## Model Number

**NCN3-F25-N4-V1**

## Features

- **Direct mounting on standard actuators**
- **EC-Type Examination Certificate TÜV99 ATEX 1479X**

## Accessories

**BT32**
Activator for F25 series

**BT32XS**
Activator for F25 series

**BT32XAS**
Activator for F25 series

**BT33**
Activator for F25 series

**BT34**
Activator for F25 series

**V1-G-N4-5M-PUR**
Female cordset, M12, 4-pin, NAMUR, PUR cable

## Technical Data

| | | |
|---|---|---|
| **General specifications** | | |
| 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 ... 2.43 mm |
| Actual operating distance | $s_r$ | 2.7 ... 3.3 mm typ. |
| Reduction factor $r_{Al}$ | | 0.5 |
| Reduction factor $r_{Cu}$ | | 0.4 |
| Reduction factor $r_{304}$ | | 1 |
| Reduction factor $r_{St37}$ | | 1.1 |
| Reduction factor $r_{Brass}$ | | 0.63 |
| **Nominal ratings** | | |
| Nominal voltage | $U_o$ | 8.2 V ($R_i$ approx. 1 kΩ) |
| Switching frequency | f | 0 ... 1500 Hz |
| 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 |
| **Functional safety related parameters** | | |
| $MTTF_d$ | | 2070 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 type | | Connector M12 x 1 , 4-pin |
| Housing material | | PBT |
| Sensing face | | PBT |
| Degree of protection | | IP67 |
| Tightening torque, fastening screws | | M5 x 25 : 2.7 Nm |
| Note | | Mounted on mechanical drive |
| **General information** | | |
| Use in the hazardous area | | see instruction manuals |
| Category | | 1G; 2G; 3G; 3D |
| **Compliance with standards and directives** | | |
| 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>IEC 60947-5-2:2007 |
| **Approvals and certificates** | | |
| FM approval | | |
| Control drawing | | 116-0165 |
| UL approval | | cULus Listed, General Purpose |
| CSA approval | | cCSAus Listed, General Purpose |
| CCC approval | | CCC approval / marking not required for products rated ≤36 V |

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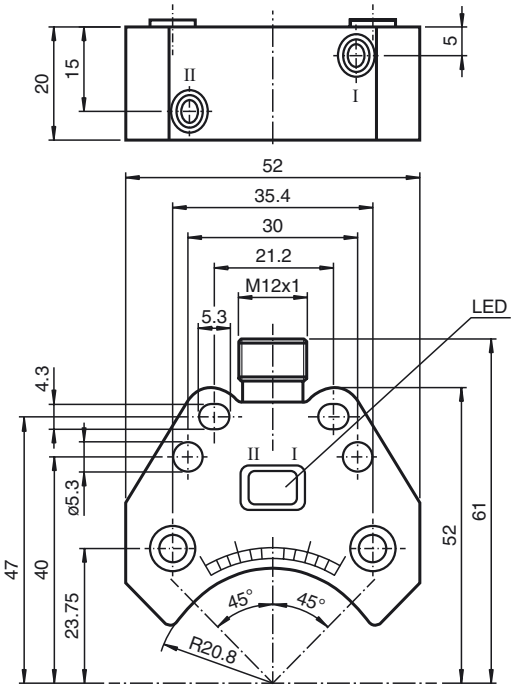
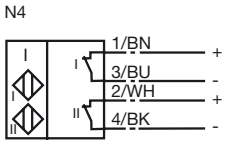
## Dimensions




