Inductive sensor NCN8-18GM40-N0

Model Number
NCN8-18GM40-N0

Features
- 8 mm non-flush
- Stainless steel housing
- Usable up to SIL2 acc. to IEC 61508

Technical Data

### General specifications
- **Switching element function**: NAMUR, NC
- **Rated operating distance** $s_n$: 8 mm
- **Installation**: non-flush
- **Output polarity**: NAMUR
- **Assured operating distance** $s_a$: 0 ... 6.48 mm
- **Reduction factor** $f_{Al}$: 0.42
- **Reduction factor** $f_{Cu}$: 0.4
- **Reduction factor** $f_{304}$: 0.72

### Nominal ratings
- **Nominal voltage** $U_{in}$: 8.2 V (Ri approx. 1 kΩ)
- **Switching frequency** $f$: 0 ... 300 Hz
- **Hysteresis**: $H$: 1 ... 15 typ. 5 %
- **Reverse polarity protection**: reverse polarity protected
- **Short-circuit protection**: yes
- **Current consumption**:
  - Measuring plate not detected: ≥ 3 mA
  - Measuring plate detected: ≤ 1 mA
- **Switching state indication**: all direction LED, yellow

### Functional safety related parameters
- **MTTFd**: 2040 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**: cable PVC, 2 m
- **Core cross-section**: 0.75 mm²
- **Housing material**: Stainless steel 1.4305 / AISI 303
- **Sensing face**: PBT
- **Protection degree**: 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

### 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 ≤ 36 V

### Dimensions

![Dimensions Diagram]
**Electrical Connection**

![Electrical Connection Diagram]

- **BN** to **L+**
- **BU** to **L-**
ATEX 1G

Instruction

for use in hazardous areas with gas, vapour and mist

EC-Type Examination Certificate

PTB 00 ATEX 2048 X

ATEX marking

II 1G Ex ia IIC T6 G a

Directive conformity

94/9/EG

Standards


Appropriate type

NCNB-18GM-...-N0...

Effective internal capacitance $C_i$

$\leq 95\ \text{nF}$; a cable length of 10 m is considered.

Effective internal inductance $L_i$

$\leq 100\ \mu\text{H}$; a cable length of 10 m is considered.

Explosion group IIA

78 cm

Explosion group IIB

39 cm

Explosion group IIC

6 cm

General

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 $> 60\ ^{\circ}\text{C}$ 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.

Ambient temperature

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.

Installation, Commissioning

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.

Maintenance

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

Repairs to these apparatus are not possible.

Specific conditions

Protection from mechanical danger

When used in the temperature range below $-20\ ^{\circ}\text{C}$ the sensor should be protected from knocks by the provision of an additional housing.

Electrostatic charging

Electrostatic charges on the metal housing components must be avoided. Dangerous electrostatic charges on the metal housing components can be avoided by incorporating these components in the equipotential bonding.
### Inductive sensor NCN8-18GM40-N0

**Manual electrical apparatus for hazardous areas**

for use in hazardous areas with gas, vapour and mist

- **PTB 00 ATEX 2048 X**
  - \(\text{\textcopyright} 0102\)
  - \(\text{\textregistered} \ II 1G \text{ Ex ia IIC T6 Gd}\)
  - 94/9/EG
  - **ATEX marking**
  - \(\text{\textregistered} \ II 1G \text{ Ex ia IIC T6 Gd}\)
  - Directive conformity
  - 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 \(> 60 \degree C\) 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.

#### General

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.

- **Ambient temperature**
  - The temperature ranges, according to temperature class, are given in the EC-Type Examination Certificate.

- **Installation, Commissioning**
  - 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.

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

#### Specific conditions

**Protection from mechanical danger**

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

**Electrostatic charging**

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.

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**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**

\(\leq 95 \text{nF} ; \) a cable length of 10 m is considered.

\(\leq 100 \text{\mu H} ; \) 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 \(> 60 \degree C\) 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.

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**Refer to "General Notes Relating to Pepperl+Fuchs Product Information"."
ATEX 3G (nL)

Instruction

Device category 3G (nL)

CE marking

ATEX marking

Directive conformity

Standard conformity

Effective internal capacitance $C_i$

Effective internal inductance $L_i$

General

Installation, Commissioning

Maintenance

Specific conditions

Maximum permissible ambient temperature $T_{U\text{max}}$ at $U_i = 20\,\text{V}$

