



## Model Number

NJ2-11-SN-G-10M

## Features

- 2 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	$s_n$ 2 mm
Installation	flush
Assured operating distance	$s_a$ 0 ... 1.62 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 ... 3000 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>	10660 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, 10 m
Core cross-section	0.34 mm <sup>2</sup>
Housing material	stainless steel (303/1.4305)
Sensing face	Valox (PBT), black
Degree of protection	IP68
Cable	
Bending radius	> 10 x cable diameter

### General information

Use in the hazardous area	see instruction manuals
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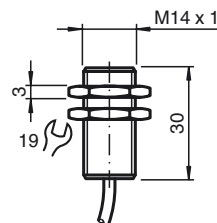
### Compliance with standards and directives

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

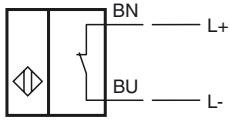
### Approvals and certificates

EAC conformity	TR CU 012/2011
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 $\leq 36$ 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 2-11-SN-G...
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  $C_i$   $\leq 50 \mu\text{F}$   
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  $T_{\text{amb}}$  Also observe the maximum permissible ambient temperature stated in the general technical data.  
Keep to the lower of the two values.

for ATEX

at  $U_i = 16 \text{ V}$  ,  $I_i = 25 \text{ mA}$  ,  $P_i = 34 \text{ mW}$  ,  
 $T_6 : 59 \text{ }^\circ\text{C} (138.2 \text{ }^\circ\text{F})$   
 $T_5 : 71 \text{ }^\circ\text{C} (159.8 \text{ }^\circ\text{F})$   
 $T_4 : 99 \text{ }^\circ\text{C} (210.2 \text{ }^\circ\text{F})$   
 $T_3 : 99 \text{ }^\circ\text{C} (210.2 \text{ }^\circ\text{F})$   
 $T_2 : 99 \text{ }^\circ\text{C} (210.2 \text{ }^\circ\text{F})$   
 $T_1 : 99 \text{ }^\circ\text{C} (210.2 \text{ }^\circ\text{F})$

at  $U_i = 16 \text{ V}$  ,  $I_i = 25 \text{ mA}$  ,  $P_i = 64 \text{ mW}$  ,  
 $T_6 : 56 \text{ }^\circ\text{C} (132.8 \text{ }^\circ\text{F})$   
 $T_5 : 68 \text{ }^\circ\text{C} (154.4 \text{ }^\circ\text{F})$   
 $T_4 : 96 \text{ }^\circ\text{C} (204.8 \text{ }^\circ\text{F})$   
 $T_3 : 96 \text{ }^\circ\text{C} (204.8 \text{ }^\circ\text{F})$   
 $T_2 : 96 \text{ }^\circ\text{C} (204.8 \text{ }^\circ\text{F})$   
 $T_1 : 96 \text{ }^\circ\text{C} (204.8 \text{ }^\circ\text{F})$

at  $U_i = 16 \text{ V}$  ,  $I_i = 52 \text{ mA}$  ,  $P_i = 169 \text{ mW}$  ,  
 $T_6 : 45 \text{ }^\circ\text{C} (113 \text{ }^\circ\text{F})$   
 $T_5 : 57 \text{ }^\circ\text{C} (134.6 \text{ }^\circ\text{F})$   
 $T_4 : 81 \text{ }^\circ\text{C} (177.8 \text{ }^\circ\text{F})$   
 $T_3 : 81 \text{ }^\circ\text{C} (177.8 \text{ }^\circ\text{F})$   
 $T_2 : 81 \text{ }^\circ\text{C} (177.8 \text{ }^\circ\text{F})$   
 $T_1 : 81 \text{ }^\circ\text{C} (177.8 \text{ }^\circ\text{F})$

at  $U_i = 16 \text{ V}$  ,  $I_i = 76 \text{ mA}$  ,  $P_i = 242 \text{ mW}$  ,  
 $T_6 : 37 \text{ }^\circ\text{C} (98.6 \text{ }^\circ\text{F})$   
 $T_5 : 49 \text{ }^\circ\text{C} (120.2 \text{ }^\circ\text{F})$   
 $T_4 : 63 \text{ }^\circ\text{C} (145.4 \text{ }^\circ\text{F})$   
 $T_3 : 63 \text{ }^\circ\text{C} (145.4 \text{ }^\circ\text{F})$   
 $T_2 : 63 \text{ }^\circ\text{C} (145.4 \text{ }^\circ\text{F})$   
 $T_1 : 63 \text{ }^\circ\text{C} (145.4 \text{ }^\circ\text{F})$

for IECEx

at  $U_i = 16 \text{ V}$  ,  $I_i = 25 \text{ mA}$  ,  $P_i = 34 \text{ mW}$  ,  
 $T_6 : 76 \text{ }^\circ\text{C} (168.8 \text{ }^\circ\text{F})$   
 $T_5 : 91 \text{ }^\circ\text{C} (195.8 \text{ }^\circ\text{F})$   
 $T_4 : 100 \text{ }^\circ\text{C} (212 \text{ }^\circ\text{F})$   
 $T_3 : 100 \text{ }^\circ\text{C} (212 \text{ }^\circ\text{F})$   
 $T_2 : 100 \text{ }^\circ\text{C} (212 \text{ }^\circ\text{F})$   
 $T_1 : 100 \text{ }^\circ\text{C} (212 \text{ }^\circ\text{F})$

