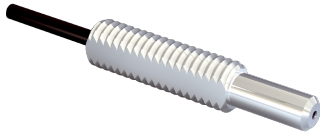


## LL3-TM02

Fiber-optic cables

FIBER-OPTIC SENSORS

**SICK**  
Sensor Intelligence.



### Ordering information

| Type     | part no. |
|----------|----------|
| LL3-TM02 | 5308069  |

Other models and accessories → [www.sick.com/Fiber-optic\\_cables](http://www.sick.com/Fiber-optic_cables)

### Detailed technical data

#### Features

|  |   |
|--|---|
| <b>Device type</b>                       | Fiber-optic cables  |
| <b>Functional principle</b>              | Through-beam system, consisting of a sender and a receiver  |
| <b>Fiber-optic head design</b>           | Threaded sleeve   |
| <b>Application</b>                       | Standard  |
| <b>Compatible fiber-optic amplifiers</b> | GLL70, WLL80, WLL180, GLL170(T)   |
| <b>Sensing range max.</b>                | 1,540 mm (Sensing range of WLL80 at 8 ms)   |
| <b>Minimal object diameter</b>           | 0.1 mm <sup>1)</sup>  |
| <b>Optical fiber head</b>                |   |
| Angle of dispersion                      | 60°   |
| Integrated lens                          | No  |
| Compatibility tip adapters               | No  |
| <b>Optical fiber</b>                     |   |
| Compatibility with infrared light        | No  |
| Optical fiber cable can be shortened     | ✓   |
| Adapter end sleeves required             | Yes   |
| <b>Included with delivery</b>            | Mounting, 4 x M3 hexagon nut, 4 x washer, adapter sleeves, BF-WLL160-10 (1.0 mm) adapter sleeves, FC fiber cutter (5304141) |

<sup>1)</sup> Minimum detectable object was determined at optimum measuring distance and optimum setting.

#### Mechanics

|  |                      |
|--|----------------------|
| <b>Optical fiber head</b>                        |                      |
| Light emission                                   | Axial                |
| Thread diameter (housing)                        | M3                   |
| Optical fiber taper diameter                     | ≥ 2 mm               |
| Optical fiber taper length after 2 mm            | ≥ 5 mm               |
| <b>Optical fiber</b>                             |                      |
| Fiber length                                     | 2,000 mm             |
| Bending radius                                   | 15 mm                |
| Dynamic flexibility (robotics)                   | No                   |
| Outside diameter, optical fiber cable connection | 1 mm                 |
| Fiber arrangement                                | Singlefiber          |
| Core structure                                   | Ø 0,5 mm Singlefiber |
| <b>Material</b>                                  |                      |

|                    |                              |
|--------------------|------------------------------|
| Optical fiber head | Stainless steel              |
| Sheath             | Polyethylen (PE)             |
| Fibers             | Polymethylmethacrylat (PMMA) |
| <b>Weight</b>      | 20 g                         |

## Ambient data

|                                      |                   |
|--------------------------------------|-------------------|
| <b>Ambient operating temperature</b> | -40 °C ... +70 °C |
|--------------------------------------|-------------------|

## Classifications

|                       |          |
|-----------------------|----------|
| <b>ECLASS 5.0</b>     | 27270905 |
| <b>ECLASS 5.1.4</b>   | 27270905 |
| <b>ECLASS 6.0</b>     | 27270905 |
| <b>ECLASS 6.2</b>     | 27270905 |
| <b>ECLASS 7.0</b>     | 27270905 |
| <b>ECLASS 8.0</b>     | 27270905 |
| <b>ECLASS 8.1</b>     | 27270905 |
| <b>ECLASS 9.0</b>     | 27270905 |
| <b>ECLASS 10.0</b>    | 27270905 |
| <b>ECLASS 11.0</b>    | 27270905 |
| <b>ECLASS 12.0</b>    | 27270905 |
| <b>ETIM 5.0</b>       | EC002651 |
| <b>ETIM 6.0</b>       | EC002651 |
| <b>ETIM 7.0</b>       | EC002651 |
| <b>ETIM 8.0</b>       | EC002651 |
| <b>UNSPSC 16.0901</b> | 39121528 |

## Sensing ranges with GLL70

|                              |          |
|------------------------------|----------|
| <b>Operating mode 50 µs</b>  | 135 mm   |
| <b>Operating mode 250 µs</b> | 410 mm   |
| <b>Operating mode 1 ms</b>   | 590 mm   |
| <b>Operating mode 4 ms</b>   | 1,260 mm |

## Sensing ranges with WLL80

|                              |   |
|------------------------------|---|
| <b>Operating mode 16 µs</b>  | 100 mm  |
| <b>Operating mode 70 µs</b>  | 290 mm  |
| <b>Operating mode 250 µs</b> | 465 mm  |
| <b>Operating mode 500 µs</b> | 600 mm  |
| <b>Operating mode 1 ms</b>   | 680 mm  |
| <b>Operating mode 2 ms</b>   | 965 mm  |
| <b>Operating mode 8 ms</b>   | 1,540 mm  |
| <b>Note</b>                  | Sensing ranges related to fiber-optic sensors with type of light: visible red light |

## Sensing ranges with WLL180T

|                             |        |
|-----------------------------|--------|
| <b>Operating mode 16 µs</b> | 55 mm  |
| <b>Operating mode 70 µs</b> | 175 mm |

|   |   |
|---|---|
| <b>Operating mode 250 <math>\mu</math>s</b> | 300 mm  |
| <b>Operating mode 2 ms</b>                  | 700 mm  |
| <b>Operating mode 8 ms</b>                  | 1,100 mm  |
| <b>Note</b>                                 | Sensing ranges related to fiber-optic sensors with type of light: visible red light |

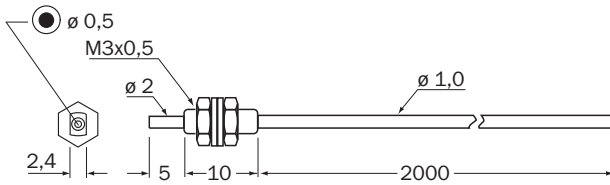
Sensing ranges with GLL170

|   |        |
|---|--------|
| <b>Operating mode 250 <math>\mu</math>s</b> | 150 mm |
|---|--------|

Sensing ranges with GLL170T

|   |        |
|---|--------|
| <b>Operating mode 50 <math>\mu</math>s</b>  | 140 mm |
| <b>Operating mode 250 <math>\mu</math>s</b> | 230 mm |

### Dimensional drawing



Dimensions in mm (inch)

## 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)