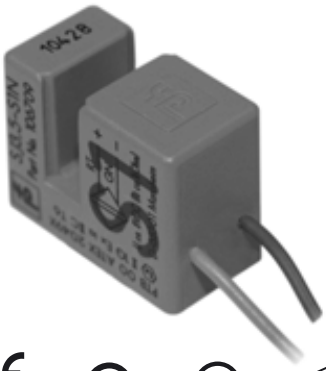


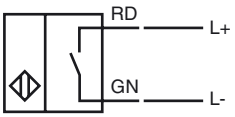
Model Number

SJ3,5-S1N

Features

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

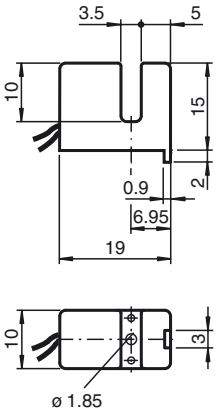
Connection



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.

Dimensions



Technical Data

General specifications		
Switching element function		NAMUR, NO
Slot width		3.5 mm
Depth of immersion (lateral)		5 ... 7 typ. 6 mm
Installation		
Output polarity		Safety Function
Nominal ratings		
Nominal voltage	U_o	8 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		≤ 1 mA
Measuring plate detected		≥ 3 mA
Functional safety related parameters		
$MTTF_d$		7974 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		flexible leads LIY , 500 mm
Core cross-section		0.14 mm^2
Housing material		PBT
Protection degree		IP67
Note		only for non-ferrous metal Adjustable stop
General information		
Use in the hazardous area		see instruction manuals
Category		1G; 2G; 3G; 1D
Compliance with standards and directives		
Standard conformity		
Standards		EN 60947-5-2:2007 IEC 60947-5-2:2007
Approvals and certificates		
FM approval		
Control drawing		116-0165F
UL approval		cULus Listed, General Purpose
CSA approval		cCSAus Listed, General Purpose
CCC approval		Products with a maximum operating voltage of ≤36 V do not bear a CCC marking because they do not require approval.

Release date: 2013-02-08 10:13 Date of issue: 2013-02-08 106709_eng.xml

ATEX 1G

Instruction	**Manual electrical apparatus for hazardous areas**
Device category 1G	for use in hazardous areas with gas, vapour and mist
Directive conformity	94/9/EG
Standard conformity	EN 60079-0:2009, EN 60079-11:2007, EN 60079-26:2007 Ignition protection "Intrinsic safety" Use is restricted to the following stated conditions
CE marking	CE 0102
Ex-identification	Ex II 1G Ex ia IIC T6 Ga
EC-Type Examination Certificate	PTB 00 ATEX 2049 X
Appropriate type	SJ3,5-S1N...
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.
Cable length	Dangerous electrostatic charges on the fixed connection cable must be taken into account for lengths equal to and exceeding the following values:
Explosion group IIC	30 cm
General	The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The EC-Type Examination Certificate has to be observed. The special conditions must be adhered to!
Highest permissible ambient temperature	The temperature ranges, according to temperature class, are given in the EC-Type Examination Certificate. Note: Use the temperature table for category 1 !!! The 20 % reduction in accordance with EN 1127-1:2007 has already been accounted for in the temperature table for category 1.
Installation, Comissioning	Laws and/or regulations and standards governing the use or intended usage goal must be observed. The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety. The associated apparatus must satisfy the requirements of category ia. Due to the possible danger of ignition, which can arise due to faults and/or transient currents in the equipotential bonding system, galvanic isolation of the power supply and signal circuit is preferable. Associated apparatus without electrical isolation must only be used if the appropriate requirements of IEC 60079-14 are met.
Maintenance	No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

Specific conditions

Protection from mechanical danger	When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.

