



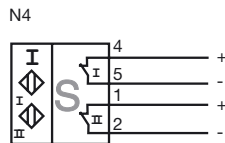
**Model Number**

NCN3-F31K-N4-S

**Features**

- Direct mounting on standard actuators
- Compact and stable housing with terminal compartment connection
- Fixed setting
- EC-Type Examination Certificate TÜV99 ATEX 1479X
- Screw terminals
- Usable up to SIL2 acc. to IEC 61508

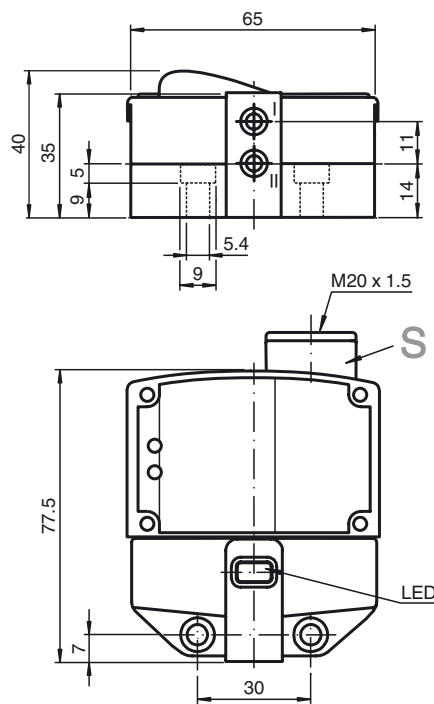
**Connection**



**Accessories**

- BT65A**  
Activator for F31 series
- BT65X**  
Activator for F31 series
- BT115A**  
Activator for F31 series
- BT115X**  
Activator for F31 series
- BT65B**  
Activator for F31 series
- BT115B**  
Activator for F31 series

**Dimensions**





**Technical Data**

<b>General specifications</b>	
Switching element function	DC Dual NC
Rated operating distance	$s_n$ 3 mm
Installation	flush mountable
Output polarity	NAMUR
Assured operating distance	$s_a$ 0 ... 2.4 mm
Reduction factor $r_{AI}$	0.35
Reduction factor $r_{Cu}$	0.3
Reduction factor $r_{304}$	0.75
Reduction factor $r_{Si37}$	1
Reduction factor $r_{Brass}$	0.45
<b>Nominal ratings</b>	
Nominal voltage	$U_o$ 8 V
Switching frequency	$f$ 0 ... 3 kHz
Hysteresis	H typ. 5 %
Reverse polarity protected	reverse polarity protected
Short-circuit protection	yes
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
Indication of the switching state	LED, yellow
<b>Ambient conditions</b>	
Ambient temperature	-25 ... 100 °C (-13 ... 212 °F)
Storage temperature	-40 ... 100 °C (-40 ... 212 °F)
<b>Mechanical specifications</b>	
Connection (system side)	Screw terminals, tightening torque min. 0.5Nm Stripped length 7 mm
Core cross-section (system side)	rigid: 0.14 ... 2.5 mm <sup>2</sup> flexible: 0.14 ... 1.5 mm <sup>2</sup> flexible with core-end sleeve: 0.25 ... 1.5 mm <sup>2</sup>
Housing material	PBT
Sensing face	PBT
Protection degree	IP67
Tightening torque, housing screws	1 Nm
Tightening torque, cable gland	M20 x 1.5 ; $\leq 7$ Nm
<b>General information</b>	
Use in the hazardous area	see instruction manuals
Category	1G; 2G; 3G
<b>Compliance with standards and directives</b>	
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
<b>Approvals and certificates</b>	
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.

