P_i=64$ mW, $I_i=25$ mA, T6	66 °C (150.8 °F)
for $P_i=64$ mW, $I_i=25$ mA, T5	81 °C (177.8 °F)
for $P_i=64$ mW, $I_i=25$ mA, T4-T1	100 °C (212 °F)
for $P_i=169$ mW, $I_i=52$ mA, T6	45 °C (113 °F)
for $P_i=169$ mW, $I_i=52$ mA, T5	60 °C (140 °F)
for $P_i=169$ mW, $I_i=52$ mA, T4-T1	89 °C (192.2 °F)
for $P_i=242$ mW, $I_i=76$ mA, T6	30 °C (86 °F)
for $P_i=242$ mW, $I_i=76$ mA, T5	45 °C (113 °F)
for $P_i=242$ mW, $I_i=76$ mA, T4-T1	74 °C (165.2 °F)

Equipment protection level Da

ATEX marking	⊕ II 1D Ex ia IIIC T135°C Da The Ex-related marking can also be printed on the enclosed label.
Standards	EN 60079-0:2012+A11:2013 EN 60079-11:2012 Ignition protection "Intrinsic safety" Use is restricted to the following stated conditions
Appropriate type	NCB20-L2-N0...
Effective internal capacitance C_i	≤ 110 nF ; a cable length of 10 m is considered.
Effective internal inductance L_i	≤ 200 μ H ; a cable length of 10 m is considered.

Equipment protection level Dc

CE marking	CE 0102
ATEX marking	⊕ II 3D IP69K T 112 °C (233.6 °F) X
Standards	EN 50281-1-1 Protection via housing Use is restricted to the following stated conditions

Special conditions

Maximum heating (Temperature rise)	Values can be obtained from the following list, depending on the max. operating voltage U_{Bmax} and the minimum series resistance R_v .
at $U_{Bmax}=9$ V, $R_v=562$ Ω	12 K
using an amplifier in accordance with EN 60947-5-6	12 K

Equipment protection level Dc (tc)

CE marking	CE
ATEX marking	⊕ II 3D Ex tc IIIC T80°C Dc The Ex-related marking can also be printed on the enclosed label.

Release date: 2019-05-22 11:07 Date of issue: 2019-05-22 182705_eng.xml

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}	Values can be obtained from the following list, depending on the max. operating voltage $U_{b\ max}$ and the minimum series resistance R_v .
at $U_{Bmax}=9\ V, R_v=562\ \Omega$	57 °C (134.6 °F)
using an amplifier in accordance with EN 60947-5-6	57 °C (134.6 °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	
Minimum series resistance R_v	A minimum series resistance R_v is to be provided between the power supply voltage and the proximity switch in accordance with the following list. This can also be assured by using a switch amplifier.
Maximum permissible ambient temperature T_{Umax}	Values can be obtained from the following list, depending on the max. operating voltage $U_{b\ max}$ and the minimum series resistance R_v .
at $U_{Bmax}=9\ V, R_v=562\ \Omega$	57 °C (134.6 °F)
using an amplifier in accordance with EN 60947-5-6	57 °C (134.6 °F)