



## Model Number

NCB2-12GM35-N0-V1

## Features

- 2 mm flush
- Usable up to SIL2 acc. to IEC 61508

## Technical Data

### General specifications

|                            |       |               |
|----------------------------|-------|---------------|
| Switching element function |       | NAMUR, NC     |
| Rated operating distance   | $s_n$ | 2 mm          |
| Installation               |       | flush         |
| Output polarity            |       | NAMUR         |
| Assured operating distance | $s_a$ | 0 ... 1.62 mm |
| Reduction factor $r_{Al}$  |       | 0.23          |
| Reduction factor $r_{Cu}$  |       | 0.21          |
| Reduction factor $r_{304}$ |       | 0.7           |

### Nominal ratings

|                              |       |                                                     |
|------------------------------|-------|-----------------------------------------------------|
| Nominal voltage              | $U_o$ | 8.2 V ( $R_i$ approx. 1 k $\Omega$ )                |
| Operating voltage            | $U_B$ | 5 ... 25 V                                          |
| Switching frequency          | $f$   | 0 ... 1000 Hz                                       |
| Hysteresis                   | $H$   | 1 ... 10 typ. 5 %                                   |
| Reverse polarity protection  |       | reverse polarity protected                          |
| Short-circuit protection     |       | yes                                                 |
| Suitable for 2:1 technology  |       | yes, Reverse polarity protection diode not required |
| Current consumption          |       |                                                     |
| Measuring plate not detected |       | $\geq 2.2$ mA                                       |
| Measuring plate detected     |       | $\leq 1$ mA                                         |
| Switching state indicator    |       | Multihole-LED, yellow                               |

### Functional safety related parameters

|                          |        |
|--------------------------|--------|
| MTTF <sub>d</sub>        | 2698 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 | IP66 / IP67                       |

### General information

|                           |                                          |
|---------------------------|------------------------------------------|
| Scope of delivery         | 2 self locking nuts in scope of delivery |
| Use in the hazardous area | see instruction manuals                  |
| Category                  | 1G; 2G; 1D                               |

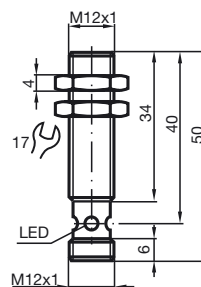
### Compliance with standards and directives

|                               |                                         |
|-------------------------------|-----------------------------------------|
| Standard conformity           |                                         |
| NAMUR                         | EN 60947-5-6:2000<br>IEC 60947-5-6:1999 |
| Electromagnetic compatibility | NE 21:2007                              |
| Standards                     | EN 60947-5-2:2007<br>IEC 60947-5-2:2007 |

### Approvals and certificates

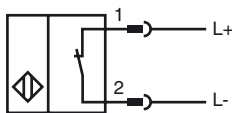
|                 |                                                                    |
|-----------------|--------------------------------------------------------------------|
| FM approval     |                                                                    |
| Control drawing | 116-0165F                                                          |
| 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



Wire colors in accordance with EN 60947-5-6

|   |  |    |         |
|---|--|----|---------|
| 1 |  | BN | (brown) |
| 2 |  | BU | (blue)  |

**ATEX 1G**

Instruction

Device category 1G

EC-Type Examination Certificate

CE marking

ATEX marking

Directive conformity

Standards

Appropriate type

Effective internal capacitance  $C_i$ 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

CE 0102

II 1G Ex ia IIC T6...T1 Ga

94/9/EG

EN 60079-0:2012, EN 60079-11:2012, EN 60079-26:2007

Ignition protection "Intrinsic safety"

Use is restricted to the following stated conditions

NCB2-12GM...-N0...

 $\leq 90$  nF ; a cable length of 10 m is considered. $\leq 100$   $\mu$ 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 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.

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.

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.

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

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.

## ATEX 2G

Instruction

### Device category 2G

EC-Type Examination Certificate

CE marking

ATEX marking

Directive conformity

Standards

Appropriate type

Effective internal capacitance  $C_i$

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

 0102

 II 1G Ex ia IIC T6...T1 Ga

94/9/EG

EN 60079-0:2012, EN 60079-11:2012

Ignition protection "Intrinsic safety"

Use is restricted to the following stated conditions

NCB2-12GM...-N0...

$\leq 90$  nF ; a cable length of 10 m is considered.

$\leq 100$   $\mu$ 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 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.

The temperature ranges, according to temperature class, are given in 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.

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

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.

**ATEX 1D**

Instruction

**Device category 1D**

EC-Type Examination Certificate

CE marking

ATEX marking

Directive conformity

Standards

Appropriate type

Effective internal capacitance  $C_i$ Effective internal inductance  $L_i$ 

General

Maximum housing surface temperature

Installation, commissioning

Maintenance

**Special conditions**

Electrostatic charge

**Manual electrical apparatus for hazardous areas**

for use in hazardous areas with combustible dust

ZELM 03 ATEX 0128 X

CE 0102

Ⓔ II 1D Ex iaD 20 T 108 °C (226.4 °F)

The Ex-significant identification is on the enclosed adhesive label

94/9/EG

IEC 61241-11:2002: draft; prEN61241-0:2002

type of protection intrinsic safety "iD"

Use is restricted to the following stated conditions

NCB2-12GM...-N0...

≤ 90 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 EC-Type Examination Certificate has to be observed.

The special conditions must be adhered to!

The maximum surface temperature of the housing is given in 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.

The associated apparatus must satisfy at least the requirements of category Ia IIB or iaD. Because of the possibility of the danger of ignition, which can arise due to faults and/or transient currents in the equipotential bonding system, galvanic isolation in the power supply and signal circuits is preferable. Associated apparatus without electrical isolation must only be used if the appropriate requirements of IEC 60079-14 are met.

The intrinsically safe circuit has to be protected against influences due to lightning. When used in the isolating wall between Zone 20 and Zone 21 or Zone 21 und Zone 22 the sensor must not be exposed to any mechanical danger and must be sealed in such a way, that the protective function of the isolating wall is not impaired. The applicable directives and standards 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!

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

Repairs to these apparatus are not possible.

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.