



## Model Number

**NBN3-F31K2M-E8-B13-S-3G-3D**

## Features

- Direct mounting on standard actuators
- ATEX-approval for zone 2 and zone 22
- Rugged metal base
- Weatherproof housing for outdoor applications
- Plug-in terminals

## Application

### Note

The connections to this sensor are sealed with stopping plugs to protect against dirt and moisture. If not all of the connections are used in your application, then seal the remaining stopping plugs on the sensor permanently or check during initial installation and when performing regular maintenance work that the stopping plugs are secure and impermeable. If necessary, tighten the stopping plugs to a torque of 2 Nm.

## 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 open (NO)
Output type		PNP
Rated operating distance	$s_n$	2.5 mm
Installation		for non-flush mounting
Output polarity		DC
Assured operating distance	$s_a$	0 ... 1.5 mm
Output type		4-wire

### Nominal ratings

Operating voltage	$U_B$	10 ... 30 V
Switching frequency	$f$	0 ... 100 Hz
Hysteresis	$H$	typ. 5 %
Reverse polarity protection		all connections
Short-circuit protection		pulsing
Voltage drop	$U_d$	$\leq 3$ V
Operating current	$I_L$	0 ... 100 mA
Off-state current	$I_r$	0 ... 0.5 mA typ. 0.1 $\mu$ A
No-load supply current	$I_0$	$\leq 25$ mA

### Functional safety related parameters

MTTF <sub>d</sub>	490 a
Mission Time (T <sub>M</sub> )	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 ... 75 °C (-40 ... 167 °F), restriction for use in hazardous area, see instruction manual
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)

### Mechanical specifications

Connection (system side)	M20 x 1.5 cable gland, ground connection with earthing screw only for wire cross-section 4 mm <sup>2</sup> , use solid wire or stranded wire with wire end ferrule
Connection (valve side)	screw terminal, Cable gland M20 x 1.5
Housing material	rugged polycarbonate (PC) + GF 10%, optimised for outdoor use
Housing base	powder coated aluminum
Degree of protection	IP67; additional degree of protection IP66/IP69 with BT65-F31K2-RG-EN-01 and SH-F31K2-B13
Terminal assembly	
Number	10
Connection type	For connection of copper wires with 7 mm dismantle length Tightening torque 0.5 ... 0.6 Nm
Type	Screw terminal block, pluggable
Terminal capacity	Conductor cross-section 0,25 ... 2,5 mm <sup>2</sup> , flexible/rigid For Multiple-wire connection: two wires of equal cross-section per 0,25 ... 1 mm <sup>2</sup>
Tightening torque, fastening screws	2 Nm
Tightening torque, housing screws	1.5 Nm
Tightening torque, earthing screw	1.5 Nm
Tightening torque, cable gland	M20 x 1.5; $\leq 11$ Nm
Tightening torque, stopping plug	2 Nm

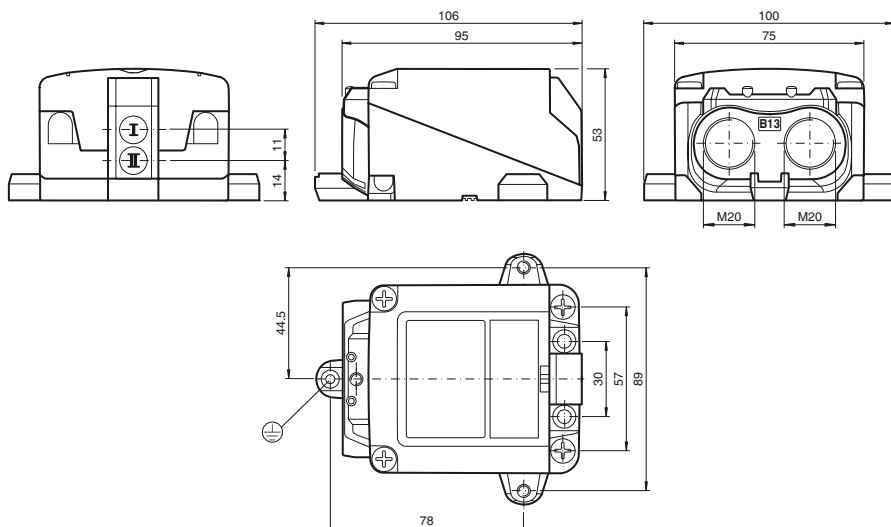
### General information

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

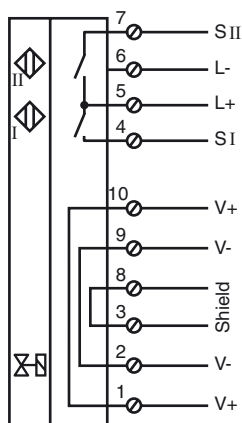
### Compliance with standards and directives

Standard conformity	
Standards	EN 60947-5-2:2007 EN 60947-5-2/A1:2012 IEC 60947-5-2:2007 IEC 60947-5-2 AMD 1:2012 VDI / VDE 3845

**Dimensions**



**Electrical Connection**



**Equipment protection level Gc (nA)**

Certificate	PF 15CERT3754 X
CE marking	<b>CE</b>
ATEX marking	<b>Ex</b> II 3G Ex nA IIC T6...T1 Gc The Ex-related marking can also be printed on the enclosed label.
Standards	EN 60079-0:2012+A11:2013, EN 60079-15:2010 Ignition protection category "n" Use is restricted to the following stated conditions
<b>Special conditions</b>	
Maximum operating current $I_L$	The maximum permissible load current must be restricted to the values given in the following list. High load currents and load short-circuits are not permitted.
Maximum operating voltage $U_{Bmax}$	The maximum permissible operating voltage $U_{Bmax}$ is restricted to the values in the following list. Tolerances are not permissible.
Maximum permissible ambient temperature $T_{Umax}$	Depending on the load current $I_L$ , the maximum operating voltage $U_{Bmax}$ , and the temperature class. Details can be found in the following list.
at $U_{Bmax}=30\text{ V}$ , $I_L=100\text{ mA}$ , T6	35 °C (95 °F)
at $U_{Bmax}=30\text{ V}$ , $I_L=100\text{ mA}$ , T1 ... T5	60 °C (140 °F)
Maximum values of the valve circuit	$U_V = 32\text{ V}$ ; $I_V = 240\text{ mA}$

**Equipment protection level Dc (tc)**

CE marking	<b>CE</b>
ATEX marking	<b>Ex</b> II 3D Ex tc IIC T80°C Dc The Ex-related marking can also be printed on the enclosed label.
Standards	EN 60079-0:2012+A11:2013, EN 60079-31:2014 Protection by enclosure "tc" Some of the information in this instruction manual is more specific than the information provided in the datasheet.

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## General

The corresponding datasheets, declarations of conformity, EC-type examination certificates, certifications, and control drawings, where applicable (see datasheets), form an integral part of this document. These documents can be found at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com). The maximum surface temperature of the device was determined without a layer of dust on the apparatus. Some of the information in this instruction manual is more specific than the information provided in the datasheet.

## Special conditions

Maximum permissible ambient temperature  $T_{Umax}$  dependant of the load current  $I_L$  and the max. operating voltage  $U_{Bmax}$   
Information can be taken from the following list.

at  $U_{Bmax}=30\text{ V}$ ,  $I_L=100\text{ mA}$  60 °C (140 °F)