



Model Number

NCN3-F31K2M-N4-B13-S

Features

- Direct mounting on standard actuators
- ATEX & IECEX certifications
- Usable up to SIL 2 acc. to IEC 61508
- Weatherproof housing for outdoor applications
- Rugged metal base
- LEDs for switching state of sensor and solenoid valve
- Plug-in terminals
- Temperature range -40 ... 100 °C (-40 ... 212 °F)

Accessories

BT65-F31K2-RG-EN-01

Activator for F31K2 series including protective housing

SH-F31K2-B13

Protective cap for mechanically protected mounting

SH-BT65-F31K2-01

Protective housing for activator BT65-F31K2-RG-EN-01

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
		For assured operating distance s_{ar} see Manual Functional Safety.
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}		0.4
Reduction factor r_{Cu}		0.4
Reduction factor r_{304}		0.7
Reduction factor r_{Si37}		1
Reduction factor r_{Brass}		0.5
Output type		2-wire

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 ms
Switching state indicator		LED, yellow
Valve status indicator		LED, yellow

Functional safety related parameters

Safety Integrity Level (SIL)		SIL 2
MTTF _d		1730 a
Mission Time (T _M)		20 a
Diagnostic Coverage (DC)		0 %

Valve circuit

Voltage		max. 32 V DC
Current		max. 240 mA
Short-circuit protection		no
Reverse polarity protection		yes, with reversed output LED is out of function, therefore more power for solenoid valve

Ambient conditions

Ambient temperature		-40 ... 100 °C (-40 ... 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, M20 x 1.5
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		PC (glass-fiber-reinforced Makrolon)
Housing base		powder coated aluminum
Degree of protection		IP66 / IP68 / IP69
Tightening torque, housing screws		≤ 2 Nm
Tightening torque, cable gland		M20 x 1.5; ≤ 11 Nm
Tightening torque, stopping plug		1 Nm
Note		LED switch-off

General information

Use in the hazardous area		see instruction manuals
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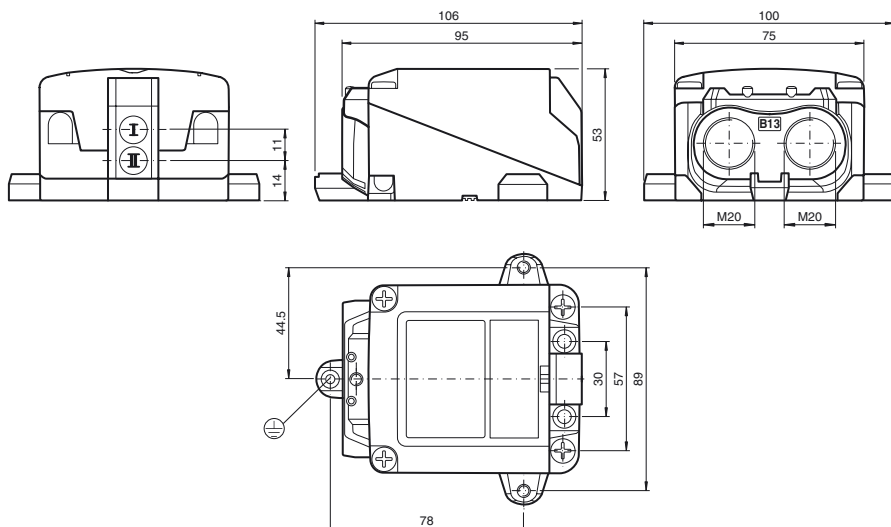
Compliance with standards and directives

Standard conformity		
NAMUR		EN 60947-5-6:2000 IEC 60947-5-6:1999
Electromagnetic compatibility Standards		NE 21:2007 EN 60947-5-2:2007 EN 60947-5-2/A1:2012 IEC 60947-5-2:2007 IEC 60947-5-2 AMD 1:2012

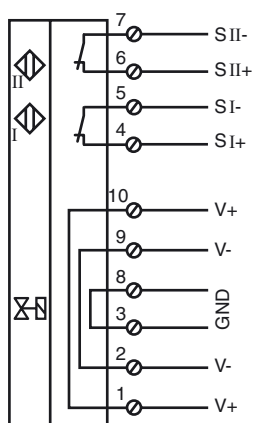
Approvals and certificates

UL approval		cULus Listed, General Purpose, Class 2 Power Source
CCC approval		CCC approval / marking not required for products rated ≤ 36 V

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.

