



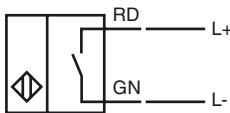
**Model Number**

**SJ2-S1N**

**Features**

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

**Connection**



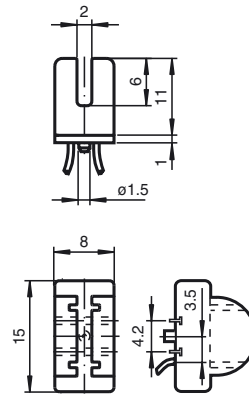
**Application**



**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](http://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	2 mm
Depth of immersion (lateral)	5 ... 7 typ. 6 mm
Installation	
Output polarity	Safety Function

**Nominal ratings**

<b>Installation conditions</b>	
O	0 mm
P	5 mm
Nominal voltage	U <sub>o</sub> 8 V
Switching frequency	f 0 ... 5000 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	2.3 mA / mm
<b>Current consumption</b>	
Measuring plate not detected	≤ 1 mA
Measuring plate detected	≥ 3 mA
Constant magnetic field	B 50 mT
Alternating magnetic field	B 80 mT

**Functional safety related parameters**

MTTF <sub>d</sub>	7628 a
Mission Time (T <sub>M</sub> )	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 LIFYW , 500 mm
Core cross-section	0.06 mm <sup>2</sup>
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**

<b>Standard conformity</b>	
Standards	EN 60947-5-2:2007 IEC 60947-5-2:2007

**Approvals and certificates**

<b>FM approval</b>	
Control drawing	116-0165F
<b>UL approval</b>	
CSA approval	cULus Listed, General Purpose
CCC approval	cCSAus Listed, General Purpose
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 106704\_eng.xml

**ATEX 1G**

Instruction

Device category 1G

Directive conformity

Standard conformity

CE marking

Ex-identification

EC-Type Examination Certificate

Appropriate type

Effective internal capacitance  $C_i$ Effective internal inductance  $L_i$ 

General

Highest permissible ambient temperature

Installation, Commissioning

Maintenance

**Specific conditions**

Protection from mechanical danger

**Manual electrical apparatus for hazardous areas**

for use in hazardous areas with gas, vapour and mist


94/9/EG

EN 60079-0:2009, EN 60079-11:2007, EN 60079-26:2007

Ignition protection "Intrinsic safety"

Use is restricted to the following stated conditions


 0102

 II 1G Ex ia IIC T6 Ga

PTB 00 ATEX 2049 X

SJ2-S1N...

≤ 30 nF ; a cable length of 10 m is considered.

≤ 100 μH ; a cable length of 10 m is considered.

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!

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.

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.

No changes can be made to apparatus, which are operated in hazardous areas.

Repairs to these apparatus are not possible.

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

**ATEX 2G**

Instruction

**Device category 2G**

Directive conformity

Standard conformity

CE marking

Ex-identification

EC-Type Examination Certificate

Appropriate type

Effective internal capacitance  $C_i$ Effective internal inductance  $L_i$ 

General

Highest permissible ambient temperature

Installation, Commissioning

Maintenance

**Specific conditions**

Protection from mechanical danger

**Manual electrical apparatus for hazardous areas**

for use in hazardous areas with gas, vapour and mist


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EN 60079-0:2009, EN 60079-11:2007

Ignition protection "Intrinsic safety"

Use is restricted to the following stated conditions


 0102

 II 1G Ex ia IIC T6 Ga

PTB 00 ATEX 2049 X

SJ2-S1N...

 $\leq 30$  nF ; a cable length of 10 m is considered. $\leq 100$   $\mu$ H ; a cable length of 10 m is considered.

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!

The temperature ranges, according to temperature class, are given in the EC-Type Examination Certificate.

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.

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

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

**ATEX 1D**

Instruction

**Device category 1D**

Directive conformity

Standard conformity

CE marking

Ex-identification

EC-Type Examination Certificate

Appropriate type

Effective internal capacitance  $C_i$ Effective internal inductance  $L_i$ 

General

Maximum housing surface temperature

Installation, Commissioning

Maintenance

**Specific conditions**

Electrostatic charging

**Manual electrical apparatus for hazardous areas**

for use in hazardous areas with combustible dust

94/9/EG

IEC 61241-11:2002: draft; prEN61241-0:2002

type of protection intrinsic safety "ID"

Use is restricted to the following stated conditions

**CE** 0102**Ex** II 1D Ex iaD 20 T 108 °C (226.4 °F)

The Ex-significant identification is on the enclosed adhesive label

ZELM 03 ATEX 0128 X

SJ2-S1N...

≤ 30 nF ; a cable length of 10 m is considered.

≤ 100 μH ; a cable length of 10 m is considered.

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!

The maximum surface temperature of the housing is given in the EC-Type Examination Certificate.

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.

The adhesive label provided must be affixed in the immediate vicinity of the sensor!

