



## Model Number

NCN4-12GM35-N0-V1

## Features

- 4 mm non-flush
- Usable up to SIL 2 acc. to IEC 61508

## Technical Data

### General specifications

|                            |       |                      |
|----------------------------|-------|----------------------|
| Switching function         |       | Normally closed (NC) |
| Output type                |       | NAMUR                |
| Rated operating distance   | $s_n$ | 4 mm                 |
| Installation               |       | non-flush            |
| Assured operating distance | $s_a$ | 0 ... 3.24 mm        |
| Actual operating distance  | $s_r$ | 3.6 ... 4.4 mm typ.  |
| Reduction factor $r_{AI}$  |       | 0.37                 |
| Reduction factor $r_{CU}$  |       | 0.36                 |
| Reduction factor $r_{304}$ |       | 0.74                 |
| Output type                |       | 2-wire               |

### Nominal ratings

|                              |       |                                      |
|------------------------------|-------|--------------------------------------|
| Nominal voltage              | $U_o$ | 8.2 V ( $R_i$ approx. 1 k $\Omega$ ) |
| Switching frequency          | f     | 0 ... 800 Hz                         |
| Hysteresis                   | H     | 1 ... 10 typ. 5 %                    |
| Reverse polarity protection  |       | reverse polarity protected           |
| Short-circuit protection     |       | yes                                  |
| Current consumption          |       |                                      |
| Measuring plate not detected |       | $\geq 3$ mA                          |
| Measuring plate detected     |       | $\leq 1$ mA                          |
| Switching state indicator    |       | Multihole-LED, yellow                |

### Functional safety related parameters

|                              |        |
|------------------------------|--------|
| Safety Integrity Level (SIL) | SIL 2  |
| MTTF <sub>d</sub>            | 2520 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     | Stainless steel 1.4305 / AISI 303 |
| Sensing face         | PBT                               |
| Degree of protection | IP67                              |

### General information

|                           |  |
|---------------------------|--|
| Scope of delivery         | 2 self locking nuts in scope of delivery |
| Use in the hazardous area | see instruction manuals                  |

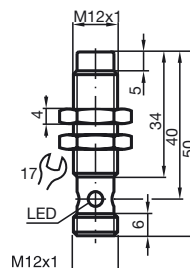
### Compliance with standards and directives

|                               |   |
|-------------------------------|---|
| 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>EN 60947-5-2/A1:2012<br>IEC 60947-5-2:2007<br>IEC 60947-5-2 AMD 1:2012 |

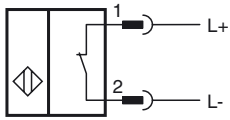
### Approvals and certificates

|                    |  |
|--------------------|--|
| EAC conformity     | TR CU 012/2011   |
| FM approval        |  |
| Control drawing    | 116-0165   |
| UL approval        |  |
| Ordinary Location  | E87056   |
| Hazardous Location | E501628  |
| Control drawing    | 116-0452   |
| 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)  |

**Data for application in connection with hazardous areas**

|                            |                             |
|----------------------------|-----------------------------|
| Equipment protection level | Ga , Gb , Gc (ic) , Da , Mb |
|----------------------------|-----------------------------|

**Equipment protection level Ga**

|                    |                  |
|--------------------|------------------|
| Type of protection | intrinsic safety |
| CE marking         | CE 0102          |

**Certificates**

|                   |   |
|-------------------|---|
| Appropriate type  | NCN4-12GM...-N0...                          |
| ATEX certificate  | PTB 00 ATEX 2048 X                          |
| ATEX marking      | Ⓔ II 1G Ex ia IIC T6...T1 Ga                |
| Standards         | EN 60079-0:2012+A11:2013 , EN 60079-11:2012 |
| IECEX certificate | IECEX PTB 11.0037X                          |
| IECEX marking     | Ex ia IIC T6...T1 Ga                        |
| Standards         | IEC 60079-0:2011 , IEC 60079-11:2011        |

