

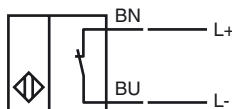
### Model Number

SC3,5-N0-BU

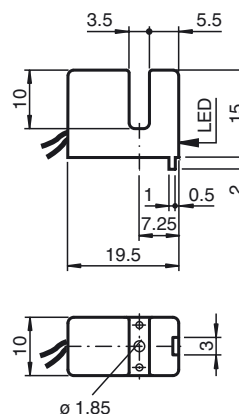
### Features

- Comfort series
- 3.5 mm slot width
- Usable up to SIL2 acc. to IEC 61508

### Connection



### Dimensions



### Technical Data

#### General specifications

Switching element function	NAMUR, NC
Slot width	3.5 mm
Depth of immersion (lateral)	5 ... 7 typ. 6 mm
Installation	
Output polarity	NAMUR

#### Nominal ratings

Nominal voltage	$U_o$	8.2 V ( $R_i$ approx. 1 k $\Omega$ )
Operating voltage	$U_B$	5 ... 25 V
Switching frequency	f	0 ... 3000 Hz
Hysteresis	H	0.21 ... 0.4 mm
Suitable for 2:1 technology		yes, Reverse polarity protection diode not required
Current consumption		
Measuring plate not detected		$\geq 3$ mA
Measuring plate detected		$\leq 1$ mA
Switching state indication		LED, yellow

#### Functional safety related parameters

MTTF <sub>d</sub>	6270 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 <sup>2</sup>
Housing material	PBT
Protection degree	IP67

#### General information

Use in the hazardous area	see instruction manuals
Category	1G; 2G; 3G; 1D



#### Compliance with standards and directives

Standard conformity	
NAMUR	EN 60947-5-6:2000 IEC 60947-5-6:1999
Electromagnetic compatibility	NE 21:2007
Standards	EN 60947-5-2:2007 IEC 60947-5-2:2007

#### Approvals and certificates

UL approval	cULus Listed, General Purpose
CSA approval	cCSAus Listed, General Purpose
CCC approval	Products with a maximum operating voltage of $\leq 36$ V do not bear a CCC marking because they do not require approval.

**ATEX 1G**

Instruction	<b>Manual electrical apparatus for hazardous areas</b>
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
CE marking	Ignition protection "Intrinsic safety" Use is restricted to the following stated conditions  0102
Ex-identification	 II 1G Ex ia IIC T6 Ga
EC-Type Examination Certificate	PTB 99 ATEX 2219 X
Appropriate type	SC3,5...-N0...
Effective internal capacitance $C_i$	$\leq 150$ 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.
Cable length	Dangerous electrostatic charges on the fixed connection cable must be taken into account for lengths equal to and exceeding the following values: 30 cm
Explosion group IIC	
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, Commissioning	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.
<b>Specific conditions</b>	
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.

**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

94/9/EG

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

Ignition protection "Intrinsic safety"

Use is restricted to the following stated conditions

C  $\text{E}$  0102 $\text{Ex}$  II 1G Ex ia IIC T6 Ga

PTB 99 ATEX 2219 X

SC3,5...-N0...

 $\leq 150$  nF ; a cable length of 10 m is considered. $\leq 150$   $\mu$ 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



 0102


 II 1D Ex iaD 20 T 108 °C (226.4 °F)

ZELM 03 ATEX 0128 X

SC3,5...-N0...

≤ 150 nF ; a cable length of 10 m is considered.

≤ 150 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 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.

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 XEffective internal capacitance  $C_i$  $\leq 150 \text{ nF}$  ; a cable length of 10 m is considered.Effective internal inductance  $L_i$  $\leq 150 \text{ }\mu\text{H}$  ; 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 an energy-limited circuit, which satisfies the requirements of IEC 60079-15. The explosion group complies with the connected, supplying, power limiting 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  $U_i = 20 \text{ V}$ for  $P_i=34 \text{ mW}$ ,  $I_i=25 \text{ mA}$ , T6

66 °C (150.8 °F)

for  $P_i=34 \text{ mW}$ ,  $I_i=25 \text{ mA}$ , T5

81 °C (177.8 °F)

for  $P_i=34 \text{ mW}$ ,  $I_i=25 \text{ mA}$ , T4-T1

100 °C (212 °F)

for  $P_i=64 \text{ mW}$ ,  $I_i=25 \text{ mA}$ , T6

66 °C (150.8 °F)

for  $P_i=64 \text{ mW}$ ,  $I_i=25 \text{ mA}$ , T5

81 °C (177.8 °F)

for  $P_i=64 \text{ mW}$ ,  $I_i=25 \text{ mA}$ , T4-T1

100 °C (212 °F)

for  $P_i=169 \text{ mW}$ ,  $I_i=52 \text{ mA}$ , T6

45 °C (113 °F)

for  $P_i=169 \text{ mW}$ ,  $I_i=52 \text{ mA}$ , T5

60 °C (140 °F)

for  $P_i=169 \text{ mW}$ ,  $I_i=52 \text{ mA}$ , T4-T1

89 °C (192.2 °F)

for  $P_i=242 \text{ mW}$ ,  $I_i=76 \text{ mA}$ , T6

30 °C (86 °F)

for  $P_i=242 \text{ mW}$ ,  $I_i=76 \text{ mA}$ , T5

45 °C (113 °F)

for  $P_i=242 \text{ mW}$ ,  $I_i=76 \text{ mA}$ , 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.

**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

 $\leq 150$  nF ; a cable length of 10 m is considered. $\leq 150$   $\mu$ 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 complies with the connected, supplying, power limiting circuit.

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

Repairs to these apparatus are not possible.

66 °C (150.8 °F)

81 °C (177.8 °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)

89 °C (192.2 °F)

30 °C (86 °F)

45 °C (113 °F)

74 °C (165.2 °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.