



## 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 $r_{AI}$	0.4
Reduction factor $r_{Cu}$	0.3
Reduction factor $r_{304}$	0.85
Safety Integrity Level (SIL)	up to SIL3 acc. to IEC 61508 <b>Danger!</b> 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 <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> as an integral part of this product's documentation.
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

Safety Integrity Level (SIL)	SIL 3
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)
---------------------	---------------------------------

### 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	
Cable diameter	6 mm ± 0.2 mm
Bending radius	> 10 x cable diameter

### General information

Use in the hazardous area	see instruction manuals
---------------------------	-------------------------

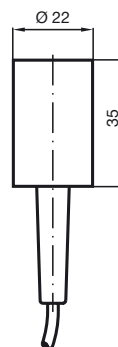
### Compliance with standards and directives

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

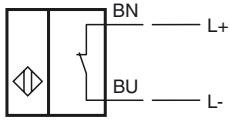
### Approvals and certificates

FM approval	
Control drawing	116-0165
UL approval	cULus Listed, General Purpose
Ordinary Location	E87056
Hazardous Location	E501628
Control drawing	116-0454
CCC approval	CCC approval / marking not required for products rated ≤36 V

## Dimensions



Electrical Connection



**Data for application in connection with hazardous areas**

Equipment protection level Ga , Gb , Gc (nA) , Da , Dc , Mb

**Equipment protection level Ga**

Type of protection intrinsic safety

CE marking  0102**Certificates**

Appropriate type NJ 6-22-SN-...

ATEX certificate PTB 00 ATEX 2049 X

ATEX marking  II 1G Ex ia IIC T6...T1 Ga

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

IECEX certificate IECEX PTB 11.0092X

IECEX marking Ex ia IIC T6...T1 Ga

Standards IEC 60079-0:2011 , IEC 60079-11:2011

Effective internal capacitance  $C_i$   $\leq 110$  nF  
A cable length of 10 m is considered.Effective internal inductance  $L_i$   $\leq 150$   $\mu$ H  
A cable length of 10 m is considered.Maximum permissible ambient temperature  $T_{amb}$  Also observe the maximum permissible ambient temperature stated in the general technical data.  
Keep to the lower of the two values.

for ATEX

at  $U_i = 16$  V ,  $I_i = 25$  mA ,  $P_i = 34$  mW ,  
T6 : 57 °C (134.6 °F)  
T5 : 69 °C (156.2 °F)  
T4 : 97 °C (206.6 °F)  
T3 : 97 °C (206.6 °F)  
T2 : 97 °C (206.6 °F)  
T1 : 97 °C (206.6 °F)

at  $U_i = 16$  V ,  $I_i = 25$  mA ,  $P_i = 64$  mW ,  
T6 : 52 °C (125.6 °F)  
T5 : 64 °C (147.2 °F)  
T4 : 92 °C (197.6 °F)  
T3 : 92 °C (197.6 °F)  
T2 : 92 °C (197.6 °F)  
T1 : 92 °C (197.6 °F)

at  $U_i = 16$  V ,  $I_i = 52$  mA ,  $P_i = 169$  mW ,  
T6 : 34 °C (93.2 °F)  
T5 : 46 °C (114.8 °F)  
T4 : 74 °C (165.2 °F)  
T3 : 74 °C (165.2 °F)  
T2 : 74 °C (165.2 °F)  
T1 : 74 °C (165.2 °F)

at  $U_i = 16$  V ,  $I_i = 76$  mA ,  $P_i = 242$  mW ,  
T6 : 22 °C (71.6 °F)  
T5 : 34 °C (93.2 °F)  
T4 : 61 °C (141.8 °F)  
T3 : 61 °C (141.8 °F)  
T2 : 61 °C (141.8 °F)  
T1 : 61 °C (141.8 °F)

for IECEX

at  $U_i = 16$  V ,  $I_i = 25$  mA ,  $P_i = 34$  mW ,  
T6 : 73 °C (163.4 °F)  
T5 : 88 °C (190.4 °F)  
T4 : 100 °C (212 °F)  
T3 : 100 °C (212 °F)  
T2 : 100 °C (212 °F)  
T1 : 100 °C (212 °F)