Release date: 2013-02-08 10:13 Date of issue: 2013-02-08 106709_eng.xml

Pepperl+Fuchs Group www.pepperl-fuchs.com
USA: +1 330 486 0001 fa-info@us.pepperl-fuchs.com
Germany: +49 621 776-4411 fa-info@pepperl-fuchs.com
Singapore: +65 6779 9091 fa-info@sg.pepperl-fuchs.com

ATEX 2G

Instruction	**Manual electrical apparatus for hazardous areas**
Device category 2G	for use in hazardous areas with gas, vapour and mist
Directive conformity	94/9/EG
Standard conformity	EN 60079-0:2009, EN 60079-11:2007 Ignition protection "Intrinsic safety" Use is restricted to the following stated conditions
CE marking	CE 0102
Ex-identification	Ex II 1G Ex ia IIC T6 Ga
EC-Type Examination Certificate	PTB 00 ATEX 2049 X
Appropriate type	SJ3,5-S1N...
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.
General	The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The EC-Type Examination Certificate has to be observed. The special conditions must be adhered to!
Highest permissible ambient temperature	The temperature ranges, according to temperature class, are given in the EC-Type Examination Certificate.
Installation, Comissioning	Laws and/or regulations and standards governing the use or intended usage goal must be observed. The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety.
Maintenance	No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.
Specific conditions	
Protection from mechanical danger	When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.

Release date: 2013-02-08 10:13 Date of issue: 2013-02-08 106709_eng.xml

ATEX 1D

Instruction	**Manual electrical apparatus for hazardous areas**
Device category 1D	for use in hazardous areas with combustible dust
Directive conformity	94/9/EG
Standard conformity	IEC 61241-11:2002: draft; prEN61241-0:2002 type of protection intrinsic safety "iD" Use is restricted to the following stated conditions
CE marking	CE 0102
Ex-identification	Ex II 1D Ex iaD 20 T 108 °C (226.4 °F)
EC-Type Examination Certificate	ZELM 03 ATEX 0128 X
Appropriate type	SJ3,5-S1N...
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.
General	The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The EC-Type Examination Certificate has to be observed. The special conditions must be adhered to!
Maximum housing surface temperature	The maximum surface temperature of the housing is given in the EC-Type Examination Certificate.
Installation, Comissioning	Laws and/or regulations and standards governing the use or intended usage goal must be observed. The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety. The associated apparatus must satisfy at least the requirements of category ia IIB or iaD. Because of the possibility of the danger of ignition, which can arise due to faults and/or transient currents in the equipotential bonding system, galvanic isolation in the power supply and signal circuits is preferable. Associated apparatus without electrical isolation must only be used if the appropriate requirements of IEC 60079-14 are met. The intrinsically safe circuit has to be protected against influences due to lightning. When used in the isolating wall between Zone 20 and Zone 21 or Zone 21 und Zone 22 the sensor must not be exposed to any mechanical danger and must be sealed in such a way, that the protective function of the isolating wall is not impaired. The applicable directives and standards must be observed.
Maintenance	No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.
Specific conditions	
Electrostatic charging	The connection cables are to be laid in accordance with EN 50281-1-2 and must not normally be subjected to chaffing during use.

Release date: 2013-02-08 10:13 Date of issue: 2013-02-08 106709_eng.xml

ATEX 3G (nL)

Note	This instruction is only valid for products according to EN 60079-15:2003, valid until 31-May-2008
Instruction	**Manual electrical apparatus for hazardous areas**
Device category 3G (nL)	for use in hazardous areas with gas, vapour and mist
Directive conformity	94/9/EG
Standard conformity	EN 60079-15:2003 Ignition protection category "n" Use is restricted to the following stated conditions
CE marking	CE 0102
Ex-identification	Ex II 3G EEx nL IIC T6 X
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.
General	The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The data stated in the data sheet are restricted by this operating instruction! The special conditions must be observed!
Installation, Comissioning	Laws and/or regulations and standards governing the use or intended usage goal must be observed. The sensor must only be operated with energy-limited circuits, which satisfy the requirements of IEC 60079-15. The explosion group depends on the connected and energy-limited supply circuit.
Maintenance	No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

