**Inductive sensor NJ5-11-N-G**

**Features**
- 5 mm non-flush
- Usable up to SIL2 acc. to IEC 61508

**Technical Data**

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<th>Switching element function</th>
<th>NAMUR, NC</th>
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<td>Rated operating distance ( s_n )</td>
<td>5 mm</td>
<td></td>
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<tr>
<td>Installation</td>
<td>non-flush</td>
<td></td>
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<tr>
<td>Output polarity</td>
<td>NAMUR</td>
<td></td>
</tr>
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<td>Assured operating distance ( s_a )</td>
<td>0 ... 4.05 mm</td>
<td></td>
</tr>
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<td>0.4</td>
<td></td>
</tr>
<tr>
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<td>0.85</td>
<td></td>
</tr>
<tr>
<td>Nominal ratings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal voltage ( U_o )</td>
<td>8.2 V (( R_i ) approx. 1 kΩ)</td>
<td></td>
</tr>
<tr>
<td>Switching frequency ( f )</td>
<td>0 ... 3000 Hz</td>
<td></td>
</tr>
<tr>
<td>Hysteresis</td>
<td>( H ) typ. 5 %</td>
<td></td>
</tr>
<tr>
<td>Suitable for 2:1 technology</td>
<td>yes, Reverse polarity protection diode not required</td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measuring plate not detected</td>
<td>≥ 3 mA</td>
<td></td>
</tr>
<tr>
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<td>≤ 1 mA</td>
<td></td>
</tr>
<tr>
<td>Functional safety related parameters</td>
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<td></td>
</tr>
<tr>
<td>MTTFd</td>
<td>11774 a</td>
<td></td>
</tr>
<tr>
<td>Mission Time (( T_M ))</td>
<td>20 a</td>
<td></td>
</tr>
<tr>
<td>Diagnostic Coverage (DC)</td>
<td>0 %</td>
<td></td>
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<td>Ambient conditions</td>
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<tr>
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<td>-25 ... 100 °C (-13 ... 212 °F)</td>
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<td></td>
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<tr>
<td>Connection type</td>
<td>cable PVC , 2 m</td>
<td></td>
</tr>
<tr>
<td>Core cross-section</td>
<td>0.34 mm²</td>
<td></td>
</tr>
<tr>
<td>Housing material</td>
<td>Stainless steel 1.4305 / AISI 303</td>
<td></td>
</tr>
<tr>
<td>Sensing face</td>
<td>PVDF</td>
<td></td>
</tr>
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<td>IP68</td>
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<td>2G; 3G; 1D; 3D</td>
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</tr>
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</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>IEC 60947-5-2:2007</td>
<td></td>
</tr>
<tr>
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<td></td>
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<td>UL approval</td>
<td>cULus Listed, General Purpose</td>
<td></td>
</tr>
<tr>
<td>CSA approval</td>
<td>cCSAus Listed, General Purpose</td>
<td></td>
</tr>
<tr>
<td>CCC approval</td>
<td>CCC approval / marking not required for products rated ≤36 V</td>
<td></td>
</tr>
<tr>
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<td></td>
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</tbody>
</table>

**Electrical Connection**

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".
**ATEX 2G**

**Instruction**

**Device category 2G**

EC-Type Examination Certificate

ATEX marking

Directive conformity

Standards

**Appropriate type**

Effective internal capacitance $C_i$

Effective internal inductance $L_i$

**General**

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist

PTB 00 ATEX 2048 X

EC 0102

II 2G Ex ia IIC T6 Gb

94/9/EG

EN 60079-0:2009, EN 60079-11:2012

Ignition protection "Intrinsic safety"

Use is restricted to the following stated conditions

NJ 5-11-N...

$\leq 45 \text{ nF} $; a cable length of 10 m is considered.

$\leq 50 \mu \text{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 $> 60 \ ^\circ \text{C}$ 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.

**Installation, Comissioning**

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 $-20 \ ^\circ \text{C}$ 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.
Inductive sensor
NJ5-11-N-G

ATEX 3G (nL)

Note

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 \( P_i=34 \, \text{mW}, I_i=25 \, \text{mA}, T_6 \)
- for \( P_i=34 \, \text{mW}, I_i=25 \, \text{mA}, T_5 \)
- for \( P_i=34 \, \text{mW}, I_i=25 \, \text{mA}, T_4-T_1 \)
- for \( P_i=64 \, \text{mW}, I_i=25 \, \text{mA}, T_6 \)
- for \( P_i=64 \, \text{mW}, I_i=25 \, \text{mA}, T_5 \)
- for \( P_i=64 \, \text{mW}, I_i=25 \, \text{mA}, T_4-T_1 \)
- for \( P_i=169 \, \text{mW}, I_i=52 \, \text{mA}, T_6 \)
- for \( P_i=169 \, \text{mW}, I_i=52 \, \text{mA}, T_5 \)
- for \( P_i=169 \, \text{mW}, I_i=52 \, \text{mA}, T_4-T_1 \)
- for \( P_i=242 \, \text{mW}, I_i=76 \, \text{mA}, T_6 \)
- for \( P_i=242 \, \text{mW}, I_i=76 \, \text{mA}, T_5 \)
- for \( P_i=242 \, \text{mW}, I_i=76 \, \text{mA}, T_4-T_1 \)

Protection from mechanical danger

Protection from UV light

Protection of the connection cable

Electrostatic charging

Connection parts

This instruction is only valid for products according to EN 60079-15:2005, valid until 01-May-2013

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist

\( \mathcal{C} \, 0102 \)

\( \odot \, II \, 3 \, G \, \text{Ex nL IIC T6 X} \)

94/9/EG

EN 60079-15:2005 Ignition protection category “n”

Use is restricted to the following stated conditions

\( \leq 45 \, \text{nF} \); a cable length of 10 m is considered.

