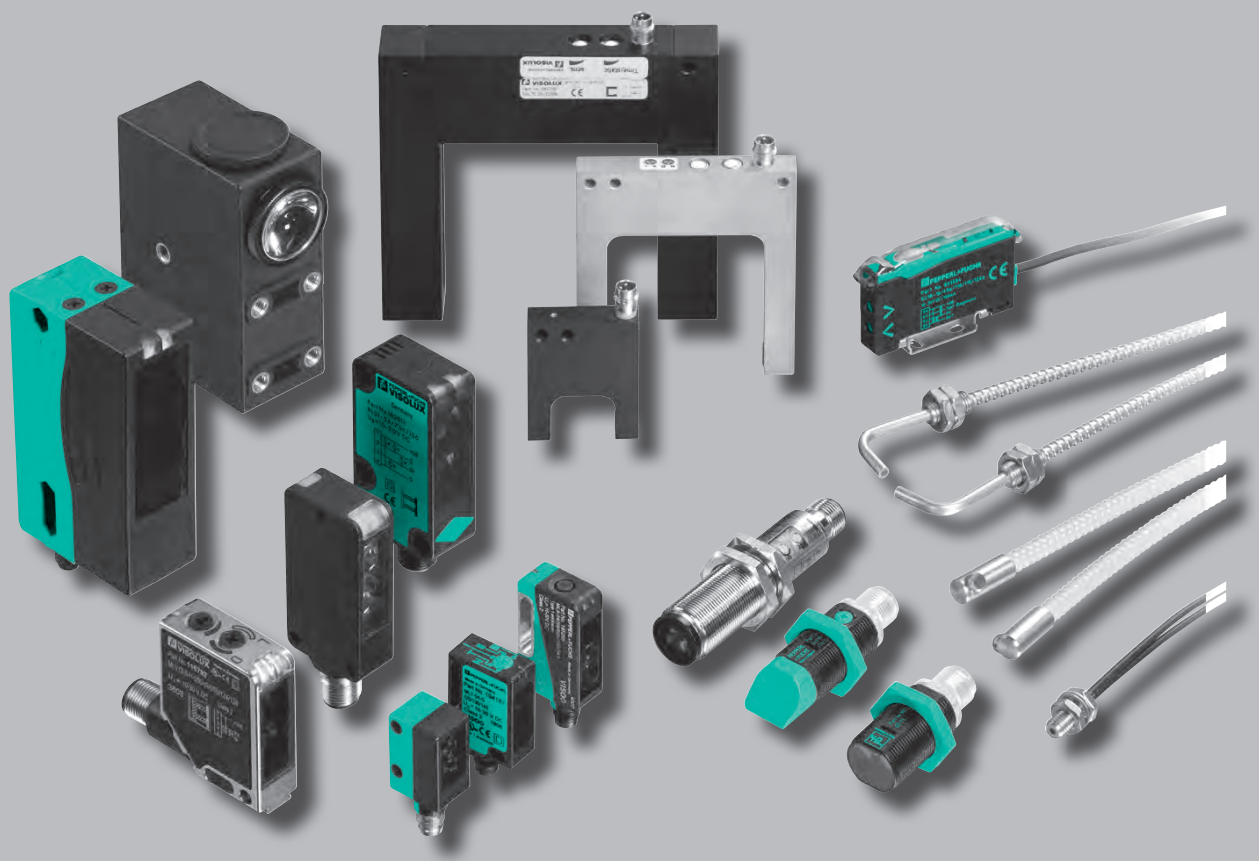
# Contents



## Photoelectric Sensors




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# Photoelectric Sensors

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# The Functional Principles of Photoelectric Sensors at a Glance

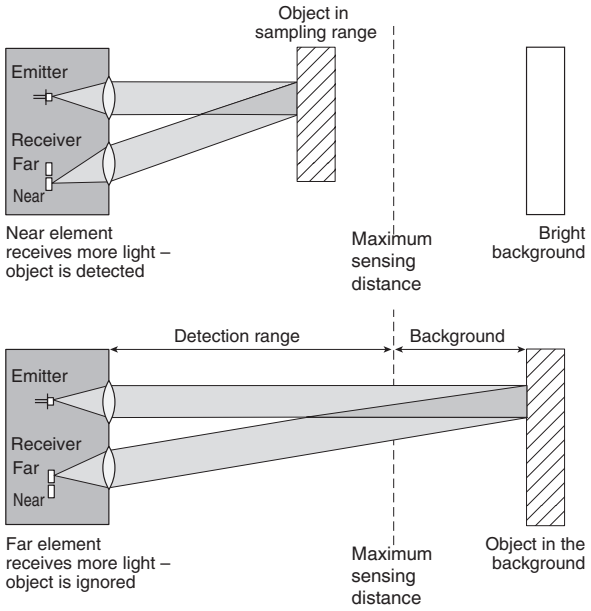
Type, size, shape, and surface characteristics of the objects to be detected, the distance between the sensor and the object, and the ambient conditions determine the optimal photoelectric sensing mode.

## 1. Diffuse mode sensors with background suppression



Diffuse mode sensors with background suppression were developed to achieve a defined sensing range for objects regardless of their brightness, color, and other characteristics, as well as the presence of a background. The following figure illustrates the functional principle of a diffuse mode sensor with background suppression. A focused light spot from the emitter and directed by the lens reaches the object. If the object is within the sensing range, then a portion of the reflected light, focused by the receiver lens, is directed to the "near" element of the receiver, and the sensor's output switches on.

As the object's distance increases, this light spot moves towards the "far" element of the receiver. Near the sensing range limit, half of the light spot is on the "near" and half on the "far" elements, and the sensor's output turns off. If the object moves farther away, the light only falls onto the "far" element and the sensor's output continues to stay "off."




**Features:**

- *A nearly constant sensing range to materials with sharply different reflectivity*
- *Dark objects in front of a bright background are reliably detected*
- *Insensitive to interfering reflections from objects outside of the specified sensing range*
- *High excess gain*
- *Quick installation since the sensor consists of only one housing and no reflector*

The principle of **foreground suppression** is similar to background suppression. Diffuse mode sensors of this type ignore all objects that are located closer to the sensor than a preset minimum sensing range.

### Multipixel array photoelectric sensors

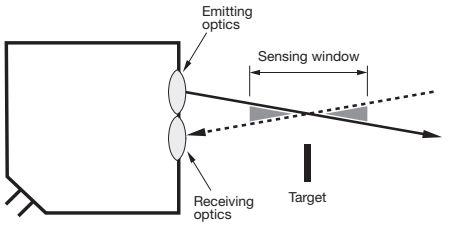


Multipixel array photoelectric sensors combine the advantages of background/foreground suppression with the measuring functionality of a distance sensor. At its core is an integral measuring technology, otherwise found only in distance sensors, that enables different sensing functions in one device and provides outstanding performance data.

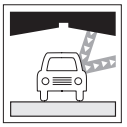
### Diffuse mode sensors with convergent mode



A convergent mode sensor is a more efficient type of diffuse mode sensing. The emitter lens is focused to an exact point in front of the sensor and the receiver lens is focused to the same point. The range for a convergent mode sensor is fixed and defined around this focus point. The sensor is able to detect an object at the focus point, plus or minus some distance. Because all the emitted energy is focused to a single point, a high amount of excess gain is available. This excess gain enables the sensor to easily detect narrow or low reflectivity targets.

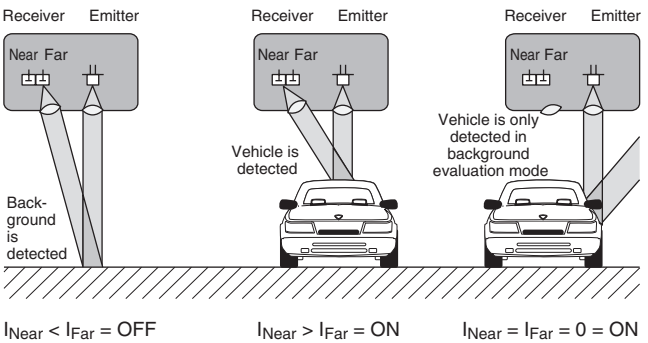



### Diffuse mode sensors with background evaluation



In addition to background suppression, the reverse principle, background evaluation, is used for certain applications. While the first process ignores the background and only looks at objects within the sensing range, the other evaluates only the light reflected from the background. The background, not the object, is the reference. (See the following figure) If an object obstructs the light path to the background, the sensor switches regardless of whether or not the reflected light reaches the receiver, thus detecting or not detecting the object in front of the background (even for very reflective objects).

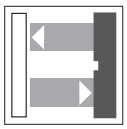
Sensors with background evaluation have no minimum sensing distance and are more suitable for detecting complex, highly reflective objects. In addition, they can be tested and are designed to be self-monitoring.



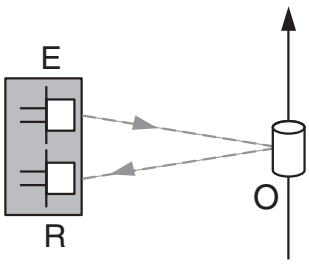


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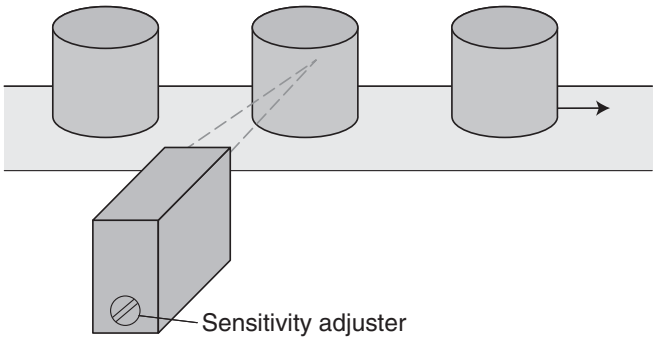
## 2. Diffuse Mode Sensors



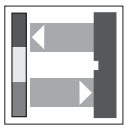
In principle, a diffuse mode sensor is constructed similarly to a retroreflective sensor. However, it does not use a reflector and the receiver evaluates the light reflected from the detected object instead.




Due to the diffuse reflection from the object, the detection range of the diffuse sensor is reduced compared with that of the retroreflective sensor. This sensing range is the maximum distance from the emitter at which an object can be reliably detected.




### Special versions of diffuse mode sensors



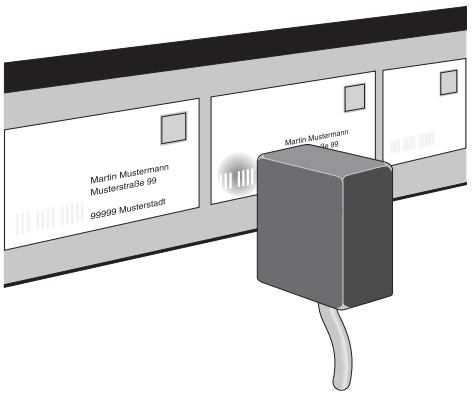
The standard principle of the diffuse mode sensors—that they react to light reflected from an object's surface—is put to use by contrast and color sensors.

### Contrast sensors

This sensor evaluates the difference in brightness between an object and a marking on it. The color of the emitted light or the color of the marking must be selected so that as large a contrast as possible is achieved. Our contrast sensors are equipped with a three-color LED light source. The optimum light emission color is selected automatically during the sensor teach-in process. Many sensors are based on the auto-collimation principle, i.e., emitter and receiver are on a common optical axis (one-eyed system). This permits greater flexibility in the installation position of the sensor.

### Luminescence sensors

A variation of the contrast sensor, the luminescence sensor, works with modulated ultra-violet light. Suitable materials (luminophores), either inherent to the material or intentionally added, are stimulated by ultra-violet light and emit visible light at a determined wavelength. These materials include optical brighteners in white paper, but they are also components in certain kinds of chalk, paint, oils, greases, and printed marks.




The light emitted by the luminophores to the sensor's receiver has a longer wavelength than the light emitted from the emitter; it is within the visible part of the spectrum. Because of the modulation and the precisely defined frequency offset between the transmitted and received light, luminescence sensors have high immunity to ambient light and are highly reliable.

### Color sensors

While a standard contrast senor evaluates only differences in brightness within a specific range of the spectrum determined by the color of the transmitted light of the sensor, the color sensor breaks up the light reflected from the target into several portions of the spectrum and returns an intensity value for each of these sub-spectra. The distribution of this value determines the spectral properties—and thus the color—of the target.

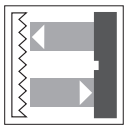
Pepperl+Fuchs color sensors work according to the three-range procedure. Below are descriptions of the active and passive three-range procedure.

- ***Active three-range procedure:***
  *The sensor emits three emitter colors (red, green, and blue) sequentially onto the sensed object. The magnitude of light reflected is individually measured for each emitted color. The three colors that are obtained are used to determine the color of the sensor object.*
- ***Passive three-range procedure:***
  *The sensor emits white emitted light onto the sensed object. After this, the red, green, and blue portions of the reflected light are filtered out and the light magnitude is determined for each one. Three receivers are used for this process. The color of the target is determined in this manner.*

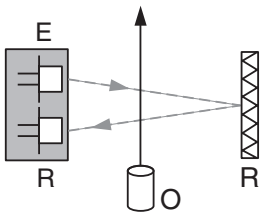



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## 3. Retroreflective Sensors

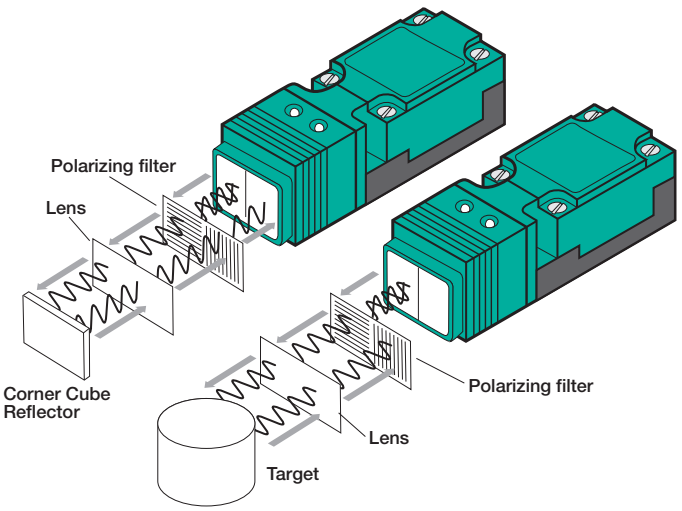


Retroreflective sensors contain an emitter and a receiver in one housing. The emitted light is reflected back to the receiver by a reflector. When the light beam is interrupted, the output is switched.




### Retroreflective sensors with polarization filter

A problem typically associated with reflector systems is that shiny and reflective objects cannot be reliably detected. This problem is solved through the use of a polarization filter. Linear polarizing filters are positioned in front of the sensor's emitter and receiver, and the polarization levels are aligned perpendicular to one another (see figure below.). These filters create two polarization planes positioned at 90° from each other. As such, only the light beams from the corner cube reflectors reach the receiver because it changes the polarization level of the light, allowing it to pass freely through the filter in front of the receiver.




**Features:**

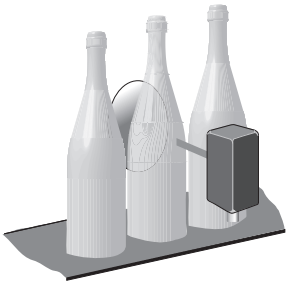
- *Detects opaque and glossy objects*
- *Versions for clear object detection*
- *Reduced installation time and cost since the electrical connection is required only on the sensor side.*

### Special versions of retroreflective mode sensors

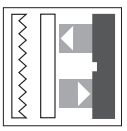
#### Retroreflective sensors for clear object detection



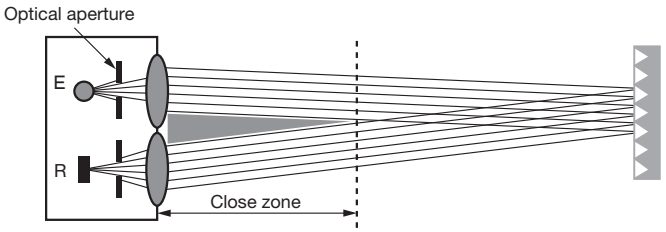
The clear object detection sensor detects clear objects. Through the use of a low hysteresis circuit and lower excess gain, the sensor detects small changes in light typical when sensing clear objects.



#### Retroreflective sensors with foreground suppression



In addition to the polarization filters, optical apertures are added to the emitter and receiver elements. These apertures tighten the light spot and only allow light that is reflected directly at the receiver and phase rotated to be detected. This creates a defined area in front of the sensor that mechanically blocks false readings and ensures error-free detection of highly reflective, depolarized material.




#### Retroreflective area sensors



This sensor employs multiple light beams in one housing aimed at a reflector. It provides more sensing coverage than a single-beam retroreflective sensor and without the added expense of a thru-beam light grid. It's also well suited to detect objects with variable contours, positions, and shapes.



Retroreflective area sensor



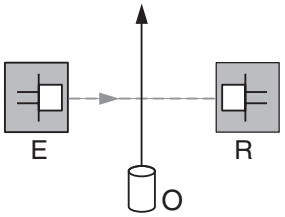
Single-beam retroreflective sensor



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## 4. Thru-Beam Sensors

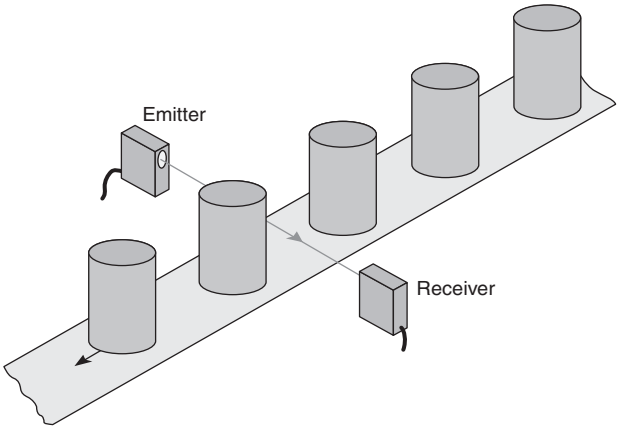
The emitter and receiver of the thru-beam sensor are in separate housings. The emitter (E) is aimed directly into the receiver (R). If an object (O) obstructs the light beam, the output is switched.




**Features:**

- *Detects opaque and reflective objects*
- *Long range and high reliability because the light beam only travels one path, from the emitter to the receiver*
- *Not significantly affected by contamination and, therefore, suitable for applications in harsh environments. Possible applications include outside installations or in dirty or dusty environments.*

Typically, thru-beam sensors are used to monitor production and packaging lines (see the following figure), to measure fill levels in transparent containers, or as a safety measure for doors and dangerous areas. There is, however, an additional expense because both units need to be mounted and wired.

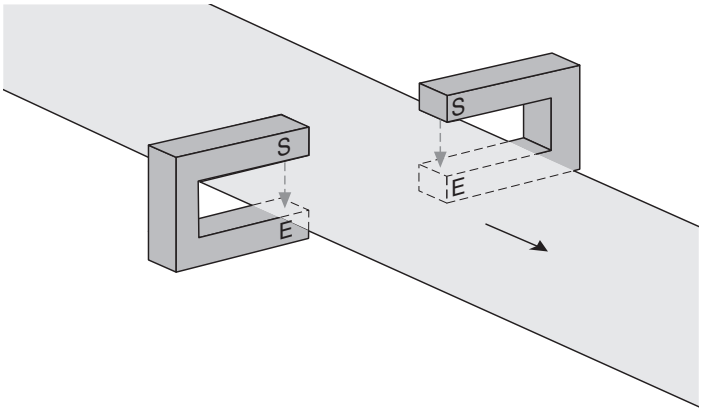



### Special versions of thru-beam sensors

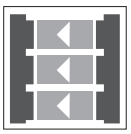
#### Photoelectric slot sensors



If the distance between the emitter and receiver is small - a few millimeters or centimeters - the two can be positioned across from each other in a u-shaped housing. Since wiring is only required for one device, slot style sensors (see the following figure) are easier to mount and wire. In addition, there is no need to align the emitter to the receiver.




#### Light grids



In safety and some nonsafety applications, the task at hand often involves monitoring a large surface. The easiest way to achieve this is by arranging a number of thru-beam sensors parallel to each other. In a light grid of this type, all emitters are combined in a single housing. This also applies to the receivers, any of which can switch the light grid's output. This reduces installation time and expense when compared to a comparable number of thru-beam sensors. The distances between the individual beams of the grid can be selected specifically for the application.

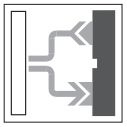
#### Slot grid sensors

Slot grid sensors are designed for filling and counting applications. Unlike standard slot sensors, slot grid sensors create a sheet of light between the forks for object detection and offer maximum response time of 100 ms with target object sizes as small as 1mm. Slot grid sensors are available in 4 sizes and offer active sensing fields from 34 mm x 50 mm up to 142 mm x 150 mm. Dynamic mode sensing can be used to detect only moving targets and ignore static objects in the sensing field.




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## 5. Fiber Optic Sensors



Depending on their design, the characteristics of fiber optic cables are similar to those of a thru-beam or a diffuse mode sensor.

Thru-beam systems have one fiber optic cable each for the emitter and the receiver. For diffuse systems, the light is guided in a single fiber optic cable through separate emitter and receiver fibers.

The emitter and receiver are housed together in a single sensor housing. The light beam is guided via a flexible fiber optic cable (glass or plastic) from the fiber optic sensor to the sensing location. Due to their small optical surfaces, fiber optic cables are also suitable for detecting small details in close range. Special fiber optic cables are used with a coaxial or mixed fiber arrangement and small fiber diameters (plastic fibers: a few hundred µm, glass fibers: typically 50 µm).

The large opening angle at the light exit of the fiber optic cable (approx. 70°) also enables it to be used to achieve shorter detection ranges than standard photoelectric sensors or light sensors; if necessary, these can be increased using suitable lens attachments.

### Glass or plastic?

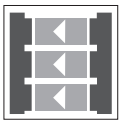
When choosing a suitable fiber optic cable, users can choose between plastic or glass fiber optic. The characteristics of both these materials are briefly outlined as follows.



- ***Plastic fiber optics***
  *consist of a single PVC-sheathed fiber. As the fiber optic cable material is lightweight and very flexible, it can be used on machines with moving parts. One advantage in particular is the individual assembly of the fibers. The standard length is 2 m. The cutter, provided with the fiber-optic cable, can be used to easily shorten the fiber optic cable to the length required for the application. Two different fiber diameters and a range of different fiber heads are available to choose from. You are sure to find a type to suit your application.*

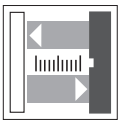
- ***Glass fiber optics***
  *consist of many individual fibers, each with a diameter of approx. 50 µm. Depending upon the application, sheathing is available in stainless steel, PVC, metal and silicone, or silicone. Due to the low optical attenuation of glass fibers compared to plastic fibers, larger sensing ranges are possible. The robust mechanical design of the stainless steel sheathing means that the cables can be used at temperatures of up to 300 °C. You will find a suitable solution for your application from the range of fiber heads, each of which can be combined with the sheathing materials.*

## 6. Distance Measurement Sensors

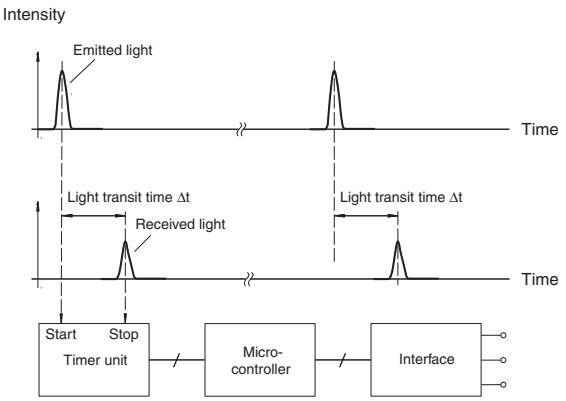


These devices measure the time for light to travel from the sensor' emitter to an object and back to the sensor's receiver. This time interval is used to determine the distance to the target object.

### Pulse Range Technology (PRT):



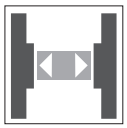
Pulse Ranging Technology is a direct method of measurement. The distance is determined based on the time interval Δt for light to travel from the emitter to the target object and back to the receiver. A sequence of very short, high-intensity, laser light pulses is generated from the emitter. These pulses propagate at the speed of light to the target object or reflector and are returned to the receiver. The time of flight of these light pulses are captured and very accurately measured. Based on this time interval, the distance can be accurately determined. (See the figure below.) The high-speed timer unit and microprocessor then send an output signal that is proportional to the distance to the target object.





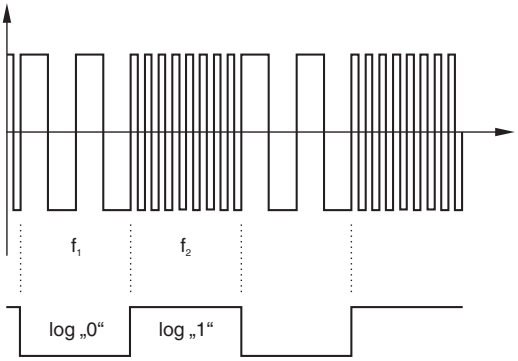
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## 7. Optical Data Couplers



Optical data couplers are used for the cable-free transmission of information via modulated light between two points along a line-of-sight axis. Unlike RF-based communication, the modulated signal is immune to noise interference. And they replace mechanical means of data transfer like slip rings and drag cables that are susceptible to noise and offer little flexibility. For optical transmission, the FSK method (Frequency Shift Keying) is used. In other words, the bit information is coded in the carrier frequency.

The emitted signal is shifted between two frequencies, f1 and f2, that correspond to either logic bits 0 or 1. Narrow band filtering, used on the receiver side to convert the data back to logic, prevents extraneous signals from corrupting the transmitted data. The data transmission is unaffected by signal level variation.




Pepperl+Fuchs offers optical data couplers for parallel as well as serial data transfer.

- *Parallel data transfer:*
  *An optical data coupler can transfer eight bits bidirectionally. To do this, the signals in the device are converted into a serial bit sequence. The data is then applied to the parallel outputs in the receiver. FSK modulation, which is noise-resistant, is used to transfer the binary signals.*

- *Serial data transfer:*
  *Our serial optical data couplers also use the FSK method. The data that is available at the interface is transferred protocol free and is then converted again at the serial interface. Many optical data couplers with serial interface are also available with visible red light transmitters. These devices are used with infrared data couplers to prevent cross-talk between data routes when used in close proximity to each other.*

## 8. Our guarantee for safety and reliability

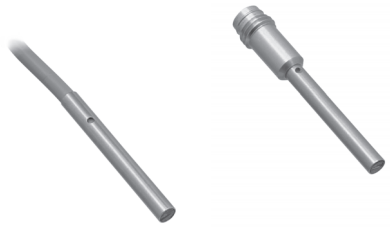
The new generation of photoelectric sensors with the features you need today - economical, easy to install, and reliable in harsh environments.

- Highly visible LEDs
- Enhanced status LED indications
- Modern outputs such as 4-in-1 or AS-Interface 2.11
- High ambient light resistance
- Cross-talk immunity




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CE

## Properties

- Diffuse type
- Cylindrical non-threaded housing
- Stainless steel housing
- DC sensor
- Discrete output
- Cable and connector versions
- Infrared light

## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Glass detection | ✔ |
| Detection range | 0 ... 50 mm |
| Light type | modulated infrared light |
| Optical face | frontal |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 15 mA |
| Switching type | light on |
| Switching current | max. 100 mA |
| Switching frequency | ≤ 250 Hz |
| Ambient temperature | 0 ... 55 °C (32 ... 131 °F) |
| Housing | Stainless steel 1.4305 / AISI 303 |
| Optical face | Scratch resistant mineral glass lens |
| Protection degree | IP67 |

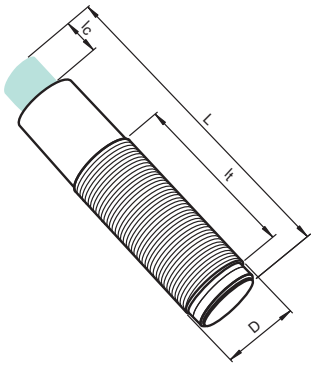
| Model Number | | KT9-50/25/102/115 | KT9-50/25/103/115 | KT9-50/25/98a/102 | KT9-50/25/98a/103 |
|---|---|---|---|---|---|
| Signal output | 1 switch output NPN | ● | | ● | |
| | 1 switch output PNP | | ● | | ● |
| Connection | 2 m, 3 x 0.14 mm², PVC cable | ● | ● | | |
| | M8 x 1 connector, 3-pin | | | ● | ● |
| | |  | |  | |
| **Dimensions** | | | | | |
| Length L [mm] | | 35 | | 45 | |
| Diameter D [mm] | | 4 | | 4 / 8 | |
| Thread length $l_t$ [mm] | | 0 | | | |
| Connector length $l_c$ [mm] | | 0 | | 10 | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **BF 4** | Mounting bracket, 4 mm |
| **V3-GM-BK2M-PUR-U** | Female cordset, M8, 3-pin, PUR cable, straight |
| **V3-WM-BK2M-PUR-U** | Female cordset, M8, 3-pin, PUR cable, angled |

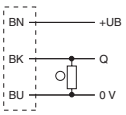



## Electrical Connection

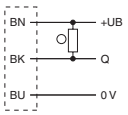
❍ = light on, ● = dark on



KT9-50/25/103/115 Option 25/103/115

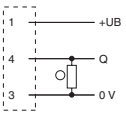



KT9-50/25/102/115 Option 25/102/115

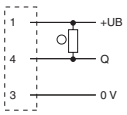





KT9-50/25/98a/103 Option 25/98/103




KT9-50/25/98a/102 Option 25/98/102





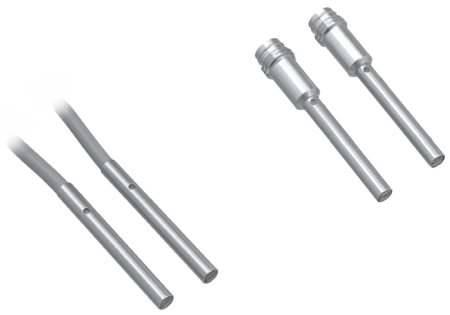


Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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CE

## Properties

- Thru-beam type
- Cylindrical non-threaded housing
- Stainless steel housing
- DC sensor
- Discrete output
- Cable and connector versions
- Infrared light

## Technical Data

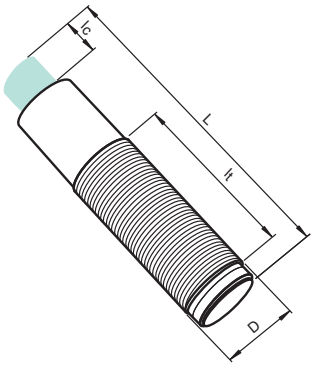
*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Set (Emitter + Receiver) | ✔ |
| Test input | ✔ |
| Effective detection range | 0 ... 250 mm |
| Light type | modulated infrared light |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 15 mA (device) |
| Switching type | dark on |
| Switching current | max. 100 mA |
| Switching frequency | ≤ 250 Hz |
| Test input (emitter) | inactive: ≤ 4 V; active: ≥ 8 V or unwired |
| Ambient temperature | 0 ... 55 °C (32 ... 131 °F) |
| Housing | Stainless steel 1.4305 / AISI 303 |
| Optical face | Scratch resistant mineral glass lens |
| Protection degree | IP67 |

| Model Number | | KS9/KSE9/59/102/115 | KS9/KSE9/59/103/115 | KS9/KSE9/59/98a/102 | KS9/KSE9/59/98a/103 |
|---|---|---|---|---|---|
| Set (emitter + receiver) | | ● | ● | ● | ● |
| Signal output | 1 switch output NPN | ● | | ● | |
| | 1 switch output PNP | | ● | | ● |
| Connection | 2 m fixed cable ; 3 x 0.14 mm² , PVC | ● | ● | | |
| | M8 x 1 connector, 3-pin | | | ● | ● |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | | |
|---|---|---|
| Length L [mm] | 35 | 45 |
| Diameter D [mm] | 4 | 4 / 8 |
| Thread length $l_t$ [mm] | 0 | |
| Connector length $l_c$ [mm] | 0 | 10 |




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

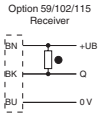
| | |
|---|---|
| **BF 4** | Mounting bracket, 4 mm |
| **V3-GM-BK2M-PUR-U** | Female cordset, M8, 3-pin, PUR cable, straight |
| **V3-WM-BK2M-PUR-U** | Female cordset, M8, 3-pin, PUR cable, angled |

## Electrical Connection

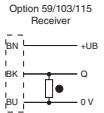
❍ = light on, ● = dark on

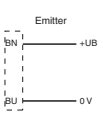


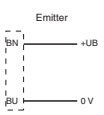
KS9/KSE9/59/102/115




KS9/KSE9/59/103/115

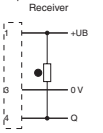


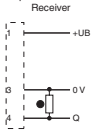



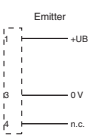


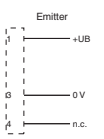

KS9/KSE9/59/98a/102




KS9/KSE9/59/98a/103







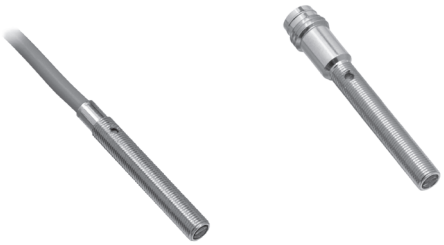
Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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CE

## Properties

- Diffuse type
- Cylindrical threaded housing
- Stainless steel housing
- DC sensor
- Discrete output
- Cable and connector versions
- Infrared light

## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Glass detection | ✔ |
| Wide light spot | ✔ |
| Detection range | 0 ... 50 mm |
| Light type | modulated infrared light |
| Optical face | frontal |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 15 mA |
| Switching type | light on |
| Switching current | max. 100 mA |
| Switching frequency | ≤ 250 Hz |
| Ambient temperature | 0 ... 55 °C (32 ... 131 °F) |
| Housing | Stainless steel 1.4305 / AISI 303 |
| Optical face | Scratch resistant mineral glass lens |
| Protection degree | IP67 |

| Model Number | | KT11-50/25/102/115 | KT11-50/25/103/115 | KT11-50/25/98a/102 | KT11-50/25/98a/103 |
|---|---|---|---|---|---|
| Signal output | 1 switch output NPN | ● | | ● | |
| | 1 switch output PNP | | ● | | ● |
| Connection | 2 m PVC cable, 3 x 0.14 mm² | ● | ● | | |
| | M8 x 1 connector, 3-pin | | | ● | ● |
| | |  | |  | |

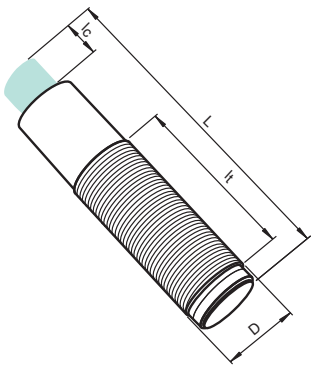
| Dimensions | | |
|---|---|---|
| Length L [mm] | 35 | 45 |
| Diameter D [mm] | M5 x 0.5 | M5 x 0.5 / 8 |
| Thread length $l_t$ [mm] | 26.5 | 30 |
| Connector length $l_c$ [mm] | 0 | 10 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **BF 5** | Mounting bracket, 5 mm |
| **V3-GM-BK2M-PUR-U** | Female cordset, M8, 3-pin, PUR cable, straight |
| **V3-WM-BK2M-PUR-U** | Female cordset, M8, 3-pin, PUR cable, angled |



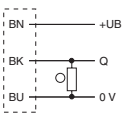

## Electrical Connection

❍ = light on, ● = dark on



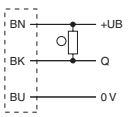
KT11-50/25/103/115

Option 25/103/115




KT11-50/25/102/115

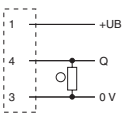
Option 25/102/115





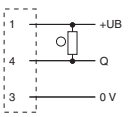

KT11-50/25/98a/103

Option 25/98/103




KT11-50/25/98a/102

Option 25/98/102







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



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CE

## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Set (Emitter + Receiver) | ✔ |
| Test input | ✔ |
| Effective detection range | 0 ... 250 mm |
| Light type | modulated infrared light |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 15 mA (device) |
| Switching type | dark on |
| Switching current | max. 100 mA |
| Switching frequency | ≤ 250 Hz |
| Test input (emitter) | inactive: ≤ 4 V; active: ≤ 8 V or unwired |
| Ambient temperature | 0 ... 55 °C (32 ... 131 °F) |
| Housing | Stainless steel 1.4305 / AISI 303 |
| Optical face | Scratch resistant mineral glass lens |
| Protection degree | IP67 |

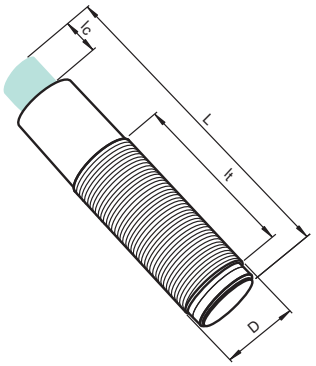
| Model Number | | KS11/KSE11/59/102/115 | KS11/KSE11/59/103/115 | KS11/KSE11/59/98a/102 | KS11/KSE11/59/98a/103 |
|---|---|---|---|---|---|
| Set (emitter + receiver) | | ● | ● | ● | ● |
| Signal output | 1 switch output NPN | ● | | ● | |
| | 1 switch output PNP | | ● | | ● |
| Connection | 2 m fixed cable ; 3 x 0.14 mm², PVC | ● | ● | | |
| | M8 x 1 connector, 3-pin | | | ● | ● |
| | |  | |  | |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | | |
|---|---|---|
| Length L [mm] | 35 | 45 |
| Diameter D [mm] | M5 x 0.5 | M5 x 0.5 / 8 |
| Thread length $l_t$ [mm] | 30 | |
| Connector length $l_c$ [mm] | 0 | 10 |

## Properties

- Thru-beam type
- Cylindrical threaded housing
- Stainless steel housing
- DC sensor
- Discrete output
- Cable and connector versions
- Infrared light




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

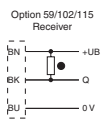
| | |
|---|---|
| **BF 5** | Mounting bracket, 5 mm |
| **V3-GM-BK2M-PUR-U** | Female cordset, M8, 3-pin, PUR cable, straight |
| **V3-WM-BK2M-PUR-U** | Female cordset, M8, 3-pin, PUR cable, angled |

## Electrical Connection

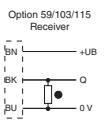
❍ = light on, ● = dark on

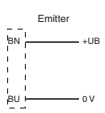


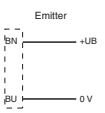
KS11/KSE11/59/102/115




KS11/KSE11/59/103/115

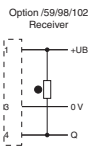


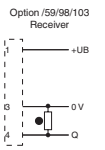



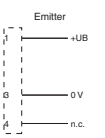


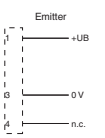

KS11/KSE11/59/98a/102




KS11/KSE11/59/98a/103







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 3 | BU | (blue) |
| 4 | BK | (black) |





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CE

## Properties

- Thru-beam type
- Plug-in style housing
- Plastic housing
- Discrete output
- Cable version
- Infrared light

## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

### General Data

| | |
|---|---|
| Set (Emitter + Receiver) | ✔ |
| Threshold detection range | 4 m |
| Effective detection range | 0 ... 3 m |
| Light type | modulated infrared light , 880 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | Emitter: ≤ 20 mA<br>Receiver: ≤ 10 mA |
| Switching current | max. 100 mA |
| Switching frequency | 100 Hz |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) , static<br>-20 ... 60 °C (-4 ... 140 °F) , dynamic |
| Housing | PC , black |
| Optical face | Plastic pane |
| Protection degree | IP67 |
| Connection | 7 m fixed cable<br>Receiver: gray ; Emitter: black |



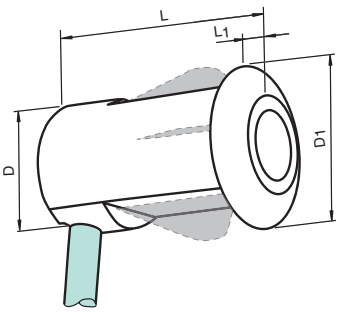
| Model Number | | BB10-P-F1/33/35/59/103/115-7m | BB10-P-F2/33/35/59/103/115-7m | BB10-P-F1/33/35/59/102/115-7m | BB10-P-F2/33/35/59/102/115-7m | BB10-P-F1/25/33/35/103/115-7m | BB10-P-F2/25/33/35/103/115-7m | BB10-P-F1/25/33/35/102/115-7m | BB10-P-F2/25/33/35/102/115-7m |
|---|---|---|---|---|---|---|---|---|---|
| Switching type | dark on | ● | ● | ● | ● | | | | |
| | light on | | | | | ● | ● | ● | ● |
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | | | ● | ● | | | ● | ● |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | ● | ● | | | ● | ● | | |

### Approvals and Certificates

| | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

### Dimensions

| | |
|---|---|
| Length L [mm] | 22 |
| Diameter D [mm] | 12.4 |
| Cap length $L_1$ [mm] | 2.2 |
| Cap diameter $D_1$ [mm] | 15 |

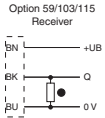


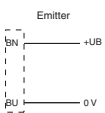

## Electrical Connection

❍ = light on, ● = dark on

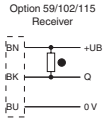


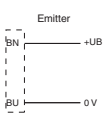
BB10-P-F1/33/35/59/103/115-7m
BB10-P-F2/33/35/59/103/115-7m



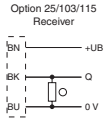



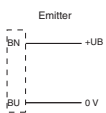

BB10-P-F1/33/35/59/102/115-7m
BB10-P-F2/33/35/59/102/115-7m



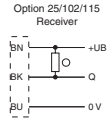



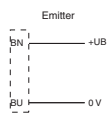

BB10-P-F1/25/33/35/103/115-7m
BB10-P-F2/25/33/35/103/115-7m




BB10-P-F1/25/33/35/102/115-7m
BB10-P-F2/25/33/35/102/115-7m






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CE

## Properties

- Thru-beam type
- Plug-in style housing
- Plastic housing
- Discrete output
- Cable version
- Infrared light

## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

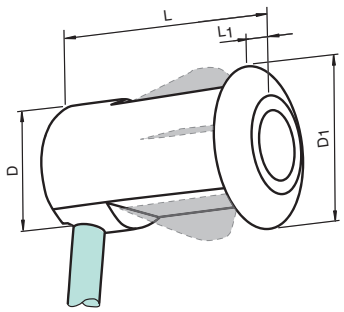
| General Data | |
|---|---|
| Set (Emitter + Receiver) | ✔ |
| Test input | ✔ |
| Threshold detection range | 8 m |
| Effective detection range | 0 ... 6 m |
| Light type | modulated infrared light , 880 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | Emitter: ≤ 20 mA<br>Receiver: ≤ 10 mA |
| Switching current | max. 100 mA |
| Switching frequency | 62.5 Hz |
| Test input | emitter deactivation at 0 V |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) , static<br>-20 ... 60 °C (-4 ... 140 °F) , dynamic |
| Housing | PC , black |
| Optical face | Plastic pane |
| Protection degree | IP67 |
| Connection | 7 m fixed cable<br>Receiver: gray ; Emitter: black |



| Model Number | | BB10-P/33/59/76b/103/115-7m | BB10-P/33/59/76b/102/115-7m | BB10-P/25/33/76b/103/115-7m | BB10-P/25/33/76b/102/115-7m |
|---|---|---|---|---|---|
| Switching type | dark on | ● | ● | | |
| | light on | | | ● | ● |
| Signal output | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | |
| | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 22 |
| Diameter D [mm] | 12.4 |
| Cap length $L_1$ [mm] | 2.2 |
| Cap diameter $D_1$ [mm] | 15 |

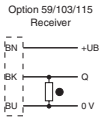


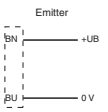

## Electrical Connection

❍ = light on, ● = dark on

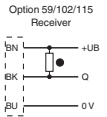


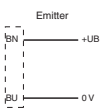
BB10-P/33/59/76b/103/115-7m



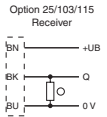



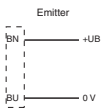

BB10-P/33/59/76b/102/115-7m



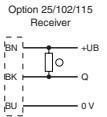



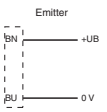

BB10-P/25/33/76b/103/115-7m




BB10-P/25/33/76b/102/115-7m







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CE

## Properties

- Diffuse type
- Cylindrical threaded housing
- Nickel-plated brass housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Technical Data

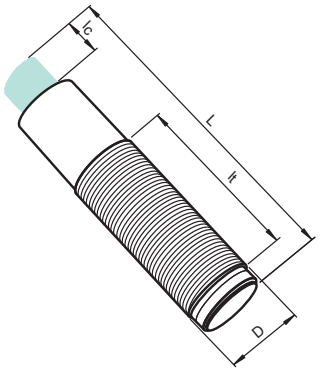
*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Light/dark adjustment | ✔ |
| Sensitivity Adjustment | ✔ |
| Detection range | 0 ... 200 mm |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 20 mA |
| Switching type | light/dark on |
| Switching current | max. 300 mA |
| Switching frequency | ≤ 700 Hz |
| Control input | light on +UB<br>dark on: 0 V |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Material | |
| Housing | brass, nickel-plated |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GLV12-8-200/36/40b/115 | GLV12-8-200/37/40b/115 | GLV12-8-200/36/40b/92 | GLV12-8-200/37/40b/92 |
|---|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | |
| | 1 PNP output, short-circuit protected, protected from reverse polarity, open collector | | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | | |
| | connector M12 x 1, 4-pin | | | ● | ● |
| | |  | |  | |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | | | | |
|---|---|---|---|---|
| Length L [mm] | 55 | | 65 | |
| Diameter D [mm] | M12 x 1 | | | |
| Thread length $l_t$ [mm] | 35 | | | |
| Connector length $l_c$ [mm] | 0 | | 12 | |




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **AB-12** | Right angled mounting bracket |
| **BF 12** | Mounting bracket, 12 mm |
| **BF 12-F** | Mounting bracket with stop, 12 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

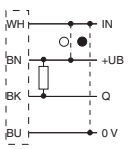
## Electrical Connection

❍ = light on, ● = dark on

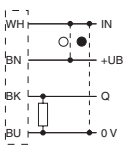


GLV12-8-200/36/40b/115 GLV12-8-200/37/40b/115

Option 36/40b/115



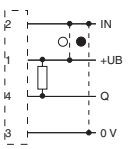

Option 37/40b/115



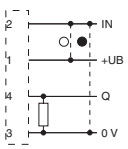


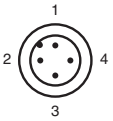

GLV12-8-200/36/40b/92 GLV12-8-200/37/40b/92

Option 36/40b/92




Option 37/40b/92




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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CE

## Properties

- Polarized type
- Cylindrical threaded housing
- Nickel plated brass housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Technical Data

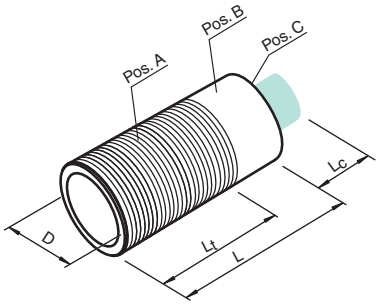
*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Light/dark adjustment | ✔ |
| Sensitivity adjustment | ✔ |
| Threshold detection range | 1200 mm |
| Effective detection range | 0 ... 1000 mm |
| Reference target | REF-H85-2 reflector |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 20 mA |
| Control input | light on +UB<br>dark on: 0 V |
| Switching type | light/dark on |
| Switching current | max. 300 mA |
| Switching frequency | ≤ 700 Hz |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Material | |
| Housing | brass, nickel-plated |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GLV12-54/36/40b/115 | GLV12-54/37/40b/115 | GLV12-54/36/40b/92 | GLV12-54/37/40b/92 |
|---|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | | |
| | connector M12 x 1, 4-pin | | | ● | ● |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | | |
|---|---|---|
| Length L [mm] | 55 | |
| Diameter D [mm] | M12 x 1 | |
| Thread length $l_t$ [mm] | 34 | |
| Connector length $l_c$ [mm] | 0 | 10 |
| LED position | Pos. B | |




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

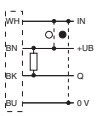
| | |
|---|---|
| **AB-12** | Right angled mounting bracket |
| **BF 12** | Mounting bracket, 12 mm |
| **BF 12-F** | Mounting bracket with stop, 12 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **REF-H85-2** | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

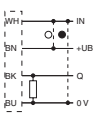
## Electrical Connection

❍ = light on, ● = dark on



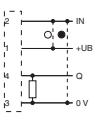
GLV12-54/36/40b/115 GLV12-54/37/40b/115

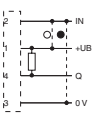


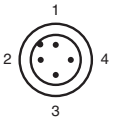






GLV12-54/37/40b/92 GLV12-54/36/40b/92




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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CE

## Properties

- Non-polarized type
- Cylindrical threaded housing
- Nickel plated brass housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Technical Data

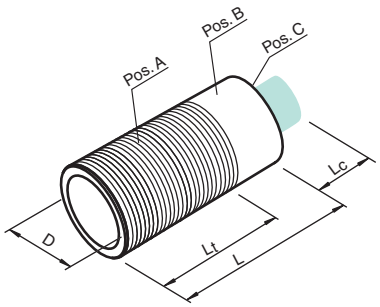
*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Light/dark adjustment | ✔ |
| Sensitivity adjustment | ✔ |
| Threshold detection range | 2500 mm |
| Effective detection range | 0 ... 2000 mm |
| Reference target | REF-H85-2 reflector |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 20 mA |
| Control input | light on +UB<br>dark on: 0 V |
| Switching type | light/dark on |
| Switching current | max. 300 mA |
| Switching frequency | ≤ 700 Hz |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Material | |
| Housing | brass, nickel-plated |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GLV12-6/36/40b/115 | GLV12-6/37/40b/115 | GLV12-6/36/40b/92 | GLV12-6/37/40b/92 |
|---|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | | |
| | connector M12 x 1, 4-pin | | | ● | ● |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | | |
|---|---|---|
| Length L [mm] | 55 | |
| Diameter D [mm] | M12 x 1 | |
| Thread length $l_t$ [mm] | 34 | |
| Connector length $l_c$ [mm] | 0 | 10 |
| LED position | Pos. B | |




## Accessories

**These and more accessories can be found in chapter 10**
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **AB-12** | Right angled mounting bracket |
| **BF 12** | Mounting bracket, 12 mm |
| **BF 12-F** | Mounting bracket with stop, 12 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **REF-H85-2** | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

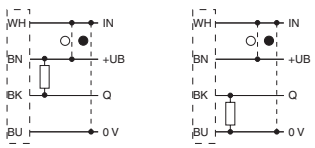
## Electrical Connection

❍ = light on, ● = dark on



GLV12-6/36/40b/115 GLV12-6/37/40b/115

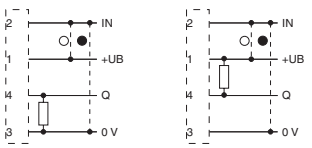
Option 36/40b/115 Option 37/40b/115

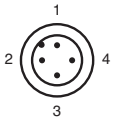





GLV12-6/37/40b/92 GLV12-6/36/40b/92

Option 37/40b/92 Option 36/40b/92




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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CE

## Technical Data

*For detailed data and product description refer to the data sheets at* **www.pepperl-fuchs.us**

| General Data | |
|---|---|
| Light/dark adjustment | ✔ |
| Sensitivity adjustment | ✔ |
| Effective detection range | 0 ... 5000 mm |
| Light type | modulated visible red light , 660 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 20 mA |
| Switching type | light/dark on |
| Switching current | max. 300 mA |
| Switching frequency | ≤ 500 Hz |
| Control input | light on +UB<br>dark on: 0 V |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Material | |
| Housing | brass, nickel-plated |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | G12/115 GV12/36/40b/115 | G12/115 GV12/37/40b/115 | G12/92 GV12/36/40b/92 | G12/92 GV12/37/40b/92 |
|---|---|---|---|---|---|
| Emitter | | ● | ● | ● | ● |
| Receiver | | ● | ● | ● | ● |
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | | |
| | connector M12 x 1, 4-pin | | | ● | ● |



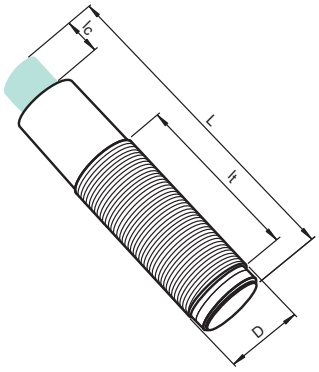


| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | | |
|---|---|---|
| Length L [mm] | 55 | 65 |
| Diameter D [mm] | M12 x 1 | |
| Thread length $l_t$ [mm] | 34 | |
| Connector length $l_c$ [mm] | 0 | 10 |

## Properties

- Thru-beam type
- Cylindrical threaded housing
- Nickel plated brass housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets  See pages 1066 ... for mounting accessories

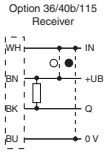
| | |
|---|---|
| **AB-12** | Right angled mounting bracket |
| **BF 12** | Mounting bracket, 12 mm |
| **BF 12-F** | Mounting bracket with stop, 12 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

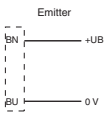
## Electrical Connection

❍ = light on, ● = dark on

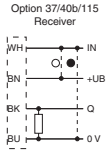


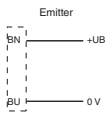
G12/115 + GV12/36/40b/115



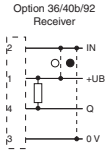

G12/115 + GV12/37/40b/115

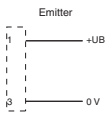


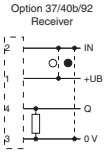


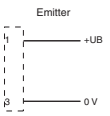

G12/92 + GV12/36/40b/92

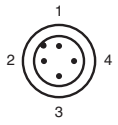



G12/92 + GV12/37/40b/92




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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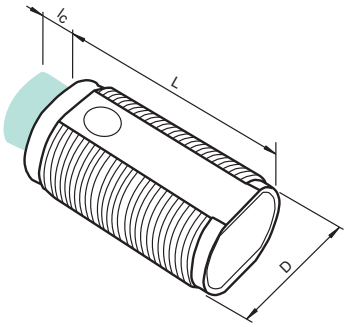


## Properties

- Background suppression
- Cylindrical threaded housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Your Benefit

- Most compact mechanically adjustable M18-background suppression sensor for space-saving mounting
- Reliable detection of all surfaces, regardless of color and texture
- Minimal black/white difference
- Adjustable switchpoint




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Detection range | 10 ... 120 mm |
| Adjustment range | 40 ... 120 mm |
| Light type | modulated visible red light , 640 nm |
| Black/White difference (6 %/90 %) | < 6% |
| Diameter of the light spot | approx. 6 mm at detection range 120 mm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 15 mA |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Housing | PC |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GLV18-8-H-120/115/120 | GLV18-8-H-120/25/102/115 | GLV18-8-H-120/59/102/115 | GLV18-8-H-120/25/102/159 | GLV18-8-H-120/59/102/159 | GLV18-8-H-120/73/120 |
|---|---|---|---|---|---|---|---|
| Switching type | dark on | | | ● | | ● | |
| | light/dark on | ● | | | | | ● |
| | light on | | ● | | ● | | |
| Signal output | 1 NPN, short-circuit protected open collector | | ● | ● | ● | ● | |
| | 2 PNP, complementary, short-circuit protected, open collectors | ● | | | | | ● |
| Connection | 2 m fixed cable | ● | ● | ● | | | |
| | Connector M12 x 1, 3-pin | | | | ● | ● | |
| | connector M12 x 1, 4-pin | | | | | | ● |
| | |  | | |  | | |

| Approvals and Certificates | | | | | | | |
|---|---|---|---|---|---|---|---|
| Protection class | II, rated insulation voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1 | ● | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |

| Dimensions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Length L [mm] | | 33 | | | | | |
| Diameter D [mm] | | M18 x 1 | | | | | |
| Connector length $l_c$ [mm] | | 7 | | | 11 | | |

## Accessories

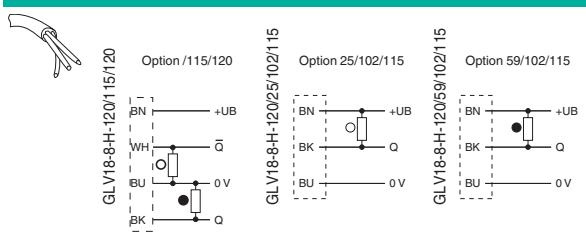
**These and more accessories can be found in chapter 10**

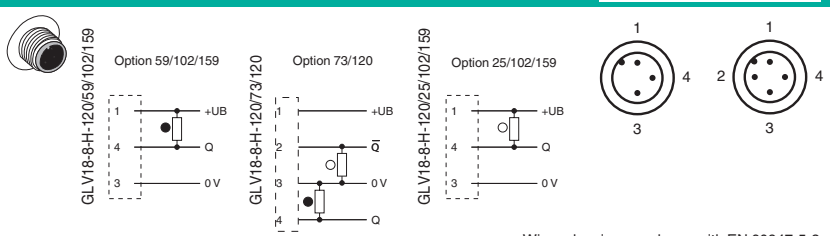
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CPZ18B03** | Mounting Bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

## Electrical Connection

❍ = light on, ● = dark on




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Detection range | 50 ... 200 mm adjustable |
| Light type | modulated visible red light , 640 nm |
| Optical face | frontal |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 20 mA |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Housing | PC |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GLV18-8-200/115/120 | GLV18-8-200/25/102/115 | GLV18-8-200/59/102/115 | GLV18-8-200/73/120 | GLV18-8-200/25/102/159 | GLV18-8-200/59/102/159 |
|---|---|---|---|---|---|---|---|
| Signal output | 1 NPN, short-circuit protected open collector | | ● | ● | | ● | ● |
| | 2 PNP, complementary, short-circuit protected, open collectors | ● | | | ● | | |
| Switching type | dark on | | | ● | | | ● |
| | light/dark on | ● | | | ● | | |
| | light on | | ● | | | ● | |
| Connection | 2 m fixed cable | ● | ● | ● | | | |
| | Connector M12 x 1, 3-pin | | | | | ● | ● |
| | connector M12 x 1, 4-pin | | | | ● | | |

| Approvals and Certificates | | | | | | | |
|---|---|---|---|---|---|---|---|
| Protection class | II, rated insulation voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1 | ● | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |

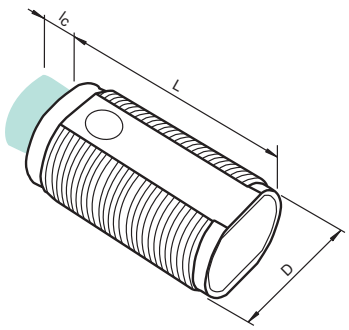
| Dimensions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Length L [mm] | | 33 | | | | | |
| Diameter D [mm] | | M18 x 1 | | | | | |
| Connector length $l_c$ [mm] | | 7 | | | 11 | | |

## Properties

- Diffuse type
- Cylindrical threaded housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Short sensor design for space-saving mounting




## Accessories

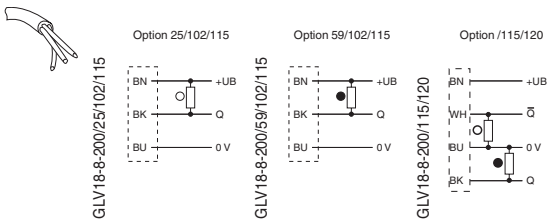
**These and more accessories can be found in chapter 10**

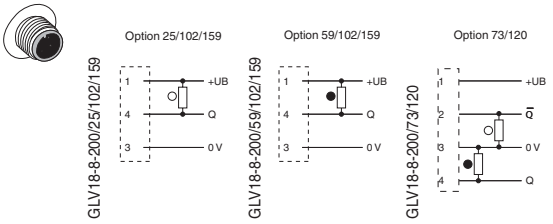
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

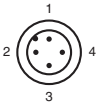
| | |
|---|---|
| **CPZ18B03** | Mounting Bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

## Electrical Connection

❍ = light on, ● = dark on




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |





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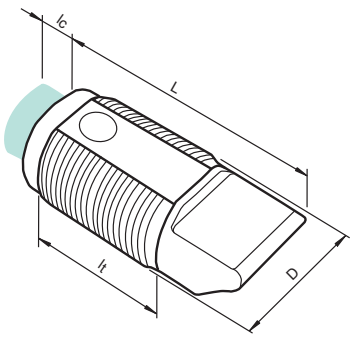


## Properties

- Diffuse type
- Cylindrical threaded housing, side view
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Short sensor design for space-saving mounting