## Electrical Connection

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**ATEX 1G**

| | |
|---|---|
| Instruction | **Manual electrical apparatus for hazardous areas** |
| Device category 1G | for use in hazardous areas with gas, vapour and mist |
| EC-Type Examination Certificate | TÜV 99 ATEX 1479 X |
| CE marking | CE 0102 |
| ATEX marking | Ex II 1G Ex ia IIC T6…T1 Ga |
| Directive conformity | 94/9/EG |
| Standards | EN 60079-0:2012, EN 60079-11:2012, EN 60079-26:2007<br>Ignition protection "Intrinsic safety"<br>Use is restricted to the following stated conditions |
| Appropriate type | NCN3-F25.-N4... |
| Effective internal capacitance $C_i$ | ≤ 100 nF A cable length of 10 m is considered.<br>The value is applicable for one sensor circuit. |
| Effective internal inductance $L_i$ | ≤ 100 µH A cable length of 10 m is considered.<br>The value is applicable for one sensor circuit. |
| General | The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual.<br>The EC-Type Examination Certificate has to be observed. The special conditions must be adhered to!<br>Directive 94/9/EG and hence also EC-Type Examination Certificates apply in general only to the use of electrical apparatus under atmospheric conditions.<br>The use in ambient temperatures of > 60 °C was tested with regard to hot surfaces by the mentioned certification authority.<br>If the equipment is not used under atmospheric conditions, a reduction of the permissible minimum ignition energies may have to be taken into consideration. |
| 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.<br>The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety.<br>The associated apparatus must satisfy the requirements of category ia.<br>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.<br>Install the device in such a way that the resin surface is not exposed to mechanical hazards. |
| Maintenance | No changes can be made to apparatus, which are operated in hazardous areas.<br>Repairs to these apparatus are not possible. |

**Special conditions**

| | |
|---|---|
| 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 charge | When used in group IIC non-permissible electrostatic charges should be avoided on the plastic housing parts. Information on electrostatic hazards can be found in the technical specification IEC/TS 60079-32-1. Additional requirements for gas group IIC. Avoid electrostatic charges that can cause electrostatic discharge when installing or operating the device. |

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**ATEX 2G**

| | |
|---|---|
| Instruction | **Manual electrical apparatus for hazardous areas** |
| **Device category 2G** | for use in hazardous areas with gas, vapour and mist |
| EC-Type Examination Certificate | TÜV 99 ATEX 1479 X |
| CE marking | CE 0102 |
| ATEX marking | Ex II 1G Ex ia IIC T6…T1 Ga |
| Directive conformity | 94/9/EG |
| Standards | EN 60079-0:2012, EN 60079-11:2012<br>Ignition protection "Intrinsic safety"<br>Use is restricted to the following stated conditions |
| Appropriate type | NCN3-F25.-N4... |
| Effective internal capacitance $C_i$ | ≤ 100 nF ; a cable length of 10 m is considered. The value is applicable for one sensor circuit. |
| Effective internal inductance $L_i$ | ≤ 100 µH ; a cable length of 10 m is considered. The value is applicable for one 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!<br>Directive 94/9/EG and hence also EC-Type Examination Certificates apply in general only to the use of electrical apparatus under atmospheric conditions.<br>The use in ambient temperatures of > 60 °C was tested with regard to hot surfaces by the mentioned certification authority.<br>If the equipment is not used under atmospheric conditions, a reduction of the permissible minimum ignition energies may have to be taken into consideration. |
| Ambient temperature | The temperature ranges, according to temperature class, are given in the EC-Type Examination Certificate. |
| 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. Install the device in such a way that the resin surface is not exposed to mechanical hazards. |
| Maintenance | No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible. |

**Special conditions**

| | |
|---|---|
| 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. |

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Refer to “General Notes Relating to Pepperl+Fuchs Product Information”.
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**ATEX 3G (nL)**

