



### Model Number

NJ6-22-SN

### Features

- 6 mm flush
- Usable up to SIL 3 acc. to IEC 61508
- ATEX approval Ex-i and Ex-nA/tc for zone 0-2 and zone 20-22
- Degree of protection IP68

### Application



#### Danger!

In safety-related applications the sensor must be operated with a qualified fail safe interface from Pepperl+Fuchs, such as KFD2-SH-EX1. Consider the "exida Functional Safety Assessment" document which is available on [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com) as an integral part of this product's documentation.

## Technical Data

### General specifications

Switching function	Normally closed (NC)
Output type	NAMUR with safety function
Rated operating distance	$s_n$ 6 mm
Installation	flush
Assured operating distance	$s_a$ 0 ... 4.86 mm
Reduction factor $r_{Al}$	0.4
Reduction factor $r_{Cu}$	0.3
Reduction factor $r_{304}$	0.85
Output type	2-wire

### Nominal ratings

Nominal voltage	$U_o$ 8.2 V
Switching frequency	$f$ 0 ... 2000 Hz
Suitable for 2:1 technology	yes, with reverse polarity protection diode
Current consumption	
Measuring plate not detected	$\geq 3$ mA
Measuring plate detected	$\leq 1$ mA

### Functional safety related parameters

MTTF <sub>d</sub>	11850 a
Mission Time (T <sub>M</sub> )	20 a
Diagnostic Coverage (DC)	0 %

### Ambient conditions

Ambient temperature	-40 ... 100 °C (-40 ... 212 °F)
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### Mechanical specifications

Connection type	cable silicone, 2 m
Core cross-section	0.75 mm <sup>2</sup>
Housing material	Valox (PBT), green
Sensing face	Valox (PBT), green
Degree of protection	IP68
Cable	
Bending radius	> 10 x cable diameter

### General information

Use in the hazardous area	see instruction manuals
Category	1G; 2G; 3G; 1D; 3D

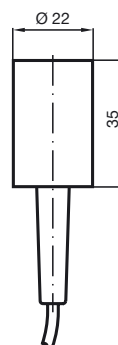
### Compliance with standards and directives

Standard conformity	
NAMUR	EN 60947-5-6:2000 IEC 60947-5-6:1999
Standards	EN 60947-5-2:2007 EN 60947-5-2/A1:2012 IEC 60947-5-2:2007 IEC 60947-5-2 AMD 1:2012

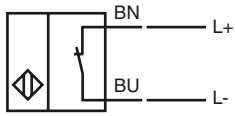
### Approvals and certificates

FM approval	
Control drawing	116-0165
UL approval	cULus Listed, General Purpose
CCC approval	CCC approval / marking not required for products rated $\leq 36$ V

## Dimensions



Electrical Connection



Release date: 2017-04-12 10:41 Date of issue: 2017-04-12 250955\_eng.xml



**Equipment protection level Ga**

Effective internal inductivity	C <sub>i</sub>
Effective internal inductance	L <sub>i</sub>
Ambient temperature	

≤ 110 nF ; a cable length of 10 m is considered.

≤ 150 μH ; a cable length of 10 m is considered.

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. **Note:** 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.

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

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**Equipment protection level Gb**

Effective internal inductivity  $C_i$   
 Effective internal inductance  $L_i$   
 Maximum permissible ambient temperature  $T_{amb}$

$\leq 110 \text{ nF}$  ; a cable length of 10 m is considered.

$\leq 150 \text{ }\mu\text{H}$  ; a cable length of 10 m is considered.

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.

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**Equipment protection level Gc (nA)**

Instruction

**Device category 3G (nA)**

Certificate

CE marking

ATEX marking

Standards

General

Installation, commissioning

Maintenance

**Special conditions**Minimum series resistance  $R_V$ Maximum operating voltage  $U_{Bmax}$ Maximum permissible ambient temperature  $T_{Umax}$ at  $U_{Bmax}=9\text{ V}$ ,  $R_V=562\ \Omega$ 

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

Protection from mechanical danger

Protection from UV light

Protection of the connection cable

Protection against transients

Material selection accessories

**Manual electrical apparatus for hazardous areas**

for use in hazardous areas with gas, vapour and mist

PF 15CERT3754 X

CE

II 3G Ex nA IIC T6 Gc

The Ex-related marking can also be printed on the enclosed label.

EN 60079-0:2012+A11:2013, EN 60079-15:2010

Ignition protection category "n"

Use is restricted to the following stated conditions

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. If the Ex-related marking is printed only on the supplied label, then this must be attached in the immediate vicinity of the sensor. The sticking surface for the label must be clean and free from grease. The attached label must be legible and indelible, including in the event of possible chemical corrosion.

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

Repairs to these apparatus are not possible.

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.

The maximum permissible operating voltage  $U_{Bmax}$  is restricted to the values in the following list. Tolerances are not permissible.