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Detection range | 50 ... 200 mm adjustable |
| Light type | modulated visible red light , 640 nm |
| Optical face | lateral |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 20 mA |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Housing | PC |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GLV18-8-200-S/115/120 | GLV18-8-200-S/25/102/115 | GLV18-8-200-S/59/102/115 | GLV18-8-200-S/73/120 | GLV18-8-200-S/25/102/159 | GLV18-8-200-S/59/102/159 |
|---|---|---|---|---|---|---|---|
| Signal output | 1 NPN, short-circuit protected open collector | | ● | ● | | ● | ● |
| | 2 PNP, complementary, short-circuit protected, open collectors | ● | | | ● | | |
| Switching type | dark on | | | ● | | | ● |
| | light/dark on | ● | | | ● | | |
| | light on | | ● | | | ● | |
| Connection | 2 m fixed cable | ● | ● | ● | | | |
| | Connector M12 x 1, 3-pin | | | | | ● | ● |
| | connector M12 x 1, 4-pin | | | | ● | | |
| **Approvals and Certificates** | | | | | | | |
| Protection class | II, rated insulation voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1 | ● | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |
| **Dimensions** | | | | | | | |
| Length L [mm] | | 46 | | | | | |
| Diameter D [mm] | | M18 x 1 | | | | | |
| Thread length $l_t$ [mm] | | 27.2 | | | | | |
| Connector length $l_c$ [mm] | | 7 | | | 11 | | |

## Accessories

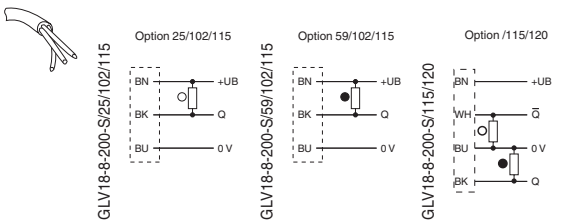
**These and more accessories can be found in chapter 10**

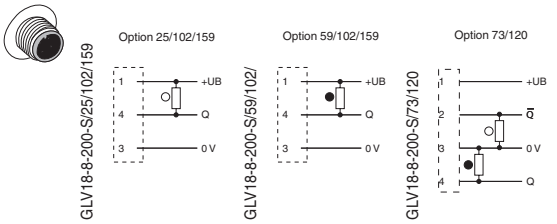
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

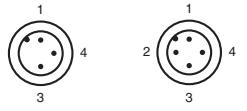
| | |
|---|---|
| **CPZ18B03** | Mounting Bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

## Electrical Connection

❍ = light on, ● = dark on




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Detection range | 50 ... 450 mm adjustable |
| Light type | modulated visible red light , 640 nm |
| Optical face | frontal |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 20 mA |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Housing | PC |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GLV18-8-450/115/120 | GLV18-8-450/25/102/115 | GLV18-8-450/59/102/115 | GLV18-8-450/73/120 | GLV18-8-450/25/102/159 | GLV18-8-450/59/102/159 |
|---|---|---|---|---|---|---|---|
| Signal output | 1 NPN, short-circuit protected open collector | | ● | ● | | ● | ● |
| | 2 PNP, complementary, short-circuit protected, open collectors | ● | | | ● | | |
| Switching type | dark on | | | ● | | | ● |
| | light/dark on | ● | | | ● | | |
| | light on | | ● | | | ● | |
| Connection | 2 m fixed cable | ● | ● | ● | | | |
| | Connector M12 x 1, 3-pin | | | | | ● | ● |
| | connector M12 x 1, 4-pin | | | | ● | | |
| | |  | | | |  | |

| Approvals and Certificates | | | | | | | |
|---|---|---|---|---|---|---|---|
| Protection class | II, rated insulation voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1 | ● | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |

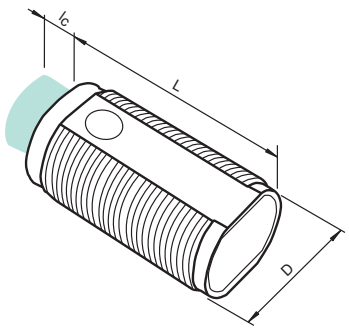
| Dimensions | | | |
|---|---|---|---|
| Length L [mm] | 33 | | |
| Diameter D [mm] | M18 x 1 | | |
| Connector length $l_c$ [mm] | 7 | 11 | |

## Properties

- Diffuse type
- Cylindrical threaded housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Short sensor design for space-saving mounting




## Accessories

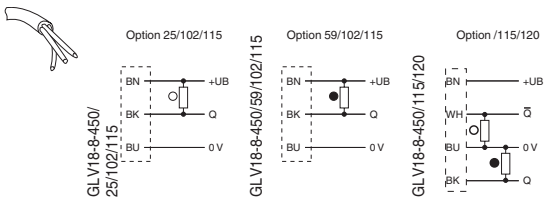
**These and more accessories can be found in chapter 10**

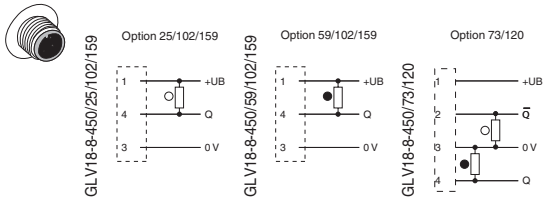
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

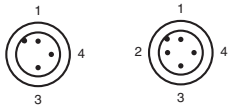
| | |
|---|---|
| **CPZ18B03** | Mounting Bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

## Electrical Connection

❍ = light on, ● = dark on




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |





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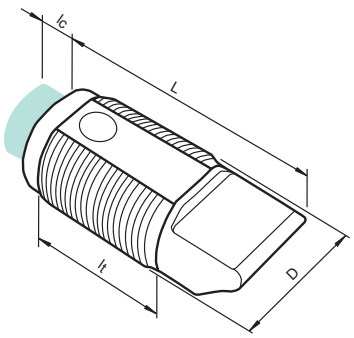


## Properties

- Diffuse type
- Cylindrical threaded housing, side view
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Short sensor design for space-saving mounting




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Detection range | 50 ... 400 mm adjustable |
| Light type | modulated visible red light , 640 nm |
| Optical face | lateral |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 20 mA |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Housing | PC |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GLV18-8-400-S/115/120 | GLV18-8-400-S/25/102/115 | GLV18-8-400-S/59/102/115 | GLV18-8-400-S/73/120 | GLV18-8-400-S/25/102/159 | GLV18-8-400-S/59/102/159 |
|---|---|---|---|---|---|---|---|
| Signal output | 1 NPN, short-circuit protected open collector | | ● | ● | | ● | ● |
| | 2 PNP, complementary, short-circuit protected, open collectors | ● | | | ● | | |
| Switching type | dark on | | | ● | | | ● |
| | light/dark on | ● | | | ● | | |
| | light on | | ● | | | ● | |
| Connection | 2 m fixed cable | ● | ● | ● | | | |
| | Connector M12 x 1, 3-pin | | | | | ● | ● |
| | connector M12 x 1, 4-pin | | | | ● | | |
| | |  | | |  | | |
| **Approvals and Certificates** | | | | | | | |
| Protection class | II, rated insulation voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1 | ● | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |
| **Dimensions** | | | | | | | |
| Length L [mm] | | 46 | | | | | |
| Diameter D [mm] | | M18 x 1 | | | | | |
| Thread length $l_1$ [mm] | | 27.2 | | | | | |
| Connector length $l_c$ [mm] | | 7 | | | 11 | | |

## Accessories

**These and more accessories can be found in chapter 10**

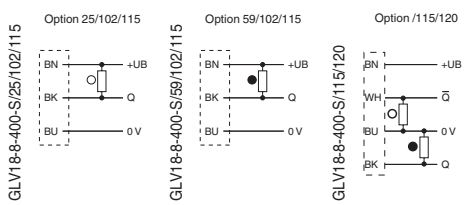
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CPZ18B03** | Mounting Bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

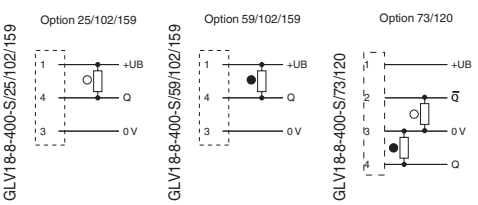
## Electrical Connection

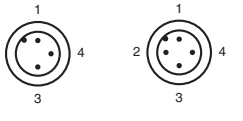
❍ = light on, ● = dark on








Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Light type | modulated visible red light , 640 nm |
| Optical face | frontal |
| Operating voltage | 20 ... 250 V AC/DC |
| No-load supply current | < 2.5 mA |
| Signal output | N-channel MOSFET, short circuit protected |
| Switching current | max. 200 mA |
| Switching frequency | 50 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC-PBT |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GLK18-8-200/25/115/161 | GLK18-8-200/59/115/161 | GLK18-8-450/25/115/161 | GLK18-8-450/59/115/161 | GLK18-8-200/25/161/166 | GLK18-8-200/59/161/166 | GLK18-8-450/25/161/166 | GLK18-8-450/59/161/166 |
|---|---|---|---|---|---|---|---|---|---|
| Detection range | 20 ... 200 mm adjustable | ● | ● | | | ● | ● | | |
| | 50 ... 450 mm adjustable | | | ● | ● | | | ● | ● |
| Switching type | dark on | | ● | | ● | | ● | | ● |
| | light on | ● | | ● | | ● | | ● | |
| Connection | 2 m, 3 x 0.34 mm², PVC cable | ● | ● | ● | ● | | | | |
| | Micro AC connector, 1/2" V124 ; 4-pin | | | | | ● | ● | ● | ● |

| Approvals and Certificates | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Protection class | II, rated insulation voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1 | ● | ● | ● | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Type 1 enclosure | ● | ● | ● | ● | ● | ● | ● | ● |

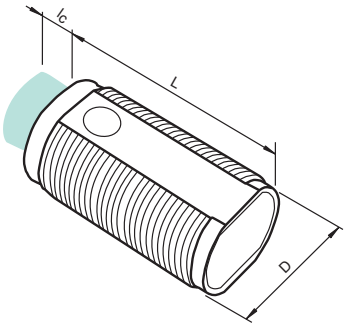
| Dimensions | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Length L [mm] | | 49 | | | | | | | |
| Diameter D [mm] | | M18 x 1 | | | | | | | |
| Connector length $l_c$ [mm] | | 7 | | | | 11 | | | |

## Properties

- Diffuse type
- Cylindrical threaded housing
- Plastic housing
- AC/DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Universal usage with AC or DC power supply




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CPZ18B03** | Mounting Bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **V124-G-YE2M-PVC** | Female cordset, 1/2" - 20 UNF, 4-pin, PVC cable, straight |
| **V124-W-YE2M-PVC** | Female cordset, 1/2" - 20 UNF, 4-pin, PVC cable, angled |

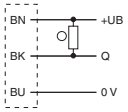
## Electrical Connection

❍ = light on, ● = dark on



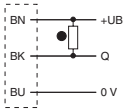
GLK18-8-200/25/115/161
GLK18-8-450/25/115/161

Option 25/115/161




GLK18-8-200/59/115/161
GLK18-8-450/59/115/161

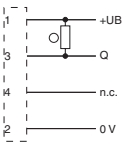
Option 59/115/161





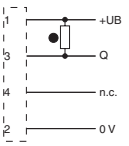

GLK18-8-200/25/161/166
GLK18-8-450/25/161/166

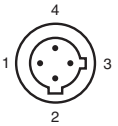
Option 25/161/166




GLK18-8-200/59/161/166
GLK18-8-450/59/161/166

Option 59/161/166




Wire colors

| | | |
|---|---|---|
| 1 | RD/BK | (red/black) |
| 2 | RD/WH | (red/white) |
| 3 | RD | (red) |
| 4 | GN | (green) |




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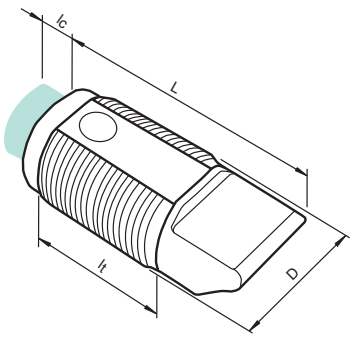


## Properties

- Diffuse type
- Cylindrical threaded housing, side view
- Plastic housing
- AC/DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Universal usage with AC or DC power supply




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Light type | modulated visible red light , 640 nm |
| Optical face | lateral |
| Operating voltage | 20 ... 250 V AC/DC |
| No-load supply current | < 2.5 mA |
| Signal output | N-channel MOSFET, short circuit protected |
| Switching current | max. 200 mA |
| Switching frequency | 50 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC-PBT |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GLK18-8-200-S/25/115/161 | GLK18-8-200-S/59/115/161 | GLK18-8-400-S/25/115/161 | GLK18-8-400-S/59/115/161 | GLK18-8-200-S/25/161/166 | GLK18-8-200-S/59/161/166 | GLK18-8-400-S/25/161/166 | GLK18-8-400-S/59/161/166 |
|---|---|---|---|---|---|---|---|---|---|
| Detection range | 50 ... 200 mm adjustable | ● | ● | | | ● | ● | | |
| | 50 ... 400 mm adjustable | | | ● | ● | | | ● | ● |
| Switching type | dark on | | ● | | ● | | ● | | ● |
| | light on | ● | | ● | | ● | | ● | |
| Connection | 2 m, 3 x 0.34 mm², PVC cable | ● | ● | ● | ● | | | | |
| | Micro AC connector, 1/2" V124 ; 4-pin | | | | | ● | ● | ● | ● |

| Approvals and Certificates | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Protection class | II, rated insulation voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1 | ● | ● | ● | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Type 1 enclosure | ● | ● | ● | ● | ● | ● | ● | ● |

| Dimensions | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Length L [mm] | | 64 | | | | | | | |
| Diameter D [mm] | | M18 x 1 | | | | | | | |
| Thread length $l_1$ [mm] | | 43 | | | | | | | |
| Connector length $l_c$ [mm] | | 7 | | | | 11 | | | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

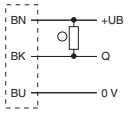
| | |
|---|---|
| **CPZ18B03** | Mounting Bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **V124-G-YE2M-PVC** | Female cordset, 1/2" - 20 UNF, 4-pin, PVC cable, straight |
| **V124-W-YE2M-PVC** | Female cordset, 1/2" - 20 UNF, 4-pin, PVC cable, angled |

## Electrical Connection

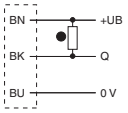
❍ = light on, ● = dark on

GLK18-8-400-S/25/115/161
GLK18-8-200-S/25/115/161
GLK18-8-200-S/59/115/161
GLK18-8-400-S/59/115/161

Option 25/115/161

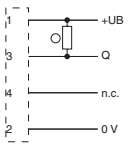



Option 59/115/161

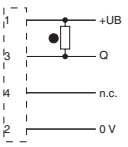


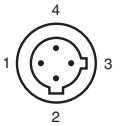

GLK18-8-200-S/25/161/166
GLK18-8-400-S/25/161/166
GLK18-8-200-S/59/161/166
GLK18-8-400-S/59/161/166

Option 25/161/166




Option 59/161/166




Wire colors

| | | |
|---|---|---|
| 1 | RD/BK | (red/black) |
| 2 | RD/WH | (red/white) |
| 3 | RD | (red) |
| 4 | GN | (green) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Threshold detection range | 5.5 m |
| Effective detection range | 0 ... 4 m |
| Reference target | reflector REF-C110-2 |
| Light type | modulated visible red light , 640 nm |
| Optical face | frontal |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 20 mA |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Material | |
| Housing | PC |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GLV18-55/115/120 | GLV18-55/59/102/115 | GLV18-55/25/102/115 | GLV18-55/59/102/159 | GLV18-55/25/102/159 | GLV18-55/73/120 |
|---|---|---|---|---|---|---|---|
| Signal output | 1 NPN, short-circuit protected open collector | | ● | ● | ● | ● | |
| | 1 PNP, short-circuit protected, open collector | | | | | | |
| | 2 PNP, complementary, short-circuit protected, open collectors | ● | | | | | ● |
| Switching type | dark on | | ● | | ● | | |
| | light on | | | ● | | ● | |
| | light/dark on | ● | | | | | ● |
| Connection | 2 m fixed cable | ● | ● | ● | | | |
| | Connector M12 x 1, 3-pin | | | | ● | ● | |
| | connector M12 x 1, 4-pin | | | | | | ● |

| Approvals and Certificates | | | | | | | |
|---|---|---|---|---|---|---|---|
| Protection class | II | ● | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |

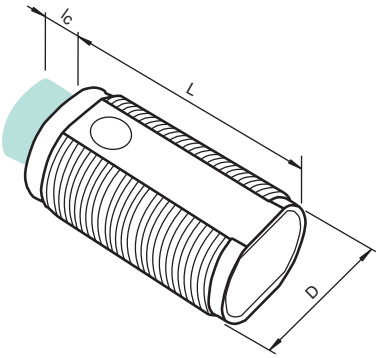
| Dimensions | | | |
|---|---|---|---|
| Length L [mm] | 33 | | |
| Diameter D [mm] | M18 x 1 | | |
| Connector length $l_c$ [mm] | 7 | 11 | |

## Properties

- Polarized type
- Cylindrical threaded housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Short sensor design for space-saving mounting




## Accessories

**These and more accessories can be found in chapter 10**

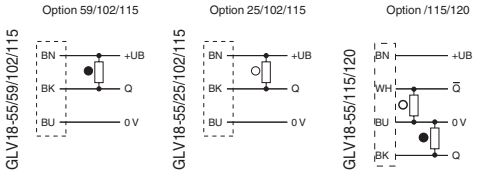
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CPZ18B03** | Mounting bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **REF-C110-2** | Reflector, round ø 84 mm, central mounting hole |
| **REF-H85-2** | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

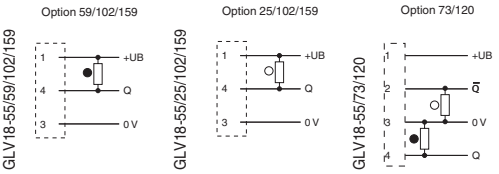
## Electrical Connection

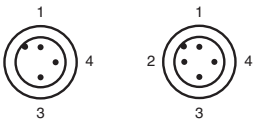
❍ = light on, ● = dark on








Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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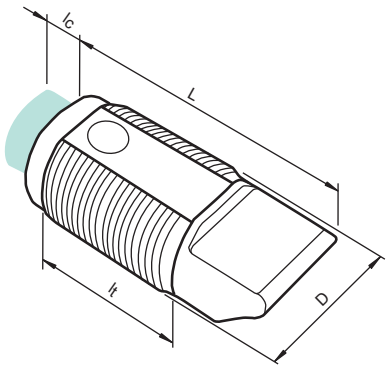


## Properties

- Polarized type
- Cylindrical threaded housing, side view
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Short sensor design for space-saving mounting




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Threshold detection range | 4.5 m |
| Effective detection range | 0 ... 3.5 m |
| Reference target | reflector REF-C110-2 |
| Light type | modulated visible red light, 640 nm |
| Optical face | lateral |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 20 mA |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Material | |
| Housing | PC |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GLV18-55-S/115/120 | GLV18-55-S/59/102/115 | GLV18-55-S/25/102/115 | GLV18-55-S/59/102/159 | GLV18-55-S/59/102/159 | GLV18-55-S/73/120 |
|---|---|---|---|---|---|---|---|
| Signal output | 1 NPN, short-circuit protected open collector | | ● | ● | ● | ● | |
| | 2 PNP, complementary, short-circuit protected, open collectors | ● | | | | | ● |
| Switching type | dark on | | ● | | ● | | |
| | light on | | | ● | | ● | |
| | light/dark on | ● | | | | | ● |
| Connection | 2 m fixed cable | ● | ● | ● | | | |
| | Connector M12 x 1, 3-pin | | | | ● | ● | |
| | connector M12 x 1, 4-pin | | | | | | ● |

| Approvals and Certificates | | | | | | | |
|---|---|---|---|---|---|---|---|
| Protection class | II | ● | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |

| Dimensions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Length L [mm] | | 46 | | | | | |
| Diameter D [mm] | | M18 x 1 | | | | | |
| Thread length $l_1$ [mm] | | 27.2 | | | | | |
| Connector length $l_c$ [mm] | | 7 | | | 11 | | |

## Accessories

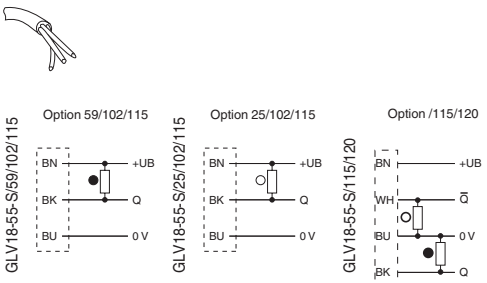
**These and more accessories can be found in chapter 10**

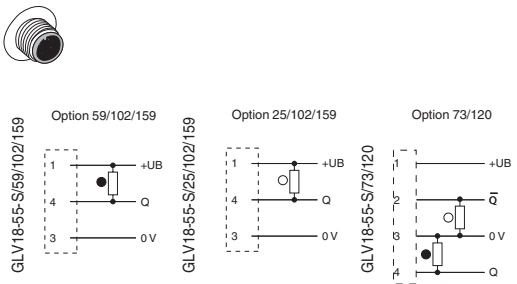
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

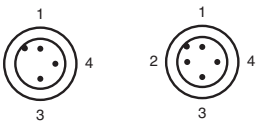
| | |
|---|---|
| **CPZ18B03** | Mounting bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **REF-C110-2** | Reflector, round ø 84 mm, central mounting hole |
| **REF-H85-2** | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

## Electrical Connection

❍ = light on, ● = dark on




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Glass detection | ✔ |
| Threshold detection range | 6.5 m |
| Effective detection range | 0 ... 2.5 m in glass mode;<br>0 ... 5 m in normal mode |
| Reference target | reflector REF-C110-2 |
| Light type | modulated visible red light , 640 nm |
| Optical face | frontal |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 15 mA |
| Switching current | max. 100 mA |
| Switching frequency | 1 kHz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Material | |
| Housing | PC |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GLV18-55-G/115/120 | GLV18-55-G/59/102/115 | GLV18-55-G/59/102/115 | GLV18-55-G/59/102/159 | GLV18-55-G/59/102/159 | GLV18-55-G/73/120 |
|---|---|---|---|---|---|---|---|
| Signal output | 1 NPN, short-circuit protected open collector | | ● | ● | ● | ● | |
| | 2 PNP, complementary, short-circuit protected, open collectors | ● | | | | | ● |
| Switching type | dark on | | ● | | ● | | |
| | light on | | | ● | | ● | |
| | light/dark on | ● | | | | | ● |
| Connection | 2 m fixed cable | ● | ● | ● | | | |
| | Connector M12 x 1, 3-pin | | | | ● | ● | |
| | connector M12 x 1, 4-pin | | | | | | ● |





| Approvals and Certificates | | | | | | | |
|---|---|---|---|---|---|---|---|
| Protection class | II | ● | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |

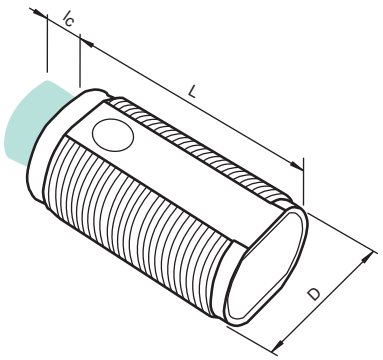
| Dimensions | | |
|---|---|---|
| Length L [mm] | 33 | |
| Diameter D [mm] | M18 x 1 | |
| Connector length $l_c$ [mm] | 7 | 11 |

## Properties

- Clear object detection type
- Cylindrical threaded housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Short sensor design for space-saving mounting
- Automatic threshold adjustment compensates for presence of dust and moisture




## Accessories

**These and more accessories can be found in chapter 10**

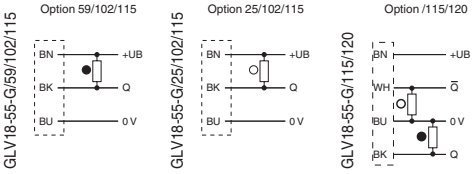
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CPZ18B03** | Mounting bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **REF-C110-2** | Reflector, round ø 84 mm, central mounting hole |
| **REF-H85-2** | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

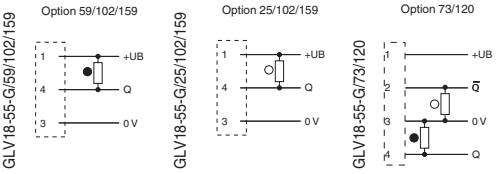
## Electrical Connection

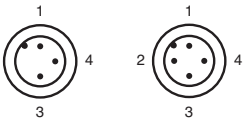
❍ = light on, ● = dark on







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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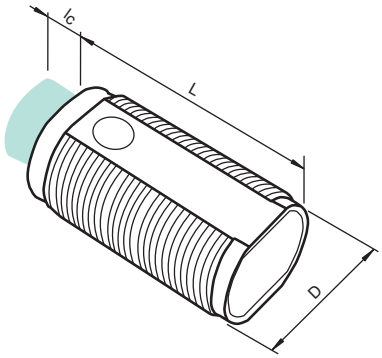


## Properties

- Non-polarized type
- Cylindrical threaded housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Short sensor design for space-saving mounting




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | | |
|---|---|---|
| Threshold detection range | 8 m | |
| Effective detection range | 0 ... 6.5 m | |
| Reference target | reflector REF-C110-2 | |
| Light type | modulated visible red light , 640 nm | |
| Optical face | frontal | |
| Operating voltage | 10 ... 30 V DC | |
| No-load supply current | < 20 mA | |
| Switching current | max. 100 mA | |
| Switching frequency | 500 Hz | |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) | |
| Material | | |
| Housing | PC | |
| Optical face | PMMA | |
| Protection degree | IP67 | |

| Model Number | | GLV18-6/115/120 | GLV18-6/59/102/115 | GLV18-6/25/102/115 | GLV18-6/59/102/159 | GLV18-6/25/102/159 | GLV18-6/73/120 |
|---|---|---|---|---|---|---|---|
| Signal output | 1 NPN, short-circuit protected open collector | | ● | ● | ● | ● | |
| | 2 PNP, complementary, short-circuit protected, open collectors | ● | | | | | ● |
| Switching type | dark on | | ● | | ● | | |
| | light on | | | ● | | ● | |
| | light/dark on | ● | | | | | ● |
| Connection | 2 m fixed cable | ● | ● | ● | | | |
| | Connector M12 x 1, 3-pin | | | | ● | ● | |
| | connector M12 x 1, 4-pin | | | | | | ● |
| | |  | | |  | | |
| **Approvals and Certificates** | | | | | | | |
| Protection class | II | ● | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |
| **Dimensions** | | | | | | | |
| Length L [mm] | | 33 | | | | | |
| Diameter D [mm] | | M18 x 1 | | | | | |
| Connector length $l_c$ [mm] | | 7 | | | 11 | | |

## Accessories

**These and more accessories can be found in chapter 10**

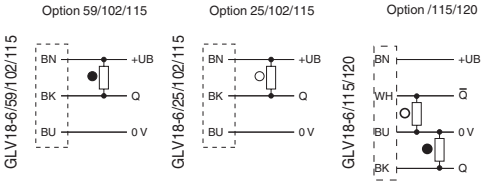
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CPZ18B03** | Mounting bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **REF-C110-2** | Reflector, round ø 84 mm, central mounting hole |
| **REF-H85-2** | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

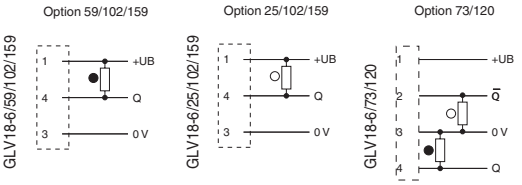
## Electrical Connection

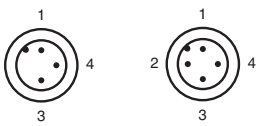
❍ = light on, ● = dark on








Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
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| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Threshold detection range | 6.5 m |
| Effective detection range | 0 ... 5.5 m |
| Reference target | reflector REF-C110-2 |
| Light type | modulated visible red light , 640 nm |
| Optical face | lateral |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 20 mA |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Material | |
| Housing | PC |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GLV18-6-S/115/120 | GLV18-6-S/59/102/115 | GLV18-6-S/25/102/115 | GLV18-6-S/59/102/159 | GLV18-6-S/25/102/159 | GLV18-6-S/73/120 |
|---|---|---|---|---|---|---|---|
| Signal output | 1 NPN, short-circuit protected open collector | | ● | ● | ● | ● | |
| | 2 PNP, complementary, short-circuit protected, open collectors | ● | | | | | ● |
| Switching type | dark on | | ● | | ● | | |
| | light on | | | ● | | ● | |
| | light/dark on | ● | | | | | ● |
| Connection | 2 m fixed cable | ● | ● | ● | | | |
| | Connector M12 x 1, 3-pin | | | | ● | ● | |
| | connector M12 x 1, 4-pin | | | | | | ● |
| | |  | | |  | | |

| Approvals and Certificates | | | | | | | |
|---|---|---|---|---|---|---|---|
| Protection class | II | ● | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |

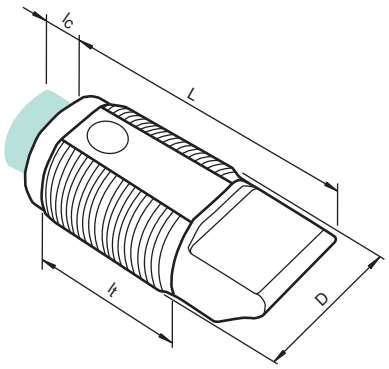
| Dimensions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Length L [mm] | | | | 46 | | | |
| Diameter D [mm] | | | | M18 x 1 | | | |
| Thread length $l_1$ [mm] | | | | 27.2 | | | |
| Connector length $l_c$ [mm] | | | 7 | | | 11 | |

## Properties

- Non-polarized type
- Cylindrical threaded housing, side view
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Short sensor design for space-saving mounting




## Accessories

**These and more accessories can be found in chapter 10**

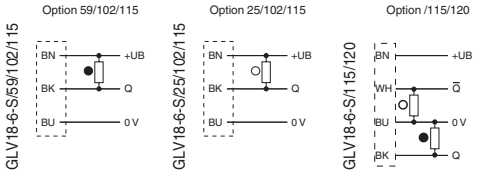
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CPZ18B03** | Mounting bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **REF-C110-2** | Reflector, round ø 84 mm, central mounting hole |
| **REF-H85-2** | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

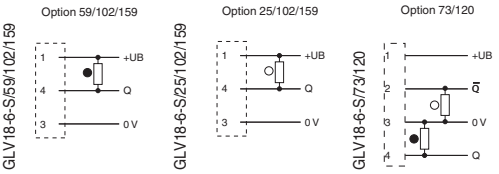
## Electrical Connection

❍ = light on, ● = dark on











Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Reference target | reflector REF-C110-2 |
| Light type | modulated visible red light , 640 nm |
| Optical face | frontal |
| Operating voltage | 20 ... 250 V AC/DC |
| No-load supply current | < 2.5 mA |
| Signal output | N-channel MOSFET, short circuit protected |
| Switching current | max. 200 mA |
| Switching frequency | 50 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC-PBT |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GLK18-55/59/115/161 | GLK18-55/25/115/161 | GLK18-6/59/115/161 | GLK18-6/25/115/161 | GLK18-55/59/161/166 | GLK18-55/25/161/166 | GLK18-6/59/161/166 | GLK18-6/25/161/166 |
|---|---|---|---|---|---|---|---|---|---|
| Polarization filter | ✔ | ● | ● | | | ● | ● | | |
| Threshold detection range | 5.5 m | ● | ● | | | ● | ● | | |
| | 8 m | | | ● | ● | | | ● | ● |
| Effective detection range | 0 ... 4 m | ● | ● | | | ● | ● | | |
| | 0 ... 6.5 m | | | ● | ● | | | ● | ● |
| Switching type | dark on | ● | | ● | | ● | | ● | |
| | light on | | ● | | ● | | ● | | ● |
| Connection | 2 m, 3 x 0.34 mm², PVC cable | ● | ● | ● | ● | | | | |
| | Micro AC connector, 1/2" V124 ; 4-pin | | | | | ● | ● | ● | ● |

| Approvals and Certificates | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Protection class | II, rated insulation voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1 | ● | ● | ● | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Type 1 enclosure | ● | ● | ● | ● | ● | ● | ● | ● |

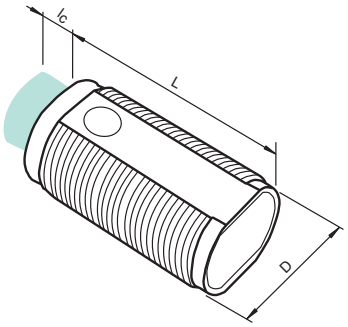
| Dimensions | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Length L [mm] | | 49 | | | | | | | |
| Diameter D [mm] | | M18 x 1 | | | | | | | |
| Thread length $l_t$ [mm] | | 43 | | | | | | | |
| Connector length $l_c$ [mm] | | 7 | | | | 11 | | | |

## Properties

- Polarized and non-polarized types
- Cylindrical threaded housing
- Plastic housing
- AC/DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Universal usage with AC or DC power supply




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CPZ18B03** | Mounting Bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **REF-C110-2** | Reflector, round ø 84 mm, central mounting hole |
| **REF-H85-2** | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes |
| **V124-G-YE2M-PVC** | Female cordset, 1/2" - 20 UNF, 4-pin, PVC cable, straight |
| **V124-W-YE2M-PVC** | Female cordset, 1/2" - 20 UNF, 4-pin, PVC cable, angled |

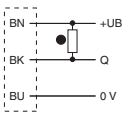
## Electrical Connection

❍ = light on, ● = dark on



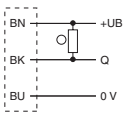
GLK18-6/59/115/161
GLK18-55/59/115/161

Option 59/115/161




GLK18-55/25/115/161
GLK18-6/25/115/161

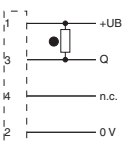
Option 25/115/161





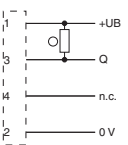

GLK18-6/59/161/166
GLK18-55/59/161/166

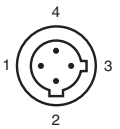
Option 59/161/166




GLK18-55/25/161/166
GLK18-6/25/161/166

Option 25/161/166




Wire colors

| | | |
|---|---|---|
| 1 | RD/BK | (red/black) |
| 2 | RD/WH | (red/white) |
| 3 | RD | (red) |
| 4 | GN | (green) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Reference target | reflector REF-C110-2 |
| Light type | modulated visible red light , 640 nm |
| Optical face | lateral |
| Operating voltage | 20 ... 250 V AC/DC |
| No-load supply current | < 2.5 mA |
| Signal output | N-channel MOSFET, short circuit protected |
| Switching current | max. 200 mA |
| Switching frequency | 50 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC-PBT |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GLK18-55-S/59/115/161 | GLK18-55-S/25/115/161 | GLK18-6-S/59/115/161 | GLK18-6-S/25/115/161 | GLK18-55-S/59/161/166 | GLK18-55-S/25/161/166 | GLK18-6-S/59/161/166 | GLK18-6-S/25/161/166 |
|---|---|---|---|---|---|---|---|---|---|
| Polarization filter | ✔ | ● | ● | | | ● | ● | | |
| Threshold detection range | 4.5 m | ● | ● | | | ● | ● | | |
| | 6.5 m | | | ● | ● | | | ● | ● |
| Effective detection range | 0 ... 3.5 m | ● | ● | | | ● | ● | | |
| | 0 ... 5.5 m | | | ● | ● | | | ● | ● |
| Switching type | dark on | ● | | ● | | ● | | ● | |
| | light on | | ● | | ● | | ● | | ● |
| Connection | 2 m, 3 x 0.34 mm², PVC cable | ● | ● | ● | ● | | | | |
| | Micro AC connector, 1/2" V124 ; 4-pin | | | | | ● | ● | ● | ● |

| Approvals and Certificates | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Protection class | II, rated insulation voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1 | ● | ● | ● | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Type 1 enclosure | ● | ● | ● | ● | ● | ● | ● | ● |

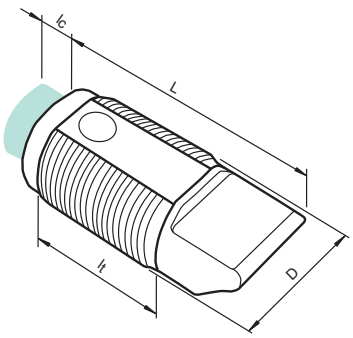
| Dimensions | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Length L [mm] | | 64 | | | | | | | |
| Diameter D [mm] | | M18 x 1 | | | | | | | |
| Thread length $l_t$ [mm] | | 43 | | | | | | | |
| Connector length $l_c$ [mm] | | 7 | | | | 11 | | | |

## Properties

- Polarized and non-polarized types
- Cylindrical threaded housing
- Plastic housing
- AC/DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Universal usage with AC or DC power supply




## Accessories

**These and more accessories can be found in chapter 10**
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CPZ18B03** | Mounting Bracket with swivel nut |
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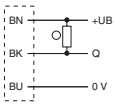
## Electrical Connection

❍ = light on, ● = dark on

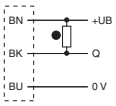


GLK18-55-S/25/115/161
GLK18-6-S/25/115/161
GLK18-6-S/59/115/161
GLK18-55-S/59/115/161

Option 25/115/161



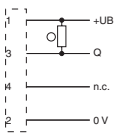

Option 59/115/161



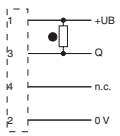


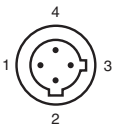

GLK18-55-S/25/161/166
GLK18-6-S/25/161/166
GLK18-6-S/59/161/166
GLK18-55-S/59/161/166

Option 25/161/166




Option 59/161/166




Wire colors

| | | |
|---|---|---|
| 1 | RD/BK | (red/black) |
| 2 | RD/WH | (red/white) |
| 3 | RD | (red) |
| 4 | GN | (green) |




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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Threshold detection range | 25 m |
| Effective detection range | 0 ... 20 m |
| Light type | modulated visible red light , 640 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 20 mA |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Housing | PC |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GD18/115 GV18/59/102/115 | GD18/115 GV18/25/102/115 | GD18/115 GV18/115/120 | GD18/159 GV18/59/102/159 | GD18/159 GV18/25/102/159 | GD18/159 GV18/73/120 |
|---|---|---|---|---|---|---|---|
| Emitter | | ● | ● | ● | ● | ● | ● |
| Receiver | | ● | ● | ● | ● | ● | ● |
| Switching type | dark on | ● | | | ● | | |
| | light on | | ● | | | ● | |
| | light/dark on | | | ● | | | ● |
| Signal output | 1 NPN, short-circuit protected open collector | ● | ● | | ● | ● | |
| | 2 PNP, complementary, short-circuit protected, open collectors | | | ● | | | ● |
| Connection | 2 m fixed cable | ● | ● | ● | | | |
| | Connector M12 x 1, 3-pin | | | | ● | ● | |
| | connector M12 x 1, 4-pin | | | | | | ● |
| | |  | | |  | | |

| Approvals and Certificates | | | | | | | |
|---|---|---|---|---|---|---|---|
| Protection class | II, rated insulation voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1 | ● | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |

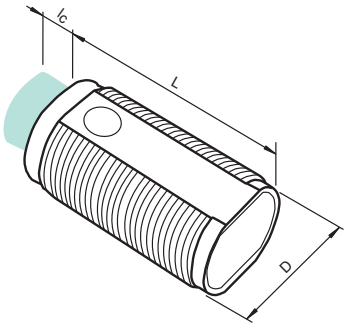
| Dimensions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Length L [mm] | | 33 | | | | | |
| Diameter D [mm] | | M18 x 1 | | | | | |
| Connector length $l_c$ [mm] | | 7 | | | 11 | | |

## Properties

- Thru-beam type
- Cylindrical threaded housing
- Plastic housing
- DC sensor
- Cable and connector versions
- Visible red light

## Benefits

- Short sensor design for space-saving mounting




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

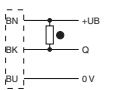
| | |
|---|---|
| **CPZ18B03** | Mounting Bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

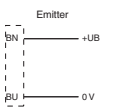
## Electrical Connection

❍ = light on, ● = dark on

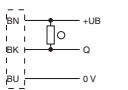


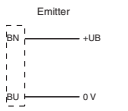
GD18/115 + GV18/59/102/115



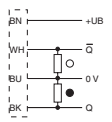



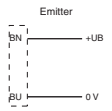

GD18/115 + GV18/25/102/115



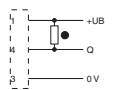

GD18/115 GV18/115/120

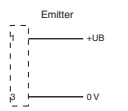


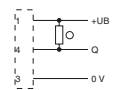


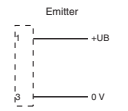

GD18/159 + GV18/59/102/159



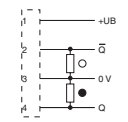



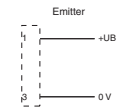

GD18/159 + GV18/25/102/159

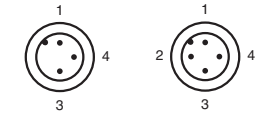



GD18/159 + GV18/73/120




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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Singapore: +65 6779 9091 fa-info@sg.pepperl-fuchs.com
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Threshold detection range | 17.5 m |
| Effective detection range | 0 ... 12 m |
| Light type | modulated visible red light , 640 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 20 mA |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Housing | PC |
| Optical face | PMMA |
| Protection degree | IP67 |

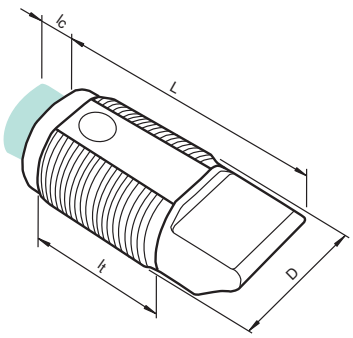
| Model Number | | GD18-S/115 GV18-S/59/102/115 | GD18-S/115 GV18-S/25/102/115 | GD18-S/115 GV18-S/115/120 | GD18-S/159 GV18-S/59/102/159 | GD18-S/159 GV18-S/25/102/159 | GD18-S/159 GV18-S/73/120 |
|---|---|---|---|---|---|---|---|
| Emitter | | ● | ● | ● | ● | ● | ● |
| Receiver | | | ● | ● | ● | ● | ● |
| Switching type | dark on | ● | | | ● | | |
| | light/dark on | | | ● | | | ● |
| | light on | | ● | | | ● | |
| Signal output | 1 NPN, short-circuit protected open collector | ● | ● | | ● | ● | |
| | 2 PNP, complementary, short-circuit protected, open collectors | | | ● | | | ● |
| Connection | 2 m fixed cable | ● | ● | ● | | | |
| | Connector M12 x 1, 3-pin | | | | ● | ● | |
| | connector M12 x 1, 4-pin | | | | | | ● |
| | |  | | |  | | |
| **Approvals and Certificates** | | | | | | | |
| Protection class | II, rated insulation voltage ≤ 250 V AC with pollution degree 1-2 according to IEC 60664-1 | ● | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |
| **Dimensions** | | | | | | | |
| Length L [mm] | | 46 | | | | | |
| Diameter D [mm] | | M18 x 1 | | | | | |
| Thread length $l_1$ [mm] | | 27.2 | | | | | |
| Connector length $l_c$ [mm] | | 7 | | | 11 | | |

## Properties

- Thru-beam type
- Cylindrical threaded housing, side view
- Plastic housing
- DC sensor
- Cable and connector versions
- Visible red light

## Benefits

- Short sensor design for space-saving mounting




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

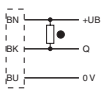
| | |
|---|---|
| **CPZ18B03** | Mounting Bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

## Electrical Connection

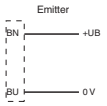
❍ = light on, ● = dark on



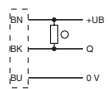
GD18-S/115 + GV18-S/59/102/115 — Option 59/102/115 Receiver



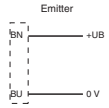

Emitter



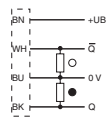

GD18-S/115 + GV18-S/25/102/115 — Option 25/102/115 Receiver



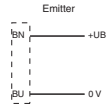

Emitter




GD18-S/115 GV18-S/115/120 — Option 115/120 Receiver

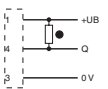



Emitter

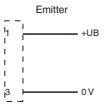




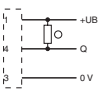

GD18-S/159 + GV18-S/59/102/159 — Option 59/102/159 Receiver



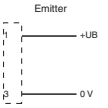

Emitter



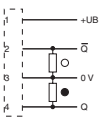

GD18-S/159 + GV18-S/25/102/159 — Option 25/102/159 Receiver



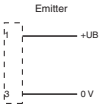

Emitter

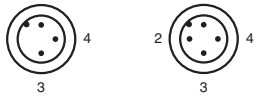



GD18-S/159 + GV18-S/73/120 — Option 115/120 Receiver




Emitter




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |





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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | | | | | |
|---|---|---|---|---|---|
| Threshold detection range | 25 m | | | | |
| Effective detection range | 0 ... 20 m | | | | |
| Light type | modulated visible red light , 640 nm | | | | |
| Operating voltage | 20 ... 250 V AC/DC | | | | |
| No-load supply current | < 2.5 mA | | | | |
| Signal output | N-channel MOSFET, short circuit protected | | | | |
| Switching current | max. 200 mA | | | | |
| Switching frequency | 50 Hz | | | | |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) | | | | |
| Material | | | | | |
| Housing | PC-PBT | | | | |
| Optical face | PMMA | | | | |
| Protection degree | IP67 | | | | |

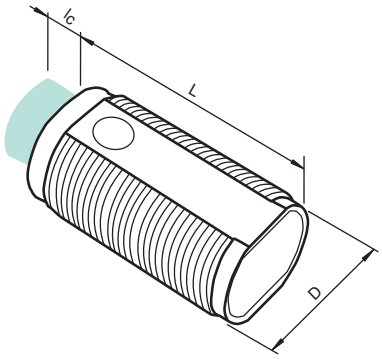
| Model Number | | GA18/115 GK18/59/115/161 | GA18/115 GK18/25/115/161 | GA18/166 GK18/59/161/166 | GA18/166 GK18/25/161/166 |
|---|---|---|---|---|---|
| Emitter | | ● | ● | ● | ● |
| Receiver | | ● | ● | ● | ● |
| Switching type | dark on | ● | | ● | |
| | light on | | ● | | ● |
| Connection | 2 m fixed cable ; 3 x 0.14 mm$^2$ , PVC | ● | ● | | |
| | Micro AC connector, 1/2" V124 ; 4-pin | | | ● | ● |
| | |  | |  | |
| **Approvals and Certificates** | | | | | |
| Protection class | II | ● | ● | ● | ● |
| UL approval | cULus Listed, Type 1 enclosure | ● | ● | ● | ● |
| **Dimensions** | | | | | |
| Length L [mm] | | 49 | | | |
| Diameter D [mm] | | M18 x 1 | | | |
| Connector length $l_c$ [mm] | | 7 | | 11 | |

## Properties

- **Thru-beam type**
- **Cylindrical threaded housing**
- **Plastic housing**
- **AC/DC sensor**
- **Cable and connector versions**
- **Visible red light**

## Benefits

- **Universal usage with AC or DC power supply**




## Accessories

**These and more accessories can be found in chapter 10**
**See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories**

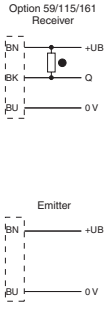
| | |
|---|---|
| **CPZ18B03** | Mounting bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **V124-G-YE2M-PVC** | Female cordset, 1/2" - 20 UNF, 4-pin, PVC cable, straight |
| **V124-W-YE2M-PVC** | Female cordset, 1/2" - 20 UNF, 4-pin, PVC cable, angled |

## Electrical Connection

❍ = light on, ● = dark on

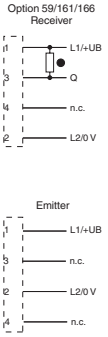


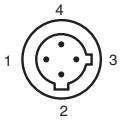
GA18/115 + GK18/59/115/161
GA18/115 + GK18/25/115/161






GA18/166 + GK18/59/161/166
GA18/166 + GK18/25/161/166






Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Threshold detection range | 17.5 m |
| Effective detection range | 0 ... 12 m |
| Light type | modulated visible red light , 640 nm |
| Operating voltage | 20 ... 250 V AC/DC |
| No-load supply current | < 2.5 mA |
| Signal output | N-channel MOSFET, short circuit protected |
| Switching current | max. 200 mA |
| Switching frequency | 50 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | PC-PBT |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | GA18-S/115 GK18-S/59/115/161 | GA18-S/115 GK18-S/25/115/161 | GA18-S/166 GK18-S/59/161/166 | GA18-S/166 GK18-S/25/161/166 |
|---|---|---|---|---|---|
| Emitter | | ● | ● | ● | ● |
| Receiver | | | ● | | ● |
| Switching type | dark on | ● | | ● | |
| | light on | | ● | | ● |
| Connection | 2 m fixed cable ; 3 x 0.14 mm² , PVC | ● | ● | | |
| | Micro AC connector, 1/2" V124 ; 4-pin | | | ● | ● |
| | |  | |  | |
| **Approvals and Certificates** | | | | | |
| Protection class | II | ● | ● | ● | ● |
| UL approval | cULus Listed, Type 1 enclosure | ● | ● | ● | ● |

| Dimensions | | |
|---|---|---|
| Length L [mm] | 64 | |
| Diameter D [mm] | M18 x 1 | |
| Thread length $l_t$ [mm] | 43 | |
| Connector length $l_c$ [mm] | 7 | 11 |

## Properties

- Thru-beam type
- Cylindrical threaded housing, side view
- Plastic housing
- AC/DC sensor
- Cable and connector versions
- Visible red light

## Benefits

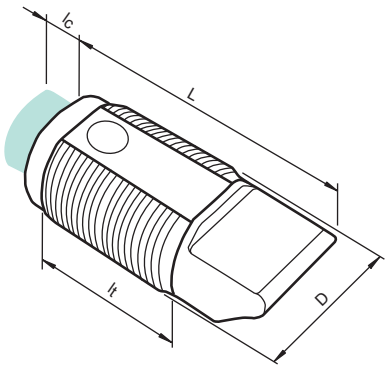
- Universal usage with AC or DC power supply

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CPZ18B03** | Mounting bracket with swivel nut |
| **MH01-M18** | Mounting bracket M18 - 1/2" rod type |
| **OMH-ML17-R** | Mounting bracket |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **V124-G-YE2M-PVC** | Female cordset, 1/2" - 20 UNF, 4-pin, PVC cable, straight |
| **V124-W-YE2M-PVC** | Female cordset, 1/2" - 20 UNF, 4-pin, PVC cable, angled |

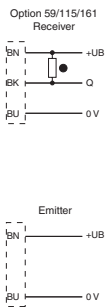



## Electrical Connection

○ = light on, ● = dark on

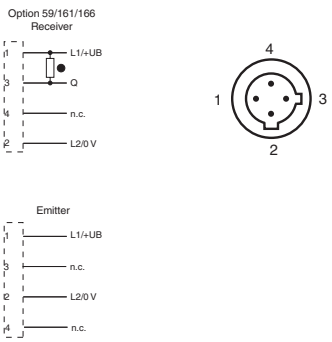


GA18-S/115 + GK18-S/59/115/161
GA18-S/115 + GK18-S/25/115/161






GA18-S/166 + GK18-S/59/161/166
GA18-S/166 + GK18-S/25/161/166







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## Properties

- Diffuse type
- Cylindrical threaded housing
- Nickel-plated brass housing
- DC sensor
- Discrete output
- Cable and connector versions
- Infrared light

## Technical Data

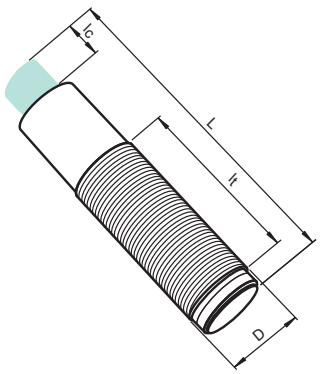
*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Light/dark adjustment | ✔ |
| Sensitivity adjustment | ✔ |
| Light type | infrared |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | ≤ 25 mA |
| Switching type | light/dark on electrically switchable |
| Switching current | max. 100 mA |
| Switching frequency | ≤ 500 Hz |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Material | |
| Housing | brass, nickel-plated |
| Optical face | PC |
| Protection degree | IP67 |

| Model Number | | OBT200-18GM60-E4 | OBT200-18GM60-E5 | OBT500-18GM60-E4 | OBT500-18GM60-E5 | OBT200-18GM60-E4-V1 | OBT200-18GM60-E5-V1 | OBT500-18GM60-E4-V1 | OBT500-18GM60-E5-V1 |
|---|---|---|---|---|---|---|---|---|---|
| Detection range | 0 ... 200 mm | ● | ● | | | ● | ● | | |
| | 0 ... 500 mm | | | ● | ● | | | ● | ● |
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | | ● | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● | | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | ● | ● | | | | |
| | connector M12 x 1, 4-pin | | | | | ● | ● | ● | ● |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | | |
|---|---|---|
| Length L [mm] | 60 | 70 |
| Diameter D [mm] | M18 x 1 | |
| Thread length $l_t$ [mm] | 38 | |
| Connector length $l_c$ [mm] | 0 | 10 |




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CPZ18B03** | Mounting bracket with swivel nut |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **OSP 18 B** | 90° optical deflector for sensors with M18 threaded housing |
| **V1-G-BK2M-PUR-U** | Female cordset, M12 x 1, 4-pin, PUR cable, straight, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12 x 1, 4-pin, PUR cable, angled, angled |

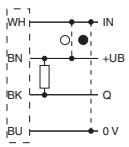
## Electrical Connection

❍ = light on, ● = dark on



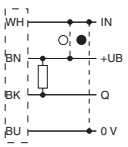
OBT200-18GM60-E4
OBT500-18GM60-E4

Option E4




OBT200-18GM60-E5
OBT500-18GM60-E5

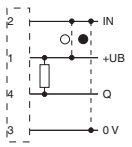
Option E5





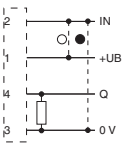

OBT200-18GM60-E4-V1
OBT500-18GM60-E4-V1

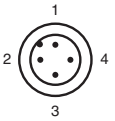
Option E4-V1




OBT200-18GM60-E5-V1
OBT500-18GM60-E5-V1

Option E5-V1




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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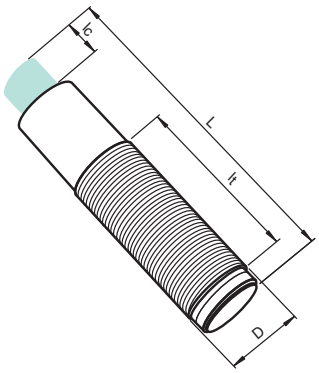
## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| | | | | | |
|---|---|---|---|---|---|
| **General Data** | | | | | |
| Polarization filter | ✔ | | | | |
| Light/dark adjustment | ✔ | | | | |
| Sensitivity adjustment | ✔ | | | | |
| Threshold detection range | 4.5 m | | | | |
| Effective detection range | 0 ... 4 m | | | | |
| Reference target | REF-H50 reflector | | | | |
| Light type | modulated visible red light , 660 nm | | | | |
| Optical face | frontal | | | | |
| Operating voltage | 10 ... 30 V DC , class 2 | | | | |
| No-load supply current | ≤ 25 mA | | | | |
| Switching type | light/dark on electrically switchable | | | | |
| Switching current | max. 100 mA | | | | |
| Switching frequency | ≤ 500 Hz | | | | |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) | | | | |
| Material | | | | | |
| Housing | brass, nickel-plated | | | | |
| Optical face | PMMA | | | | |
| Protection degree | IP67 | | | | |
| **Model Number** | | OBS4000-18GM60-E4 | OBS4000-18GM60-E5 | OBS4000-18GM60-E4-V1 | OBS4000-18GM60-E5-V1 |
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | | |
| | connector M12 x 1, 4-pin | | | ● | ● |
| **Approvals and Certificates** | | | | | |
| UL approval | cULus Listed, Type 1 enclosure | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |
| **Dimensions** | | | | | |
| Length L [mm] | | 60 | | 70 | |
| Diameter D [mm] | | M18 x 1 | | | |
| Thread length $l_t$ [mm] | | 38 | | | |
| Connector length $l_c$ [mm] | | 0 | | 10 | |

## Properties

- Polarized type
- Cylindrical threaded housing
- Nickel-plated brass housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets  See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CPZ18B03** | Mounting bracket with swivel nut |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **OSP 18 A** | 90° optical deflector for sensors with M18 threaded housing |
| **REF-H50** | Reflector, rectangular 51 mm x 51 mm, mounting holes, fixing strap |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

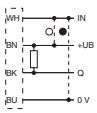
## Electrical Connection

❍ = light on, ● = dark on

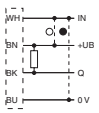


OBS4000-18GM60-E4 OBS4000-18GM60-E5

Option E4



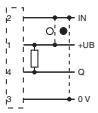

Option E5



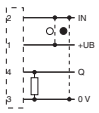


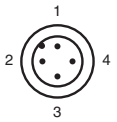

OBS4000-18GM60-E4-V1 OBS4000-18GM60-E5-V1

Option E4-V1




Option E5-V1




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |





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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | | | | | | |
|---|---|---|---|---|---|---|
| Light/dark adjustment | ✔ | | | | | |
| Sensitivity adjustment | ✔ | | | | | |
| Effective detection range | 0 ... 10 m | | | | | |
| Light type | 880 nm IR light | | | | | |
| Operating voltage | 10 ... 30 V DC , class 2 | | | | | |
| No-load supply current | ≤ 25 mA (device) | | | | | |
| Switching type | light/dark on electrically switchable | | | | | |
| Switching current | max. 100 mA | | | | | |
| Switching frequency | ≤ 500 Hz | | | | | |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) | | | | | |
| Material | | | | | | |
| Housing | brass, nickel-plated | | | | | |
| Optical face | PC | | | | | |
| Protection degree | IP67 | | | | | |

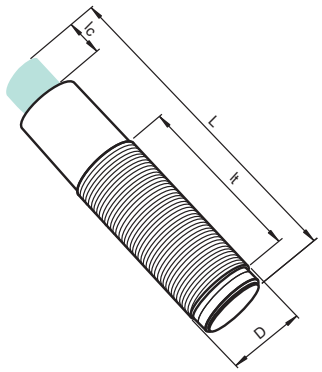
| Model Number | | OBE10M-18GM60-S<br>OBE10M-18GM60-E4 | OBE10M-18GM60-S<br>OBE10M-18GM60-E5 | OBE10M-18GM60-S-V1<br>OBE10M-18GM60-E4-V1 | OBE10M-18GM60-S-V1<br>OBE10M-18GM60-E5-V1 |
|---|---|---|---|---|---|
| Emitter | | ● | ● | ● | ● |
| Receiver | | ● | ● | ● | ● |
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | | |
| | connector M12 x 1, 4-pin | | | ● | ● |
| | |  | |  | |

| Approvals and Certificates | | |
|---|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | |

| Dimensions | | |
|---|---|---|
| Length L [mm] | 60 | 70 |
| Diameter D [mm] | M18 x 1 | |
| Thread length $l_t$ [mm] | 38 | |
| Connector length $l_c$ [mm] | 0 | 10 |

## Properties

- Thru-beam type
- Cylindrical threaded housing
- Nickel plated brass housing
- Discrete output
- Cable and connector versions
- Infrared light version




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

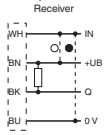
| | |
|---|---|
| **CPZ18B03** | Mounting bracket with swivel nut |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **OSP 18 B** | 90° optical deflector for sensors with M18 threaded housing |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

## Electrical Connection

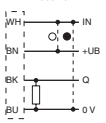
❍ = light on, ● = dark on



OBE10M-18GM60-S +
OBE10M-18GM60-E4

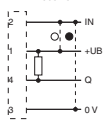



OBE10M-18GM60-S
OBE10M-18GM60-E5

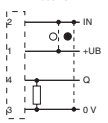


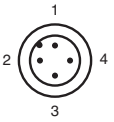



OBE10M-18GM60-S-V1
OBE10M-18GM60-E4-V1




OBE10M-18GM60-S-V1
OBE10M-18GM60-E5-V1




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | VT18-8-H-120-M/40a/65b/118/128 |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark switch | ✔ |
| 4-in-1 output | ✔ |
| Detection range | 20 ... 120 mm , adjustable |
| Light type | modulated visible red light |
| Black/White difference (6%/90) | < 10% at a distance of 120 mm |
| Diameter of the light spot | approx. 6 mm at a distance of 120 mm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 35 mA |
| Switching type | light/dark on, switchable |
| Signal output | Push-pull (4-in-1) output short-circuit protected overvoltage protected |
| Switching current | max. 200 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 70 °C (-13 ... 158 °F) |
| Material | |
| Housing | brass, nickel-plated |
| Optical face | plastic |
| Protection degree | IP67 |
| Connection | M12 connector, 4-pin (Vario-Quick quick connect technology) |



| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 78 |
| Diameter D [mm] | M18 x 1 |
| Thread length $l_t$ [mm] | 41 |
| Connector length $l_c$ [mm] | 13 |

