



Model Number

NCB10-30GM40-N0-V1

Features

- 10 mm flush
- Usable up to SIL 2 acc. to IEC 61508
- Stainless steel housing

Technical Data

General specifications

Switching function		Normally closed (NC)
Output type		NAMUR
Rated operating distance	s_n	10 mm
Installation		flush
Assured operating distance	s_a	0 ... 8.1 mm
Actual operating distance	s_r	9 ... 11 mm typ.
Reduction factor r_{AI}		0.35
Reduction factor r_{Cu}		0.3
Reduction factor r_{304}		0.75

Nominal ratings

Nominal voltage	U_o	8 V
Switching frequency	f	0 ... 200 Hz
Hysteresis	H	1 ... 15 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		Multihole-LED, yellow

Functional safety related parameters

MTTF _d	1821 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 M12 x 1, 4-pin
Housing material	Stainless steel 1.4305 / AISI 303
Sensing face	PBT
Degree of protection	IP67

General information

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

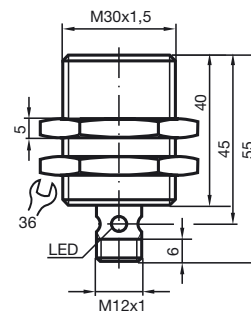
Compliance with standards and directives

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

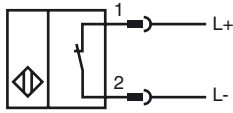
Approvals and certificates

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



Electrical Connection



Wire colors in accordance with EN 60947-5-6

1		BN	(brown)
2		BU	(blue)

Equipment protection level Ga

Instruction

Device category 1G
 EC-Type Examination Certificate
 CE marking

ATEX marking

Standards

Appropriate type

Effective internal inductivity C_i Effective internal inductance L_i

General

Ambient temperature

Installation, commissioning

Maintenance

Special conditions

Protection from mechanical danger


Electrostatic charge

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist

PTB 00 ATEX 2048 X

CE0102

 II 1G Ex ia IIC T6...T1 Ga The Ex-related marking can also be printed on the enclosed label.

EN 60079-0:2012+A11:2013 EN 60079-11:2012 Ignition protection "Intrinsic safety"
 Use is restricted to the following stated conditions

NCB10-30GM...-N0...

≤ 105 nF ; a cable length of 10 m is considered.

≤ 100 μH ; a cable length of 10 m is considered.

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The EU-type examination certificate has to be observed. The special conditions must be adhered to!

The ATEX directive and therefore the EU-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.

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.

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. 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.

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

The connecting parts of the sensor must be set up in such a way that degree of protection IP20, in accordance with IEC 60529, is achieved as a minimum.

When using the device in a temperature range of -60 °C to -20 °C, protect the sensor against the effects of impact by installing an additional enclosure.

The information regarding the minimum ambient temperature for the sensor as provided in the datasheet must also be observed.

When used in group IIC non-permissible electrostatic charges should be avoided on the plastic housing parts. 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. 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.

Equipment protection level Gb

Instruction

Device category 2G

EC-Type Examination Certificate

CE marking

ATEX marking

Standards

Appropriate type

Effective internal inductivity C_i Effective internal inductance L_i

General

Maximum permissible ambient temperature T_{amb}

Installation, commissioning

Maintenance

Special conditions

Protection from mechanical danger

Electrostatic charge

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist

PTB 00 ATEX 2048 X

CE 0102

Ⓔ II 1G Ex ia IIC T6...T1 Ga

The Ex-significant identification is on the enclosed adhesive label

EN 60079-0:2012+A11:2013 EN 60079-11:2012 Ignition protection "Intrinsic safety"
Use is restricted to the following stated conditions

NCB10-30GM...-N0...

≤ 105 nF ; a cable length of 10 m is considered.

≤ 100 μH ; a cable length of 10 m is considered.

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The EU-type examination certificate has to be observed. The special conditions must be adhered to!

The ATEX directive and therefore the EU-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.

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.

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.

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.

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

The connecting parts of the sensor must be set up in such a way that degree of protection IP20, in accordance with IEC 60529, is achieved as a minimum.

When using the device in a temperature range of -60 °C to -20 °C, protect the sensor against the effects of impact by installing an additional enclosure. The information regarding the minimum ambient temperature for the sensor as provided in the datasheet must also be observed.

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.