The surface to which the label is applied must be clean, flat and free from grease!

The affixed adhesive label must be readable and durable, taking account of the possibility of chemical corrosion!

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.

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

The connection cables are to be laid in accordance with EN 50281-1-2 and must not normally be subjected to chaffing during use.

**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  
94/9/EG

Directive conformity

EN 60079-15:2003 Ignition protection category "n"  
Use is restricted to the following stated conditions

Standard conformity

**CE** 0102

CE marking

Ex-identification

**Ex** II 3G EEx nL IIC T6 X The Ex-significant identification is on the enclosed adhesive labelEffective internal capacitance  $C_i$  $\leq 30$  nF ; A cable length of 10 m is considered.Effective internal inductance  $L_i$  $\leq 100$   $\mu$ H ; 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, Commissioning

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.

The adhesive label provided must be affixed in the immediate vicinity of the sensor! The surface to which the label is applied must be clean, flat and free from grease! The affixed adhesive label must be readable and durable, taking account of the possibility of chemical corrosion!

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  $U_i = 20$  Vfor  $P_i=34$  mW,  $I_i=25$  mA, T6

70 °C (158 °F)

for  $P_i=34$  mW,  $I_i=25$  mA, T5

85 °C (185 °F)

for  $P_i=34$  mW,  $I_i=25$  mA, T4-T1

100 °C (212 °F)

for  $P_i=64$  mW,  $I_i=25$  mA, T6

66 °C (150.8 °F)

for  $P_i=64$  mW,  $I_i=25$  mA, T5

81 °C (177.8 °F)

for  $P_i=64$  mW,  $I_i=25$  mA, T4-T1

100 °C (212 °F)

for  $P_i=169$  mW,  $I_i=52$  mA, T6

45 °C (113 °F)

for  $P_i=169$  mW,  $I_i=52$  mA, T5

60 °C (140 °F)

for  $P_i=169$  mW,  $I_i=52$  mA, T4-T1

78 °C (172.4 °F)

for  $P_i=242$  mW,  $I_i=76$  mA, T6

30 °C (86 °F)

for  $P_i=242$  mW,  $I_i=76$  mA, T5

45 °C (113 °F)

for  $P_i=242$  mW,  $I_i=76$  mA, T4-T1

57 °C (134.6 °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.

**ATEX 3G (ic)**

Instruction

**Device category 3G (ic)**

Directive conformity

Standard conformity

CE marking

Ex-identification

Effective internal capacitance  $C_i$ Effective internal inductance  $L_i$ 

General

Installation, Commissioning

Maintenance

**Specific conditions**Maximum permissible ambient temperature  $T_{Umax}$  at  $U_i = 20$  Vfor  $P_i=34$  mW,  $I_i=25$  mA, T6for  $P_i=34$  mW,  $I_i=25$  mA, T5for  $P_i=34$  mW,  $I_i=25$  mA, T4-T1for  $P_i=64$  mW,  $I_i=25$  mA, T6for  $P_i=64$  mW,  $I_i=25$  mA, T5for  $P_i=64$  mW,  $I_i=25$  mA, T4-T1for  $P_i=169$  mW,  $I_i=52$  mA, T6for  $P_i=169$  mW,  $I_i=52$  mA, T5for  $P_i=169$  mW,  $I_i=52$  mA, T4-T1for  $P_i=242$  mW,  $I_i=76$  mA, T6for  $P_i=242$  mW,  $I_i=76$  mA, T5for  $P_i=242$  mW,  $I_i=76$  mA, T4-T1

Protection from mechanical danger

Connection parts

**Manual electrical apparatus for hazardous areas**

for use in hazardous areas with gas, vapour and mist

94/9/EG

EN 60079-0:2009, EN 60079-11:2007 Ignition protection category "ic"

Use is restricted to the following stated conditions

CE 0102

II 3G Ex ic IIC T6 Gc X

The Ex-significant identification is on the enclosed adhesive label

 $\leq 30$  nF ; A cable length of 10 m is considered. $\leq 100$   $\mu$ H ; A cable length of 10 m is considered.

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!

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.

The adhesive label provided must be affixed in the immediate vicinity of the sensor!

The surface to which the label is applied must be clean, flat and free from grease!

The affixed adhesive label must be readable and durable, taking account of the possibility of chemical corrosion!

No changes can be made to apparatus, which are operated in hazardous areas.

Repairs to these apparatus are not possible.

70 °C (158 °F)

85 °C (185 °F)

100 °C (212 °F)

66 °C (150.8 °F)

81 °C (177.8 °F)

100 °C (212 °F)

45 °C (113 °F)

60 °C (140 °F)

78 °C (172.4 °F)

30 °C (86 °F)

45 °C (113 °F)

57 °C (134.6 °F)

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.

The connection parts are to be installed, such that a minimum protection class of IP20 is achieved, in accordance with IEC 60529.