Data for application in connection with hazardous areas

Equipment protection level	Ga , Gb , Gc (ic) , Da
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Equipment protection level Ga

Type of protection	intrinsic safety
CE marking	CE 0102

Certificates

Appropriate type	NCN3-F31K2...-N4...
ATEX certificate	TÜV 17 ATEX 8125 X
ATEX marking	Ⓔ II 1G Ex ia IIC T6...T1 Ga
Standards	EN 60079-0:2012+A11:2013 , EN 60079-11:2012
IECEX certificate	IECEX TUR 17.0055X
IECEX marking	Ex ia IIC T6...T1 Ga
Standards	IEC 60079-0:2011 , IEC 60079-11:2011

Effective internal capacitance	C_i	≤ 100 nF The value is applicable for one sensor circuit. A cable length of 10 m is considered.
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Effective internal inductance	L_i	≤ 100 μ H The value is applicable for one sensor circuit. A cable length of 10 m is considered.
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Maximum permissible ambient temperature T_{amb}	Also observe the maximum permissible ambient temperature stated in the general technical data. Keep to the lower of the two values.
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for ATEX	at $U_i = 15$ V , $I_i = 25$ mA , $P_i = 34$ mW , T6 : 55 °C (131 °F) T5 : 65 °C (149 °F) T4 : 95 °C (203 °F) T3 : 95 °C (203 °F) T2 : 95 °C (203 °F) T1 : 95 °C (203 °F) at $U_i = 15$ V , $I_i = 25$ mA , $P_i = 64$ mW , T6 : 50 °C (122 °F) T5 : 65 °C (149 °F) T4 : 90 °C (194 °F) T3 : 90 °C (194 °F) T2 : 90 °C (194 °F) T1 : 90 °C (194 °F) at $U_i = 15$ V , $I_i = 52$ mA , $P_i = 169$ mW , T6 : 45 °C (113 °F) T5 : 55 °C (131 °F) T4 : 75 °C (167 °F) T3 : 75 °C (167 °F) T2 : 75 °C (167 °F) T1 : 75 °C (167 °F)
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for IECEX	at $U_i = 15$ V , $I_i = 25$ mA , $P_i = 34$ mW , T6 : 70 °C (158 °F) T5 : 85 °C (185 °F) T4 : 100 °C (212 °F) T3 : 100 °C (212 °F) T2 : 100 °C (212 °F) T1 : 100 °C (212 °F) at $U_i = 15$ V , $I_i = 25$ mA , $P_i = 64$ mW , T6 : 70 °C (158 °F) T5 : 85 °C (185 °F) T4 : 100 °C (212 °F) T3 : 100 °C (212 °F) T2 : 100 °C (212 °F) T1 : 100 °C (212 °F) at $U_i = 15$ V , $I_i = 52$ mA , $P_i = 169$ mW , T6 : 60 °C (140 °F) T5 : 75 °C (167 °F) T4 : 75 °C (167 °F) T3 : 75 °C (167 °F) T2 : 75 °C (167 °F) T1 : 75 °C (167 °F)
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Maximum values of the valve circuit	The value applies to each valve circuit. A cable length of 10 m is considered.
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Voltage	U_i	≤ 32 V
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Current	I_i	≤ 240 mA
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Internal capacitance	C_i	≤ 10 nF
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Internal inductance	L_i	≤ 20 μ H
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Equipment protection level Gb

Type of protection	intrinsic safety	
CE marking	CE 0102	
Certificates		
Appropriate type	NCN3-F31K2...-N4...	
ATEX certificate	TÜV 17 ATEX 8125 X	
ATEX marking	II 1G Ex ia IIC T6...T1 Ga	
Standards	EN 60079-0:2012+A11:2013 , EN 60079-11:2012	
IECEX certificate	IECEX TUR 17.0055X	
IECEX marking	Ex ia IIC T6...T1 Ga	
Standards	IEC 60079-0:2011 , IEC 60079-11:2011	
Effective internal capacitance	C_i	$\leq 100 \text{ nF}$ The value is applicable for one sensor circuit. A cable length of 10 m is considered.
Effective internal inductance	L_i	$\leq 100 \text{ }\mu\text{H}$ The value is applicable for one sensor circuit. A cable length of 10 m is considered.
Maximum permissible ambient temperature T_{amb}	Also observe the maximum permissible ambient temperature stated in the general technical data. Keep to the lower of the two values. at $U_i = 15 \text{ V}$, $I_i = 25 \text{ mA}$, $P_i = 34 \text{ mW}$, T6 : 70 °C (158 °F) T5 : 85 °C (185 °F) T4 : 100 °C (212 °F) T3 : 100 °C (212 °F) T2 : 100 °C (212 °F) T1 : 100 °C (212 °F) at $U_i = 15 \text{ V}$, $I_i = 25 \text{ mA}$, $P_i = 64 \text{ mW}$, T6 : 70 °C (158 °F) T5 : 85 °C (185 °F) T4 : 100 °C (212 °F) T3 : 100 °C (212 °F) T2 : 100 °C (212 °F) T1 : 100 °C (212 °F) at $U_i = 15 \text{ V}$, $I_i = 52 \text{ mA}$, $P_i = 169 \text{ mW}$, T6 : 60 °C (140 °F) T5 : 75 °C (167 °F) T4 : 75 °C (167 °F) T3 : 75 °C (167 °F) T2 : 75 °C (167 °F) T1 : 75 °C (167 °F)	
Maximum values of the valve circuit	The value applies to each valve circuit. A cable length of 10 m is considered.	
Voltage	U_i	$\leq 32 \text{ V}$
Current	I_i	$\leq 240 \text{ mA}$
Internal capacitance	C_i	$\leq 10 \text{ nF}$
Internal inductance	L_i	$\leq 20 \text{ }\mu\text{H}$