Values can be obtained from the following list, depending on the max. operating voltage  $U_{Bmax}$  and the minimum series resistance  $R_V$ .

58 °C (136.4 °F)

58 °C (136.4 °F)

The sensor must not be exposed to **ANY FORM** of mechanical danger.

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.

Ensure transient protection is provided and that the maximum value of the transient protection (140% of 85 V) is not exceeded.

When selecting accessories, ensure that the material allows the temperature of the enclosure to rise to up to 70 °C.

**Equipment protection level Da**

Instruction

**Device category 1D**

EC-Type Examination Certificate

CE marking

ATEX marking

Standards

Appropriate type

Effective internal inductivity  $C_i$ Effective internal inductance  $L_i$ 

General

Permissible ambient temperature range

Installation, commissioning

Maintenance

**Special conditions**

Protection from mechanical danger

Electrostatic charge

Degree of protection required when installing connecting components

**Manual electrical apparatus for hazardous areas**

for use in hazardous areas with combustible dust

PTB 00 ATEX 2049 X

CE 0102

II 1D Ex ia IIC T135°C Da

The Ex-related marking can also be printed on the enclosed label.

EN 60079-0:2012+A11:2013 EN 60079-11:2012

Ignition protection "Intrinsic safety" Use is restricted to the following stated conditions

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 $\leq 110 \text{ nF}$ ; a cable length of 10 m is considered. $\leq 150 \mu\text{H}$ 

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 EU-type examination certificate has to be observed. The ATEX directive and therefore the EU-type-examination certificates generally apply only to the use of electrical apparatus under atmospheric conditions. The device has been checked for suitability for use at ambient temperatures of  $\geq 60 \text{ }^\circ\text{C}$  by the named certification authority. The surface temperature of the device remains within the required limits.

For the use of apparatus outside of atmospheric conditions, a reduction of the permissible minimum ignition energies may need to be considered.

Details of the correlation between the type of circuit connected, the maximum permissible ambient temperature, the surface temperature, and the effective internal reactance values can be found on the EC-type-examination certificate. **The maximum permissible ambient temperature of the data sheet must be noted, in addition, the lower of the two values must be maintained.**

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. If the Ex-related marking is printed only on the supplied label, then this must be attached in the immediate vicinity of the sensor. The sticking surface for the label must be clean and free from grease. The attached label must be legible and indelible, including in the event of possible chemical corrosion.

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

When using the device in a temperature range of  $-60 \text{ }^\circ\text{C}$  to  $-20 \text{ }^\circ\text{C}$ , protect the sensor against the effects of impact by installing an additional enclosure. The information regarding the minimum ambient temperature for the sensor as provided in the datasheet must also be observed.

Avoid electrostatic charges that can cause electrostatic discharge when installing or operating the device. Information on electrostatic hazards can be found in the technical specification IEC/TS 60079-32-1. Do not attach the nameplate provided in areas where electrostatic charge can build up.

The connecting parts of the sensor must be set up in such a way that degree of protection IP20, in accordance with IEC 60529, is achieved as a minimum.

**Equipment protection level Dc (tc)**

Instruction

**Device category 3D**

Certificate

CE marking

ATEX marking

Standards

General

Installation, commissioning

Maintenance

**Special conditions**Minimum series resistance  $R_V$ Maximum operating voltage  $U_{Bmax}$ Maximum permissible ambient temperature  $T_{Umax}$ at  $U_{Bmax}=9\text{ V}$ ,  $R_V=562\ \Omega$ 

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

Protection from mechanical danger

Protection from UV light

Protection of the connection cable

Electrostatic charge

**Manual electrical apparatus for hazardous areas**

for use in hazardous areas with combustible dust

PF 15CERT3774 X



II 3D Ex tc IIIC T80°C Dc

The Ex-related marking can also be printed on the enclosed label.

EN 60079-0:2012+A11:2013, EN 60079-31:2014

Protection by enclosure "tc". Some of the information in this instruction manual is more specific than the information provided in the datasheet.

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](http://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.

Laws and/or regulations and standards governing the use or intended usage goal must be observed. If the Ex-related marking is printed only on the supplied label, then this must be attached in the immediate vicinity of the sensor. The sticking surface for the label must be clean and free from grease. The attached label must be legible and indelible, including in the event of possible chemical corrosion.

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

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.The maximum permissible operating voltage  $U_{Bmax}$  must be restricted to the values given in the following list. Tolerances are not permitted.Values can be obtained from the following list, depending on the max. operating voltage  $U_b$  max and the minimum series resistance  $R_V$ .

58 °C (136.4 °F)

58 °C (136.4 °F)

The sensor must not be exposed to **ANY FORM** of mechanical danger.

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.

Avoid electrostatic charges that can cause electrostatic discharge when installing or operating the device. Information on electrostatic hazards can be found in the technical specification IEC/TS 60079-32-1. Do not attach the nameplate provided in areas where electrostatic charge can build up.