Equipment protection level Gc (nL)

Note

This instruction is only valid for products according to EN 60079-15:2005, valid until 01-May-2013

Instruction**Manual electrical apparatus for hazardous areas****Device category 3G (nL)**

for use in hazardous areas with gas, vapour and mist

CE marking



ATEX marking

⊕ II 3G Ex nL IIC T6 X The Ex-significant identification is on the enclosed adhesive label

Standard conformity

EN 60079-15:2005 Ignition protection category "n"
Use is restricted to the following stated conditions

Effective internal capacitance C_i

≤ 105 nF ; a cable length of 10 m is considered.

Effective internal inductance L_i

≤ 100 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.

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 an energy-limited circuit, which satisfies the requirements of IEC 60079-15. The explosion group complies with the connected, supplying, power limiting circuit. The adhesive label provided must be affixed in the immediate vicinity of the sensor! The surface to which the label is applied must be clean, flat and free from grease! The affixed adhesive label must be readable and durable, taking account 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

for $P_i=34$ mW, $I_i=25$ mA, T6

55 °C (131 °F)

for $P_i=34$ mW, $I_i=25$ mA, T5

55 °C (131 °F)

for $P_i=34$ mW, $I_i=25$ mA, T4-T1

55 °C (131 °F)

for $P_i=64$ mW, $I_i=25$ mA, T6

55 °C (131 °F)

for $P_i=64$ mW, $I_i=25$ mA, T5

55 °C (131 °F)

for $P_i=64$ mW, $I_i=25$ mA, T4-T1

55 °C (131 °F)

for $P_i=169$ mW, $I_i=52$ mA, T6

52 °C (125.6 °F)

for $P_i=169$ mW, $I_i=52$ mA, T5

52 °C (125.6 °F)

for $P_i=169$ mW, $I_i=52$ mA, T4-T1

52 °C (125.6 °F)

for $P_i=242$ mW, $I_i=76$ mA, T6

44 °C (111.2 °F)

for $P_i=242$ mW, $I_i=76$ mA, T5

44 °C (111.2 °F)

for $P_i=242$ mW, $I_i=76$ mA, T4-T1

44 °C (111.2 °F)

Protection from mechanical danger

The sensor must not be exposed to **ANY FORM** of 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.

Protection from UV light

The sensor must be protected against harmful UV radiation. This can be achieved by using the sensor indoors.

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.

Connection parts

The connection parts are to be installed, such that a minimum protection class of IP20 is achieved, in accordance with IEC 60529.

Equipment protection level Gc (ic)

Instruction

Device category 3G (ic)

Certificate of Compliance

CE marking

ATEX marking

Standards

Effective internal inductivity C_i Effective internal inductance L_i

General

Installation, commissioning

Maintenance

Special conditionsfor $P_i=34$ mW, $I_i=25$ mA, T6for $P_i=34$ mW, $I_i=25$ mA, T5for $P_i=34$ mW, $I_i=25$ mA, T4-T1for $P_i=64$ mW, $I_i=25$ mA, T6for $P_i=64$ mW, $I_i=25$ mA, T5for $P_i=64$ mW, $I_i=25$ mA, T4-T1for $P_i=169$ mW, $I_i=52$ mA, T6for $P_i=169$ mW, $I_i=52$ mA, T5for $P_i=169$ mW, $I_i=52$ mA, T4-T1for $P_i=242$ mW, $I_i=76$ mA, T6for $P_i=242$ mW, $I_i=76$ mA, T5for $P_i=242$ mW, $I_i=76$ mA, T4-T1

Protection from mechanical danger

Electrostatic charge

Connection parts

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist

PF 13 CERT 2895 X

CE

II 3G Ex ic IIC T6...T1 Gc

The Ex-significant identification is on the enclosed adhesive label

EN 60079-0:2012+A11:2013 EN 60079-11:2012 Ignition protection category "ic"

Use is restricted to the following stated conditions

 ≤ 105 nF ; a cable length of 10 m is considered. ≤ 100 μ H ; A cable length of 10 m is considered.

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.

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. 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 adhesive label 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!

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

55 °C (131 °F)

55 °C (131 °F)

55 °C (131 °F)

55 °C (131 °F)

55 °C (131 °F)

55 °C (131 °F)

52 °C (125.6 °F)

52 °C (125.6 °F)

52 °C (125.6 °F)

44 °C (111.2 °F)

44 °C (111.2 °F)

44 °C (111.2 °F)

The sensor must not be mechanically damaged.