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Equipment protection level Gc (ic)

Type of protection	intrinsic safety	
CE marking	CE	
Certificates		
ATEX certificate	PF 13 CERT 2895 X	
ATEX marking	Ⓔ II 3G Ex ic IIC T6...T1 Gc	
Standards	EN 60079-0:2012+A11:2013 , EN 60079-11:2012	
Effective internal capacitance	C_i	≤ 100 nF The value is applicable for one sensor circuit. A cable length of 10 m is considered.
Effective internal inductance	L_i	≤ 100 μH The value is applicable for one sensor circuit. A cable length of 10 m is considered.
Maximum permissible ambient temperature T_{amb}	Also observe the maximum permissible ambient temperature stated in the general technical data. Keep to the lower of the two values. at $U_i = 20 V$, $I_i = 25 mA$, $P_i = 34 mW$, T6 : 70 °C (158 °F) T5 : 85 °C (185 °F) T4 : 100 °C (212 °F) T3 : 100 °C (212 °F) T2 : 100 °C (212 °F) T1 : 100 °C (212 °F) at $U_i = 20 V$, $I_i = 25 mA$, $P_i = 64 mW$, T6 : 70 °C (158 °F) T5 : 85 °C (185 °F) T4 : 100 °C (212 °F) T3 : 100 °C (212 °F) T2 : 100 °C (212 °F) T1 : 100 °C (212 °F) at $U_i = 20 V$, $I_i = 52 mA$, $P_i = 169 mW$, T6 : 60 °C (140 °F) T5 : 75 °C (167 °F) T4 : 75 °C (167 °F) T3 : 75 °C (167 °F) T2 : 75 °C (167 °F) T1 : 75 °C (167 °F)	
Maximum values of the valve circuit	The value applies to each valve circuit. A cable length of 10 m is considered.	
Voltage	U_i	≤ 32 V
Current	I_i	≤ 240 mA
Internal capacitance	C_i	≤ 10 nF
Internal inductance	L_i	≤ 20 μH

Equipment protection level Da

Type of protection	intrinsic safety	
CE marking	CE 0102	
Certificates		
Appropriate type	NCN3-F31K2M-N4-B13...	
ATEX certificate	TÜV 17 ATEX 8125 X	
ATEX marking	Ⓔ II 1D Ex ia IIIC T135°C Da	
Standards	EN 60079-0:2012+A11:2013 , EN 60079-11:2012	
IECEx certificate	IECEx TUR 17.0055X	
IECEx marking	Ex ia IIIC T135°C Da	
Standards	IEC 60079-0:2011 , IEC 60079-11:2011	
Effective internal capacitance	C_i	≤ 100 nF A cable length of 10 m is considered.
Effective internal inductance	L_i	≤ 100 μH A cable length of 10 m is considered.
Maximum permissible ambient temperature T_{amb}	Also observe the maximum permissible ambient temperature stated in the general technical data. Keep to the lower of the two values. at $U_i = 15 V$, $I_i = 25 mA$, $P_i = 34 mW$: 50 °C (122 °F) at $U_i = 15 V$, $I_i = 25 mA$, $P_i = 64 mW$: 45 °C (113 °F) at $U_i = 15 V$, $I_i = 52 mA$, $P_i = 169 mW$: 40 °C (104 °F)	
Maximum values of the valve circuit	The value applies to each valve circuit. A cable length of 10 m is considered.	
Voltage	U_i	≤ 32 V
Current	I_i	≤ 240 mA
Internal capacitance	C_i	≤ 10 nF
Internal inductance	L_i	≤ 20 μH

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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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