## Properties

- Background suppression
- Cylindrical threaded housing
- Nickel-plated brass housing
- DC sensor
- Discrete output
- Connector version
- Visible red light

## Benefits

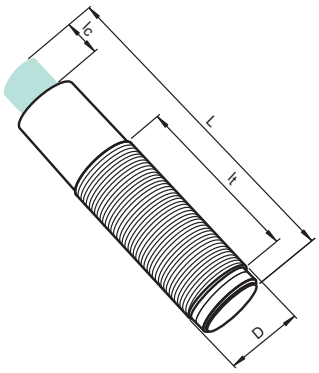
- Reliable detection of all surfaces, regardless of color and texture
- Minimal black/white difference
- Adjustable switchpoint

## Accessories

These and more accessories can be found in chapter 10

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket, 5 ... 30 mm |
| **OSP 18 A** | 90° optical deflector for sensors with M18 threaded housing |
| **OMH-VL18** | Mounting Bracket with swivel nut |



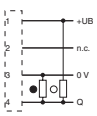

## Electrical Connection

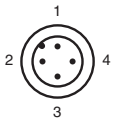
❍ = light on, ● = dark on



VT18-8-H-120-M/40a/65b/118/128

Option 40a/118/128




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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## Properties

- Diffuse type
- Cylindrical threaded housing
- Nickel-plated brass housing
- DC sensor
- Discrete output
- Connector version
- Visible red light

## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | VT18-8-400-M/40a/118/128 |
|---|---|
| Light/dark switch | ✔ |
| Sensing range adjustment | ✔ |
| 4-in-1 output | ✔ |
| Detection range | 0 ... 400 mm , adjustable |
| Light type | modulated visible red light |
| Optical face | frontal |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 30 mA |
| Signal output | Push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching type | light/dark on, switchable |
| Switching current | max. 200 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 70 °C (-13 ... 158 °F) |
| Material | |
| Housing | brass, nickel-plated |
| Optical face | plastic |
| Protection degree | IP67 |
| Connection | M12 connector, 4-pin (Vario-Quick quick connect technology) |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

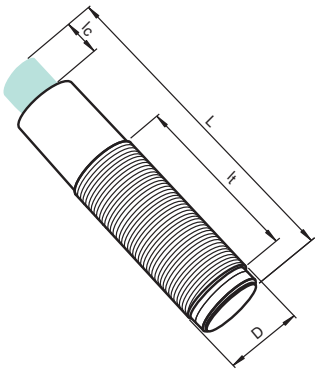
| Dimensions | |
|---|---|
| Length L [mm] | 78 |
| Diameter D [mm] | M18 x 1 |
| Thread length $l_t$ [mm] | 41 |
| Connector length $l_c$ [mm] | 13 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-VL18** | Mounting Bracket with swivel nut |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **OSP 18 A** | 90° optical deflector for sensors with M18 threaded housing |
| **V1-G-BK2M-PUR-U** | Female cordset, M12 x 1, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12 x 1, 4-pin, PUR cable, angled |



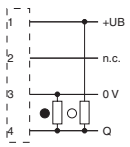

## Electrical Connection

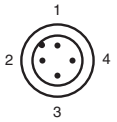
❍ = light on, ● = dark on



VT18-8-400-M/40a/118/128

Option 40a/118/128




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



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## Technical Data

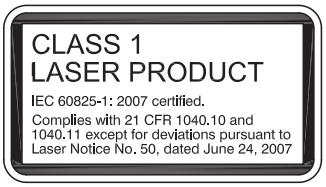
*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | VT18-8-400-M-LAS/40a/118/128 |
|---|---|
| Light/dark switch | ✔ |
| Sensing range adjustment | ✔ |
| 4-in-1 output | ✔ |
| Detection range | 0 ... 400 mm , adjustable |
| Light type | modulated visible red light |
| Laser class | 1 |
| Optical face | frontal |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 25 mA |
| Signal output | Push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching type | light/dark on, switchable |
| Switching current | max. 200 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Material | |
| Housing | brass, nickel-plated |
| Optical face | plastic |
| Protection degree | IP67 |
| Connection | connector M12 x 1, 4-pin (Vario-Quick quick connect technology) |



| Approvals and Certificates | |
|---|---|
| Protection class | II |
| UL approval | cULus Listed, Type 1 enclosure |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

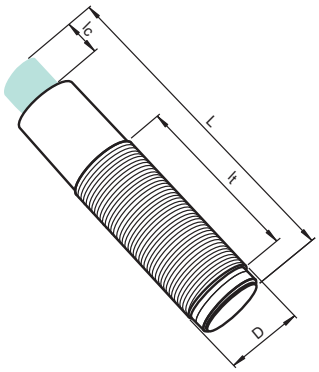
| Dimensions | |
|---|---|
| Length L [mm] | 78 |
| Diameter D [mm] | M18 x 1 |
| Thread length $l_t$ [mm] | 41 |
| Connector length $l_c$ [mm] | 13 |




**Note:** For detailed Laser specifications refer to the data sheet at www.pepperl-fuchs.us

## Properties

- **Diffuse type**
- **Cylindrical threaded housing**
- **Nickel-plated brass housing**
- **DC sensor**
- **Discrete output**
- **Connector version**
- **Laser red light**




## Accessories

**These and more accessories can be found in chapter 10**
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-VL18** | Mounting Bracket with swivel nut |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **OSP 18 A** | 90° optical deflector for sensors with M18 threaded housing |
| **V1-G-BK2M-PUR-U** | Female cordset, M12 x 1, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12 x 1, 4-pin, PUR cable, angled |

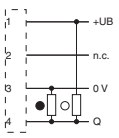
## Electrical Connection

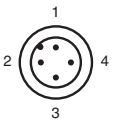
❍ = light on, ● = dark on



VT18-8-400-M-LAS/40a/118/128

Option 40a/118/128




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | VL18-54-M/40a/118/128 |
|---|---|
| Polarization filter | ✔ |
| Light/dark switch | ✔ |
| Sensitivity adjustment | ✔ |
| 4-in-1 output | ✔ |
| Threshold detection range | 4 m |
| Effective detection range | 0 ... 3.5 m |
| Reference target | REF-H50 reflector |
| Light type | modulated visible red light , 632 nm |
| Optical face | frontal |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 25 mA |
| Signal output | Push-pull (4-in-1) output short-circuit protected overvoltage protected |
| Switching type | light/dark on, switchable |
| Switching current | max. 200 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 70 °C (-13 ... 158 °F) |
| Material | |
| Housing | brass, nickel-plated |
| Optical face | PMMA |
| Protection degree | IP67 |
| Connection | connector M12 x 1, 4-pin |
| |  |
| **Approvals and Certificates** | |
| Protection class | II |
| UL approval | cULus Listed, Type 1 enclosure |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |
| **Dimensions** | |
| Length L [mm] | 78 |
| Diameter D [mm] | M18 x 1 |
| Thread length $l_t$ [mm] | 41 |
| Connector length $l_c$ [mm] | 13 |

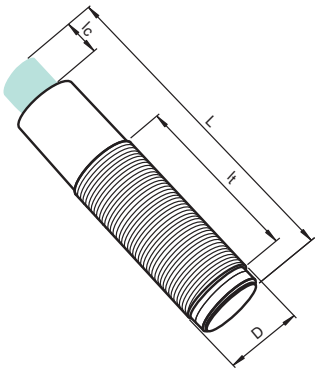
## Properties

- **Polarized type**
- **Cylindrical threaded housing**
- **Nickel-plated brass housing**
- **DC sensor**
- **Discrete output**
- **Connector version**
- **Visible red light**

## Accessories

**These and more accessories can be found in chapter 10**
**See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories**

| | |
|---|---|
| **CPZ18B03** | Mounting bracket with swivel nut |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **REF-H50** | Reflector, rectangular 51 mm x 51 mm, mounting holes, fixing strap |
| **OSP 18 A** | 90° optical deflector for sensors with M18 threaded housing |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |



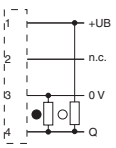

## Electrical Connection

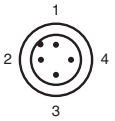
❍ = light on, ● = dark on



VL18-54-M/40a/118/128

Option 40a/118/128




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | VL18-54-MS/40a/118/128 |
|---|---|
| Polarization filter | ✔ |
| Light/dark switch | ✔ |
| Sensitivity adjustment | ✔ |
| 4-in-1 output | ✔ |
| Threshold detection range | 4 m |
| Effective detection range | 0 ... 3.5 m |
| Reference target | REF-H50 reflector |
| Light type | modulated visible red light , 632 nm |
| Optical face | lateral |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 25 mA |
| Signal output | Push-pull (4-in-1) output short-circuit protected overvoltage protected |
| Switching type | light/dark on, switchable |
| Switching current | max. 200 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 70 °C (-13 ... 158 °F) |
| Material | |
| Housing | brass, nickel-plated |
| Optical face | PMMA |
| Protection degree | IP67 |
| Connection | connector M12 x 1, 4-pin |

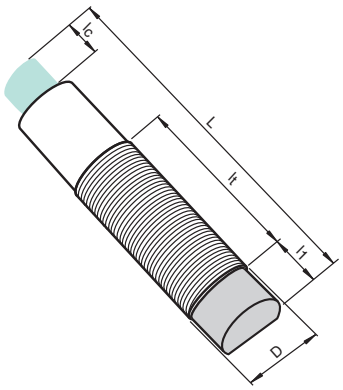


| Approvals and Certificates | |
|---|---|
| Protection class | II |
| UL approval | cULus Listed, Type 1 enclosure |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 78 |
| Diameter D [mm] | M18 x 1 |
| Cap length $l_1$ [mm] | 15 |
| Thread length $l_t$ [mm] | 41 |
| Connector length $l_c$ [mm] | 13 |

## Properties

- Polarized type
- Cylindrical threaded housing, side view
- Nickel-plated brass housing
- DC sensor
- Discrete output
- Connector version
- Visible red light




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CPZ18B03** | Mounting bracket with swivel nut |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **REF-H50** | Reflector, rectangular 51 mm x 51 mm, mounting holes, fixing strap |
| **OSP 18 A** | 90° optical deflector for sensors with M18 threaded housing |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

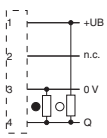
## Electrical Connection

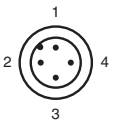
❍ = light on, ● = dark on



VL18-54-MS/40a/118/128

Option 40a/118/128




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | VL18-54-M-LAS/40a/118/128 |
|---|---|
| Polarization filter | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| 4-in-1 output | ✔ |
| Threshold detection range | 20 m |
| Effective detection range | 0 ... 18 m |
| Reference target | REF-H85-2 reflector |
| Light type | modulated visible red light |
| Laser class | 1 |
| Optical face | frontal |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 20 mA |
| Signal output | Push-pull (4-in-1) output short-circuit protected overvoltage protected |
| Switching type | light/dark on, switchable |
| Switching current | max. 200 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Material | |
| Housing | brass, nickel-plated |
| Optical face | PMMA |
| Protection degree | IP67 |
| Connection | connector M12 x 1, 4-pin |

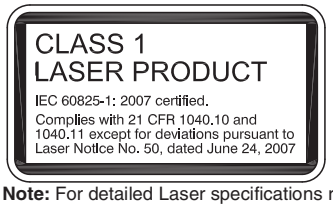


| Approvals and Certificates | |
|---|---|
| Protection class | II |
| UL approval | cULus Listed, Type 1 enclosure |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

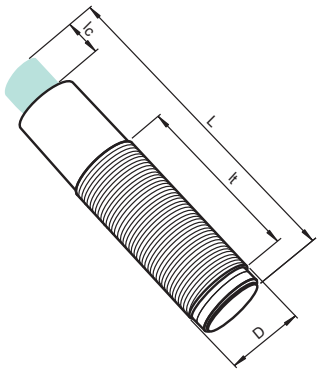
| Dimensions | |
|---|---|
| Length L [mm] | 78 |
| Diameter D [mm] | M18 x 1 |
| Thread length $l_t$ [mm] | 41 |
| Connector length $l_c$ [mm] | 13 |

## Properties

- Polarized type
- Cylindrical threaded housing
- Nickel-plated brass housing
- DC sensor
- Discrete output
- Connector version
- Laser red light




**Note:** For detailed Laser specifications refer to the data sheet at www.pepperl-fuchs.us




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-VL18** | Mounting bracket with precision alignment |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **REF-MH23** | Reflector with Micro-structure, rectangular 23 mm x 13.8 mm, diagonal mounting hole |
| **REF-H85-2** | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes |
| **REF-H100** | Reflector, rectangular 122 mm x 99.35 mm, mounting holes |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

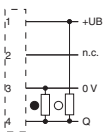
## Electrical Connection

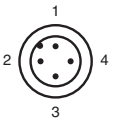
❍ = light on, ● = dark on



VL18-54-M-LAS/40a/118/128

Option 40a/118/128




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

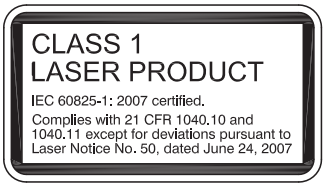
*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| Model Number | |
|---|---|
| Emitter | **VS18-M-LAS/76a/118** |
| Receiver | **VSE18-M-LAS/40a/118/128** |
| Test input | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| 4-in-1 output | ✔ |
| Threshold detection range | 85 m |
| Effective detection range | 0 ... 60 m |
| Light type | modulated visible red light |
| Laser class | 1 |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | Emitter: 20 mA , Receiver: 15 mA |
| Switching type | light/dark on, switchable |
| Signal output | Push-pull (4-in-1) output short-circuit protected overvoltage protected |
| Switching current | max. 200 mA |
| Switching frequency | 5000 Hz |
| Test input | emitter deactivation at $+U_B$ |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Material | |
| Housing | brass, nickel-plated |
| Optical face | plastic |
| Protection degree | IP67 |
| Connection | connector M12 x 1, 4-pin (Vario-Quick quick connect technology) |



| Approvals and Certificates | |
|---|---|
| UL approval | cULus Listed, Type 1 enclosure |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | Emitter: 79.3<br>Receiver: 78 |
| Diameter D [mm] | M18 x 1 |
| Thread length $l_t$ [mm] | 40 |
| Connector length $l_c$ [mm] | 13 |



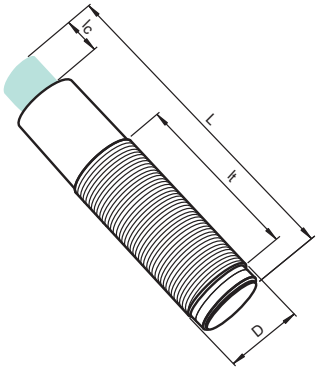

**Note:** For detailed Laser specifications refer to the data sheet at www.pepperl-fuchs.us

## Properties

- **Thru-beam type**
- **Cylindrical threaded housing**
- **Nickel plated brass housing**
- **Discrete output**
- **Connector version**
- **Laser red light**

## Benefits

- **Best small part detection with adjustable focus**




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

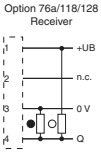
| | |
|---|---|
| **OMH-VL18** | Mounting bracket with precision alignment |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

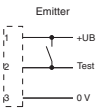
## Electrical Connection

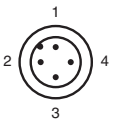
❍ = light on, ● = dark on



VS18-M-LAS/76a/118 + VSE18-M-LAS/40a/118/128




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



## Properties

- Thru-beam type
- Cylindrical threaded housing
- Nickel plated brass housing
- DC sensor
- Connector version
- Laser red light

## Technical Data

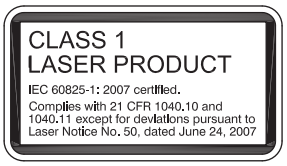
*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | |
|---|---|
| Emitter | **E18-LAS/92** |
| Receiver | **EV18-LAS/32/92** |
| Test input | ✔ |
| Weak signal output | ✔ |
| Threshold detection range | 18 m |
| Effective detection range | 0 ... 10 m |
| Light type | modulated visible red light |
| Laser class | 1 |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | emitter ≤ 25 mA , receiver ≤ 60 mA |
| Switching type | light on |
| Signal output | 1 PNP, short-circuit protected, open collector |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Pre-fault indication output | PNP, open collector , short-circuit protected<br>inactive: signal strength > approx. 30 % of the strength with clean optic<br>active: signal strength < approx. 30 % of the strength with clean optic |
| Test input | emitter deactivation<br>emitter on: 0 ... +3V<br>emitter off: +5V ... +$U_B$ |
| Ambient temperature | 0 ... 50 °C (32 ... 122 °F) |
| Housing | brass, nickel-plated |
| Optical face | glass |
| Protection degree | IP65 |
| Connection | connector M12 x 1, 4-pin |

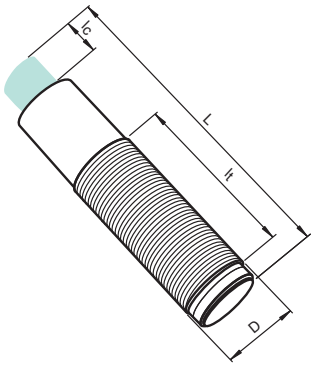


| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | Emitter: 65<br>Receiver: 80 |
| Diameter D [mm] | M18 x 1 |
| Thread length $l_t$ [mm] | Emitter: 34<br>Receiver: 45 |
| Connector length $l_c$ [mm] | 10 |




**Note:** For detailed Laser specifications refer to the data sheet at www.pepperl-fuchs.us




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

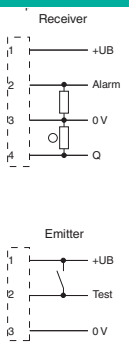
| | |
|---|---|
| **CPZ18B03** | Mounting Bracket with swivel nut |
| **OMH-VL18** | Mounting bracket with precision alignment |
| **AB-18** | Right angled mounting bracket |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **V1-G-2M-PVC** | Female cordset, M12, 4-pin, PVC cable, straight |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-2M-PVC** | Female cordset, M12, 4-pin, PVC cable, angled |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

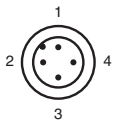
## Electrical Connection

❍ = light on, ● = dark on



E18-LAS/92 + EV18-LAS/32/92




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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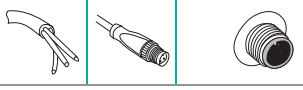


## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| 4-in-1 output | ✔ |
| Light/dark adjustment | ✔ |
| Light type | modulated visible red light , 640 nm |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 30 mA |
| Switching type | light/dark on, electrically switchable |
| Signal output | 2 Push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protection, overvoltage protected |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -20 ... 55 °C (-4 ... 131 °F) |
| Material | |
| Housing | ABS |
| Optical face | Acrylic |
| Protection degree | IP67 |

| Model Number | | ML17-8-H-50-RT/115/136 | ML17-8-H-100-RT/115/136 | ML17-8-H-50-RT/115b/136 | ML17-8-H-100-RT/115b/136 | ML17-8-H-50-RT/136/143 | ML17-8-H-100-RT/136/143 | ML17-8-H-50-RT/73/136 | ML17-8-H-100-RT/73/136 |
|---|---|---|---|---|---|---|---|---|---|
| Detection range | 10 ... 100 mm | | ● | | ● | | ● | | ● |
| | 10 ... 50 mm | ● | | ● | | ● | | ● | |
| Diameter of the light spot | ≤ 3 mm at 50 mm | ● | | ● | | ● | | ● | |
| | ≤ 6 mm at 100 mm | | ● | | ● | | ● | | ● |
| Connection | 150 mm PVC cable with 4-pin, M12 connector | | | ● | ● | | | | |
| | 2 m PVC cable | ● | ● | | | | | | |
| | 4-pin , M12 x 1 connector | | | | | | | ● | ● |
| | 4-pin , M8 x 1 connector | | | | | ● | ● | | |



| Approvals and Certificates | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| UL approval | cULus | ● | ● | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | | | |

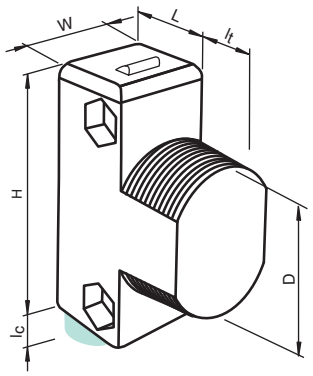
| Dimensions | | | |
|---|---|---|---|
| Length L [mm] | 19 | | |
| Width W [mm] | 15 | | |
| Height H [mm] | 35 | | |
| Diameter D [mm] | 18 | | |
| Thread length $l_t$ [mm] | 10 | | |
| Connector length $l_c$ [mm] | 0 | 10 | 18 |

## Properties

- Background suppression
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable, connector and pigtailed connector versions
- Visible red light

## Benefits

- Reliable detection of all surfaces, regardless of color and texture
- Minimal black/white difference
- Threaded face and side thru-holes provide flexible mounting options




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-ML17-EZ** | Mounting bracket |
| **OMH-ML17** | Mounting bracket |
| **OMH-ML17-1** | Mounting bracket |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

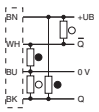
## Electrical Connection

❍ = light on, ● = dark on



ML17-8-H-100-RT/115/136
ML17-8-H-50-RT/115/136

Option 59/115/136

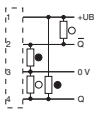






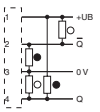

ML17-8-H-100-RT/73/136
ML17-8-H-50-RT/73/136

Option 73/136



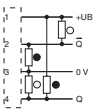

ML17-8-H-100-RT/115b/136
ML17-8-H-50-RT/115b/136

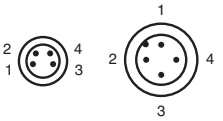
Option 59/115b/136




ML17-8-H-100-RT/136/143
ML17-8-H-50-RT/136/143

Option 59/136/143




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| 4-in-1 output | ✔ |
| Light/dark adjustment | ✔ |
| Detection range adjuster | ✔ |
| Detection range | 10 ... 450 mm |
| Light type | modulated infrared light , 950 nm |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 25 mA |
| Signal output | 2 Push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protected, overvoltage protected |
| Switching type | light/dark on, electrically switchable |
| Switching current | max. 100 mA per output |
| Switching frequency | 500 Hz |
| Ambient temperature | -20 ... 55 °C (-4 ... 131 °F) |
| Material | |
| Housing | ABS |
| Optical face | Acrylic |
| Protection degree | IP67 |

| Model Number | | ML17-8-450/115/136 | ML17-8-450/115b/136 | ML17-8-450/136/143 | ML17-8-450/73/136 |
|---|---|---|---|---|---|
| Connection | 150 mm PVC cable with 4-pin, M12 connector | | ● | | |
| | 2 m PVC cable | ● | | | |
| | 4-pin , M12 x 1 connector | | | | ● |
| | 4-pin , M8 x 1 connector | | | ● | |
| | |  |  |  | |
| Approvals and Certificates | | | | | |
| UL approval | cULus | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |

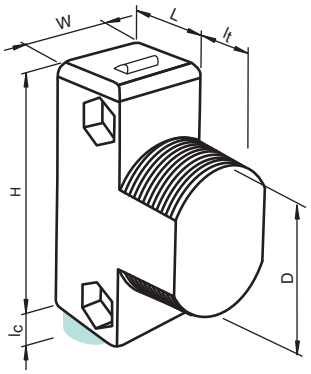
| Dimensions | | | |
|---|---|---|---|
| Length L [mm] | 19 | | |
| Width W [mm] | 15 | | |
| Height H [mm] | 34.5 | | |
| Diameter D [mm] | 18 | | |
| Thread length $l_t$ [mm] | 10.2 | | |
| Connector length $l_c$ [mm] | 0 | 9.8 | 18 |

## Properties

- Diffuse type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Infrared light

## Benefits

- Threaded face and side thru-holes provide flexible mounting options




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-ML17-EZ** | Mounting bracket |
| **OMH-ML17** | Mounting bracket |
| **OMH-ML17-1** | Mounting bracket |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, angled |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |
| **V31-GM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, straight |

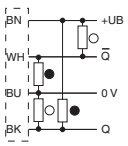
## Electrical Connection

❍ = light on, ● = dark on



ML17-8-450/115/136

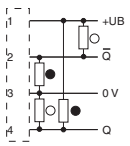
Option 59/115/136





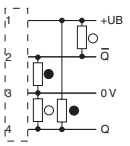

ML17-8-450/73/136

Option 73/136



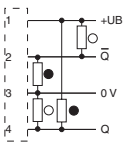

ML17-8-450/115b/136

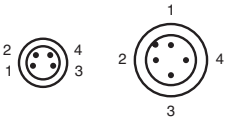
Option 59/115b/136




ML17-8-450/136/143

Option 59/136/143



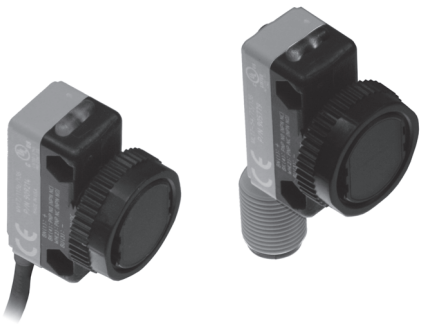




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| 4-in-1 output | ✔ |
| Light/dark adjustment | ✔ |
| Sensitivity adjustment | ✔ |
| Threshold detection range | 5 m |
| Effective detection range | 0 ... 3.5 m |
| Reference target | FE-RR1 reflector |
| Light type | modulated visible red light , 626 nm |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 25 mA |
| Signal output | 2 Push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protected, overvoltage protected |
| Switching type | light/dark on electrically switchable |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -20 ... 55 °C (-4 ... 131 °F) |
| Material | |
| Housing | ABS |
| Optical face | Acrylic |
| Protection degree | IP67 |

| Model Number | | ML17-54/115/136 | ML17-54/115b/136 | ML17-54/136/143 | ML17-54/73/136 |
|---|---|---|---|---|---|
| Connection | fixed cable 150 mm with M12 x 1 male connector, 4 pin | | ● | | |
| | 2 m fixed cable | ● | | | |
| | connector M12 x 1, 4-pin | | | | ● |
| | M8 x 1 connector, 4-pin | | | ● | |
| | |  |  |  | |
| **Approvals and Certificates** | | | | | |
| UL approval | cULus | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |

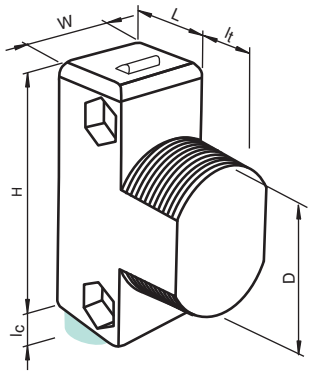
| Dimensions | | | |
|---|---|---|---|
| Length L [mm] | 19.1 | | |
| Width W [mm] | 15 | | |
| Height H [mm] | 34.5 | | |
| Diameter D [mm] | 18 | | |
| Thread length $l_t$ [mm] | 10.2 | | |
| Connector length $l_c$ [mm] | 0 | 9.8 | 18 |

## Properties

- Polarized type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable, connector and pigtailed connector versions
- Visible red light

## Benefits

- Threaded face and side thru-holes provide flexible mounting options




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-ML17-EZ** | Mounting bracket |
| **OMH-ML17** | Mounting bracket |
| **OMH-ML17-1** | Mounting bracket |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

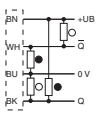
## Electrical Connection

○ = light on, ● = dark on

ML17-54/115/136



Option 115/136

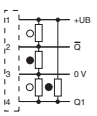



ML17-54/115b/136 ML17-54/73/136 ML17-54/136/143

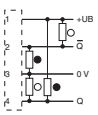




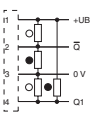
Option 115b/136

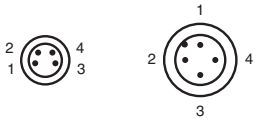



Option 73/136




Option 136/143



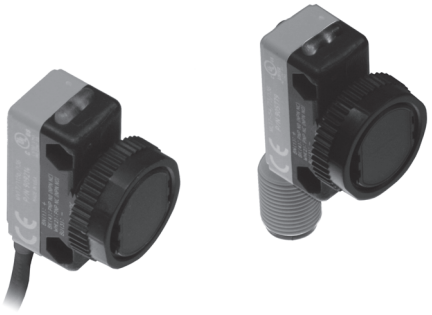

Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| 4-in-1 output | ✔ |
| Light/dark adjustment | ✔ |
| Sensitivity adjustment | ✔ |
| Effective detection range | 0 ... 4 m |
| Reference target | FE-RR1 reflector |
| Light type | modulated visible red light , 626 nm |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 25 mA |
| Signal output | 2 Push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protected, overvoltage protected |
| Switching type | light/dark on electrically switchable |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -20 ... 55 °C (-4 ... 131 °F) |
| Material | |
| Housing | ABS |
| Optical face | Acrylic |
| Protection degree | IP67 |

| Model Number | | ML17-6/115/136 | ML17-6/115b/136 | ML17-6/136/143 | ML17-6/73/136 |
|---|---|---|---|---|---|
| Connection | fixed cable 150 mm with M12 x 1 male connector, 4 pin | | ● | | |
| | 2 m fixed cable | ● | | | |
| | connector M12 x 1, 4-pin | | | | ● |
| | M8 x 1 connector, 4-pin | | | ● | |

| Approvals and Certificates | | | | | |
|---|---|---|---|---|---|
| UL approval | cULus | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |

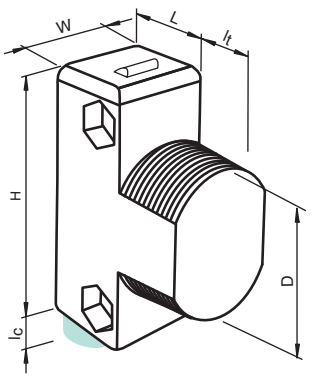
| Dimensions | | | |
|---|---|---|---|
| Length L [mm] | 19.1 | | |
| Width W [mm] | 15 | | |
| Height H [mm] | 34.5 | | |
| Diameter D [mm] | 18 | | |
| Thread length $l_t$ [mm] | 10.2 | | |
| Connector length $l_c$ [mm] | 0 | 9.8 | 18 |

## Properties

- **Non-polarized type**
- **Rectangular miniature housing**
- **Plastic housing**
- **DC sensor**
- **Discrete output**
- **Cable, connector and pigtailed connector versions**
- **Visible red light**

## Benefits

- **Threaded face and side thru-holes provide flexible mounting options**




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-ML17-EZ** | Mounting bracket |
| **OMH-ML17** | Mounting bracket |
| **OMH-ML17-1** | Mounting bracket |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

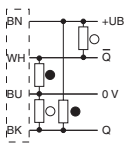
## Electrical Connection

❍ = light on, ● = dark on



ML17-6/115/136

Option 115/136

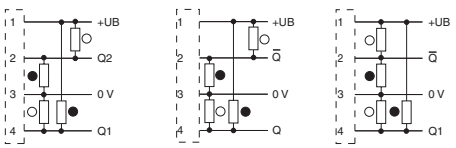


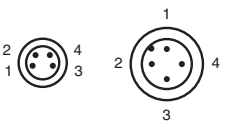





ML17-6/115b/136 ML17-6/73/136 ML17-6/136/143

Option /115b/136 Option 73/136 Option 136/143




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| 4-in-1 output | ✔ |
| Light/dark adjustment | ✔ |
| Threshold detection range | 20 m |
| Effective detection range | 0 ... 15 m |
| Light type | modulated infrared light , 950 nm |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 25 mA |
| Switching type | light/dark on, electrically switchable |
| Signal output | 2 push-pull (4-in-1)outputs, short-circuit protected, reverse polarity protected, overvoltage protected |
| Switching current | max. 100 mA |
| Switching frequency | 150 Hz |
| Ambient temperature | -20 ... 55 °C (-4 ... 131 °F) |
| Housing | ABS |
| Optical face | Acrylic |
| Protection degree | IP67 |

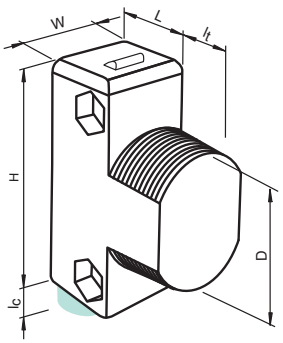
| Model Number | | MD17/115 MV17/115/136 | MD17/115b MV17/115b/136 | MD17/73 MV17/73/136 |
|---|---|---|---|---|
| Emitter | | ● | ● | ● |
| Receiver | | ● | ● | ● |
| Connection | fixed cable 150 mm with M12 x 1 male connector, 4 pin | | ● | |
| | 2 m fixed cable | ● | | |
| | connector M12 x 1, 4-pin | | | ● |
| | |  |  |  |
| **Approvals and Certificates** | | | | |
| UL approval | cULus | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |
| **Dimensions** | | | | |
| Length L [mm] | | 19.1 | | |
| Width W [mm] | | 15 | | |
| Height H [mm] | | 34.5 | | |
| Diameter D [mm] | | 18 | | |
| Thread length $l_t$ [mm] | | 10.2 | | |
| Connector length $l_c$ [mm] | | 0 | 0 | 18 |

## Properties

- Thru-beam type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable, connector and pigtailed connector versions
- Infrared light

## Benefits

- Threaded face and side thru-holes provide flexible mounting options
- Tamper-proof, no operating controls




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

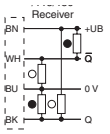
| | |
|---|---|
| **OMH-ML17-EZ** | Mounting bracket |
| **OMH-ML17** | Mounting bracket |
| **OMH-ML17-1** | Mounting bracket |
| **ML17-OA-05V** | Accessories apertures |
| **ML17-OA-10V** | Accessories apertures |
| **ML17-OA-25D** | Accessories apertures |
| **ML17-OA-KIT** | Accessories apertures |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

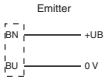
## Electrical Connection

❍ = light on, ● = dark on

MD17/115 + MV17/115/136



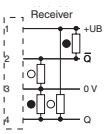



MD17/115b + MV17/115b/136
MD17/73 + MV17/73/136

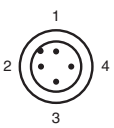












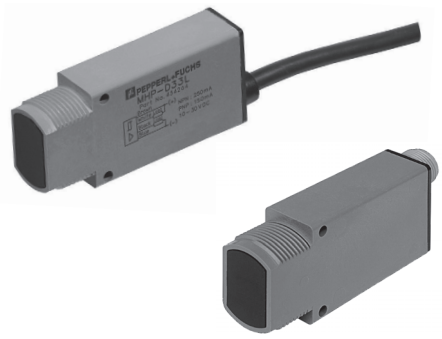

Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Light/dark switch | ✔ |
| Sensitivity adjustment | ✔ |
| Light type | modulated visible red light |
| Ambient temperature | -30 ... 70 °C (-22 ... 158 °F) |
| Housing | Polysulphone |
| Optical face | Polycarbonate |
| Protection degree | IP69K |

| Model Number | | MHP-C133L | MHP-C233L | MHP-C22AL | MHP-C133Q | MHP-C233Q | MHP-C22AQ |
|---|---|---|---|---|---|---|---|
| Sensing range | 25 mm, adjustable | ● | | | ● | | |
| | 63 mm, adjustable | | ● | ● | | ● | ● |
| Operating voltage | 10 ... 30 V DC | ● | ● | | ● | ● | |
| | 20 - 260 V AC, 50 - 60 Hz | | | ● | | | ● |
| No-load supply current | ≤ 35 mA | ● | ● | | ● | ● | |
| | ≤ 1.5 mA | | | ● | | | ● |
| Signal output | 1 NPN and 1 PNP | ● | ● | | ● | ● | |
| | Thyristor | | | ● | | | ● |
| Switching frequency | 500 Hz | ● | ● | | ● | ● | |
| | 60 Hz | | | ● | | | ● |
| Connection | 2 m fixed cable , PVC | ● | ● | | | | |
| | 3 m fixed cable , PVC | | | ● | | | |
| | connector M12 x 1, 4-pin | | | | ● | ● | |
| | Micro AC connector, 1/2" ; 3-pin | | | | | | ● |





| Approvals and Certificates | | | | | | | |
|---|---|---|---|---|---|---|---|
| UL approval | cULus | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | ● | ● | | ● | ● | |

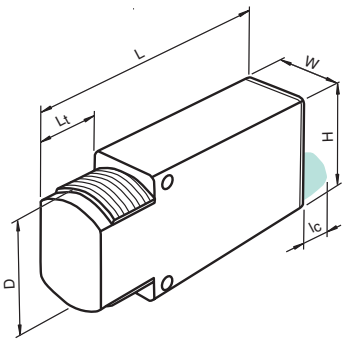
| Dimensions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Length L [mm] | | | | 64.8 | | | |
| Width W [mm] | | | | 15.8 | | | |
| Height H [mm] | | | | 30 | | | |
| Diameter D [mm] | | | | 25.4 | | | |
| Thread length $l_t$ [mm] | | | | 15.3 | | | |
| Connector length $l_c$ [mm] | | 0 | | | 6.4 | | |

## Properties

- Convergent mode sensor
- Rectangular miniature housing
- Plastic housing
- DC and AC sensor versions
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Threaded face and side thru-holes provide flexible mounting options
- Rugged IP69k housing withstands harsh environments and high-pressure washdown areas
- Convergent sensing ignores some objects in the background




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

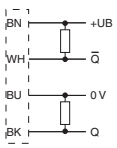
| | |
|---|---|
| **MHPHDW** | Mounting set |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |
| **V12-G-YE2M-PVC** | Female cordset, 1/2“ - 20 UNF, 3-pin, PUR cable, straight |
| **V12-W-YE2M-PVC** | Female cordset, 1/2“ - 20 UNF, 3-pin, PUR cable, angled |

## Electrical Connection

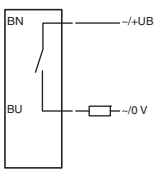
❍ = light on, ● = dark on



MHP-C133L
MHP-C233L

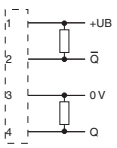



MHP-C22AL

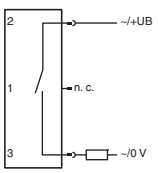


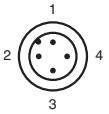



MHP-C133Q
MHP-C233Q



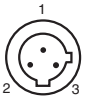

MHP-C22AQ




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |

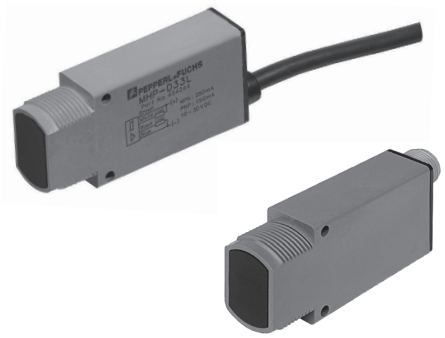



Wire colors

| | | |
|---|---|---|
| 1 | GN | (green) |
| 2 | RD/BK | (red/black) |
| 3 | RD/WH | (red/white) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Light/dark switch | ✔ |
| Sensitivity adjustment | ✔ |
| Ambient temperature | -30 ... 70 °C (-22 ... 158 °F) |
| Housing | Polysulphone |
| Optical face | Polycarbonate |
| Protection degree | IP69K |

| Model Number | | MHP-D33L | MHP-DR33L | MHP-D2AL | MHP-D33Q | MHP-DR33Q | MHP-D2AQ |
|---|---|---|---|---|---|---|---|
| Detection range | 0 ... 150 mm adjustable | | ● | | | ● | |
| | 0 ... 450 mm adjustable | ● | | ● | ● | | ● |
| Light type | modulated infrared light | ● | | ● | ● | | ● |
| | modulated visible red light | | ● | | | ● | |
| Operating voltage | 10 ... 30 V DC | ● | ● | | ● | ● | |
| | 20 - 260 V AC, 50 - 60 Hz | | | ● | | | ● |
| No-load supply current | ≤ 1.5 mA | | | ● | | | ● |
| | ≤ 35 mA | ● | ● | | ● | ● | |
| Signal output | 1 NPN and 1 PNP | ● | ● | | ● | ● | |
| | Thyristor | | | ● | | | ● |
| Switching frequency | 500 Hz | ● | ● | | ● | ● | |
| | 60 Hz | | | ● | | | ● |
| Connection | 2 m fixed cable , PVC | ● | ● | | | | |
| | 3 m fixed cable , PVC | | | ● | | | |
| | connector M12 x 1, 4-pin | | | | ● | ● | |
| | Micro AC connector, 1/2" ; 3-pin | | | | | | ● |

| Approvals and Certificates | | | | | | | |
|---|---|---|---|---|---|---|---|
| UL approval | cULus | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | ● | ● | | ● | ● | |

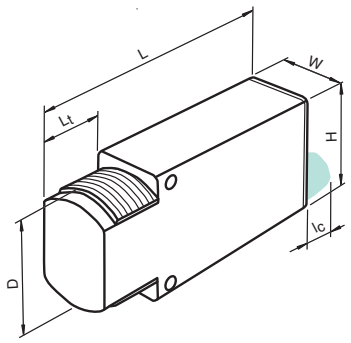
| Dimensions | | | |
|---|---|---|---|
| Length L [mm] | 64.8 | | |
| Width W [mm] | 15.8 | | |
| Height H [mm] | 30 | | |
| Diameter D [mm] | 25.4 | | |
| Thread length $l_t$ [mm] | 15.3 | | |
| Connector length $l_c$ [mm] | 0 | 6.4 | |

## Properties

- Diffuse type
- Rectangular miniature housing
- Plastic housing
- DC and AC sensor versions
- Discrete output
- Cable and connector versions
- Visible red and infrared light versions

## Benefits

- Threaded face and side thru-holes provide flexible mounting options
- Rugged IP69k housing withstands harsh environments and high-pressure washdown areas




## Accessories

These and more accessories can be found in chapter 10

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

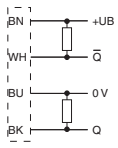
| | |
|---|---|
| **MHPHDW** | Mounting set |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |
| **V12-G-YE2M-PVC** | Female cordset, 1/2" - 20 UNF, 3-pin, PUR cable, straight |
| **V12-W-YE2M-PVC** | Female cordset, 1/2" - 20 UNF, 3-pin, PUR cable, angled |

## Electrical Connection

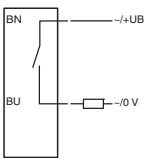
❍ = light on, ● = dark on

MHP-D33L
MHP-DR33L



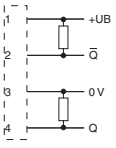



MHP-D2AL

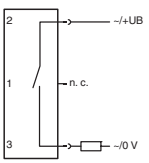


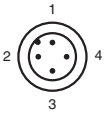

MHP-D33Q
MHP-DR33Q





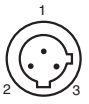

MHP-D2AQ




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



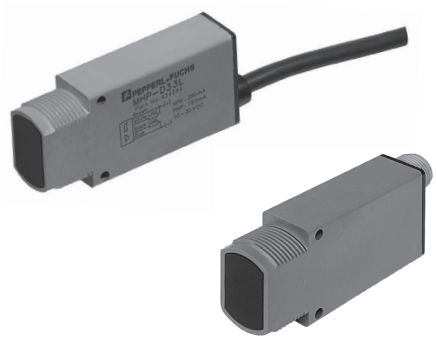

Wire colors

| | | |
|---|---|---|
| 1 | GN | (green) |
| 2 | RD/BK | (red/black) |
| 3 | RD/WH | (red/white) |




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Singapore: +65 6779 9091 fa-info@sg.pepperl-fuchs.com

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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Light/dark switch | ✔ |
| Sensitivity adjustment | ✔ |
| Reference target | Reflector FE-RR1 |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 35 mA |
| Signal output | 1 NPN and 1 PNP |
| Switching frequency | 500 Hz |
| Ambient temperature | -30 ... 70 °C (-22 ... 158 °F) |
| Housing | Polysulphone |
| Optical face | Polycarbonate |
| Protection degree | IP69K |

| Model Number | | MHP-P33L | MHP-LR33L | MHP-P33Q | MHP-LR33Q |
|---|---|---|---|---|---|
| Polarization filter | ✔ | ● | | ● | |
| Effective detection range | 0 ... 2.4 m | ● | | ● | |
| | 0 ... 9.1 m | | ● | | ● |
| Light type | modulated infrared light | | ● | | ● |
| | modulated visible red light | ● | | ● | |
| Connection | 2 m fixed cable , PVC | ● | ● | | |
| | connector M12 x 1, 4-pin | | | ● | ● |

| Approvals and Certificates | | | | | |
|---|---|---|---|---|---|
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |

| Dimensions | | |
|---|---|---|
| Length L [mm] | 67 | |
| Width W [mm] | 15.8 | |
| Height H [mm] | 30 | |
| Diameter D [mm] | 25.4 | |
| Thread length $l_t$ [mm] | 17.5 | |
| Connector length $l_c$ [mm] | 0 | 6.4 |

## Properties

- Polarized and non-polarized types
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red and infrared light versions

## Benefits

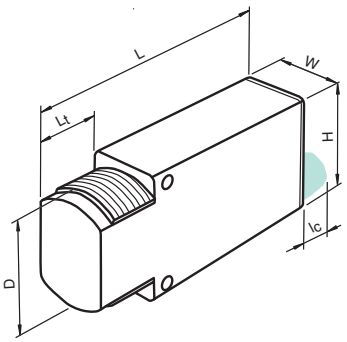
- Threaded face and side thru-holes provide flexible mounting options
- Rugged IP69k housing withstands harsh environments and high-pressure washdown areas

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **MHPHDW** | Mounting set |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

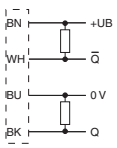



## Electrical Connection

❍ = light on, ● = dark on

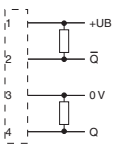


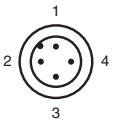
MHP-P33L
MHP-LR33L






MHP-P33Q
MHP-LR33Q



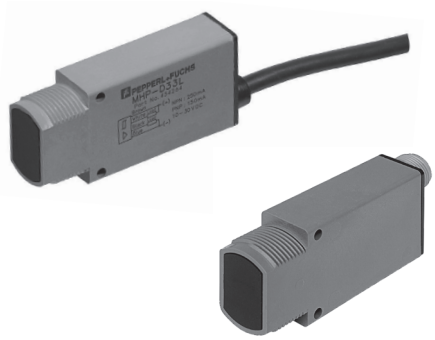




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Light/dark switch | ✔ |
| Sensitivity adjustment | ✔ |
| Reference target | Reflector FE-RR1 |
| Operating voltage | 20 ... 260 V , 50 ... 60 Hz |
| No-load supply current | ≤ 1.5 mA |
| Signal output | Thyristor |
| Switching frequency | 60 Hz |
| Ambient temperature | -30 ... 70 °C (-22 ... 158 °F) |
| Housing | Polysulphone |
| Optical face | Polycarbonate |
| Protection degree | IP69K |

| Model Number | | MHP-P2AL | MHP-LR2AL | MHP-P2AQ | MHP-LR2AQ |
|---|---|---|---|---|---|
| Polarization filter | ✔ | ● | | ● | |
| Effective detection range | 0 ... 2.4 m | ● | | ● | |
| | 0 ... 9.1 m | | ● | | ● |
| Light type | modulated infrared light | | ● | | ● |
| | modulated visible red light | ● | | ● | |
| Connection | 3 m fixed cable , PVC | ● | ● | | |
| | Micro AC connector, 1/2" ; 3-pin | | | ● | ● |
| | |  | |  | |
| **Approvals and Certificates** | | | | | |
| UL approval | cULus | ● | ● | ● | ● |
| **Dimensions** | | | | | |
| Length L [mm] | | 67 | | | |
| Width W [mm] | | 15.8 | | | |
| Height H [mm] | | 30 | | | |
| Diameter D [mm] | | 25.4 | | | |
| Thread length $l_t$ [mm] | | 17.5 | | | |
| Connector length $l_c$ [mm] | | 0 | | 6.4 | |

## Properties

- Polarized and non-polarized types
- Rectangular miniature housing
- Plastic housing
- AC sensor
- Discrete output
- Cable and connector versions
- Visible red and infrared light versions

## Benefits

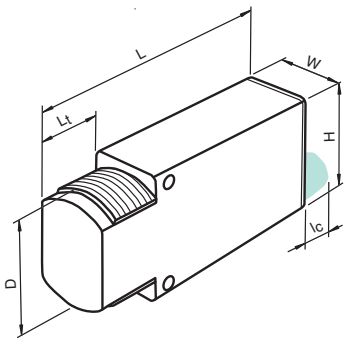
- Threaded face and side thru-holes provide flexible mounting options
- Rugged IP69k housing withstands harsh environments and high-pressure washdown areas

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **MHPHDW** | Mounting set |
| **V12-G-YE2M-PVC** | Female cordset, 1/2“ - 20 UNF, 3-pin, PUR cable, straight |
| **V12-W-YE2M-PVC** | Female cordset, 1/2“ - 20 UNF, 3-pin, PUR cable, angled |

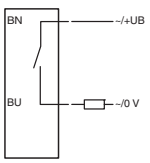



## Electrical Connection

❍ = light on, ● = dark on

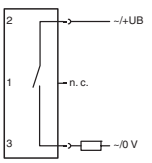


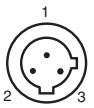
MHP-P2AL
MHP-LR2AL






MHP-P2AQ
MHP-LR2AQ

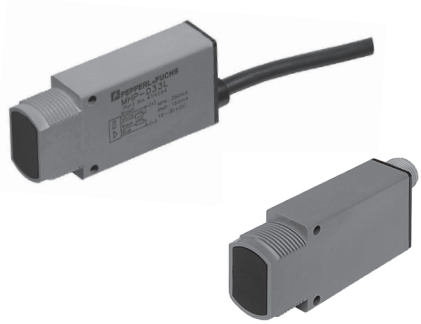







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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Light/dark switch | ✔ |
| Sensitivity adjustment | ✔ |
| Effective detection range | 0 ... 30.4 m |
| Light type | modulated infrared light |
| Ambient temperature | -30 ... 70 °C (-22 ... 158 °F) |
| Housing | Polysulphone |
| Optical face | Polycarbonate |
| Protection degree | IP69K |

| Model Number | | MHP-TLE30L | MHP-TLR33L | MHP-TE2AL | MHP-TR2AL | MHP-TLE30Q | MHP-TLR33Q | MHP-TE2AQ | MHP-TR2AQ |
|---|---|---|---|---|---|---|---|---|---|
| Emitter | | ● | | ● | | ● | | ● | |
| Receiver | | | ● | | ● | | ● | | ● |
| Operating voltage | 10 ... 30 V DC | ● | | | | ● | | | |
| | 20 ... 260 V, 50 ... 60 Hz | | | ● | | | | | ● |
| No-load supply current | ≤ 35 mA | ● | | | | ● | | | |
| | ≤ 1.5 mA | | | ● | | | | | ● |
| Signal output | 1 NPN and 1 PNP | ● | | | | ● | | | |
| | Thyristor | | | ● | | | | | ● |
| Switching frequency | 500 Hz | ● | | | | ● | | | |
| | 60 Hz | | | ● | | | | | ● |
| Connection | 2 m fixed cable , PVC | ● | | | | | | | |
| | 3 m fixed cable , PVC | | | ● | | | | | |
| | connector M12 x 1, 4-pin | | | | | ● | | | |
| | Micro AC connector, 1/2" ; 3-pin | | | | | | | | ● |





| Approvals and Certificates | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | ● | | | | ● | | | |

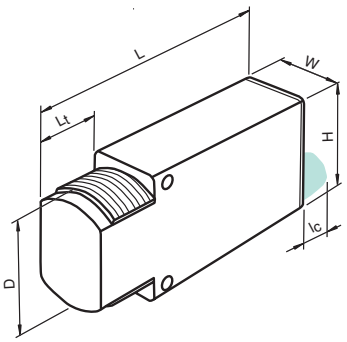
| Dimensions | | |
|---|---|---|
| Length L [mm] | 64.8 | |
| Width W [mm] | 15.8 | |
| Height H [mm] | 30 | |
| Diameter D [mm] | 25.4 | |
| Thread length $l_t$ [mm] | 15.3 | |
| Connector length $l_c$ [mm] | 0 | 6.4 |

## Properties

- Thru-beam type
- Rectangular miniature housing
- Plastic housing
- DC and AC sensor versions
- Discrete output
- Cable and connector versions
- Infrared light

## Benefits

- Threaded face and side thru-holes provide flexible mounting options
- Rugged IP69k housing withstands harsh environments and high-pressure washdown areas




## Accessories

**These and more accessories can be found in chapter 10**

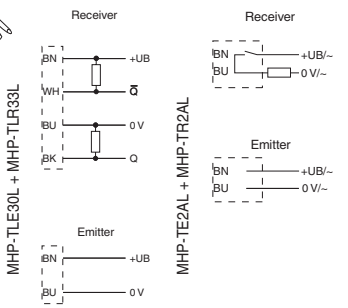
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **MHPHDW** | Mounting set |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |
| **V12-G-YE2M-PVC** | Female cordset, 1/2“ - 20 UNF, 3-pin, PUR cable, straight |
| **V12-W-YE2M-PVC** | Female cordset, 1/2“ - 20 UNF, 3-pin, PUR cable, angled |

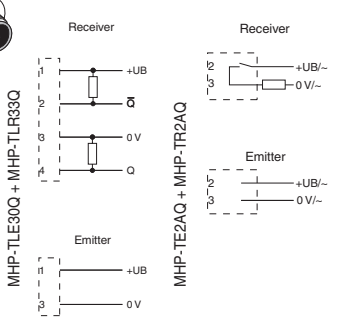
## Electrical Connection

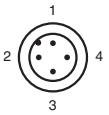
❍ = light on, ● = dark on





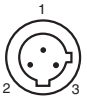



Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




Wire colors

| | | |
|---|---|---|
| 1 | GN | (green) |
| 2 | RD/BK | (red/black) |
| 3 | RD/WH | (red/white) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | ML10-8-H-3,2-IR/115 |
|---|---|
| Background suppression | ✔ |
| Detection range | 0.9 ... 2.2 mm |
| Light type | modulated infrared light , 870 nm |
| Diameter of the light spot | 2 mm at sensor range 2.2 mm |
| Operating voltage | see accessory: external amplifier |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | PC/ABS |
| Optical face | glass |
| Protection degree | IP65 |
| Connection | 2 m cable with 5-pin connector |

| Approvals and Certificates | |
|---|---|
| UL approval | cULus Recognized, Class 2 Power Source |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

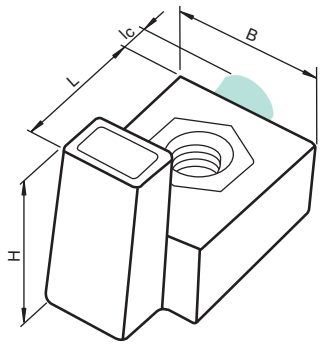
| Dimensions | |
|---|---|
| Length L [mm] | 20 |
| Width W [mm] | 12 |
| Height H [mm] | 14 |
| Connector length $l_c$ [mm] | 0 |

## Properties

- Background suppression
- Rectangular nano housing
- Plastic housing
- Requires external amplifier
- Cable version
- Infrared light

## Benefits

- Special miniature design fits under feeder tables
- Smallest rectangular background suppression sensor for space saving
- Almost as small as fiber optics, but much better performance
- Precision through maximum switching accuracy
- Simple mounting with only one screw




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

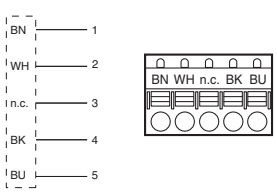
| | | |
|---|---|---|
| **SU100/25/145/165** | External amplifier for connection of up to 3 devices ML10 | |
| | Operating voltage | 10 ... 30 V DC |
| | No-load supply current | < 75 mA |
| | Signal output | 3 push-pull (4-in-1) outputs, short-circuit proof, reverse polarity protected |
| | Switching current | max. 100 mA |
| | Switching frequency | 1000 Hz |
| | Connection | removable spring terminals T1 - T4 |

## Electrical Connection

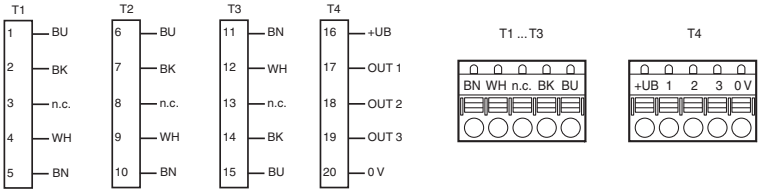
❍ = light on, ● = dark on

ML10-8-H-3,2-IR/115

ML10-8-H-3,2-IR/115*




SU100/25/145/165








Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

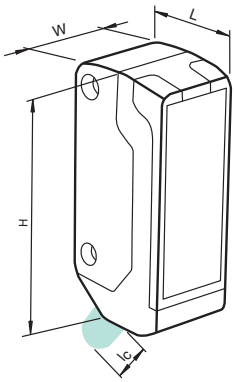


## Properties

- Background suppression
- Rectangular sub-miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and pigtailed connector versions
- Visible red light

## Benefits

- Reliable detection of all surfaces, regardless of color and texture
- Scratch-resistant, antistatic glass optical face
- Simple alignment and set-up with ultra-bright emitter LED
- Tamper-proof, no operating controls




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Light type | modulated visible red light , 630 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 10 mA |
| Switching type | NO contact |
| Switching current | max. 50 mA , resistive load |
| Switching frequency | approx. 800 Hz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Housing | PC/ABS and PBT |
| Optical face | glass |
| Protection degree | IP67 |

| Model Number | | OBT15-R2-E0 | OBT15-R2-E2 | OBT30-R2-E0 | OBT30-R2-E2 | OBT50-R2-E0 | OBT50-R2-E2 | OBT80-R2-E0 | OBT80-R2-E2 | OBT40-R2-E2-0,2M-V31 | OBT20-R2-E2-0,2M-V31 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Detection range | 2 ... 15 mm | ● | ● | | | | | | | | |
| | 4 ... 20 mm | | | | | | | | | | ● |
| | 1 ... 30 mm | | | ● | ● | | | | | | |
| | 2 ... 40 mm | | | | | | | | | ● | |
| | 3 ... 50 mm | | | | | ● | ● | | | | |
| | 10 ... 80 mm | | | | | | | ● | ● | | |
| Diameter of the light spot | approx. 2 mm at a distance of 15 mm | ● | ● | | | | | | | | |
| | approx. 2 mm at a distance of 20 mm | | | | | | | | | | ● |
| | approx. 2 mm at a distance of 30 mm | | | ● | ● | | | | | | |
| | approx. 2.5 mm at a distance of 40 mm | | | | | | | | | ● | |
| | approx. 3.5 mm at a distance of 50 mm | | | | | ● | ● | | | | |
| | approx. 5 mm at a distance of 80 mm | | | | | | | ● | ● | | |
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | | ● | | ● | | | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● | | ● | | ● | ● | ● |
| Connection | 2 m fixed cable | ● | ● | ● | ● | ● | ● | ● | ● | | |
| | 200 mm fixed cable with 4-pin, M8x1 connector | | | | | | | | | ● | ● |

| Approvals and Certificates | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| UL approval | cULus Recognized, Class 2 Power Source | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | | | | | |

| Dimensions | |
|---|---|
| Length L [mm] | 11.2 |
| Width W [mm] | 7.5 |
| Height H [mm] | 24 |
| Connector length $l_c$ [mm] | 0 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **MH-R2-01** | Mounting bracket |
| **MH-R2-02** | Mounting bracket |
| **MH-R2-03** | Mounting bracket |
| **MH-R2-04** | Mounting bracket |
| **V31-WM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, angled |
| **V31-GM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, straight |

## Electrical Connection

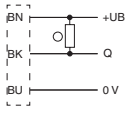
❍ = light on, ● = dark on



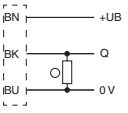
OBT15-R2-E0
OBT30-R2-E0
OBT50-R2-E0
OBT80-R2-E0

OBT15-R2-E2
OBT30-R2-E2
OBT50-R2-E2
OBT80-R2-E2

Option E0



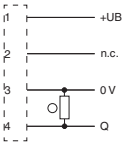

Option E2






OBT20-R2-E2-0,2M-V31
OBT40-R2-E2-0,2M-V31

Option E2







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background evaluation | ✔ |
| Light type | modulated visible red light , 630 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 10 mA |
| Switching type | NO contact |
| Switching current | max. 50 mA , resistive load |
| Switching frequency | approx. 800 Hz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Housing | PC/ABS and PBT |
| Optical face | glass |
| Protection degree | IP67 |
| Connection | 2 m fixed cable |



