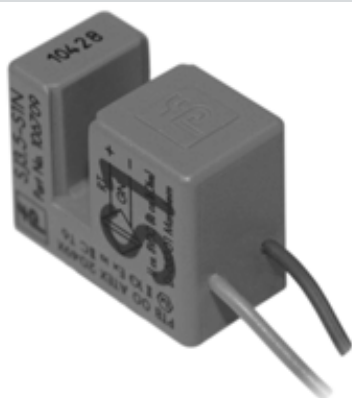




Model Number

SJ3,5-S1N

Features

- 3.5 mm slot width
- Usable up to SIL 3 acc. to IEC 61508
- Nonferrous targets

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 open (NO)
Output type	NAMUR with safety function
Slot width	3.5 mm
Depth of immersion (lateral)	5 ... 7 typ. 6 mm
Reference target	10 x 7 x 0.3 mm ³ , Al
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
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Nominal ratings

Nominal voltage	U _o	8.2 V
Switching frequency	f	0 ... 2500 Hz
Hysteresis	H	with NAMUR switch amplifier: 0.09 mm (e. g. Pepperl+Fuchs KCD2-SR-Ex1.LB) with safety switch amplifier 0.05 mm (e. g. Pepperl+Fuchs KFD2-SH-Ex1)
Suitable for 2:1 technology		yes, with reverse polarity protection diode
Rate of current rise		2.1 mA / mm
Current consumption		
Measuring plate not detected		0.2 ... 1 mA
Measuring plate detected		≥ 3 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	-25 ... 100 °C (-13 ... 212 °F)
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Mechanical specifications

Connection type	flexible leads LiY, 500 mm
Core cross-section	0.14 mm ²
Housing material	PBT
Degree of protection	IP67
Note	only for non-ferrous metal Adjustable stop

General information

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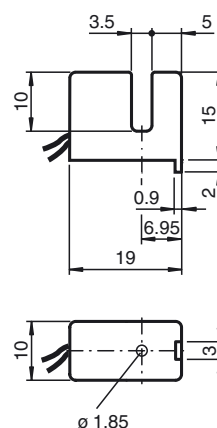
Compliance with standards and directives

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

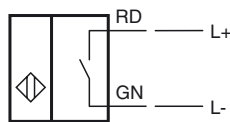
EAC conformity	TR CU 012/2011
FM approval	
Control drawing	116-0165
UL approval	cULus Listed, General Purpose
CCC approval	CCC approval / marking not required for products rated ≤36 V

Dimensions





Electrical Connection



Data for application in connection with hazardous areas

Equipment protection level	Ga , Gb , Gc (ic) , Da , Mb
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Equipment protection level Ga

Type of protection	intrinsic safety
CE marking	CE 0102

Certificates

Appropriate type	SJ3,5-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	$\leq 30 \text{ nF}$ A cable length of 10 m is considered.
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Effective internal inductance	L_i	$\leq 100 \text{ }\mu\text{H}$ 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.
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for ATEX

at $U_i = 16 \text{ V}$, $I_i = 25 \text{ mA}$, $P_i = 34 \text{ mW}$,
 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 $U_i = 16 \text{ V}$, $I_i = 25 \text{ mA}$, $P_i = 64 \text{ mW}$,
 T6 : 49 °C (120.2 °F)
 T5 : 61 °C (141.8 °F)
 T4 : 89 °C (192.2 °F)
 T3 : 89 °C (192.2 °F)
 T2 : 89 °C (192.2 °F)
 T1 : 89 °C (192.2 °F)
 at $U_i = 16 \text{ V}$, $I_i = 52 \text{ mA}$, $P_i = 169 \text{ mW}$,
 T6 : 28 °C (82.4 °F)
 T5 : 40 °C (104 °F)
 T4 : 68 °C (154.4 °F)
 T3 : 68 °C (154.4 °F)
 T2 : 68 °C (154.4 °F)
 T1 : 68 °C (154.4 °F)
 at $U_i = 16 \text{ V}$, $I_i = 76 \text{ mA}$, $P_i = 242 \text{ mW}$,
 T6 : 13 °C (55.4 °F)
 T5 : 25 °C (77 °F)
 T4 : 53 °C (127.4 °F)
 T3 : 53 °C (127.4 °F)
 T2 : 53 °C (127.4 °F)
 T1 : 53 °C (127.4 °F)

