



# CM18-12NNP-EC1

CM

CAPACITIVE PROXIMITY SENSORS

**SICK**  
Sensor Intelligence.



Ordering information

| Type           | part no. |
|----------------|----------|
| CM18-12NNP-EC1 | 6058151  |

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

Illustration may differ



Detailed technical data

Features

|                                            |                                                                                   |
|--------------------------------------------|-----------------------------------------------------------------------------------|
| <b>Housing</b>                             | Metric                                                                            |
| <b>Thread size</b>                         | M18 x 1                                                                           |
| <b>Diameter</b>                            | Ø 18 mm                                                                           |
| <b>Sensing range <math>S_n</math></b>      | 3 mm ... 12 mm                                                                    |
| <b>Safe sensing range <math>S_a</math></b> | 9.18 mm <sup>1)</sup>                                                             |
| <b>Installation type</b>                   | Non-flush                                                                         |
| <b>Switching frequency</b>                 | 50 Hz                                                                             |
| <b>Connection type</b>                     | Male connector M12, 4-pin                                                         |
| <b>Switching output</b>                    | NPN                                                                               |
| <b>Switching output detail</b>             | NPN                                                                               |
| <b>Output function</b>                     | Complementary                                                                     |
| <b>Output characteristic</b>               | Wire configurable                                                                 |
| <b>Electrical wiring</b>                   | DC 4-wire                                                                         |
| <b>Adjustment</b>                          |                                                                                   |
| Potentiometer                              | Sensitivity (11 turns)                                                            |
| <b>Enclosure rating</b>                    | IP68 <sup>2)</sup><br>IP69K                                                       |
| <b>Items supplied</b>                      | Mounting nut, PA12 plastic (2x)<br>Screwdriver for potentiometer adjustment (1 x) |

<sup>1)</sup> For flush mounting in electrically conductive materials  $S_a = 0.8 \times S_r$  at temperatures <0 °C and >60 °C.

<sup>2)</sup> 1 m water depth / 60 min.

## Mechanics/electronics

|                                             |                                    |
|---------------------------------------------|------------------------------------|
| <b>Supply voltage</b>                       | 10 V DC ... 36 V DC                |
| <b>Ripple</b>                               | $\leq 10 \% ^{1)}$                 |
| <b>Voltage drop</b>                         | $\leq 2.5 \text{ V DC } ^{2)}$     |
| <b>Current consumption</b>                  | 12 mA <sup>3)</sup>                |
| <b>Time delay before availability</b>       | $\leq 200 \text{ ms}$              |
| <b>Hysteresis</b>                           | 3 % ... 20 %                       |
| <b>Reproducibility</b>                      | $\leq 5 \% ^{4)}$<br><sup>5)</sup> |
| <b>Temperature drift (of S<sub>r</sub>)</b> | $\pm 10 \%$                        |
| <b>EMC</b>                                  | According to EN 60947-5-2          |
| <b>Continuous current I<sub>a</sub></b>     | $\leq 200 \text{ mA}$              |
| <b>Short-circuit protection</b>             | ✓                                  |
| <b>Power-up pulse protection</b>            | ✓                                  |
| <b>Shock and vibration resistance</b>       | According to EN 60068              |
| <b>Ambient operating temperature</b>        | -30 °C ... +85 °C <sup>6)</sup>    |
| <b>Ambient temperature, storage</b>         | -40 °C ... +85 °C                  |
| <b>Housing material</b>                     | Plastic, PBT                       |
| <b>Housing length</b>                       | 85 mm                              |
| <b>Thread length</b>                        | 47 mm                              |
| <b>Tightening torque, max.</b>              | $\leq 2.6 \text{ Nm}$              |
| <b>UL File No.</b>                          | NRKH.E191603                       |

<sup>1)</sup> Of U<sub>B</sub>.

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

<sup>3)</sup> Without load.

<sup>4)</sup> Of S<sub>r</sub>.

<sup>5)</sup> Supply voltage U<sub>B</sub> and constant ambient temperature T<sub>a</sub>.