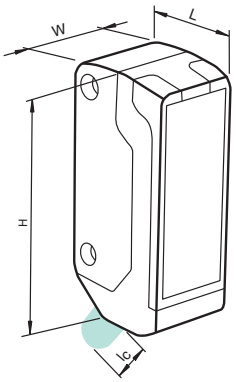
| Model Number | | OBT15-R2-E0-1T | OBT15-R2-E2-1T | OBT30-R2-E0-1T | OBT30-R2-E2-1T | OBT50-R2-E0-1T | OBT50-R2-E2-1T |
|---|---|---|---|---|---|---|---|
| Detection range | 0 ... 15 mm | ● | ● | | | | |
| | 0 ... 30 mm | | | ● | ● | | |
| | 0 ... 50 mm | | | | | ● | ● |
| Diameter of the light spot | approx. 2 mm at a distance of 15 mm | ● | ● | | | | |
| | approx. 2 mm at a distance of 30 mm | | | ● | ● | | |
| | approx. 3.5 mm at a distance of 50 mm | | | | | ● | ● |
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● | | ● |
| **Approvals and Certificates** | | | | | | | |
| UL approval | cULus Recognized, Class 2 Power Source | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |
| **Dimensions** | | | | | | | |
| Length L [mm] | | 11.2 | | | | | |
| Width W [mm] | | 7.5 | | | | | |
| Height H [mm] | | 24 | | | | | |
| Connector length $l_c$ [mm] | | 0 | | | | | |

## Properties

- Background evaluation
- Rectangular sub-miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable version
- Visible red light

## Benefits

- Improved detection of reflective materials, regardless of color and texture
- Scratch-resistant, antistatic glass optical face
- Simple alignment and set-up with ultra-bright emitter LED
- Tamper-proof, no operating controls




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **MH-R2-01** | Mounting bracket |
| **MH-R2-02** | Mounting bracket |
| **MH-R2-03** | Mounting bracket |
| **MH-R2-04** | Mounting bracket |

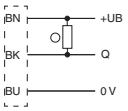
## Electrical Connection

❍ = light on, ● = dark on



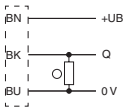
OBT15-R2-E0-1T
OBT30-R2-E0-1T
OBT50-R2-E0-1T

Option E0




OBT15-R2-E2-1T
OBT30-R2-E2-1T
OBT50-R2-E2-1T

Option E2







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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Test input | ✔ |
| Threshold detection range | 1.4 m |
| Effective detection range | 0 ... 1 m |
| Reference target | H40 reflector |
| Light type | modulated visible red light , 630 nm |
| Optical face | frontal |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 10 mA |
| Test input | emitter deactivation at 0 V |
| Switching type | NO contact |
| Switching current | max. 50 mA |
| Switching frequency | approx. 800 Hz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Housing | PC (Polycarbonate) |
| Optical face | glass |
| Protection degree | IP67 |

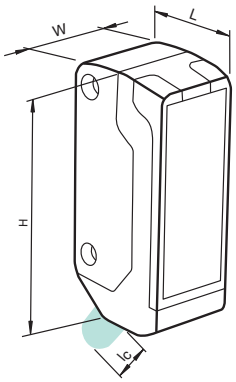
| Model Number | | OBR1000-R2-E0 | OBR1000-R2-E2 | OBR1000-R2-E2-0,2M-V31 |
|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | ● |
| Connection | 2 m fixed cable | ● | ● | |
| | 200 mm fixed cable with 4-pin, M8x1 connector | | | ● |
| | |  | |  |
| **Approvals and Certificates** | | | | |
| UL approval | cULus Recognized, Class 2 Power Source | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |
| **Dimensions** | | | | |
| Length L [mm] | | | 11.2 | |
| Width W [mm] | | | 7.5 | |
| Height H [mm] | | | 24 | |
| Connector length $l_c$ [mm] | | | 0 | |

## Properties

- Polarized type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and pigtailed connector versions
- Visible red light

## Benefits

- Scratch-resistant, antistatic glass optical face
- Simple alignment and set-up with ultra-bright emitter LED
- Tamper-proof, no operating controls
- 45° cable outlet provides greater mounting flexibility




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **MH-R2-01** | Mounting bracket |
| **MH-R2-02** | Mounting bracket |
| **MH-R2-03** | Mounting bracket |
| **MH-R2-04** | Mounting bracket |
| **V31-WM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, angled |
| **V31-GM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, straight |

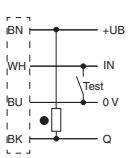
## Electrical Connection

❍ = light on, ● = dark on

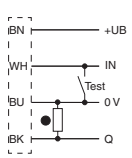


OBR1000-R2-E0 OBR1000-R2-E2

Option E0



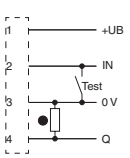

Option E2






OBR1000-R2-E2-0,2M-V31

Option E2







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Teach-In | ✔ |
| Threshold detection range | Long range mode: 2.5 m<br>High precision mode: 300 mm |
| Effective detection range | Long range mode: 0 ... 2 m<br>High precision mode: 0 ... 200 mm |
| Light type | modulated visible red light , 630 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | Emitter: ≤ 11 mA<br>Receiver: ≤ 8 mA |
| Switching type | NO contact |
| Switching current | max. 50 mA |
| Switching frequency | approx. 800 Hz |
| Control input | Emitter selection BK: not connected, Long Range mode BK: 0 V, High Precicion Mode |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Housing | PC (Polycarbonate) |
| Optical face | glass |
| Protection degree | IP67 |
| Connection | 2 m fixed cable |



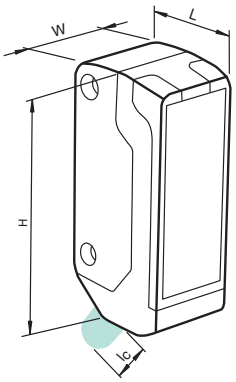
| Model Number | | OBE2000-R2<br>OBE2000-R2-E0 | OBE2000-R2<br>OBE2000-R2-E2 |
|---|---|---|---|
| Emitter | | ● | ● |
| Receiver | | ● | ● |
| Signal output | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● |
| | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | |
| **Approvals and Certificates** | | | |
| UL approval | cULus Recognized, Class 2 Power Source | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |
| **Dimensions** | | | |
| Length L [mm] | | 11.2 | |
| Width W [mm] | | 7.5 | |
| Height H [mm] | | 24 | |
| Connector length $l_c$ [mm] | | 0 | |

## Properties

- Thru-beam type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable version
- Visible red light

## Benefits

- Two in one sensor - Long operating range or high precision detection
- Unique Teach-In function for increased performance and accuracy
- Scratch-resistant, antistatic glass optical face
- Tamper-proof, no operating controls




## Accessories

These and more accessories can be found in chapter 10

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

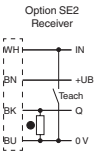
| | |
|---|---|
| **MH-R2-01** | Mounting bracket |
| **MH-R2-02** | Mounting bracket |
| **MH-R2-03** | Mounting bracket |
| **MH-R2-04** | Mounting bracket |

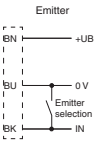
## Electrical Connection

❍ = light on, ● = dark on

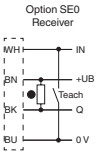


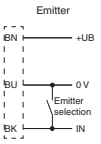
OBE2000-R2 + OBE2000-R2-E2




OBE2000-R2 + OBE2000-R2-E0







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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| 4-in-1 output | ✔ |
| Light/dark adjustment | ✔ |
| Light type | modulated visible red light , 660 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 25 mA |
| Switching type | light/dark on electrically switchable |
| Signal output | Push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | ABS |
| Optical face | glass pane |
| Protection degree | IP67 / IP69k |

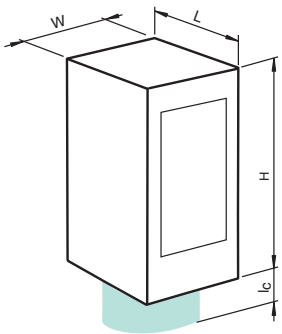
| Model Number | | ML4.2-8-H-20-RT/40b/110/115 | ML4.2-8-H-40-RT/40b/110/115 | ML4.2-8-H-60-RT/40b/110/115 | ML4.2-8-H-80-RT/40b/110/115 | ML4.2-8-H-20-RT/40b/95/110 | ML4.2-8-H-20-RT/40b/95/110/130 | ML4.2-8-H-40-RT/40b/95/110 | ML4.2-8-H-40-43-RT/40b/95/110 | ML4.2-8-H-60-RT/40b/95/110 | ML4.2-8-H-80-RT/40b/95/110 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Detection range | 7 ... 20 mm | ● | | | | ● | ● | | | | |
| | 10 ... 40 mm | | ● | | | | | ● | ● | | |
| | 10 ... 60 mm | | | ● | | | | | | ● | |
| | 10 ... 80 mm | | | | ● | | | | | | ● |
| Diameter of the light spot | approx. 1.5 mm at 20 mm | ● | | | | ● | ● | | | | |
| | approx. 3 mm at 40 mm | | ● | | | | | ● | ● | | |
| | approx. 4 mm at 60 mm | | | ● | | | | | | ● | |
| | approx. 6 mm at 80 mm | | | | ● | | | | | | ● |
| Switching frequency | 1000 Hz | ● | ● | ● | ● | ● | | ● | ● | ● | ● |
| | 2000 Hz | | | | | | ● | | | | |
| Connection | 2 m fixed cable | ● | ● | ● | ● | | | | | | |
| | M8 x 1 connector, 4-pin | | | | | ● | ● | ● | ● | ● | ● |
| | |  | | | |  | | | | | |
| **Approvals and Certificates** | | | | | | | | | | | |
| UL approval | cULus Listed | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | | | | | |
| **Dimensions** | | | | | | | | | | | |
| Length L [mm] | | 18 | | | | | | | | | |
| Width W [mm] | | 13.9 | | | | | | | | | |
| Height H [mm] | | 25.4 | | | | | | | | | |
| Connector length $l_c$ [mm] | | 7.5 | | | | 13.9 | | | | | |

## Properties

- Background suppression
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Reliable detection of all surfaces, regardless of color and texture
- Small, sharp light spots provide reliable, color insensitive object positioning
- Extremely sharp background suppression
- Antistatic optical face inhibits dust build-up in paper and printing applications




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

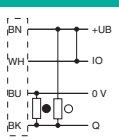
| | |
|---|---|
| **OMH-4.1** | Mounting Clamp |
| **OMH-ML6** | Mounting bracket |
| **OMH-ML6-U** | Mounting bracket |
| **OMH-ML6-Z** | Mounting bracket |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |

## Electrical Connection

❍ = light on, ● = dark on

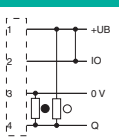


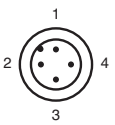
ML4.2-8-H-20-RT/40b/110/115
ML4.2-8-H-40-RT/40b/110/115
ML4.2-8-H-60-RT/40b/110/115
ML4.2-8-H-80-RT/40b/110/115





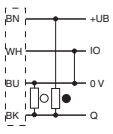

ML4.2-8-H-20-RT/40b/95/110
ML4.2-8-H-40-RT/40b/95/110
ML4.2-8-H-60-RT/40b/95/110
ML4.2-8-H-80-RT/40b/95/110
ML4.2-8-H-40-43-RT/40b/95/110

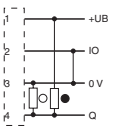



Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |






Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| 4-in-1 output | ✔ |
| Light/dark adjustment | ✔ |
| Light type | modulated infrared light , 880 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 25 mA |
| Switching type | light/dark on electrically switchable |
| Signal output | Push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | ABS |
| Optical face | glass pane |
| Protection degree | IP67 / IP69k |

| Model Number | | ML4.2-8-H-20-IR/40b/110/115 | ML4.2-8-H-40-IR/40b/110/115 | ML4.2-8-H-60-IR/40b/110/115 | ML4.2-8-H-80-IR/40b/110/115 | ML4.2-8-H-20-IR/40b/95/110 | ML4.2-8-H-21-22-IR/40b/95/110 | ML4.2-8-H-40-IR/40b/95/110 | ML4.2-8-H-60-IR/40b/95/110 | ML4.2-8-H-80-IR/40b/95/110 |
|---|---|---|---|---|---|---|---|---|---|---|
| Detection range | 7 ... 20 mm | ● | | | | ● | | | | |
| | 10 ... 20 mm | | | | | | ● | | | |
| | 10 ... 40 mm | | ● | | | | | ● | | |
| | 10 ... 60 mm | | | ● | | | | | ● | |
| | 10 ... 80 mm | | | | ● | | | | | ● |
| Diameter of the light spot | approx. 1.5 mm at 20 mm | ● | | | | ● | ● | | | |
| | approx. 3 mm at 40 mm | | ● | | | | | ● | | |
| | approx. 4 mm at 60 mm | | | ● | | | | | ● | |
| | approx. 6 mm at 80 mm | | | | ● | | | | | ● |
| Connection | 2 m fixed cable | ● | ● | ● | ● | | | | | |
| | M8 x 1 connector, 4-pin | | | | | ● | ● | ● | ● | ● |

| Approvals and Certificates | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| UL approval | cULus Listed | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | | | | | |

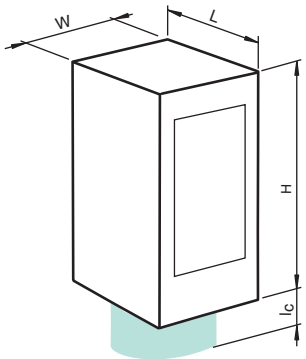
| Dimensions | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Length L [mm] | | | | | | 18 | | | | | |
| Width W [mm] | | | | | | 13.9 | | | | | |
| Height H [mm] | | | | | | 25.4 | | | | | |
| Connector length $l_c$ [mm] | | 7.5 | | | | 13.9 | | | | | |

## Properties

- Background suppression
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Infrared light

## Benefits

- Reliable detection of all surfaces, regardless of color and texture
- Small, sharp light spots provide reliable, color insensitive object positioning
- Extremely sharp background suppression
- Antistatic optical face inhibits dust build-up in paper and printing applications




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

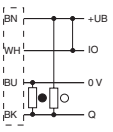
| | |
|---|---|
| **OMH-4.1** | Mounting clamp |
| **OMH-ML6** | Mounting bracket |
| **OMH-ML6-U** | Mounting bracket |
| **OMH-ML6-Z** | Mounting bracket |
| **V31-GM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, straight |
| **V31-WM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, angled |

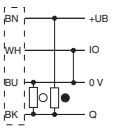
## Electrical Connection

❍ = light on, ● = dark on



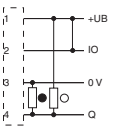
ML4.2-8-H-40-IR/40b/110/115
ML4.2-8-H-60-IR/40b/110/115
ML4.2-8-H-80-IR/40b/110/115
ML4.2-8-H-20-IR/40b/110/115

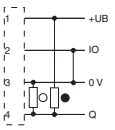





ML4.2-8-H-20-IR/40b/95/110
ML4.2-8-H-40-IR/40b/95/110
ML4.2-8-H-60-IR/40b/95/110
ML4.2-8-H-21-22-IR/40b/95/110
ML4.2-8-H-80-IR/40b/95/110
ML4.2-8-H-21-22-IR/40b/95/110







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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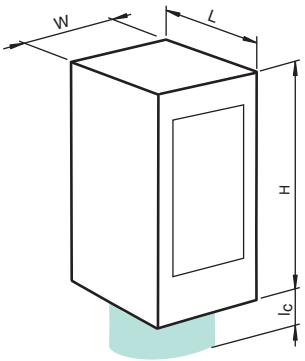


## Properties

- Background suppression with multiple beams
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Infrared light

## Benefits

- Dual sensor with two light spots
- Improved detection of transparent or reflective materials
- Simple 2-point edge control
- Antistatic optical face inhibits dust in paper and printing applications




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Multiple light spots | ✔ |
| Light type | modulated infrared light , 880 nm |
| Diameter of the light spot | 2 light spots, 5 mm apart, spotsize 2.5 mm at a distance of 20 mm (ML4.2-8-H-20...)<br>2 light spots, 9 mm apart, spotsize 3.5 mm at a distance of 40 mm (ML4.2-8-H-40...) |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 20 mA |
| Switching type | light/dark on electrically switchable |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | ABS |
| Optical face | glass pane |
| Protection degree | IP67 / IP69k |

| Model Number | | ML4.2-8-H-20-IR/DS/25/95/136 | ML4.2-8-H-20-IR/DS/40b/95/110 | ML4.2-8-H-40-IR/DS/40b/95/110 | ML4.2-8-H-40-IR/DS/40b/110/115 |
|---|---|---|---|---|---|
| Detection range | 10 ... 40 mm | | | ● | ● |
| | 7 ... 20 mm | ● | ● | | |
| 4-in-1 output | ✔ | | ● | ● | ● |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected | | ● | ● | ● |
| | 2 Push-pull outputs, short-circuit protected, reverse polarity protected | ● | | | |
| Connection | 2 m fixed cable | | | | ● |
| | M8 x 1 connector, 4-pin | ● | ● | ● | |
| | |  | | |  |
| **Approvals and Certificates** | | | | | |
| UL approval | cULus Listed | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |
| **Dimensions** | | | | | |
| Length L [mm] | | 18 | | | |
| Width W [mm] | | 13.9 | | | |
| Height H [mm] | | 25.4 | | | |
| Connector length $l_c$ [mm] | | 13.9 | | | 7.5 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-4.1** | Mounting Clamp |
| **OMH-ML6** | Mounting bracket |
| **OMH-ML6-U** | Mounting bracket |
| **OMH-ML6-Z** | Mounting bracket |
| **V31-GM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, straight |
| **V31-WM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, angled |

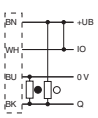
## Electrical Connection

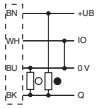
❍ = light on, ● = dark on

ML4.2-8-H-40-IR/DS/40b/110/115



Option 40b/110/115

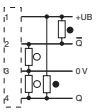



ML4.2-8-H-20-IR/DS/25/95/136

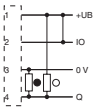


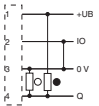
Option 25/95/136




ML4.2-8-H-20-IR/DS/40b/95/110
ML4.2-8-H-40-IR/DS/40b/95/110

Option 40b/95/110







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | ML4.2-54-F/40b/95/110 |
|---|---|
| Polarization filter | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Threshold detection range | 6 m |
| Effective detection range | 0 ... 5 m |
| Reference target | H85-2 reflector |
| Light type | modulated visible red light , 660 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 20 mA at 24 V DC |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching type | light/dark on electrically switchable |
| Switching current | max. 100 mA |
| Switching frequency | 1 kHz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | ABS |
| Optical face | glass pane |
| Protection degree | IP67 / IP69K |
| Connection | M8 x 1 connector, 4-pin |



| Approvals and Certificates | |
|---|---|
| UL approval | cULus Listed |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

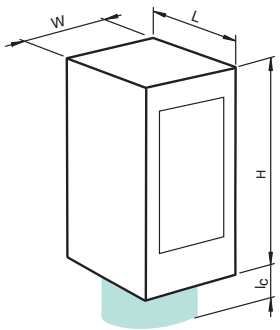
| Dimensions | |
|---|---|
| Length L [mm] | 18 |
| Width W [mm] | 13.9 |
| Height H [mm] | 25.4 |
| Connector length $l_c$ [mm] | 13.9 |

## Properties

- Polarized type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Connector version
- Visible red light

## Benefits

- Reflector distance down to 0 mm due to coaxial optics
- Scratch-resistant, antistatic glass optical face
- Simple alignment and set-up with ultra-bright emitter LED
- Tamper-proof, no operating controls
- Rugged housing with metal-reinforced mounting holes




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

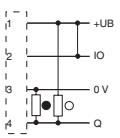
| | |
|---|---|
| **OMH-4.1** | Mounting Clamp |
| **OMH-ML6** | Mounting bracket |
| **OMH-ML6-Z** | Mounting bracket |
| **OMH-ML6-U** | Mounting bracket |
| **OMH-11-02 Aperture-V-H 0.5 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-04 Aperture-V-H 1.0 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-06 Aperture-V-H 1.5 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-08 Aperture-V-H 2.0 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **V31-GM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, straight |
| **V31-WM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, angled |
| **REF-H85-2** | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes |
| **REF-C110-2** | Reflector, round ø 84 mm, central mounting hole |
| **REF-H60** | Reflector, rectangular 40.5 mm x 60 mm, mounting holes |
| **REF-VR10** | Reflector, rectangular 60 mm x 19 mm, mounting holes |
| **OFR-100/100** | Reflective tape 100 mm x 100 mm |
| **REF-A17** | Reflector, round ø 20.5 mm, self-adhesive |

## Electrical Connection

❍ = light on, ● = dark on

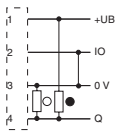


ML4.2-54-F/40b/95/110










Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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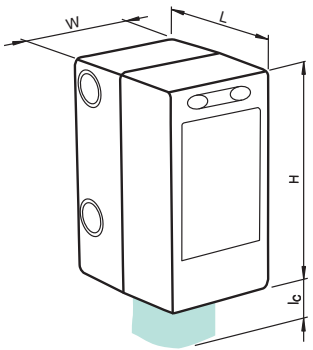


## Properties

- Clear object detection type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Reflector distance down to 0 mm due to coaxial optics
- Two in one sensor - high operating range or transparent object detection
- Scratch-resistant, antistatic glass optical face
- Simple alignment and set-up with ultra-bright emitter LED




## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Glass detection | ✔ |
| Teach-In | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Threshold detection range | 6 m |
| Effective detection range | 0 ... 3.5 m in TEACH mode 0 ... 5 m at switch position "N" |
| Reference target | H85-2 reflector |
| Light type | modulated visible red light , 660 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 15 mA at 24 V DC |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching type | light/dark on electrically switchable |
| Switching current | max. 100 mA |
| Switching frequency | 1 kHz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | ABS |
| Optical face | glass pane |
| Protection degree | IP67 / IP69K |

| Model Number | | ML4.2-54-G/40b/110/115 | ML4.2-54-G/40b/95/110 |
|---|---|---|---|
| Connection | 2 m fixed cable | ● | |
| | M8 x 1 connector, 4-pin | | ● |
| | |  |  |
| **Approvals and Certificates** | | | |
| UL approval | cULus Listed | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |
| **Dimensions** | | | |
| Length L [mm] | | 18 | |
| Width W [mm] | | 13.9 | |
| Height H [mm] | | 25.4 | |
| Connector length $l_c$ [mm] | | 7.7 | 13.9 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

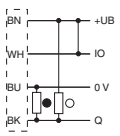
| | |
|---|---|
| **OMH-4.1** | Mounting Clamp |
| **OMH-ML6** | Mounting bracket |
| **OMH-ML6-Z** | Mounting bracket |
| **OMH-ML6-U** | Mounting bracket |
| **OMH-11-02 Aperture-V-H 0.5 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-04 Aperture-V-H 1.0 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-06 Aperture-V-H 1.5 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-08 Aperture-V-H 2.0 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **V31-GM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, straight |
| **REF-H85-2** | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes |
| **V31-WM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, angled |
| **REF-C110-2** | Reflector, round ø 84 mm, central mounting hole |
| **REF-H60-2** | Reflector with mounting holes |
| **REF-VR10** | Reflector, rectangular 60 mm x 19 mm, mounting holes |
| **OFR-100/100** | Reflective tape 100 mm x 100 mm |

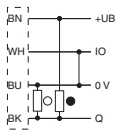
## Electrical Connection

❍ = light on, ● = dark on

ML4.2-54-G/40b/110/115

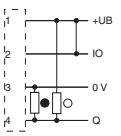


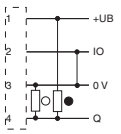



ML4.2-54-G/40b/95/110









Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | |
|---|---|
| Emitter | **M4.2-8000-RT/76a/95** |
| Receiver | **MV4.2-8000-RT/40b/95/110** |
| Light/dark adjustment | ✔ |
| Sensitivity adjustment | ✔ |
| Test input | ✔ |
| 4-in-1 output | ✔ |
| Threshold detection range | 10000 mm |
| Effective detection range | 0 ... 8000 mm |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 15 mA at 24 V DC |
| Switching type | light/dark on electrically switchable |
| Signal output | Push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 2000 Hz |
| Test input | emitter deactivation at $+U_B$ |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | ABS |
| Optical face | glass pane |
| Protection degree | IP67 / IP69k |
| Connection | M8 x 1 connector, 4-pin |



| Approvals and Certificates | |
|---|---|
| UL approval | cULus Listed, General Purpose |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

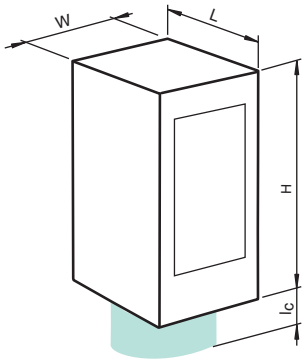
| Dimensions | |
|---|---|
| Length L [mm] | 18 |
| Width W [mm] | 13.9 |
| Height H [mm] | 25.4 |
| Connector length $l_c$ [mm] | 16.6 |

## Properties

- **Thru-beam type**
- **Rectangular miniature housing**
- **Plastic housing**
- **Discrete output**
- **Connector version**
- **Visible red light**

## Benefits

- **Scratch-resistant, antistatic glass optical face**
- **Mount from back surface without additional mounting accessories**




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-4.1** | Mounting Clamp |
| **OMH-ML6** | Mounting bracket |
| **OMH-ML6-U** | Mounting bracket |
| **OMH-ML6-Z** | Mounting bracket |
| **OMH-11-02 Aperture-V-H 0.5 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-04 Aperture-V-H 1.0 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-06 Aperture-V-H 1.5 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-08 Aperture-V-H 2.0 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **V31-GM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, straight |
| **V31-WM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, angled |

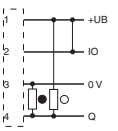
## Electrical Connection

❍ = light on, ● = dark on

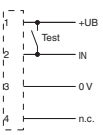


M4.2-8000-RT/76a/95 + MV4.2-8000-RT/40b/95/110

Receiver

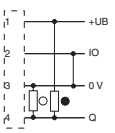



Transmitter










Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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## Properties

- Background suppression
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Reliable detection of all surfaces, regardless of color and texture
- Small, sharp light spots provide reliable, color insensitive object positioning
- Extremely sharp background suppression

## Technical Data

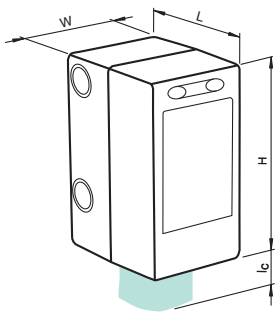
*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Light type | modulated visible red light , 660 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 25 mA |
| Switching type | light/dark on electrically switchable |
| Signal output | 2 Push-pull (4-in-1) outputs, complementary, short-circuit proof, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | ABS |
| Optical face | PMMA |
| Protection degree | IP67 / IP69k |

| Model Number | | ML6-8-H-20-RT/59/115/136 | ML6-8-H-40-RT/59/115/136 | ML6-8-H-60-RT/59/115/136 | ML6-8-H-80-RT/59/115/136 | ML6-8-H-120-RT/59/65a/115/136 | ML6-8-H-20-RT/59/95/136 | ML6-8-H-40-RT/59/95/136 | ML6-8-H-60-RT/59/95/136 | ML6-8-H-80-RT/59/95/136 | ML6-8-H-120-RT/59/65a/95/136 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Detection range | 7 ... 20 mm | ● | | | | | ● | | | | |
| | 10 ... 40 mm | | ● | | | | | ● | | | |
| | 10 ... 60 mm | | | ● | | | | | ● | | |
| | 10 ... 80 mm | | | | ● | | | | | ● | |
| | 15 ... 120 mm, adjustable | | | | | ● | | | | | ● |
| Diameter of the light spot | approx. 1.5 mm at 20 mm | ● | | | | | ● | | | | |
| | approx. 3 mm at 40 mm | | ● | | | | | ● | | | |
| | approx. 4 mm at 60 mm | | | ● | | | | | ● | | |
| | approx. 6 mm at 80 mm | | | | ● | | | | | ● | |
| | approx. 5 mm at 120 mm | | | | | ● | | | | | ● |
| Connection | 2 m fixed cable | ● | ● | ● | ● | ● | | | | | |
| | M8 x 1 connector, 4-pin | | | | | | ● | ● | ● | ● | ● |

| Approvals and Certificates | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| UL approval | cULus Listed | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | | | | | |

| Dimensions | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Length L [mm] | 18 | | | | | | | | | | |
| Width W [mm] | 13.9 | | | | | | | | | | |
| Height H [mm] | 25.4 | | | | | | | | | | |
| Connector length $l_c$ [mm] | 7.5 | | | | | 13.9 | | | | | |




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-4.1** | Mounting Clamp |
| **OMH-ML6** | Mounting bracket |
| **OMH-ML6-U** | Mounting bracket |
| **V31-GM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, straight |
| **V31-WM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, angled |

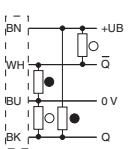
## Electrical Connection

❍ = light on, ● = dark on



ML6-8-H-60-RT/59/115/136
ML6-8-H-80-RT/59/115/136
ML6-8-H-20-RT/59/115/136
ML6-8-H-40-RT/59/115/136
ML6-8-H-120-RT/59/65a/115/136

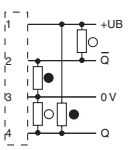
Option 59/115/136






ML6-8-H-60-RT/59/95/136
ML6-8-H-80-RT/59/95/136
ML6-8-H-20-RT/59/95/136
ML6-8-H-40-RT/59/95/136
ML6-8-H-120-RT/59/65a/95/136

Option 59/95/136







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Detection range | 15 ... 150 mm |
| Adjustment range | 30 ... 150 mm |
| Light type | modulated visible red light , 660 nm |
| Diameter of the light spot | approx. 6 mm at detection range 150 mm |
| Operating voltage | 10 ... 30 V DC , class 2 |
| Switching type | light/dark on electrically switchable |
| No-load supply current | < 25 mA |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | ABS |
| Optical face | PMMA |
| Protection degree | IP67 / IP69k |

| Model Number | | ML6-8-H-150-RT/59/65a/115/136 | ML6-8-H-150-RT/59/65a/115b/136 | ML6-8-H-150-RT/40b/65a/95/110 |
|---|---|---|---|---|
| Signal output | Push-pull (4-in-1) output, short-circuit protected, reverse polarity protected | | | ● |
| | 2 Push-pull (4-in-1) outputs, complementary, short-circuit proof, reverse polarity protected | ● | ● | |
| Connection | 2 m fixed cable | ● | | |
| | 300 mm fixed cable with M12 x 1, 4-pin connector | | ● | |
| | M8 x 1 connector, 4-pin | | | ● |
| | |  |  |  |
| **Approvals and Certificates** | | | | |
| UL approval | cULus Listed | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |

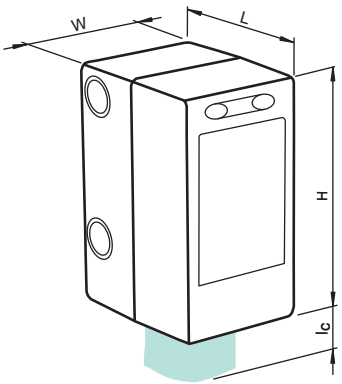
| Dimensions | | |
|---|---|---|
| Length L [mm] | 18 | |
| Width W [mm] | 13.9 | |
| Height H [mm] | 25.4 | |
| Connector length $l_c$ [mm] | 7.5 | 13.9 |

## Properties

- Background suppression
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable, connector and pigtailed connector versions
- Visible red light

## Benefits

- Reliable detection of all surfaces, regardless of color and texture
- Minimal black/white difference
- Sharp background suppression
- Adjustable switchpoint




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-4.1** | Mounting Clamp |
| **OMH-ML6** | Mounting bracket |
| **OMH-ML6-U** | Mounting bracket |
| **V31-GM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, straight |
| **V31-WM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, angled |
| **V1-G-2M-PVC** | Female cordset, M12, 4-pin, PVC cable, straight |
| **V1-W-2M-PVC** | Female cordset, M12, 4-pin, PVC cable, angled |

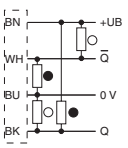
## Electrical Connection

❍ = light on, ● = dark on

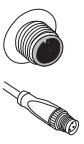
ML6-8-H-150-RT/59/65a/115/136



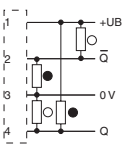
Option 59/115/136




ML6-8-H-150-RT/59/65a/115b/136

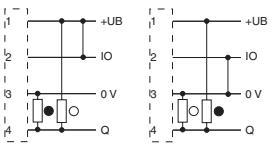


Option 59/115b/136




ML6-8-H-150-RT/40b/65a/95/110

Option 40b/95/110







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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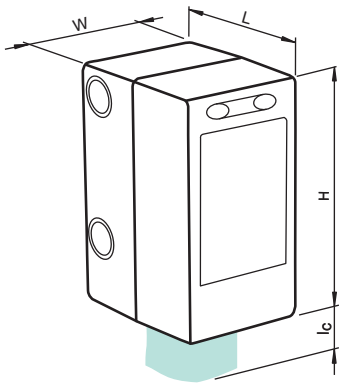


## Properties

- Background suppression with multiple beams
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Dual sensor with two light spots
- Improved detection of transparent or reflective materials and 2-point edge control




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Multiple light spots | ✔ |
| Light type | 660 nm visible red light |
| Diameter of the light spot | 2 light spots, 5 mm apart, spotsize 2.5 mm at a distance of 20 mm (ML6-8-H-20...)<br>2 light spots, 9 mm apart, spotsize 3.5 mm at a distance of 40 mm (ML6-8-H-40...) |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 20 mA |
| Switching type | light on: PNP/dark on: NPN |
| Signal output | 2 Push-pull outputs, short-circuit protected, reverse polarity protection |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | ABS |
| Optical face | PMMA |
| Protection degree | IP67 / IP69k |

| Model Number | | ML6-8-H-40-RT/DS/25/115/136 | ML6-8-H-20-RT/DS/25/95/136 | ML6-8-H-40-RT/DS/25/95/136 |
|---|---|---|---|---|
| Detection range | 7 ... 20 mm | | ● | |
| | 10 ... 40 mm | ● | | ● |
| Connection | 2 m fixed cable | ● | | |
| | M8 x 1 connector, 4-pin | | ● | ● |

| Approvals and Certificates | | | | |
|---|---|---|---|---|
| UL approval | cULus Listed | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |

| Dimensions | | | |
|---|---|---|---|
| Length L [mm] | 18 | | |
| Width W [mm] | 13.9 | | |
| Height H [mm] | 25.4 | | |
| Connector length $l_c$ [mm] | 7.5 | 13.9 | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-4.1** | Mounting Clamp |
| **OMH-ML6** | Mounting bracket |
| **OMH-ML6-U** | Mounting bracket |
| **OMH-ML6-Z** | Mounting bracket |
| **V31-GM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, straight |
| **V31-WM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, angled |

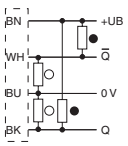
## Electrical Connection

❍ = light on, ● = dark on



ML6-8-H-40-RT/DS/25/115/136

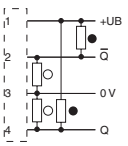
Option 25/115/136






ML6-8-H-20-RT/DS/25/95/136
ML6-8-H-40-RT/DS/25/95/136

Option 25/95/136







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Threshold detection range | 6 m |
| Effective detection range | 0 ... 5 m |
| Reference target | H85-2 reflector |
| Light type | modulated visible red light , 660 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 20 mA at 24 V DC |
| Signal output | 2 Push-pull (4-in-1) outputs, complementary, short-circuit proof, reverse polarity protected |
| Switching type | light/dark on electrically switchable |
| Switching current | max. 100 mA |
| Switching frequency | 1 kHz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | ABS |
| Optical face | PMMA |
| Protection degree | IP67 / IP69k |

| Model Number | | ML6-54-F/25/115/136 | ML6-54-F/25/95/136 |
|---|---|---|---|
| Connection | 2 m fixed cable | ● | |
| | M8 x 1 connector, 4-pin | | ● |

| Approvals and Certificates | | | | | |
|---|---|---|---|---|---|
| UL approval | cULus Listed | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |

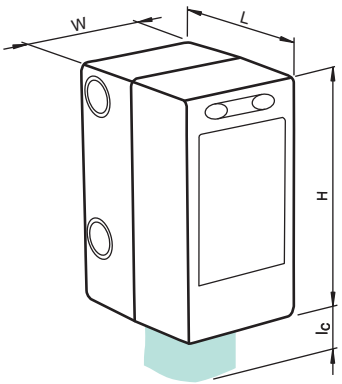
| Dimensions | | |
|---|---|---|
| Length L [mm] | 18 | |
| Width W [mm] | 13.9 | |
| Height H [mm] | 25.4 | |
| Connector length $l_c$ [mm] | 7.5 | 13.9 |

## Properties

- Polarized type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Reflector distance down to 0 mm due to coaxial optics




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-4.1** | Mounting Clamp |
| **OMH-ML6** | Mounting bracket |
| **OMH-ML6-Z** | Mounting bracket |
| **OMH-ML6-U** | Mounting bracket |
| **OMH-11-02 Aperture-V-H 0.5 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-04 Aperture-V-H 1.0 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-06 Aperture-V-H 1.5 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-08 Aperture-V-H 2.0 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **REF-H85-2** | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes |
| **REF-C110-2** | Reflector, round ø 84 mm, central mounting hole |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |

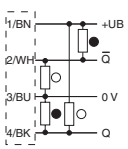
## Electrical Connection

❍ = light on, ● = dark on

ML6-54-F/25/115/136



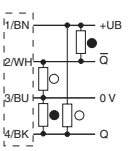
Option 25/136




ML6-54-F/25/95/136



Option 25/136







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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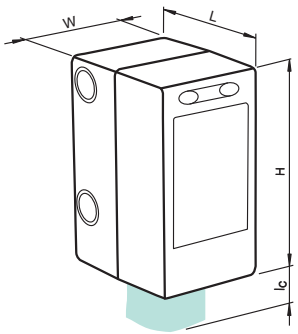


## Properties

- Clear object detection type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Reflector distance down to 0 mm due to coaxial optics
- Two in one sensor - high operating range or transparent object detection
- 3 selectable contrast levels
- Most relaible detection of PET-bottles
- Automatic threshold adjustment compensates for presence of dust and moisture




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Glass detection | ✔ |
| Teach-In | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Threshold detection range | 6 m |
| Effective detection range | 0 ... 3.5 m in TEACH mode 0 ... 5 m at switch position "N" |
| Reference target | H85-2 reflector |
| Light type | modulated visible red light , 660 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 15 mA at 24 V DC |
| Signal output | 2 Push-pull (4-in-1) outputs, complementary, short-circuit proof, reverse polarity protected |
| Switching type | light/dark on electrically switchable |
| Switching current | max. 100 mA |
| Switching frequency | 1 kHz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | ABS |
| Optical face | PMMA |
| Protection degree | IP67 / IP69k |

| Model Number | | ML6-54-G/25/115/136 | ML6-54-G/25/95/136 |
|---|---|---|---|
| Connection | 2 m fixed cable | ● | |
| | M8 x 1 connector, 4-pin | | ● |
| | |  |  |
| **Approvals and Certificates** | | | |
| UL approval | cULus Listed | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |

| Dimensions | | |
|---|---|---|
| Length L [mm] | 18 | |
| Width W [mm] | 13.9 | |
| Height H [mm] | 25.4 | |
| Connector length $l_c$ [mm] | 7.5 | 13.9 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-4.1** | Mounting Clamp |
| **OMH-ML6** | Mounting bracket |
| **OMH-ML6-U** | Mounting bracket |
| **OMH-ML6-Z** | Mounting bracket |
| **REF-H85-2** | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes |
| **REF-C110-2** | Reflector, round ø 84 mm, central mounting hole |
| **OFR-100/100** | Reflective tape 100 mm x 100 mm |
| **REF-MH23** | Reflector with Micro-structure, rectangular 23 mm x 13.8 mm, diagonal mounting hole |
| **REF-H50HT** | Reflector, rectangular 50.9 mm x 50.9 mm, mounting holes, fixing strap |
| **OMH-11-02 Aperture-V-H 0.5 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-04 Aperture-V-H 1.0 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-06 Aperture-V-H 1.5 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-08 Aperture-V-H 2.0 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |

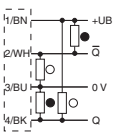
## Electrical Connection

❍ = light on, ● = dark on



ML6-54-G/25/115/136

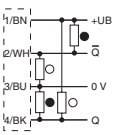
Option 25/136






ML6-54-G/25/95/136

Option 25/136







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Light/dark adjustment | ✔ |
| Sensitivity adjustment | ✔ |
| 4-in-1 output | ✔ |
| Test input | ✔ |
| Threshold detection range | 10000 mm |
| Effective detection range | 0 ... 8000 mm |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 15 mA at 24 V DC |
| Switching type | light/dark on electrically switchable |
| Signal output | 2 push-pull (4-in-1) outputs, complementary, short-circuit proof, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 1 kHz |
| Test input | emitter deactivation at $+U_B$ |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | ABS |
| Optical face | PMMA |
| Protection degree | IP67 / IP69K |

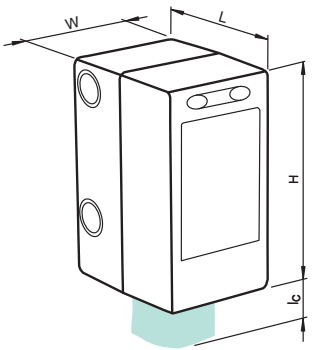
| Model Number | | ML6-T-8m-RT/76a/115<br>ML6-R/25/115/136 | ML6-T-8m-RT/76a/95<br>ML6-R/25/95/136 |
|---|---|---|---|
| Emitter | | ● | ● |
| Receiver | | ● | ● |
| Connection | 2 m fixed cable | ● | |
| | M8 x 1 connector, 4-pin | | ● |
| | |  |  |

| Approvals and Certificates | | | |
|---|---|---|---|
| UL approval | cULus Listed | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |

| Dimensions | | |
|---|---|---|
| Length L [mm] | 18 | |
| Width W [mm] | 13.9 | |
| Height H [mm] | 25.4 | |
| Connector length $l_c$ [mm] | 7.5 | 13.9 |

## Properties

- Thru-beam type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

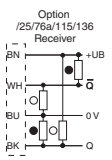
| | |
|---|---|
| **OMH-4.1** | Mounting Clamp |
| **OMH-ML6** | Mounting bracket |
| **OMH-ML6-U** | Mounting bracket |
| **OMH-ML6-Z** | Mounting bracket |
| **OMH-11-02 Aperture-V-H 0.5 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-04 Aperture-V-H 1.0 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-06 Aperture-V-H 1.5 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **OMH-11-08 Aperture-V-H 2.0 mm** | Slit diaphragm can be affixed for detecting very small parts |
| **V31-GM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, straight |
| **V31-WM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, angled |

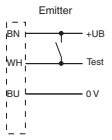
## Electrical Connection

❍ = light on, ● = dark on

ML6-T-8m-RT/76a/115 +
ML6-R/25/115/136

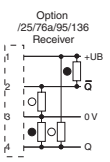


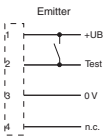



ML6-T-8m-RT/76a/95 +
ML6-R/25/95/136









Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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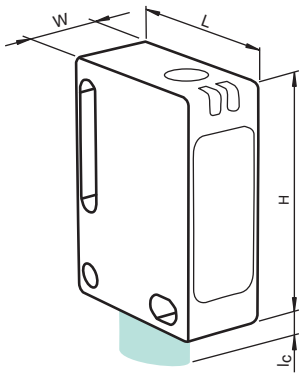


## Properties

- Background suppression
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable, connector and pigtailed connector versions
- Visible red light

## Benefits

- Slotted mounting holes provide flexible mounting options
- Reliable detection of all surfaces, regardless of color and texture
- Minimal black/white difference
- Sharp background suppression
- Adjustable switchpoint
- ECOLAB certificate




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Detection range | 5 ... 140 mm |
| Adjustment range | 25 ... 140 mm |
| Light type | modulated visible red light |
| Diameter of the light spot | approx. 5 mm at detection range 120 mm |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 20 mA |
| Switching type | light/dark on electrically switchable |
| Signal output | 2 Push-pull (4-in-1) outputs, complementary, short-circuit proof, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 1 kHz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 / IP69K |

| Model Number | | ML7-8-H-140-RT/59/65a/115/136 | ML7-8-H-140-RT/59/65a/115b/136 | ML7-8-H-140-RT/59/65a/136/143 |
|---|---|---|---|---|
| Connection | 2 m fixed cable | ● | | |
| | 200 mm fixed cable with 4-pin, M12x1 connector | | ● | |
| | M8 x 1 connector, 4-pin | | | ● |
| | |  |  |  |
| **Approvals and Certificates** | | | | |
| Protection class | II | ● | ● | ● |
| UL approval | cULus | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |
| **Dimensions** | | | | |
| Length L [mm] | | 23 | | |
| Width W [mm] | | 11 | | |
| Height H [mm] | | 31 | | |
| Connector length $l_c$ [mm] | | 7.6 | | 9.1 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-ML7-01-KIT** | Mounting set consisting of bracket OMH-ML-01 sheet OMH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

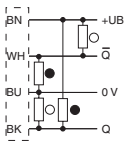
## Electrical Connection

❍ = light on, ● = dark on

ML7-8-H-140-RT/59/65a/115/136



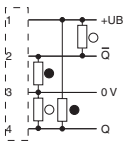
Option 59/115/136




ML7-8-H-140-RT/59/65a/115b/136



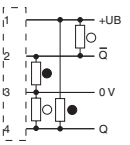
Option 59/115b/136

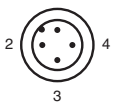



ML7-8-H-140-RT/59/65a/136/143



Option 59/136/143




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Light type | modulated infrared light |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 20 mA |
| Switching type | light/dark on electrically switchable |
| Signal output | 2 push-pull (4-in-1) outputs, complementary, short-circuit proof, reverse polarity protected |
| Switching current | max. 100 mA |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 / IP69K |

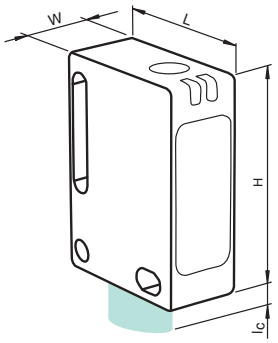
| Model Number | | ML7-8-H-140-IR/59/65a/115/136 | ML7-8-H-140-IR/59/65a/115b/136 | ML7-8-H-140-IR/59/65a/136/143 | ML7-8-H-350-IR/59/65a/136/143 |
|---|---|---|---|---|---|
| Detection range | 4 ... 140 mm | ● | ● | ● | |
| | 5 ... 350 mm | | | | ● |
| Adjustment range | 25 ... 140 mm | ● | ● | ● | |
| | 25 ... 350 mm | | | | ● |
| Diameter of the light spot | approx. 15 mm at detection range 350 mm | | | | ● |
| | approx. 5 mm at detection range 120 mm | ● | ● | ● | |
| Switching frequency | 1 kHz | ● | ● | ● | |
| | 250 Hz | | | | ● |
| Connection | 2 m fixed cable | ● | | | |
| | fixed cable 200 mm with M12 connector, 4-pin | | ● | | |
| | M8 x 1 connector, 4-pin | | | ● | ● |
| **Approvals and Certificates** | | | | | |
| Protection class | II | ● | ● | ● | ● |
| UL approval | cULus | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |
| **Dimensions** | | | | | |
| Length L [mm] | | 23 | | | |
| Width W [mm] | | 11 | | | |
| Height H [mm] | | 31 | | | |
| Connector length $l_c$ [mm] | | 7.6 | | 9.1 | |

## Properties

- Background suppression
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector and pigtailed connector versions
- Infrared light

## Your Benefit

- Slotted mounting holes provide flexible mounting options
- Reliable detection of all surfaces, regardless of color and texture
- Minimal black/white difference
- Sharp background suppression
- Adjustable switchpoint
- ECOLAB certificate




## Accessories

**These and more accessories can be found in chapter 10**
**See pages from 970 ... for cordsets  See pages 1066 ... for mounting accessories**

| | |
|---|---|
| **OMH-ML7-01-KIT** | Mounting set consisting of bracket OMH-ML-01 sheet OMH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V31-GM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, straight |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |

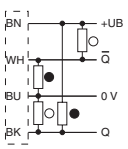
## Electrical Connection

❍ = light on, ● = dark on

ML7-8-H-140-IR/59/65a/115/136



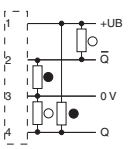
Option 59/115/136




ML7-8-H-140-IR/59/65a/136/143
ML7-8-H-350-IR/59/65a/136/143



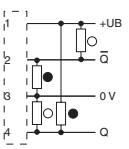
Option 59/136/143




ML7-8-H-140-IR/59/65a/115b/136

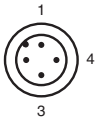


Option 59/115b/136










Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Teach-In | ✔ |
| Detection range | 20 ... 200 mm |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 20 mA |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 / IP69K |

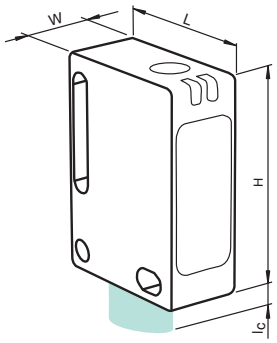
| Model Number | | ML7-8-200/25/102/115 | ML7-8-200/25/103/115 | ML7-8-200/59/102/115 | ML7-8-200/59/103/115 | ML7-8-200/25/103/115b | ML7-8-200/25/102/143 | ML7-8-200/25/103/143 |
|---|---|---|---|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● | ● | | ● |
| Switching type | dark on | | | ● | ● | | | |
| | light on | ● | ● | | | ● | ● | ● |
| Connection | 2 m fixed cable | ● | ● | ● | ● | | | |
| | fixed cable 200 mm with M12 connector, 4-pin | | | | | ● | | |
| | M8 x 1 connector, 4-pin | | | | | | ● | ● |
| | |  | | | |  |  | |
| **Approvals and Certificates** | | | | | | | | |
| Protection class | II | ● | ● | ● | ● | ● | ● | ● |
| UL approval | cULus | ● | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | | |
| **Dimensions** | | | | | | | | |
| Length L [mm] | | 23 | | | | | | |
| Width W [mm] | | 11 | | | | | | |
| Height H [mm] | | 31 | | | | | | |
| Connector length $l_c$ [mm] | | 7.6 | | | | | 9.1 | |

## Properties

- Diffuse type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable, connector and pigtailed connector versions
- Visible red light

## Your Benefit

- Slotted mounting holes provide flexible mounting options
- ECOLAB certificate




## Accessories

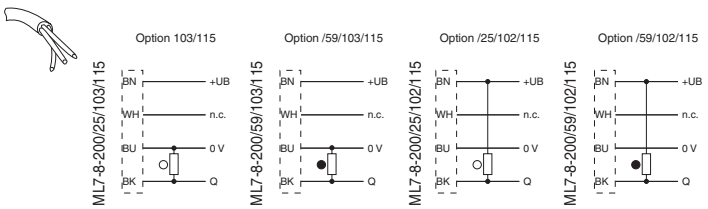
**These and more accessories can be found in chapter 10**

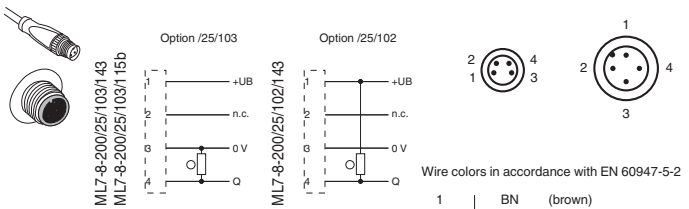
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-ML7-01-KIT** | Mounting set consisting of bracket OMH-ML-01 sheet OMH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V31-WM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, angled |
| **V31-GM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, straight |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

## Electrical Connection

❍ = light on, ● = dark on







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Teach-In | ✔ |
| Threshold detection range | 3.5 m |
| Effective detection range | 0 ... 3 m |
| Light type | modulated visible red light , 635 nm |
| Reference target | H85-2 reflector |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 20 mA |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 / IP69K |

| Model Number | | ML7-55/59/102/115 | ML7-55/25/102/115 | ML7-55/59/103/115 | ML7-55/59/102/143 | ML7-55/59/103/143 | ML7-55/25/103/143 |
|---|---|---|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | ● | | ● | | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | | ● | | ● | ● |
| Switching type | dark on | ● | | ● | ● | ● | |
| | light on | | ● | | | | ● |
| Connection | 2 m fixed cable | ● | ● | ● | | | |
| | M8 x 1 connector, 4-pin | | | | ● | ● | ● |





| Approvals and Certificates | | | | | | | |
|---|---|---|---|---|---|---|---|
| Protection class | II | ● | ● | ● | ● | ● | ● |
| UL approval | cULus | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |

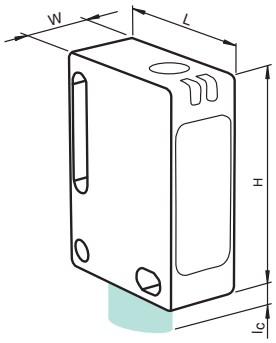
| Dimensions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Length L [mm] | | | | 23 | | | |
| Width W [mm] | | | | 11 | | | |
| Height H [mm] | | | | 31 | | | |
| Connector length $l_c$ [mm] | | 7.6 | | | 9.1 | | |

## Properties

- Polarized type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red and infrared light versions

## Benefits

- Slotted mounting holes provide flexible mounting options
- ECOLAB certificate




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets  See pages 1066 ... for mounting accessories

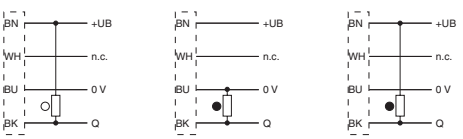
| | |
|---|---|
| **OMH-ML7-01-KIT** | Mounting set consisting of bracket OMH-ML-01 sheet OMH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V31-WM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, angled |
| **V31-GM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, straight |

## Electrical Connection

❍ = light on, ● = dark on

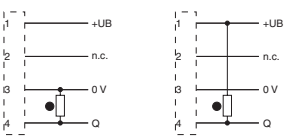


ML7-55/25/102/115 ML7-55/59/103/115 ML7-55/59/102/115






ML7-55/59/103/143 ML7-55/25/103/143 ML7-55/59/102/143







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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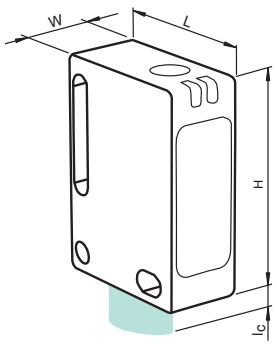


## Properties

- Non-polarized type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Slotted mounting holes provide flexible mounting options
- ECOLAB certificate




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Teach-In | ✔ |
| Threshold detection range | 3.5 m |
| Effective detection range | 0 ... 3 m |
| Reference target | H85-2 reflector |
| Light type | modulated visible red light , 635 nm |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 20 mA |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 / IP69K |

| Model Number | | ML7-6/59/102/115 | ML7-6/25/102/115 | ML7-6/59/103/115 | ML7-6/59/102/143 | ML7-6/59/103/143 |
|---|---|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | ● | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | | ● | | ● |
| Switching type | dark on | ● | | ● | ● | ● |
| | light on | | ● | | | |
| Connection | 2 m fixed cable | ● | ● | ● | | |
| | M8 x 1 connector, 4-pin | | | | ● | ● |

| Approvals and Certificates | | | | | | |
|---|---|---|---|---|---|---|
| Protection class | II | ● | ● | ● | ● | ● |
| UL approval | cULus | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | |

| Dimensions | | | | | |
|---|---|---|---|---|---|
| Length L [mm] | 23 | | | | |
| Width W [mm] | 11 | | | | |
| Height H [mm] | 31 | | | | |
| Connector length $l_c$ [mm] | | 7.6 | | 9.1 | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

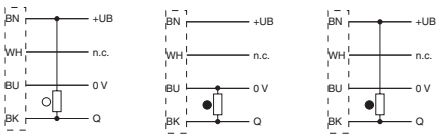
| | |
|---|---|
| **OMH-ML7-01-KIT** | Mounting set consisting of bracket OMH-ML-01 sheet OMH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V31-WM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, angled |
| **V31-GM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, straight |

## Electrical Connection

❍ = light on, ● = dark on

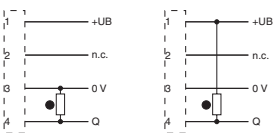


ML7-6/25/102/115 ML7-6/59/103/115 ML7-6/59/102/115






ML7-6/59/103/143 ML7-6/59/102/143







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Glass detection | ✔ |
| Teach-In | ✔ |
| Light/dark adjustment | ✔ |
| Threshold detection range | 7.6 m |
| Effective detection range | 0 ... 3.5 m in TEACH mode 0 ... 5.7 m at switch position "N" |
| Reference target | H85-2 reflector |
| Light type | modulated visible red light , 660 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | < 20 mA at 24 V DC |
| Switching type | light/dark on electrically switchable |
| Switching current | max. 100 mA |
| Switching frequency | 1 kHz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 / IP69K |

| Model Number | | ML7-54-G/25/136/115 | ML7-54-G/25/136/115b | ML7-54-G/25/110/123/143 | ML7-54-G/25/136/143 |
|---|---|---|---|---|---|
| 4-in-1 output | ✔ | ● | ● | | ● |
| Function input | Ext. Teach-In input (ET) | | | ● | |
| Signal output | 1 push-pull output, short-circuit protected, reverse polarity protected | | | ● | |
| | 2 push-pull (4-in-1) outputs, complementary, short-circuit proof, reverse polarity protected | ● | ● | | ● |
| Connection | 200 mm connecting cable with 4-pin, M12x1 connector | | ● | | |
| | 2 m fixed cable | ● | | | |
| | M8 x 1 connector, 4-pin | | | ● | ● |
| | |  |  |  | |
| **Approvals and Certificates** | | | | | |
| Protection class | II | ● | ● | ● | ● |
| UL approval | cULus | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |

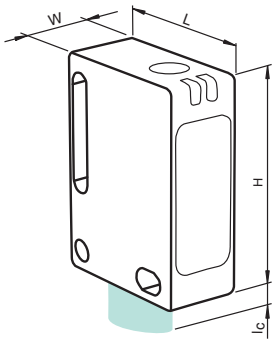
| Dimensions | | |
|---|---|---|
| Length L [mm] | 23 | |
| Width W [mm] | 11 | |
| Height H [mm] | 31 | |
| Connector length $l_c$ [mm] | 7.6 | 9.1 |

## Properties

- Clear object detection type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable, connector and pigtailed connector versions
- Visible red light

## Benefits

- Reflector distance down to 0 mm due to coaxial optics
- Two in one sensor - high operating range or transparent object detection
- Slotted mounting holes provide flexible mounting options
- ECOLAB certificate




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

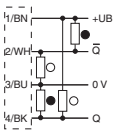
| | |
|---|---|
| **OMH-ML7-01-KIT** | Mounting set consisting of bracket OMH-ML-01 sheet OMH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, angled |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

## Electrical Connection

❍ = light on, ● = dark on

ML7-54-G/25/136/115

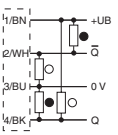




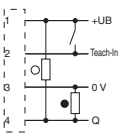

ML7-54-G/25/136/115b
ML7-54-G/25/136/143





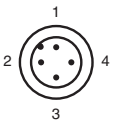



ML7-54-G/25/110/123/143










Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Test input | ✔ |
| Teach-In | ✔ |
| Threshold detection range | 4.5 m |
| Effective detection range | 0 ... 3.5 m |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | Emitter: ≤ 17 mA<br>Receiver: ≤ 15 mA |
| Switching type | dark on |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Test input | emitter deactivation at $+U_B$ |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 / IP69K |

| Model Number | | M7/76a/115 MV7/59/102/115 | M7/76a/115 MV7/59/82b/103/115 | M7/76a/143 MV7/59/102/126b/143 | M7/76a/143 MV7/59/82b/103/143 |
|---|---|---|---|---|---|
| Weak signal output | ✔ | | ● | ● | ● |
| Emitter | | ● | ● | ● | ● |
| Receiver | | ● | ● | ● | ● |
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● |
| Weak signal output | 1 NPN | | | ● | |
| | 1 PNP | | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | | |
| | M8 x 1 connector, 4-pin | | | ● | ● |
| | |  | |  | |

| Approvals and Certificates | | | | | |
|---|---|---|---|---|---|
| Protection class | II | ● | ● | ● | ● |
| UL approval | cULus | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |

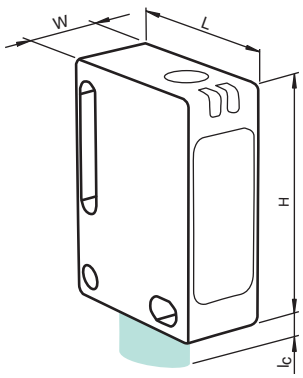
| Dimensions | | |
|---|---|---|
| Length L [mm] | 23 | |
| Width W [mm] | 11 | |
| Height H [mm] | 31 | |
| Connector length $l_c$ [mm] | 7.6 | 9.1 |

## Properties

- Thru-beam type
- Rectangular miniature housing
- Plastic housing
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Slotted mounting holes provide flexible mounting options
- ECOLAB certificate