for IECEx

at $U_i = 16 \text{ V}$, $I_i = 25 \text{ mA}$ 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 $U_i = 16 \text{ V}$, $I_i = 25 \text{ mA}$, $P_i = 64 \text{ mW}$,
 T6 : 66 °C (150.8 °F)
 T5 : 81 °C (177.8 °F)
 T4 : 100 °C (212 °F)
 T3 : 100 °C (212 °F)
 T2 : 100 °C (212 °F)
 T1 : 100 °C (212 °F)
 at $U_i = 16 \text{ V}$, $I_i = 52 \text{ mA}$, $P_i = 169 \text{ mW}$,
 T6 : 45 °C (113 °F)
 T5 : 60 °C (140 °F)
 T4 : 89 °C (192.2 °F)
 T3 : 89 °C (192.2 °F)
 T2 : 89 °C (192.2 °F)
 T1 : 89 °C (192.2 °F)
 at $U_i = 16 \text{ V}$, $I_i = 76 \text{ mA}$, $P_i = 242 \text{ mW}$,
 T6 : 30 °C (86 °F)
 T5 : 45 °C (113 °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)

Equipment protection level Gb

Type of protection		intrinsic safety
CE marking		 0102
Certificates		
Appropriate type		SJ3,5-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	$\leq 30 \text{ nF}$ A cable length of 10 m is considered.
Effective internal inductance	L_i	$\leq 100 \text{ }\mu\text{H}$ 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 : 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 : 66 °C (150.8 °F) T5 : 81 °C (177.8 °F) T4 : 100 °C (212 °F) T3 : 100 °C (212 °F) T2 : 100 °C (212 °F) T1 : 100 °C (212 °F) at $U_i = 16 \text{ V}$, $I_i = 52 \text{ mA}$, $P_i = 169 \text{ mW}$, T6 : 45 °C (113 °F) T5 : 60 °C (140 °F) T4 : 89 °C (192.2 °F) T3 : 89 °C (192.2 °F) T2 : 89 °C (192.2 °F) T1 : 89 °C (192.2 °F) at $U_i = 16 \text{ V}$, $I_i = 76 \text{ mA}$, $P_i = 242 \text{ mW}$, T6 : 30 °C (86 °F) T5 : 45 °C (113 °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)

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	≤ 30 nF A cable length of 10 m is considered.
Effective internal inductance	L _i	≤ 100 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 : 66 °C (150.8 °F) T5 : 81 °C (177.8 °F) T4 : 100 °C (212 °F) T3 : 100 °C (212 °F) T2 : 100 °C (212 °F) T1 : 100 °C (212 °F) at U _i = 20 V , I _i = 52 mA , P _i = 169 mW , T6 : 45 °C (113 °F) T5 : 60 °C (140 °F) T4 : 89 °C (192.2 °F) T3 : 89 °C (192.2 °F) T2 : 89 °C (192.2 °F) T1 : 89 °C (192.2 °F) at U _i = 20 V , I _i = 76 mA , P _i = 242 mW , T6 : 30 °C (86 °F) T5 : 45 °C (113 °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)	

Equipment protection level Da

Type of protection	intrinsic safety
CE marking	CE 0102

Certificates

Appropriate type	SJ3,5-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 ≤ 30 nF ; a cable length of 10 m is considered.

Effective internal inductance L_i ≤ 100 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 $U_i = 16\text{ V}$, $I_i = 25\text{ mA}$, $P_i = 34\text{ mW}$: 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 $U_i = 16\text{ V}$, $I_i = 52\text{ mA}$, $P_i = 169\text{ mW}$: 89 °C (192.2 °F)
at $U_i = 16\text{ V}$, $I_i = 76\text{ mA}$, $P_i = 242\text{ mW}$: 74 °C (165.2 °F)

Equipment protection level Mb

Type of protection	intrinsic safety
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Certificates

Appropriate type	SJ3,5-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 ≤ 30 nF
A cable length of 10 m is considered.

Effective internal inductance L_i ≤ 100 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 $U_i = 16\text{ V}$, $I_i = 25\text{ mA}$, $P_i = 34\text{ mW}$: 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 $U_i = 16\text{ V}$, $I_i = 52\text{ mA}$, $P_i = 169\text{ mW}$: 89 °C (192.2 °F)
at $U_i = 16\text{ V}$, $I_i = 76\text{ mA}$, $P_i = 242\text{ mW}$: 74 °C (165.2 °F)