



# IMC12-04BPPVC0SA71

IMC

**INDUCTIVE PROXIMITY SENSORS**

**SICK**  
Sensor Intelligence.



Illustration may differ



### Ordering information

| Type               | Part no. |
|--------------------|----------|
| IMC12-04BPPVC0SA71 | 1079288  |

**Included in delivery:** BEF-MU-M12N (2)

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

### Detailed technical data

#### Features

|                                                    |                                                                        |
|----------------------------------------------------|------------------------------------------------------------------------|
| <b>Housing</b>                                     | Cylindrical thread design                                              |
| <b>Thread size</b>                                 | M12 x 1                                                                |
| <b>Diameter</b>                                    | Ø 12 mm                                                                |
| <b>Sensing range <math>S_n</math></b>              | 0 mm ... 4 mm <sup>1)</sup>                                            |
| <b>Safe sensing range <math>S_a</math></b>         | 3.24 mm                                                                |
| <b>Number of switching points</b>                  | Up to 4 adjustable switching points or windows                         |
| <b>Switching modes</b>                             | Single point, Window mode, Two point mode, Visual adjustment indicator |
| <b>Switching frequency Qint.1 / Qint.2 on Pin2</b> | 1,000 Hz                                                               |
| <b>Installation type</b>                           | Flush                                                                  |
| <b>Connection type</b>                             | Male connector M12, 4-pin <sup>2)</sup>                                |
| <b>Switching output</b>                            | PNP                                                                    |
| <b>Output Q/C</b>                                  | Switching output or IO-Link mode                                       |
| <b>Output MFC</b>                                  | Switching output or input                                              |
| <b>Output function</b>                             | NC / NO                                                                |
| <b>Output characteristic</b>                       | Programmable                                                           |
| <b>Electrical wiring</b>                           | DC 4-wire                                                              |
| <b>Enclosure rating</b>                            | IP68 <sup>3)</sup><br>IP69K <sup>4)</sup>                              |
| <b>Special features</b>                            | Smart Task, Resistant against coolant lubricants, IO-Link              |
| <b>Special applications</b>                        | Zones with coolants and lubricants, Difficult application conditions   |

<sup>1)</sup> Adjustable.

<sup>2)</sup> With gold plated contact pins.

<sup>3)</sup> According to EN 60529.

<sup>4)</sup> According to ISO 20653:2013-03.

|                               |                                            |
|-------------------------------|--------------------------------------------|
| <b>Special characteristic</b> | Resistant against coolant lubricants       |
| <b>Diagnosis</b>              | Chip temperature                           |
| <b>Pin 2 configuration</b>    | External input, Teach-in, switching signal |

1) Adjustable.

2) With gold plated contact pins.

3) According to EN 60529.

4) According to ISO 20653:2013-03.

## Mechanics/electronics

|                                             |                                                                                                  |
|---------------------------------------------|--------------------------------------------------------------------------------------------------|
| <b>Supply voltage</b>                       | 10 V DC ... 30 V DC <sup>1)</sup>                                                                |
| <b>Ripple</b>                               | ≤ 10 %                                                                                           |
| <b>Voltage drop</b>                         | ≤ 2 V <sup>2)</sup>                                                                              |
| <b>Current consumption</b>                  | 35 mA <sup>3)</sup>                                                                              |
| <b>Hysteresis</b>                           | Programmable <sup>4)</sup>                                                                       |
| <b>Reproducibility</b>                      | ≤ 5 % <sup>5)</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>6)</sup>                                                                           |
| <b>Short-circuit protection</b>             | ✓                                                                                                |
| <b>Reverse polarity 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>        | -40 °C ... +75 °C                                                                                |
| <b>Housing material</b>                     | Stainless steel V2A, DIN 1.4305 / AISI 303                                                       |
| <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 <sup>7)</sup>                                                                         |
| <b>Items supplied</b>                       | Mounting nut, V2A stainless steel, with locking teeth (2x)                                       |
| <b>UL File No.</b>                          | E181493                                                                                          |
| <b>Teach-in accuracy</b>                    | +/- 3% of Sr                                                                                     |
| <b>Resolution, typical (range)</b>          | 10 µm (0 mm ... 1 mm)<br>20 µm (1 mm ... 3 mm)<br>40 µm (3 mm ... 4 mm)                          |
| <b>Resolution, maximum (area)</b>           | 20 µm (0 mm ... 1 mm)<br>40 µm (1 mm ... 3 mm)<br>75 µm (3 mm ... 4 mm)                          |

1) IO-Link mode: 18 VDC ... 30 VDC.