## Accessories

**These and more accessories can be found in chapter 10**

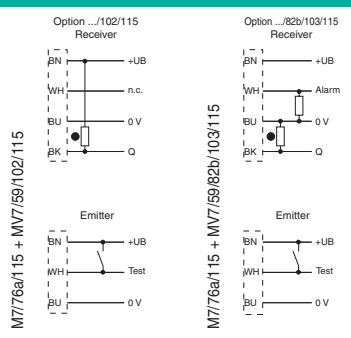
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-ML7-01-KIT** | Mounting set consisting of bracket OMH-ML-01 sheet OMH-ML7-03, and fastening material |
| **V31-GM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, straight |
| **V31-WM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, angled |

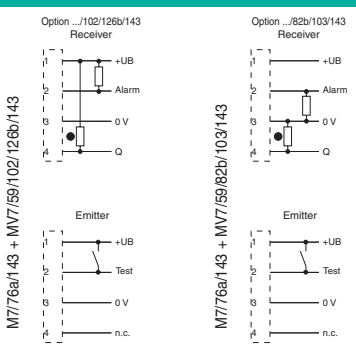
## Electrical Connection

❍ = light on, ● = dark on











Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Teach-In | ✔ |
| Detection range | 20 ... 200 mm |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 20 mA |
| Switching type | light on |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 / IP69K |

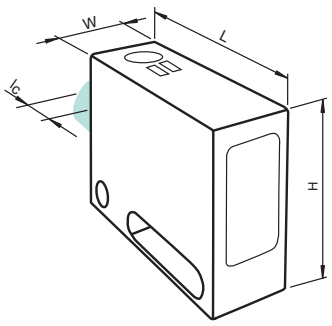
| Model Number | | ML71-8-200/25/102/115 | ML71-8-200/25/103/115 | ML71-8-200/25/102/143 | ML71-8-200/25/103/143 |
|---|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | | |
| | 4-pin, M8 plastic connector | | | ● | ● |
| | |  | |  | |
| **Approvals and Certificates** | | | | | |
| Protection class | II | ● | ● | ● | ● |
| UL approval | cULus | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |
| **Dimensions** | | | | | |
| Length L [mm] | | 31 | | | |
| Width W [mm] | | 11 | | | |
| Height H [mm] | | 23 | | | |
| Connector length $l_c$ [mm] | | 7,6 | | 9,1 | |

## Properties

- **Diffuse type**
- **Rectangular miniature housing, side view**
- **Plastic housing**
- **DC sensor**
- **Discrete output**
- **Cable and connector versions**
- **Visible red light**

## Benefits

- **Slotted mounting holes provide flexible mounting options**
- **ECOLAB certificate**




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

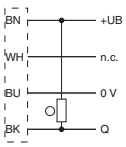
| | |
|---|---|
| **OMH-ML7-02-KIT** | Mounting set consisting of bracket OMH-ML-02 sheet OMH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V31-GM-2M-PVC** | Female cordset, M8, 4-pin, PVC cable, straight, straight |
| **V31-WM-2M-PVC** | Female cordset, M8, 4-pin, PVC cable, angled, angled |

## Electrical Connection

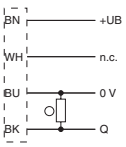
❍ = light on, ● = dark on



ML71-8-200/25/102/115

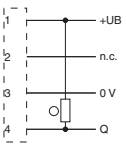



ML71-8-200/25/103/115

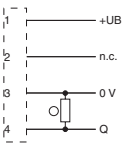





ML71-8-200/25/102/143




ML71-8-200/25/103/143







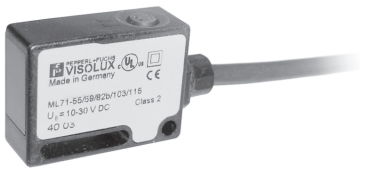
Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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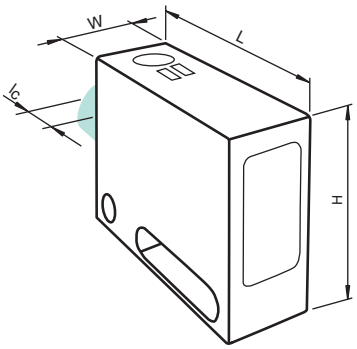



## Properties

- Polarized type
- Rectangular miniature housing, side view
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Slotted mounting holes provide flexible mounting options
- ECOLAB certificate




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Teach-In | ✔ |
| Threshold detection range | 3.5 m |
| Effective detection range | 0 ... 3 m |
| Reference target | H85-2 reflector |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 20 mA |
| Switching type | dark on |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 / IP69K |

| Model Number | | ML71-55/59/102/115 | ML71-55/59/103/115 | ML71-55/59/102/143 | ML71-55/59/103/143 |
|---|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | | |
| | 4-pin, M8 plastic connector | | | ● | ● |
| | |  | |  | |
| **Approvals and Certificates** | | | | | |
| Protection class | II | ● | ● | ● | ● |
| UL approval | cULus | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |

| Dimensions | | |
|---|---|---|
| Length L [mm] | 31 | |
| Width W [mm] | 11 | |
| Height H [mm] | 23 | |
| Connector length $l_c$ [mm] | 7.6 | 9.1 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

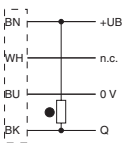
| | |
|---|---|
| **OMH-ML7-02-KIT** | Mounting set consisting of bracket OMH-ML-02 sheet OMH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |

## Electrical Connection

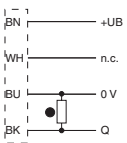
❍ = light on, ● = dark on



ML71-55/59/102/115

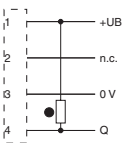



ML71-55/59/103/115

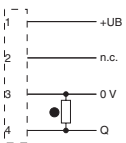





ML71-55/59/102/143




ML71-55/59/103/143







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Teach-In | ✔ |
| Threshold detection range | 3.5 m |
| Effective detection range | 0 ... 3 m |
| Reference target | H85-2 reflector |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 20 mA |
| Switching type | dark on |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 / IP69K |

| Model Number | | ML71-6/59/102/115 | ML71-6/59/103/115 | ML71-6/59/102/143 | ML71-6/59/103/143 |
|---|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | | |
| | Plastic connector M8 x 1 , 4-pin | | | ● | ● |

| Approvals and Certificates | | | | | |
|---|---|---|---|---|---|
| Protection class | II | ● | ● | ● | ● |
| UL approval | cULus | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |

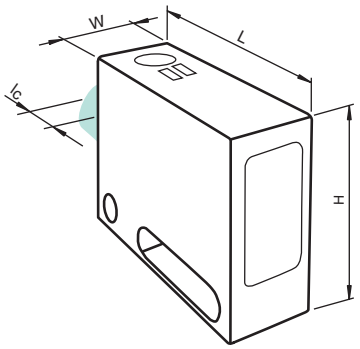
| Dimensions | | | | | |
|---|---|---|---|---|---|
| Length L [mm] | | 31 | | | |
| Width W [mm] | | 11 | | | |
| Height H [mm] | | 23 | | | |
| Connector length $l_c$ [mm] | | 7.6 | | 9.1 | |

## Properties

- Non-polarized type
- Rectangular miniature housing, side view
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Slotted mounting holes provide flexible mounting options
- ECOLAB certificate




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

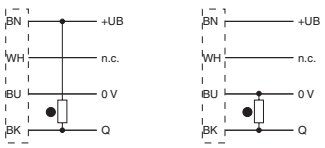
| | |
|---|---|
| **OMH-ML7-02-KIT** | Mounting set consisting of bracket OMH-ML-02 sheet OMH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |

## Electrical Connection

❍ = light on, ● = dark on

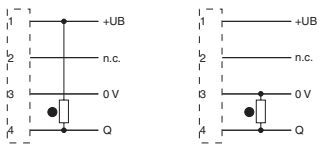
ML71-6/59/102/115 ML71-6/59/103/115






ML71-6/59/102/143 ML71-6/59/103/143









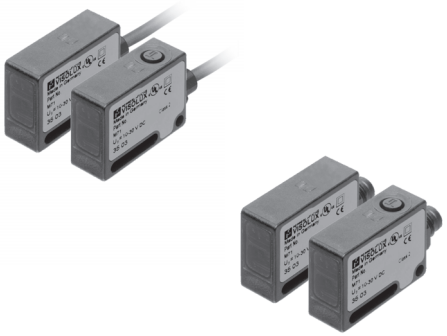
Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Test input | ✔ |
| Teach-In | ✔ |
| Threshold detection range | 4.5 m |
| Effective detection range | 0 ... 3.5 m |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | Emitter: ≤ 17 mA<br>Receiver: ≤ 15 mA |
| Switching type | dark on |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Test input | emitter deactivation at $+U_B$ |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 / IP69K |

| Model Number | | M71/76a/115 MV71/59/102/115 | M71/76a/115 MV71/59/82b/103/115 | M71/76a/143 MV71/59/102/126b/143 | M71/76a/143 MV71/59/82b/103/143 |
|---|---|---|---|---|---|
| Weak signal output | ✔ | | ● | ● | ● |
| Emitter | | ● | ● | ● | ● |
| Receiver | | ● | ● | ● | ● |
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● |
| Weak signal output | 1 NPN | | | ● | |
| | 1 PNP | | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | | |
| | 4-pin, M8 plastic connector | | | ● | ● |



| Approvals and Certificates | | | | | |
|---|---|---|---|---|---|
| Protection class | II | ● | ● | ● | ● |
| UL approval | cULus | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |

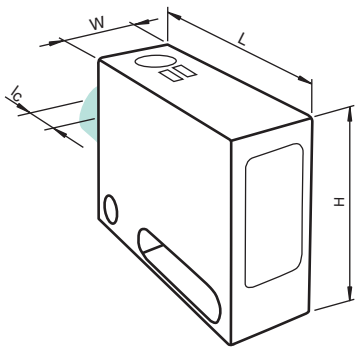
| Dimensions | | |
|---|---|---|
| Length L [mm] | 31 | |
| Width W [mm] | 11 | |
| Height H [mm] | 23 | |
| Connector length $l_c$ [mm] | 7.6 | 9.1 |

## Properties

- Thru-beam type
- Rectangular miniature housing, side view
- Plastic housing
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Slotted mounting holes provide flexible mounting options
- ECOLAB certificate




## Accessories

**These and more accessories can be found in chapter 10**

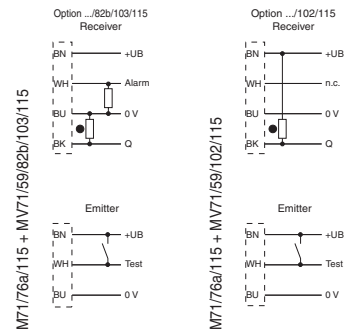
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-ML7-02-KIT** | Mounting set consisting of bracket OMH-ML-02 sheet OMH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V31-GM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, straight |
| **V31-WM-2M-PVC** | Female cordset M8, 4-pin, PVC cable, angled |

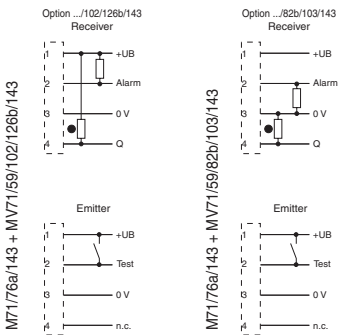
## Electrical Connection

❍ = light on, ● = dark on











Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Multiple light spots | ✔ |
| Light type | modulated visible red light , 640 nm |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 15 mA |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | ML8-8-H-30-RT/102/115/162 | ML8-8-H-30-RT/59/102/115/162 | ML8-8-H-50-RT/102/115/162 | ML8-8-H-50-RT/59/102/115/162 | ML8-8-H-30-RT/103/143/162 | ML8-8-H-50-RT/103/143/162 |
|---|---|---|---|---|---|---|---|
| Detection range | 15 ... 30 mm | ● | ● | | | ● | |
| | 20 ... 50 mm | | | ● | ● | | ● |
| Diameter of the light spot | 2 light spots, 11 mm apart, spotsize 4 mm at a distance of 50 mm | | | ● | ● | | ● |
| | 3 light spots, 12 mm apart, spotsize 3.5 mm at a distance of 30 mm | ● | ● | | | ● | |
| Switching type | dark on | | ● | | ● | | |
| | light on | ● | | ● | | ● | ● |
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | ● | ● | ● | | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | | | | ● | ● |
| Connection | 2 m fixed cable | ● | ● | ● | ● | | |
| | M8 x 1 connector, 4-pin | | | | | ● | ● |

| Approvals and Certificates | | | | | | | |
|---|---|---|---|---|---|---|---|
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |

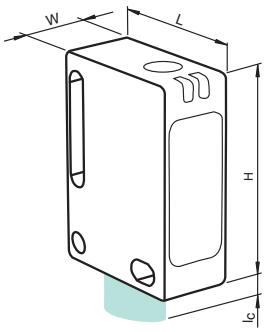
| Dimensions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Length L [mm] | | 23 | | | | | |
| Width W [mm] | | 11 | | | | | |
| Height H [mm] | | 31 | | | | | |
| Connector length $l_c$ [mm] | | 7.6 | | | | 9.1 | |

## Properties

- Background suppression with multiple beams
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Your Benefit

- Special sensors for printed circuit board and irregular object detection
- Reliably detects printed circuit boards with multiple light spots in a row
- Reliable detection of PCBs even with a near background
- Ignores holes, indentations and components on the circuit board
- Slotted mounting holes provide flexible mounting options




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

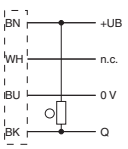
| | |
|---|---|
| **OMH-ML7-02-KIT** | Mounting set consisting of bracket OMH-ML-02 sheet OMH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V31-WM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, angled |
| **V31-GM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, straight |

## Electrical Connection

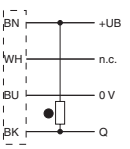
❍ = light on, ● = dark on



ML8-8-H-50-RT/102/115/162
ML8-8-H-30-RT/102/115/162

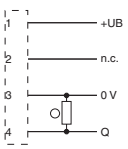



ML8-8-H-30-RT/59/102/115/162
ML8-8-H-50-RT/59/102/115/162






ML8-8-H-50-RT/103/143/162
ML8-8-H-30-RT/103/143/162







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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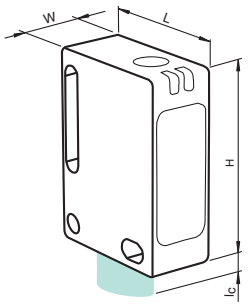


## Properties

- Background suppression with multiple beams
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Special sensors for printed circuit board and irregular object detection
- Reliably detects printed circuit boards with multiple light spots in a row
- Reliable detection of PCBs even with a near background
- Ignores holes, indentations and components on the circuit board
- Slotted mounting holes provide flexible mounting options




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Multiple light spots | ✔ |
| Detection range | 20 ... 100 mm |
| Adjustment range | 25 ... 100 mm |
| Light type | modulated visible red light , 640 nm |
| Diameter of the light spot | 2 light spots, 25 mm apart, spotsize 10 mm at a distance of 100 mm |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 15 mA |
| Switching type | light on |
| Signal output | 1 PNP output, short-circuit protected, reverse polarity protected, open collector |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | ML8-8-H-100-RT/65a/103/115/162 | ML8-8-H-100-RT/65a/103/143/162 |
|---|---|---|---|
| Connection | 2 m fixed cable | ● | |
| | M8 x 1 connector, 4-pin | | ● |
| | |  |  |
| **Approvals and Certificates** | | | |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |
| **Dimensions** | | | |
| Length L [mm] | | 23 | |
| Width W [mm] | | 11 | |
| Height H [mm] | | 31 | |
| Connector length $l_c$ [mm] | | 7.6 | 9.1 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-ML7-01-KIT** | Mounting set consisting of bracket OMH-ML-01 sheet OMH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |

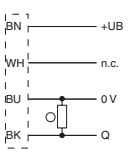
## Electrical Connection

❍ = light on, ● = dark on

ML8-8-H-100-RT/65a/103/115/162



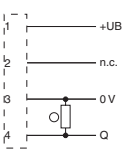
Option 103/115




ML8-8-H-100-RT/65a/103/143/162



Option /103/143







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 20 mA |
| Signal output | 1 PNP output, short-circuit protected, reverse polarity protected, open collector |
| Switching current | max. 100 mA |
| Switching frequency | 200 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP65 |
| Connection | fixed cable 300 mm with M12 connector, 4-pin |



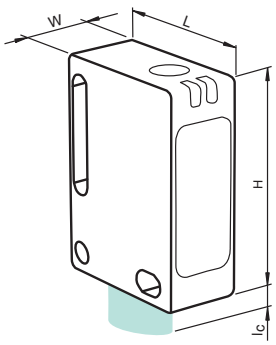
| Model Number | | ML8-8-H-140-RT/25/65a/103/115b | ML8-8-H-350-IR/25/65a/103/115b | ML8-8-H-350-IR/59/65a/103/115b |
|---|---|---|---|---|
| Detection range | 5 ... 140 mm | ● | | |
| | 4 ... 350 mm | | ● | ● |
| Adjustment range | 25 ... 140 mm | ● | | |
| | 25 ... 350 mm | | ● | ● |
| Light type | modulated visible red light | ● | | |
| | modulated infrared light | | ● | ● |
| Diameter of the light spot | approx. 5 mm at detection range 120 mm | | | |
| | approx. 15 mm at detection range 350 mm | | | |
| Switching type | dark on | | | ● |
| | light on | ● | ● | |
| **Approvals and Certificates** | | | | |
| Protection class | II | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |
| **Dimensions** | | | | |
| Length L [mm] | | | 23 | |
| Width W [mm] | | | 11 | |
| Height H [mm] | | | 31 | |
| Connector length $l_c$ [mm] | | | 7.6 | |

## Properties

- Background suppression
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Pigtailed connector version
- Visible red and infrared light versions

## Your Benefit

- Reliable detection of all surfaces, regardless of color and texture
- Minimal black/white difference
- Slotted mounting holes provide flexible mounting options




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

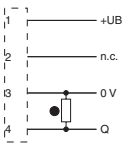
| | |
|---|---|
| **OMH-ML7-01-KIT** | Mounting set consisting of bracket OMH-ML-01 sheet ONH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

## Electrical Connection

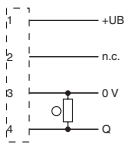
❍ = light on, ● = dark on

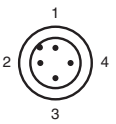


ML8-8-H-350-IR/59/65a/103/115b




ML8-8-H-350-IR/25/65a/103/115b
ML8-8-H-140-RT/25/65a/103/115b




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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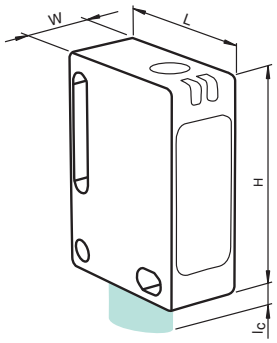


## Properties

- Diffuse type with convergent beams
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Your Benefit

- Special sensors for printed circuit board or irregular object detection
- Reliably detects printed circuit boards using a long and very narrow light spot
- Accurate position detection
- Elliptical light spot ignores holes and indentations
- Slotted mounting holes provide flexible mounting options




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Elliptical light spot | ✔ |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 20 mA |
| Switching current | max. 100 mA |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP65 / IP67 |

| Model Number | | ML8-8-HGU-30-RT/102/115/162 | ML8-8-HGU-30-RT/59/102/115/162 | ML8-8-HGU-50-RT/102/115/162 | ML8-8-HGU-50-RT/59/102/115/162 | ML8-8-HGU-30-RT/103/143/162 | ML8-8-HGU-50-RT/103/143/162 |
|---|---|---|---|---|---|---|---|
| Detection range | 15 ... 30 mm | ● | ● | | | ● | |
| | 25 ... 50 mm | | | ● | ● | | ● |
| Diameter of the light spot | approx. 4 mm x 35 mm at 50 mm | | | ● | ● | | ● |
| | approx. 5 mm x 25 mm at 30 mm | ● | ● | | | ● | |
| Switching type | dark on | | ● | | ● | | |
| | light on | ● | | ● | | ● | ● |
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | ● | ● | ● | | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | | | | ● | ● |
| Connection | 2 m fixed cable | ● | ● | ● | ● | | |
| | M8 x 1 connector, 4-pin | | | | | ● | ● |

| Approvals and Certificates | | | | | | | |
|---|---|---|---|---|---|---|---|
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |

| Dimensions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Length L [mm] | | 23 | | | | | |
| Width W [mm] | | 11 | | | | | |
| Height H [mm] | | 31 | | | | | |
| Connector length $l_c$ [mm] | | 7.6 | | | | 9.1 | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

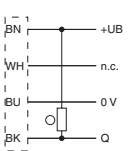
| | |
|---|---|
| **OMH-ML7-01-KIT** | Mounting set consisting of bracket OMH-ML-01 sheet OMH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V31-WM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, angled |
| **V31-GM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, straight |

## Electrical Connection

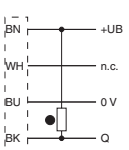
❍ = light on, ● = dark on



ML8-8-HGU-50-RT/102/115/162
ML8-8-HGU-30-RT/102/115/162

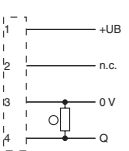



ML8-8-HGU-30-RT/59/102/115/162
ML8-8-HGU-50-RT/59/102/115/162






ML8-8-HGU-30-RT/103/143/162
ML8-8-HGU-50-RT/103/143/162







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | ML8-8-HGU-220-RT/103/143 |
|---|---|
| Sensing range adjustment | ✔ |
| Detection range | 5 ... 220 mm |
| Adjustment range | 100 ... 220 mm |
| Light type | modulated visible red light |
| Diameter of the light spot | approx. 10 mm at detection range 220 mm |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 15 mA |
| Switching type | light on |
| Signal output | 1 PNP output, short-circuit protected, reverse polarity protected, open collector |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -30 ... 60 °C (-22 ... 140 °F) |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP65/IP67 |
| Connection | M8 x 1 connector, 4-pin |



| Approvals and Certificates | |
|---|---|
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 23 |
| Width W [mm] | 11 |
| Height H [mm] | 31 |
| Connector length $l_c$ [mm] | 9.1 |

## Properties

- Diffuse type with convergent beam
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Connector version
- Visible red light

## Your Benefit

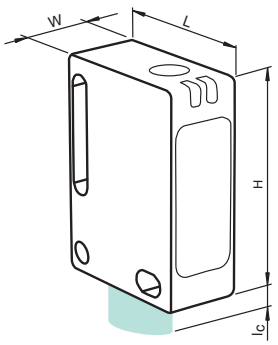
- Convergent sensing ignores some objects in the background
- Slotted mounting holes provide flexible mounting options

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-ML7-01-KIT** | Mounting set consisting of bracket OMH-ML-01 sheet OMH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V31-WM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, angled |
| **V31-GM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, straight |

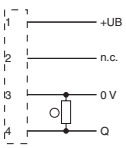



## Electrical Connection

❍ = light on, ● = dark on

ML8-8-HGU-220-RT/103/143









Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |





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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Detection range | 20 ... 200 mm |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 20 mA |
| Switching type | light on |
| Switching current | max. 100 mA |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 |

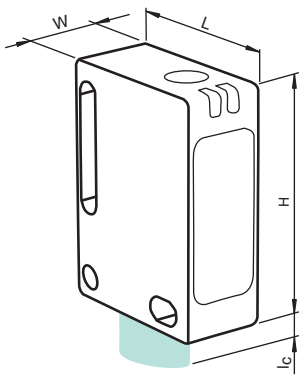
| Model Number | | ML8-8-200-RT/103/115b | ML8-8-200-RT/102/143 | ML8-8-200-RT/103/143 |
|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | ● | | ● |
| Connection | fixed cable 300 mm with M12 connector, 4-pin | ● | | |
| | M8 x 1 connector, 4-pin | | ● | ● |
| | |  |  | |
| **Approvals and Certificates** | | | | |
| Protection class | II | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |
| **Dimensions** | | | | |
| Length L [mm] | | | 23 | |
| Width W [mm] | | | 11 | |
| Height H [mm] | | | 31 | |
| Connector length $l_c$ [mm] | | 7.6 | 9.1 | |

## Properties

- **Diffuse type**
- **Rectangular miniature housing**
- **Plastic housing**
- **DC sensor**
- **Discrete output**
- **Cable and connector versions**
- **Visible red light**

## Benefits

- **Slotted mounting holes provide flexible mounting options**
- **Tamper-proof, no operating controls**




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

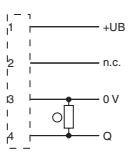
| | |
|---|---|
| **OMH-ML7-01-KIT** | Mounting set consisting of bracket OMH-ML-01 sheet OMH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V31-GM-2M-PVC** | Female cordset, M8, 4-pin, PVC cable, straight |
| **V31-WM-2M-PVC** | Female cordset, M8, 4-pin, PVC cable, angled |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

## Electrical Connection

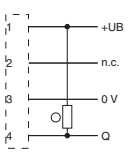
❍ = light on, ● = dark on



ML8-8-200-RT/103/115b
ML8-8-200-RT/103/143

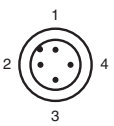



ML8-8-200-RT/102/143










Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



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## Technical Data

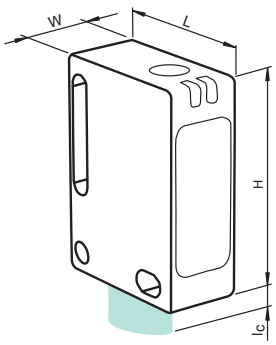
*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Threshold detection range | 3.5 m |
| Effective detection range | 0 ... 3 m |
| Reference target | H85-2 reflector |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 12 mA |
| Switching current | max. 100 mA |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | ML8-55/103/115b | ML8-55/102/143 | ML8-55/103/143 | ML8-55/25/103/143 |
|---|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | | ● | | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | ● |
| Switching type | dark on | ● | ● | ● | |
| | light on | | | | ● |
| Connection | fixed cable 300 mm with M12 x 1 connector , 4-pin | ● | | | |
| | M8 x 1 connector, 4-pin | | ● | ● | ● |
| | |  | |  | |
| **Approvals and Certificates** | | | | | |
| Protection class | II | ● | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |
| **Dimensions** | | | | | |
| Length L [mm] | | | 31 | | |
| Width W [mm] | | | 11 | | |
| Height H [mm] | | | 23 | | |
| Connector length $l_c$ [mm] | | 7.6 | 9.1 | | |

## Properties

- Polarized type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Pigtailed connector and connector versions
- Visible red light




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

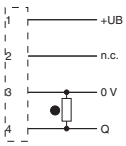
| | |
|---|---|
| **OMH-ML7-01-KIT** | Mounting set consisting of bracket OMH-ML-01 sheet OMH-ML7-03, and fastening material |
| **OMH-ML7-01** | Mounting bracket |
| **V31-WM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, angled |
| **V31-GM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, straight |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

## Electrical Connection

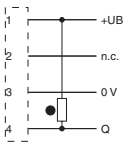
❍ = light on, ● = dark on



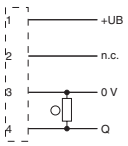
ML8-55/103/143
ML8-55/103/115b

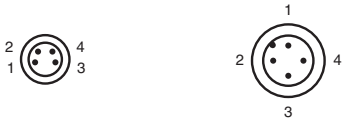



ML8-55/102/143




ML8-55/25/103/143




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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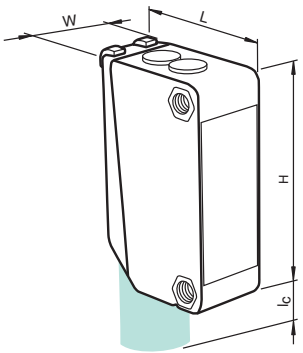


## Properties

- Background suppression
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable, connector and pigtailed connector versions
- Visible red light

## Benefits

- Reliable detection of all surfaces, regardless of color and texture
- Simplest alignment and set-up with ultra-bright Power-Beam emitter LED
- Small black/white difference
- Adjustable long range version
- Rugged housing has metal-reinforced mounting holes




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark switch | ✔ |
| Detection range | 5 ... 350 mm |
| Adjustment range | 30 ... 350 mm |
| Light type | modulated visible red light |
| Diameter of the light spot | approx. 20 mm at a distance of 350 mm |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 20 mA |
| Switching type | light/dark on, switchable |
| Switching current | max. 100 mA , resistive load |
| Switching frequency | 500 Hz |
| Ambient temperature | -30 ... 60 °C (-22 ... 140 °F) |
| Material | |
| Housing | PC (Polycarbonate) |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | ML100-8-H-350-RT/102/115 | ML100-8-H-350-RT/103/115 | ML100-8-H-350-RT/103/115b | ML100-8-H-350-RT/95/102 | ML100-8-H-350-RT/95/103 |
|---|---|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | | | |
| | 300 mm fixed cable with 4-pin, M12 x 1 connector | | | ● | | |
| | connector M8 x 1 , 4-pin | | | | ● | ● |
| | |  | |  |  | |
| **Approvals and Certificates** | | | | | | |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | |
| **Dimensions** | | | | | | |
| Length L [mm] | | 20 | | | | |
| Width W [mm] | | 11 | | | | |
| Height H [mm] | | 31 | | | | |
| Connector length $l_c$ [mm] | | 0 | | | 10 | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-ML100-01** | Mounting bracket |
| **OMH-ML100-02** | Mounting bracket |
| **OMH-ML100-S1** | Mounting bracket |
| **OMH-F10-ML100** | Mounting aid for ML100 series |
| **OMH-10** | Mounting aid |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

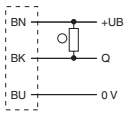
## Electrical Connection

❍ = light on, ● = dark on

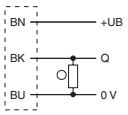


ML100-8-H-350-RT/102/115 ML100-8-H-350-RT/103/115

Option 102/115



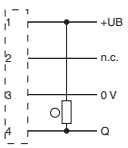

Option 103/115



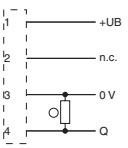



ML100-8-H-350-RT/95/102 ML100-8-H-350-RT/95/103 ML100-8-H-350-RT/103/115b

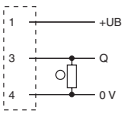
Option 95/102

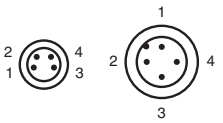



Option 95/103




Option 103/115b




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Detection range | 0 ... 1000 mm |
| Light type | modulated visible red light |
| Optical face | frontal |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 20 mA |
| Switching type | light/dark on, switchable |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Ambient temperature | -30 ... 60 °C (-22 ... 140 °F) |
| Material | |
| Housing | PC (Polycarbonate) |
| Optical face | PMMA |
| Protection degree | IP67 |

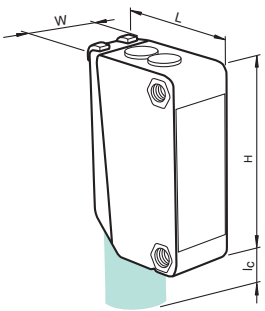
| Model Number | | ML100-8-1000-RT/102/115 | ML100-8-1000-RT/103/115 | ML100-8-1000-RT/95/102 | ML100-8-1000-RT/95/103 |
|---|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | | |
| | Male connector M8 x 1 , 4-pin | | | ● | ● |
| **Approvals and Certificates** | | | | | |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |
| **Dimensions** | | | | | |
| Length L [mm] | | 20 | | | |
| Width W [mm] | | 11 | | | |
| Height H [mm] | | 31 | | | |
| Connector length $l_c$ [mm] | | 0 | | 10 | |

## Properties

- Diffuse type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Simplest alignment and set-up with ultra-bright Power-Beam emitter LED
- Rugged housing has metal-reinforced mounting holes




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

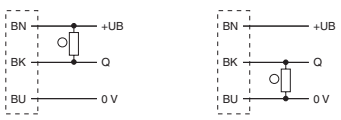
| | |
|---|---|
| **OMH-ML100-01** | Mounting bracket |
| **OMH-ML100-03** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-ML100-02** | Mounting bracket |
| **OMH-ML100-04** | Mounting bracket |
| **OMH-ML100-05** | Mounting bracket |
| **OMH-ML100-S1** | Mounting bracket |
| **OMH-F10-ML100** | Mounting aid for ML100 series |
| **OMH-10** | Mounting aid |
| **V31-WM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, angled |
| **V31-GM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, straight |

## Electrical Connection

❍ = light on, ● = dark on

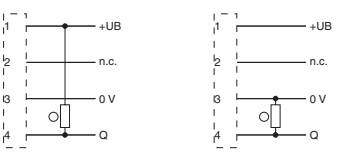


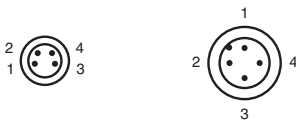
ML100-8-1000-RT/102/115 ML100-8-1000-RT/103/115






ML100-8-1000-RT/95/102 ML100-8-1000-RT/95/103




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Glass detection | ✔ |
| Wide light spot | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Detection range | 0 ... 200 mm |
| Light type | modulated visible red light |
| Optical face | frontal |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 20 mA |
| Switching type | light/dark on, switchable |
| Switching current | max. 100 mA , resistive load |
| Switching frequency | 1000 Hz |
| Ambient temperature | -30 ... 60 °C (-22 ... 140 °F) |
| Housing | PC (Polycarbonate) |
| Optical face | PMMA |
| Protection degree | IP67 |

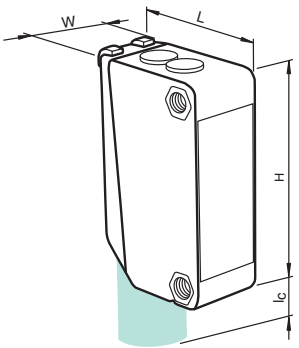
| Model Number | | ML100-8-W-200-RT/102/115 | ML100-8-W-200-RT/103/115 | ML100-8-W-200-RT/102/115b | ML100-8-W-200-RT/103/115b | ML100-8-W-200-RT/95/102 | ML100-8-W-200-RT/95/103 |
|---|---|---|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | | | | |
| | 300 mm fixed cable with 4-pin, M12 x 1 connector | | | ● | ● | | |
| | Male connector M8 x 1 , 4-pin | | | | | ● | ● |
| | |  | |  | |  | |
| **Approvals and Certificates** | | | | | | | |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | |
| **Dimensions** | | | | | | | |
| Length L [mm] | | 20 | | | | | |
| Width W [mm] | | 11 | | | | | |
| Height H [mm] | | 31 | | | | | |
| Connector length $l_c$ [mm] | | 0 | | | | 10 | |

## Properties

- Diffuse type with divergent beam
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable, connector and pigtailed connector versions
- Visible red light

## Benefits

- Optimized for transparent object detection




## Accessories

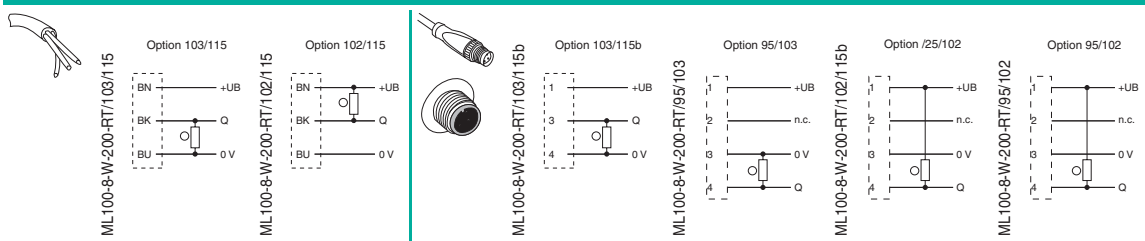
**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-ML100-01** | Mounting bracket |
| **OMH-ML100-02** | Mounting bracket |
| **OMH-ML100-03** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-ML100-04** | Mounting bracket |
| **OMH-ML100-05** | Mounting bracket |
| **OMH-F10-ML100** | Mounting aid for ML100 series |
| **OMH-10** | Mounting aid |

## Electrical Connection

❍ = light on, ● = dark on






Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Threshold detection range | 7 m |
| Effective detection range | 0 ... 5 m |
| Reference target | H50 reflector |
| Light type | modulated visible red light |
| Optical face | frontal |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 20 mA |
| Switching type | light/dark on, switchable |
| Switching current | max. 100 mA , resistive load |
| Switching frequency | 1000 Hz |
| Ambient temperature | -30 ... 60 °C (-22 ... 140 °F) |
| Material | |
| Housing | PC (Polycarbonate) |
| Optical face | PMMA |
| Protection degree | IP67 |

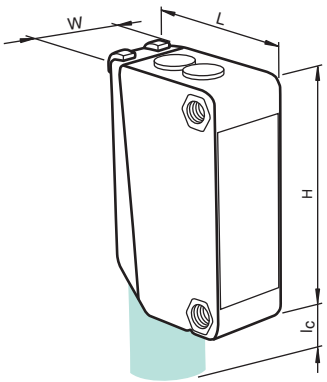
| Model Number | | ML100-55/102/115 | ML100-55/103/115 | ML100-55/103/115b | ML100-55/95/102 | ML100-55/95/103 |
|---|---|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | ● | | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | | | |
| | 300 mm fixed cable with 4-pin, M12 x 1 connector | | | ● | | |
| | connector M8 x 1 , 4-pin | | | | ● | ● |
| | |  | |  |  | |
| **Approvals and Certificates** | | | | | | |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | |
| **Dimensions** | | | | | | |
| Length L [mm] | | | | 20 | | |
| Width W [mm] | | | | 11 | | |
| Height H [mm] | | | | 31 | | |
| Connector length $l_c$ [mm] | | | 0 | | 10 | |

## Properties

- Polarized type
- Rectangular miniature housing
- Plastic housing
- DC sensor
- Discrete output
- Cable, connector and pigtailed connector versions
- Visible red light

## Benefits

- Simplest alignment and set-up with ultra-bright Power-Beam emitter LED
- Rugged housing has metal-reinforced mounting holes




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-F10-ML100** | Mounting aid for ML100 series |
| **OMH-ML100-01** | Mounting bracket |
| **OMH-ML100-S1** | Mounting bracket |
| **OMH-ML100-02** | Mounting bracket |
| **OMH-ML100-03** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **REF-H85-2** | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

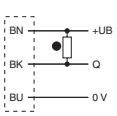
## Electrical Connection

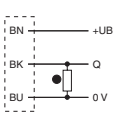
❍ = light on, ● = dark on



ML100-55/102/115 ML100-55/103/115

Option 102/115 Option 103/115



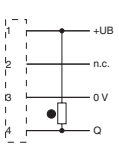



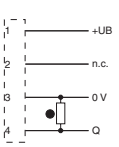





ML100-55/95/102 ML100-55/103/115b ML100-55/95/103

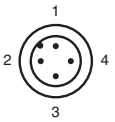
Option 95/102 Option 95/103










Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

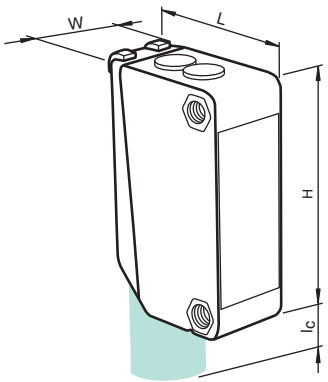


## Properties

- Thru-beam type
- Rectangular miniature housing
- Plastic housing
- Discrete output
- Cable version
- Visible red light

## Benefits

- Simplest alignment and set-up with ultra-bright Power-Beam emitter LED
- Rugged housing has metal-reinforced mounting holes




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| | | M100-RT/35/76a/115 MV100-RT/35/103/115 | M100-RT/35/76b/115 MV100-RT/35/102/115 | M100-RT/76a/115 MV100-RT/103/115 | M100-RT/76b/115 MV100-RT/102/115 |
|---|---|---|---|---|---|
| **General Data** | | | | | |
| Test input | ✔ | | | | |
| Sensitivity adjustment | ✔ | | | | |
| Light/dark switch | ✔ | | | | |
| Light type | modulated visible red light | | | | |
| Operating voltage | 10 ... 30 V DC , class 2 | | | | |
| No-load supply current | Emitter: ≤ 15 mA<br>Receiver: ≤ 8 mA | | | | |
| Switching type | light/dark on, switchable | | | | |
| Switching current | max. 100 mA | | | | |
| Test input | emitter deactivation | | | | |
| Ambient temperature | -30 ... 60 °C (-22 ... 140 °F) | | | | |
| Material | | | | | |
| Housing | PC (Polycarbonate) | | | | |
| Optical face | PMMA | | | | |
| Protection degree | IP67 | | | | |
| Connection | 2 m fixed cable | | | | |
| Emitter | | ● | ● | ● | ● |
| Receiver | | ● | ● | ● | ● |
| Threshold detection range | 15 m | | | ● | ● |
| | 30 m | ● | ● | | |
| Effective detection range | 0 ... 10 m | | | ● | ● |
| | 0 ... 20 m | ● | ● | | |
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | |
| Switching frequency | 1000 Hz | | | ● | ● |
| | 250 Hz | ● | ● | | |
| **Approvals and Certificates** | | | | | |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |

| **Dimensions** | |
|---|---|
| Length L [mm] | 20 |
| Width W [mm] | 11 |
| Height H [mm] | 31 |
| Connector length $l_c$ [mm] | 0 |

## Accessories

**These and more accessories can be found in chapter 10**

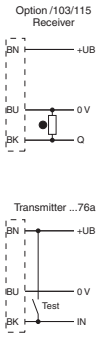
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-ML100-S1** | Mounting bracket |
| **OMH-ML100-01** | Mounting bracket |
| **OMH-ML100-02** | Mounting bracket |
| **OMH-F10-ML100** | Mounting aid for ML100 series |

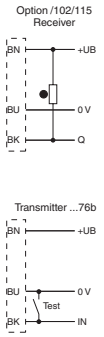
## Electrical Connection

❍ = light on, ● = dark on

M100-RT/35/76a/115 + MV100-RT/35/103/115
M100-RT/76a/115 + MV100-RT/103/115




M100-RT/35/76b/115 + MV100-RT/35/102/115
M100-RT/76b/115 + MV100-RT/102/115






Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Test input | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | Emitter: ≤ 15 mA<br>Receiver: ≤ 8 mA |
| Switching type | light/dark on, switchable |
| Switching current | max. 100 mA , resistive load |
| Test input | emitter deactivation |
| Ambient temperature | -30 ... 60 °C (-22 ... 140 °F) |
| Material | |
| Housing | PC (Polycarbonate) |
| Optical face | PMMA |
| Protection degree | IP67 |
| Connection | M8 x 1 connector, 4-pin |



| Model Number | | M100-RT/76a/95<br>MV100-RT/95/103 | M100-RT/76b/95<br>MV100-RT/95/102 | M100-RT/35/76a/95<br>MV100-RT/35/95/103 | M100-RT/35/76b/95<br>MV100-RT/35/95/102 |
|---|---|---|---|---|---|
| Emitter | | ● | ● | ● | ● |
| Receiver | | ● | ● | ● | ● |
| Threshold detection range | 15 m | ● | ● | | |
| | 30 m | | | ● | ● |
| Effective detection range | 0 ... 10 m | ● | ● | | |
| | 0 ... 20 m | | | ● | ● |
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected, open collector | | ● | | ● |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | ● | | ● | |
| Switching frequency | 1000 Hz | ● | ● | | |
| | 250 Hz | | | ● | ● |
| **Approvals and Certificates** | | | | | |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |

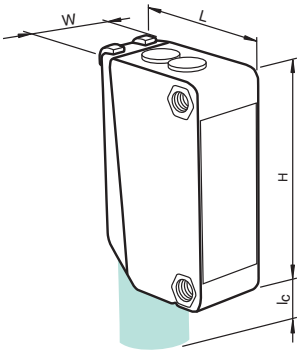
| Dimensions | |
|---|---|
| Length L [mm] | 20 |
| Width W [mm] | 11 |
| Height H [mm] | 31 |
| Connector length $l_c$ [mm] | 10 |

## Properties

- Thru-beam type
- Rectangular miniature housing
- Plastic housing
- Discrete output
- Connector version
- Visible red light

## Benefits

- Simplest alignment and set-up with ultra-bright Power-Beam emitter LED
- Rugged housing has metal-reinforced mounting holes




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

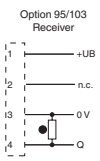
| | |
|---|---|
| **OMH-ML100-03** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-ML100-01** | Mounting bracket |
| **OMH-ML100-04** | Mounting bracket |
| **OMH-F10-ML100** | Mounting aid for ML100 series |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |

## Electrical Connection

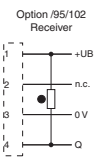
❍ = light on, ● = dark on

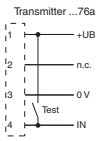


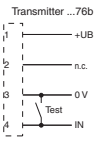
M100-RT/35/76a/95 + MV100-RT/35/95/103
M100-RT/76a/95 + MV100-RT/95/103




M100-RT/35/76b/95 + MV100-RT/35/95/102
M100-RT/76b/95 + MV100-RT/95/102







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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## Properties

- Background suppression
- Rectangular compact housing
- Die cast zinc frame housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Reliable detection of all surfaces, regardless of color and texture
- Minimal black/white difference
- Adjustable switchpoint
- Extreme low-temperature operation

## Technical Data

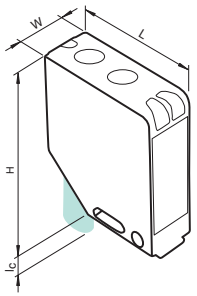
*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark switch | ✔ |
| Detection range | 20 ... 250 mm , adjustable |
| Adjustment range | 50 ... 250 mm |
| Light type | modulated visible red light , 660 nm |
| Diameter of the light spot | 8 mm at Tw 250 mm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 55 mA |
| Switching type | light/dark on switchable |
| Switching current | max. 0.2 A |
| Switching frequency | 1000 Hz |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) |
| Material | |
| Housing | Frame: nickel plated, die cast zinc, Laterals: glass-fiber reinforced plastic PC |
| Optical face | Plastic pane |
| Protection degree | IP67 |

| Model Number | | MLV12-8-H-250-RT/65b/115/128 | MLV12-8-H-250-RT/65b/95/128 | MLV12-8-H-250-RT/47/65b/95 | MLV12-8-H-250-RT/47/65b/124 | MLV12-8-H-250-RT/65b/124/128 |
|---|---|---|---|---|---|---|
| 4-in-1 output | ✔ | ● | ● | | | ● |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected, 0.2 A / 30 V DC | ● | ● | | | ● |
| | 2 PNP outputs, complementary, short-circuit protected, reverse polarity protected, open collector | | | ● | ● | |
| Connection | 2500 mm fixed cable , PUR | ● | | | | |
| | Metal connector, M12, 5-pin, 90° rotatable | | | | ● | ● |
| | 4-pin M8 metal connector, 90° rotatable | | ● | ● | | |

| Approvals and Certificates | | | | | | |
|---|---|---|---|---|---|---|
| Protection class | II | ● | | | ● | ● |
| UL approval | cULus | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | |

| Dimensions | | | | |
|---|---|---|---|---|
| Length L [mm] | 41.5 | | | |
| Width W [mm] | 15 | | | |
| Height H [mm] | 49 | | | |
| Connector length $l_c$ [mm] | 0 | 12 | | 16 |




## Accessories

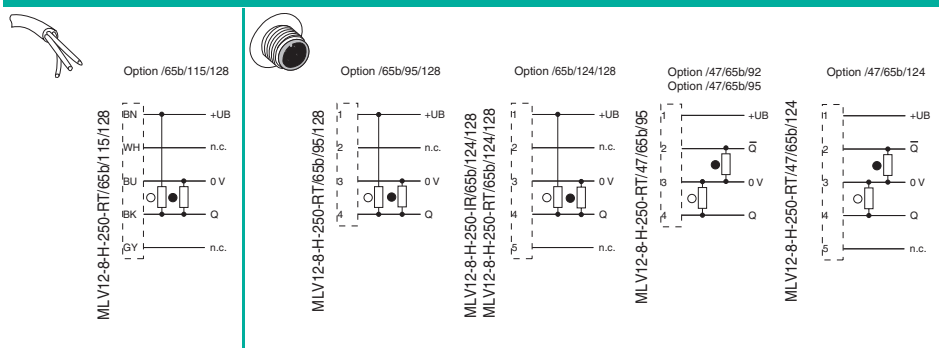
**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-MLV12-HWG** | Mounting bracket for series MLV12 sensors |
| **OMH-MLV12-HWK** | Mounting bracket for series MLV12 sensors |
| **OMH-MLV12-C** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-K02** | dove tail mounting clamp |
| **OMH-K03** | dove tail mounting clamp |
| **OMH-06** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |

## Electrical Connection

❍ = light on, ● = dark on

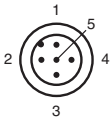






Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |



Refer to General Notes Relating to Product Information
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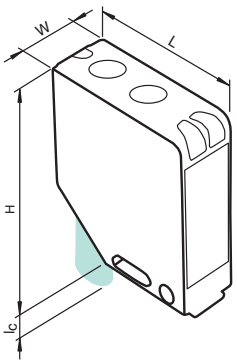


## Properties

- Background evaluation
- Rectangular compact housing
- Die cast zinc frame housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Reliable detection of all surfaces, regardless of color and texture
- Minimal black/white difference
- Adjustable switchpoint
- Extreme low-temperature operation




## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | | |
|---|---|---|
| Background evaluation | ✔ | |
| Sensing range adjustment | ✔ | |
| Light/dark switch | ✔ | |
| 4-in-1 output | ✔ | |
| Detection range | 50 ... 150 mm , adjustable | |
| Adjustment range | 50 ... 150 mm | |
| Light type | modulated visible red light , 680 nm | |
| Diameter of the light spot | 4 mm at Tw 150 mm | |
| Operating voltage | 10 ... 30 V DC | |
| No-load supply current | ≤ 55 mA | |
| Switching type | light/dark on switchable | |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected, 0.2 A / 30 V DC | |
| Switching current | max. 0.2 A | |
| Switching frequency | 1000 Hz | |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) | |
| Material | | |
| Housing | Frame: nickel plated, die cast zinc, Laterals: glass-fiber reinforced plastic PC | |
| Optical face | Plastic pane | |
| Protection degree | IP67 | |

| Model Number | | MLV12-8-HW-RT/65b/115/128 | MLV12-8-HW-RT/65b/95/128 | MLV12-8-HW-RT/65b/124/128 |
|---|---|---|---|---|
| Connection | 2500 mm fixed cable , PUR | ● | | |
| | 5-pin M12 metal connector, 90° rotatable | | | ● |
| | 4-pin M8 metal connector, 90° rotatable | | ● | |
| | |  |  | |
| **Approvals and Certificates** | | | | |
| Protection class | II | ● | | ● |
| UL approval | cULus | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |
| **Dimensions** | | | | |
| Length L [mm] | | | 41.5 | |
| Width W [mm] | | | 15 | |
| Height H [mm] | | | 49 | |
| Connector length $l_c$ [mm] | | 0 | 12 | 16 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-MLV12-HWG** | Mounting bracket for series MLV12 sensors |
| **OMH-MLV12-HWK** | Mounting bracket for series MLV12 sensors |
| **OMH-MLV12-C** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-K02** | dove tail mounting clamp |
| **OMH-K03** | dove tail mounting clamp |
| **OMH-06** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |

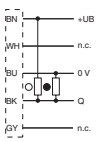
## Electrical Connection

❍ = light on, ● = dark on

MLV12-8-HW-RT/65b/115/128



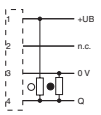
Option /65b/115/128




MLV12-8-HW-RT/65b/95/128

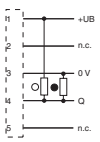


Option /65b/95/128




MLV12-8-HW-RT/65b/124/128

Option /65b/124/128

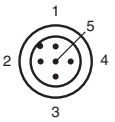



Wire colors in accordance with EN 60947-5-2




| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |

Wire colors in accordance with EN 60947-5-2




| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |




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## Properties

- Polarized type
- Rectangular compact housing
- Die-cast zinc frame housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Extreme low-temperature operation

## Technical Data

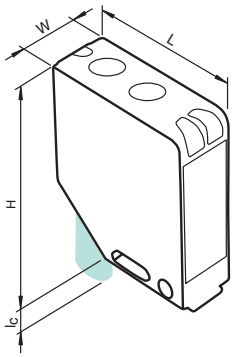
*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Threshold detection range | 9 m |
| Effective detection range | 0 ... 6.5 m |
| Reference target | H85-2 reflector |
| Light type | modulated visible red light , 660 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | max. 40 mA |
| Switching type | light/dark on switchable |
| Switching current | max. 0.2 A |
| Switching frequency | 1000 Hz |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) |
| Housing | Frame: nickel plated, die cast zinc,<br>Laterals: glass-fiber reinforced plastic PC |
| Optical face | Plastic pane |
| Protection degree | IP67 |

| Model Number | | MLV12-54/76b/115/128 | MLV12-54/32/82b/124 | MLV12-54/76b/124/128 |
|---|---|---|---|---|
| Weak signal output | ✔ | | ● | |
| Test input | ✔ emitter deactivation at 0 V | ● | | ● |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected | ● | | ● |
| | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | ● | |
| Weak signal output | 1 PNP,<br>output is active for adequate excess gain | | ● | |
| Connection | 2500 mm fixed cable , PUR | ● | | |
| | Metal connector, M12, 5-pin, 90° rotatable | | ● | ● |
| | |  |  | |

| Approvals and Certificates | | | | |
|---|---|---|---|---|
| Protection class | II | ● | ● | ● |
| UL approval | cULus | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |

| Dimensions | | | |
|---|---|---|---|
| Length L [mm] | 41.5 | | |
| Width W [mm] | 15 | | |
| Height H [mm] | 49 | | |
| Connector length $l_c$ [mm] | 0 | 16 | |




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-MLV12-HWG** | Mounting bracket for series MLV12 sensors |
| **OMH-MLV12-HWK** | Mounting bracket for series MLV12 sensors |
| **OMH-MLV12-C** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-K02** | dove tail mounting clamp |
| **OMH-K03** | dove tail mounting clamp |
| **OMH-06** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |

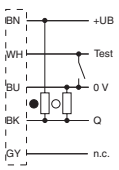
## Electrical Connection

❍ = light on, ● = dark on

MLV12-54/76b/115/128



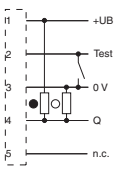
Option /76b/115/128




MLV12-54/76b/124/128

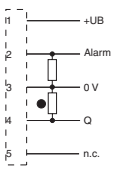


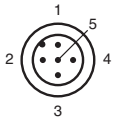
Option /76b/124/128




MLV12-54/32/82b/124

Option /32/82b/124




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Test input | ✔ |
| Reference target | MH82 reflector |
| Light type | modulated visible red light |
| Laser class | 1 |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | max. 40 mA |
| Test input | emitter deactivation at 0 V |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching type | light/dark on switchable |
| Switching current | max. 0.1 A |
| Switching frequency | 2500 Hz |
| Ambient temperature | -10 ... 50 °C (14 ... 122 °F) |
| Housing | Frame: nickel plated, die cast zinc,<br>Laterals: glass-fiber reinforced plastic PC |
| Optical face | Plastic pane |
| Protection degree | IP67 |

| Model Number | | MLV12-54-LAS/76b/110/115 | MLV12-54-LAS-300/76b/110/124 | MLV12-54-LAS/76b/110/124 |
|---|---|---|---|---|
| Threshold detection range | 21 m | ● | | ● |
| | 5.6 m | | ● | |
| Effective detection range | 0 ... 15 m | ● | | ● |
| | 100 ... 450 mm | | ● | |
| Diameter of the light spot | approx. 5 mm x 12 mm at 15 m detection range | ● | | ● |
| | approx. 0.5 mm at detection range 150 mm up to 400 mm | | ● | |
| Connection | 2500 mm fixed cable , PUR | ● | | |
| | Metal connector, M12, 5-pin, 90° rotatable | | ● | ● |
| | |  |  | |

| Approvals and Certificates | | | | |
|---|---|---|---|---|
| Protection class | II | ● | ● | ● |
| UL approval | cULus Listed, Type 1 enclosure | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |

| Dimensions | | | |
|---|---|---|---|
| Length L [mm] | 41.5 | | |
| Width W [mm] | 15 | | |
| Height H [mm] | 49 | | |
| Connector length $l_c$ [mm] | 0 | 16 | |

## Properties

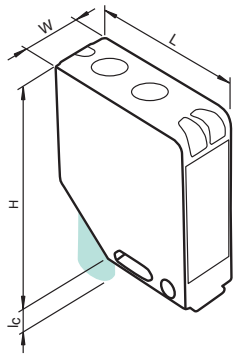
- Polarized type
- Rectangular compact housing
- Die-cast zinc frame housing
- DC sensor
- Discrete output
- Cable and connector versions
- Laser red light

## Benefits

- Small, sharp light spots provide reliable object positioning
- Optimized for small part detection




**Note:** For detailed Laser specifications refer to the data sheet at www.pepperl-fuchs.us




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-MLV12-HWG** | Mounting bracket for series MLV12 sensors |
| **OMH-MLV12-HWK** | Mounting bracket for series MLV12 sensors |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-01** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |

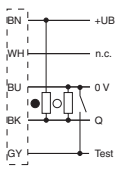
## Electrical Connection

❍ = light on, ● = dark on



MLV12-54-LAS/76b/110/115

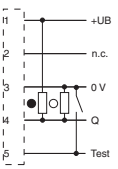
Option /76b/110/115

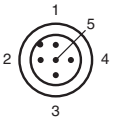





MLV12-54-LAS/76b/110/124
MLV12-54-LAS-300/76b/110/124

Option /76b/110/124



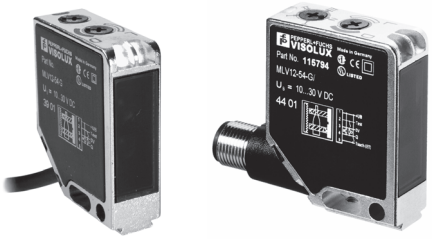

Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |




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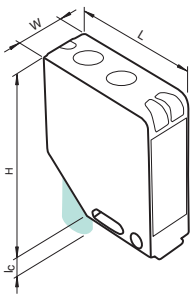


## Properties

- Clear object detection type
- Rectangular compact housing
- Die-cast zinc frame housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Reflector distance down to 0 mm due to coaxial optics
- Two in one sensor - high operating range or transparent object detection
- 3 selectable contrast levels
- Most reliable detection of PET-bottles
- Automatic threshold adjustment compensates for presence of dust and moisture
- Extreme low-temperature operation




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Glass detection | ✔ |
| Teach-In | ✔ |
| Light/dark switch | ✔ |
| 4-in-1 output | ✔ |
| Test input | ✔ |
| Threshold detection range | 5.6 m |
| Effective detection range | 0 ... 4.2 m |
| Reference target | H85-2 reflector |
| Light type | modulated visible red light, 660 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | max. 55 mA |
| Test input | emitter deactivation at 0 V |
| Function input | Ext. Teach-In input (ET) |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching type | light/dark on switchable |
| Switching current | max. 0.2 A |
| Switching frequency | 1000 Hz |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) |
| Material | |
| Housing | Frame: nickel plated, die cast zinc,<br>Laterals: glass-fiber reinforced plastic PC |
| Optical face | Plastic pane |
| Protection degree | IP67 |

| Model Number | | MLV12-54-G/76b/115/128 | MLV12-54-G/76b/124/128 |
|---|---|---|---|
| Connection | 2500 mm fixed cable , PUR | ● | |
| | Metal connector, M12, 5-pin, 90° rotatable | | ● |
| | |  |  |
| **Approvals and Certificates** | | | |
| Protection class | II | ● | ● |
| UL approval | cULus | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |
| **Dimensions** | | | |
| Length L [mm] | | 41,5 | |
| Width W [mm] | | 15 | |
| Height H [mm] | | 49 | |
| Connector length $l_c$ [mm] | | 0 | 16 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-MLV12-HWG** | Mounting bracket for series MLV12 sensors |
| **OMH-K01** | dove tail mounting clamp |

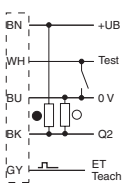
## Electrical Connection

❍ = light on, ● = dark on



MLV12-54-G/76b/115/128

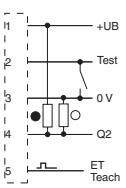
Option /76b/115/128

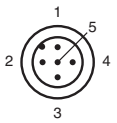





MLV12-54-G/76b/124/128

Option /76b/124/128




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |



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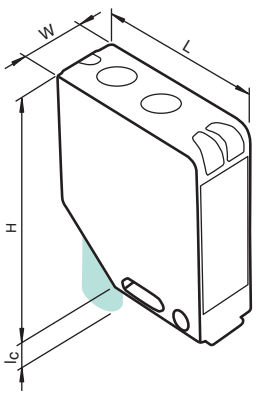


## Properties

- Thru-beam type
- Rectangular compact housing
- Die cast zinc frame housing
- Discrete output
- Cable and connector versions
- Visible red and infrared light versions

## Benefits

- Integral alignment aid LED simplifies setup
- Contrast detection mode automatically compensates for lens contaminants
- Extreme low-temperature operation




## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Teach-In | ✔ |
| Light/dark switch | ✔ |
| Test input | ✔ |
| 4-in-1 output | ✔ |
| Weak signal output | ✔ |
| Threshold detection range | 25 m |
| Effective detection range | 0 ... 16 m |
| Light type | modulated visible red light , 660 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | Emitter: ≤ 35 mA<br>Receiver: ≤ 45 mA |
| Function input | Ext. Teach-In input (ET) |
| Switching type | light/dark on, switchable |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching current | max. 0.2 A |
| Switching frequency | 1000 Hz |
| Weak signal output | 1 PNP |
| Test input | emitter deactivation at 0 V |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) |
| Material | |
| Housing | Frame: nickel plated, die cast zinc,<br>Laterals: glass-fiber reinforced plastic PC |
| Optical face | Plastic pane |
| Protection degree | IP67 |

| Model Number | | M12-F1/76b/115 | MV12-F1/82b/115/128 | M12-F1/76b/124 | MV12-F1/82b/124/128 |
|---|---|---|---|---|---|
| Emitter | | ● | | ● | |
| Receiver | | | ● | | ● |
| Connection | 2500 mm fixed cable, PUR | ● | | | |
| | 5-pin M12 metal connector, 90° rotatable | | | ● | |

| Approvals and Certificates | | | | | |
|---|---|---|---|---|---|
| Protection class | II | ● | | ● | |
| UL approval | cULus | ● | | ● | |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |

| Dimensions | | | |
|---|---|---|---|
| Length L [mm] | 41.5 | | |
| Width W [mm] | 15 | | |
| Height H [mm] | 49 | | |
| Connector length $l_c$ [mm] | 0 | 16 | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

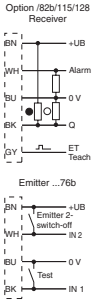
| | |
|---|---|
| **OMH-MLV12-HWG** | Mounting bracket for series MLV12 sensors |
| **OMH-MLV12-HWK** | Mounting bracket for series MLV12 sensors |
| **OMH-MLV12-C** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **V15-GM-2M-PVC** | Female cordset M12, 5-pin, PVC cable, straight |

## Electrical Connection

❍ = light on, ● = dark on

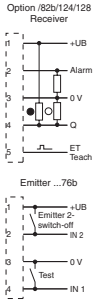
M12-F1/76b/115 + MV12-F1/82b/115

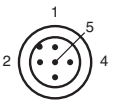





M12-F1/76b/124 + MV12-F1/82b/124/128






Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |




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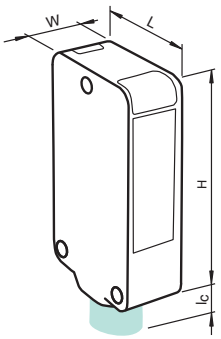


## Properties

- Background suppression
- Rectangular compact housing
- Aluminium with Delta®-Seal coating housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red and infrared light versions

## Your Benefit

- Reliable detection of all surfaces, regardless of color and texture
- Minimal black/white difference
- Adjustable long range version
- Corrosion resistant Delta®-Seal housing
- Extreme low-temperature operation




## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Detection range | 50 ... 350 mm , adjustable |
| Adjustment range | 50 ... 350 mm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | max. 25 mA |
| Signal output | 2 push-pull (4-in-1) outputs, complementary, short-circuit proof, reverse polarity protected |
| Switching type | light/dark on electrically switchable |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) |
| Housing | aluminum , Delta-Seal coated |
| Optical face | glass pane |
| Protection degree | IP67 |

| Model Number | | MLV41-8-H-350-IR/59/115/136 | MLV41-8-H-350-RT/59/115/136 | MLV41-8-H-350-RT/25/115/136 | MLV41-8-H-350-IR/59/95/136 | MLV41-8-H-350-RT/59/95/136 | MLV41-8-H-350-IR/59/92/136 | MLV41-8-H-350-RT/59/92/136 | MLV41-8-H-350-RT/25/92/136 |
|---|---|---|---|---|---|---|---|---|---|
| Light type | modulated infrared light , 880 nm | ● | | | ● | | ● | | |
| | modulated visible red light , 660 nm | | ● | ● | | ● | | ● | ● |
| Diameter of the light spot | approx. 18 mm at 350 mm sensor range | ● | | | ● | | ● | | |
| | approx. 8 mm at 350 mm sensor range | | ● | ● | | ● | | ● | ● |
| Connection | 2500 mm fixed cable | ● | ● | ● | | | | | |
| | connector M12 x 1, 4-pin | | | | | | ● | ● | ● |
| | M8 x 1 connector, 4-pin | | | | ● | ● | | | |
| | |  | | |  | | | | |
| **Approvals and Certificates** | | | | | | | | | |
| Protection class | II | ● | ● | ● | | | ● | ● | ● |
| UL approval | cULus Listed 57M3 (Only in association with UL Class 2 power supply; Type 1 enclosure) | ● | ● | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | | | |

| Dimensions | | | |
|---|---|---|---|
| Length L [mm] | 31 | | |
| Width W [mm] | 13.6 | | |
| Height H [mm] | 56.5 | | |
| Connector length $l_c$ [mm] | 3 | 12.5 | 16 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets  See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-40** | Mounting bracket |
| **OMH-09** | Mounting bracket for Sensors series MLV41 for M12 rod mounting |
| **V31-WM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, angled |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V31-GM-BK2M-PUR-U** | Female cordset M8, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

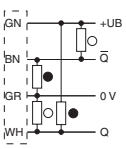
## Electrical Connection

❍ = light on, ● = dark on



MLV41-8-H-350-IR/59/115/136
MLV41-8-H-350-RT/59/115/136
MLV41-8-H-350-RT/25/115/136

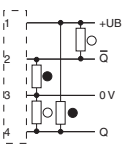
Option 59/115/136





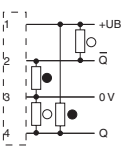

MLV41-8-H-350-IR/59/95/136
MLV41-8-H-350-RT/59/95/136

Option 59/95/136



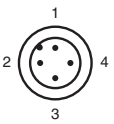

MLV41-8-H-350-IR/59/92/136
MLV41-8-H-350-RT/59/92/136
MLV41-8-H-350-RT/25/92/136

Option 59/92/136










Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | MLV41-8-HV-60-IR/110/124/167 |
|---|---|
| Foreground suppression | ✔ |
| Background suppression | ✔ |
| Weak signal output | ✔ |
| Test input | ✔ |
| Foreground suppression | 0 ... 15 mm |
| Background suppression | starts from 70 mm |
| Detection range | 20 ... 60 mm fixed |
| Light type | modulated infrared light , 880 nm |
| Diameter of the light spot | max. 6 mm at a distance of 70 mm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | max. 25 mA |
| Signal output | 1 push-pull output, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 250 Hz |
| Weak signal output | 1 push-pull output, short-circuit protected, reverse polarity protected |
| Test input | emitter deactivation at $+U_B$ |
| Ambient temperature | 0 ... 70 °C (32 ... 158 °F) |
| Material | |
| Housing | aluminum , Delta-Seal coated |
| Optical face | glass pane |
| Protection degree | IP67 |
| Connection | M12 x 1 connector, 5-pin |

| Approvals and Certificates | |
|---|---|
| Protection class | II |
| UL approval | cULus Listed 57M3 (Only in association with UL Class 2 power supply; Type 1 enclosure) |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

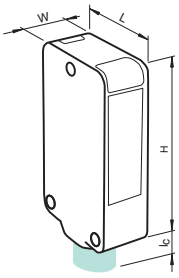
| Dimensions | |
|---|---|
| Length L [mm] | 31 |
| Width W [mm] | 13.6 |
| Height H [mm] | 56.5 |
| Connector length $l_c$ [mm] | 16 |

## Properties

- Foreground and background suppression
- Rectangular compact housing
- Aluminium with Delta®-Seal coating housing
- DC sensor
- Discrete output
- Connector version
- Infrared light

## Benefits

- Special version for web-break monitoring
- Reliable detection of printed materials of any kind
- Extremely sharp background suppression
- Antistatic optical face inhibits dust in paper and printing applications
- Corrosion resistant Delta-Seal housing
- Patented design monitors lens contamination




## Accessories

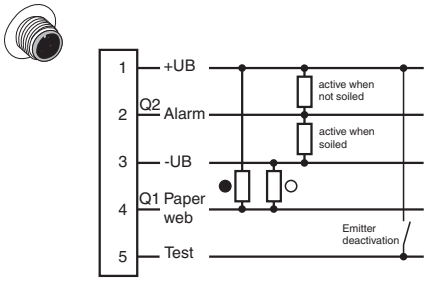
**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-MLV41-8-HV-L** | Mounting bracket |
| **OMH-MLV41-8-HV-U** | Mounting bracket |
| **OMH-40** | Mounting bracket |
| **OMH-09** | Mounting bracket for Sensors series MLV41 for M12 rod mounting |

## Electrical Connection

❍ = light on, ● = dark on







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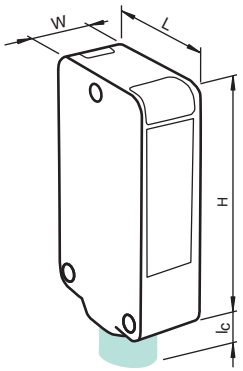


## Properties

- Polarized type
- Rectangular compact housing
- Aluminium with Delta®-Seal coating housing
- DC sensor
- Discrete output with IO-Link
- Connector version
- Visible red light

## Benefits

- Corrosion resistant Delta-Seal coated housing
- Easy configuration and diagnosis via standard communication IO-Link interface
- Simplest alignment and set-up with ultra-bright Power-Beam emitter LED




## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | | | |
|---|---|---|---|
| Polarization filter | ✔ | | |
| Light/dark adjustment | ✔ | | |
| 4-in-1 output | ✔ | | |
| Effective detection range | 0 ... 8 m | | |
| Threshold detection range | 10 m | | |
| Reference target | H85-2 reflector | | |
| Light type | modulated visible red light , 625 nm | | |
| Optical face | frontal | | |
| Operating voltage | 10 ... 30 V DC | | |
| No-load supply current | max. 30 mA | | |
| Interface type | IO-Link | | |
| Signal output | 2 Push-pull (4-in-1) outputs, complementary, short-circuit proof, reverse polarity protected | | |
| Switching type | light/dark on electrically switchable | | |
| Switching current | max. 100 mA | | |
| Switching frequency | 1000 Hz | | |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) | | |
| Material | | | |
| Housing | aluminum , Delta-Seal coated | | |
| Optical face | glass pane | | |
| Protection degree | IP67 | | |
| **Model Number** | | **MLV41-55-IO/95/136** | **MLV41-55-IO/92/136** |
| Connection | M12 x 1 connector, 4-pin | | ● |
| | M8 x 1 connector, 4-pin | ● | |
| **Approvals and Certificates** | | | |
| UL approval | cULus Listed 57M3 (Only in association with UL Class 2 power supply; Type 1 enclosure) | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |
| **Dimensions** | | | |
| Length L [mm] | | 31 | |
| Width W [mm] | | 13.6 | |
| Height H [mm] | | 56.5 | |
| Connector length $l_c$ [mm] | | 12.5 | 16 |

## Accessories

These and more accessories can be found in chapter 10

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-09** | Mounting bracket for Sensors series MLV41 for M12 rod mounting |
| **OMH-40** | Mounting bracket |
| **IO-Link-Master01-USB** | IO-Link Master |
| **IO-Link-Master-USB DTM** | Communication DTM for use of IO-Link-Master |
| **IODD Interpreter** | Software for the integration of IODDs in a frame application (e. g. PACTware) |
| **PACTware 4.X** | FDT frame application |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

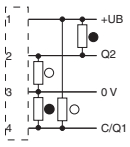
## Electrical Connection

❍ = light on, ● = dark on



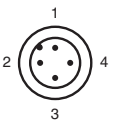
MLV41-55-IO/92/136
MLV41-55-IO/95/136

Option IO/92/136
Option IO/95/136










Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

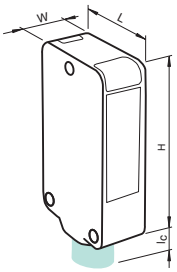
| | | | | |
|---|---|---|---|---|
| **General Data** | | | | |
| Polarization filter | ✔ | | | |
| Glass detection | ✔ | | | |
| Teach-In | ✔ | | | |
| Light/dark adjustment | ✔ | | | |
| 4-in-1 output | ✔ | | | |
| Threshold detection range | 6.5 m | | | |
| Effective detection range | 0 ... 4 m in TEACH mode , 0 ... 5.2 m at switch position "N" | | | |
| Reference target | H85-2 reflector | | | |
| Light type | modulated visible red light , 660 nm | | | |
| Operating voltage | 10 ... 30 V DC | | | |
| No-load supply current | max. 35 mA | | | |
| Signal output | 2 Push-pull (4-in-1) outputs, complementary, short-circuit proof, reverse polarity protected | | | |
| Switching type | light/dark on electrically switchable | | | |
| Switching current | max. 100 mA | | | |
| Switching frequency | 1000 Hz | | | |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) | | | |
| Material | | | | |
| Housing | aluminum , Delta-Seal coated | | | |
| Optical face | glass pane | | | |
| Protection degree | IP67 | | | |
| **Model Number** | | MLV41-54-G25/115/123/136 | MLV41-54-G25/95/136 | MLV41-54-G25/123/124/136 |
| Function input | Ext. Teach-In input (ET) | ● | | ● |
| Connection | 2500 mm fixed cable | ● | | |
| | M12 x 1 connector, 5-pin | | | ● |
| | M8 x 1 connector, 4-pin | | ● | |
| **Approvals and Certificates** | | | | |
| Protection class | II | ● | | ● |
| UL approval | cULus Listed 57M3 (Only in association with UL Class 2 power supply; Type 1 enclosure) | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |
| **Dimensions** | | | | |
| Length L [mm] | | | 31 | |
| Width W [mm] | | | 13.6 | |
| Height H [mm] | | | 56.5 | |
| Connector length $l_c$ [mm] | | 3 | 12.5 | 16 |

## Properties

- Clear object detection type
- Rectangular compact housing
- Aluminium with Delta®-Seal coating housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Corrosion resistant Delta-Seal housing
- Reflector distance down to 0 mm due to coaxial optics
- Two in one sensor - high operating range or clear class detection
- 3 selectable contrast levels
- Most reliable detection of PET-bottles
- Automatic threshold adjustment compensates for presence of dust and moisture




## Accessories

These and more accessories can be found in chapter 10

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-41** | Mounting bracket |
| **OMH-09** | Mounting bracket for Sensors series MLV41 for M12 rod mounting |

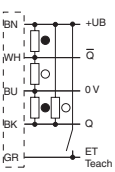
## Electrical Connection

❍ = light on, ● = dark on



MLV41-54-G/25/115/123/136

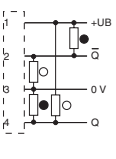
Option 115/136





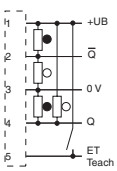

MLV41-54-G/25/95/136

Option 25/95/136



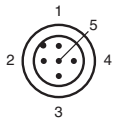

MLV41-54-G/25/123/124/136

Option 124/136










Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |




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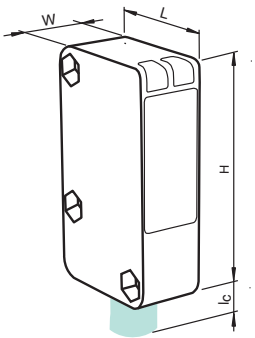


## Properties

- Diffuse type with convergent beam
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Connector and pigtailed connector versions
- Visible red light

## Your Benefit

- Convergent sensing ignores some objects in the background




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Detection range | 10 ... 300 mm |
| Light type | modulated visible red light , 630 nm |
| Convergent mode | ≥ 450 mm |
| Diameter of the light spot | approx. 8 mm at a distance of 300 mm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 25 mA |
| Signal output | 2 push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching type | light/dark on electrically switchable |
| Switching frequency | ≤ 500 Hz |
| Ambient temperature | -30 ... 55 °C (-22 ... 131 °F) |
| Housing | plastic |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | RL31-8-HGU-300-RT/115b/136 | RL31-8-HGU-300-RT/73c/136 | RL31-8-HGU-300-RT/59/73c/136 |
|---|---|---|---|---|
| Connection | 300 mm fixed cable with M12 x 1, 4-pin connector | ● | | |
| | connector M12 x 1, 4-pin | | ● | ● |
| | |  |  | |
| **Approvals and Certificates** | | | | |
| Protection class | II | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |
| **Dimensions** | | | | |
| Length L [mm] | | 35 | | |
| Width W [mm] | | 18 | | |
| Height H [mm] | | 62 | | |
| Connector length $l_c$ [mm] | | 0 | 10.3 | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-RL31-01** | Mounting bracket |
| **OMH-RL31-02** | Mounting bracket narrow |
| **OMH-RL31-03** | Mounting bracket narrow |
| **OMH-RL31-04** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-RL31-05** | Mounting bracket with M10 threaded rod |
| **OMH-RL31-06** | Stainless steel mounting bracket with adjustable half clamp on the side |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

## Electrical Connection

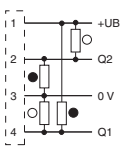
❍ = light on, ● = dark on



RL31-8-HGU-300-RT/59/73c/136

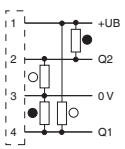


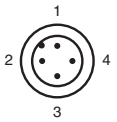
Option /59/73c/136




RL31-8-HGU-300-RT/115b/136
RL31-8-HGU-300-RT/73c/136

Option /25/73c/136




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



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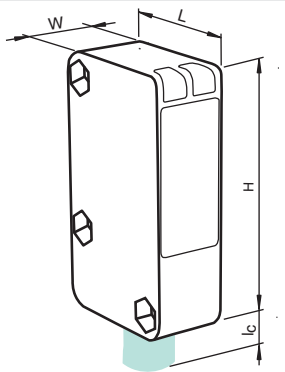


## Properties

- Background suppression
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output with IO-Link
- Cable and connector versions
- Visible red light

## Benefits

- Measuring photoelectric sensor with 4 selectable operating modes
- Easily adapts to the application by the standard communication IO-Link interface
- Simplest alignment and set-up with ultra-bright Power-Beam emitter LED
- Minimal black/white difference
- Adjustable switchpoint




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| | |
|---|---|
| **General Data** | |
| Background suppression | ✔ |
| Background evaluation | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Detection range | 50 ... 800 mm |
| Adjustment range | 100 ... 800 mm |
| Light type | modulated visible red light |
| Diameter of the light spot | approx. 25 mm at a distance of 800 mm |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | max. 25 mA at 24 V supply voltage |
| Interface | |
| Interface type | IO-Link |
| Mode | COM 2 (38.4 kBaud) |
| Switching output | |
| Switching type | light/dark on electrically switchable |
| Signal output | 2 Push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 200 Hz |
| Ambient temperature | -30 ... 55 °C (-22 ... 131 °F) |
| Material | |
| Housing | Polycarbonate |
| Optical face | PMMA |
| Protection degree | IP67 |

| **Model Number** | | RL31-8-H-800-RT-IO/59/115/136 | RL31-8-H-800-RT-IO/59/73c/136 |
|---|---|---|---|
| Connection | 2 m fixed cable , 4-wire | ● | |
| | connector M12 x 1, 4-pin | | ● |
| | |  |  |
| **Approvals and Certificates** | | | |
| Protection class | II | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |
| **Dimensions** | | | |
| Length L [mm] | | 35 | |
| Width W [mm] | | 18 | |
| Height H [mm] | | 62 | |
| Connector length $l_c$ [mm] | | 0 | 10.3 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **PACTware 4.X** | |
| **IODD Interpreter** | Software for the integration of IODDs in a frame application (e. g. PACTware) |
| **IO-Link-Master01-USB** | IO-Link Master |
| **OMH-RL31-01** | Mounting bracket |
| **OMH-RL31-02** | Mounting bracket |
| **OMH-RL31-04** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

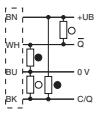
## Electrical Connection

❍ = light on, ● = dark on



RL31-8-H-800-RT-IO/59/115/136

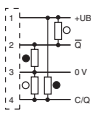
Option 59/115/136

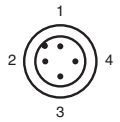





RL31-8-H-800-RT-IO/59/73c/136

Option /59/73c/136




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



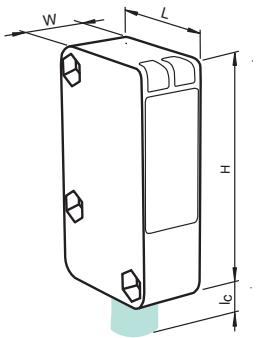

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## Properties

- Diffuse type
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red and infrared light versions




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Sensing range adjustment | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | ≤ 20 mA |
| Signal output | 2 push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching type | light/dark on electrically switchable |
| Switching frequency | ≤ 500 Hz |
| Ambient temperature | -30 ... 55 °C (-22 ... 131 °F) |
| Housing | Polycarbonate |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | RL31-8-2500-IR/115/136 | RL31-8-1200-RT/73c/136 | RL31-8-1200-RT/59/73c/136 | RL31-8-2500-IR/73c/136 | RL31-8-2500-IR/59/73c/136 |
|---|---|---|---|---|---|---|
| Detection range | 0 ... 1200 mm adjustable | | ● | ● | | |
| | 0 ... 2500 mm adjustable | ● | | | ● | ● |
| Light type | modulated infrared light , 850 nm | ● | | | ● | ● |
| | modulated visible red light , 630 nm | | ● | ● | | |
| Connection | 2 m fixed cable , 4-wire | ● | | | | |
| | connector M12 x 1, 4-pin | | ● | ● | ● | ● |
| | |  |  | | | |
| **Approvals and Certificates** | | | | | | |
| Protection class | II | ● | ● | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | |
| **Dimensions** | | | | | | |
| Length L [mm] | | 35 | | | | |
| Width W [mm] | | 18 | | | | |
| Height H [mm] | | 62 | | | | |
| Connector length $l_c$ [mm] | | 0 | 10.2 | | | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-RL31-01** | Mounting bracket |
| **OMH-RL31-02** | Mounting bracket narrow |
| **OMH-RL31-03** | Mounting bracket narrow |
| **OMH-RL31-04** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-RL31-05** | Mounting bracket with M10 threaded rod |
| **OMH-RL31-06** | Stainless steel mounting bracket with adjustable half clamp on the side |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

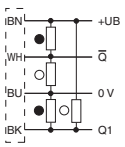
## Electrical Connection

❍ = light on, ● = dark on



RL31-8-2500-IR/115/136

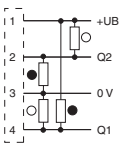
Option 115/136





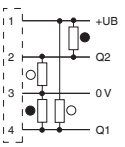

RL31-8-1200-RT/59/73c/136

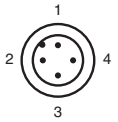
Option /59/73c/136




RL31-8-2500-IR/73c/136
RL31-8-1200-RT/73c/136
RL31-8-2500-IR/59/73c/136

Option /25/73c/136




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

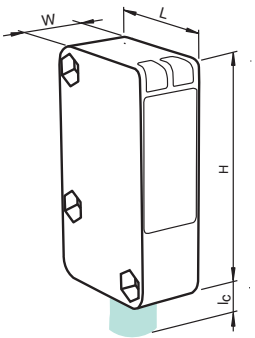
| General Data | |
|---|---|
| Sensing range adjustment | ✔ |
| Light/dark adjustment | ✔ |
| Operating voltage | 24 ... 240 V AC<br>12 ... 240 V DC |
| No-load supply current | ≤ 40 mA |
| Power consumption | ≤ 2 VA |
| Signal output | 1 SPDT relay output |
| Switching type | light/dark on electrically switchable |
| Switching current | max. 3 A |
| Switching power | DC: max. 150 W AC: max. 750 VA |
| Switching frequency | ≤ 20 Hz |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Housing | Polycarbonate |
| Optical face | PMMA |
| Protection degree | IP67 |
| Connection | 2 m fixed cable , 5-wire |



| Model Number | | RLK31-8-1200-RT/31/115 | RLK31-8-1200-RT/31/59/115 | RLK31-8-2500-IR/31/115 | RLK31-8-2500-IR/31/59/115 |
|---|---|---|---|---|---|
| Detection range | 0 ... 1200 mm adjustable | ● | ● | | |
| | 0 ... 2500 mm adjustable | | | ● | ● |
| Light type | modulated infrared light , 850 nm | | | ● | ● |
| | modulated visible red light , 630 nm | ● | ● | | |
| **Approvals and Certificates** | | | | | |
| Protection class | II | ● | ● | ● | ● |
| CCC approval | Certified by China Compulsory Certification (CCC) | ● | ● | ● | ● |
| **Dimensions** | | | | | |
| Length L [mm] | | 35 | | | |
| Width W [mm] | | 18 | | | |
| Height H [mm] | | 62 | | | |
| Connector length $l_c$ [mm] | | 0 | | | |

## Properties

- Diffuse type
- Rectangular full-size housing
- Plastic housing
- AC/DC sensor
- Relay output
- Cable version
- Visible red and infrared light versions




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-RL31-01** | Mounting bracket |
| **OMH-RL31-02** | Mounting bracket narrow |
| **OMH-RL31-03** | Mounting bracket narrow |
| **OMH-RL31-04** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-RL31-05** | Mounting bracket with M10 threaded rod |
| **OMH-RL31-06** | Stainless steel mounting bracket with adjustable half clamp on the side |

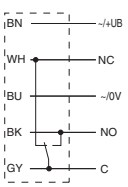
## Electrical Connection

❍ = light on, ● = dark on



RLK31-8-2500-IR/31/115
RLK31-8-1200-RT/31/115
RLK31-8-1200-RT/31/59/115
RLK31-8-2500-IR/31/59/115

Option 31/115





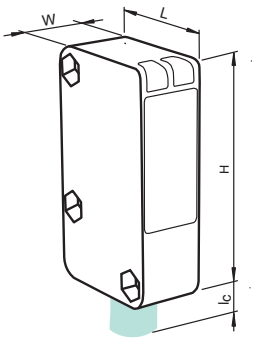



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## Properties

- Polarized type
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Threshold detection range | 12 m |
| Effective detection range | 0 ... 9000 mm |
| Reference target | reflector C110-2 |
| Light type | modulated visible red light , 630 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 20 mA |
| Signal output | 2 push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching type | light/dark on electrically switchable |
| Switching frequency | ≤ 500 Hz |
| Ambient temperature | -30 ... 55 °C (-22 ... 131 °F) |
| Housing | plastic |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | RL31-54/115/136 | RL31-54/73c/136 | RL31-54/25/73c/136 |
|---|---|---|---|---|
| Connection | 2 m fixed cable | ● | | |
| | connector M12 x 1, 4-pin | | ● | ● |
| | |  |  | |
| **Approvals and Certificates** | | | | |
| Protection class | II | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |
| **Dimensions** | | | | |
| Length L [mm] | | | 35 | |
| Width W [mm] | | | 18 | |
| Height H [mm] | | | 62 | |
| Connector length $l_c$ [mm] | | 0 | 10 | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-RL31-01** | Mounting bracket |
| **OMH-RL31-02** | Mounting bracket narrow |
| **OMH-RL31-03** | Mounting bracket narrow |
| **OMH-RL31-04** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-RL31-05** | Mounting bracket with M10 threaded rod |
| **OMH-RL31-06** | Stainless steel mounting bracket with adjustable half clamp on the side |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

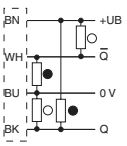
## Electrical Connection

❍ = light on, ● = dark on

RL31-54/115/136



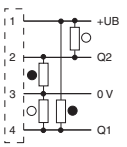
Option 59/115/136




RL31-54/73c/136

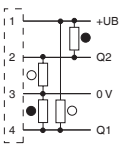


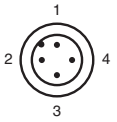
Option /59/73c/136




RL31-54/25/73c/136

Option /25/73c/136




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| | |
|---|---|
| **General Data** | |
| Light/dark adjustment | ✔ |
| Light type | modulated visible red light , 630 nm |
| Operating voltage | 24 ... 240 V AC / 12 ... 240 V DC |
| No-load supply current | ≤ 40 mA |
| Power consumption | ≤ 2 VA |
| Signal output | 1 SPDT relay output |
| Switching current | max. 3 A |
| Switching power | DC: max. 150 W AC: max. 750 VA |
| Switching type | light/dark on electrically switchable |
| Switching frequency | 20 Hz |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Material | |
| Housing | Polycarbonate |
| Optical face | PMMA |
| Protection degree | IP67 |
| Connection | 2 m fixed cable , 5-wire |



| Model Number | | RLK31-6/31/115 | RLK31-6/25/31/115 | RLK31-54/31/115 | RLK31-54/25/31/115 |
|---|---|---|---|---|---|
| Polarization filter | ✔ | | | ● | ● |
| Threshold detection range | 12 m | | | ● | ● |
| | 16.5 m | ● | ● | | |
| Effective detection range | 0 ... 9 m | | | ● | ● |
| | 0 ... 14 m | ● | ● | | |
| Reference target | reflector C110-2 | | | ● | ● |
| | H85-2 reflector | ● | ● | | |
| **Approvals and Certificates** | | | | | |
| Protection class | II | ● | ● | ● | ● |
| CCC approval | Certified by China Compulsory Certification (CCC) | ● | ● | ● | ● |

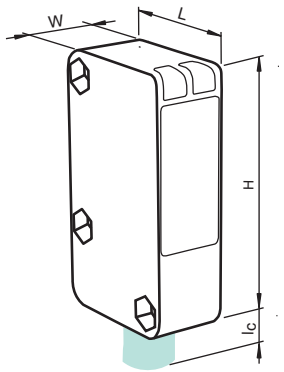
| **Dimensions** | |
|---|---|
| Length L [mm] | 35 |
| Width W [mm] | 18 |
| Height H [mm] | 62 |
| Connector length $l_c$ [mm] | 0 |

## Properties

- Polarized and non-polarized types
- Rectangular full-size housing
- Plastic housing
- AC/DC sensor
- Relay output
- Cable version
- Visible red light

## Benefits

- Universal usage with AC or DC power supply




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-RL31-01** | Mounting bracket |
| **OMH-RL31-02** | Mounting bracket |
| **OMH-RL31-03** | Mounting bracket |
| **OMH-RL31-04** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-RL31-05** | Mounting bracket |
| **OMH-RL31-06** | Mounting bracket |

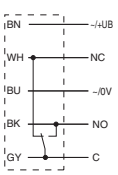
## Electrical Connection

❍ = light on, ● = dark on



RLK31-54/31/115
RLK31-6/31/115
RLK31-54/25/31/115
RLK31-6/25/31/115

Option 31/115








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## Properties

- Thru-beam type
- Rectangular full-size housing
- Plastic housing
- Discrete output
- Cable and connector versions
- Visible red light

## Technical Data

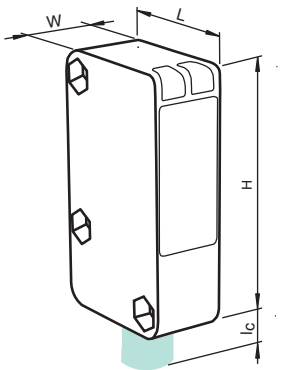
*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Test input | ✔ |
| Threshold detection range | 43 m |
| Effective detection range | 0 ... 30 m |
| Light type | modulated visible red light , 630 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | Emitter: ≤ 18 mA<br>Receiver: ≤ 18 mA |
| Signal output | 2 Push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching type | light/dark on electrically switchable |
| Switching frequency | ≤ 250 Hz |
| Test input | emitter deactivation at $+U_B$ |
| Ambient temperature | -30 ... 55 °C (-22 ... 131 °F) |
| Material | |
| Housing | Polycarbonate |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | LD31/76a/115<br>LV31/115/136 | LD31/73c/76a<br>LV31/73c/136 | LD31/73c/76a<br>LV31/25/73c/136 |
|---|---|---|---|---|
| Emitter | | ● | ● | ● |
| Receiver | | ● | ● | ● |
| Connection | connector M12 x 1, 4-pin | | ● | ● |
| | Emitter: 2 m fixed cable , 3-wire<br>Receiver: 2 m fixed cable , 4-wire | ● | | |

| Approvals and Certificates | | | | |
|---|---|---|---|---|
| Protection class | II | ● | | ● |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |

| Dimensions | | | |
|---|---|---|---|
| Length L [mm] | 35 | | |
| Width W [mm] | 18 | | |
| Height H [mm] | 62 | | |
| Connector length $l_c$ [mm] | 0 | 10 | |




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

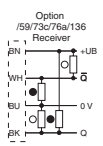
| | |
|---|---|
| **OMH-RL31-01** | Mounting bracket |
| **OMH-RL31-02** | Mounting bracket |
| **OMH-RL31-03** | Mounting bracket |
| **OMH-RL31-04** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-RL31-05** | Mounting bracket |
| **V1-GM-2M-PUR** | Female cordset M12, 4-pin, PUR cable, straight |
| **V1-WM-2M-PUR** | Female cordset M12, 4-pin, PUR cable, angled |

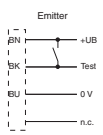
## Electrical Connection

❍ = light on, ● = dark on

LD31/76a/115 + LV31/115/136

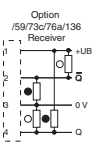


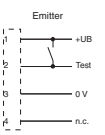


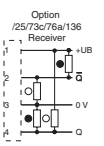

LD31/73c/76a + LV31/73c/136

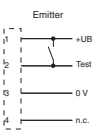


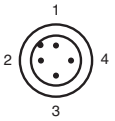



LD31/73c/76a + LV31/25/73c/136




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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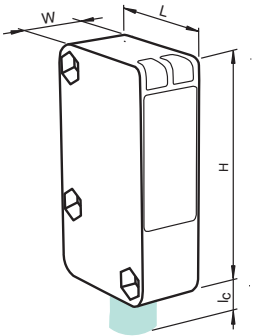


## Properties

- Thru-beam type
- Rectangular full-size housing
- Plastic housing
- AC / DC sensor
- Relay output
- Cable version
- Visible red light

## Benefits

- Universal usage with AC or DC power supply




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Light/dark adjustment | ✔ |
| Threshold detection range | 43 m |
| Effective detection range | 0 ... 30 m |
| Light type | modulated visible red light , 630 nm |
| Operating voltage | 24 ... 240 V AC<br>12 ... 240 V DC |
| No-load supply current | Emitter: ≤ 20 mA<br>Receiver: ≤ 20 mA |
| Power consumption | Emitter: ≤ 1 VA<br>Receiver: ≤ 1 VA |
| Signal output | 1 SPDT relay output |
| Switching current | max. 3 A |
| Switching power | DC: max. 150 W AC: max. 750 VA |
| Switching type | light/dark on electrically switchable |
| Switching frequency | ≤ 20 Hz |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Housing | Polycarbonate |
| Optical face | PMMA |
| Protection degree | IP67 |
| Connection | Emitter: 2 m fixed cable , 2-wire<br>Receiver: 2 m fixed cable , 5-wire |



| Model Number | LA31/115 LK31/31/115 | LA31/115 LK31/25/31/115 |
|---|---|---|
| Emitter | ● | ● |
| Receiver | ● | ● |
| **Approvals and Certificates** | | |
| Protection class II | ● | ● |
| CCC approval Certified by China Compulsory Certification (CCC) | ● | ● |
| **Dimensions** | | |
| Length L [mm] | 35 | |
| Width W [mm] | 18 | |
| Height H [mm] | 62 | |
| Connector length $l_c$ [mm] | 0 | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

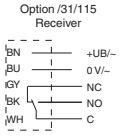
| | |
|---|---|
| **OMH-RL31-01** | Mounting bracket |
| **OMH-RL31-02** | Mounting bracket narrow |
| **OMH-RL31-03** | Mounting bracket narrow |
| **OMH-RL31-04** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-RL31-06** | Stainless steel mounting bracket with adjustable half clamp on the side |
| **OMH-RL31-05** | Mounting bracket with M10 threaded rod |

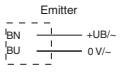
## Electrical Connection

❍ = light on, ● = dark on



LA31/115 + LK31/31/115
LA31/115 + LK31/25/31/115







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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark switch | ✔ |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | 100 mA |
| Switching type | light/dark on switchable |
| Signal output | 1 PNP and 1 NPN short-circuit protected, reverse polarity protected |
| Switching current | max. 200 mA |
| Switching frequency | 70 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | Terluran GV15 |
| Optical face | glass |
| Protection degree | IP65 |
| Connection | connector M12 x 1, 4-pin |



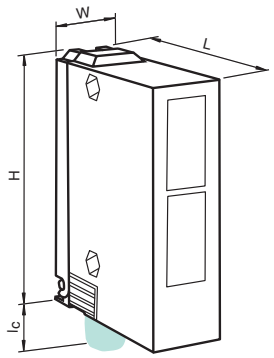
| Model Number | | RL23-8-H-500-RT/49/92 | RL23-8-H-1000-IR/49/92 | RL23-8-H-2000-IR/49/92 |
|---|---|---|---|---|
| Timer | ✔ | | | ● |
| Detection range | 50 ... 1000 mm | | ● | |
| | 50 ... 2000 mm | | | ● |
| | 50 ... 500 mm | ● | | |
| Light type | modulated infrared light | | ● | ● |
| | modulated visible red light | ● | | |
| Diameter of the light spot | 12 mm at 500 mm sensor range | ● | | |
| | 25 mm at 1000 mm sensor range | | ● | |
| | 50 mm at 2000 mm sensor range | | | ● |
| **Approvals and Certificates** | | | | |
| UL approval | cULus | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |
| **Dimensions** | | | | |
| Length L [mm] | | 67.6 | | |
| Width W [mm] | | 26.8 | | |
| Height H [mm] | | 91 | | |
| Connector length $l_c$ [mm] | | 17 | | |

## Properties

- Background suppression
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Connector version
- Visible red and infrared light versions

## Benefits

- Reliable detection of all surfaces, regardless of color and texture
- Small black/white difference
- Adjustable switchpoint




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-21** | Mounting bracket |
| **OMH-22** | Mounting bracket |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-RL25** | Mounting bracket |
| **OMH-RL2-H** | Mounting bracket |
| **OMH-21-T** | Mounting bracket |
| **OMH-RL2-S** | Mounting bracket |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

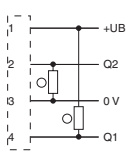
## Electrical Connection

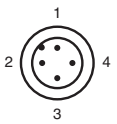
❍ = light on, ● = dark on



RL23-8-H-1000-IR/49/92
RL23-8-H-2000-IR/49/92
RL23-8-H-500-RT/49/92

Option /49/92




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark switch | ✔ |
| Operating voltage | 12 ... 240 V AC , 10 ... 30 V DC |
| Power consumption | 3 VA |
| Switching type | light/dark on switchable |
| Signal output | 1 SPDT relay output |
| Switching current | max. 2 A |
| Switching frequency | 10 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | Terluran GV15 |
| Optical face | glass |
| Protection degree | IP65 |
| Connection | terminal compartment |



| Model Number | | RLK23-8-H-500-RT/31/116 | RLK23-8-H-1000-IR/31/116 | RLK23-8-H-2000-IR/31/104/116 |
|---|---|---|---|---|
| Timer | ✔ | | | ● |
| Detection range | 50 ... 500 mm | ● | | |
| | 50 ... 1000 mm | | ● | |
| | 50 ... 2000 mm | | | ● |
| Light type | modulated infrared light | | ● | ● |
| | modulated visible red light | ● | | |
| Diameter of the light spot | 12 mm at 500 mm sensor range | ● | | |
| | 25 mm at 1000 mm sensor range | | ● | |
| | 50 mm at 2000 mm sensor range | | | ● |
| **Approvals and Certificates** | | | | |
| UL approval | cULus | ● | ● | ● |
| CCC approval | Certified by China Compulsory Certification (CCC) | ● | ● | ● |

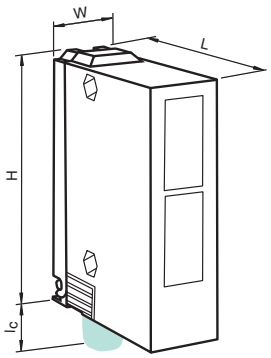
| Dimensions | |
|---|---|
| Length L [mm] | 67.6 |
| Width W [mm] | 26.8 |
| Height H [mm] | 91 |
| Connector length $l_c$ [mm] | 0 |

## Properties

- Background suppression
- Rectangular full-size housing
- Plastic housing
- AC/DC sensor
- Relay output
- Terminal compartment
- Visible red and infrared light versions

## Your Benefit

- Universal usage with AC or DC power supply
- Reliable detection of all surfaces, regardless of color and texture
- Small black/white difference
- Adjustable switchpoint




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-21** | Mounting bracket |
| **OMH-22** | Mounting bracket |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-RL25** | Mounting bracket |
| **OMH-RL2-H** | Mounting bracket |
| **OMH-RL2-S** | Mounting bracket |

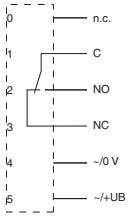
## Electrical Connection

❍ = light on, ● = dark on



RLK23-8-H-1000-IR/31/116
RLK23-8-H-2000-IR/31/104/116
RLK23-8-H-500-RT/31/116

Option /31/116







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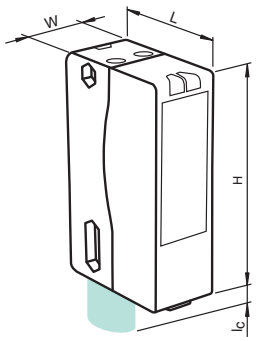


## Properties

- Background suppression
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Connector version
- Visible red and infrared light versions

## Your Benefit

- Reliable detection of all surfaces, regardless of color and texture
- Small black/white difference
- Adjustable switchpoint
- Extreme low-temperature operation




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark switch | ✔ |
| 4-in-1 output | ✔ |
| Detection range | 20 ... 400 mm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 40 mA |
| Switching type | light/dark on switchable |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 250 Hz |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) |
| Housing | Plastic ABS |
| Optical face | plastic |
| Protection degree | IP67 |
| Connection | M12 x 1 connector, 5-pin |



| Model Number | | RL28-8-H-400-RT/105/110 | RL28-8-H-400-IR/105/110 |
|---|---|---|---|
| Light type | modulated infrared light , 880 nm | | ● |
| | modulated visible red light , 660 nm | ● | |
| Diameter of the light spot | approx. 12 mm at a distance of 400 mm | ● | |
| | approx. 14 mm at a distance of 400 mm | | ● |
| **Approvals and Certificates** | | | |
| Protection class | II | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |

| Dimensions | |
|---|---|
| Length L [mm] | 54.3 |
| Width W [mm] | 25.8 |
| Height H [mm] | 88 |
| Connector length $l_c$ [mm] | 12 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-21** | Mounting bracket |
| **OMH-22** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-RLK29** | Mounting bracket |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-RL28-C** | Weld slag cover model |
| **OMH-RL2-S** | Mounting bracket |
| **OMH-RL29-06** | Mounting bracket |
| **V15-G-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, straight |
| **V15-W-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, angled |

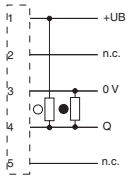
## Electrical Connection

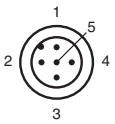
❍ = light on, ● = dark on



RL28-8-H-400-RT/105/110
RL28-8-H-400-IR/105/110

Option /105/110




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark switch | ✔ |
| 4-in-1 output | ✔ |
| Detection range | 20 ... 700 mm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 40 mA |
| Switching type | light/dark on switchable |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 250 Hz |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) |
| Housing | Plastic ABS |
| Optical face | plastic |
| Protection degree | IP67 |
| Connection | M12 x 1 connector, 5-pin |



| Model Number | | RL28-8-H-700-RT/105/110 | RL28-8-H-700-IR/105/110 |
|---|---|---|---|
| Light type | modulated infrared light , 880 nm | | ● |
| | modulated visible red light , 660 nm | ● | |
| Diameter of the light spot | approx. 15 mm at a distance of 700 mm | ● | |
| | approx. 24 mm at a distance of 700 mm | | ● |
| **Approvals and Certificates** | | | |
| Protection class | II | ● | ● |
| UL approval | cULus | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |

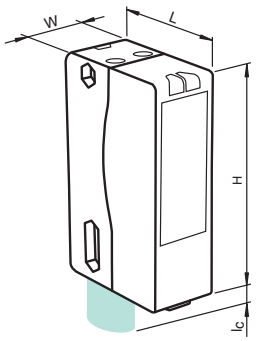
| Dimensions | |
|---|---|
| Length L [mm] | 54.3 |
| Width W [mm] | 25.8 |
| Height H [mm] | 88 |
| Connector length $l_c$ [mm] | 12 |

## Properties

- Background suppression
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Connector version
- Visible red and infrared light versions

## Your Benefit

- Reliable detection of all surfaces, regardless of color and texture
- Small black/white difference
- Adjustable switchpoint




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-21** | Mounting bracket |
| **OMH-22** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-RLK29** | Mounting bracket |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-RL28-C** | Weld slag cover model |
| **OMH-RL2-S** | Mounting bracket |
| **OMH-RL29-06** | Mounting bracket |
| **OMH-21-T** | Mounting bracket |
| **V15-G-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, straight |
| **V15-W-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, angled |

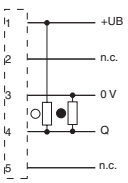
## Electrical Connection

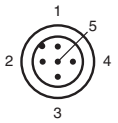
❍ = light on, ● = dark on



RL28-8-H-700-RT/105/110
RL28-8-H-700-IR/105/110

Option /105/110



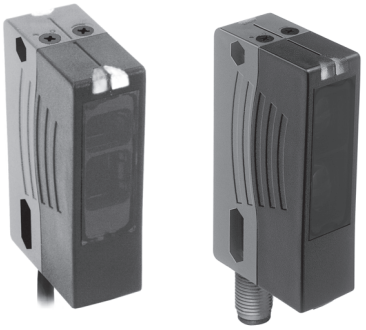

Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |





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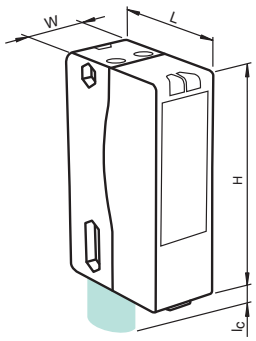


## Properties

- Background suppression
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Infrared light

## Your Benefit

- Reliable detection of all surfaces, regardless of color and texture
- Small black/white difference
- Adjustable long range version
- Extreme low-temperature operation




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark switch | ✔ |
| 4-in-1 output | ✔ |
| Detection range | 20 ... 2000 mm |
| Light type | modulated infrared light , 880 nm |
| Diameter of the light spot | approx. 70 mm at a distance of 2000 mm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 40 mA |
| Switching type | light/dark on switchable |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 250 Hz |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) |
| Housing | Plastic ABS |
| Optical face | plastic |
| Protection degree | IP67 |

| Model Number | | RL28-8-H-2000-IR/110/115 | RL28-8-H-2000-IR/105/110 |
|---|---|---|---|
| Connection | 2500 mm fixed cable | ● | |
| | M12 x 1 connector, 5-pin | | ● |
| | |  |  |
| **Approvals and Certificates** | | | |
| Protection class | II | ● | ● |
| UL approval | cULus | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |
| **Dimensions** | | | |
| Length L [mm] | | 54.3 | |
| Width W [mm] | | 25.8 | |
| Height H [mm] | | 88 | |
| Connector length $l_c$ [mm] | | 0 | 120 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-21** | Mounting bracket |
| **OMH-22** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-RLK29** | Mounting bracket |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-RL28-C** | Weld slag cover model |
| **OMH-RL2-S** | Mounting bracket |
| **OMH-RL29-06** | Mounting bracket |
| **OMH-21-T** | Mounting bracket |
| **V15-G-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, straight |
| **V15-W-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, angled |

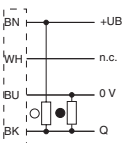
## Electrical Connection

❍ = light on, ● = dark on

RL28-8-H-2000-IR/110/115



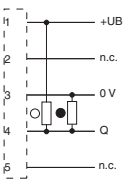
Option /110/115

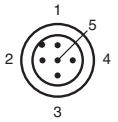



RL28-8-H-2000-IR/105/110



Option /105/110




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | RL28-8-H-1500-LAS/105/110 |
|---|---|
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark switch | ✔ |
| 4-in-1 output | ✔ |
| Detection range | 100 ... 1500 mm |
| Light type | modulated visible red light |
| Laser class | 1 |
| Wave length | 650 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 40 mA |
| Switching type | light/dark on switchable |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 140 Hz |
| Ambient temperature | -10 ... 50 °C (14 ... 122 °F) |
| Material | |
| Housing | Plastic ABS |
| Optical face | plastic |
| Protection degree | IP67 |
| Connection | 5-pin, M12 x 1 plastic connector |



| Approvals and Certificates | |
|---|---|
| Protection class | II |
| UL approval | cULus |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

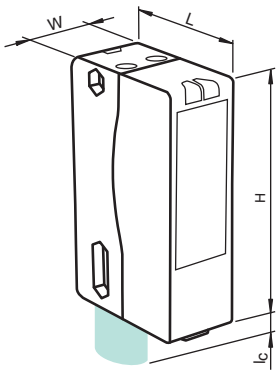
| Dimensions | |
|---|---|
| Length L [mm] | 54.3 |
| Width W [mm] | 25.8 |
| Height H [mm] | 88 |
| Connector length $l_c$ [mm] | 12 |

## Properties

- Background suppression
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Connector version
- Laser red light

## Benefits

- Reliable detection of all surfaces, regardless of color and texture
- Small black/white difference
- Adjustable long range version
- Small, sharp light spots provide reliable object positioning
- Optimized for small part detection




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-21** | Mounting bracket |
| **OMH-22** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-RL28-C** | Protective cover |
| **OMH-RL2-S** | Mounting bracket |
| **OMH-RL29-06** | Mounting bracket |
| **OMH-21-T** | Mounting bracket |
| **V15-G-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, straight |
| **V15-W-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, angled |

CLASS 1
LASER PRODUCT
IEC 60825-1: 2007 certified.
Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

**Note:** For detailed Laser specifications refer to the data sheet at www.pepperl-fuchs.us

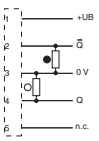
## Electrical Connection

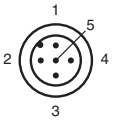
❍ = light on, ● = dark on

RL28-8-H-1500-LAS/105/110



Option /47/105




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |





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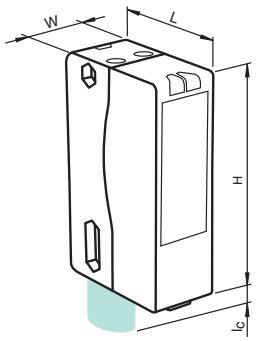


## Properties

- Background suppression
- Rectangular full-size housing
- Plastic housing
- AC/DC sensor
- Relay output
- Terminal compartment
- Visible red and infrared light versions

## Your Benefit

- Universal usage with AC or DC power supply
- Reliable detection of all surfaces, regardless of color and texture
- Small black/white difference
- Adjustable switchpoint
- Extreme low-temperature operation




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Timer | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark switch | ✔ |
| Operating voltage | 12 ... 240 V AC/DC |
| Power consumption | ≤ 3.5 VA |
| Switching type | light/dark on, switchable |
| Signal output | 1 SPDT relay output |
| Switching current | max. 2 A |
| Switching power | DC: max. 50 W AC: max. 500 VA |
| Switching frequency | 25 Hz |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) |
| Housing | Plastic ABS |
| Optical face | Plastic pane |
| Protection degree | IP67 |
| Connection | terminal compartment with 8 spring-loaded terminals for wire cross section 0.5 ... 1.5 mm², insulation stripping 7.5 ... 8.5 mm, M16 x 1.5 cable gland |



| Model Number | | RLK28-8-H-400-RT-Z/31/116 | RLK28-8-H-400-IR-Z/31/116 | RLK28-8-H-700-RT-Z/31/116 | RLK28-8-H-700-IR-Z/31/116 | RLK28-8-H-2000-IR-Z/31/116 |
|---|---|---|---|---|---|---|
| Detection range | 20 ... 400 mm | ● | ● | | | |
| | 20 ... 700 mm | | | ● | ● | |
| | 20 ... 2000 mm | | | | | ● |
| Adjustment range | 150 ... 400 mm | ● | ● | | | |
| | 200 ... 700 mm | | | ● | ● | |
| | 200 ... 2000 mm | | | | | ● |
| Light type | modulated infrared light , 880 nm | | ● | | ● | ● |
| | modulated visible red light , 660 nm | ● | | ● | | |
| Diameter of the light spot [mm] | approx. at a distance of 400 mm | 12 | 14 | 15 | 24 | 70 |
| **Approvals and Certificates** | | | | | | |
| Protection class | II | ● | ● | ● | ● | ● |
| UL approval | cULus Listed , Class 2 power source | ● | ● | ● | ● | ● |
| CCC approval | Certified by China Compulsory Certification (CCC) | ● | ● | ● | ● | ● |
| **Dimensions** | | | | | | |
| Length L [mm] | | 65.5 | | | | |
| Width W [mm] | | 25.8 | | | | |
| Height H [mm] | | 88 | | | | |
| Connector length $l_c$ [mm] | | 0 | | | | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-RLK29** | Mounting bracket |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-RL28-C** | Weld slag cover model |

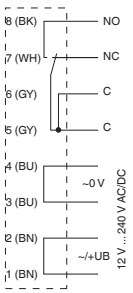
## Electrical Connection

❍ = light on, ● = dark on



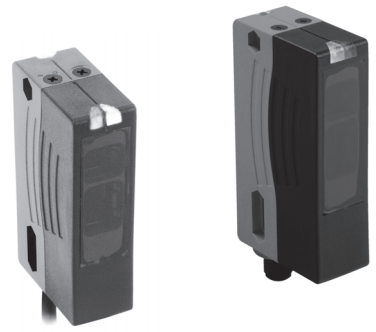
RLK28-8-H-2000-IR-Z/31/116
RLK28-8-H-400-RT-Z/31/116
RLK28-8-H-700-RT-Z/31/116
RLK28-8-H-400-IR-Z/31/116
RLK28-8-H-700-IR-Z/31/116

Option /31/116






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## Technical Data

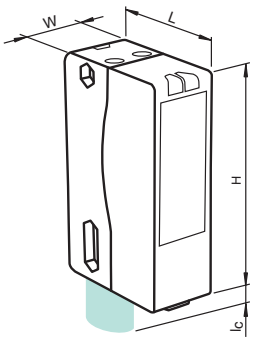
*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Weak signal output | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| 4-in-1 output | ✔ |
| Reference target | H85-2 reflector |
| Light type | modulated visible red light , 660 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 40 mA |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching type | light/dark on switchable |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Weak signal output | 1 PNP, output is active for adequate excess gain |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) |
| Housing | Plastic ABS |
| Optical face | plastic |
| Protection degree | IP67 |

| Model Number | | RL28-55/82b/110/115 | RL28-55/82b/105/110 | RL28-55-V/82b/105/110 |
|---|---|---|---|---|
| Foreground suppression | ✔ | | | ● |
| Threshold detection range | 17 m | | | ● |
| | 21 m | ● | ● | |
| Effective detection range | 0 ... 13 m | | | ● |
| | 0 ... 17 m | ● | ● | |
| Connection | 2500 mm fixed cable | ● | | |
| | M12 x 1 connector, 5-pin | | ● | ● |
| | |  |  | |
| **Approvals and Certificates** | | | | |
| Protection class | II | ● | ● | ● |
| UL approval | cULus | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |
| **Dimensions** | | | | |
| Length L [mm] | | | 54.3 | |
| Width W [mm] | | | 25.8 | |
| Height H [mm] | | | 90 | |
| Connector length $l_c$ [mm] | | 5.5 | 12 | |

## Properties

- Polarized type
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-21** | Mounting bracket |
| **OMH-22** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-RLK29** | Mounting bracket |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-RL28-C** | Weld slag cover model |
| **V15-G-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, straight |
| **V15-W-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, angled |

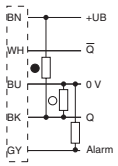
## Electrical Connection

❍ = light on, ● = dark on



RL28-55/82b/110/115

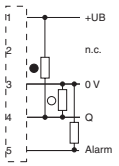
Option /82b/110/115

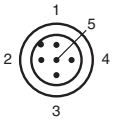





RL28-55/82b/105/110
RL28-55-V/82b/105/110

Option /82b/105/110



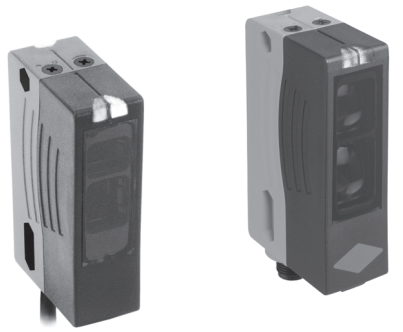

Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |




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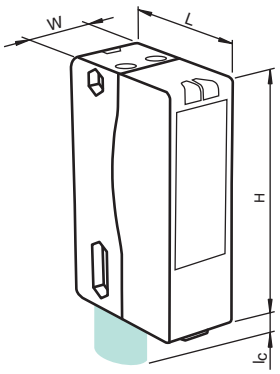


## Properties

- Polarized type
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Laser red light

CLASS 1
LASER PRODUCT
IEC 60825-1: 2007 certified.
Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

**Note:** For detailed Laser specifications refer to the data sheet at www.pepperl-fuchs.us




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| 4-in-1 output | ✔ |
| Test input | ✔ |
| Weak signal output | ✔ |
| Threshold detection range | 42 m |
| Effective detection range | 0 ... 30 m |
| Reference target | MH82 reflector |
| Light type | modulated visible red light |
| Laser class | 1 |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 35 mA |
| Switching type | light/dark on switchable |
| Test input | emitter deactivation with +Ub |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Weak signal output | 1 PNP |
| Ambient temperature | -10 ... 50 °C (14 ... 122 °F) |
| Material | |
| Housing | Plastic ABS |
| Optical face | Plastic pane |
| Protection degree | IP67 |

| Model Number | | RL28-55-LAS/76a/82b/110/115 | RL28-55-LAS/76a/82b/105/110 |
|---|---|---|---|
| Connection | 2.5 m, 5-wire, fixed cable | ● | |
| | 5-pin, M12 x 1 plastic connector | | ● |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | | |
|---|---|---|
| Length L [mm] | 54.3 | |
| Width W [mm] | 25.8 | |
| Height H [mm] | 90 | |
| Connector length $l_c$ [mm] | 6 | 12 |

## Accessories

**These and more accessories can be found in chapter 10**
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

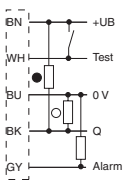
| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-RLK29** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-RL28-C** | Protective cover |
| **OMH-RL2-S** | Mounting bracket |
| **OMH-RL29-06** | Mounting bracket |
| **V15-G-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, straight |
| **V15-W-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, angled |

## Electrical Connection

❍ = light on, ● = dark on

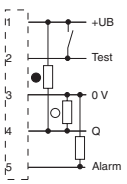
RL28-55-LAS/76a/82b/110/115

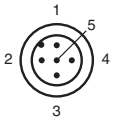
Option /76a/82b/110/115




RL28-55-LAS/76a/82b/105/110

Option /76a/82b/105/110



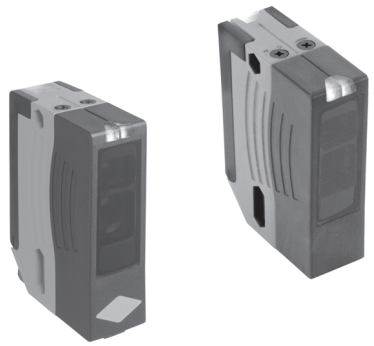




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Light type | modulated visible red light , 660 nm |
| Operating voltage | 12 ... 240 V AC/DC |
| Power consumption | ≤ 3.5 VA |
| Signal output | 1 SPDT relay output |
| Switching type | light/dark on switchable |
| Switching current | max. 2 A |
| Switching power | DC: max. 50 W AC: max. 500 VA |
| Switching frequency | 25 Hz |
| Material | |
| Housing | Plastic ABS |
| Optical face | Plastic pane |
| Protection degree | IP67 |
| Connection | terminal compartment with 8 spring-loaded terminals |



| Model Number | | RLK28-55/31/116 | RLK28-55-Z/31/116 | RLK28-55-LAS-Z/31/116 |
|---|---|---|---|---|
| Timer | ✔ | | ● | ● |
| Threshold detection range | 21 m | ● | ● | |
| | 42 m | | | ● |
| Effective detection range | 0 ... 17 m | ● | ● | |
| | 0 ... 30 m | | | ● |
| Reference target | H85-2 reflector | ● | ● | |
| | MH82 reflector | | | ● |
| Laser class | 1 | | | ● |
| Ambient temperature | -10 ... 50 °C (14 ... 122 °F) | | | ● |
| | -40 ... 60 °C (-40 ... 140 °F) | ● | ● | |
| **Approvals and Certificates** | | | | |
| Protection class | II | ● | ● | ● |
| UL approval | cULus Listed , Class 2 power source | ● | ● | ● |
| CCC approval | Certified by China Compulsory Certification (CCC) | ● | ● | ● |

| Dimensions | |
|---|---|
| Length L [mm] | 65,5 |
| Width W [mm] | 25,8 |
| Height H [mm] | 90 |
| Connector length $l_c$ [mm] | 0 |