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**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 symbol	Ignition protection "Intrinsic safety" Use is restricted to the following stated conditions  0102
Ex-identification	 II 1G Ex ia IIC T6
EC-Type Examination Certificate	TÜV 99 ATEX 1479 X
Appropriate type	NCN3-F31K-N4...
Effective internal capacitance $C_i$	≤ 100 nF A cable length of 10 m is considered. The value is applicable for the sensor circuit.
Effective internal inductance $L_i$	≤ 100 μH A cable length of 10 m is considered. The value is applicable for the sensor circuit.
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! Directive 94/9/EG and hence also EC-Type Examination Certificates apply in general only to the use of electrical apparatus under atmospheric conditions. The use in ambient temperatures of > 60 °C was tested with regard to hot surfaces by the mentioned certification authority. If the equipment is not used under atmospheric conditions, a reduction of the permissible minimum ignition energies may have to be taken into consideration.
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>Special 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.
Electrostatic charging	When used in group IIB/IIC non-permissible electrostatic charges should be avoided on the plastic housing parts..
Lead insertion	The connection cables should either be fixed when laid and mechanically protected or installed in such a way, that a force of 30 N applied in the direction of the cable inlet for one hour, does not lead to any visible displacement of the cable connections, even though the cable sheathing is displaced, see also IEC 60079-11. Depending on the type of installation, a suitable cable in accordance with Type A oder B of IEC 60079-14, must be used.

**ATEX 2G**

Instruction

**Device category 2G**

Directive conformity

Standard conformity

CE symbol

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

**Special conditions**

Protection from mechanical danger

Electrostatic charging

Lead insertion

**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

 0102

 II 1G Ex ia IIC T6

TÜV 99 ATEX 1479 X

NCN3-F31K-N4...

≤ 100 nF ; a cable length of 10 m is considered. The value is applicable for the sensor circuit.

≤ 100 μH ; a cable length of 10 m is considered. The value is applicable for the sensor circuit.

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!

Directive 94/9/EG and hence also EC-Type Examination Certificates apply in general only to the use of electrical apparatus under atmospheric conditions.

The use in ambient temperatures of > 60 °C was tested with regard to hot surfaces by the mentioned certification authority.

If the equipment is not used under atmospheric conditions, a reduction of the permissible minimum ignition energies may have to be taken into consideration.

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.

When used in group IIC non-permissible electrostatic charges should be avoided on the plastic housing parts.

The connection cables should either be fixed when laid and mechanically protected or installed in such a way, that a force of 30 N applied in the direction of the cable inlet for one hour, does not lead to any visible displacement of the cable connections, even though the cable sheathing is displaced, see also IEC 60079-11. Depending on the type of installation, a suitable cable in accordance with Type A oder B of IEC 60079-14, must be used.

**ATEX 3G (ic)**

Instruction

**Device category 3G (ic)**

Directive conformity

Standard conformity

CE symbol

Ex-identification

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

General

Installation, Commissioning

Maintenance

**Special 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-T1

Protection from mechanical danger

Electrostatic charging

Connection parts

Lead insertion

**Manual electrical apparatus for hazardous areas**

for use in hazardous areas with gas, vapour and mist

94/9/EG

EN 60079-11:2007 Ignition protection category "ic"

Use is restricted to the following stated conditions

CE 0102

II 3G Ex ic IIC T6 X

 $\leq 100$  nF ; A cable length of 10 m is considered.  
The value is applicable for the sensor circuit. $\leq 100$   $\mu$ H ; A cable length of 10 m is considered.  
The value is applicable for the sensor circuit.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, energy-limited power supply circuits.

The maximum values of the connected, energy-limited valve circuits, must be observed.

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

Each sensor circuit can be operated with the stated maximum values and with simultaneous operation of the valve circuits.

63 °C (145.4 °F)

78 °C (172.4 °F)

100 °C (212 °F)

63 °C (145.4 °F)

78 °C (172.4 °F)

100 °C (212 °F)

63 °C (145.4 °F)

78 °C (172.4 °F)

90 °C (194 °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.

When used in group IIC non-permissible electrostatic charges should be avoided on the plastic housing parts.

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

The connecting cable must be protected from tension and torsional loading or installed in such a way, that an applied force of 30 N, acting in the direction of the cable inlet for one hour, does not lead to any visible displacement of the cable connections, even though the cable sheathing is displaced, see also IEC 60079-11.