|                                |       |   |
|--------------------------------|-------|---|
| Effective internal capacitance | $C_i$ | $\leq 95 \text{ nF}$<br>A cable length of 10 m is considered. |
|--------------------------------|-------|---|

|                               |       |   |
|-------------------------------|-------|---|
| Effective internal inductance | $L_i$ | $\leq 100 \text{ }\mu\text{H}$<br>A cable length of 10 m is considered. |
|-------------------------------|-------|---|

|   |  |
|---|--|
| Maximum permissible ambient temperature $T_{amb}$ | Also observe the maximum permissible ambient temperature stated in the general technical data.<br>Keep to the lower of the two values. |
|---|--|

|          |  |
|----------|--|
| for ATEX | <p>at <math>U_i = 16 \text{ V}</math> , <math>I_i = 25 \text{ mA}</math> , <math>P_i = 34 \text{ mW}</math> ,<br/> <math>T_6 : 59 \text{ }^\circ\text{C}</math> (138.2 °F)<br/> <math>T_5 : 71 \text{ }^\circ\text{C}</math> (159.8 °F)<br/> <math>T_4 : 99 \text{ }^\circ\text{C}</math> (210.2 °F)<br/> <math>T_3 : 99 \text{ }^\circ\text{C}</math> (210.2 °F)<br/> <math>T_2 : 99 \text{ }^\circ\text{C}</math> (210.2 °F)<br/> <math>T_1 : 99 \text{ }^\circ\text{C}</math> (210.2 °F)</p> <p>at <math>U_i = 16 \text{ V}</math> , <math>I_i = 25 \text{ mA}</math> , <math>P_i = 64 \text{ mW}</math> ,<br/> <math>T_6 : 56 \text{ }^\circ\text{C}</math> (132.8 °F)<br/> <math>T_5 : 68 \text{ }^\circ\text{C}</math> (154.4 °F)<br/> <math>T_4 : 96 \text{ }^\circ\text{C}</math> (204.8 °F)<br/> <math>T_3 : 96 \text{ }^\circ\text{C}</math> (204.8 °F)<br/> <math>T_2 : 96 \text{ }^\circ\text{C}</math> (204.8 °F)<br/> <math>T_1 : 96 \text{ }^\circ\text{C}</math> (204.8 °F)</p> <p>at <math>U_i = 16 \text{ V}</math> , <math>I_i = 52 \text{ mA}</math> , <math>P_i = 169 \text{ mW}</math> ,<br/> <math>T_6 : 45 \text{ }^\circ\text{C}</math> (113 °F)<br/> <math>T_5 : 57 \text{ }^\circ\text{C}</math> (134.6 °F)<br/> <math>T_4 : 81 \text{ }^\circ\text{C}</math> (177.8 °F)<br/> <math>T_3 : 81 \text{ }^\circ\text{C}</math> (177.8 °F)<br/> <math>T_2 : 81 \text{ }^\circ\text{C}</math> (177.8 °F)<br/> <math>T_1 : 81 \text{ }^\circ\text{C}</math> (177.8 °F)</p> <p>at <math>U_i = 16 \text{ V}</math> , <math>I_i = 76 \text{ mA}</math> , <math>P_i = 242 \text{ mW}</math> ,<br/> <math>T_6 : 37 \text{ }^\circ\text{C}</math> (98.6 °F)<br/> <math>T_5 : 49 \text{ }^\circ\text{C}</math> (120.2 °F)<br/> <math>T_4 : 63 \text{ }^\circ\text{C}</math> (145.4 °F)<br/> <math>T_3 : 63 \text{ }^\circ\text{C}</math> (145.4 °F)<br/> <math>T_2 : 63 \text{ }^\circ\text{C}</math> (145.4 °F)<br/> <math>T_1 : 63 \text{ }^\circ\text{C}</math> (145.4 °F)</p> |
|----------|--|