at  $U_i = 16 \text{ V}$  ,  $I_i = 25 \text{ mA}$  ,  $P_i = 64 \text{ mW}$  ,  
 $T_6 : 73 \text{ }^\circ\text{C} (163.4 \text{ }^\circ\text{F})$   
 $T_5 : 88 \text{ }^\circ\text{C} (190.4 \text{ }^\circ\text{F})$   
 $T_4 : 100 \text{ }^\circ\text{C} (212 \text{ }^\circ\text{F})$   
 $T_3 : 100 \text{ }^\circ\text{C} (212 \text{ }^\circ\text{F})$   
 $T_2 : 100 \text{ }^\circ\text{C} (212 \text{ }^\circ\text{F})$   
 $T_1 : 100 \text{ }^\circ\text{C} (212 \text{ }^\circ\text{F})$

at  $U_i = 16 \text{ V}$  ,  $I_i = 52 \text{ mA}$  ,  $P_i = 169 \text{ mW}$  ,  
 $T_6 : 62 \text{ }^\circ\text{C} (143.6 \text{ }^\circ\text{F})$   
 $T_5 : 77 \text{ }^\circ\text{C} (170.6 \text{ }^\circ\text{F})$   
 $T_4 : 81 \text{ }^\circ\text{C} (177.8 \text{ }^\circ\text{F})$   
 $T_3 : 81 \text{ }^\circ\text{C} (177.8 \text{ }^\circ\text{F})$   
 $T_2 : 81 \text{ }^\circ\text{C} (177.8 \text{ }^\circ\text{F})$   
 $T_1 : 81 \text{ }^\circ\text{C} (177.8 \text{ }^\circ\text{F})$

at  $U_i = 16 \text{ V}$  ,  $I_i = 76 \text{ mA}$  ,  $P_i = 242 \text{ mW}$  ,  
 $T_6 : 54 \text{ }^\circ\text{C} (129.2 \text{ }^\circ\text{F})$   
 $T_5 : 63 \text{ }^\circ\text{C} (145.4 \text{ }^\circ\text{F})$   
 $T_4 : 63 \text{ }^\circ\text{C} (145.4 \text{ }^\circ\text{F})$   
 $T_3 : 63 \text{ }^\circ\text{C} (145.4 \text{ }^\circ\text{F})$   
 $T_2 : 63 \text{ }^\circ\text{C} (145.4 \text{ }^\circ\text{F})$   
 $T_1 : 63 \text{ }^\circ\text{C} (145.4 \text{ }^\circ\text{F})$

**Equipment protection level Gb**

Type of protection	intrinsic safety	
CE marking	CE 0102	
<b>Certificates</b>		
Appropriate type	NJ 2-11-SN-G...	
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	$C_i$	$\leq 50$ 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 : 76 °C (168.8 °F) T5 : 91 °C (195.8 °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 : 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 , $I_i = 52$ mA , $P_i = 169$ mW , T6 : 62 °C (143.6 °F) T5 : 77 °C (170.6 °F) T4 : 81 °C (177.8 °F) T3 : 81 °C (177.8 °F) T2 : 81 °C (177.8 °F) T1 : 81 °C (177.8 °F) at $U_i = 16$ V , $I_i = 76$ mA , $P_i = 242$ mW , T6 : 54 °C (129.2 °F) T5 : 63 °C (145.4 °F) T4 : 63 °C (145.4 °F) T3 : 63 °C (145.4 °F) T2 : 63 °C (145.4 °F) T1 : 63 °C (145.4 °F)	

**Equipment protection level Gc (nA)**

Type of protection	"n"	
CE marking	CE	
<b>Certificates</b>		
ATEX certificate	PF 15 CERT 3754 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 : 61 °C (141.8 °F) at $U_{Bmax} = 9$ V , $R_V = 562$ $\Omega$ : 61 °C (141.8 °F)	

**Equipment protection level Da**

Type of protection	intrinsic safety	
CE marking	CE 0102	
<b>Certificates</b>		
Appropriate type	NJ 2-11-SN-G...	
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	$C_i$	$\leq 50$ 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 : 81 °C (177.8 °F) at $U_i = 16$ V , $I_i = 76$ mA , $P_i = 242$ mW : 63 °C (145.4 °F)	

**Equipment protection level Dc**

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

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**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 : 61 °C (141.8 °F) at $U_{Bmax} = 9 V$ , $R_V = 562 \Omega$ : 61 °C (141.8 °F)	
<b>Equipment protection level Mb</b>		
Type of protection	intrinsic safety	
<b>Certificates</b>		
Appropriate type	NJ 2-11-SN-G...	
IECEX certificate	IECEX PTB 11.0092X	
IECEX marking	Ex ia I Mb	
Standards	IEC 60079-0:2011 , IEC 60079-11:2011	
Effective internal capacitance	$C_i$	$\leq 50 \text{ nF}$ 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 $U_i = 16 V$ , $I_i = 52 \text{ mA}$ , $P_i = 169 \text{ mW}$ : 81 °C (177.8 °F) at $U_i = 16 V$ , $I_i = 76 \text{ mA}$ , $P_i = 242 \text{ mW}$ : 63 °C (145.4 °F)	