

# Proximity Sensors Inductive Stainless Steel Housing Types IA, M12, M18 and M30, NAMUR

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- Stainless steel housing, cylindrical
- Diameter: M12, M18, M30
- Short or long versions
- Sensing distance: 2 to 15 mm
- Output: NAMUR EN 50 227
- Protection: Reverse polarity
- LED-indication
- 2 m cable or plug M12



## Product Description

Proximity switch in M12, M18 and M30 stainless steel housing. Made in accordance with Euronorm EN 50 227 and EN 60 947-5-2. For thermoplastic housing refer to type IA 12C.... Amplifier relay SD.... is available.

## Ordering Key

**IA 12 ESF 02 UC M1**

Type \_\_\_\_\_  
Housing size \_\_\_\_\_  
Housing type \_\_\_\_\_  
Sensing function \_\_\_\_\_  
Sensing distance \_\_\_\_\_  
Output type \_\_\_\_\_  
Plug \_\_\_\_\_

## Type Selection

| Housing diameter | Body style | Connection | Rated operating distance (S <sub>n</sub> ) | Ordering no. Namur |
|------------------|------------|------------|--|--------------------|
| M12              | Short      | Cable      | 2 mm <sup>1)</sup>                         | IA 12 ESF 02 UC    |
| M12              | Short      | Plug       | 2 mm <sup>1)</sup>                         | IA 12 ESF 02 UC M1 |
| M12              | Long       | Cable      | 2 mm <sup>1)</sup>                         | IA 12 ELF 02 UC    |
| M12              | Long       | Plug       | 2 mm <sup>1)</sup>                         | IA 12 ELF 02 UC M1 |
| M12              | Short      | Cable      | 4 mm <sup>2)</sup>                         | IA 12 ESN 04 UC    |
| M12              | Short      | Plug       | 4 mm <sup>2)</sup>                         | IA 12 ESN 04 UC M1 |
| M12              | Long       | Cable      | 4 mm <sup>2)</sup>                         | IA 12 ELN 04 UC    |
| M12              | Long       | Plug       | 4 mm <sup>2)</sup>                         | IA 12 ELN 04 UC M1 |
| M18              | Short      | Cable      | 5 mm <sup>1)</sup>                         | IA 18 ESF 05 UC    |
| M18              | Short      | Plug       | 5 mm <sup>1)</sup>                         | IA 18 ESF 05 UC M1 |
| M18              | Long       | Cable      | 5 mm <sup>1)</sup>                         | IA 18 ELF 05 UC    |
| M18              | Long       | Plug       | 5 mm <sup>1)</sup>                         | IA 18 ELF 05 UC M1 |
| M18              | Short      | Cable      | 8 mm <sup>2)</sup>                         | IA 18 ESN 08 UC    |
| M18              | Short      | Plug       | 8 mm <sup>2)</sup>                         | IA 18 ESN 08 UC M1 |
| M18              | Long       | Cable      | 8 mm <sup>2)</sup>                         | IA 18 ELN 08 UC    |
| M18              | Long       | Plug       | 8 mm <sup>2)</sup>                         | IA 18 ELN 08 UC M1 |
| M30              | Short      | Cable      | 10 mm <sup>1)</sup>                        | IA 30 ESF 10 UC    |
| M30              | Short      | Plug       | 10 mm <sup>1)</sup>                        | IA 30 ESF 10 UC M1 |
| M30              | Long       | Cable      | 10 mm <sup>1)</sup>                        | IA 30 ELF 10 UC    |
| M30              | Long       | Plug       | 10 mm <sup>1)</sup>                        | IA 30 ELF 10 UC M1 |
| M30              | Short      | Cable      | 15 mm <sup>2)</sup>                        | IA 30 ESN 15 UC    |
| M30              | Short      | Plug       | 15 mm <sup>2)</sup>                        | IA 30 ESN 15 UC M1 |
| M30              | Long       | Cable      | 15 mm <sup>2)</sup>                        | IA 30 ELN 15 UC    |
| M30              | Long       | Plug       | 15 mm <sup>2)</sup>                        | IA 30 ELN 15 UC M1 |

<sup>1)</sup> For flush mounting in metal

<sup>2)</sup> For non-flush mounting in metal



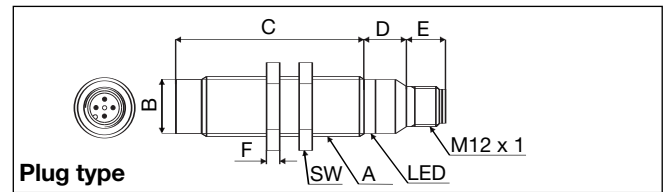
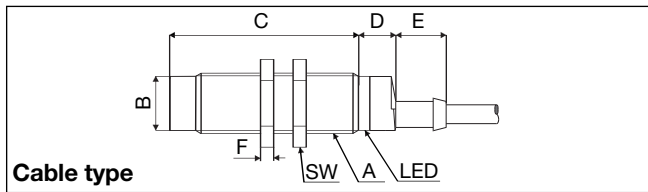
## Specifications