Specific conditions

Maximum permissible ambient temperature T_{Umax} at Ui = 20 V	
for Pi=34 mW, Ii=25 mA, T6	70 °C (158 °F)
for Pi=34 mW, Ii=25 mA, T5	85 °C (185 °F)
for Pi=34 mW, Ii=25 mA, T4-T1	100 °C (212 °F)
for Pi=64 mW, Ii=25 mA, T6	66 °C (150.8 °F)
for Pi=64 mW, Ii=25 mA, T5	81 °C (177.8 °F)
for Pi=64 mW, Ii=25 mA, T4-T1	100 °C (212 °F)
for Pi=169 mW, Ii=52 mA, T6	45 °C (113 °F)
for Pi=169 mW, Ii=52 mA, T5	60 °C (140 °F)
for Pi=169 mW, Ii=52 mA, T4-T1	89 °C (192.2 °F)
for Pi=242 mW, Ii=76 mA, T6	30 °C (86 °F)
for Pi=242 mW, Ii=76 mA, T5	45 °C (113 °F)
for Pi=242 mW, Ii=76 mA, T4-T1	74 °C (165.2 °F)
Protection from mechanical danger	The sensor must not be mechanically damaged. When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.
Connection parts	The connection parts are to be installed, such that a minimum protection class of IP20 is achieved, in accordance with IEC 60529.

Release date: 2013-02-08 10:13 Date of issue: 2013-02-08 106709_eng.xml

ATEX 3G (ic)

Instruction	**Manual electrical apparatus for hazardous areas**
Device category 3G (ic)	for use in hazardous areas with gas, vapour and mist
Directive conformity	94/9/EG
Standard conformity	EN 60079-0:2009, EN 60079-11:2007 Ignition protection category "ic" Use is restricted to the following stated conditions
CE marking	CE 0102
Ex-identification	Ex II 3G Ex ic IIC T6 Gc X
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.
General	The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The data stated in the data sheet are restricted by this operating instruction! The special conditions must be observed!
Installation, Comissioning	Laws and/or regulations and standards governing the use or intended usage goal must be observed. The sensor must only be operated with energy-limited circuits, which satisfy the requirements of IEC 60079-11. The explosion group depends on the connected and energy-limited supply circuit.
Maintenance	No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

Specific conditions

Maximum permissible ambient temperature T_{Umax} at Ui = 20 V	
for Pi=34 mW, Ii=25 mA, T6	70 °C (158 °F)
for Pi=34 mW, Ii=25 mA, T5	85 °C (185 °F)
for Pi=34 mW, Ii=25 mA, T4-T1	100 °C (212 °F)
for Pi=64 mW, Ii=25 mA, T6	66 °C (150.8 °F)
for Pi=64 mW, Ii=25 mA, T5	81 °C (177.8 °F)
for Pi=64 mW, Ii=25 mA, T4-T1	100 °C (212 °F)
for Pi=169 mW, Ii=52 mA, T6	45 °C (113 °F)
for Pi=169 mW, Ii=52 mA, T5	60 °C (140 °F)
for Pi=169 mW, Ii=52 mA, T4-T1	89 °C (192.2 °F)
for Pi=242 mW, Ii=76 mA, T6	30 °C (86 °F)
for Pi=242 mW, Ii=76 mA, T5	45 °C (113 °F)
for Pi=242 mW, Ii=76 mA, T4-T1	74 °C (165.2 °F)
Protection from mechanical danger	The sensor must not be mechanically damaged. When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.
Connection parts	The connection parts are to be installed, such that a minimum protection class of IP20 is achieved, in accordance with IEC 60529.

Release date: 2013-02-08 10:13 Date of issue: 2013-02-08 106709_eng.xml