|           |   |
|-----------|---|
| for IECEX | <p>at <math>U_i = 16 \text{ V}</math> , <math>I_i = 25 \text{ mA}</math> , <math>P_i = 34 \text{ mW}</math> ,<br/> <math>T_6 : 76 \text{ }^\circ\text{C}</math> (168.8 °F)<br/> <math>T_5 : 91 \text{ }^\circ\text{C}</math> (195.8 °F)<br/> <math>T_4 : 100 \text{ }^\circ\text{C}</math> (212 °F)<br/> <math>T_3 : 100 \text{ }^\circ\text{C}</math> (212 °F)<br/> <math>T_2 : 100 \text{ }^\circ\text{C}</math> (212 °F)<br/> <math>T_1 : 100 \text{ }^\circ\text{C}</math> (212 °F)</p> <p>at <math>U_i = 16 \text{ V}</math> , <math>I_i = 25 \text{ mA}</math> , <math>P_i = 64 \text{ mW}</math> ,<br/> <math>T_6 : 73 \text{ }^\circ\text{C}</math> (163.4 °F)<br/> <math>T_5 : 88 \text{ }^\circ\text{C}</math> (190.4 °F)<br/> <math>T_4 : 100 \text{ }^\circ\text{C}</math> (212 °F)<br/> <math>T_3 : 100 \text{ }^\circ\text{C}</math> (212 °F)<br/> <math>T_2 : 100 \text{ }^\circ\text{C}</math> (212 °F)<br/> <math>T_1 : 100 \text{ }^\circ\text{C}</math> (212 °F)</p> <p>at <math>U_i = 16 \text{ V}</math> , <math>I_i = 52 \text{ mA}</math> , <math>P_i = 169 \text{ mW}</math> ,<br/> <math>T_6 : 62 \text{ }^\circ\text{C}</math> (143.6 °F)<br/> <math>T_5 : 77 \text{ }^\circ\text{C}</math> (170.6 °F)<br/> <math>T_4 : 81 \text{ }^\circ\text{C}</math> (177.8 °F)<br/> <math>T_3 : 81 \text{ }^\circ\text{C}</math> (177.8 °F)<br/> <math>T_2 : 81 \text{ }^\circ\text{C}</math> (177.8 °F)<br/> <math>T_1 : 81 \text{ }^\circ\text{C}</math> (177.8 °F)</p> <p>at <math>U_i = 16 \text{ V}</math> , <math>I_i = 76 \text{ mA}</math> , <math>P_i = 242 \text{ mW}</math> ,<br/> <math>T_6 : 54 \text{ }^\circ\text{C}</math> (129.2 °F)<br/> <math>T_5 : 63 \text{ }^\circ\text{C}</math> (145.4 °F)<br/> <math>T_4 : 63 \text{ }^\circ\text{C}</math> (145.4 °F)<br/> <math>T_3 : 63 \text{ }^\circ\text{C}</math> (145.4 °F)<br/> <math>T_2 : 63 \text{ }^\circ\text{C}</math> (145.4 °F)<br/> <math>T_1 : 63 \text{ }^\circ\text{C}</math> (145.4 °F)</p> |
|-----------|---|

