



Model Number

NJ6-22-SN-G

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 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 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 ... 2000 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	11850 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	0.75 mm ²
Housing material	stainless steel (303/1.4305)
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
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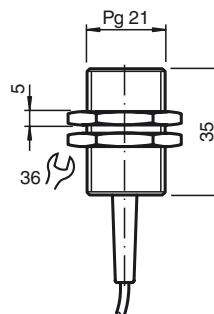
Compliance with standards and directives

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

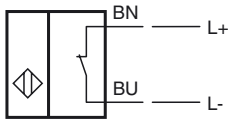
Approvals and certificates

FM approval	
Control drawing	116-0165
UL approval	cULus Listed, General Purpose
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-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 ≤ 110 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.

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)

Equipment protection level Gb

Type of protection	intrinsic safety	
CE marking	CE 0102	
Certificates		
Appropriate type	NJ 6-22-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	$\leq 110 \text{ nF}$ A cable length of 10 m is considered.
Effective internal inductance	L_i	$\leq 150 \text{ }\mu\text{H}$ 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 $U_i = 16 \text{ V}$, $I_i = 25 \text{ mA}$, $P_i = 34 \text{ mW}$, 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 $U_i = 16 \text{ V}$, $I_i = 25 \text{ mA}$, $P_i = 64 \text{ mW}$, 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 $U_i = 16 \text{ V}$, $I_i = 52 \text{ mA}$, $P_i = 169 \text{ mW}$, 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 $U_i = 16 \text{ V}$, $I_i = 76 \text{ mA}$, $P_i = 242 \text{ mW}$, 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} , load current I_L , 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 $U_{Bmax} = 9 \text{ V}$, $R_V = 562 \text{ }\Omega$: 61 °C (141.8 °F)	

Equipment protection level Da

Type of protection	intrinsic safety	
CE marking	CE 0102	
Certificates		
Appropriate type	NJ 6-22-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 capacitance	C_i	$\leq 110 \text{ nF}$ A cable length of 10 m is considered.
Effective internal inductance	L_i	$\leq 150 \text{ }\mu\text{H}$ 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 $U_i = 16 \text{ V}$, $I_i = 25 \text{ mA}$, $P_i = 34 \text{ mW}$: 100 °C (212 °F) at $U_i = 16 \text{ V}$, $I_i = 25 \text{ mA}$, $P_i = 64 \text{ mW}$: 100 °C (212 °F) at $U_i = 16 \text{ V}$, $I_i = 52 \text{ mA}$, $P_i = 169 \text{ mW}$: 81 °C (177.8 °F) at $U_i = 16 \text{ V}$, $I_i = 76 \text{ mA}$, $P_i = 242 \text{ mW}$: 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	Ⓔ 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 6-22-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	$\leq 110 \text{ nF}$ 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 $U_i = 16 V$, $I_i = 52 \text{ mA}$, $P_i = 169 \text{ mW}$: 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)	