



### Model Number

NJ4-12GK-SN-1M

### Features

- 4 mm non-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](http://www.pepperl-fuchs.com) as an integral part of this product's documentation.

### Accessories

BF 12  
Mounting flange, 12 mm

## Technical Data

### General specifications

Switching function		Normally closed (NC)
Output type		NAMUR with safety function
Rated operating distance	$s_n$	4 mm
Installation		non-flush
Assured operating distance	$s_a$	0 ... 3.24 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 <b>Danger!</b> 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 <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> 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 ... 1500 Hz
Current consumption		
Measuring plate not detected		$\geq 3$ mA
Measuring plate detected		$\leq 1$ mA

### Functional safety related parameters

Safety Integrity Level (SIL)		SIL 3
MTTF <sub>d</sub>		10660 a
Mission Time (T <sub>M</sub> )		20 a
Diagnostic Coverage (DC)		0 %

### Ambient conditions

Ambient temperature		-50 ... 100 °C (-58 ... 212 °F)
Safety application:		-40 ... 100°C

### Mechanical specifications

Connection type		cable silicone , 1 m
Core cross-section		0,34 mm <sup>2</sup>
Housing material		Crastin (PBTB), black
Sensing face		Crastin (PBTB), black
Degree of protection		IP68
Cable		
Bending radius		> 10 x cable diameter
Note		Security relevant only up to -40°C

### General information

Use in the hazardous area		see instruction manuals
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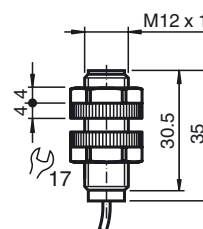
### Compliance with standards and directives

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

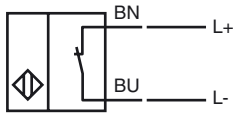
### Approvals and certificates

EAC conformity		TR CU 012/2011
CCC approval		CCC approval / marking not required for products rated $\leq 36$ V

## Dimensions



Electrical Connection



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**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	NJ4-12GK-SN...
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  $C_i$  ≤ 70 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.

## 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	CE 0102	
Certificates		
Appropriate type	NJ4-12GK-SN...	
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	$C_i$	$\leq 70$ nF 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. 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 inductivity	$C_i$	$\leq 70$ nF 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. at $U_i = 20$ V , $I_i = 25$ mA , $P_i = 34$ mW , T6 : 55 °C (131 °F) T5 : 55 °C (131 °F) T4 : 55 °C (131 °F) T3 : 55 °C (131 °F) T2 : 55 °C (131 °F) T1 : 55 °C (131 °F) at $U_i = 20$ V , $I_i = 25$ mA , $P_i = 64$ mW , T6 : 55 °C (131 °F) T5 : 55 °C (131 °F) T4 : 55 °C (131 °F) T3 : 55 °C (131 °F) T2 : 55 °C (131 °F) T1 : 55 °C (131 °F) at $U_i = 20$ V , $I_i = 52$ mA , $P_i = 169$ mW , T6 : 41 °C (105.8 °F) T5 : 41 °C (105.8 °F) T4 : 41 °C (105.8 °F) T3 : 41 °C (105.8 °F) T2 : 41 °C (105.8 °F) T1 : 41 °C (105.8 °F) at $U_i = 20$ V , $I_i = 76$ mA , $P_i = 242$ mW , T6 : 29 °C (84.2 °F) T5 : 29 °C (84.2 °F) T4 : 29 °C (84.2 °F) T3 : 29 °C (84.2 °F) T2 : 29 °C (84.2 °F) T1 : 29 °C (84.2 °F)	

**Equipment protection level Gc (nA)**

Type of protection	"n"
CE marking	CE
<b>Certificates</b>	
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 $U_{Bmax}$ , 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 $U_{Bmax} = 9\text{ V}$ , $R_V = 562\ \Omega$ : 58 °C (136.4 °F)

**Equipment protection level Da**

Type of protection	intrinsic safety
CE marking	CE 0102
<b>Certificates</b>	
Appropriate type	NJ4-12GK-SN...
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 inductivity $C_i$	$\leq 70\text{ nF}$ 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 $U_i = 16\text{ V}$ , $I_i = 25\text{ mA}$ , $P_i = 34\text{ mW}$ : 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)

**Equipment protection level Dc**

Type of protection	Protection by enclosure "tc"
CE marking	CE
<b>Certificates</b>	
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 $U_{Bmax} = 9\text{ V}$ , $R_V = 562\ \Omega$ : 58 °C (136.4 °F)

**Equipment protection level Mb**

Type of protection	intrinsic safety
<b>Certificates</b>	
Appropriate type	NJ 4-12GK-SN...
IECEX certificate	IECEX PTB 11.0092X
IECEX marking	Ex ia I Mb
Standards	IEC 60079-0:2011, IEC 60079-11:2011
Effective internal inductivity $C_i$	$\leq 70\text{ nF}$ 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 $U_i = 16\text{ V}$ , $I_i = 25\text{ mA}$ , $P_i = 34\text{ mW}$ : 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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