Inductive sensor NCN40-L2-N0-V1

Model Number
NCN40-L2-N0-V1

Features
- Sensor head bidirectional and rotatable
- 40 mm non-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 $s_n$: 40 mm
- Installation: non-flush
- Assured operating distance $s_a$: 0 ... 32.4 mm
- Actual operating distance $s_r$: 36 ... 44 mm
- Reduction factor $r_{Al}$: 0.31
- Reduction factor $r_{Cu}$: 0.3
- Reduction factor $r_{304}$: 0.74

Nominal ratings
- Nominal voltage $U_o$: 8.2 V (Ri approx. 1 kΩ)
- Switching frequency $f$: 0 ... 150 Hz
- Hysteresis $H$: typ. 5 %
- Reverse polarity protection: reverse polarity protected
- Short-circuit protection: yes
- Measuring plate not detected: ≥ 2.2 mA
- Measuring plate detected: ≤ 1 mA
- Switching state indicator: LED, yellow

Functional safety related parameters
- MTTFd: 1670 a
- Mission Time (TM): 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: 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
  - 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: cULus Listed, General Purpose
- CCC approval: CCC approval / marking not required for products rated ≤36 V

Dimensions

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".
## Electrical Connection

![Diagram of electrical connection](image)

## Pinout

![Diagram of pinout](image)

### Wire colors in accordance with EN 60947-5-6

<table>
<thead>
<tr>
<th>Pin</th>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BN</td>
<td>(brown)</td>
</tr>
<tr>
<td>2</td>
<td>BU</td>
<td>(blue)</td>
</tr>
</tbody>
</table>

### Equipment protection level Ga

<table>
<thead>
<tr>
<th>CE marking</th>
<th>C0102</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX marking</td>
<td>II 1G Ex ia IIC T6 ... T1 Ga</td>
</tr>
<tr>
<td>The Ex-related marking can also be printed on the enclosed label.</td>
<td></td>
</tr>
<tr>
<td>Ignition protection “Intrinsic safety”</td>
<td></td>
</tr>
<tr>
<td>Use is restricted to the following stated conditions</td>
<td></td>
</tr>
<tr>
<td>Appropriate type</td>
<td>NCN40-L2-N0...</td>
</tr>
<tr>
<td>Effective internal capacitance $C_i$</td>
<td>$\leq 105 \text{nF} ; \text{a cable length of 10 m is considered.}$</td>
</tr>
<tr>
<td>Effective internal inductance $L_i$</td>
<td>$\leq 300 \mu\text{H} ; \text{a cable length of 10 m is considered.}$</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>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.</td>
</tr>
<tr>
<td>Note:</td>
<td>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.</td>
</tr>
</tbody>
</table>

### Equipment protection level Gb

<table>
<thead>
<tr>
<th>CE marking</th>
<th>C0102</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX marking</td>
<td>II 1G Ex ia IIC T6 ... T1 Ga</td>
</tr>
<tr>
<td>The Ex-related marking can also be printed on the enclosed label.</td>
<td></td>
</tr>
<tr>
<td>Ignition protection “Intrinsic safety”</td>
<td></td>
</tr>
<tr>
<td>Use is restricted to the following stated conditions</td>
<td></td>
</tr>
<tr>
<td>Appropriate type</td>
<td>NCN40-L2-N0...</td>
</tr>
<tr>
<td>Effective internal capacitance $C_i$</td>
<td>$\leq 105 \text{nF} ; \text{a cable length of 10 m is considered.}$</td>
</tr>
<tr>
<td>Effective internal inductance $L_i$</td>
<td>$\leq 300 \mu\text{H} ; \text{a cable length of 10 m is considered.}$</td>
</tr>
<tr>
<td>Maximum permissible ambient temperature $T_{amb}$</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>
Inductive sensor

NCN40-L2-N0-V1

Equipment protection level Gc (ic)

Certificate
PF 13 CERT 2895 X

CE marking

ATEX marking
II 3G Ex ic 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 $C_i$ ≤ 105 nF; a cable length of 10 m is considered.
Effective internal inductance $L_i$ ≤ 300 µH; A cable length of 10 m is considered.

