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**

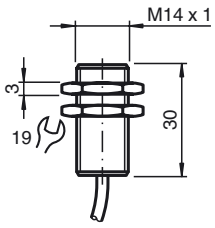
Application

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_{Al}		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 **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.
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)
Mechanical specifications		
Connection type		cable silicone , 2 m
Core cross-section		0.34 mm²
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
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
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



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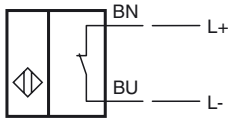
Electrical Connection



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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 capacitance	C_i	≤ 50 µF A cable length of 10 m is considered.
Effective internal inductance	L_i	≤ 150 µH 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		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	≤ 50 nF A cable length of 10 m is considered.
Effective internal inductance	L_i	≤ 150 µH 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		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 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		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	≤ 50 nF A cable length of 10 m is considered.
Effective internal inductance	L_i	≤ 150 µH 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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Type of protection		Protection by enclosure "tc"
CE marking		CE
Certificates		
ATEX certificate		PF 15 CERT 3774 X
ATEX marking		Ex 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 Ω : 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 capacitance	C_i	≤ 50 nF A cable length of 10 m is considered.
Effective internal inductance	L_i	≤ 150 µH 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)

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