



# IMF12-04BPSNC0SX01

IMF

INDUCTIVE PROXIMITY SENSORS

**SICK**  
Sensor Intelligence.



### Ordering information

| Type               | part no. |
|--------------------|----------|
| IMF12-04BPSNC0SX01 | 1099579  |

**Included in delivery:** BEF-MU-M12N1 (1), Cable housing/cover (1)

Other models and accessories → [www.sick.com/IMF](http://www.sick.com/IMF)

Illustration may differ



### Detailed technical data

#### Features

|                                            |                                                                                |
|--------------------------------------------|--------------------------------------------------------------------------------|
| <b>Housing</b>                             | Metric                                                                         |
| <b>Housing</b>                             | Standard design                                                                |
| <b>Thread size</b>                         | M12 x 1                                                                        |
| <b>Diameter</b>                            | Ø 12 mm                                                                        |
| <b>Sensing range <math>S_n</math></b>      | 4 mm                                                                           |
| <b>Safe sensing range <math>S_a</math></b> | 3.24 mm                                                                        |
| <b>Installation type</b>                   | Flush                                                                          |
| <b>Switching frequency</b>                 | 2,000 Hz                                                                       |
| <b>Connection type</b>                     | Male connector M12, 4-pin <sup>1)</sup>                                        |
| <b>Switching output</b>                    | PNP                                                                            |
| <b>Switching output detail</b>             | PNP                                                                            |
| <b>Output function</b>                     | NO                                                                             |
| <b>Electrical wiring</b>                   | DC 3-wire                                                                      |
| <b>Enclosure rating</b>                    | IP67 <sup>2)</sup>                                                             |
| <b>Special features</b>                    | Resistant to cleaning agents, Visual adjustment indicator, IO-Link             |
| <b>Special applications</b>                | Hygienic and washdown zones, Difficult application conditions, Explosive areas |
| <b>Items supplied</b>                      | Mounting nut, V4A stainless steel (2x)<br>Cable housing/cover                  |

<sup>1)</sup> With gold plated contact pins.

<sup>2)</sup> According to EN 60529.

## Mechanics/electronics

|                                             |                                                                                                  |
|---------------------------------------------|--------------------------------------------------------------------------------------------------|
| <b>Supply voltage</b>                       | 10 V DC ... 30 V DC                                                                              |
| <b>Ripple</b>                               | ≤ 10 %                                                                                           |
| <b>Voltage drop</b>                         | ≤ 2 V <sup>1)</sup>                                                                              |
| <b>Hysteresis</b>                           | 3 % ... 20 %                                                                                     |
| <b>Reproducibility</b>                      | ≤ 2 % <sup>2) 3)</sup>                                                                           |
| <b>Temperature drift (of S<sub>r</sub>)</b> | ± 10 %                                                                                           |
| <b>EMC</b>                                  | According to EN 60947-5-2                                                                        |
| <b>Continuous current I<sub>a</sub></b>     | ≤ 200 mA <sup>4)</sup>                                                                           |
| <b>No load current</b>                      | ≤ 10 mA                                                                                          |
| <b>Short-circuit protection</b>             | ✓                                                                                                |
| <b>Power-up pulse protection</b>            | ✓                                                                                                |
| <b>Shock and vibration resistance</b>       | 100 g / 2 ms / 500 cycles; 150 g / 1 Mio cycles; 10 Hz ... 55 Hz / 1 mm; 55 Hz ... 500 Hz / 60 g |
| <b>Ambient operating temperature</b>        | -20 °C ... +85 °C                                                                                |
| <b>Housing material</b>                     | Stainless steel V4A, DIN 1.4404 / AISI 316L                                                      |
| <b>Sensing face material</b>                | Plastic, LCP                                                                                     |
| <b>Housing length</b>                       | 65 mm                                                                                            |
| <b>Thread length</b>                        | 48 mm                                                                                            |
| <b>Tightening torque, max.</b>              | Typ. 32 Nm                                                                                       |
| <b>ATEX marking</b>                         | II 3G Ex ec IIC T4 Gc X, II 3D Ex tc IIIC T135 °C Dc X                                           |
| <b>Ex area category</b>                     | 3G, 3D                                                                                           |
| <b>Protection class</b>                     | III                                                                                              |
| <b>UL File No.</b>                          | E181493                                                                                          |

<sup>1)</sup> At I<sub>a</sub> max.