- for $P_i=34\,\text{mW}$, $I_i=25\,\text{mA}$, $T_6$:
  - 55 °C (131 °F)
- for $P_i=34\,\text{mW}$, $I_i=25\,\text{mA}$, $T_5$:
  - 55 °C (131 °F)
- for $P_i=34\,\text{mW}$, $I_i=25\,\text{mA}$, $T_4-T_1$:
  - 55 °C (131 °F)
- for $P_i=64\,\text{mW}$, $I_i=25\,\text{mA}$, $T_6$:
  - 55 °C (131 °F)
- for $P_i=64\,\text{mW}$, $I_i=25\,\text{mA}$, $T_5$:
  - 55 °C (131 °F)
- for $P_i=64\,\text{mW}$, $I_i=25\,\text{mA}$, $T_4-T_1$:
  - 55 °C (131 °F)
- for $P_i=169\,\text{mW}$, $I_i=52\,\text{mA}$, $T_6$:
  - 52 °C (125.6 °F)
- for $P_i=169\,\text{mW}$, $I_i=52\,\text{mA}$, $T_5$:
  - 52 °C (125.6 °F)
- for $P_i=169\,\text{mW}$, $I_i=52\,\text{mA}$, $T_4-T_1$:
  - 52 °C (125.6 °F)
- for $P_i=242\,\text{mW}$, $I_i=76\,\text{mA}$, $T_6$:
  - 44 °C (111.2 °F)
- for $P_i=242\,\text{mW}$, $I_i=76\,\text{mA}$, $T_5$:
  - 44 °C (111.2 °F)
- for $P_i=242\,\text{mW}$, $I_i=76\,\text{mA}$, $T_4-T_1$:
  - 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 and the connection cable must be protected from damaging UV-radiation. This can be achieved when the sensor is used in internal areas.

Protection of the connection cable

The connection cable must be prevented from being subjected to tension and torsional loading.

Electrostatic charging

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.
Inductive sensor

NCN8-18GM40-N0

ATEX 3G (ic)

Instruction

Device category 3G (ic)

CE marking

ATEX marking

Directive conformity

Standards

Effective internal capacitance $C_i$

Effective internal inductance $L_i$

General

Installation, Commissioning

Maintenance

Specific conditions

Maximum permissible ambient temperature $T_{\text{Umax}}$ at $U_i = 20$ V

- For $P_i=34$ mW, $I_i=25$ mA, $T_6$ 55 °C (131 °F)
- For $P_i=34$ mW, $I_i=25$ mA, $T_5$ 55 °C (131 °F)
- For $P_i=64$ mW, $I_i=25$ mA, $T_6$ 55 °C (131 °F)
- For $P_i=64$ mW, $I_i=25$ mA, $T_5$ 55 °C (131 °F)
- For $P_i=64$ mW, $I_i=52$ mA, $T_6$ 52 °C (125.6 °F)
- For $P_i=169$ mW, $I_i=52$ mA, $T_5$ 52 °C (125.6 °F)
- For $P_i=169$ mW, $I_i=52$ mA, $T_{4-T1}$ 52 °C (125.6 °F)
- For $P_i=242$ mW, $I_i=76$ mA, $T_6$ 44 °C (111.2 °F)
- For $P_i=242$ mW, $I_i=76$ mA, $T_5$ 44 °C (111.2 °F)
- For $P_i=242$ mW, $I_i=76$ mA, $T_{4-T1}$ 44 °C (111.2 °F)

Protection from mechanical danger

Electrostatic charging

Connection parts

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist

- $C_i \leq 95$ nF; a cable length of 10 m is considered.
- $L_i \leq 100$ 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 data stated in the data sheet are restricted by this operating instruction! The special conditions must be observed!

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.

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

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.
Inductive sensor NCN8-18GM40-N0

ATEX 1D

Instruction for use in hazardous areas with combustible dust

EC-Type Examination Certificate ZELM 03 ATEX 0128 X

ATEX marking C 0102

Directive conformity II 1D Ex iaD 20 T 108 °C (226.4 °F)

Standards 94/9/EG

Appropriate type EC- T ype Examination Certificate ZELM 03 ATEX 0128 X

Effective internal capacitance C_{i} ≤ 95 nF; a cable length of 10 m is considered.

Effective internal inductance L_{i} ≤ 100 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 EC-Type Examination Certificate has to be observed. The special conditions must be adhered to!

Maximum housing surface temperature The maximum surface temperature of the housing is given in the EC-Type Examination Certificate.

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.

Specific conditions Electrostatic charging The connection cables are to be laid in accordance with EN 50281-1-2 and must not normally be subjected to chaffing during use. 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.
Inductive sensor
NCN8-18GM40-N0

ATEX 3D (tD)

Instruction

Device category 3D

for use in hazardous areas with non-conducting combustible dust

CE marking

ATEX marking

II 3D Ex d I A22 IP67 T80°C X

Directive conformity

EN 61241-0:2006, EN 61241-1:2004

Standards

Protection via housing "tD"

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.

Specific 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 \( U_{B_{\text{max}}} \)

The maximum permissible operating voltage \( U_{B_{\text{max}}} \) must be restricted to the values given in the following list. Tolerances are not permitted.

Maximum permissible ambient temperature \( T_{U_{\text{max}}} \)

Values can be obtained from the following list, depending on the max. operating voltage \( U_{B_{\text{max}}} \) and the minimum series resistance \( R_V \).

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.

Protection of the connection cable

The connection cable must be prevented from being subjected to tension and torsional loading.

Electrostatic charging

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.