Special conditions
for $P_i=34$ mW, $I_i=25$ mA, $T_6$ 66 °C (150.8 °F)
for $P_i=34$ mW, $I_i=25$ mA, $T_5$ 81 °C (177.8 °F)
for $P_i=34$ mW, $I_i=25$ mA, $T_4-T_1$ 100 °C (212 °F)
for $P_i=64$ mW, $I_i=25$ mA, $T_6$ 66 °C (150.8 °F)
for $P_i=64$ mW, $I_i=25$ mA, $T_5$ 81 °C (177.8 °F)
for $P_i=64$ mW, $I_i=25$ mA, $T_4-T_1$ 100 °C (212 °F)
for $P_i=169$ mW, $I_i=52$ mA, $T_6$ 45 °C (113 °F)
for $P_i=169$ mW, $I_i=52$ mA, $T_5$ 60 °C (140 °F)
for $P_i=169$ mW, $I_i=52$ mA, $T_4-T_1$ 89 °C (192.2 °F)
for $P_i=242$ mW, $I_i=76$ mA, $T_6$ 30 °C (86 °F)
for $P_i=242$ mW, $I_i=76$ mA, $T_5$ 45 °C (113 °F)
for $P_i=242$ mW, $I_i=76$ mA, $T_4-T_1$ 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 $C_i$ ≤ 105 nF; a cable length of 10 m is considered.
Effective internal inductance $L_i$ ≤ 300 µH; 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, $T_6$ 66 °C (150.8 °F)
for $P_i=34$ mW, $I_i=25$ mA, $T_5$ 81 °C (177.8 °F)
for $P_i=34$ mW, $I_i=25$ mA, $T_4-T_1$ 100 °C (212 °F)
for $P_i=64$ mW, $I_i=25$ mA, $T_6$ 66 °C (150.8 °F)
for $P_i=64$ mW, $I_i=25$ mA, $T_5$ 81 °C (177.8 °F)
for $P_i=64$ mW, $I_i=25$ mA, $T_4-T_1$ 100 °C (212 °F)
for $P_i=169$ mW, $I_i=52$ mA, $T_6$ 45 °C (113 °F)
for $P_i=169$ mW, $I_i=52$ mA, $T_5$ 60 °C (140 °F)
for $P_i=169$ mW, $I_i=52$ mA, $T_4-T_1$ 89 °C (192.2 °F)
for $P_i=242$ mW, $I_i=76$ mA, $T_6$ 30 °C (86 °F)
for $P_i=242$ mW, $I_i=76$ mA, $T_5$ 45 °C (113 °F)
for $P_i=242$ mW, $I_i=76$ mA, $T_4-T_1$ 74 °C (165.2 °F)

Equipment protection level Da

ATEX marking
II 3D Ex ia IIC 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
NCN40-L2-N0...

Effective internal capacitance $C_i$ ≤ 105 nF; a cable length of 10 m is considered.
Effective internal inductance $L_i$ ≤ 300 µH; A cable length of 10 m is considered.

Equipment protection level Dc

CE marking
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 $U_b$max and the minimum series resistance $R_v$.

at $U_{b,max}=9$ V, $R_v=562$ Ω
12 K
using an amplifier in accordance with EN 60947-5-6
5-6

Equipment protection level Dc (tc)

CE marking

ATEX marking
II 3D Ex tc IIC T80°C Dc
The Ex-related marking can also be printed on the enclosed label.
## Standards

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

<table>
<thead>
<tr>
<th>Maximum permissible ambient temperature $T_{\text{U}_{\text{max}}}$</th>
<th>Values can be obtained from the following list, depending on the max. operating voltage $U_{\text{b_{max}}}$ and the minimum series resistance $R_v$.</th>
</tr>
</thead>
<tbody>
<tr>
<td>at $U_{\text{b_{max}}}=9 \text{ V}$, $R_v=562 \Omega$</td>
<td>$57 \degree\text{C} \ (134.6 \degree\text{F})$ using an amplifier in accordance with EN 60947-5-6</td>
</tr>
<tr>
<td>5-6</td>
<td></td>
</tr>
</tbody>
</table>

### Equipment protection level Dc (ID)

**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**

<table>
<thead>
<tr>
<th>Minimum series resistance $R_v$</th>
<th>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.</th>
</tr>
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<tr>
<td>Maximum permissible ambient temperature $T_{\text{U}_{\text{max}}}$</td>
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