<sup>2)</sup> Supply voltage U<sub>B</sub> and constant ambient temperature Ta.

<sup>3)</sup> Of S<sub>r</sub>.

<sup>4)</sup> Depend on ambient temperature. For details see operating instructions under „performance data of the sensor“.

## Safety-related parameters

|                                     |             |
|-------------------------------------|-------------|
| <b>MTTF<sub>D</sub></b>             | 1,971 years |
| <b>DC<sub>avg</sub></b>             | 0 %         |
| <b>T<sub>M</sub> (mission time)</b> | 20 years    |

## Communication interface

|                                       |                                                                  |
|---------------------------------------|------------------------------------------------------------------|
| <b>Communication interface</b>        | IO-Link V1.0                                                     |
| <b>Communication Interface detail</b> | COM2 (38,4 kBaud)                                                |
| <b>Process data length</b>            | 1 Byte                                                           |
| <b>Process data structure</b>         | Bit 0 = S <sub>r</sub> reached<br>Bit 1 = S <sub>a</sub> reached |

## Reduction factors

|                                   |                                                |
|-----------------------------------|------------------------------------------------|
| <b>Note</b>                       | The values are reference values which may vary |
| <b>Stainless steel (V2A, 304)</b> | Approx. 0.65                                   |
| <b>Aluminum (Al)</b>              | Approx. 0.35                                   |

|                    |              |
|--------------------|--------------|
| <b>Copper (Cu)</b> | Approx. 0.24 |
| <b>Brass (Br)</b>  | Approx. 0.38 |

## Installation note

|               |                                       |
|---------------|---------------------------------------|
| <b>Remark</b> | Associated graphic see "Installation" |
| <b>B</b>      | 12 mm                                 |
| <b>C</b>      | 12 mm                                 |
| <b>D</b>      | 12 mm                                 |
| <b>F</b>      | 32 mm                                 |

## Certificates

|                                           |   |
|-------------------------------------------|---|
| <b>EU declaration of conformity</b>       | ✓ |
| <b>UK declaration of conformity</b>       | ✓ |
| <b>ACMA declaration of conformity</b>     | ✓ |
| <b>Moroccan declaration of conformity</b> | ✓ |
| <b>China RoHS</b>                         | ✓ |
| <b>ECOLAB certificate</b>                 | ✓ |
| <b>FDA certificate</b>                    | ✓ |
| <b>cULus certificate</b>                  | ✓ |
| <b>IO-Link</b>                            | ✓ |

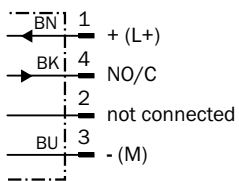
## Classifications

|                       |          |
|-----------------------|----------|
| <b>ECLASS 5.0</b>     | 27270101 |
| <b>ECLASS 5.1.4</b>   | 27270101 |
| <b>ECLASS 6.0</b>     | 27270101 |
| <b>ECLASS 6.2</b>     | 27270101 |
| <b>ECLASS 7.0</b>     | 27270101 |
| <b>ECLASS 8.0</b>     | 27270101 |
| <b>ECLASS 8.1</b>     | 27270101 |
| <b>ECLASS 9.0</b>     | 27270101 |
| <b>ECLASS 10.0</b>    | 27270101 |
| <b>ECLASS 11.0</b>    | 27270101 |
| <b>ECLASS 12.0</b>    | 27274001 |
| <b>ETIM 5.0</b>       | EC002714 |
| <b>ETIM 6.0</b>       | EC002714 |
| <b>ETIM 7.0</b>       | EC002714 |
| <b>ETIM 8.0</b>       | EC002714 |
| <b>UNSPSC 16.0901</b> | 39122230 |