\( \leq 50 \, \mu \text{H} \); 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!

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.

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 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.

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.

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

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.
ATEX 3G (ic)

Instruction

Device category 3G (ic)
Certificate of Compliance
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

<table>
<thead>
<tr>
<th>Power and Input Current</th>
<th>Temperature Limit</th>
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</thead>
<tbody>
<tr>
<td>Pi=34 mW, Ii=25 mA, T6</td>
<td>55 °C (131 °F)</td>
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<tr>
<td>Pi=34 mW, Ii=25 mA, T5</td>
<td>55 °C (131 °F)</td>
</tr>
<tr>
<td>Pi=64 mW, Ii=25 mA, T6</td>
<td>55 °C (131 °F)</td>
</tr>
<tr>
<td>Pi=64 mW, Ii=25 mA, T5</td>
<td>55 °C (131 °F)</td>
</tr>
<tr>
<td>Pi=169 mW, Ii=52 mA, T6</td>
<td>32 °C (89.6 °F)</td>
</tr>
<tr>
<td>Pi=169 mW, Ii=52 mA, T5</td>
<td>32 °C (89.6 °F)</td>
</tr>
<tr>
<td>Pi=242 mW, Ii=76 mA, T6</td>
<td>16 °C (60.8 °F)</td>
</tr>
<tr>
<td>Pi=242 mW, Ii=76 mA, T5</td>
<td>16 °C (60.8 °F)</td>
</tr>
</tbody>
</table>

Protection from mechanical danger

Electrostatic charging

Connection parts

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist

PF 13 CERT 2895 X

\(\Phi\) II 3G Ex ic II T6 Gc

94/9/EG

EN 60079-0:2009, EN 60079-11:2012 Ignition protection category "ic"

Use is restricted to the following stated conditions

\(\leq 45\) nF; a cable length of 10 m is considered.

\(\leq 50\) 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 depends on the connected and energy-limited supply 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
NJ5-11-N-G

ATEX 1D

Instruction

Device category 1D

EC-Type Examination Certificate

CE marking

ATEX marking

Directive marking

Standards

Appropriate type

Effective internal capacitance \( C_i \)

Effective internal inductance \( L_i \)

General

Maximum housing surface temperature

Installation, Commissioning

Maintenance

Specific conditions

Electrostatic charging

Manual electrical apparatus for hazardous areas

for use in hazardous areas with combustible dust

ZELM 03 ATEX 0128 X

\( \text{C\,0102} \)

\( \text{II\,1D\,Ex\,iaD\,20\,T\,108\,°C\,(226.4\,°F)} \)

The Ex-relevant identification may also be printed on the accompanying adhesive label.

\( \text{II\,1D\,Ex\,iaD\,20\,T\,108\,°C\,(226.4\,°F)} \)

The Ex-relevant identification may also be printed on the accompanying adhesive label.

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 iaB 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 and 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.

If the Ex-relevant identification is exclusively printed on the included adhesive label, this must be applied in the direct vicinity of the sensor! The surface to which the label is to be applied must be clean and free from grease! The applied adhesive label must be durable and legible to protect it against 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.

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.

Effective internal capacitance \( C_i \) \( \leq 45 \text{ nF} \); a cable length of 10 m is considered.

Effective internal inductance \( L_i \) \( \leq 50 \text{ µH} \); 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 iaB 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.

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

Repairs to these apparatus are not possible.

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

NJ5-11-N-G

ATEX 3D (tD)

Note

This instruction is only valid for products according to EN 61241-0:2006 and EN 61241-1:2004
Note the ex-marking on the sensor or on the enclosed adhesive label

Instruction

Manual electrical apparatus for hazardous areas

Device category 3D

for use in hazardous areas with non-conducting combustible dust

ATEX marking

II 3D Ex d A22 IP67 T80°C X

Note

This instruction is only valid for products according to EN 61241-0:2006 and EN 61241-1:2004
Note the ex-marking on the sensor or on the enclosed adhesive label

CE marking

94/9/EG

Directive conformity

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

Standards

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.

Specific conditions

Minimum series resistance RV

Maximum operating voltage U_Bmax

Maximum permissible ambient temperature T_Bmax

at U_Bmax=9 V, R_V=562 Ω

using an amplifier in accordance with EN 60947-5-6

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.

Directive conformity 94/9/EG

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.

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Minimum series resistance RV

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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.