**Equipment protection level Gb**

|  |  |   |
|--|--|---|
| Type of protection                                       | intrinsic safety   |   |
| CE marking   | CE 0102  |   |
| <b>Certificates</b>                                      |  |   |
| Appropriate type   | NCN4-12GM...-N0...   |   |
| ATEX certificate   | PTB 00 ATEX 2048 X   |   |
| ATEX marking   | Ex II 1G Ex ia IIC T6...T1 Ga  |   |
| Standards  | EN 60079-0:2012+A11:2013 , EN 60079-11:2012  |   |
| IECEX certificate  | IECEX PTB 11.0037X   |   |
| IECEX marking  | Ex ia IIC T6...T1 Ga   |   |
| Standards  | IEC 60079-0:2011 , IEC 60079-11:2011   |   |
| Effective internal capacitance                           | $C_i$  | $\leq 95 \text{ nF}$ ; a cable length of 10 m is considered.            |
| Effective internal inductance                            | $L_i$  | $\leq 100 \text{ }\mu\text{H}$<br>A cable length of 10 m is considered. |
| Maximum permissible ambient temperature $T_{\text{amb}}$ | Also observe the maximum permissible ambient temperature stated in the general technical data.<br>Keep to the lower of the two values.<br>at $U_i = 16 \text{ V}$ , $I_i = 25 \text{ mA}$ , $P_i = 34 \text{ mW}$ ,<br>T6 : 76 °C (168.8 °F)<br>T5 : 91 °C (195.8 °F)<br>T4 : 100 °C (212 °F)<br>T3 : 100 °C (212 °F)<br>T2 : 100 °C (212 °F)<br>T1 : 100 °C (212 °F)<br>at $U_i = 16 \text{ V}$ , $I_i = 25 \text{ mA}$ , $P_i = 64 \text{ mW}$ ,<br>T6 : 73 °C (163.4 °F)<br>T5 : 88 °C (190.4 °F)<br>T4 : 100 °C (212 °F)<br>T3 : 100 °C (212 °F)<br>T2 : 100 °C (212 °F)<br>T1 : 100 °C (212 °F)<br>at $U_i = 16 \text{ V}$ , $I_i = 52 \text{ mA}$ , $P_i = 169 \text{ mW}$ ,<br>T6 : 62 °C (143.6 °F)<br>T5 : 77 °C (170.6 °F)<br>T4 : 81 °C (177.8 °F)<br>T3 : 81 °C (177.8 °F)<br>T2 : 81 °C (177.8 °F)<br>T1 : 81 °C (177.8 °F)<br>at $U_i = 16 \text{ V}$ , $I_i = 76 \text{ mA}$ , $P_i = 242 \text{ mW}$ ,<br>T6 : 54 °C (129.2 °F)<br>T5 : 63 °C (145.4 °F)<br>T4 : 63 °C (145.4 °F)<br>T3 : 63 °C (145.4 °F)<br>T2 : 63 °C (145.4 °F)<br>T1 : 63 °C (145.4 °F) |   |

**Equipment protection level Gc (ic)**

|  |  |   |
|--|--|---|
| Type of protection                                       | intrinsic safety   |   |
| CE marking   | CE   |   |
| <b>Certificates</b>                                      |  |   |
| ATEX certificate   | PF13CERT2895 X   |   |
| ATEX marking   | Ex II 3G Ex ic IIC T6...T1 Gc  |   |
| Standards  | EN 60079-0:2012+A11:2013 , EN 60079-11:2012  |   |
| Effective internal capacitance                           | $C_i$  | $\leq 95 \text{ nF}$<br>A cable length of 10 m is considered.           |
| Effective internal inductance                            | $L_i$  | $\leq 100 \text{ }\mu\text{H}$<br>A cable length of 10 m is considered. |
| Maximum permissible ambient temperature $T_{\text{amb}}$ | Also observe the maximum permissible ambient temperature stated in the general technical data.<br>Keep to the lower of the two values.<br>at $U_i = 20 \text{ V}$ , $I_i = 25 \text{ mA}$ , $P_i = 34 \text{ mW}$ ,<br>T6 : 55 °C (131 °F)<br>T5 : 55 °C (131 °F)<br>T4 : 55 °C (131 °F)<br>T3 : 55 °C (131 °F)<br>T2 : 55 °C (131 °F)<br>T1 : 55 °C (131 °F)<br>at $U_i = 20 \text{ V}$ , $I_i = 25 \text{ mA}$ , $P_i = 64 \text{ mW}$ ,<br>T6 : 55 °C (131 °F)<br>T5 : 55 °C (131 °F)<br>T4 : 55 °C (131 °F)<br>T3 : 55 °C (131 °F)<br>T2 : 55 °C (131 °F)<br>T1 : 55 °C (131 °F)<br>at $U_i = 20 \text{ V}$ , $I_i = 52 \text{ mA}$ , $P_i = 169 \text{ mW}$ ,<br>T6 : 52 °C (125.6 °F)<br>T5 : 52 °C (125.6 °F)<br>T4 : 52 °C (125.6 °F)<br>T3 : 52 °C (125.6 °F)<br>T2 : 52 °C (125.6 °F)<br>T1 : 52 °C (125.6 °F)<br>at $U_i = 20 \text{ V}$ , $I_i = 76 \text{ mA}$ , $P_i = 242 \text{ mW}$ ,<br>T6 : 44 °C (111.2 °F)<br>T5 : 44 °C (111.2 °F)<br>T4 : 44 °C (111.2 °F)<br>T3 : 44 °C (111.2 °F)<br>T2 : 44 °C (111.2 °F)<br>T1 : 44 °C (111.2 °F) |   |