2) At I<sub>a</sub> max.

3) Without load.

4) To comply with EN 60947-5-2, a hysteresis of approx. 10% must be set.

5) U<sub>b</sub> and T<sub>a</sub> constant.

6) 200 mA total for both switching outputs.

7) Valid if toothed side of nut is used.

### Safety-related parameters

|                         |           |
|-------------------------|-----------|
| <b>MTTF<sub>D</sub></b> | 860 years |
| <b>DC<sub>avg</sub></b> | 0%        |

### Communication interface

|                                       |                                                                                                                                                                                                                    |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Communication interface</b>        | IO-Link V1.1                                                                                                                                                                                                       |
| <b>Communication Interface detail</b> | COM2 (38,4 kBaud)                                                                                                                                                                                                  |
| <b>Cycle time</b>                     | 5 ms                                                                                                                                                                                                               |
| <b>Process data length</b>            | 32 Bit                                                                                                                                                                                                             |
| <b>Process data structure</b>         | Bit 0 = switching signal Q <sub>L1</sub><br>Bit 1 = switching signal Q <sub>L2</sub><br>Bit 2 = switching signal Q <sub>Int3</sub><br>Bit 3 = switching signal Q <sub>Int4</sub><br>Bit 18 ... 31 = counting value |
| <b>Factory setting</b>                | Switching Point 1: reference value 1<br>Output: normally open<br>Pin 2 configuration: input                                                                                                                        |

### Reference values

|                          |                                                                          |
|--------------------------|--------------------------------------------------------------------------|
| <b>Note</b>              | Reference value in Digits for switching point in mm stored in the sensor |
| <b>Reference value 1</b> | 4 mm                                                                     |
| <b>Reference value 2</b> | 3 mm                                                                     |
| <b>Reference value 3</b> | 2 mm                                                                     |
| <b>Reference value 4</b> | 1 mm                                                                     |

### Reduction factors

|                                   |             |
|-----------------------------------|-------------|
| <b>Stainless steel (V2A, 304)</b> | Approx. 0.7 |
| <b>Aluminum (Al)</b>              | Approx. 0.4 |
| <b>Copper (Cu)</b>                | Approx. 0.3 |
| <b>Brass (Br)</b>                 | Approx. 0.4 |

### 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                                 |

### Smart Task

|                        |                                                          |
|------------------------|----------------------------------------------------------|
| <b>Smart Task name</b> | Counter + debouncing                                     |
| <b>Logic function</b>  | Window<br>Hysteresis<br>Direct                           |
| <b>Timer function</b>  | Deactivated<br>On delay<br>Off delay<br>ON and OFF delay |

<sup>1)</sup> SIO Logic: Sensor operation in standard I/O mode without IO-Link communication. Sensor-internal logic or timing parameters plus Automation Functions used.

<sup>2)</sup> IOL: Sensor operation with full IO-Link communication and usage of logic, timing and Automation Function parameters.

|                                                        |                                                                |
|--------------------------------------------------------|----------------------------------------------------------------|
|                                                        | Impulse (one shot)                                             |
| <b>Inverter</b>                                        | Adjustable                                                     |
| <b>Maximum counting frequency</b>                      | SIO Logic: 1000 Hz <sup>1)</sup><br>IOL: 1000 Hz <sup>2)</sup> |
| <b>Counter reset</b>                                   | SIO Logic: 500 µs <sup>1)</sup><br>IOL: --- <sup>2)</sup>      |
| <b>Min. Time between two process events (switches)</b> | SIO Logic: 0.5 ms <sup>1)</sup><br>IOL: 0.5 ms <sup>2)</sup>   |
| <b>Debounce time max.</b>                              | SIO Logic: 30 s <sup>1)</sup><br>IOL: 30 s <sup>2)</sup>       |
| <b>Switching signal Q<sub>L1</sub></b>                 | Output type (dependant on the adjusted threshold)              |
| <b>Switching signal Q<sub>L2</sub></b>                 | Output type (dependant on the adjusted threshold)              |
| <b>Measuring value</b>                                 | Counting value                                                 |

<sup>1)</sup> SIO Logic: Sensor operation in standard I/O mode without IO-Link communication. Sensor-internal logic or timing parameters plus Automation Functions used.