|   |  |   |   |
|---|--|---|---|
| <b>Rated operational volt.</b> ( $U_e$ )<br>( $U_B$ ) | 8.2 VDC<br>7 to 9 VDC<br>(6 to 35 VDC, all specifications not observed in extended supply range)   | <b>Hysteresis (H)</b><br>(Differential travel)      | 1 to 15% of sensing distance  |
| <b>Self-inductance</b>                                | $\leq 500\mu\text{H}$  | <b>Effective operating dist. (<math>S_r</math>)</b> | $0.9 \times S_n \leq S_r \leq 1.1 \times S_n$   |
| <b>Self-capacitance</b>                               | $\leq 120 \text{ nF}$  | <b>Usable operating dist. (<math>S</math>)</b>      | $0.9 \times S_r \leq S_u \leq 1.1 \times S_r$   |
| <b>No-load supply current (<math>I_0</math>)</b>      | Activated: $\leq 1 \text{ mA}$<br>Not activated: $\geq 2.2 \text{ mA}$<br>Max. 9.35 mA   | <b>Ambient temperature</b>                          | Operating<br>Storage  |
| <b>Protection</b>                                     | Reverse polarity   | <b>Degree of protection</b>                         | IP 67 (Nema 1, 3, 4, 6, 13)   |
| <b>Transient voltage</b>                              | $\leq 1 \text{ kV}/0.5 \text{ J}$  | <b>Housing material</b>                             | Body<br>Front<br>Back   |
| <b>EMC</b>  | Approved according to<br>EN 50 080, EN 50 081  | <b>Connection</b>                                   | Stainless Steel (1.4301)<br>Grey thermoplastic polyester<br>Black thermoplastic polyester                                   |
| <b>Power ON delay</b>                                 | $< 10 \text{ ms}$  | Cable   | 2 m, 2 x 0.5 mm <sup>2</sup> ,<br>grey PVC, oil proof<br>M12 x 1  |
| <b>Frequency of operating cycles (f)</b>              | <b>IA12xxF02</b> 1.400 Hz<br><b>IA12xxN04</b> 1.200 Hz<br><b>IA18xxF05</b> 500 Hz<br><b>IA18xxN08</b> 200 Hz<br><b>IA30xxF10</b> 300 Hz<br><b>IA30xxF15</b> 100 Hz | Plug<br>Cables for plug (-1)                        | CONH1A series   |
| <b>Indication not activated</b>                       | LED, yellow  | <b>Weight (cable excluded)</b>                      | <b>IA 12xx</b> 20 g<br><b>IA 18xxF05</b> 26 g<br><b>IA 18xxN08</b> 30 g<br><b>IA 30xxF10</b> 75 g<br><b>IA 30xxN15</b> 80 g |
| <b>Assured operating dist. (<math>S_a</math>)</b>     | $0 \leq S_a \leq 0.81 S_n$   | <b>Tightening torque</b>                            | <b>IA 12</b> 7.5 Nm<br><b>IA 18</b> 27.5 Nm<br><b>IA 30</b> 100 Nm  |
| <b>Repeat accuracy (R)</b>                            | $\leq 5\%$   | <b>Approvals</b>                                    | UL  |
|   |  | <b>CE-marking</b>                                   | Yes   |

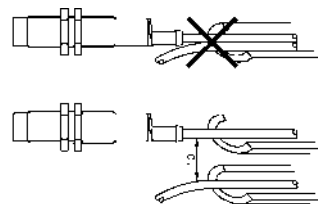
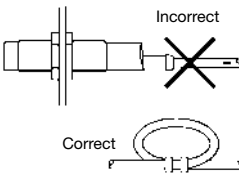
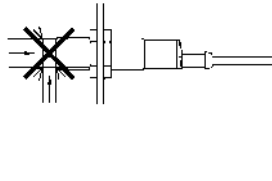
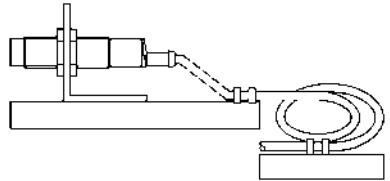
## Dimensions