| | |
|---|---|
| Note | This instruction is only valid for products according to EN 60079-15:2005, valid until 01-May-2013 |
| **Instruction** | **Manual electrical apparatus for hazardous areas** |
| **Device category 3G (nL)** | for use in hazardous areas with gas, vapour and mist |
| CE marking | CE 0102 |
| ATEX marking | Ex II 3G Ex nL IIC T6 X |
| Directive conformity | 94/9/EG |
| Standard conformity | EN 60079-15:2005 Ignition protection category "n"<br>Use is restricted to the following stated conditions |
| Effective internal capacitance $C_i$ | ≤ 100 nF ; A cable length of 10 m is considered.<br>The value is applicable for one sensor circuit. |
| Effective internal inductance $L_i$ | ≤ 100 µH ; A cable length of 10 m is considered.<br>The value is applicable for one sensor circuit. |
| General | 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!<br>The special conditions must be observed! |
| Installation, commissioning | Laws and/or regulations and standards governing the use or intended usage goal must be observed. The sensor must only be operated with an energy-limited circuit, which satisfies the requirements of IEC 60079-15. The explosion group complies with the connected, supplying, power limiting circuit. |
| Maintenance | No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible. |
| **Special conditions** | |
| Maximum permissible ambient temperature $T_{Umax}$ at Ui = 20 V | Each sensor circuit van be operated with the stated maximum values. |
| for Pi=34 mW, Ii=25 mA, T6 | 64 °C (147.2 °F) |
| for Pi=34 mW, Ii=25 mA, T5 | 64 °C (147.2 °F) |
| for Pi=34 mW, Ii=25 mA, T4-T1 | 64 °C (147.2 °F) |
| for Pi=64 mW, Ii=25 mA, T6 | 59 °C (138.2 °F) |
| for Pi=64 mW, Ii=25 mA, T5 | 59 °C (138.2 °F) |
| for Pi=64 mW, Ii=25 mA, T4-T1 | 59 °C (138.2 °F) |
| for Pi=169 mW, Ii=52 mA, T6 | 41 °C (105.8 °F) |
| for Pi=169 mW, Ii=52 mA, T5 | 41 °C (105.8 °F) |
| for Pi=169 mW, Ii=52 mA, T4-T1 | 41 °C (105.8 °F) |
| Protection from mechanical danger | The sensor must not be exposed to **ANY FORM** of 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. |
| Protection from UV light | The sensor and the connection cable must be protected from damaging UV-radiation. This can be achieved when the sensor is used in internal areas. |
| Connection parts | The connection parts are to be installed, such that a minimum protection class of IP20 is achieved, in accordance with IEC 60529. |

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**ATEX 3G (ic)**

| | |
|---|---|
| Instruction | **Manual electrical apparatus for hazardous areas** |
| **Device category 3G (ic)** | for use in hazardous areas with gas, vapour and mist |
| Certificate of Compliance | PF 13 CERT 2895 X |
| CE marking | CE |
| ATEX marking | Ex II 3G Ex ic IIC T6…T1 Gc |
| Directive conformity | 94/9/EG |
| Standards | EN 60079-0:2012, EN 60079-11:2012 Ignition protection category "ic"<br>Use is restricted to the following stated conditions |
| Effective internal capacitance $C_i$ | ≤ 100 nF ; a cable length of 10 m is considered. The value is applicable for one sensor circuit. |
| Effective internal inductance $L_i$ | ≤ 100 µH ; A cable length of 10 m is considered.<br>The value is applicable for one sensor circuit. |
| General | 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!<br>The special conditions must be observed! |
| Installation, commissioning | 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 and energy-limited supply circuit.<br>Install the device in such a way that the resin surface is not exposed to mechanical hazards. |
| Maintenance | No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible. |

**Special conditions**

| | |
|---|---|
| Maximum permissible ambient temperature $T_{Umax}$ at Ui = 20 V | Each sensor circuit van be operated with the stated maximum values. |
| for Pi=34 mW, Ii=25 mA, T6 | 64 °C (147.2 °F) |
| for Pi=34 mW, Ii=25 mA, T5 | 64 °C (147.2 °F) |
| for Pi=34 mW, Ii=25 mA, T4-T1 | 64 °C (147.2 °F) |
| for Pi=64 mW, Ii=25 mA, T6 | 59 °C (138.2 °F) |
| for Pi=64 mW, Ii=25 mA, T5 | 59 °C (138.2 °F) |
| for Pi=64 mW, Ii=25 mA, T4-T1 | 59 °C (138.2 °F) |
| for Pi=169 mW, Ii=52 mA, T6 | 41 °C (105.8 °F) |
| for Pi=169 mW, Ii=52 mA, T5 | 41 °C (105.8 °F) |
| for Pi=169 mW, Ii=52 mA, T4-T1 | 41 °C (105.8 °F) |
| Protection from mechanical danger | The sensor must not be mechanically damaged.<br>When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing. |
| Connection parts | The connection parts are to be installed, such that a minimum protection class of IP20 is achieved, in accordance with IEC 60529. |