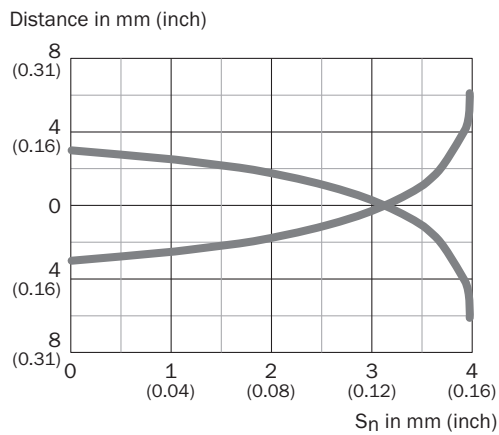
## Installation note Flush installation



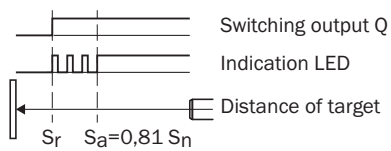
## Connection diagram Cd-456



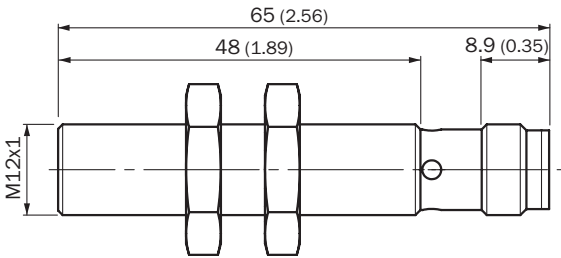
## Response diagram



## Functional principle Installation aid



Dimensional drawing IMF12, flush



Dimensions in mm (inch)

Recommended accessories

Other models and accessories → [www.sick.com/IMF](http://www.sick.com/IMF)

|                                                                                     | Brief description                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Type         | part no. |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------|
| Mounting systems                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |              |          |
|    | <ul style="list-style-type: none"><li>• <b>Description:</b> Mounting bracket for M12 sensors</li><li>• <b>Material:</b> Steel</li><li>• <b>Details:</b> Steel, zinc coated</li><li>• <b>Items supplied:</b> Without mounting hardware</li></ul>                                                                                                                                                                                                                       | BEF-WN-M12   | 5308447  |
|   | <ul style="list-style-type: none"><li>• <b>Description:</b> Mounting plate for M12 sensors</li><li>• <b>Material:</b> Stainless steel</li><li>• <b>Details:</b> Stainless steel</li><li>• <b>Items supplied:</b> Without mounting hardware</li></ul>                                                                                                                                                                                                                  | BEF-WG-M12N  | 5320950  |
|  | <ul style="list-style-type: none"><li>• <b>Description:</b> Mounting bracket for M12 housing</li><li>• <b>Material:</b> Stainless steel</li><li>• <b>Details:</b> Stainless steel</li><li>• <b>Items supplied:</b> Without mounting hardware</li></ul>                                                                                                                                                                                                                | BEF-WN-M12N  | 5320949  |
|  | <ul style="list-style-type: none"><li>• <b>Description:</b> Plate N05N for universal clamp bracket, M12</li><li>• <b>Material:</b> Stainless steel, stainless steel</li><li>• <b>Details:</b> Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)</li><li>• <b>Items supplied:</b> Universal clamp (5322627), mounting hardware</li><li>• <b>Usable for:</b> IMA, IMF, M12 round sensors, UC4, V12-2, MultiV, MultiLine, W4-3, MultiV, MultiLine</li></ul> | BEF-KHS-N05N | 2051621  |

