



## Model Number

NJ40-FP-SN-P1

## Features

- 40 mm non-flush
- Usable up to SIL 3 acc. to IEC 61508

## 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	$s_n$ 40 mm
Installation	non-flush
Assured operating distance	$s_a$ 0 ... 32.4 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 ( $R_i$ approx. 1 k $\Omega$ )
Switching frequency	$f$ 0 ... 100 Hz
Current consumption	
Measuring plate not detected	$\geq 3$ mA
Measuring plate detected	$\leq 1$ mA

### Functional safety related parameters

MTTF <sub>d</sub>	7560 a
Mission Time ( $T_M$ )	20 a
Diagnostic Coverage (DC)	0 %

### Ambient conditions

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

Connection type	screw terminals
Core cross-section	up to 2.5 mm <sup>2</sup>
Housing material	PBT
Sensing face	PBT
Degree of protection	IP68

### General information

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

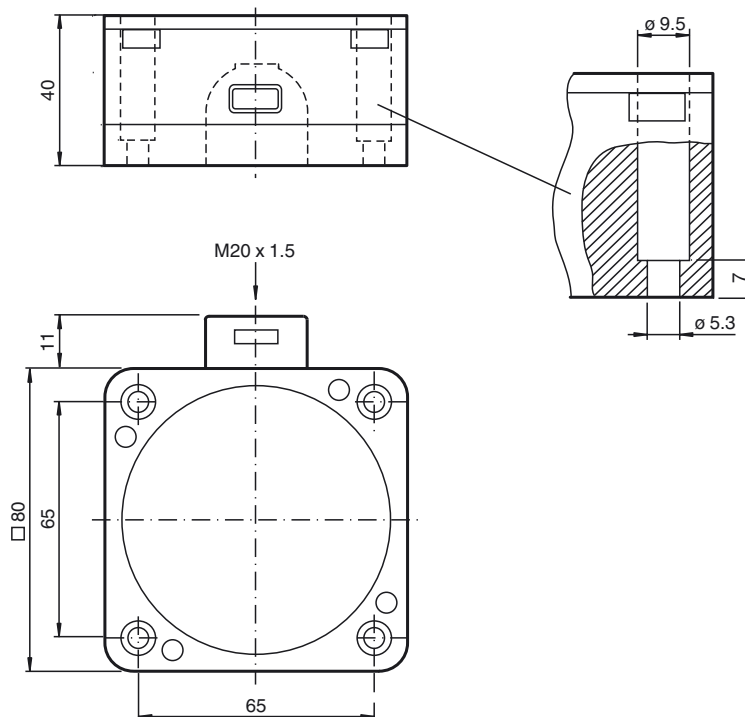
### Compliance with standards and directives

Standard conformity	
NAMUR	EN 60947-5-6:2000 IEC 60947-5-6:1999
Standards	EN 60947-5-2:2007 IEC 60947-5-2:2007

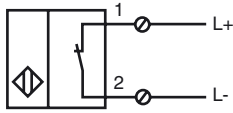
### Approvals and certificates

UL approval	cULus Listed, General Purpose
CSA approval	cCSAus Listed, General Purpose
CCC approval	CCC approval / marking not required for products rated $\leq 36$ V

## Dimensions



Electrical Connection



**Equipment protection level Gb**

Instruction

**Device category 2G**

EC-Type Examination Certificate

CE marking

ATEX marking

Standards

Appropriate type

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

General

Maximum permissible ambient temperature  $T_{amb}$ 

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 gas, vapour and mist

PTB 00 ATEX 2049 X

CE 0102

Ex II 2G Ex ia IIC T6...T1 Gb

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

NJ 40-FP-SN...

 $\leq 370$  nF ; a cable length of 10 m is considered. $\leq 300$   $\mu$ 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 EU-type examination certificate has to be observed. The special conditions must be adhered to! 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  $\geq 60$  °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 temperature class, and the effective internal reactance values can be found on 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. 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. After opening the housing, you should check that the seal is in the correct position and is clean and intact before closing the housing again.

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 °C to -20 °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.

When used in group IIC non-permissible electrostatic charges should be avoided on the plastic housing parts. 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.

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 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

Ex 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

NJ 40-FP-SN...

 $\leq 370 \text{ nF}$  ; a cable length of 10 m is considered. $\leq 300 \mu\text{H}$ 

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. After opening the housing, you should check that the seal is in the correct position and is clean and intact before closing the housing again.

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.