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**ATEX 3D**

| | |
|---|---|
| Note | **This instruction is only valid for products according to EN 50281-1-1, valid until 30-September-2008**<br>Note the ex-marking on the sensor or on the enclosed adhesive label |
| **Instruction** | **Manual electrical apparatus for hazardous areas** |
| **Device category 3D** | for use in hazardous areas with non-conducting combustible dust |
| CE marking | CE 0102 |
| ATEX marking | Ex II 3D IP67 T 111 °C (231.8 °F) X |
| Directive conformity | 94/9/EG |
| Standards | EN 50281-1-1<br>Protection via housing<br>Use is restricted to the following stated conditions |
| General | The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual.<br>The data stated in the data sheet are restricted by this operating instruction! The special conditions must be adhered to! |
| Installation, commissioning | Laws and/or regulations and standards governing the use or intended usage goal must be observed. Each sensor circuit van be operated with the stated maximum values. |
| Maintenance | No changes can be made to apparatus, which are operated in hazardous areas.<br>Repairs to these apparatus are not possible. |
| **Special conditions** | |
| Minimum series resistance $R_V$ | A minimum series resistance RV is to be provided between the power supply voltage and the proximity switch in accordance with the following list. This can also be assured by using a switch amplifier. |
| Maximum operating voltage $U_{Bmax}$ | The maximum permissible operating voltage UBmax must be restricted to the values given in the following list. Tolerances are not permitted. |
| Maximum heating (Temperature rise) | Values can be obtained from the following list, depending on the max. operating voltage Ub max and the minimum series resistance Rv. |
| at $U_{Bmax}$=9 V, $R_V$=562 Ω | 11 K |
| using an amplifier in accordance with EN 60947-5-6 | 11 K |
| Protection from mechanical danger | The sensor must not be mechanically damaged. |
| Plug connector | The plug connector must not be disconnected under voltage. The proximity switch is marked as follows: "DO NOT DISCONNECT UNDER VOLTAGE!" When the plug connector is disconnected the ingress of dirt into the inner areas (i.e. the areas, which are not accessible in the plugged-in condition) must be prevented.<br>The plug connection can only be separated using a tool. This is achieved by using the locking protection V1-Clip (Mounting accessory from Pepperl + Fuchs). |

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**ATEX 3D (tD)**

| | |
|---|---|
| Note | **This instruction is only valid for products according to EN 61241-0:2006 and EN 61241-1:2004**<br>Note the ex-marking on the sensor or on the enclosed adhesive label |
| **Instruction** | **Manual electrical apparatus for hazardous areas** |
| **Device category 3D** | for use in hazardous areas with non-conducting combustible dust |
| CE marking | CE |
| ATEX marking | Ex II 3D Ex tD A22 IP67 T80°C X |
| Directive conformity | 94/9/EG |
| Standards | EN 61241-0:2006, EN 61241-1:2004<br>Protection via housing "tD"<br>Use is restricted to the following stated conditions |
| General | The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual.<br>The maximum surface temperature has been determined in accordance with method A without a dust layer on the equipment.<br>The data stated in the data sheet are restricted by this operating instruction!<br>The special conditions must be adhered to! |
| Installation, commissioning | Laws and/or regulations and standards governing the use or intended usage goal must be observed. Each sensor circuit van be operated with the stated maximum values. |
| Maintenance | No changes can be made to apparatus, which are operated in hazardous areas.<br>Repairs to these apparatus are not possible. |

**Special conditions**

| | |
|---|---|
| Minimum series resistance $R_V$ | A minimum series resistance RV is to be provided between the power supply voltage and the proximity switch in accordance with the following list. This can also be assured by using a switch amplifier. |
| Maximum operating voltage $U_{Bmax}$ | The maximum permissible operating voltage UBmax must be restricted to the values given in the following list. Tolerances are not permitted. |
| Maximum permissible ambient temperature $T_{Umax}$ | Values can be obtained from the following list, depending on the max. operating voltage Ub max and the minimum series resistance Rv. |
| at $U_{Bmax}$=9 V, $R_V$=562 Ω | 59 °C (138.2 °F) |
| using an amplifier in accordance with EN 60947-5-6 | 59 °C (138.2 °F) |
| Protection from mechanical danger | The sensor must not be exposed to **ANY FORM** of mechanical danger. |
| Protection from UV light | The sensor and the connection cable must be protected from damaging UV-radiation. This can be achieved when the sensor is used in internal areas. |
| Plug connector | The plug connector must not be withdrawn under voltage. The proximity switch is identified as follows: "WARNING - DO NOT SEPARATE WHEN ENERGIZED". With the plug connector disconnected, soiling of the internal area must be prevented.(i.e. the area that is inaccessible when the connector is inserted)<br>The plug connection can only be separated using a tool. This is achieved by using the locking protection V1-Clip (Mounting accessory from Pepperl + Fuchs). |

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