



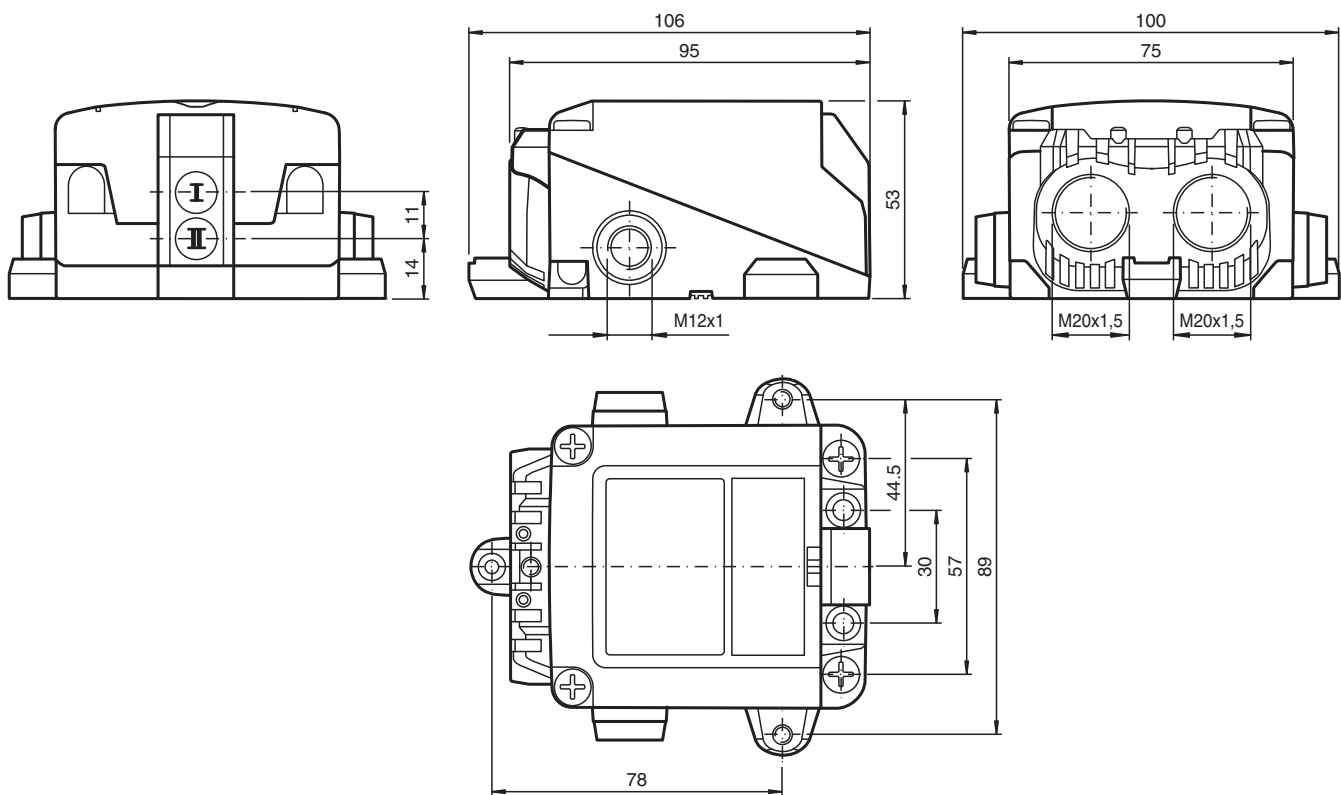
# Inductive sensor

## NCN3-F31K2-N5-B33-S

- Direct mounting on standard actuators
- ATEX & IECEx certifications
- Usable up to SIL 2 acc. to IEC 61508
- Weatherproof housing for outdoor applications
- LEDs for switching state of sensor and solenoid valve
- Plug-in terminals
- 2:1 transfer method
- Temperature range  
-40 ... 100 °C (-40 ... 212 °F)
- 2 solenoid valves can be connected



### Dimensions



### Technical Data

| General specifications |                          |
|------------------------|--------------------------|
| Switching function     | 2 x normally closed (NC) |
| Output type            | NAMUR                    |