at  $U_i = 16$  V ,  $I_i = 25$  mA ,  $P_i = 64$  mW ,  
T6 : 69 °C (156.2 °F)  
T5 : 84 °C (183.2 °F)  
T4 : 100 °C (212 °F)  
T3 : 100 °C (212 °F)  
T2 : 100 °C (212 °F)  
T1 : 100 °C (212 °F)

at  $U_i = 16$  V ,  $I_i = 52$  mA ,  $P_i = 169$  mW ,  
T6 : 51 °C (123.8 °F)  
T5 : 66 °C (150.8 °F)  
T4 : 80 °C (176 °F)  
T3 : 80 °C (176 °F)  
T2 : 80 °C (176 °F)  
T1 : 80 °C (176 °F)

at  $U_i = 16$  V ,  $I_i = 76$  mA ,  $P_i = 242$  mW ,  
T6 : 39 °C (102.2 °F)  
T5 : 54 °C (129.2 °F)  
T4 : 61 °C (141.8 °F)  
T3 : 61 °C (141.8 °F)  
T2 : 61 °C (141.8 °F)  
T1 : 61 °C (141.8 °F)

**Equipment protection level Gb**

Type of protection	intrinsic safety	
CE marking	CE 0102	
<b>Certificates</b>		
Appropriate type	NJ 6-22-SN-...	
ATEX certificate	PTB 00 ATEX 2049 X	
ATEX marking	Ex II 1G Ex ia IIC T6...T1 Ga	
Standards	EN 60079-0:2012+A11:2013, EN 60079-11:2012	
IECEX certificate	IECEX PTB 11.0092X	
IECEX marking	Ex ia IIC T6...T1 Ga	
Standards	IEC 60079-0:2011, IEC 60079-11:2011	
Effective internal capacitance	$C_i$	$\leq 110$ nF A cable length of 10 m is considered.
Effective internal inductance	$L_i$	$\leq 150$ $\mu$ H A cable length of 10 m is considered.
Maximum permissible ambient temperature $T_{amb}$	Also observe the maximum permissible ambient temperature stated in the general technical data. Keep to the lower of the two values. at $U_i = 16$ V, $I_i = 25$ mA, $P_i = 34$ mW, T6: 73 °C (163.4 °F) T5: 88 °C (190.4 °F) T4: 100 °C (212 °F) T3: 100 °C (212 °F) T2: 100 °C (212 °F) T1: 100 °C (212 °F) at $U_i = 16$ V, $I_i = 25$ mA, $P_i = 64$ mW, T6: 69 °C (156.2 °F) T5: 84 °C (183.2 °F) T4: 100 °C (212 °F) T3: 100 °C (212 °F) T2: 100 °C (212 °F) T1: 100 °C (212 °F) at $U_i = 16$ V, $I_i = 52$ mA, $P_i = 169$ mW, T6: 51 °C (123.8 °F) T5: 66 °C (150.8 °F) T4: 80 °C (176 °F) T3: 80 °C (176 °F) T2: 80 °C (176 °F) T1: 80 °C (176 °F) at $U_i = 16$ V, $I_i = 76$ mA, $P_i = 242$ mW, T6: 39 °C (102.2 °F) T5: 54 °C (129.2 °F) T4: 61 °C (141.8 °F) T3: 61 °C (141.8 °F) T2: 61 °C (141.8 °F) T1: 61 °C (141.8 °F)	

**Equipment protection level Gc (nA)**

Type of protection	"n"	
CE marking	CE	
<b>Certificates</b>		
ATEX certificate	PF 15CERT3754 X	
ATEX marking	Ex II 3G Ex nA IIC T6 Gc	
Standards	EN 60079-0:2012+A11:2013, EN 60079-15:2010	
Possible characteristics	maximum operating voltage $U_{Bmax}$ , maximum load current $I_{Lmax}$ , minimum series resistance $R_V$ , maximum analog output voltage $U_{Amax}$ , maximum analog output current $I_{Amax}$	
Maximum permissible ambient temperature $T_{amb}$	Also observe the maximum permissible ambient temperature stated in the general technical data. Keep to the lower of the two values. using an amplifier in accordance with EN 60947-5-6: 58 °C (136.4 °F) at $U_{Bmax} = 9$ V, $R_V = 562$ $\Omega$ : 58 °C (136.4 °F)	

