



Model Number

NJ2-11-SN-G

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 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
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		≥ 3 mA
Measuring plate detected		≤ 1 mA

Functional safety related parameters

Safety Integrity Level (SIL)	SIL 3
MTTF _d	10660 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	cable silicone, 2 m
Core cross-section	0.34 mm ²
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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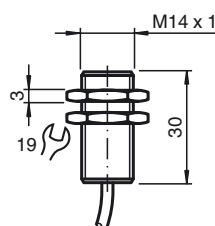
Compliance with standards and directives

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

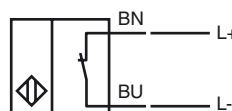
Approvals and certificates

FM approval	
Control drawing	116-0165
UL approval	cULus Listed, General Purpose
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	CE 0102	
Certificates		
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 inductivity	C_i	$\leq 50 \mu F$ 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 : 59 °C (138.2 °F) T5 : 71 °C (159.8 °F) T4 : 99 °C (210.2 °F) T3 : 99 °C (210.2 °F) T2 : 99 °C (210.2 °F) T1 : 99 °C (210.2 °F) at $U_i = 16 V$, $I_i = 25 mA$, $P_i = 64 mW$, T6 : 56 °C (132.8 °F) T5 : 68 °C (154.4 °F) T4 : 96 °C (204.8 °F) T3 : 96 °C (204.8 °F) T2 : 96 °C (204.8 °F) T1 : 96 °C (204.8 °F) at $U_i = 16 V$, $I_i = 52 mA$, $P_i = 169 mW$, T6 : 45 °C (113 °F) T5 : 57 °C (134.6 °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 : 37 °C (98.6 °F) T5 : 49 °C (120.2 °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)	
for IECEx	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)	

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Equipment protection level Gb

Type of protection	intrinsic safety	
CE marking	CE 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 inductivity	C_i	≤ 50 nF A cable length of 10 m is considered.
Effective internal inductance	L_i	≤ 150 μ 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	
Certificates		
ATEX certificate	PF 15 CERT 3754 X	
ATEX marking	Ⓔ 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, $R_V = 562$ Ω : 61 °C (141.8 °F)	

Equipment protection level Da

Type of protection	intrinsic safety	
CE marking	CE 0102	
Certificates		
Appropriate type	NJ 2-11-SN-G...	
ATEX certificate	PTB 00 ATEX 2049 X	
ATEX marking	Ⓔ 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 inductivity	C_i	≤ 50 nF A cable length of 10 m is considered.
Effective internal inductance	L_i	≤ 150 μ 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

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

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Type of protection	Protection by enclosure "tc"	
CE marking	CE	
Certificates		
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)	
Equipment protection level Mb		
Type of protection	intrinsic safety	
Certificates		
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 inductivity	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)	