<sup>6)</sup> +120 °C short time, at the front of the sensor.

## Safety-related parameters

|                                     |           |
|-------------------------------------|-----------|
| <b>MTTF<sub>D</sub></b>             | 919 years |
| <b>DC<sub>avg</sub></b>             | 0 %       |
| <b>T<sub>M</sub> (mission time)</b> | 20 years  |

## Reduction factors

|                 |                                                |
|-----------------|------------------------------------------------|
| <b>Note</b>     | The values are reference values which may vary |
| <b>Metal</b>    | 1                                              |
| <b>Water</b>    | 1                                              |
| <b>PVC</b>      | Approx. 0.4                                    |
| <b>Oil</b>      | Approx. 0.25                                   |
| <b>Glass</b>    | 0.6                                            |
| <b>Ceramics</b> | 0.5                                            |
| <b>Alcohol</b>  | 0.7                                            |

|             |             |
|-------------|-------------|
| <b>Wood</b> | 0.2 ... 0.7 |
|-------------|-------------|

#### Installation note

|               |                                       |
|---------------|---------------------------------------|
| <b>Remark</b> | Associated graphic see "Installation" |
| <b>A</b>      | 18 mm                                 |
| <b>B</b>      | 36 mm                                 |
| <b>C</b>      | 18 mm                                 |
| <b>D</b>      | 36 mm                                 |
| <b>E</b>      | 8 mm                                  |

#### Certificates

|                                           |   |
|-------------------------------------------|---|
| <b>EU declaration of conformity</b>       | ✓ |
| <b>UK declaration of conformity</b>       | ✓ |
| <b>Moroccan declaration of conformity</b> | ✓ |
| <b>China-RoHS</b>                         | ✓ |
| <b>cULus certificate</b>                  | ✓ |

#### Classifications

|                       |          |
|-----------------------|----------|
| <b>ECLASS 5.0</b>     | 27270102 |
| <b>ECLASS 5.1.4</b>   | 27270102 |
| <b>ECLASS 6.0</b>     | 27270102 |
| <b>ECLASS 6.2</b>     | 27270102 |
| <b>ECLASS 7.0</b>     | 27270102 |
| <b>ECLASS 8.0</b>     | 27270102 |
| <b>ECLASS 8.1</b>     | 27270102 |
| <b>ECLASS 9.0</b>     | 27270102 |
| <b>ECLASS 10.0</b>    | 27270102 |
| <b>ECLASS 11.0</b>    | 27270102 |
| <b>ECLASS 12.0</b>    | 27274201 |
| <b>ETIM 5.0</b>       | EC002715 |
| <b>ETIM 6.0</b>       | EC002715 |
| <b>ETIM 7.0</b>       | EC002715 |
| <b>ETIM 8.0</b>       | EC002715 |
| <b>UNSPSC 16.0901</b> | 39122230 |

## Installation note Non-flush installation



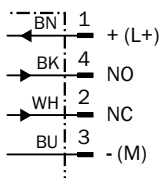
## Shock and vibration resistance

|                                                |                                      |
|------------------------------------------------|--------------------------------------|
| <b>Shock (IEC 60068-2-27):</b>                 | 30 G / 11ms, 3 pos, 3 neg per axis   |
| <b>Rough handling shocks (IEC 60068-2-31):</b> | 2 times from 1m, 100 times from 0,5m |
| <b>Vibration (IEC 60068-2-6):</b>              | 10 to 150 Hz, 1 mm / 15 G            |