**Equipment protection level Da**

Type of protection	intrinsic safety	
CE marking	CE 0102	
<b>Certificates</b>		
Appropriate type	NJ 6-22-SN-...	
ATEX certificate	PTB 00 ATEX 2049 X	
ATEX marking	Ex II 1D Ex ia IIIC T135°C Da	
Standards	EN 60079-0:2012+A11:2013, EN 60079-11:2012	
IECEX certificate	IECEX PTB 11.0092X	
IECEX marking	Ex ia IIIC T135°C Da	
Standards	IEC 60079-0:2011, IEC 60079-11:2011	
Effective internal capacitance	$C_i$	$\leq 110$ nF A cable length of 10 m is considered.
Effective internal inductance	$L_i$	$\leq 150$ $\mu$ H A cable length of 10 m is considered.
Maximum permissible ambient temperature $T_{amb}$	Also observe the maximum permissible ambient temperature stated in the general technical data. Keep to the lower of the two values. at $U_i = 16$ V, $I_i = 25$ mA, $P_i = 34$ mW: 100 °C (212 °F) at $U_i = 16$ V, $I_i = 25$ mA, $P_i = 64$ mW: 100 °C (212 °F) at $U_i = 16$ V, $I_i = 52$ mA, $P_i = 169$ mW: 80 °C (176 °F) at $U_i = 16$ V, $I_i = 76$ mA, $P_i = 242$ mW: 61 °C (141.8 °F)	

**Equipment protection level Dc**

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

Pepperl+Fuchs Group  
www.pepperl-fuchs.comUSA: +1 330 486 0001  
fa-info@us.pepperl-fuchs.comGermany: +49 621 776 1111  
fa-info@de.pepperl-fuchs.comSingapore: +65 6779 9091  
fa-info@sg.pepperl-fuchs.com

**PEPPERL+FUCHS**

Type of protection	Protection by enclosure "tc"	
CE marking	CE	
<b>Certificates</b>		
ATEX certificate	PF 15 CERT 3774 X	
ATEX marking	Ⓔ II 3D Ex tc IIIC T80 °C Dc	
Standards	EN 60079-0:2012+A11:2013 , EN 60079-31:2014	
Possible characteristics	maximum operating voltage $U_{Bmax}$ , maximum load current $I_{Lmax}$ , minimum series resistance $R_V$ , maximum analog output voltage $U_{Amax}$ , maximum analog output current $I_{Amax}$	
Maximum permissible ambient temperature $T_{amb}$	Also observe the maximum permissible ambient temperature stated in the general technical data. Keep to the lower of the two values. using an amplifier in accordance with EN 60947-5-6 : 58 °C (136.4 °F) at $U_{Bmax} = 9 V$ , $R_V = 562 \Omega$ : 58 °C (136.4 °F)	
<b>Equipment protection level Mb</b>		
Type of protection	intrinsic safety	
<b>Certificates</b>		
Appropriate type	NJ 6-22-SN-...	
IECEX certificate	IECEX PTB 11.0092X	
IECEX marking	Ex ia I Mb	
Standards	IEC 60079-0:2011 , IEC 60079-11:2011	
Effective internal capacitance $C_i$	$\leq 110 \text{ nF}$ A cable length of 10 m is considered.	
Effective internal inductance $L_i$	$\leq 150 \mu\text{H}$ A cable length of 10 m is considered.	
Maximum permissible ambient temperature $T_{amb}$	Also observe the maximum permissible ambient temperature stated in the general technical data. Keep to the lower of the two values. at $U_i = 16 V$ , $I_i = 25 \text{ mA}$ , $P_i = 34 \text{ mW}$ : 100 °C (212 °F) at $U_i = 16 V$ , $I_i = 25 \text{ mA}$ , $P_i = 64 \text{ mW}$ : 100 °C (212 °F) at $U_i = 16 V$ , $I_i = 52 \text{ mA}$ , $P_i = 169 \text{ mW}$ : 80 °C (176 °F) at $U_i = 16 V$ , $I_i = 76 \text{ mA}$ , $P_i = 242 \text{ mW}$ : 61 °C (141.8 °F)	