| Type               | A              | B<br>Ø mm | C<br>mm | D<br>mm | E<br>mm | F<br>mm | SW<br>mm |
|--------------------|----------------|-----------|---------|---------|---------|---------|----------|
| IA 12 ESF 02 UC    | M12 x 1 x 30   | 10.7      | 30      | 11      | 5.0     | 4       | 17       |
| IA 12 ELF 02 UC    | M12 x 1 x 50   | 10.7      | 50      | 11      | 5.0     | 4       | 17       |
| IA 12 ESF 02 UC M1 | M12 x 1 x 30   | 10.7      | 30      | 12.6    | 11.9    | 4       | 17       |
| IA 12 ELF 02 UC M1 | M12 x 1 x 50   | 10.7      | 50      | 12.6    | 11.9    | 4       | 17       |
| IA 12 ESN 04 UC    | M12 x 1 x 30   | 10.7      | 34      | 11      | 5.0     | 4       | 17       |
| IA 12 ELN 04 UC    | M12 x 1 x 50   | 10.7      | 54      | 11      | 5.0     | 4       | 17       |
| IA 12 ESN 04 UC M1 | M12 x 1 x 30   | 10.7      | 34      | 12.6    | 11.9    | 4       | 17       |
| IA 12 ELN 04 UC M1 | M12 x 1 x 50   | 10.7      | 54      | 12.6    | 11.9    | 4       | 17       |
| IA 18 ESF 05 UC    | M18 x 1 x 30   | 16.7      | 30      | 11.6    | 15.4    | 4       | 24       |
| IA 18 ELF 05 UC    | M18 x 1 x 50   | 16.7      | 50      | 11.6    | 15.4    | 4       | 24       |
| IA 18 ESF 05 UC M1 | M18 x 1 x 30   | 16.7      | 30      | 13.1    | 11.9    | 4       | 24       |
| IA 18 ELF 05 UC M1 | M18 x 1 x 50   | 16.7      | 50      | 13.1    | 11.9    | 4       | 24       |
| IA 18 ESN 08 UC    | M18 x 1 x 30   | 16.7      | 38      | 11.6    | 15.4    | 4       | 24       |
| IA 18 ELN 08 UC    | M18 x 1 x 50   | 16.7      | 58      | 11.6    | 15.4    | 4       | 24       |
| IA 18 ESN 08 UC M1 | M18 x 1 x 30   | 16.7      | 38      | 13.1    | 11.9    | 4       | 24       |
| IA 18 ELN 08 UC M1 | M18 x 1 x 50   | 16.7      | 58      | 13.1    | 11.9    | 4       | 24       |
| IA 30 ESF 10 UC    | M30 x 1.5 x 30 | 28        | 30      | 13.6    | 15.4    | 5       | 36       |
| IA 30 ELF 10 UC    | M30 x 1.5 x 50 | 28        | 50      | 13.6    | 15.4    | 5       | 36       |
| IA 30 ESF 10 UC M1 | M30 x 1.5 x 30 | 28        | 30      | 13.6    | 11.9    | 5       | 36       |
| IA 30 ELF 10 UC M1 | M30 x 1.5 x 50 | 28        | 50      | 13.6    | 11.9    | 5       | 36       |
| IA 30 ESN 15 UC    | M30 x 1.5 x 30 | 28        | 42      | 13.6    | 15.4    | 5       | 36       |
| IA 30 ELN 15 UC    | M30 x 1.5 x 50 | 28        | 62      | 13.6    | 15.4    | 5       | 36       |
| IA 30 ESN 15 UC M1 | M30 x 1.5 x 30 | 28        | 42      | 13.6    | 11.9    | 5       | 36       |
| IA 30 ELN 15 UC M1 | M30 x 1.5 x 50 | 28        | 62      | 13.6    | 11.9    | 5       | 36       |

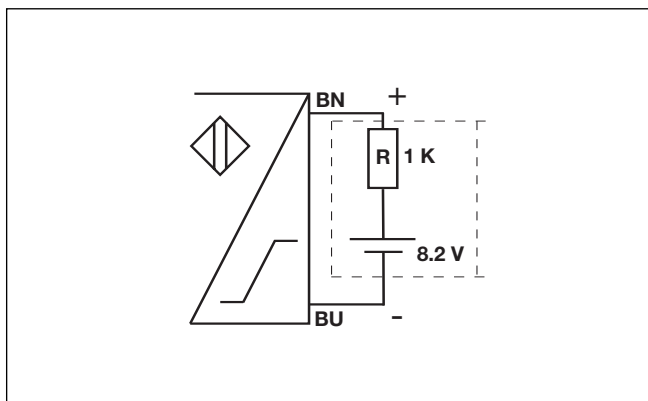
## Dimensions (cont.)



## Installation Hints

|  |  |   |   |
|--|--|---|---|
| <p><i>To avoid interference from inductive voltage/current peaks, separate the prox. switch power cables from any other power cables, e.g. motor, contactor or solenoid cables</i></p>  | <p><i>Relief of cable strain</i></p>  <p><b>Incorrect</b></p> <p><b>Correct</b></p> <p>The cable should not be pulled</p> | <p><i>Protection of the sensing face</i></p>  <p>A proximity switch should not serve as mechanical stop</p> | <p><i>Switch mounted on mobile carrier</i></p>  <p>Any repetitive flexing of the cable should be avoided</p> |
|--|--|---|---|

## Wiring Diagram



## Power Supplies

> SD 110/210 Refer to Technical information.  
 > SD 170/270