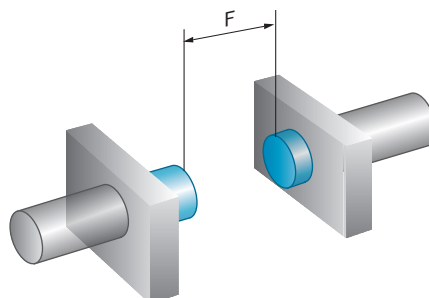
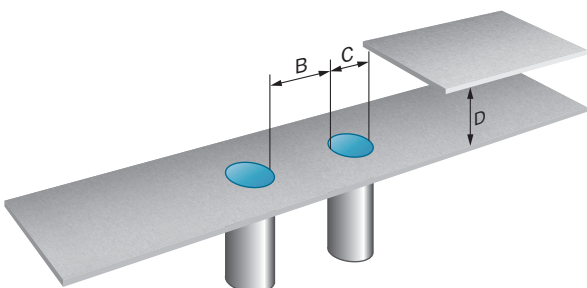
<sup>2)</sup> IOL: Sensor operation with full IO-Link communication and usage of logic, timing and Automation Function parameters.

## Classifications

|                       |          |
|-----------------------|----------|
| <b>ECI@ss 5.0</b>     | 27270101 |
| <b>ECI@ss 5.1.4</b>   | 27270101 |
| <b>ECI@ss 6.0</b>     | 27270101 |
| <b>ECI@ss 6.2</b>     | 27270101 |
| <b>ECI@ss 7.0</b>     | 27270101 |
| <b>ECI@ss 8.0</b>     | 27270101 |
| <b>ECI@ss 8.1</b>     | 27270101 |
| <b>ECI@ss 9.0</b>     | 27270101 |
| <b>ECI@ss 10.0</b>    | 27270101 |
| <b>ECI@ss 11.0</b>    | 27270101 |
| <b>ETIM 5.0</b>       | EC002714 |
| <b>ETIM 6.0</b>       | EC002714 |
| <b>ETIM 7.0</b>       | EC002714 |
| <b>UNSPSC 16.0901</b> | 39122230 |

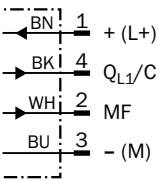
## Installation note

### Flush installation



Connection diagram

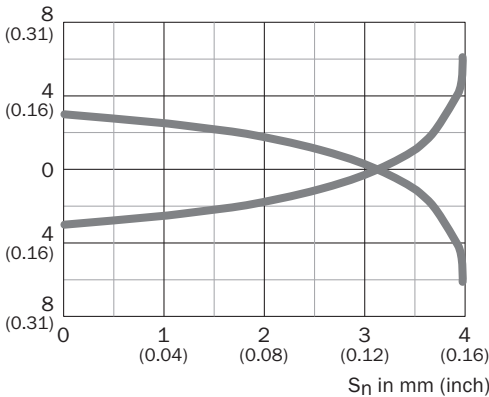
Cd-367



Characteristic curve

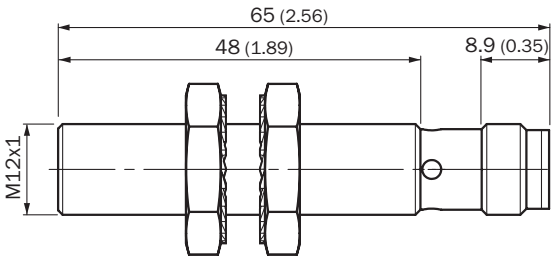
Response diagram

Distance in mm (inch)



Dimensional drawing (Dimensions in mm (inch))