## Technical Data

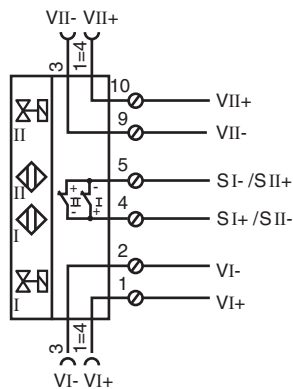
|                                                 |       |                                                                                             |
|-------------------------------------------------|-------|---------------------------------------------------------------------------------------------|
| Rated operating distance                        | $s_n$ | 3 mm                                                                                        |
| Installation                                    |       | flush mountable                                                                             |
| Assured operating distance                      | $s_a$ | 0 ... 2.4 mm<br>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<br>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 $r_{St37}$                     |       | 1                                                                                           |
| Reduction factor $r_{Brass}$                    |       | 0.5                                                                                         |
| Output type                                     |       | 2-wire                                                                                      |
| <b>Nominal ratings</b>                          |       |                                                                                             |
| Nominal voltage                                 | $U_o$ | 8 V                                                                                         |
| Switching frequency                             | $f$   | 0 ... 3 kHz                                                                                 |
| Hysteresis                                      | $H$   | typ. 5 %                                                                                    |
| 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                                                                                 |
| Time delay before availability                  | $t_v$ | $\leq 1.1$ ms                                                                               |
| Switching state indicator                       |       | LED, yellow                                                                                 |
| Valve status indicator                          |       | LED, yellow                                                                                 |
| <b>Functional safety related parameters</b>     |       |                                                                                             |
| Safety Integrity Level (SIL)                    |       | SIL 2                                                                                       |
| MTTF <sub>d</sub>                               |       | 1730 a                                                                                      |
| Mission Time ( $T_M$ )                          |       | 20 a                                                                                        |
| Diagnostic Coverage (DC)                        |       | 0 %                                                                                         |
| <b>Valve circuit</b>                            |       |                                                                                             |
| 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   |
| <b>Compliance with standards and directives</b> |       |                                                                                             |
| Standard conformity                             |       |                                                                                             |
| NAMUR                                           |       | EN 60947-5-6:2000<br>IEC 60947-5-6:1999                                                     |
| Electromagnetic compatibility                   |       | NE 21:2007                                                                                  |
| Standards                                       |       | EN 60947-5-2:2007<br>EN 60947-5-2/A1:2012<br>IEC 60947-5-2:2007<br>IEC 60947-5-2 AMD 1:2012 |
| <b>Approvals and certificates</b>               |       |                                                                                             |
| UL approval                                     |       | cULus Listed, General Purpose, Class 2 Power Source                                         |
| Ordinary Location                               |       | E87056                                                                                      |
| Hazardous Location                              |       | E501628                                                                                     |
| Control drawing                                 |       | 116-0455                                                                                    |
| CCC approval                                    |       | CCC approval / marking not required for products rated $\leq 36$ V                          |
| <b>Ambient conditions</b>                       |       |                                                                                             |
| Ambient temperature                             |       | -40 ... 100 °C (-40 ... 212 °F)                                                             |
| Storage temperature                             |       | -40 ... 100 °C (-40 ... 212 °F)                                                             |
| <b>Mechanical specifications</b>                |       |                                                                                             |
| Connection type                                 |       | screw terminals                                                                             |

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## Technical Data

|                                   |                                                                                                                                                             |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection (system side)          | Screw terminals, tightening torque min. 0.5 Nm<br>Stripped length 7 mm , M20 x 1.5 cable gland , usable thread length 13.5 mm , screw-in depth max. 13.5 mm |
| Core cross-section (system side)  | rigid: 0.14 ... 2.5 mm <sup>2</sup><br>flexible: 0.14 ... 1.5 mm <sup>2</sup><br>flexible with core-end sleeve: 0.25 ... 1.5 mm <sup>2</sup>                |
| Connection (valve side)           | 4-pin, M12 x 1 socket                                                                                                                                       |
| Core cross-section (valve side)   | like core cross section (system side)                                                                                                                       |
| Housing material                  | rugged, translucent polycarbonate (PC) optimised for outdoor use                                                                                            |
| Housing base                      | PC                                                                                                                                                          |
| Degree of protection              | IP66 / IP67 / IP69                                                                                                                                          |
| Tightening torque, housing screws | ≤ 2 Nm                                                                                                                                                      |
| Tightening torque, cable gland    | M20 x 1.5 ; max. 4 Nm                                                                                                                                       |
| Tightening torque, stopping plug  | 1 Nm                                                                                                                                                        |
| Note                              | LED switch-off                                                                                                                                              |
| <b>General information</b>        |                                                                                                                                                             |
| Use in the hazardous area         | see instruction manuals                                                                                                                                     |

## Connection



## Additional Information

### 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.

## Matching system components

|                                                                                   |               |                          |
|-----------------------------------------------------------------------------------|---------------|--------------------------|
|  | <b>BT115A</b> | Activator for F31 series |
|  | <b>BT115X</b> | Activator for F31 series |

## Accessories

|                                                                                    |                                    |                                                                     |
|------------------------------------------------------------------------------------|------------------------------------|---------------------------------------------------------------------|
|   | <b>BT65-F31K2-RG-EN</b>            | Activator for F31K2 series                                          |
|   | <b>BT65A</b>                       | Activator for F31 series                                            |
|   | <b>BT65X</b>                       | Activator for F31 series                                            |
|   | <b>VMB-2+P/Z2-0,3M-PVC-V1-W-Y</b>  | Valve connector, Form B on M12, 2+PE, LED, Z diode, PVC cable       |
|   | <b>VMBI-2+P/Z2-0,3M-PVC-V1-W-Y</b> | Valve connector, Form B (Ind) on M12, 2+PE, LED, Z diode, PVC cable |
|  | <b>VMA-2+P/Z2-0,3M-PVC-V1-W-Y</b>  | Valve connector, Form A on M12, 2+PE, LED, Z diode, PVC cable       |