



Model Number

NCN3-F31K-N4-B13-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 SIL 2 acc. to IEC 61508
- LEDs for switching state of sensor and solenoid valve
- Valve LEDs disconnectable

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

Technical Data

General specifications

Switching function		2 x normally closed (NC)
Output type		NAMUR
Rated operating distance	s_n	3 mm
Installation		flush mountable
Assured operating distance	s_a	0 ... 2.4 mm
Actual operating distance	s_r	2.7 ... 3.3 mm typ.
Actuating element		Stainless steel 1.4305 / AISI 303 8.5 mm x 8.5 mm x 0.5 mm
Reduction factor r_{Al}		0.5
Reduction factor r_{Cu}		0.4
Reduction factor r_{304}		1
Reduction factor r_{S37}		1.3
Reduction factor r_{Brass}		0.6

Nominal ratings

Nominal voltage	U_o	8 V
Switching frequency	f	0 ... 3 kHz
Hysteresis	H	typ. 5 %
Reverse polarity protection		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		≥ 3 mA
Measuring plate detected		≤ 1 mA
Time delay before availability	t_v	≤ 1.1 ms
Switching state indicator		LED, yellow
Valve status indicator		LED, yellow

Functional safety related parameters

MTTF _d		1470 a
Mission Time (T _M)		20 a
Diagnostic Coverage (DC)		0 %

Ambient conditions

Ambient temperature		-25 ... 100 °C (-13 ... 212 °F)
Storage temperature		-40 ... 100 °C (-40 ... 212 °F)

Mechanical specifications

Connection (system side)		Screw terminals, tightening torque min. 0.5 Nm Stripped length 7 mm
Core cross-section (system side)		rigid: 0.14 ... 2.5 mm ² flexible: 0.14 ... 1.5 mm ² flexible with core-end sleeve: 0.25 ... 1.5 mm ²
Connection (valve side)		like connection (system side)
Core cross-section (valve side)		like core cross-section (system side)
Housing material		PBT
Sensing face		PBT
Degree of protection		IP67
Tightening torque, housing screws		1 Nm
Tightening torque, cable gland		M20 x 1.5 ; ≤ 7 Nm
Note		LED switch-off

General information

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

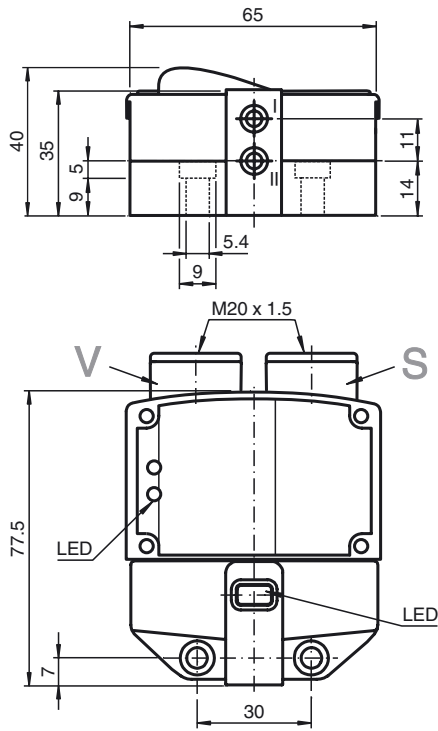
Compliance with standards and directives

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

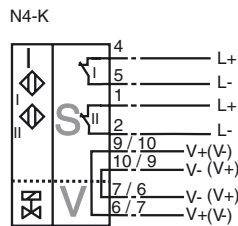
Approvals and certificates

CCC approval		CCC approval / marking not required for products rated ≤ 36 V
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Dimensions



Electrical Connection



Interruption of LED:

In the case of a polarity reversal of the valve circuit connection/s, the valve status display does not function, i.e. such that low power valves can (also) be connected.

Equipment protection level Ga

Instruction

Device category 1G

EC-Type Examination Certificate

CE marking

ATEX marking

Standards

Appropriate type

Effective internal inductivity C_i Effective internal inductance L_i

General

Ambient temperature

Installation, commissioning

Maintenance

Special conditions

Protection from mechanical danger

Electrostatic charge

Lead insertion

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist

TÜV 99 ATEX 1479 X

CE 0102

⊕ II 1G Ex ia IIC T6...T1 Ga

EN 60079-0:2012, EN 60079-11:2012, EN 60079-26:2007

Ignition protection "Intrinsic safety"

Use is restricted to the following stated conditions

NCN3-F31K-N4...

 ≤ 100 nF A cable length of 10 m is considered.

The value is applicable for one sensor circuit.

 ≤ 100 μ H A cable length of 10 m is considered.

The value is applicable for one sensor circuit.

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual.

The EU-type examination certificate has to be observed. The special conditions must be adhered to!

The ATEX directive and therefore the EU-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. 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.

Additional requirements for gas group IIB/IIC. Avoid electrostatic charges that can cause electrostatic discharge when installing or operating the device. Information on electrostatic hazards can be found in the technical specification IEC/TS 60079-32-1.

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.

Equipment protection level Gb

Instruction

Device category 2G

EC-Type Examination Certificate

CE marking

ATEX marking

Standards

Appropriate type

Effective internal inductivity C_i Effective internal inductance L_i

General

Maximum permissible ambient temperature T_{amb}

Installation, commissioning

Maintenance

Special conditions

Protection from mechanical danger

Electrostatic charge

Lead insertion

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist

TÜV 99 ATEX 1479 X

CE 0102

Ⓔ II 1G Ex ia IIC T6...T1 Ga

EN 60079-0:2012, EN 60079-11:2012

Ignition protection "Intrinsic safety"

Use is restricted to the following stated conditions

NCN3-F31K-N4...

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

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

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The EU-type examination certificate has to be observed. The special conditions must be adhered to!

The ATEX directive and therefore the EU-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.

Additional requirements for gas group IIC. Avoid electrostatic charges that can cause electrostatic discharge when installing or operating the device. Information on electrostatic hazards can be found in the technical specification IEC/TS 60079-32-1.

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.

Equipment protection level Gc (ic)

Instruction

Device category 3G (ic)

Certificate

CE marking

ATEX marking

Standards

Effective internal inductivity C_i Effective internal inductance L_i

General

Installation, commissioning

Maintenance

Special conditionsMaximum 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

Maximum values of the valve circuit

Protection from mechanical danger

Electrostatic charge

Connection parts

Lead insertion

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist

PF 13 CERT 2895 X

CE 0102

II 3G Ex ic IIC T6...T1 Gc

EN 60079-0:2012, EN 60079-11:2012 Ignition protection category "ic"
Use is restricted to the following stated conditions ≤ 100 nF ; A cable length of 10 m is considered.

The value is applicable for one sensor circuit.

 ≤ 100 μ H ; A cable length of 10 m is considered.

The value is applicable for one 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!

The ATEX Directive applies only to the use of apparatus under atmospheric conditions.

If you use the device outside atmospheric conditions, consider that the permissible safety parameters should be reduced.

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)

 $U_i = 32$ V; $I_i = 240$ mA; $C_i = 10$ nF; $L_i = 20$ μ H

The values are applicable to each valve circuit. A cable length of 10 m is taken into account.

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.

Additional requirements for gas group IIC. Avoid electrostatic charges that can cause electrostatic discharge when installing or operating the device. Information on electrostatic hazards can be found in the technical specification IEC/TS 60079-32-1.

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.