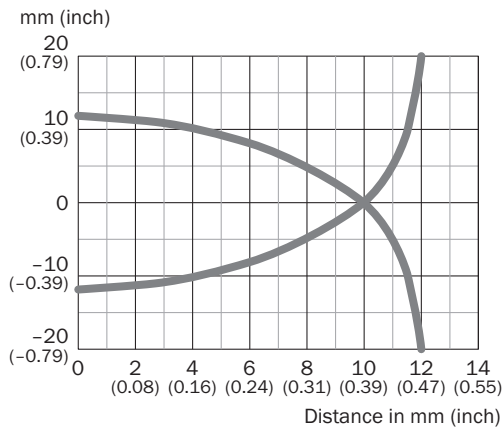
## Electromagnetic compatibility (EMC)

|                                                           |                                                                                |
|-----------------------------------------------------------|--------------------------------------------------------------------------------|
| <b>Electrostatic discharge (EN61000-4-2):</b>             | Contact discharge > 40 kV<br>Air discharge > 40 kV                             |
| <b>Electrical fast transients/burst (EN 61000-4-4):</b>   | +/- 4 kV                                                                       |
| <b>Surge (EN 61000-4-5):</b>                              | Power supply > 2 kV (with 500 Ohm)<br>Sensor output > 2 kV (with 500 Ohm)      |
| <b>Wire conducted disturbances (EN 61000-4-6):</b>        | > 20 Vrms                                                                      |
| <b>Power-frequency magnetic fields (EN 61000-4-8):</b>    | Continuous > 60 A/m, 75.9 $\mu$ tesla<br>Short-time > 600 A/m, 759 $\mu$ tesla |
| <b>Radiated RF electromagnetic fields (EN 61000-4-3):</b> | > 20 V/m                                                                       |

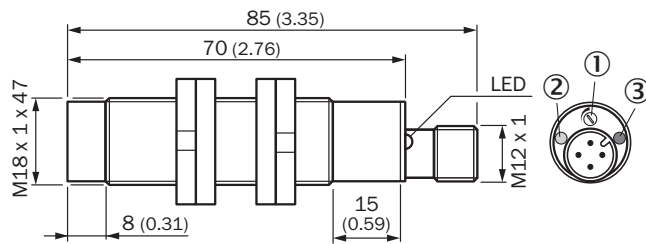
## Connection diagram Cd-006



### Response diagram CM18, Non-flush installation



### Dimensional drawing CM18, non-flush, connector



Dimensions in mm (inch)

- ① Potentiometer for sensitivity adjustment
- ② LED yellow: status indicator
- ③ LED green: operating indicator

## Recommended accessories

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

|                                                                                     | Brief description                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Type         | part no. |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------|
| Mounting systems                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |              |          |
|    | <ul style="list-style-type: none"> <li><b>Description:</b> Clamping block for round sensors M18, with fixed stop</li> <li><b>Material:</b> Plastic</li> <li><b>Details:</b> Plastic (PA12), glass-fiber reinforced</li> <li><b>Items supplied:</b> Mounting hardware included</li> <li><b>Suitable for:</b> GR18, MH15V, V180-2, V18</li> </ul>                                                                                                                                      | BEF-KHF-M18  | 2051482  |
|    | <ul style="list-style-type: none"> <li><b>Description:</b> Clamping block for round sensors M18, without fixed stop</li> <li><b>Material:</b> Plastic</li> <li><b>Details:</b> Plastic (PA12), glass-fiber reinforced</li> <li><b>Items supplied:</b> Mounting hardware included</li> <li><b>Suitable for:</b> GR18, MH15V, V180-2, V18</li> </ul>                                                                                                                                   | BEF-KH-M18   | 2051481  |
|    | <ul style="list-style-type: none"> <li><b>Description:</b> Plate N06 for universal clamp bracket, M18</li> <li><b>Material:</b> Steel, zinc diecast</li> <li><b>Details:</b> Zinc plated steel (sheet), Zinc die cast (clamping bracket)</li> <li><b>Items supplied:</b> Universal clamp (5322626), mounting hardware</li> <li><b>Usable for:</b> MH15, MH15V, V180-2, V18V, W15, GR18, V18, V18 Laser, V12-2, SimpleSense, SureSense, M18 round sensors</li> </ul>                  | BEF-KHS-N06  | 2051612  |
|    | <ul style="list-style-type: none"> <li><b>Description:</b> Plate N06N for universal clamp bracket, M18</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> MH15, MH15V, V180-2, V18V, W15, GR18, V18, V18 Laser, V12-2, SimpleSense, SureSense, M18 round sensors</li> </ul> | BEF-KHS-N06N | 2051622  |
|   | <ul style="list-style-type: none"> <li><b>Description:</b> Mounting plate for M18 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> <li><b>Suitable for:</b> GR18, V180-2, V18, W15, Z1, Z2</li> </ul>                                                                                                                                                                              | BEF-WG-M18   | 5321870  |
|  | <ul style="list-style-type: none"> <li><b>Description:</b> Mounting bracket for M18 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> <li><b>Suitable for:</b> GR18, V180-2, V18, W15, Z1, Z2</li> </ul>                                                                                                                                                                            | BEF-WN-M18   | 5308446  |

