



### 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 $\Omega$ )
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	$\geq 2.2$ mA
Measuring plate detected	$\leq 1$ mA
Switching state indicator	LED, yellow

### Functional safety related parameters

MTTF <sub>d</sub>	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 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

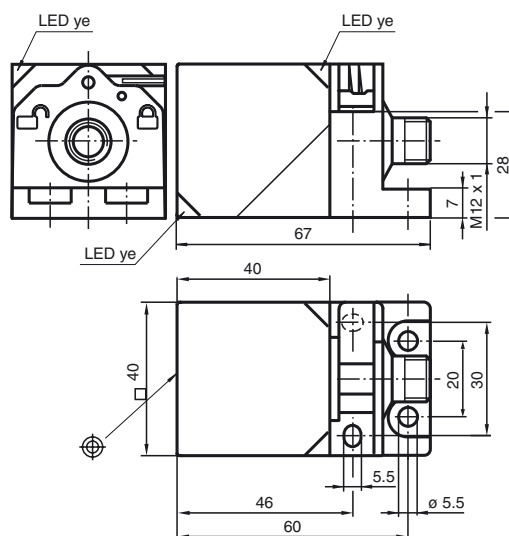
### Compliance with standards and directives

Standard conformity	
NAMUR	EN 60947-5-6:2000 IEC 60947-5-6:1999
Standards	EN 60947-5-2:2007 IEC 60947-5-2:2007

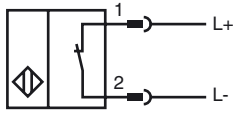
### Approvals and certificates

Protection class	II
Rated insulation voltage	$U_i$ 253 V
Rated impulse withstand voltage	$U_{imp}$ 4000 V
UL approval	cULus Listed, General Purpose
CSA approval	cCSAus Listed, General Purpose
CCC approval	CCC approval / marking not required for products rated $\leq 36$ V

## Dimensions



Electrical Connection



Pinout



Wire colors in accordance with EN 60947-5-6

1	BN	(brown)
2	BU	(blue)

**Equipment protection level Ga**

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 2032 X

CE 0102

Ex 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

NCB20-L2-N0...

 $\leq 110$  nF ; a cable length of 10 m is considered. $\leq 200$   $\mu$ 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 EU-type examination certificate has to be observed. The special conditions must be adhered to! Directive 94/9/EC and therefore the EC-type-examination certificates generally apply only to the use of electrical apparatus under atmospheric conditions. The device has been checked for suitability for use at ambient temperatures of  $\leq 60$  °C by the named certification authority. The surface temperature of the device remains within the required limits. 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 2032 X

CE 0102

Ⓔ 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

NCB20-L2-N0...

 $\leq 110$  nF ; a cable length of 10 m is considered. $\leq 200$   $\mu$ 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 EU-type examination certificate has to be observed. The special conditions must be adhered to! Directive 94/9/EC and therefore the EC-type-examination certificates generally apply only to the use of electrical apparatus under atmospheric conditions. The device has been checked for suitability for use at ambient temperatures of  $\geq 60$  °C by the named certification authority. The surface temperature of the device remains within the required limits. 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

CE 0102

ATEX marking

⊕ II 3G Ex nL IIC T6 X

Standard conformity

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

Effective internal capacitance  $C_i$ 

$\leq 110$  nF ; a cable length of 10 m is considered.

Effective internal inductance  $L_i$ 

$\leq 200$   $\mu$ 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.

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

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)

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 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.

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

CE marking

ATEX marking

Standards

Effective internal inductivity  $C_i$ Effective internal inductance  $L_i$ 

General

Installation, commissioning

Maintenance

**Special conditions**for  $P_i=34$  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****Ex** II 3G Ex ic IIC T6...T1 Gc

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

EN 60079-0:2012, EN 60079-11:2012 Ignition protection category "ic"

Use is restricted to the following stated conditions

 $\leq 110$  nF ; a cable length of 10 m is considered. $\leq 200$   $\mu$ 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! After opening the housing, you should check that the seal is in the correct position and is clean and intact before closing the housing again.

No changes can be made to apparatus, which are operated in hazardous areas.

Repairs to these apparatus are not possible.

66 °C (150.8 °F)

81 °C (177.8 °F)

100 °C (212 °F)

66 °C (150.8 °F)

81 °C (177.8 °F)

100 °C (212 °F)

45 °C (113 °F)

60 °C (140 °F)

89 °C (192.2 °F)

30 °C (86 °F)

45 °C (113 °F)

74 °C (165.2 °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

ATEX marking

Standards

Appropriate type

Effective internal inductivity  $C_i$ Effective internal inductance  $L_i$ 

General

Permissible ambient temperature range

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 2032 X

Ⓔ 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

NCB20-L2-N0...

≤ 110 nF ; a cable length of 10 m is considered.

≤ 200 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 are in general only applicable to the use of electrical apparatus operating at 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. After opening the housing, you should check that the seal is in the correct position and is clean and intact before closing the housing again.

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.

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

**Equipment protection level Dc**

Note		<b>This instruction is only valid for products according to EN 50281-1-1, valid until 30-September-2008</b> Note the ex-marking on the sensor or on the enclosed adhesive label
<b>Instruction</b>		<b>Manual electrical apparatus for hazardous areas</b>
<b>Device category 3D</b>		for use in hazardous areas with non-conducting combustible dust
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
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 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.
<b>Special conditions</b>		
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.
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 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 $U_{Bmax}=9\text{ V}$ , $R_V=562\ \Omega$		12 K
using an amplifier in accordance with EN 60947-5-6		12 K
Protection from mechanical danger		The sensor must not be mechanically damaged.
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 disconnected under voltage. The proximity switch is marked as follows: "DO NOT DISCONNECT UNDER VOLTAGE!" When the plug connector is disconnected the ingress of dirt into the inner areas (i.e. the areas, which are not accessible in the plugged-in condition) must be prevented. 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 (tD)

Note	<b>This instruction is only valid for products according to EN 61241-0:2006 and EN 61241-1:2004</b> Note the ex-marking on the sensor or on the enclosed adhesive label
<b>Instruction</b>	<b>Manual electrical apparatus for hazardous areas</b>
<b>Device category 3D</b>	for use in hazardous areas with non-conducting combustible dust
CE marking	
ATEX marking	 II 3D Ex tD A22 IP67 T80°C X
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	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.
<b>Special conditions</b>	
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 $T_{Umax}$	Values can be obtained from the following list, depending on the max. operating voltage $U_{Bmax}$ and the minimum series resistance $R_V$ .
at $U_{Bmax}=9\text{ V}$ , $R_V=562\ \Omega$	57 °C (134.6 °F)
using an amplifier in accordance with EN 60947-5-6	57 °C (134.6 °F)
Protection from mechanical danger	The sensor must not be exposed to <b>ANY FORM</b> 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 3D

Certificate  
CE marking

ATEX marking

Standards

General

Installation, commissioning

Maintenance

## Special conditions

Minimum 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

CE

Ex 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](http://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  $U_{Bmax}$  and the minimum series resistance  $R_V$ .

57 °C (134.6 °F)

57 °C (134.6 °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). If connectors are required for the installation, then the following points must be observed: ♦ The connectors must be certified in accordance with the application.

♦ The temperature range of the connectors must be selected according to the application.

♦ The degree of protection must not be reduced by the connectors.

Seal the housing. Use a seal that meets the requirements of the application. 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).