

0102

Model Number

NJ3-18GK-S1N

Features

- **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**

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.

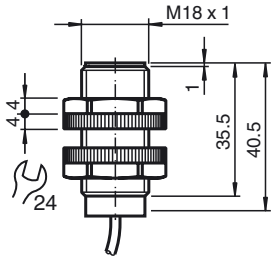
Accessories

BF 18
Mounting flange, 18 mm

Technical Data

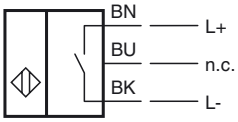
General specifications		
Switching function		Normally open (NO)
Output type		NAMUR with safety function
Rated operating distance	s_n	3 mm
Installation		flush in mild steel
Assured operating distance	s_a	0 ... 2.4 mm
Actual operating distance	s_r	2.7 ... 3.3 mm typ.
Reduction factor r_{Al}		1
Reduction 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
Switching frequency	f	0 ... 200 Hz
Suitable for 2:1 technology		yes , Reverse polarity protection diode not required
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 %
Ambient conditions		
Ambient temperature		-25 ... 100 °C (-13 ... 212 °F)
Mechanical specifications		
Connection type		cable silicone , 15 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
General information		
Use in the hazardous area		see instruction manuals
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
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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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".
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PEPPERL+FUCHS

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		CE 0102
Certificates		
Appropriate type		NJ 3-18GK-S1N...
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	≤ 70 nF A cable length of 10 m is considered.
Effective internal inductance	L_i	≤ 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.
for ATEX		at U_i = 16 V , I_i = 25 mA , P_i = 34 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 V , I_i = 25 mA , P_i = 64 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 V , I_i = 52 mA , P_i = 169 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 V , I_i = 76 mA , P_i = 242 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 V , I_i = 25 mA , P_i = 34 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 = 25 mA , P_i = 64 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 V , I_i = 52 mA , P_i = 169 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 V , I_i = 76 mA , P_i = 242 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)	

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Equipment protection level Gb		
Type of protection		intrinsic safety
CE marking		CE 0102
Certificates		
Appropriate type		NJ 3-18GK-S1N...
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	≤ 70 nF A cable length of 10 m is considered.
Effective internal inductance	L_i	≤ 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 , 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 = 25 mA , P_i = 64 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 V , I_i = 52 mA , P_i = 169 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 V , I_i = 76 mA , P_i = 242 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		CE
Certificates		
ATEX certificate		PF 13 CERT 2895 X
ATEX marking		Ex II 3G Ex ic IIC T6…T1 Gc
Standards		EN 60079-0:2012+A11:2013 , EN 60079-11:2012
Effective internal capacitance	C_i	≤ 70 nF A cable length of 10 m is considered.
Effective internal inductance	L_i	≤ 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 V , I_i = 25 mA , P_i = 34 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 V , I_i = 25 mA , P_i = 64 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 V , I_i = 52 mA , P_i = 169 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 V , I_i = 76 mA , P_i = 242 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)

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Equipment protection level Gc (nA)		
Type of protection		"n"
CE marking		CE
Certificates		
ATEX certificate		PF 15CERT3754 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} , 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 Ω : 58 °C (136.4 °F)
Equipment protection level Da		
Type of protection		intrinsic safety
CE marking		CE 0102
Certificates		
Appropriate type		NJ 3-18GK-S1N...
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	≤ 70 nF A cable length of 10 m is considered.
Effective internal inductance	L_i	≤ 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		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 : 58 °C (136.4 °F) at U_{Bmax} = 9 V , R_V = 562 Ω : 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	≤ 70 nF A cable length of 10 m is considered.
Effective internal inductance	L_i	≤ 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)

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