|                                                                                     | Brief description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Type            | part no. |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------|
| connectors and cables                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                 |          |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 4-pin, straight</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Sensor/actuator cable</li> <li>• <b>Cable:</b> 2 m, 4-wire, PP</li> <li>• <b>Description:</b> Sensor/actuator cable, unshielded</li> <li>• <b>Connection systems:</b> Flying leads</li> <li>• <b>Note:</b> This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li>• <b>Application:</b> Hygienic and washdown zones, Drag chain operation</li> </ul>                              | DOL-1204-G02MRN | 6058291  |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 4-pin, straight</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Sensor/actuator cable</li> <li>• <b>Cable:</b> 5 m, 4-wire, PP</li> <li>• <b>Description:</b> Sensor/actuator cable, unshielded</li> <li>• <b>Connection systems:</b> Flying leads</li> <li>• <b>Note:</b> This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li>• <b>Application:</b> Hygienic and washdown zones, Drag chain operation</li> </ul>                              | DOL-1204-G05MRN | 6058476  |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 4-pin, angled</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Sensor/actuator cable</li> <li>• <b>Cable:</b> 2 m, 4-wire, PP</li> <li>• <b>Description:</b> Sensor/actuator cable, unshielded</li> <li>• <b>Connection systems:</b> Flying leads</li> <li>• <b>Note:</b> This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li>• <b>Application:</b> Hygienic and washdown zones, Drag chain operation</li> </ul>                                | DOL-1204-W02MRN | 6058474  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 4-pin, angled</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Sensor/actuator cable</li> <li>• <b>Cable:</b> 5 m, 4-wire, PP</li> <li>• <b>Description:</b> Sensor/actuator cable, unshielded</li> <li>• <b>Connection systems:</b> Flying leads</li> <li>• <b>Note:</b> This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li>• <b>Application:</b> Hygienic and washdown zones, Drag chain operation</li> </ul>                                | DOL-1204-W05MRN | 6058477  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 4-pin, angled</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Sensor/actuator cable</li> <li>• <b>Cable:</b> 2 m, 4-wire, PP</li> <li>• <b>Description:</b> Sensor/actuator cable, unshielded</li> <li>• <b>Connection systems:</b> Flying leads</li> <li>• <b>Note:</b> This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid &amp; hydrogen peroxide (H2O2), only suitable for PNP sensors</li> <li>• <b>Application:</b> Hygienic and washdown zones, Drag chain operation</li> </ul> | DOL-1204-L02MRN | 6058482  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 4-pin, angled</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Sensor/actuator cable</li> <li>• <b>Cable:</b> 5 m, 4-wire, PP</li> <li>• <b>Description:</b> Sensor/actuator cable, unshielded</li> <li>• <b>Connection systems:</b> Flying leads</li> <li>• <b>Note:</b> This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid &amp; hydrogen peroxide (H2O2), only suitable for PNP sensors</li> <li>• <b>Application:</b> Hygienic and washdown zones, Drag chain operation</li> </ul> | DOL-1204-L05MRN | 6058483  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 4-pin, straight</li> <li>• <b>Connection type head B:</b> Male connector, M12, 4-pin, straight</li> <li>• <b>Signal type:</b> Sensor/actuator cable</li> <li>• <b>Cable:</b> 2 m, 4-wire, PP</li> <li>• <b>Description:</b> Sensor/actuator cable, unshielded</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | DSL-1204-G02MRN | 6058499  |

|                                                                                     | Brief description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Type               | part no. |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|
|                                                                                     | <ul style="list-style-type: none"> <li><b>Note:</b> This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li><b>Application:</b> Hygienic and washdown zones, Drag chain operation</li> </ul>                                                                                                                                                                                                                                                                                                                       |                    |          |
|    | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, straight</li> <li><b>Connection type head B:</b> Male connector, M12, 4-pin, straight</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 5 m, 4-wire, PP</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Note:</b> This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li><b>Application:</b> Hygienic and washdown zones, Drag chain operation</li> </ul>  | DSL-1204-G05MRN    | 6058500  |
|    | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, angled</li> <li><b>Connection type head B:</b> Male connector, M12, 4-pin, straight</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 2 m, 4-wire, PP</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Note:</b> This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li><b>Application:</b> Hygienic and washdown zones, Drag chain operation</li> </ul>    | DSL-1204-B02MRN    | 6058502  |
|    | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, angled</li> <li><b>Connection type head B:</b> Male connector, M12, 4-pin, straight</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 5 m, 4-wire, PP</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Note:</b> This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li><b>Application:</b> Hygienic and washdown zones, Drag chain operation</li> </ul>    | DSL-1204-B05MRN    | 6058503  |
|  | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 5 m, 4-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation</li> </ul>                                                                                                                                                                                                                                                                                                                  | YF2A14-050UB3XLEAX | 2095608  |
|  | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, straight</li> <li><b>Connection type head B:</b> Male connector, M12, 4-pin, straight</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 20 m, 4-wire, PP</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Note:</b> This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li><b>Application:</b> Hygienic and washdown zones, Drag chain operation</li> </ul> | YF2AP4-020PA2M2AP4 | 2143765  |
|  | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, angled</li> <li><b>Connection type head B:</b> Male connector, M12, 4-pin, straight</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 3 m, 4-wire, PP</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Note:</b> This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li><b>Application:</b> Hygienic and washdown zones, Drag chain operation</li> </ul>    | YG2AP4-030PA2M2AP4 | 2151191  |
| device protection and care                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |          |
|                                                                                     | <ul style="list-style-type: none"> <li><b>Description:</b> Screw-on protective cap for metric sensors. Protects the sensor from damage caused by impacts on the front.</li> <li><b>Material:</b> Plastic</li> <li><b>Usable for:</b> M12 size metric sensors, For flush mounting</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | CAP-M12-TB         | 2083430  |

## SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

**For us, that is “Sensor Intelligence.”**

## WORLDWIDE PRESENCE:

Contacts and other locations –[www.sick.com](http://www.sick.com)