IMC12 Standard, connector, M12, flush



## Recommended accessories

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

|                                                                                     | Brief description                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Type                              | Part no. |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------|
| Universal bar clamp systems                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                   |          |
|    | Plate N05N for universal clamp bracket, M12, Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp), Universal clamp (5322626), mounting hardware                                                                                                                                                                                                                                                                                                           | BEF-KHS-N05N                      | 2051621  |
|    | Plate N11N for universal clamp bracket, Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp), Universal clamp (5322626), mounting hardware                                                                                                                                                                                                                                                                                                                | BEF-KHS-N11N                      | 2071081  |
| Mounting brackets and plates                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                   |          |
|    | Mounting plate for M12 sensors, stainless steel, without mounting hardware                                                                                                                                                                                                                                                                                                                                                                                          | BEF-WG-M12N                       | 5320950  |
|    | Mounting bracket for M12 housing, stainless steel, without mounting hardware                                                                                                                                                                                                                                                                                                                                                                                        | BEF-WN-M12N                       | 5320949  |
| Modules and gateways                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                   |          |
|    | IO-Link V1.1 Class A port, USB2.0 port, optional external power supply 24V / 1A                                                                                                                                                                                                                                                                                                                                                                                     | IOLA2US-01101 (SiLink2 Master)    | 1061790  |
|    | EtherCAT IO-Link Master, IO-Link V1.1, Port Class A, power supply via 7/8" cable 24 V / 8 A, fieldbus connection via M12 cable                                                                                                                                                                                                                                                                                                                                      | IOLG2EC-03208R01 (IO-Link Master) | 6053254  |
|  | EtherNet/IP IO-Link Master, IO-Link V1.1, Port Class A, power supply via 7/8" cable 24 V / 8 A, fieldbus connection via M12-cable                                                                                                                                                                                                                                                                                                                                   | IOLG2EI-03208R01 (IO-Link Master) | 6053255  |
|  | PROFINET IO-Link Master, IO-Link V1.1, Port Class A, power supply via 7/8" cable 24 V / 8 A, fieldbus connection via M12 cable                                                                                                                                                                                                                                                                                                                                      | IOLG2PN-03208R01 (IO-Link Master) | 6053253  |
| Plug connectors and cables                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                   |          |
|  | Head A: female connector, M12, 4-pin, straight<br>Head B: Flying leads<br>Cable: PP, unshielded, 2 m<br>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 & hydrogen peroxide (H2O2)                                       | DOL-1204-G02MRN                   | 6058291  |
|                                                                                     | Head A: female connector, M12, 4-pin, straight<br>Head B: Flying leads<br>Cable: PP, unshielded, 5 m<br>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 & hydrogen peroxide (H2O2)                                       | DOL-1204-G05MRN                   | 6058476  |
|  | Head A: female connector, M12, 4-pin, angled with LED<br>Head B: Flying leads<br>Cable: PP, unshielded, 2 m<br>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 & hydrogen peroxide (H2O2), only suitable for PNP sensors | DOL-1204-L02MRN                   | 6058482  |

|                                                                                                                                                                                                                                                         | Brief description                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Type            | Part no. |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------|
|    | <p>Head A: female connector, M12, 4-pin, angled with LED<br/>Head B: Flying leads<br/>Cable: PP, unshielded, 5 m<br/>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</p> | DOL-1204-L05MRN | 6058483  |
|                                                                                                                                                                                                                                                         | <p>Head A: female connector, M12, 4-pin, angled<br/>Head B: Flying leads<br/>Cable: PP, unshielded, 2 m<br/>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)</p>                                         | DOL-1204-W02MRN | 6058474  |
|                                                                                                                                                                                                                                                         | <p>Head A: female connector, M12, 4-pin, angled<br/>Head B: Flying leads<br/>Cable: PP, unshielded, 5 m<br/>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)</p>                                         | DOL-1204-W05MRN | 6058477  |
|                                                                                                                                                                                                                                                         | <p>Head A: female connector, M12, 4-pin, angled<br/>Head B: male connector, M12, 4-pin, straight<br/>Cable: PP, unshielded, 2 m<br/>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)</p>                 | DSL-1204-B02MRN | 6058502  |
|                                                                                                                                                                                                                                                         | <p>Head A: female connector, M12, 4-pin, angled<br/>Head B: male connector, M12, 4-pin, straight<br/>Cable: PP, unshielded, 5 m<br/>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)</p>                 | DSL-1204-B05MRN | 6058503  |
|                                                                                                                                                                                                                                                         | <p>Head A: female connector, M12, 4-pin, straight<br/>Head B: male connector, M12, 4-pin, straight<br/>Cable: PP, unshielded, 2 m<br/>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)</p>               | DSL-1204-G02MRN | 6058499  |
|                                                                                                                                                                                                                                                         | <p>Head A: female connector, M12, 4-pin, straight<br/>Head B: male connector, M12, 4-pin, straight<br/>Cable: PP, unshielded, 5 m<br/>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)</p>               | DSL-1204-G05MRN | 6058500  |

## Recommended services

Additional services → [www.sick.com/IMC](https://www.sick.com/IMC)

|                                                                                                                                                                                                                                                                                                                                              | Type                   | Part no.   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------|
| Function Block Factory                                                                                                                                                                                                                                                                                                                       |                        |            |
| <ul style="list-style-type: none"><li>• <b>Brief description:</b> The Function Block Factory supports common programmable logic controllers (PLCs) from various manufacturers, such as Siemens, Beckhoff, Rockwell Automation and B&amp;R. More information on the FBF can be found <a href="https://fbf.cloud.sick.com">here</a>.</li></ul> | Function Block Factory | On request |

## 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)