**Equipment protection level Da**

|   |  |   |
|---|--|---|
| Type of protection                                | intrinsic safety   |   |
| CE marking  | CE 0102  |   |
| <b>Certificates</b>                               |  |   |
| Appropriate type                                  | NCN4-12GM...-N0...   |   |
| ATEX certificate                                  | PTB 00 ATEX 2048 X   |   |
| ATEX marking                                      | Ⓔ II 1D Ex ia IIIC T135°C Da   |   |
| Standards   | EN 60079-0:2012+A11:2013 , EN 60079-11:2012  |   |
| IECEX certificate                                 | IECEX PTB 11.0037X   |   |
| IECEX marking                                     | Ex ia IIIC T135°C Da   |   |
| Standards   | IEC 60079-0:2011 , IEC 60079-11:2011   |   |
| Effective internal capacitance                    | $C_i$  | $\leq 95$ nF<br>A cable length of 10 m is considered.       |
| Effective internal inductance                     | $L_i$  | $\leq 100$ $\mu$ H<br>A cable length of 10 m is considered. |
| Maximum permissible ambient temperature $T_{amb}$ | Also observe the maximum permissible ambient temperature stated in the general technical data.<br>Keep to the lower of the two values.<br>at $U_i = 16$ V , $I_i = 25$ mA , $P_i = 34$ mW : 100 °C (212 °F)<br>at $U_i = 16$ V , $I_i = 25$ mA , $P_i = 64$ mW : 100 °C (212 °F)<br>at $U_i = 16$ V , $I_i = 52$ mA , $P_i = 169$ mW : 81 °C (177.8 °F)<br>at $U_i = 16$ V , $I_i = 76$ mA , $P_i = 242$ mW : 63 °C (145.4 °F) |   |

**Equipment protection level Mb**

|   |  |   |
|---|--|---|
| Type of protection                                | intrinsic safety   |   |
| <b>Certificates</b>                               |  |   |
| Appropriate type                                  | NCN4-12GM...-N0...   |   |
| IECEX certificate                                 | IECEX PTB 11.0037X   |   |
| IECEX marking                                     | Ex ia I Mb   |   |
| Standards   | IEC 60079-0:2011 , IEC 60079-11:2011   |   |
| Effective internal capacitance                    | $C_i$  | $\leq 95$ nF<br>A cable length of 10 m is considered.       |
| Effective internal inductance                     | $L_i$  | $\leq 100$ $\mu$ H<br>A cable length of 10 m is considered. |
| Maximum permissible ambient temperature $T_{amb}$ | Also observe the maximum permissible ambient temperature stated in the general technical data.<br>Keep to the lower of the two values.<br>at $U_i = 16$ V , $I_i = 25$ mA , $P_i = 34$ mW : 100 °C (212 °F)<br>at $U_i = 16$ V , $I_i = 25$ mA , $P_i = 64$ mW : 100 °C (212 °F)<br>at $U_i = 16$ V , $I_i = 52$ mA , $P_i = 169$ mW : 81 °C (177.8 °F)<br>at $U_i = 16$ V , $I_i = 76$ mA , $P_i = 242$ mW : 63 °C (145.4 °F) |   |