

Inductive sensor

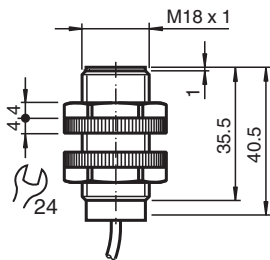
NJ3-18GK-S1N-10M



- Nonferrous targets
- 3 mm flush in ST37 / 1.0037
- 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



Dimensions



Technical Data

General specifications		
Switching function		Normally open (NO)
Output type		NAMUR with safety function
Rated operating distance	s_n	3 mm
Installation		flush in mild steel
Assured operating distance	s_a	0 ... 2.4 mm
Actual operating distance	s_r	2.7 ... 3.3 mm typ.
Reduction factor r_{Al}		1
Reduction factor r_{Cu}		1
Reduction factor r_{304}		0
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

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

Pepperl+Fuchs Group
www.pepperl-fuchs.com

USA: +1 330 486 0001
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776 1111
fa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091
fa-info@sg.pepperl-fuchs.com

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Technical Data

Switching frequency	f	0 ... 200 Hz
Current consumption		
Measuring plate not detected		≤ 1 mA
Measuring plate detected		≥ 3 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 %
Compliance with standards and directives		
Standard conformity		
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 ≤36 V
Ambient conditions		
Ambient temperature		-25 ... 100 °C (-13 ... 212 °F)
Mechanical specifications		
Connection type		cable silicone , 10 m
Core cross-section		0.75 mm ²
Housing material		Crastin (PBT), black
Sensing face		Crastin (PBT), black
Degree of protection		IP68
Cable		
Cable diameter		6.8 mm ± 0.2 mm
Bending radius		> 10 x cable diameter
Note		only for non-ferrous metal
Data for application in connection with hazardous areas		
Equipment protection level		Ga , Gb , Gc (ic) , Gc (nA) , Da , Dc , Mb
Equipment protection level Ga		
Type of protection		intrinsic safety
CE marking		[*PD-Z02585A*]
Certificates		
Appropriate type		NJ 3-18GK-S1N...
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	max. 70 nF A cable length of 10 m is considered.
Effective internal inductance	L _i	max. 200 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.

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Technical Data

for ATEX		at $U_i = 16\text{ V}$, $I_i = 25\text{ mA}$, $P_i = 34\text{ mW}$, 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 $U_i = 16\text{ V}$, $I_i = 25\text{ mA}$, $P_i = 64\text{ mW}$, 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 $U_i = 16\text{ V}$, $I_i = 52\text{ mA}$, $P_i = 169\text{ mW}$, 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 $U_i = 16\text{ V}$, $I_i = 76\text{ mA}$, $P_i = 242\text{ mW}$, 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 $U_i = 16\text{ V}$, $I_i = 25\text{ mA}$, $P_i = 34\text{ mW}$, 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 $U_i = 16\text{ V}$, $I_i = 25\text{ mA}$, $P_i = 64\text{ mW}$, 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 $U_i = 16\text{ V}$, $I_i = 52\text{ mA}$, $P_i = 169\text{ mW}$, 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 $U_i = 16\text{ V}$, $I_i = 76\text{ mA}$, $P_i = 242\text{ mW}$, 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		[*PD-Z02585A*]
Certificates		
Appropriate type		NJ 3-18GK-S1N...
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	max. 70 nF A cable length of 10 m is considered.
Effective internal inductance	L_i	max. 200 µH A cable length of 10 m is considered.

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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: 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 $U_i = 16\text{ V}$, $I_i = 25\text{ mA}$, $P_i = 64\text{ mW}$, 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 $U_i = 16\text{ V}$, $I_i = 52\text{ mA}$, $P_i = 169\text{ mW}$, 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 $U_i = 16\text{ V}$, $I_i = 76\text{ mA}$, $P_i = 242\text{ mW}$, 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 (ic)		
Type of protection		intrinsic safety
CE marking		[*PD-Z02586A*]
Certificates		
ATEX certificate		PF 13 CERT 2895 X
ATEX marking		Ⓜ II 3G Ex ic IIC T6...T1 Gc
Standards		EN 60079-0:2012+A11:2013, EN 60079-11:2012
Effective internal capacitance	C_i	max. 70 nF A cable length of 10 m is considered.
Effective internal inductance	L_i	max. 200 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 $U_i = 20\text{ V}$, $I_i = 25\text{ mA}$, $P_i = 34\text{ mW}$, T6: 70 °C (158 °F) T5: 85 °C (185 °F) T4: 100 °C (212 °F) T3: 100 °C (212 °F) T2: 100 °C (212 °F) T1: 100 °C (212 °F) at $U_i = 20\text{ V}$, $I_i = 25\text{ mA}$, $P_i = 64\text{ mW}$, 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 $U_i = 20\text{ V}$, $I_i = 52\text{ mA}$, $P_i = 169\text{ mW}$, 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 $U_i = 20\text{ V}$, $I_i = 76\text{ mA}$, $P_i = 242\text{ mW}$, 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		[*PD-Z02586A*]
Certificates		

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ATEX certificate		PF 15CERT3754 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 : 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		[*PD-Z02585A*]
Certificates		
Appropriate type		NJ 3-18GK-S1N...
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	max. 70 nF A cable length of 10 m is considered.
Effective internal inductance	L_i	max. 200 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 $U_i = 16 V$, $I_i = 52 mA$, $P_i = 169 mW$: 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		
Type of protection		Protection by enclosure "tc"
CE marking		[*PD-Z02586A*]
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 : 58 °C (136.4 °F) at $U_{Bmax} = 9 V$, $R_V = 562 \Omega$: 58 °C (136.4 °F)
Equipment protection level Mb		
Type of protection		intrinsic safety
Certificates		
Appropriate type		NJ 3-18GK-S1N...
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	max. 70 nF A cable length of 10 m is considered.
Effective internal inductance	L_i	max. 200 µH A cable length of 10 m is considered.

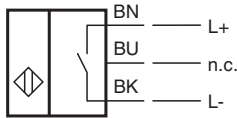
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Technical Data

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 $U_i = 16\text{ V}$, $I_i = 52\text{ mA}$, $P_i = 169\text{ mW}$: 80 °C (176 °F) at $U_i = 16\text{ V}$, $I_i = 76\text{ mA}$, $P_i = 242\text{ mW}$: 61 °C (141.8 °F)
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General information		
Use in the hazardous area		see instruction manuals

Connection



Accessories

	BF 18	Mounting flange, 18 mm
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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.