When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.

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.

The connection parts are to be installed, such that a minimum protection class of IP20 is achieved, in accordance with IEC 60529.

Equipment protection level Da

Instruction

Device category 1D

EC-Type Examination Certificate

CE marking

ATEX marking

Standards

Appropriate type

Effective internal inductivity C_i Effective internal inductance L_i

General

Maximum permissible ambient temperature T_{amb}

Installation, commissioning

Maintenance

Special conditions

Protection from mechanical danger


Electrostatic charge

Manual electrical apparatus for hazardous areas

for use in hazardous areas with combustible dust

PTB 00 ATEX 2048 X

CE0102

 II 1D Ex ia IIIC T135°C Da The Ex-related marking can also be printed on the enclosed label.

EN 60079-0:2012+A11:2013 EN 60079-11:2012 Ignition protection "Intrinsic safety"
Use is restricted to the following stated conditions

NCB10-30GM...-N0...

≤ 105 nF ; a cable length of 10 m is considered.

≤ 100 μH ; a cable length of 10 m is considered.

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual.

The EU-type examination certificate has to be observed.

The ATEX directive and therefore the EU-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.

Details of the correlation between the type of circuit connected, the maximum permissible ambient temperature, the surface temperature, and the effective internal reactance values can be found on the EC-type-examination certificate.

The maximum permissible ambient temperature of the data sheet must be noted, in addition, the lower of the two values must be maintained.

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.

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.

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

The connecting parts of the sensor must be set up in such a way that degree of protection IP20, in accordance with IEC 60529, is achieved as a minimum.

When using the device in a temperature range of -60 °C to -20 °C, protect the sensor against the effects of impact by installing an additional enclosure. The information regarding the minimum ambient temperature for the sensor as provided in the datasheet must also be observed.

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. 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. Do not attach the nameplate provided in areas where electrostatic charge can build up.

Equipment protection level Dc (tD)

Instruction	Manual electrical apparatus for hazardous areas
Device category 3D CE marking	for use in hazardous areas with non-conducting combustible dust CE
ATEX marking	⊕ II 3D Ex tD A22 IP67 T80°C X The Ex-significant identification is on the enclosed adhesive label
Standards	EN 61241-0:2006, EN 61241-1:2004 Protection via housing "tD" 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. 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	The statutory requirements, directives and standards applicable to the intended use and application must be observed. The adhesive label provided must be affixed in the immediate vicinity of the sensor! The surface to which the label is applied must be clean, flat and free from grease! The affixed adhesive label must be readable and durable, taking account 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	
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 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} at $U_{Bmax}=9\text{ V}$, $R_V=562\ \Omega$ using an amplifier in accordance with EN 60947-5-6	Values can be obtained from the following list, depending on the max. operating voltage U_b max and the minimum series resistance R_v . 66 °C (150.8 °F) 66 °C (150.8 °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.
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.
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) The plug connection can only be separated using a tool. This is achieved by using the locking protection V1-Clip (Mounting accessory from Pepperl + Fuchs).

Equipment protection level Dc (tc)

Instruction

Device category 3DCertificate of Compliance
CE marking

ATEX marking

Standards

General

Installation, commissioning

Maintenance

Special conditionsMinimum series resistance R_V Maximum operating voltage U_{Bmax} Maximum permissible ambient temperature T_{Umax} at $U_{Bmax}=9\text{ V}$, $R_V=562\ \Omega$

using an amplifier in accordance with EN 60947-5-6

Protection from mechanical danger

Protection from UV light

Electrostatic charge

Plug connector

Manual electrical apparatus for hazardous areas

for use in hazardous areas with combustible dust

PF 15CERT3774 X



II 3D Ex tc IIIC T80°C Dc

The Ex-related marking can also be printed on the enclosed label.

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.

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.

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 adhesive label 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!

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

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.The maximum permissible operating voltage U_{Bmax} must be restricted to the values given in the following list. Tolerances are not permitted.Values can be obtained from the following list, depending on the max. operating voltage $U_{b\ max}$ and the minimum series resistance R_V .

66 °C (150.8 °F)

66 °C (150.8 °F)

The sensor must not be exposed to **ANY FORM** of mechanical danger.

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 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. 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. Do not attach the nameplate provided in areas where electrostatic charge can build up.

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)