|                                                                                     | 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, A-coded</li> <li><b>Description:</b> Unshielded</li> <li><b>Connection systems:</b> Screw-type terminals</li> <li><b>Permitted cross-section:</b> ≤ 0.75 mm<sup>2</sup></li> </ul>                                                                                                                                                                             | DOS-1204-G         | 6007302  |
|    | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, angled, A-coded</li> <li><b>Description:</b> Unshielded</li> <li><b>Connection systems:</b> Screw-type terminals</li> <li><b>Permitted cross-section:</b> ≤ 0.75 mm<sup>2</sup></li> </ul>                                                                                                                                                                               | DOS-1204-W         | 6007303  |
|    | <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> 2 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> | YF2A14-020UB3XLEAX | 2095607  |
|    | <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, angled, 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> 2 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>   | YG2A14-020UB3XLEAX | 2095766  |
|   | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, angled, 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>   | YG2A14-050UB3XLEAX | 2095767  |
|  | <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> 2 m, 4-wire, PVC</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Zones with chemicals, Uncontaminated zones</li> </ul>                                                      | YF2A14-020VB3XLEAX | 2096234  |
|  | <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, PVC</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Zones with chemicals, Uncontaminated zones</li> </ul>                                                      | YF2A14-050VB3XLEAX | 2096235  |
|  | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, angled, 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> 2 m, 4-wire, PVC</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Zones with chemicals, Uncontaminated zones</li> </ul>                                                        | YG2A14-020VB3XLEAX | 2095895  |
|  | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, angled, 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, PVC</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Zones with chemicals, Uncontaminated zones</li> </ul>                                                        | YG2A14-050VB3XLEAX | 2095897  |
|  | <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> 0.6 m, 4-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> </ul>                                                                                                              | YF2A14-C60UB3XLEAX | 2145654  |

|                                                                                     | Brief description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Type               | part no. |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|
|    | <ul style="list-style-type: none"> <li><b>Application:</b> Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation</li> <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> 1 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> | YF2A14-010UB3XLEAX | 2145655  |
|    | <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> 3 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>                                                                                                                | YF2A14-030UB3XLEAX | 2145656  |
|    | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, angled, 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> 0.6 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>                                                                                                                | YG2A14-C60UB3XLEAX | 2145657  |
|    | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, angled, 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> 1 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>                                                                                                                  | YG2A14-010UB3XLEAX | 2145658  |
|    | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, angled, 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> 0.6 m, 4-wire, PVC</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Zones with chemicals, Uncontaminated zones</li> </ul>                                                                                                                                                                     | YG2A14-C60VB3XLEAX | 2145709  |
|   | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, angled, 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> 1 m, 4-wire, PVC</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Zones with chemicals, Uncontaminated zones</li> </ul>                                                                                                                                                                       | YG2A14-010VB3XLEAX | 2145710  |
|  | <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> 0.6 m, 4-wire, PVC</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Zones with chemicals, Uncontaminated zones</li> </ul>                                                                                                                                                                   | YF2A14-C60VB3XLEAX | 2145707  |
|  | <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> 1 m, 4-wire, PVC</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Zones with chemicals, Uncontaminated zones</li> </ul>                                                                                                                                                                     | YF2A14-010VB3XLEAX | 2145708  |

## 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)