## Properties

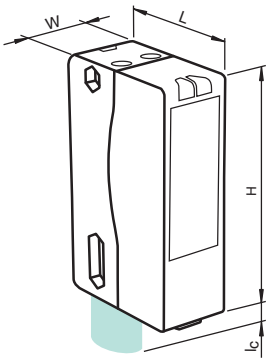
- Polarized type
- Rectangular full-size housing
- Plastic housing
- AC/DC sensor
- Relay output
- Terminals version
- Visible red light and laser red light versions

## Benefits

- Universal usage with AC or DC power supply
- Extreme low-temperature operation

CLASS 1
LASER PRODUCT
IEC 60825-1: 2007 certified,
Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

**Note:** For detailed Laser specifications refer to the data sheet at www.pepperl-fuchs.us




## Accessories

**These and more accessories can be found in chapter 10**
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-21** | Mounting bracket |
| **OMH-RLK29** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-RL28-C** | Protective cover |
| **OMH-RL2-S** | Mounting bracket |
| **OMH-RL29-06** | Mounting bracket |
| **OMH-21-T** | Mounting bracket |

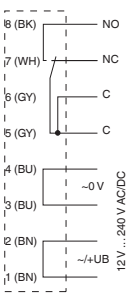
## Electrical Connection

❍ = light on, ● = dark on



RLK28-55/31/116
RLK28-55-LAS-Z/31/116
RLK28-55-Z/31/116

Option /31/116







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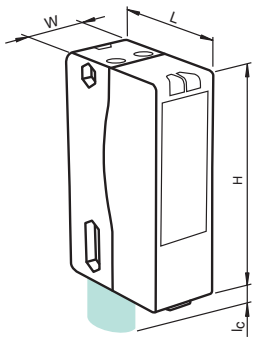


## Properties

- Clear object detection type
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Cable version
- Visible red light

## Benefits

- Reflector distance down to 0 mm due to coaxial optics
- Two in one sensor - high operating range or transparent object detection
- 3 selectable contrast levels
- Automatic threshold adjustment compensates for presence of dust and moisture




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | RL28-54-G/76a/110/115 |
|---|---|
| Polarization filter | ✔ |
| Glass detection | ✔ |
| Teach-In | ✔ |
| Light/dark switch | ✔ |
| 4-in-1 output | ✔ |
| Test input | ✔ |
| Threshold detection range | 7 m |
| Effective detection range | 0 ... 5.6 m |
| Reference target | H85-2 reflector |
| Light type | modulated visible red light , 660 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 50 mA |
| Test input | emitter deactivation with +Ub |
| Function input | Ext. Teach-In input (ET) |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching type | light/dark on switchable |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) |
| Housing | Plastic ABS |
| Optical face | Plastic pane |
| Protection degree | IP67 |
| Connection | 2500 mm fixed cable |
| |  |
| **Approvals and Certificates** | |
| Protection class | II |
| UL approval | cULus |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |
| **Dimensions** | |
| Length L [mm] | 54.3 |
| Width W [mm] | 25.8 |
| Height H [mm] | 90 |
| Connector length $l_c$ [mm] | 5.5 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-21** | Mounting bracket |
| **OMH-22** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-RLK29** | Mounting bracket |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-RL28-C** | Weld slag cover model |
| **OMH-RL2-S** | Mounting bracket |
| **OMH-RL29-06** | Mounting bracket |
| **OMH-21-T** | Mounting bracket |

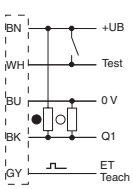
## Electrical Connection

❍ = light on, ● = dark on



RL28-54-G/76a/110/115

Option /76a/110/115






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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | RLK28-54-G/31/116 |
|---|---|
| Polarization filter | ✔ |
| Glass detection | ✔ |
| Teach-In | ✔ |
| Light/dark switch | ✔ |
| Threshold detection range | 7 m |
| Effective detection range | 0 ... 5.6 m |
| Reference target | H85-2 reflector |
| Light type | modulated visible red light , 660 nm |
| Operating voltage | 12 ... 240 V AC/DC |
| Power consumption | ≤ 3.5 VA |
| Signal output | 1 SPDT relay output |
| Switching type | light/dark on switchable |
| Switching current | max. 2 A |
| Switching power | DC: max. 50 W AC: max. 500 VA |
| Switching frequency | 25 Hz |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) |
| Material | |
| Housing | Plastic ABS |
| Optical face | Plastic pane |
| Protection degree | IP67 |
| Connection | terminal compartment |
| |  |

| Approvals and Certificates | |
|---|---|
| Protection class | II |
| UL approval | cULus Listed , Class 2 power source |
| CCC approval | Certified by China Compulsory Certification (CCC) |

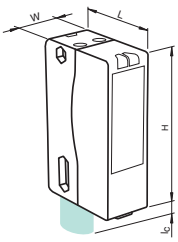
| Dimensions | |
|---|---|
| Length L [mm] | 65.5 |
| Width W [mm] | 25.8 |
| Height H [mm] | 90 |
| Connector length $l_c$ [mm] | 0 |

## Properties

- Clear object detection type
- Rectangular full-size housing
- Plastic housing
- AC/DC sensor
- Relay output
- Terminals version
- Visible red light

## Benefits

- Reflector distance down to 0 mm due to coaxial optics
- Two in one sensor - high operating range or clear class detection
- 3 selectable contrast levels
- Most reliable detection of PET-bottles
- Automatic threshold adjustment compensates for presence of dust and moisture
- Universal usage with AC or DC power supply
- Extreme low-temperature operation




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-21** | Mounting bracket |
| **OMH-22** | Mounting bracket |
| **OMH-MLV11-K** | dove tail mounting clamp |
| **OMH-RLK29** | Mounting bracket |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-RL28-C** | Protective cover |
| **OMH-RL2-S** | Mounting bracket |
| **OMH-RL29-06** | Mounting bracket |
| **OMH-21-T** | Mounting bracket |
| **M16-1/2"NPT** | Adapter |
| **M16-V125-G-S-.3M** | Male receptacle |
| **M16-V95-G-S-.15M** | Male receptacle |

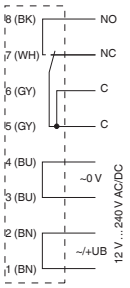
## Electrical Connection

❍ = light on, ● = dark on



RLK28-54-G/31/116

Option /31/116

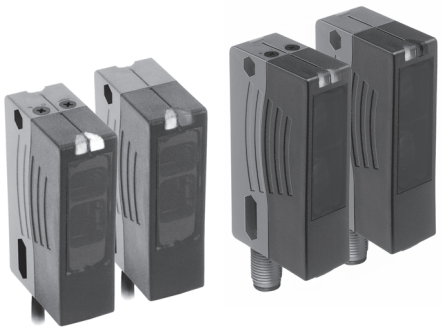






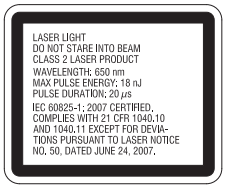
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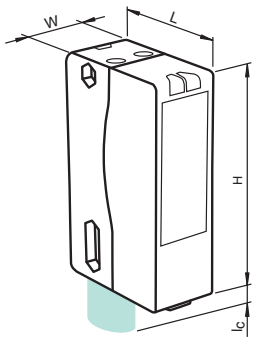


## Properties

- Thru-beam type
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Connector and pigtailed connector versions
- Visible red light and laser red light versions




**Note:** For detailed Laser specifications refer to the data sheet at www.pepperl-fuchs.us




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | | | | | | |
|---|---|---|---|---|---|---|
| Test input | ✔ | | | | | |
| Sensitivity adjustment | ✔ | | | | | |
| Light type | modulated visible red light | | | | | |
| Operating voltage | 10 ... 30 V DC | | | | | |
| No-load supply current | Emitter: ≤ 55 mA , Receiver: ≤ 35 mA | | | | | |
| Switching type | light/dark on , switchable | | | | | |
| Test input | emitter deactivation at $+U_B$ | | | | | |
| Housing | Plastic ABS | | | | | |
| Optical face | Plastic pane | | | | | |
| Protection degree | IP67 | | | | | |

| Model Number | | LD28-F1-3057/35/76a/115b LV28-F1-3057/35/47/115b | LD28-F2-3057/35/76a/115b LV28-F2-3057/35/47/115b | LD28-F1/76a/105 LV28-F1/82b/105/110 | LD28-LAS-F1/76a/105 LV28-LAS-F1/82b/105/110 | LD28-LAS-F2/76a/105 LV28-LAS-F2/47/82b/105 |
|---|---|---|---|---|---|---|
| Emitter | | ● | ● | ● | ● | ● |
| Receiver | | ● | ● | ● | ● | ● |
| Light/dark switch | ✔ | | | ● | ● | ● |
| 4-in-1 output | ✔ | | | ● | ● | ● |
| Threshold detection range | [m] | 90 | 90 | 40 | 400 | 400 |
| Effective detection range | 0 ... [m] | 65 | 65 | 30 | 300 | 300 |
| Laser class | 2 | | | | ● | ● |
| Emitter frequency | F1 = 25 kHz, F2 = 30 kHz | F1 | F2 | F1 | F1 | F2 |
| Signal output | 1 push-pull (4-in-1) output, short-circuit protected, reverse polarity protected | | | ● | ● | |
| | 2 PNP, complementary, short-circuit protected, reverse polarity protected | ● | ● | | | ● |
| Switching current | max. [mA] | 200 | 200 | 100 | 100 | 200 |
| Switching frequency | max. [Hz] | 25 | 25 | 1000 | 1000 | 1000 |
| Weak signal output | ✔ 1 PNP transistor, open collector, | | | ● | ● | ● |
| Ambient temperature | -10 ... 50 °C (14 ... 122 °F) | | | | ● | ● |
| | -40 ... 60 °C (-40 ... 140 °F) | ● | ● | ● | | |
| Connection | 230 mm cable with M12 connector, 4-pin | ● | ● | | | |
| | 5-pin, M12 x 1 plastic connector | | | ● | ● | ● |
| | |  | |  | | |

| Approvals and Certificates | | | | | | |
|---|---|---|---|---|---|---|
| Protection class | II | ● | ● | ● | ● | ● |
| UL approval | cULus | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | |

| Dimensions | | | | | | |
|---|---|---|---|---|---|---|
| Length L [mm] | | | | 54.3 | | |
| Width W [mm] | | | | 25.8 | | |
| Height H [mm] | | | | 88 | | |
| Connector length $l_c$ [mm] | | 8 | | 14 | | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

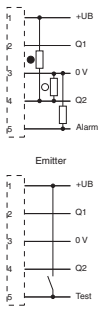
| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-RLK29** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-RL28-C** | Weld slag cover model |
| **V15-W-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, angled |

## Electrical Connection

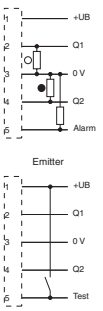
❍ = light on, ● = dark on



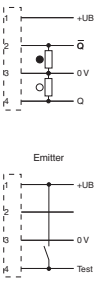
LD28-F1/76a/105 + LV28-F1/82b/105/110

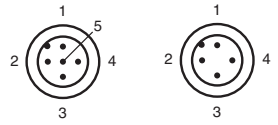



LD28-LAS-F./76a/105 + LV28-LAS-F./82b/105/110




LD28-F.-3057/35/76a/115b + LV28-F.-3057/35/47/115b




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

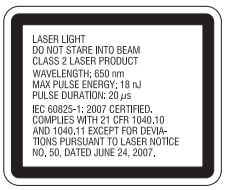
| | | LA28-F1/116 LK28-Z-F1/31/116 | LA28-F2/116 LK28-Z-F2/31/116 | LA28-LAS-F1/116 LK28-LAS-F1-Z/31/116 |
|---|---|---|---|---|
| **General Data** | | | | |
| Sensitivity adjustment | ✔ | | | |
| Light/dark switch | ✔ | | | |
| Timer | ✔ | | | |
| Light type | modulated visible red light | | | |
| Operating voltage | 12 ... 240 V AC/DC | | | |
| Power consumption | ≤ 3.5 VA | | | |
| Switching type | light/dark on, switchable | | | |
| Signal output | 1 SPDT relay output | | | |
| Switching current | max. 2 A | | | |
| Switching power | DC: max. 50 W AC: max. 500 VA | | | |
| Switching frequency | 25 Hz | | | |
| Timer function | ON delay (GAN), OFF delay (GAB), one shot (IAB), ON delay-OFF delay (GAN-GAB), programmable. Adjustment range 0.1 ...10 s | | | |
| Housing | Plastic ABS | | | |
| Optical face | Plastic pane | | | |
| Protection degree | IP67 | | | |
| Connection | terminal compartment with 8 spring-loaded terminals | | | |
| **Model Number** | | | | |
| Emitter | | ● | ● | ● |
| Receiver | | ● | ● | ● |
| Threshold detection range | 400 m | | | ● |
| | 90 m | ● | ● | |
| Effective detection range | 0 ... 300 m | | | ● |
| | 0 ... 65 m | ● | ● | |
| Laser class | 2 | | | ● |
| Emitter frequency | F1 = 25 kHz | ● | | ● |
| | F2 = 30 kHz | | ● | |
| Ambient temperature | -10 ... 50 °C (14 ... 122 °F) | | | ● |
| | -40 ... 60 °C (-40 ... 140 °F) | ● | ● | |
| **Approvals and Certificates** | | | | |
| Protection class | II | ● | ● | ● |
| UL approval | cULus Listed , Class 2 power source | ● | ● | ● |
| CCC approval | Certified by China Compulsory Certification (CCC) | ● | ● | ● |
| **Dimensions** | | | | |
| Length L [mm] | | 65.5 | | |
| Width W [mm] | | 25.8 | | |
| Height H [mm] | | 88 | | |
| Connector length $l_c$ [mm] | | 0 | | |

## Properties

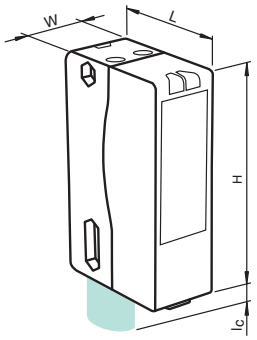
- Thru-beam type
- Rectangular full-size housing
- Plastic housing
- AC / DC sensor
- Relay output
- Terminals
- Visible red light and laser red light versions

## Benefits

- Universal usage with AC or DC power supply




**Note:** For detailed Laser specifications refer to the data sheet at www.pepperl-fuchs.us




## Accessories

**These and more accessories can be found in chapter 10**

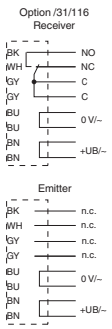
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-21** | Mounting bracket |
| **OMH-22** | Mounting bracket |
| **OMH-RLK29** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-RL28-C** | Weld slag cover model |

## Electrical Connection

❍ = light on, ● = dark on

LA28-F1/116 + LK28-Z-F1/31/116
LA28-F2/116 + LK28-Z-F2/31/116
LA28-LAS-F1/116 + LK28-LAS-F1-Z/31/116

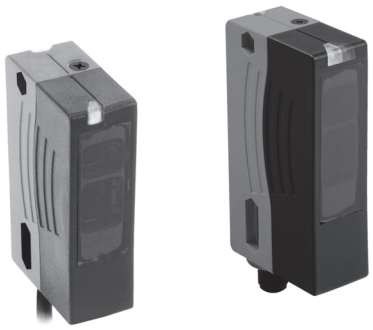






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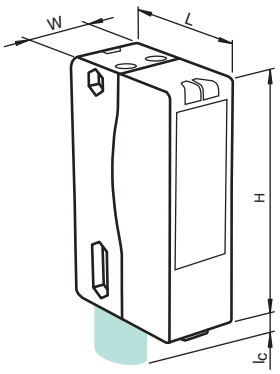


## Properties

- Background suppression
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Reliable detection of all surfaces, regardless of color and texture
- Small black/white difference
- Adjustable switchpoint




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| | |
|---|---|
| **General Data** | |
| Background suppression | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Detection range | 30 ... 1200 mm , adjustable |
| Light type | modulated visible red light |
| Diameter of the light spot | approx. 25 mm at a distance of 1200 mm |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | ≤ 40 mA |
| Switching type | light/dark on electrically switchable |
| Signal output | 2 Push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 125 Hz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Material | |
| Housing | Plastic ABS |
| Optical face | plastic |
| Protection degree | IP65 |

| **Model Number** | | RL29-8-H-1200-RT/115/136 | RL29-8-H-1200-RT/73c/136 |
|---|---|---|---|
| Connection | 2500 mm fixed cable | ● | |
| | Plastic connector M12 x 1, 4-pin | | ● |
| **Approvals and Certificates** | | | |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |
| **Dimensions** | | | |
| Length L [mm] | | 54.3 | |
| Width W [mm] | | 25.8 | |
| Height H [mm] | | 88 | |
| Connector length $l_c$ [mm] | | 5 | 12 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-21** | Mounting bracket |
| **OMH-22** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-RL28-C** | Protective cover |
| **OMH-RL2-S** | Mounting bracket |
| **OMH-RL29-06** | Mounting bracket |
| **OMH-21-T** | Mounting bracket |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

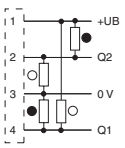
## Electrical Connection

❍ = light on, ● = dark on



RL29-8-H-1200-RT/115/136

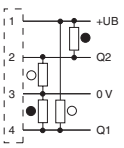
Option /73c/136

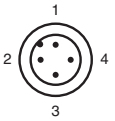





RL29-8-H-1200-RT/73c/136

Option /115b/136




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | RL29-8-2000/73c/136<br>RL29-8-2000/59/73c/136 |
|---|---|
| Light/dark adjustment | ✔ |
| Sensitivity adjustment | ✔ |
| 4-in-1 output | ✔ |
| Detection range | 20 ... 2000 mm , adjustable |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 40 mA |
| Signal output | 2 Push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching type | light/dark on electrically switchable |
| Switching frequency | 125 Hz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Material | |
| Housing | Plastic ABS |
| Optical face | plastic |
| Protection degree | IP65 |
| Connection | Plastic connector M12 x 1, 4-pin |



| Approvals and Certificates | |
|---|---|
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 54.3 |
| Width W [mm] | 25.8 |
| Height H [mm] | 88 |
| Connector length $l_c$ [mm] | 14 |

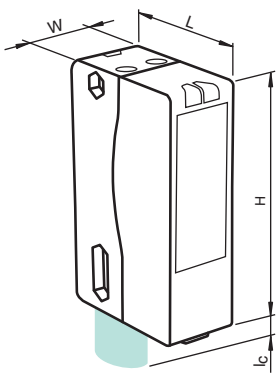
## Properties

- **Diffuse type**
- **Rectangular full-size housing**
- **Plastic housing**
- **DC sensor**
- **Discrete output**
- **Connector version**
- **Visible red light**

## Accessories

**These and more accessories can be found in chapter 10**
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-21** | Mounting bracket |
| **OMH-22** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-RL28-C** | Protective cover |
| **OMH-RL2-S** | Mounting bracket |
| **OMH-RL29-06** | Mounting bracket |
| **OMH-21-T** | Mounting bracket |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |



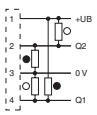

## Electrical Connection

❍ = light on, ● = dark on



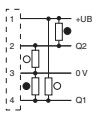
RL29-8-2000/59/73c/136

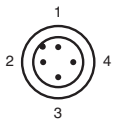
Option /59/73c/136




RL29-8-2000/73c/136

Option /73c/136




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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Singapore: +65 6779 9091 fa-info@sg.pepperl-fuchs.com

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## Properties

- Polarized type
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Connector version
- Visible red light

## Technical Data

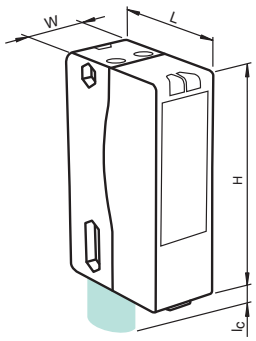
*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Reference target | H85 reflector |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | ≤ 30 mA |
| Signal output | 2 push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching type | light/dark on electrically switchable |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 60 °C (-13 ... 140 °F) |
| Housing | Plastic ABS |
| Optical face | plastic |
| Protection degree | IP65 |
| Connection | Plastic connector M12 x 1, 4-pin |



| Model Number | | RL29-55/73c/136 | RL29-55/25/73c/136 | RL29-55-V/73c/136 |
|---|---|---|---|---|
| Foreground suppression | ✔ | | | ● |
| Threshold detection range | 10 m | ● | ● | |
| | 8 m | | | ● |
| Effective detection range | 0.1 ... 7 m | ● | ● | |
| | 0.4 ... 6 m | | | ● |
| **Approvals and Certificates** | | | | |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |

| Dimensions | |
|---|---|
| Length L [mm] | 54.3 |
| Width W [mm] | 25.8 |
| Height H [mm] | 90 |
| Connector length $l_c$ [mm] | 12 |




## Accessories

**These and more accessories can be found in chapter 10**
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-21** | Mounting bracket |
| **OMH-22** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-RL28-C** | Weld slag cover model |
| **OMH-RL2-S** | Mounting bracket |
| **OMH-RL29-06** | Mounting bracket |
| **OMH-21-T** | Mounting bracket |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

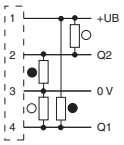
## Electrical Connection

❍ = light on, ● = dark on



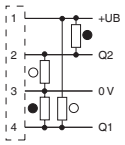
RL29-55/73c/136
RL29-55-V/73c/136

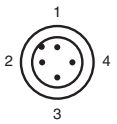
Option /73c/136




RL29-55/25/73c/136

Option /25/73c/136




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Timer | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark switch | ✔ |
| 4-in-1 output | ✔ |
| Light type | modulated infrared light , 850 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 35 mA |
| Switching type | light/dark on, switchable |
| Signal output | 2 push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -40 ... 55 °C (-40 ... 131 °F) |
| Housing | PC (Polycarbonate) |
| Optical face | PMMA |
| Protection degree | IP67 |

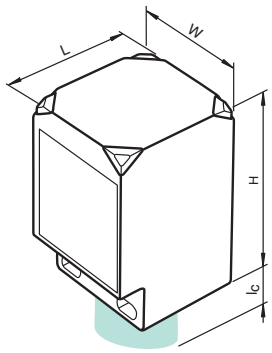
| Model Number | | RL61-8-H-500-IR-Z/115/136 | RL61-8-H-2000-IR-Z/115/136 | RL61-8-H-500-IR-Z/92/136 | RL61-8-H-2000-IR-Z/92/136 |
|---|---|---|---|---|---|
| Detection range | 20 ... 2000 mm | | ● | | ● |
| | 20 ... 500 mm | ● | | ● | |
| Adjustment range | 200 ... 500 mm | ● | | ● | |
| | 500 ... 2000 mm | | ● | | ● |
| Diameter of the light spot | approx. 24 mm at a distance of 2000 mm | | ● | | ● |
| | approx. 6 mm at a distance of 500 mm | ● | | ● | |
| Connection | 2m fixed cable | ● | ● | | |
| | connector M12 x 1, 4-pin | | | ● | ● |
| | |  | |  | |
| **Approvals and Certificates** | | | | | |
| UL approval | cULus | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |
| **Dimensions** | | | | | |
| Length L [mm] | | 49 | | | |
| Width W [mm] | | 45 | | | |
| Height H [mm] | | 74 | | | |
| Connector length $l_c$ [mm] | | 18 | | 26 | |

## Properties

- Background suppression
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Infrared light

## Your Benefit

- Reliable detection of all surfaces, regardless of color and texture
- Small black/white difference
- Adjustable switchpoint
- Extreme low-temperature operation
- Ultra-bright four-corner LEDs for
- sensor status indication




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **MPZB01** | Mounting bracket with vertical slots |
| **MPZB02** | Mounting bracket with circular slots |
| **MPZB06** | Ball and Swivel Mounting Bracket |
| **MPZB07** | Ball and Swivel Vertical Mounting Plate |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

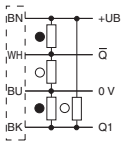
## Electrical Connection

❍ = light on, ● = dark on



RL61-8-H-2000-IR-Z/115/136
RL61-8-H-500-IR-Z/115/136

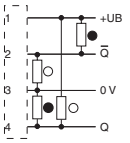
Option 115/136

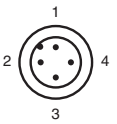





RL61-8-H-2000-IR-Z/92/136
RL61-8-H-500-IR-Z/92/136

Option 92/136




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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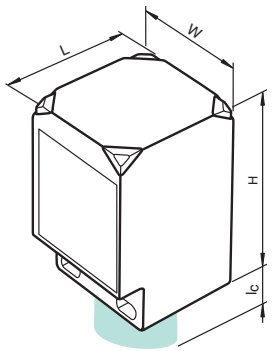


## Properties

- Background suppression
- Rectangular full-size housing
- Plastic housing
- AC/DC sensor
- Relay output
- Cable and connector versions
- Infrared light

## Your Benefit

- Universal usage with AC or DC power supply
- Reliable detection of all surfaces, regardless of color and texture
- Small black/white difference
- Adjustable switchpoint
- Extreme low-temperature operation




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Background suppression | ✔ |
| Timer | ✔ |
| Sensing range adjustment | ✔ |
| Light/dark switch | ✔ |
| Light type | modulated infrared light , 850 nm |
| Operating voltage | 24 ... 240 V AC<br>12 ... 240 V DC |
| No-load supply current | ≤ 35 mA |
| Power consumption | ≤ 2 VA |
| Switching type | light/dark on, switchable |
| Signal output | 1 SPDT relay output |
| Switching current | max. 3 A |
| Switching frequency | 20 Hz |
| Ambient temperature | -40 ... 55 °C (-40 ... 131 °F) |
| Housing | PC (Polycarbonate) |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | RLK61-8-H-500-IR-Z/31/115 | RLK61-8-H-2000-IR-Z/31/115 | RLK61-8-H-500-IR-Z/31/135 | RLK61-8-H-2000-IR-Z/31/135 |
|---|---|---|---|---|---|
| Detection range | 20 ... 500 mm | ● | | ● | |
| | 20 ... 2000 mm | | ● | | ● |
| Adjustment range | 200 ... 500 mm | ● | | ● | |
| | 500 ... 2000 mm | | ● | | ● |
| Diameter of the light spot | approx. 24 mm at a distance of 2000 mm | | ● | | ● |
| | approx. 6 mm at a distance of 500 mm | ● | | ● | |
| Switching power | DC: max. 150 W AC: max. 750 VA | ● | ● | | ● |
| | DC: max. 50 W AC: max. 500 VA | | | ● | |
| Connection | 2 m fixed cable, 5-wire | ● | ● | | |
| | Connector 7/8“ - 16 UN 2A, 5-pin | | | ● | ● |
| | |  | |  | |

| Approvals and Certificates | | | | | |
|---|---|---|---|---|---|
| UL approval | cULus | ● | ● | ● | ● |
| CCC approval | Certified by China Compulsory Certification (CCC) | ● | ● | ● | ● |

| Dimensions | | | |
|---|---|---|---|
| Length L [mm] | 49 | | |
| Width W [mm] | 45 | | |
| Height H [mm] | 74 | | |
| Connector length $l_c$ [mm] | 18 | 27.5 | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **MPZB01** | Mounting bracket with vertical slots |
| **MPZB02** | Mounting bracket with circular slots |
| **MPZB06** | Ball and Swivel Mounting Bracket |
| **MPZB07** | Ball and Swivel Vertical Mounting Plate |
| **V95-G-YE2M-STOOW** | Female cordset, 7/8" - 16 UNF, 5-pin, PVC cable, straight |
| **V95-W-YE2M-STOOW** | Female cordset, 7/8" - 16 UNF, 5-pin, PVC cable, angled |

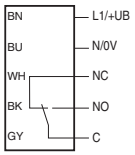
## Electrical Connection

❍ = light on, ● = dark on



RLK61-8-H-2000-IR-Z/31/115
RLK61-8-H-500-IR-Z/31/115

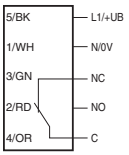
Option 31/115

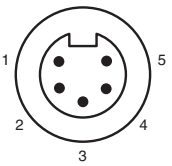





RLK61-8-H-2000-IR-Z/31/135
RLK61-8-H-500-IR-Z/31/135

Option 31/135




Wire colors

| | | |
|---|---|---|
| 1 | WH | (white) |
| 2 | RD | (red) |
| 3 | GN | (green) |
| 4 | OR | (orange) |
| 5 | BK | (black) |



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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Timer | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| 4-in-1 output | ✔ |
| Light type | modulated infrared light , 850 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 35 mA |
| Signal output | 2 Push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protection |
| Switching type | light/dark on, switchable |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -40 ... 55 °C (-40 ... 131 °F) |
| Material | |
| Housing | PC (Polycarbonate) |
| Optical face | PMMA |
| Protection degree | IP67 |

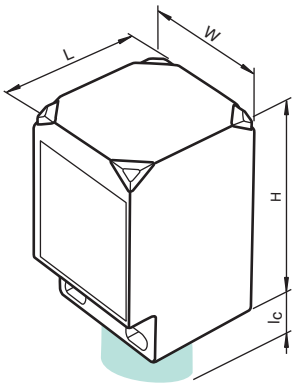
| Model Number | | RL61-8-1000-Z/115/136 | RL61-8-4000-Z/115/136 | RL61-8-1000-Z/92/136 | RL61-8-4000-Z/92/136 |
|---|---|---|---|---|---|
| Threshold detection range | 1.5 m | ● | | ● | |
| | 4.7 m | | ● | | ● |
| Detection range | 0 ... 1000 mm adjustable | ● | | ● | |
| | 0 ... 4000 mm adjustable | | ● | | ● |
| Connection | 2 m fixed cable | ● | ● | | |
| | Connector M12 x 1, 4-pin | | | ● | ● |
| **Approvals and Certificates** | | | | | |
| UL approval | cULus | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |
| **Dimensions** | | | | | |
| Length L [mm] | | 49 | | | |
| Width W [mm] | | 45 | | | |
| Height H [mm] | | 74 | | | |
| Connector length $l_c$ [mm] | | 18 | | 26 | |

## Properties

- Diffuse type
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Infrared light

## Benefits

- Ultra-bright four-corner LEDs for sensor status indication
- Threaded base and side thru-holes provide flexible mounting options




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **MPZB01** | Mounting bracket with vertical slots |
| **MPZB02** | Mounting bracket with circular slots |
| **MPZB06** | Ball and Swivel Mounting Bracket |
| **MPZB07** | Ball and Swivel Vertical Mounting Plate |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

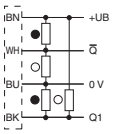
## Electrical Connection

❍ = light on, ● = dark on



RL61-8-1000-Z/115/136
RL61-8-4000-Z/115/136

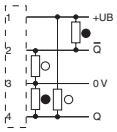
Option 115/136

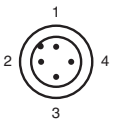





RL61-8-1000-Z/92/136
RL61-8-4000-Z/92/136

Option 92/136




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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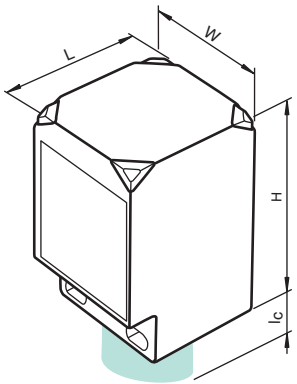


## Properties

- Diffuse type
- Rectangular full-size housing
- Plastic housing
- AC/DC sensor
- Relay output
- Cable and connector versions
- Infrared light

## Benefits

- Ultra-bright four-corner LEDs for sensor status indication
- Threaded base and side thru-holes provide flexible mounting options
- Universal usage with AC or DC power supply




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| | | | | | |
|---|---|---|---|---|---|
| **General Data** | | | | | |
| Timer | ✔ | | | | |
| Sensitivity adjustment | ✔ | | | | |
| Light/dark switch | ✔ | | | | |
| Light type | modulated infrared light , 850 nm | | | | |
| Operating voltage | 24 ... 240 V AC<br>12 ... 240 V DC | | | | |
| No-load supply current | ≤ 35 mA | | | | |
| Power consumption | ≤ 2 VA | | | | |
| Signal output | 1 SPDT relay output | | | | |
| Switching type | light/dark on, switchable | | | | |
| Switching current | max. 3 A | | | | |
| Switching power | DC: max. 150 W AC: max. 750 VA | | | | |
| Switching frequency | 20 Hz | | | | |
| Ambient temperature | -40 ... 55 °C (-40 ... 131 °F) | | | | |
| Material | | | | | |
| Housing | PC (Polycarbonate) | | | | |
| Optical face | PMMA | | | | |
| Protection degree | IP67 | | | | |
| **Model Number** | | RLK61-8-4000-Z/31/115 | RLK61-8-1000-Z/31/115 | RLK61-8-1000-Z/31/135 | RLK61-8-4000-Z/31/135 |
| Threshold detection range | 1.5 m | | ● | ● | |
| | 4.7 m | ● | | | ● |
| Detection range | 0 ... 1000 mm adjustable | | ● | ● | |
| | 0 ... 4000 mm adjustable | ● | | | ● |
| Connection | 2 m fixed cable | ● | ● | | |
| | Connector 7/8“ - 16 UN 2A, 5-pin | | | ● | ● |
| | |  | |  | |
| **Approvals and Certificates** | | | | | |
| UL approval | cULus | ● | ● | ● | ● |
| CCC approval | Certified by China Compulsory Certification (CCC) | ● | ● | ● | ● |
| **Dimensions** | | | | | |
| Length L [mm] | | 49 | | | |
| Width W [mm] | | 45 | | | |
| Height H [mm] | | 74 | | | |
| Connector length $l_c$ [mm] | | 18 | | 27.5 | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **MPZB01** | Mounting bracket with vertical slots |
| **MPZB02** | Mounting bracket with circular slots |
| **MPZB07** | Ball and Swivel Vertical Mounting Plate |
| **MPZB06** | Ball and Swivel Mounting Bracket |
| **V95-G-YE2M-STOOW** | Female cordset, 7/8“ - 16 UN, 5-pin, PVC cable, straight |
| **V95-W-YE2M-STOOW** | Female cordset, 7/8“ - 16 UN, 5-pin, PVC cable, angled |
| **V95-G** | Field attachable connector, 5-pin, straight |

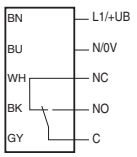
## Electrical Connection

❍ = light on, ● = dark on



RLK61-8-1000-Z/31/115
RLK61-8-4000-Z/31/115

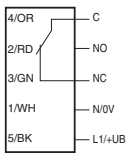
Option 31/115

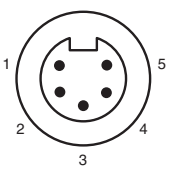





RLK61-8-1000-Z/31/135
RLK61-8-4000-Z/31/135

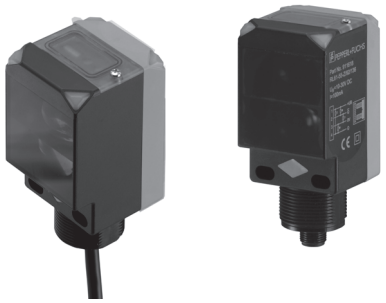
Option 31/135






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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Timer | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Threshold detection range | 25 m |
| Effective detection range | 0 ... 18 m |
| Reference target | FE-RR1 reflector |
| Light type | modulated visible red light , 630 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 35 mA |
| Switching type | light/dark on, switchable |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -40 ... 55 °C (-40 ... 131 °F) |
| Housing | PC (Polycarbonate) |
| Optical face | PMMA |
| Protection degree | IP67 |

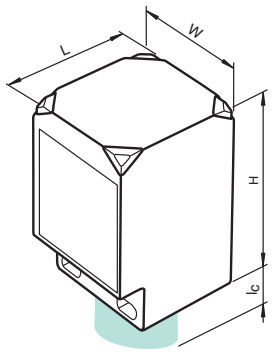
| Model Number | | RL61-55-Z/115/127 | RL61-55-Z/115/136 | RL61-55-Z/92/136 |
|---|---|---|---|---|
| 4-in-1 output | ✔ | | ● | ● |
| Signal output | 2 push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protected | | ● | ● |
| | 2 NPN complementary, short-circuit protected, reverse polarity protected | ● | | |
| Connection | 2 m fixed cable | ● | ● | |
| | Connector M12 x 1, 4-pin | | | ● |
| | |  | |  |
| **Approvals and Certificates** | | | | |
| UL approval | cULus | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |
| **Dimensions** | | | | |
| Length L [mm] | | | 49 | |
| Width W [mm] | | | 45 | |
| Height H [mm] | | | 74 | |
| Connector length $l_c$ [mm] | | | 18 | 26 |

## Properties

- Polarized type
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Visible red light

## Benefits

- Ultra-bright four-corner LEDs for sensor status indication
- Threaded base and side thru-holes provide flexible mounting options
- Extreme low-temperature operation




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **MPZB01** | Mounting bracket with vertical slots |
| **MPZB02** | Mounting bracket with circular slots |
| **MPZB06** | Ball and Swivel Mounting Bracket |
| **MPZB07** | Ball and Swivel Vertical Mounting Plate |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

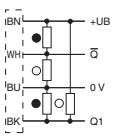
## Electrical Connection

❍ = light on, ● = dark on



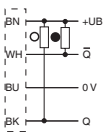
RL61-55-Z/115/136

Option 115/136




RL61-55-Z/115/127

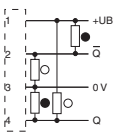
Option /115/127

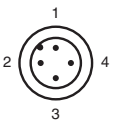





RL61-55-Z/92/136

Option 92/136




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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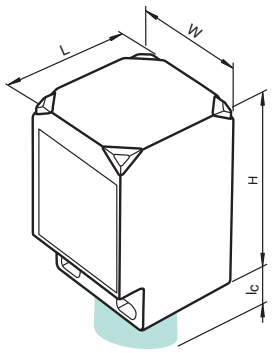


## Properties

- Polarized type
- Rectangular full-size housing
- Plastic housing
- AC/DC sensor
- Relay output
- Cable and connector versions
- Visible red light

## Benefits

- Ultra-bright four-corner LEDs for sensor status indication
- Threaded base and side thru-holes provide flexible mounting options
- Extreme low-temperature operation
- Universal usage with AC or DC power supply




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Polarization filter | ✔ |
| Timer | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Threshold detection range | 25 m |
| Effective detection range | 0 ... 18 m |
| Reference target | FE-RR1 reflector |
| Light type | modulated visible red light , 630 nm |
| Operating voltage | 24 ... 240 V AC<br>12 ... 240 V DC |
| No-load supply current | ≤ 35 mA |
| Power consumption | ≤ 2 VA |
| Signal output | 1 SPDT relay output |
| Switching type | light/dark on, switchable |
| Switching current | max. 3 A |
| Switching power | DC: max. 150 W AC: max. 750 VA |
| Switching frequency | 20 Hz |
| Ambient temperature | -40 ... 55 °C (-40 ... 131 °F) |
| Housing | PC (Polycarbonate) |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | RLK61-55-Z/31/115 | RLK61-55-Z/31/135 | RLK61-55-Z/31/168 |
|---|---|---|---|---|
| Connection | 2 m fixed cable | ● | | |
| | Connector 7/8“ - 16 UN 2A, 4-pin | | | ● |
| | Connector 7/8“ - 16 UN 2A, 5-pin | | ● | |
| | |  |  | |
| **Approvals and Certificates** | | | | |
| UL approval | cULus | ● | ● | ● |
| CCC approval | Certified by China Compulsory Certification (CCC) | ● | ● | ● |
| **Dimensions** | | | | |
| Length L [mm] | | 49 | | |
| Width W [mm] | | 45 | | |
| Height H [mm] | | 74 | | |
| Connector length $l_c$ [mm] | | 18 | 27.5 | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **MPZB01** | Mounting bracket with vertical slots |
| **MPZB02** | Mounting bracket with circular slots |
| **MPZB06** | Ball and Swivel Mounting Bracket |
| **MPZB07** | Ball and Swivel Vertical Mounting Plate |
| **V94-G-YE2M-STOOW** | Female cordset, 7/8“ - 16 UN, 4-pin, PVC cable, straight |
| **V94-W-YE2M-STOOW** | Female cordset, 7/8“ - 16 UN, 4-pin, PVC cable, angled |
| **V95-G-YE2M-STOOW** | Female cordset, 7/8“ - 16 UN, 5-pin, PVC cable, straight |
| **V95-W-YE2M-STOOW** | Female cordset, 7/8“ - 16 UN, 5-pin, PVC cable, angled |

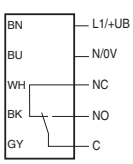
## Electrical Connection

❍ = light on, ● = dark on

RLK61-55-Z/31/115



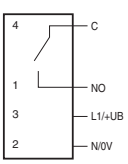
Option 31/115




RLK61-55-Z/31/168

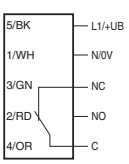


Option 31/168



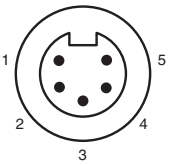

RLK61-55-Z/31/135

Option 31/135












Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Timer | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| 4-in-1 output | ✔ |
| Threshold detection range | 85 m |
| Effective detection range | 0 ... 60 m |
| Light type | modulated infrared light , 850 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 35 mA |
| Switching type | light/dark on, switchable |
| Signal output | 2 push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 500 Hz |
| Timer function | DIP-switch for selection of operating modes |
| Ambient temperature | -40 ... 55 °C (-40 ... 131 °F) |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | LD61/115 LV61-Z/115/136 | LD61/92 LV61-Z/92/136 |
|---|---|---|---|
| Emitter | | ● | ● |
| Receiver | | ● | ● |
| Connection | 2 m fixed cable | ● | |
| | Connector M12 x 1, 4-pin | | ● |

| Approvals and Certificates | | | |
|---|---|---|---|
| UL approval | cULus | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |

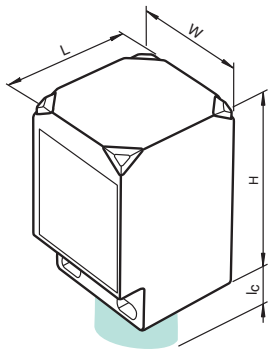
| Dimensions | | |
|---|---|---|
| Length L [mm] | 49 | |
| Width W [mm] | 45 | |
| Height H [mm] | 74 | |
| Connector length $l_c$ [mm] | 18 | 26 |

## Properties

- Thru-beam type
- Rectangular full-size housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and connector versions
- Infrared light

## Benefits

- Ultra-bright four-corner LEDs for sensor status indication
- Threaded base and side thru-holes provide flexible mounting options
- Extreme low-temperature operation




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

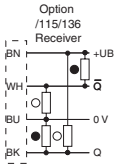
| | |
|---|---|
| **MPZB01** | Mounting bracket with vertical slots |
| **MPZB02** | Mounting bracket with circular slots |
| **MPZB06** | Ball and Swivel Mounting Bracket |
| **MPZB07** | Ball and Swivel Vertical Mounting Plate |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

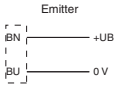
## Electrical Connection

❍ = light on, ● = dark on

LD61/115 + LV61-Z/115/136

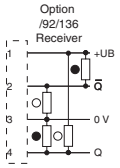


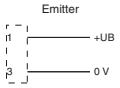


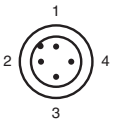




LD61/92 + LV61-Z/92/136






Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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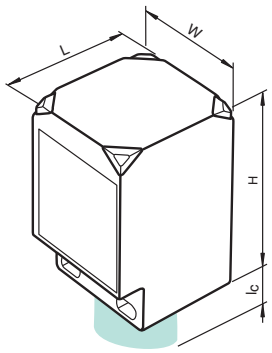


## Properties

- Thru-beam type
- Rectangular full-size housing
- Plastic housing
- AC / DC sensor
- Relay output
- Cable and connector versions
- Infrared light

## Benefits

- Ultra-bright four-corner LEDs for sensor status indication
- Threaded base and side thru-holes provide flexible mounting options
- Extreme low-temperature operation
- Universal usage with AC or DC power supply




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Timer | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Threshold detection range | 85 m |
| Effective detection range | 0 ... 60 m |
| Light type | modulated infrared light , 850 nm |
| Operating voltage | 24 ... 240 V AC<br>12 ... 240 V DC |
| No-load supply current | ≤ 35 mA |
| Power consumption | ≤ 2 VA |
| Switching type | light/dark on, switchable |
| Signal output | 1 SPDT relay output |
| Switching current | max. 3 A |
| Switching power | DC: max. 150 W AC: max. 750 VA |
| Switching frequency | 20 Hz |
| Timer function | DIP-switch for selection of operating modes |
| Ambient temperature | -40 ... 55 °C (-40 ... 131 °F) |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | PMMA |
| Protection degree | IP67 |

| Model Number | | LA61/115<br>LK61-Z/31/115 | LA61/135<br>LK61-Z/31/135 |
|---|---|---|---|
| Emitter | | ● | ● |
| Receiver | | ● | ● |
| Connection | 2 m fixed cable | ● | |
| | Connector 7/8"-16 UN 2A, 5-pin | | ● |
| | |  |  |
| **Approvals and Certificates** | | | |
| UL approval | cULus | ● | ● |
| CCC approval | Certified by China Compulsory Certification (CCC) | ● | ● |
| **Dimensions** | | | |
| Length L [mm] | | 49 | |
| Width W [mm] | | 45 | |
| Height H [mm] | | 74 | |
| Connector length $l_c$ [mm] | | 18 | 27.5 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **MPZB01** | Mounting bracket with vertical slots |
| **MPZB02** | Mounting bracket with circular slots |
| **MPZB06** | Ball and Swivel Mounting Bracket |
| **MPZB07** | Ball and Swivel Vertical Mounting Plate |
| **V95-G-YE2M-STOOW** | Female cordset, 7/8“ - 16 UN, 5-pin, PVC cable, straight |
| **V95-W-YE2M-STOOW** | Female cordset, 7/8“ - 16 UN, 5-pin, PVC cable, angled |

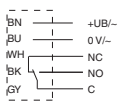
## Electrical Connection

❍ = light on, ● = dark on

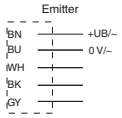
LA61/115 + LK61-Z/31/115



Option /31/115
Receiver



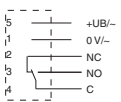

Emitter



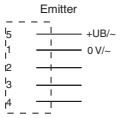

LA61/135 + LK61-Z/31/135

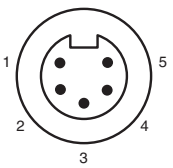


Option /31/135
Receiver




Emitter




Wire colors

| | | |
|---|---|---|
| 1 | WH | (white) |
| 2 | RD | (red) |
| 3 | GN | (green) |
| 4 | OR | (orange) |
| 5 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

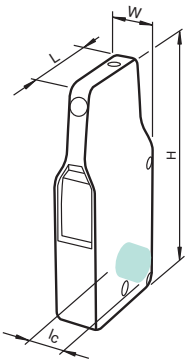
| | | | |
|---|---|---|---|
| **General Data** | | | |
| Background suppression | ✔ | | |
| Sensing range adjustment | ✔ | | |
| Light/dark adjustment | ✔ | | |
| 4-in-1 output | ✔ | | |
| Detection range | 40 ... 900 mm | | |
| Adjustment range | 340 ... 900 mm | | |
| Light type | modulated infrared light , 880 nm | | |
| Black/White difference (6%/90%) | < 10% | | |
| Diameter of the light spot | approx. 60 mm at detection range 900 mm | | |
| Operating voltage | 24 VDC -20% +10% | | |
| No-load supply current | max. 20 mA | | |
| Signal output | 2 push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protected | | |
| Switching current | max. 100 mA | | |
| Switching frequency | 100 Hz | | |
| Ambient temperature | -20 ... 50 °C (-4 ... 122 °F) | | |
| Housing | plastic | | |
| Optical face | plastic lens | | |
| Protection degree | IP65 | | |
| Connection | connector M12 x 1, 4-pin | | |
| **Model Number** | | **SBL-8-H-900-IR/25/65b/73/136** | **SBL-8-H-900-IR/59/65b/73/136** |
| Switching type | dark on | | ● |
| | light on | ● | |
| **Approvals and Certificates** | | | |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |
| **Dimensions** | | | |
| Length L [mm] | | 46 | |
| Width W [mm] | | 18 | |
| Height H [mm] | | 100 | |
| Connector length $l_c$ [mm] | | 12 | |

## Properties

- Background suppression
- Application specific housing
- Plastic housing
- DC sensor
- Discrete output
- Connector version
- Infrared light

## Your Benefit

- Detects objects on conveyor rollers to regulate flow
- Mounts under and between rollers to protect against damage
- Large sensing range
- Connection for motor or valve




## Accessories

**These and more accessories can be found in chapter 10**
**See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories**

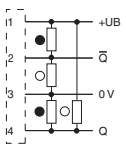
| | |
|---|---|
| **OMH-SBL-01** | Mounting bracket for sensors of SBL series |
| **V1-G-2M-PVC** | Female cordset, M12, 4-pin, PVC cable, straight |
| **V1-G-5M-PVC** | Female cordset, M12, 4-pin, PVC cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |
| **V1-W-5M-PUR** | Female cordset, M12, 4-pin, PUR cable, angled |

## Electrical Connection

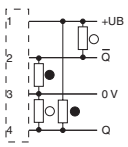
❍ = light on, ● = dark on

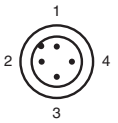


SBL-8-H-900-IR/25/65b/73/136




SBL-8-H-900-IR/59/65b/73/136




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Measuring range adjustment | ✔ |
| Analog output | ✔ |
| Teach-In | ✔ |
| Light/dark adjustment | ✔ |
| Light source | laser diode, typ. service life 50,000 h at Ta = +40 °C |
| Light type | modulated visible red light |
| Laser class | 2 |
| Wave length | 650 nm |
| Measuring method | Laser triangulation |
| Linearity error | 0.25 % of the measuring range |
| Resolution | < 0.1 % of the maximum sensing range |
| Operating voltage | 18 ... 30 V DC |
| No-load supply current | ≤ 40 mA at 24 V DC |
| Switching current | max. 100 mA |
| Switching frequency | ≤ 1 kHz |
| Measurement output | 1 analog output 4 ... 20 mA, short-circuit/overload protected , Rmax = 500 Ohm |
| Ambient temperature | -10 ... 60 °C (14 ... 140 °F) |
| Material | |
| Housing | ABS , impact resistant |
| Optical face | PMMA |
| Protection degree | IP67 |

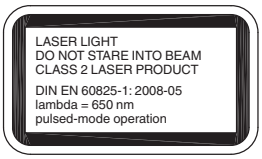
| Model Number | | VDM18-100/20/122/151 | VDM18-100/20/88/122/151 | VDM18-100/32/105/122 | VDM18-300/20/122/151 | VDM18-300/20/88/122/151 | VDM18-300/32/105/122 |
|---|---|---|---|---|---|---|---|
| Measurement range | 30 ... 100 mm | ● | ● | ● | | | |
| | 80 ... 300 mm | | | | ● | ● | ● |
| Light spot representation | approx. 1.5 mm x 3 mm at 100 mm | ● | ● | | | | |
| | approx. 1.5 mm x 3.25 mm at 100 mm | | | ● | | | |
| | approx. 2 mm x 4.5 mm at 300 mm | | | | ● | ● | ● |
| Interface type | RS 485 | | ● | | | ● | |
| Control input | Laser off (+UB) , Keypad lock (0 V) | | | ● | | | ● |
| Signal output | 1 PNP output, short-circuit protected, reverse polarity protected, open collector | | | ● | | | ● |
| | 2 PNP outputs, independent , short-circuit protected, reverse polarity protected | ● | ● | | ● | ● | |
| Connection | 5-pin, M12 x 1 plastic connector | | | ● | | | ● |
| | M12 connector, 8-pin | ● | ● | | ● | ● | |

| Approvals and Certificates | | | | | | | |
|---|---|---|---|---|---|---|---|
| UL approval | cULus Listed | ● | ● | ● | ● | ● | ● |

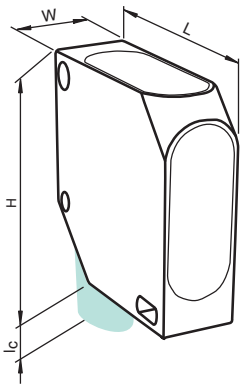
| Dimensions | |
|---|---|
| Length L [mm] | 50 |
| Width W [mm] | 17 |
| Height H [mm] | 50 |
| Connector length $l_c$ [mm] | 13.5 |

## Properties

- Rectangular compact housing
- Diffuse distance measurement
- Triangulation method
- Short range
- Analog output
- Laser red light




**Note:** For detailed Laser specifications refer to the data sheet at www.pepperl-fuchs.us




## Accessories

**These and more accessories can be found in chapter 5.6 from page xxx**

See pages from xxx ... for cordsets — See pages xxxx ... for mounting accessories

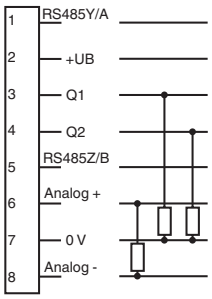
| | |
|---|---|
| **OMH-VDM18-01** | Mounting accessory, distance measuring devices Series VDM18 |
| **OMH-VDM18-02** | Mounting accessory, distance measuring devices Series VDM18 |

## Electrical Connection

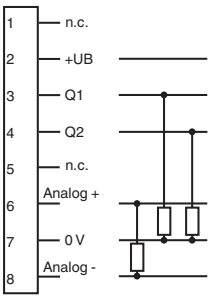
❍ = light on, ● = dark on



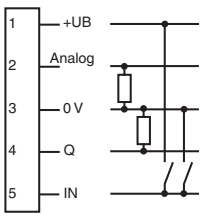
VDM18-100/20/88/122/151
VDM18-300/20/88/122/151

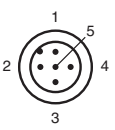


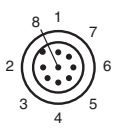

VDM18-100/20/122/151
VDM18-300/20/122/151




VDM18-100/32/105/122
VDM18-300/32/105/122




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |

| | |
|---|---|
| 1 | WH |
| 2 | BN |
| 3 | GN |
| 4 | YE |
| 5 | GY |
| 6 | PK |
| 7 | BU |
| 8 | RD |



Refer to General Notes Relating to Product Information
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IO-Link

## Properties

- Rectangular full-size housing
- Diffuse distance measurement
- Pulse Ranging Technology (PRT)
- Medium range
- Discrete and analog outputs with IO-Link
- Laser red light

## Benefits

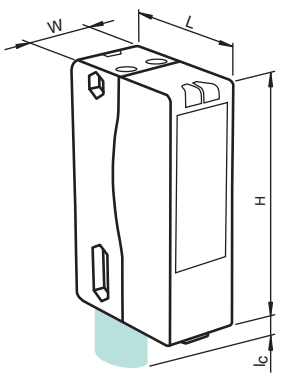
- Parallel measuring paths possible without crosstalk
- Secure measurement in difficult conditions, e.g. mist or dust
- High resistance to ambient light
- Measures distances consistently, regardless of surface color

## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| | |
|---|---|
| **General Data** | |
| Measuring range adjustment | ✔ |
| Teach-In | ✔ |
| Light/dark adjustment | ✔ |
| Measurement range | 0.2 ... 8 m |
| Reference target | Kodak white (90%) |
| Light source | laser diode |
| Light type | modulated visible red light |
| Measuring method | Pulse Ranging Technology (PRT) |
| Diameter of the light spot | < 10 mm at a distance of 8 m at 20 °C |
| Operating voltage | 10 ... 30 V DC / IO-Link mode: 18 ... 30 V DC |
| No-load supply current | ≤ 70 mA / 24 V DC |
| Interface | |
| Interface type | IO-Link |
| Mode | COM 2 (38.4 kBaud) |
| Switching current | max. 100 mA |
| Switching frequency | 50 Hz |
| Repeat accuracy | < 5 mm |
| Ambient temperature | -30 ... 50 °C (-22 ... 122 °F) |
| Material | |
| Housing | Plastic ABS |
| Optical face | Plastic pane |
| Protection degree | IP65 |

| Model Number | | VDM28-8-L-IO/110/115b/122 | VDM28-8-L-IO/115b/136 | VDM28-8-L1-IO/73c/110/122 | VDM28-8-L-IO/73c/136 |
|---|---|---|---|---|---|
| Analog output | ✔ | ● | | ● | |
| Laser class | 1 | | | ● | |
| | 2 | ● | ● | | ● |
| Signal output | Push-pull (4-in-1) output, short-circuit protected, reverse polarity protected | ● | | ● | |
| | 2 Push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protection | | ● | | ● |
| Measurement output | 1 analog output 4 ... 20 mA, short-circuit/overload protected | ● | | ● | |
| Connection | 300 mm fixed cable with M12 x 1, 4-pin connector | ● | ● | | |
| | connector M12 x 1, 4-pin | | | ● | ● |
| | |  | |  | |
| **Approvals and Certificates** | | | | | |
| Protection class | II | ● | ● | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● |
| **Dimensions** | | | | | |
| Length L [mm] | | 54.3 | | | |
| Width W [mm] | | 25.8 | | | |
| Height H [mm] | | 88 | | | |
| Connector length $l_c$ [mm] | | 5 | | 14 | |




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-21** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-VDM28-01** | Metal enclosure for inserting protective panes or apertures |

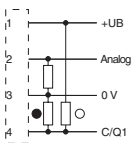
## Electrical Connection

❍ = light on, ● = dark on



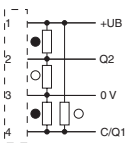
VDM28-8-L-IO/110/115b/122
VDM28-8-L1-IO/73c/110/122

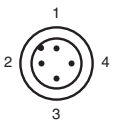
Option /110/122




VDM28-8-L-IO/115b/136
VDM28-8-L-IO/73c/136

Option /136




Wire colors in accordance with EN 60947-5-2

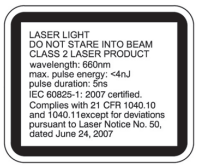
| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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CE IO-Link

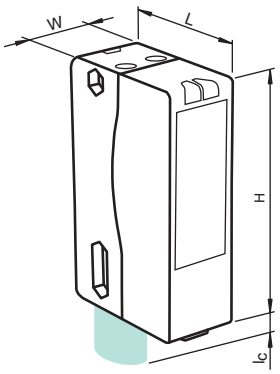


## Properties

- Rectangular full-size housing
- Diffuse distance measurement
- Pulse Ranging Technology (PRT)
- Medium range
- Discrete and analog outputs with IO-Link
- Laser red light

## Benefits

- Parallel measuring paths possible without crosstalk
- Secure measurement in difficult conditions, e.g. mist or dust
- High resistance to ambient light
- Measures distances consistently, regardless of surface color




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | VDM28-15-L-IO/73c/110/122 |
|---|---|
| Measuring range adjustment | ✔ |
| Light/dark adjustment | ✔ |
| Teach-In | ✔ |
| 4-in-1 output | ✔ |
| Analog output | ✔ |
| Measurement range | 0.2 ... 15 m |
| Reference target | Kodak white (90%) |
| Light source | laser diode |
| Light type | modulated visible red light |
| Laser class | 2 |
| Measuring method | Pulse Ranging Technology (PRT) |
| Diameter of the light spot | < 15 mm at a distance of 15 m at 20 °C |
| Operating voltage | 10 ... 30 V DC / IO-Link mode: 18 ... 30 V DC |
| No-load supply current | ≤ 70 mA / 24 V DC |
| Interface | |
| Interface type | IO-Link |
| Mode | COM 2 (38.4 kBaud) |
| Signal output | Push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 50 Hz |
| Measurement output | 1 analog output 4 ... 20 mA, short-circuit/overload protected |
| Repeat accuracy | < 5 mm |
| Ambient temperature | -30 ... 50 °C (-22 ... 122 °F) |
| Material | |
| Housing | Plastic ABS |
| Optical face | Plastic pane |
| Protection degree | IP65 |
| Connection | connector M12 x 1, 4-pin |



| Approvals and Certificates | |
|---|---|
| Protection class | II |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 54.3 |
| Width W [mm] | 25.8 |
| Height H [mm] | 88 |
| Connector length $l_c$ [mm] | 14 |

## Accessories

**These and more accessories can be found in chapter 10**
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **PACTware 4.X** | FDT frame application |
| **VDM28-IO-Link DTM** | Device DTM for communication with VDM28-IO-Link sensors |
| **IODD Interpreter** | Software for the integration of IODDs in a frame application (e. g. PACTware) |
| **IO-Link-Master01-USB** | IO-Link Master |
| **IO-Link-Master-USB DTM** | Communication DTM for use of IO-Link-Master |
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-21** | Mounting bracket |
| **OMH-22** | Mounting bracket |
| **OMH-MLV11-K** | dove tail mounting clamp |
| **OMH-RLK29** | Mounting bracket |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-RL28-C** | Protective cover |
| **OMH-K01** | dove tail mounting clamp |
| **OMH-K03** | dove tail mounting clamp |
| **OMH-VDM28-01** | Metal enclosure for inserting protective panes or apertures |

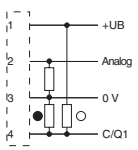
## Electrical Connection

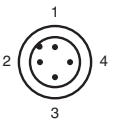
❍ = light on, ● = dark on



VDM28-15-L-IO/73c/110/122

Option /110/122




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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IO-Link

## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Measuring range adjustment | ✔ |
| Light/dark adjustment | ✔ |
| Teach-In | ✔ |
| Measurement range | 0.2 ... 50 m |
| Reference target | OFR-100/100 |
| Light source | laser diode |
| Light type | modulated visible red light |
| Measuring method | Pulse Ranging Technology (PRT) |
| Diameter of the light spot | < 50 mm at a distance of 50 m at 20 °C |
| Operating voltage | 10 ... 30 V DC / IO-Link mode: 18 ... 30 V DC |
| No-load supply current | ≤ 70 mA / 24 V DC |
| Interface | |
| Interface type | IO-Link |
| Mode | COM 2 (38.4 kBaud) |
| Switching current | max. 100 mA |
| Switching frequency | 50 Hz |
| Repeat accuracy | < 5 mm |
| Ambient temperature | -30 ... 50 °C (-22 ... 122 °F) |
| Material | |
| Housing | Plastic ABS |
| Optical face | Plastic pane |
| Protection degree | IP65 |
| Connection | connector M12 x 1, 4-pin |



| Model Number | | VDM28-50-R1-IO/73c/110/122 | VDM28-50-R-IO/73c/136 |
|---|---|---|---|
| Laser class | 1 | ● | |
| | 2 | | ● |
| Signal output | Push-pull (4-in-1) output, short-circuit protected, reverse polarity protected | ● | |
| | 2 Push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protection | | ● |
| Measurement output | 1 analog output 4 ... 20 mA, short-circuit/overload protected | ● | |
| **Approvals and Certificates** | | | |
| Protection class | II | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● |

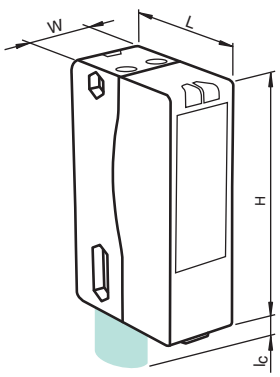
| Dimensions | |
|---|---|
| Length L [mm] | 54.3 |
| Width W [mm] | 25.8 |
| Height H [mm] | 88 |
| Connector length $l_c$ [mm] | 14 |

## Properties

- Rectangular full-size housing
- Retroreflective distance measurement
- Pulse Ranging Technology (PRT)
- Long range
- Discrete and analog outputs with IO-Link
- Laser red light

## Benefits

- Parallel measuring paths possible without crosstalk
- Secure measurement in difficult conditions, e.g. mist or dust
- High resistance to ambient light
- Measures distances consistently, regardless of surface color




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-RLK29** | Mounting bracket |
| **OMH-K01** | dove tail mounting clamp |
| **OFR-100/100** | Reflective tape 100 mm x 100 mm |
| **REF-MH82** | Reflector with Micro-structure, rectangular 82 mm x 60 mm, mounting holes |
| **OMH-VDM28-01** | Metal enclosure for inserting protective panes or apertures |

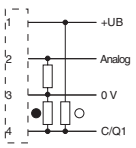
## Electrical Connection

❍ = light on, ● = dark on



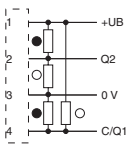
VDM28-50-R1-IO/73c/110/122

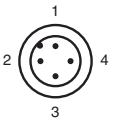
Option /110/122




VDM28-50-R-IO/73c/136

Option /136




Wire colors in accordance with EN 60947-5-2

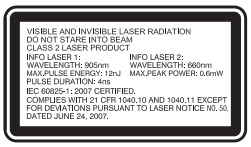
| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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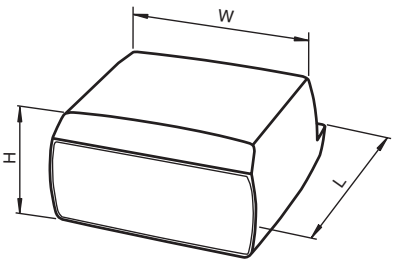



## Properties

- Rectangular full-size housing
- Retroreflective distance measurement
- Pulse Ranging Technology (PRT)
- Extended range
- SSI interface
- Laser infrared light

## Benefits

- Integral alignment aid LEDs simplify setup
- Eyesafe, due to laser class 1 in measurement operation
- Easy installation due to quick clamp tool-less mounting
- Ideal for highly dynamic control loops
- LED bar display indicates signal strength




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Light source | laser diode |
| Alignment aid | Laserpointer |
| Laser class | Measurement laser: 1<br>Alignment laser: 2 |
| Wave length | Measurement laser: 905 nm<br>Alignment laser: 660 nm |
| Measuring method | Pulse Ranging Technology (PRT) |
| Max. Motion velocity | 15 m/s |
| Resolution | 0.1 mm , adjustable |
| Absolute accuracy | ± 2.5 mm (> 3 m); ± 3.5 mm (0.3 m to 3 m) |
| Repeat accuracy | < 0.5 mm |
| Operating voltage | 18 ... 30 V DC |
| No-load supply current | 250 mA (18 V) ... 150 mA (30 V) |
| Interface type | SSI |
| Input/output type | 2 PNP inputs/outputs, independent configuration, short-circuit protected, reverse polarity protection |
| Switching current | 200 mA per output |
| Material | |
| Housing | ABS / PC |
| Optical face | PMMA , hard coated |
| Protection degree | IP65 |
| Connection | 4-pin, M12x1 connector, standard (supply) ,<br>5-pin, M12 x 1 connector, B-coded (SSI) ,<br>8-pin M12x1 connector, service |



| Model Number | | VDM100-50-SSI | VDM100-150-SSI | VDM100-300-SSI |
|---|---|---|---|---|
| Measurement range | 0.3 ... 50 m | ● | | |
| | 0.3 ... 150 m | | ● | |
| | 0.3 ... 300 m | | | ● |
| Reference target | Foil reflector 500 mm x 500 mm | ● | ● | |
| | Reflector VDM01 | | | ● |
| Diameter of the light spot | < 15 cm at 50 m | ● | | |
| | < 35 cm at 150 m | | ● | |
| | < 70 cm at 300 m | | | ● |
| Ambient temperature | -10 ... 50 °C (14 ... 122 °F) | ● | ● | ● |
| **Approvals and Certificates** | | | | |
| UL approval | cULus Listed | ● | ● | ● |
| **Dimensions** | | | | |
| Length L [mm] | | | 170 | |
| Width W [mm] | | | 140 | |
| Height H [mm] | | | 90 | |

## Accessories

**These and more accessories can be found in chapter 5.6 from page xxx**

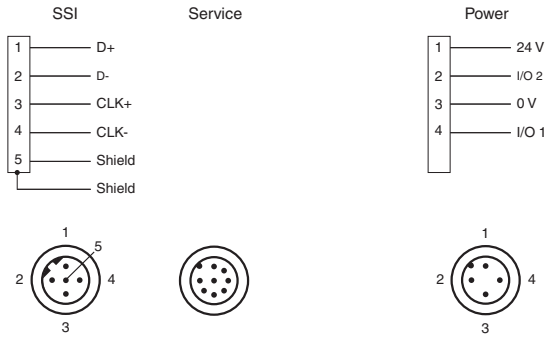
See pages from xxx ... for cordsets See pages xxxx ... for mounting accessories

| | |
|---|---|
| **OMH-LS610-05** | Mounting bracket for optical data coupler and distance measurement devices |
| **V15-G-15M-LIHCH-TP** | SSI bus cable, B-coded M12, 5-pin cable, straight |
| **OMH-VDM100-01** | Mounting bracket with deviation mirror for distance measurement devices |
| **OMH-LS610-01** | Mounting bracket for optical data coupler |
| **OMH-LS610-02** | Direct mounting set consisting of 4 x M4 threaded inserts |
| **OMH-LS610-05** | Mounting bracket |

## Electrical Connection

❍ = light on, ● = dark on

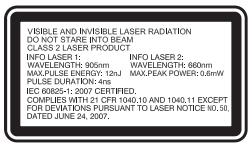







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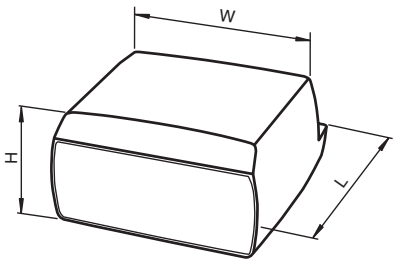



## Properties

- Rectangular full-size housing
- Retroreflective distance measurement
- Pulse Ranging Technology (PRT)
- Extended range
- PROFIBUS interface
- Laser infrared light

## Benefits

- Integral alignment aid LEDs simplify setup
- Eyesafe, due to laser class 1 in measurement operation
- Easy installation due to quick clamp tool-less mounting
- Ideal for highly dynamic control loops
- LED bar display indicates signal strength




## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Light source | laser diode |
| Alignment aid | Laserpointer |
| Laser class | Measurement laser: 1<br>Alignment laser: 2 |
| Wave length | Measurement laser: 905 nm<br>Alignment laser: 660 nm |
| Measuring method | Pulse Ranging Technology (PRT) |
| Max. Motion velocity | 15 m/s |
| Absolute accuracy | ± 2.5 mm (> 3 m); ± 3.5 mm (0.3 m to 3 m) |
| Repeat accuracy | < 0.5 mm |
| Operating voltage | 18 ... 30 V DC |
| No-load supply current | 250 mA (18 V) ... 150 mA (30 V) |
| Interface type | PROFIBUS DP acc. to EN 50170 |
| Transfer rate | 9.6 kbit/s ... 12 Mbit/s , adjustable |
| Input/output type | 2 PNP inputs/outputs, independent configuration, short-circuit protected, reverse polarity protection |
| Switching current | 200 mA per output |
| Material | |
| Housing | ABS / PC |
| Optical face | PMMA , hard coated |
| Protection degree | IP65 |
| Connection | 4-pin, M12x1 connector, standard (supply) ,<br>5-pin, M12x1 connector, B-coded (Bus In) ,<br>M12x1 socket, 5-pin, B-coded (Bus Out) ,<br>8-pin M12x1 connector, service |



| Model Number | | VDM100-50-P | VDM100-150-P | VDM100-300-P |
|---|---|---|---|---|
| Measurement range | 0.3 ... 50 m | ● | | |
| | 0.3 ... 150 m | | ● | |
| | 0.3 ... 300 m | | | ● |
| Reference target | Foil reflector 500 mm x 500 mm | ● | ● | |
| | Reflector VDM01 | | | ● |
| Diameter of the light spot | < 15 cm at 50 m | ● | | |
| | < 35 cm at 150 m | | ● | |
| | < 70 cm at 300 m | | | ● |
| Ambient temperature | -10 ... 50 °C (14 ... 122 °F) | ● | ● | ● |
| **Approvals and Certificates** | | | | |
| UL approval | cULus Listed | ● | ● | ● |
| **Dimensions** | | | | |
| Length L [mm] | | | 170 | |
| Width W [mm] | | | 140 | |
| Height H [mm] | | | 90 | |

## Accessories

**These and more accessories can be found in chapter 5.6 from page xxx**

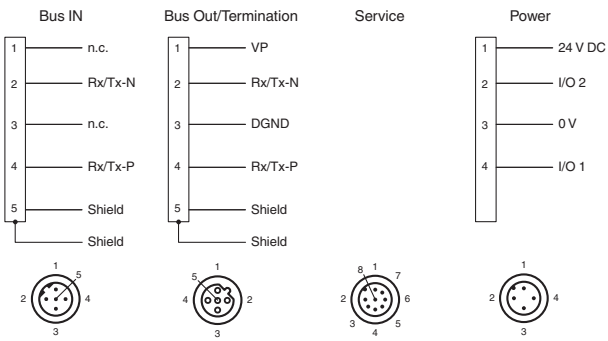
See pages from xxx ... for cordsets See pages xxxx ... for mounting accessories

| | |
|---|---|
| **OMH-LS610-05** | Mounting bracket for optical data coupler and distance measurement devices |
| **ICZ-TR-V15B** | Terminal resistor for PROFIBUS |
| **OMH-VDM100-01** | Mounting bracket with deviation mirror for distance measurement devices |
| **OMH-LS610-01** | Mounting bracket for optical data coupler |
| **OMH-LS610-02** | Direct mounting set consisting of 4 x M4 threaded inserts |
| **OMH-LS610-05** | Mounting bracket |

## Electrical Connection

❍ = light on, ● = dark on





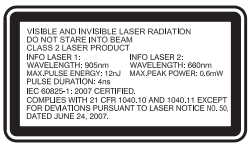




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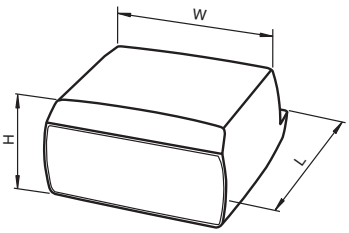



## Properties

- Rectangular full-size housing
- Retroreflective distance measurement
- Pulse Ranging Technology (PRT)
- Extended range
- INTERBUS interface
- Laser infrared light

## Benefits

- Integral alignment aid LEDs simplify setup
- Eyesafe, due to laser class 1 in measurement operation
- Easy installation due to quick clamp tool-less mounting
- Ideal for highly dynamic control loops
- LED bar display indicates signal strength




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Light source | laser diode |
| Laser class | Measurement laser: 1; Alignment laser: 2 |
| Wave length | Measurement laser: 905 nm; Alignment laser: 660 nm |
| Measuring method | Pulse Ranging Technology (PRT) |
| Max. Motion velocity | 15 m/s |
| Alignment aid | Laserpointer Laser class 2 |
| Resolution | 0.1 mm , adjustable |
| Absolute accuracy | ± 2.5 mm (> 3 m); ± 3.5 mm (0.3 m to 3 m) |
| Repeat accuracy | < 0.5 mm |
| Operating voltage | 18 ... 30 V DC |
| No-load supply current | 250 mA (18 V) ... 150 mA (30 V) |
| Interface type | INTERBUS |
| Transfer rate | 500 kBit/s |
| Input/output type | 2 PNP inputs/outputs, independent configuration, short-circuit protected, reverse polarity protected |
| Switching current | 200 mA per output |
| Ambient temperature | -10 ... 50 °C (14 ... 122 °F) |
| Housing | ABS / PC |
| Optical face | PMMA , hard coated |
| Protection degree | IP65 |
| Connection | 4-pin, M12x1 connector, standard (supply) ,<br>5-pin, M12x1 connector, B-coded (Bus In) ,<br>M12x1 socket, 5-pin, B-coded (Bus Out) ,<br>8-pin M12x1 connector, service |



| Model Number | | VDM100-50-IBS | VDM100-300-IBS | VDM100-150-IBS |
|---|---|---|---|---|
| Measurement range | 0.3 ... 150 m | | | ● |
| | 0.3 ... 300 m | | ● | |
| | 0.3 ... 50 m | ● | | |
| Reference target | Foil reflector 500 mm x 500 mm | ● | | ● |
| | Reflector VDM01 | | ● | |
| Diameter of the light spot | < 15 cm at 50 m | ● | | |
| | < 35 cm at 150 m | | | ● |
| | < 70 cm at 300 m | | ● | |
| **Approvals and Certificates** | | | | |
| UL approval | cULus Listed | ● | ● | ● |

| Dimensions | |
|---|---|
| Length L [mm] | 170 |
| Width W [mm] | 140 |
| Height H [mm] | 90 |

## Accessories

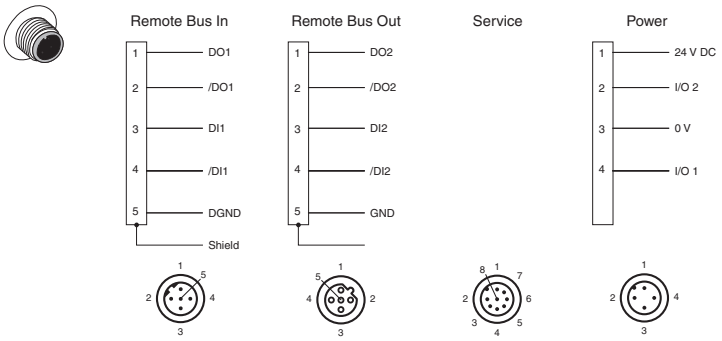
**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **V15-W-PG9** | 5-pin, M12 female field-attachable connector, angled |
| **V1-W** | 4-pin, M12 female field-attachable connector, angled |
| **V15B-G-15M-LIHCH-TP** | SSI bus cable, B-coded M12, 5-pin cable, straight |
| **OMH-VDM100-01** | Mounting bracket with deviation mirror for distance measurement devices |
| **OMH-LS610-01** | Mounting bracket for optical data coupler |
| **OMH-LS610-02** | Direct mounting set consisting of 4 x M4 threaded inserts |
| **OMH-LS610-05** | Mounting bracket |

## Electrical Connection

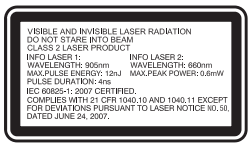
❍ = light on, ● = dark on






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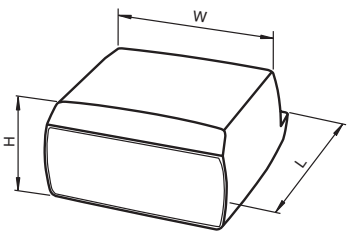



## Properties

- Rectangular full-size housing
- Retroreflective distance measurement
- Pulse Ranging Technology (PRT)
- Extended range
- Ethernet/IP interface
- Laser infrared light

## Benefits

- Integral alignment aid LEDs simplify setup
- Eyesafe, due to laser class 1 in measurement operation
- Easy installation due to quick clamp tool-less mounting
- Ideal for highly dynamic control loops
- LED bar display indicates signal strength




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | VDM100-150-EIP/G2 |
|---|---|
| Measurement range | 0.3 ... 150 m |
| Reference target | Foil reflector 500 mm x 500 mm |
| Light source | laser diode |
| Laser class | Measurement laser: 1<br>Alignment laser: 2 |
| Wave length | Measurement laser: 905 nm<br>Alignment laser: 660 nm |
| Measuring method | Pulse Ranging Technology (PRT) |
| Max. Motion velocity | 15 m/s |
| Alignment aid | Laserpointer |
| Diameter of the light spot | < 35 cm at 150 m |
| Resolution | 0.1 mm , adjustable |
| Absolute accuracy | ± 2.5 mm (> 3 m); ± 3.5 mm (0.3 m to 3 m) |
| Repeat accuracy | < 0.5 mm |
| Operating voltage | 18 ... 30 V DC |
| No-load supply current | 250 mA (18 V) ... 150 mA (30 V) |
| Interface type | EtherNet/IP / Webserver |
| Input/output type | 2 PNP inputs/outputs, independent configuration, short-circuit protected, reverse polarity protected |
| Switching current | 200 mA per output |
| Ambient temperature | -10 ... 50 °C (14 ... 122 °F) |
| Housing | ABS / PC |
| Optical face | PMMA , hard coated |
| Protection degree | IP65 |
| Connection | 4-pin, M12x1 connector, standard (supply) ,<br>M12x1 socket, 4-pin, D-coded (LAN) ,<br>8-pin M12x1 connector, service |
| **Approvals and Certificates** | |
| UL approval | cULus Listed |
| **Dimensions** | |
| Length L [mm] | 170 |
| Width W [mm] | 140 |
| Height H [mm] | 90 |

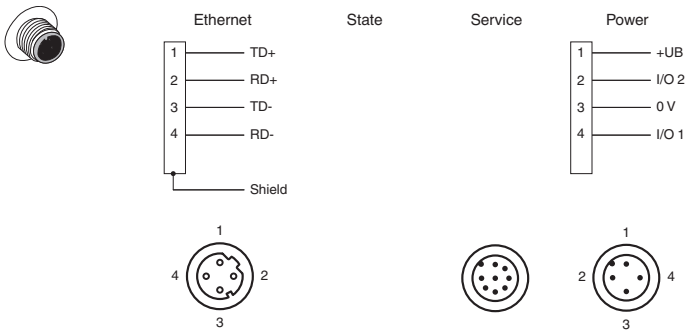
## Accessories

**These and more accessories can be found in chapter 10**
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **V15-G-PG9** | 5-pin, M12 female field-attachable connector, straight |
| **V1SD-G-2M-PUR-ABG-V45-G** | Connection cable, M12 to RJ-45, PUR cable 4-pin, CAT5e, straight |
| **V1SD-G-5M-PUR-ABG-V45-G** | Connection cable, M12 to RJ-45, PUR cable 4-pin, CAT5e, straight |
| **V1SD-G-ABG-PG9** | 4-pin, M12 female field-attachable connector, D-coded, shielded, straight |
| **V1SD-G-2M-PUR-ABG-V1SD-G** | Ethernet bus cable, M12 to M12, PUR cable 4-pin, CAT5e, straight |
| **OMH-LS610-01** | Mounting bracket for optical data coupler |
| **OMH-VDM100-01** | Mounting bracket with deviation mirror for distance measurement devices |
| **OMH-LS610-05** | Mounting bracket |

## Electrical Connection

❍ = light on, ● = dark on







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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | VL18LL-M/40a/118/128 |
|---|---|
| Sensitivity adjustment | ✔ |
| 4-in-1 output | ✔ |
| Sensor principle | Fiber optic sensor for glass fiber optics |
| Effective detection range | depends on the fiber optic cable being used |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 35 mA |
| Switching type | light/dark on, switchable |
| Signal output | Push-pull (4-in-1) output short-circuit protected overvoltage protected |
| Switching current | max. 200 mA |
| Switching frequency | 500 Hz |
| Ambient temperature | -25 ... 70 °C (-13 ... 158 °F) |
| Material | |
| Housing | brass, nickel-plated |
| Optical face | plastic |
| Protection degree | IP67 |
| Connection | M12 connector, 4-pin |



| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 78 |
| Diameter D [mm] | 18 |
| Thread length $l_t$ [mm] | 41 |
| Connector length $l_c$ [mm] | 13 |

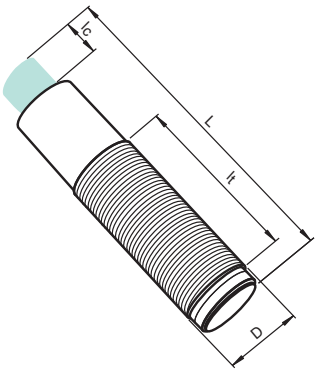
## Properties

- Suitable for use with glass fiber optics
- Cylindrical threaded housing
- Nickel-plated brass housing
- Connector version
- Visible red light

## Accessories

For suitable fiber optic cables see pages from 550
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CPZ18B03** | For Series CP18 Threaded Photoelectric Sensors |
| **BF 18** | Mounting bracket, 18 mm |
| **BF 18-F** | Mounting bracket with stop, 18 mm |
| **BF 5-30** | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |



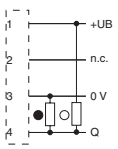

## Electrical Connection

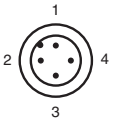
❍ = light on, ● = dark on



VL18LL-M/40a/118/128

Option 40a/118/128




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Sensor principle | Fiber Optic Diffuse and Thru-Beam Mode Sensor |
| Effective detection range | depends on the fiber optic cable being used |
| Light type | modulated visible red light , 670 nm |
| Operating voltage | 10 ... 30 V DC , class 2 |
| No-load supply current | < 25 mA |
| Switching type | light/dark on |
| Signal output | 2 Push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protection, overvoltage protected |
| Switching current | max 100 mA per output |
| Switching frequency | 500 Hz |
| Ambient temperature | -20 ... 55 °C (-4 ... 131 °F) |
| Housing | ABS |
| Optical face | Acrylic |
| Protection degree | IP67 |

| Model Number | | ML17-LL-K/115/136 | ML17-LL-K/115b/136 | ML17-LL-K/136/143 | ML17-LL-K/73/136 |
|---|---|---|---|---|---|
| Connection | fixed cable 150 mm with M12 x 1 male connector, 4 pin | | ● | | |
| | 2 m fixed cable | ● | | | |
| | 4-pin, M12 plastic connector | | | | ● |
| | 4-pin, M8 plastic connector | | | ● | |

| Approvals and Certificates | | | | | |
|---|---|---|---|---|---|
| UL approval | cULus | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |

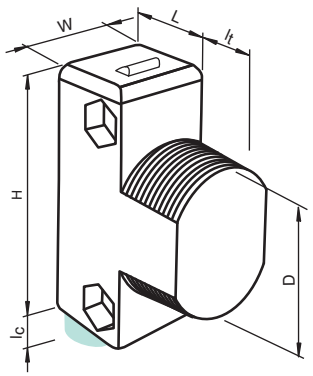
| Dimensions | | | |
|---|---|---|---|
| Length L [mm] | 19 | | |
| Thread length $L_t$ [mm] | 10 | | |
| Width W [mm] | 15 | | |
| Height H [mm] | 35 | | |
| Diameter D [mm] | 18 | | |
| Connector length $l_c$ [mm] | 0 | | 9.8 |

## Properties

- Suitable for use with glass or plastic fiber optics
- Rectangular miniature housing
- Plastic housing
- Cable, pigtailed connector and connector versions
- Visible red light

## Benefits

- Threaded face and side thru-holes provide flexible mounting options




## Accessories

**For suitable fiber optic cables see pages from 550**
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

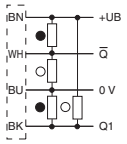
| | |
|---|---|
| **OMH-ML17-EZ** | Mounting bracket |
| **OMH-ML17** | Mounting bracket |
| **OMH-ML17-1** | Mounting bracket |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

## Electrical Connection

❍ = light on, ● = dark on

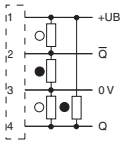
ML17-LL-K/115/136





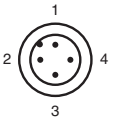

ML17-LL-K/73/136
ML17-LL-K/115b/136
ML17-LL-K/136/143












Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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## Properties

- Suitable for use with glass fiber optics and plastic fiber optics
- DIN rail housing
- Plastic housing
- Cable and pigtailed connector versions
- Visible red light

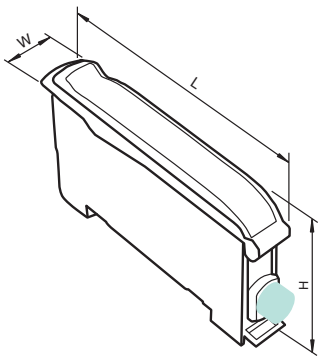
## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| 4-in-1 output | ✔ |
| Sensor principle | Fiber optic sensor for glass fiber optics and plastic fiber optics |
| Effective detection range | depends on the fiber optic cable being used |
| Light type | modulated visible red light , 640 nm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 30 mA |
| Switching type | light/dark on, switchable |
| Signal output | 1 push-pull (4-in-1) output NPN/PNP , short-circuit protected |
| Switching current | max. 100 mA , resistive load |
| Switching frequency | Standard mode: 3 kHz , High power mode: 1 kHz , Ultra mode: 100 Hz |
| Ambient temperature | -10 ... 55 °C (14 ... 131 °F) |
| Housing | PC |
| Protection degree | IP50 |

| Model Number | | SU18/35/40a/110/115/123 | SU18/35/40a/110/115/126a | SU18/16/35/40a/110/115/126a | SU18/35/40a/110/115a/126a | SU18/16/35/40a/110/115a/126a |
|---|---|---|---|---|---|---|
| Pre-fault indication output | 1 push-pull (4-in-1) output NPN/PNP , short-circuit protected | | ● | ● | ● | ● |
| Function input | external Teach-In | ● | | | | |
| Connection | 2 m PVC cable, 4 x 0,14 mm² | ● | ● | ● | | |
| | 200 mm PVC cable with M8 connector, 4-pin | | | | ● | ● |
| **Approvals and Certificates** | | | | | | |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | |

| Dimensions | |
|---|---|
| Length L [mm] | 62.3 |
| Width W [mm] | 9 |
| Height H [mm] | 34.5 |




## Accessories

**For suitable fiber optic cables see pages from 550**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **Bracket SU** | Mounting bracket for DIN rail |

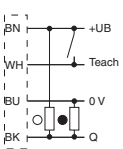
## Electrical Connection

❍ = light on, ● = dark on



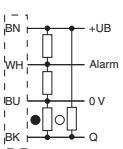
SU18/35/40a/110/115/123

Option 110/115/123




SU18/16/35/40a/110/115/126a
SU18/35/40a/110/115/126a

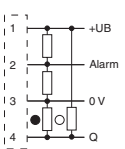
Option 110/115/126a






SU18/16/35/40a/110/115a/126a
SU18/35/40a/110/115a/126a

Option 110/115a/126a







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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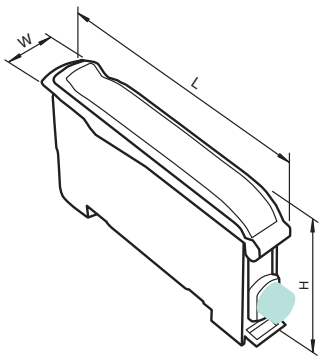
## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| | | | | | |
|---|---|---|---|---|---|
| **General Data** | | | | | |
| Sensitivity adjustment | ✔ | | | | |
| Light/dark switch | ✔ | | | | |
| 4-in-1 output | ✔ | | | | |
| Sensor principle | Fiber optic sensor for glass fiber optics and plastic fiber optics | | | | |
| Effective detection range | depends on the fiber optic cable being used | | | | |
| Light type | modulated visible red light , 660 nm | | | | |
| Operating voltage | 10 ... 30 V DC | | | | |
| No-load supply current | ≤ 30 mA | | | | |
| Signal output | 1 push-pull (4-in-1) output NPN/PNP , short-circuit protected | | | | |
| Switching type | light/dark on, switchable | | | | |
| Switching current | max. 100 mA , resistive load | | | | |
| Ambient temperature | -10 ... 55 °C (14 ... 131 °F) | | | | |
| Housing | PC | | | | |
| Protection degree | IP50 | | | | |
| **Model Number** | | SU18-40a/110/115/123 | SU18-16/40a/110/115/126a | SU18-16/40a/110/115a/126a | SU18-40a/110/115a/123 |
| Switching frequency | Standard mode: 3 kHz , High speed mode: 6 kHz , High resolution: 250 Hz | | ● | ● | |
| | Standard mode: 3 kHz , High speed mode: 6 kHz , High resolution: 500 Hz | ● | | | ● |
| Pre-fault indication output | 1 push-pull (4-in-1) output NPN/PNP , short-circuit protected | | ● | ● | ● |
| | 1 NPN, short-circuit protected open collector | | | | |
| Function input | external Teach-In | ● | | | ● |
| Connection | 2 m PVC cable, 4 x 0,14 mm² | ● | ● | | |
| | 200 mm PVC cable with M8 connector, 4-pin | | | ● | ● |
| | |  | |  | |
| **Approvals and Certificates** | | | | | |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |
| **Dimensions** | | | | | |
| Length L [mm] | | 62.3 | | | |
| Width W [mm] | | 9 | | | |
| Height H [mm] | | 34.5 | | | |

## Properties

- Suitable for use with glass fiber optics and plastic fiber optics
- DIN rail housing
- Plastic housing
- Cable and pigtailed connector versions
- Visible red light




## Accessories

**For suitable fiber optic cables see pages from 550**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **Bracket SU** | Mounting bracket for DIN rail |

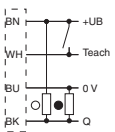
## Electrical Connection

❍ = light on, ● = dark on



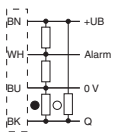
SU18-40a/110/115/123

Option 110/115/123




SU18-16/40a/110/115/126a

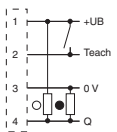
Option 110/115/126a





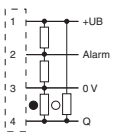

SU18-40a/110/115a/123

Option 110/115a/123




SU18-16/40a/110/115a/126a

Option 110/115a/126a







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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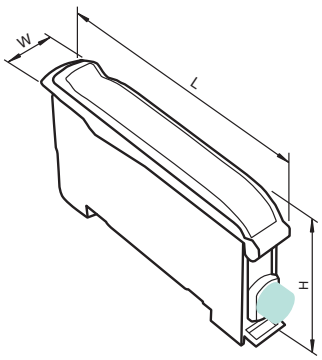


## Properties

- Suitable for use with glass fiber optics and plastic fiber optics
- DIN rail housing
- Plastic housing
- Cable version
- Visible red light

## Benefits

- AGC (Automatic Gain Control) for simple and time-saving teaching
- High resolution four-digit percentage display for clear, unambiguous indication of signal statuses




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| | | |
|---|---|---|
| **General Data** | | |
| Sensitivity adjustment | ✔ | |
| Timer | ✔ | |
| 4-in-1 output | ✔ | |
| Sensor principle | Fiber optic sensor for glass fiber optics and plastic fiber optics | |
| Effective detection range | depends on the fiber optic cable being used | |
| Light type | modulated visible red light , 660 nm | |
| Gang mounting | maximum 20 units | |
| Diagnostics display | 7-segment display | |
| Operating voltage | 10 ... 30 V DC | |
| No-load supply current | ≤ 30 mA | |
| Switching type | light/dark on selectable programmable | |
| Signal output | 1 push-pull (4-in-1) output NPN/PNP , short-circuit protected | |
| Switching current | max. 100 mA , resistive load | |
| Switching frequency | High speed mode: 16 kHz , Standard mode: 3 kHz , High resolution: 250 Hz ~ 3 kHz (selection by the sensor), Automatic: 250 Hz , Glass mode: 250 Hz | |
| Timer function | ON-delay, OFF-delay, one shot, pulse extension ; adjustable 0 ... 999 ms in 1 ms increments | |
| Ambient temperature | -10 ... 55 °C (14 ... 131 °F) | |
| Housing | PC | |
| Protection degree | IP50 | |

| **Model Number** | | SU19/110/115/123 | SU19.1/110/115 |
|---|---|---|---|
| Function input | external Teach-In | ● | |
| Connection | 2 m PVC cable, 1 x 0.25 mm² | | ● |
| | 2 m PVC cable, 4 x 0,14 mm² | ● | |
| | |  | |
| **Approvals and Certificates** | | | |
| UL approval | cULus Listed, Class 2 Power Source, Type 1 enclosure | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |
| **Dimensions** | | | |
| Length L [mm] | | 62.3 | |
| Width W [mm] | | 9 | |
| Height H [mm] | | 34.5 | |

## Accessories

For suitable fiber optic cables see pages from 550
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **Bracket SU** | Mounting bracket for DIN rail |

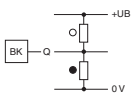
## Electrical Connection

❍ = light on, ● = dark on



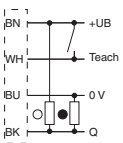
SU19.1/110/115

Option /110/115




SU19/110/115/123

Option 110/115/123






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CE

## Properties

- Suitable for use with glass fiber optics and plastic fiber optics
- DIN rail housing
- Plastic housing
- Cable version
- Visible red light

## Benefits

- SU17.1 main unit and SU17.1 expansion units can be gang mounted to reduce wiring

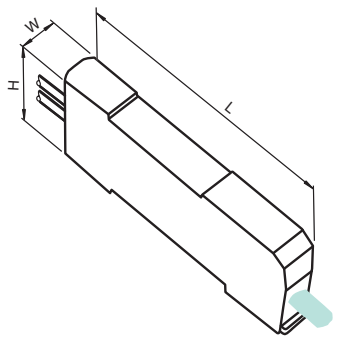
## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Light/dark adjustment | ✔ |
| Timer | ✔ |
| Sensor principle | Fiber Optic Diffuse and Thru-Beam Mode Sensor |
| Effective detection range | depends on the fiber optic cable being used |
| Diagnostics display | 8 digit display |
| Operating voltage | 12 ... 24 V DC |
| No-load supply current | ≤ 30 mA |
| Switching type | light on / dark on |
| Switching current | 30 mA max |
| Switching frequency | 3.5 kHz |
| Timer function | ON delay, OFF delay, One shot, ON delay + One shot, ON delay + OFF delay, Heartbeat, adjustment interval 250 µs ... 90 s |
| Ambient temperature | -20 ... 55 °C (-4 ... 131 °F)<br>( temperature specification changes for 2 or more units gang-mounted ) |
| Housing | PC resin |
| Protection degree | IP40 |
| Connection | 2 m PVC cable |



| Model Number | | SU17.1M-K-Z/20/115 | SU17.1M-K-Z/21/115 | SU17.1S-K-Z/20/115 | SU17.1S-K-Z/21/115 |
|---|---|---|---|---|---|
| Signal output | 2 NPN output, short-circuit protected, reverse polarity protected | | ● | | ● |
| | 2 PNP output, short-circuit protected, reverse polarity protected | ● | | ● | |
| **Dimensions** | | | | | |
| Length L [mm] | | 71 | | | |
| Width W [mm] | | 10 | | | |
| Height H [mm] | | 34 | | | |

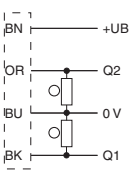



## Electrical Connection

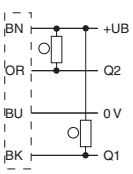
❍ = light on, ● = dark on



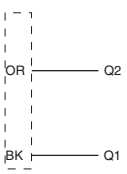
SU17.1M-K-Z/20/115




SU17.1M-K-Z/21/115




SU17.1S-K-Z/20/115
SU17.1S-K-Z/21/115




Power to expansion unit is supplied through the main unit SU17.1M...




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CE

## Properties

- Suitable for use with glass fiber optics and plastic fiber optics
- DIN rail housing
- Plastic housing
- Cable and pigtailed connector versions
- Visible red light

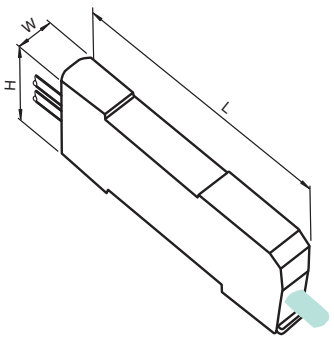
## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Light/dark adjustment | ✔ |
| Timer | ✔ |
| Sensor principle | Fiber optic diffused and Thru-Beam Mode |
| Effective detection range | depends on the fiber optic cable being used |
| Diagnostics display | 8 digit display |
| Operating voltage | 12 ... 24 V DC |
| No-load supply current | ≤ 30 mA |
| Switching type | light on / dark on |
| Switching current | 100 mA max |
| Switching frequency | 8 kHz |
| Timer function | ON delay, OFF delay, One shot, ON delay + One shot, ON delay + OFF delay, adjustment interval 250 µs ... 90 s |
| Ambient temperature | -20 ... 55 °C (-4 ... 131 °F) |
| Housing | PC resin |
| Protection degree | IP40 |

| Model Number | | SU17.1-K-Z/102a/115/123 | SU17.1-K-Z/103a/115/123 | SU17.1-K-Z/102a/115b/123 | SU17.1-K-Z/103a/115b/123 |
|---|---|---|---|---|---|
| Signal output | 1 NPN output, short-circuit protected, reverse polarity protected | ● | | ● | |
| | 1 PNP output, short-circuit protected, reverse polarity protected | | ● | | ● |
| Connection | 152 mm PVC covered pigtail, M12 x 1 quick disconnect | | | ● | ● |
| | 2 m PVC cable | ● | ● | | |

| Dimensions | |
|---|---|
| Length L [mm] | 71 |
| Width W [mm] | 10 |
| Height H [mm] | 34 |



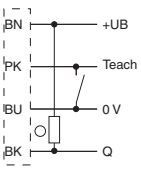

## Electrical Connection

❍ = light on, ● = dark on



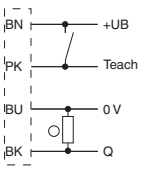
SU17.1-K-Z/103a/115/123

Option /102/115/123




SU17.1-K-Z/103a/115/123

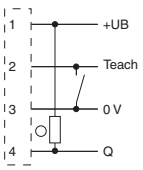
Option /103/115/123





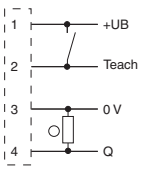

SU17.1-K-Z/102a/115b/123

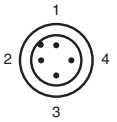
Option /102/115b/123




SU17.1-K-Z/103a/115b/123

Option /103/115b/123




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Properties

- Suitable for use with glass fiber optics and plastic fiber optics
- DIN rail housing
- Plastic housing
- Cable version
- Visible red light

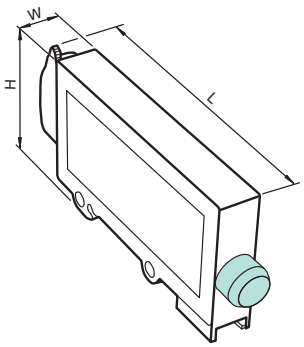
## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| | |
|---|---|
| **General Data** | |
| Sensitivity adjustment | ✔ |
| Light/dark adjustment | ✔ |
| Timer | ✔ |
| Sensor principle | Fiber optic sensor |
| Detection range | depends on the fiber optic cable being used |
| Light type | modulated visible red light |
| Diagnostics display | 7-segment display |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 24 mA at 24 V DC |
| Switching type | light/dark on selectable programmable |
| Switching current | max. 100 mA , resistive load |
| Switching frequency | High speed mode: 8 kHz , Standard mode: 1 kHz , Fine mode: 125 Hz , High detection range: 125 Hz |
| Timer function | ON-delay, OFF-delay, one shot, pulse extension ; adjustable 0 ... 2000 ms |
| Function input | (ET/LOCK):<br>+ $U_B$ = Teach-in function<br>- $U_B$ = Teach-in key locked<br>open = normal mode |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | ABS |
| Protection degree | IP64 |
| Connection | 2 m cable, 5 x 0,14 mm$^2$, PVC |



| Model Number | | SU20/40b/79a/102/115/123 | SU20/40b/79a/103/115/123 |
|---|---|---|---|
| Signal output | 1 NPN, short-circuit protected open collector | ● | |
| | 1 PNP, short-circuit protected, open collector | | ● |
| **Approvals and Certificates** | | | |
| UL approval | cULus | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |
| **Dimensions** | | | |
| Length L [mm] | | 79.3 | |
| Width W [mm] | | 10.4 | |
| Height H [mm] | | 35.4 | |
| Connector length $l_c$ [mm] | | 0 | |



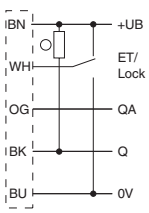

## Electrical Connection

❍ = light on, ● = dark on



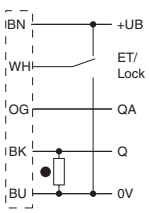
SU20/40b/79a/102/115/123

Option 102/115/123




SU20/40b/79a/103/115/123

Option 103/115/123

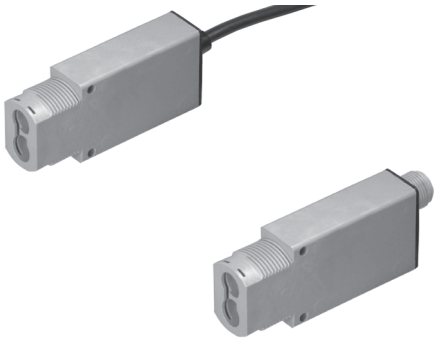






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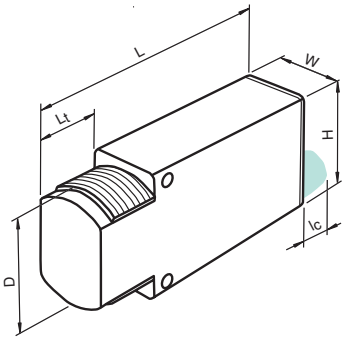


## Properties

- Suitable for use with glass fiber optics and plastic fiber optics
- Rectangular miniature housing
- Plastic housing
- Cable and connector versions
- Visible red and infrared light versions

## Benefits

- Threaded face and side thru-holes provide flexible mounting options
- Rugged IP69k housing withstands harsh environments and high-pressure washdown areas.




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Sensor principle | Fiber optic sensor |
| Effective detection range | Determined by cable |
| Ambient temperature | -30 ... 70 °C (-22 ... 158 °F) |
| Housing | Polysulphone |
| Optical face | Polycarbonate |
| Protection degree | IP69K |

| Model Number | | MHP-F33L | MHP-FR33L | MHP-F2AL | MHP-FR2AL | MHP-F33Q | MHP-FR33Q | MHP-F2AQ | MHP-FR2AQ |
|---|---|---|---|---|---|---|---|---|---|
| Light type | modulated infrared light | ● | | ● | | ● | | ● | |
| | modulated visible red light | | ● | | ● | | ● | | ● |
| Operating voltage | 10 ... 30 V DC | ● | ● | | | ● | ● | | |
| | 20 ... 260 V , 50 ... 60 Hz | | | ● | ● | | | ● | ● |
| No-load supply current | ≤ 1.5 mA | | | ● | ● | | | ● | ● |
| | ≤ 35 mA | ● | ● | | | ● | ● | | |
| Signal output | 1 NPN and 1 PNP | ● | ● | | | ● | ● | | |
| | Thyristor | | | ● | ● | | | ● | ● |
| Switching frequency | 500 Hz | ● | ● | | | ● | ● | | |
| | 60 Hz | | | ● | ● | | | ● | ● |
| Connection | 2 m fixed cable , PVC | ● | ● | | | | | | |
| | 3 m fixed cable , PVC | | | ● | ● | | | | |
| | connector M12 x 1, 4-pin | | | | | ● | ● | | |
| | Micro AC connector, 1/2" ; 3-pin | | | | | | | ● | ● |

| Approvals and Certificates | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| UL approval | cULus | ● | ● | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | ● | ● | | | ● | ● | | |

| Dimensions | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Length L [mm] | | | | | 67.8 | | | | |
| Width W [mm] | | | | | 15.8 | | | | |
| Height H [mm] | | | | | 30 | | | | |
| Diameter D [mm] | | | | | 25.4 | | | | |
| Thread length $l_t$ [mm] | | | | | 18.3 | | | | |
| Connector length $l_c$ [mm] | | | | 0 | | | 6.4 | | |

## Accessories

**For suitable fiber optic cables see pages from 550**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **MHPFOA** | Adapter |
| **MHPHDW-FO** | Mounting set |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |
| **V12-G-YE2M-PVC** | Female cordset, 1/2", 3-pin, PVC cable, straight |
| **V12-W-YE2M-PVC** | Female cordset, 1/2", 3-pin, PVC cable, angled |

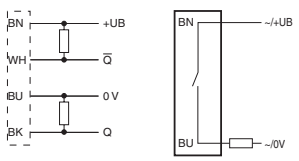
## Electrical Connection

❍ = light on, ● = dark on



MHP-F33L
MHP-FR33L

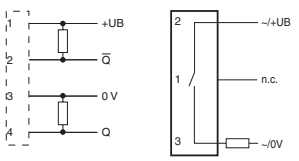
MHP-F2AL
MHP-FR2AL

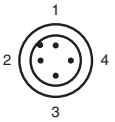


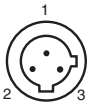



MHP-F33Q
MHP-FR33Q

MHP-F2AQ
MHP-FR2AQ



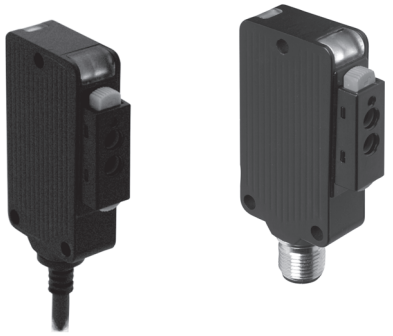




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Sensor principle | Fiber optic sensor for glass fiber optics |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | max. 35 mA |
| Switching type | light/dark on switchable |
| Signal output | 2 Push-pull (4-in-1) outputs, complementary, short-circuit proof, reverse polarity protected |
| Switching current | max. 100 mA |
| Switching frequency | 1000 Hz |
| Ambient temperature | -40 ... 60 °C (-40 ... 140 °F) |
| Material | |
| Housing | aluminum , Delta-Seal coated |
| Optical face | Fiber optic connection |
| Protection degree | IP67 |

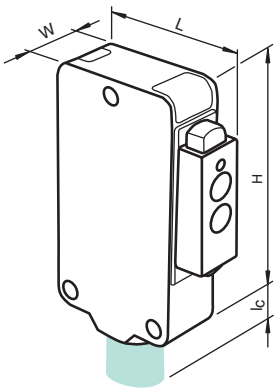
| Model Number | | MLV41-LL-RT/115/136 | MLV41-LL-IR/115/136 | MLV41-LL-IR/95/136 | MLV41-LL-IR/92/136 |
|---|---|---|---|---|---|
| Light type | modulated infrared light , 880 nm | | ● | ● | ● |
| | modulated visible red light , 660 nm | ● | | | |
| Connection | connector M12 x 1, 4-pin | | | | ● |
| | M8 x 1 connector, 4-pin | | | ● | |
| | 2 m fixed cable | ● | ● | | |
| **Approvals and Certificates** | | | | | |
| Protection class | II | ● | ● | | ● |
| UL approval | cULus Listed 57M3 (Only in association with UL Class 2 power supply; Type 1 enclosure) | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |
| **Dimensions** | | | | | |
| Length L [mm] | | 37.6 | | | |
| Width W [mm] | | 13.6 | | | |
| Height H [mm] | | 56.5 | | | |
| Connector length $l_c$ [mm] | | 5 | | 9 | 12.5 |

## Properties

- Suitable for use with glass fiber optics
- Rectangular miniature housing
- Aluminum with Delta®-Seal coating housing
- Cable and connector versions
- Visible red and infrared light versions

## Benefits

- Corrosion resistant Delta®-Seal housing
- Time saving quick connection to fiber optic cables




## Accessories

**For suitable fiber optic cables see pages from 550**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-09** | Mounting bracket |
| **OMH-40** | Mounting bracket |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

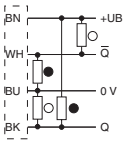
## Electrical Connection

❍ = light on, ● = dark on



MLV41-LL-IR/115/136
MLV41-LL-RT/115/136

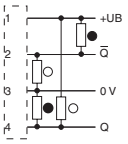
Option 59/115/136

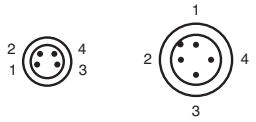





MLV41-LL-IR/92/136
MLV41-LL-IR/95/136

Option 25/95/136




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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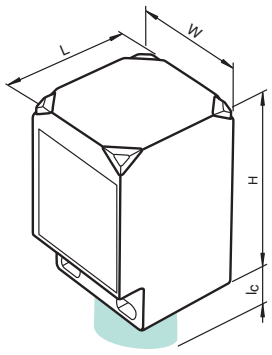


## Properties

- Suitable for use with glass fiber optics
- Rectangular full-size housing
- Plastic housing
- Cable and connector versions
- Infrared light

## Benefits

- Adjustable switchpoint
- Extreme low-temperature operation




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| | | RL61-LL-IR-Z/115/136 | RL61-LL-IR-Z/92/136 |
|---|---|---|---|
| **General Data** | | | |
| Light/dark switch | | ✔ | |
| Timer | | ✔ | |
| 4-in-1 output | | ✔ | |
| Sensor principle | | Fiber Optic Diffuse and Thru-Beam Mode Sensor | |
| Detection range | | Dependent on fibers selected | |
| Light type | | modulated infrared light , 850 nm | |
| Operating voltage | | 10 ... 30 V DC | |
| No-load supply current | | ≤ 35 mA | |
| Switching type | | light/dark on, switchable | |
| Signal output | | 2 push-pull (4-in-1) outputs, short-circuit protected, reverse polarity protected | |
| Switching current | | max. 100 mA | |
| Switching frequency | | 500 Hz | |
| Timer function | | DIP-switch for selection of operating modes | |
| Ambient temperature | | -40 ... 55 °C (-40 ... 131 °F) | |
| Housing | | PC (Polycarbonate) | |
| Optical face | | PMMA | |
| Protection degree | | IP67 | |
| **Model Number** | | | |
| Connection | 2 m fixed cable | ● | |
| | connector M12 x 1, 4-pin | | ● |
| **Approvals and Certificates** | | | |
| UL approval | cULus | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |
| **Dimensions** | | | |
| Length L [mm] | | 49 | |
| Width W [mm] | | 45 | |
| Height H [mm] | | 74 | |
| Connector length $l_c$ [mm] | | 18 | 26 |

## Accessories

**For suitable fiber optic cables see pages from 550**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **MPGKITC** | Fiber cable adapter kit |
| **MPZB01** | Mounting bracket with vertical slots |
| **MPZB02** | Mounting bracket with circular slots |
| **MPZB06** | Ball and Swivel Mounting Bracket |
| **MPZB07** | Ball and Swivel Vertical Mounting Plate |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

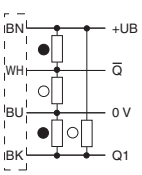
## Electrical Connection

❍ = light on, ● = dark on

RL61-LL-IR-Z/115/136



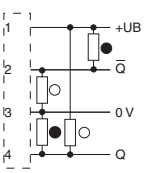
Option 115/136

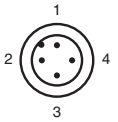



RL61-LL-IR-Z/92/136



Option 92/136




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

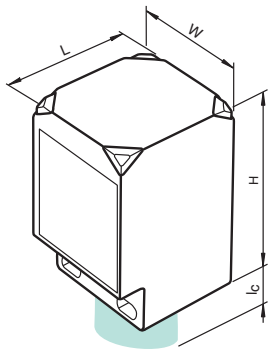
| | | | |
|---|---|---|---|
| **General Data** | | | |
| Timer | ✔ | | |
| Sensitivity adjustment | ✔ | | |
| Light/dark switch | ✔ | | |
| Sensor principle | Fiber Optic Diffuse and Thru-Beam Mode Sensor | | |
| Detection range | Dependent on fibers selected | | |
| Light type | modulated infrared light , 850 nm | | |
| Operating voltage | 24 ... 240 V AC<br>12 ... 240 V DC | | |
| No-load supply current | ≤ 35 mA | | |
| Switching type | light/dark on, switchable | | |
| Signal output | 1 SPDT relay output | | |
| Switching current | max. 3 A | | |
| Switching frequency | 20 Hz | | |
| Timer function | DIP-switch for selection of operating modes | | |
| Ambient temperature | -40 ... 55 °C (-40 ... 131 °F) | | |
| Housing | PC (Polycarbonate) | | |
| Optical face | PMMA | | |
| Protection degree | IP67 | | |
| **Model Number** | | RLK61-LL-IR-Z/31/115 | RLK61-LL-IR-Z/31/135 |
| Connection | 2 m fixed cable, 5-wire | ● | |
| | 7/8"-16 UN 2A connector, 5-pin | | ● |
| **Approvals and Certificates** | | | |
| UL approval | cULus | ● | ● |
| **Dimensions** | | | |
| Length L [mm] | | 49 | |
| Width W [mm] | | 45 | |
| Height H [mm] | | 74 | |
| Connector length $l_c$ [mm] | | 18 | 27.5 |

## Properties

- Suitable for use with glass fiber optics
- Rectangular full-size housing
- Plastic housing
- Cable and connector versions
- Infrared light

## Benefits

- Universal usage with AC or DC power supply
- Adjustable switchpoint
- Extreme low-temperature operation




## Accessories

**For suitable fiber optic cables see pages from 550**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **MPGKITC** | Fiber cable adapter kit |
| **MPZB01** | Mounting bracket with vertical slots |
| **MPZB02** | Mounting bracket with circular slots |
| **MPZB06** | Ball and Swivel Mounting Bracket |
| **MPZB07** | Ball and Swivel Vertical Mounting Plate |
| **V95-G-YE2M-STOOW** | Female cordset, 7/8"-16 UN 2A, 5-pin, 2 m PVC cable, straight |
| **V95-W-YE2M-STOOW** | Female cordset, 7/8"-16 UN 2A, 5-pin, 2 m PVC cable, angled |

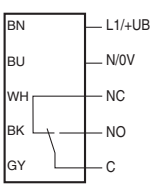
## Electrical Connection

❍ = light on, ● = dark on

RLK61-LL-IR-Z/31/115

Option 31/115

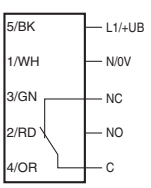


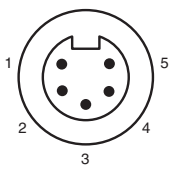



RLK61-LL-IR-Z/31/135

Option 31/135






Wire colors

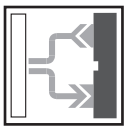
| | | |
|---|---|---|
| 1 | WH | (white) |
| 2 | RD | (red) |
| 3 | GN | (green) |
| 4 | OR | (orange) |
| 5 | BK | (black) |




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# Introduction to Fiber Optic Cables

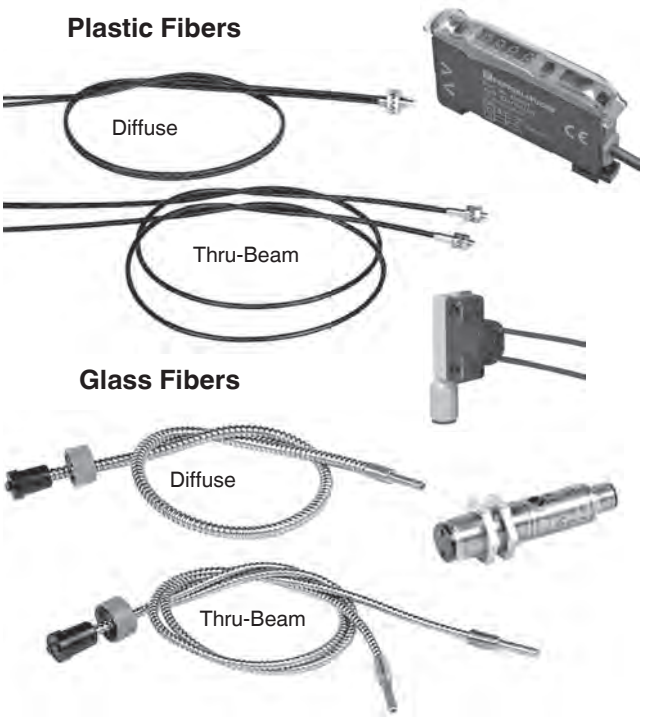


## Fiber Optic Diffuse and Thru-Beam Mode

In applications involving small targets or unfavorable conditions, fiber optic cables may be the sensible solution. Glass fiber optic cables are constructed from tiny strands of glass that are bundled together inside an application-specific sheath. Plastic fiber optic cables are manufactured from a light conductive plastic monofilament material, which is protected by a PVC jacket.

When attached to the end of certain photoelectric sensors, they guide the light through the cable and out at the sensing head. A separate fiber attached to the receiver returns the light. Pepperl+Fuchs offers both glass and plastic fiber optic cables. The diameter of the glass fiber optic cables is generally larger than plastic and provides a longer sensing range. Pepperl+Fuchs' glass cables can withstand temperatures as high as 900 °F while the plastic cables are rated as high as 221 °F. The plastic cables are typically used due to their small size and narrow beam diameter. This enables easy detection of small parts such as pins on an IC chip. Plastic cables can be "cut-to-length" in the field; therefore, the correct length doesn't have to be specified when ordering. Obtaining the maximum light intensity possible in each application is accomplished by customizing the plastic cables to the shortest possible length. This reduces the inherent "light losses" that occur inside the cable. Pepperl+Fuchs offers three standard types of sheaths: stainless steel, silicone, and PVC.

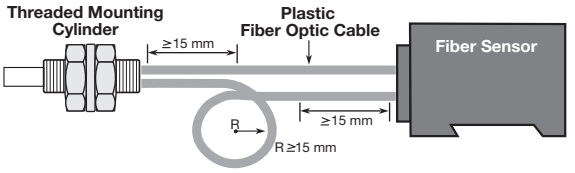
In diffuse mode sensing, a bifurcated cable (2 in 1) is used. Thru-beam requires two individual cables.

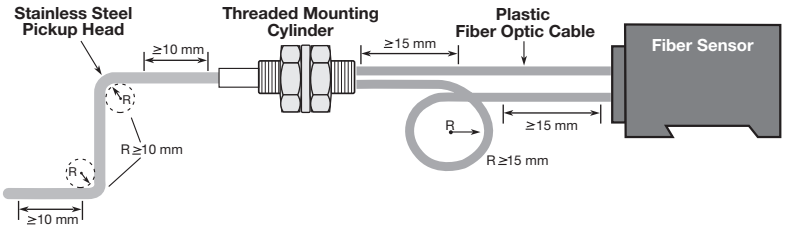



## Mounting and Fitting

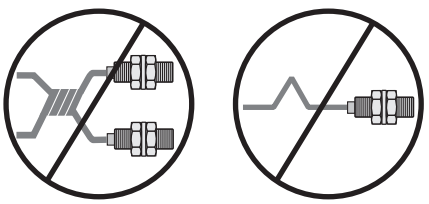
When positioning plastic fiber optic cable, a minimum bending radius of 15 mm must be maintained. In addition, a straight section of ≥15 mm must be maintained at both ends of fiber optic cable between the threaded mounting cylinder and optical sensor.

Some fiber optic cables have a flexible stainless steel pickup attached. In such a case, a minimum bending radius of 10 mm must be maintained. Also, to avoid damage to the pickup head light guide, a straight section of 10 mm must be maintained at both ends.



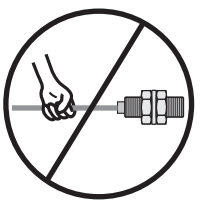

## Please Note!



Do not twist or kink plastic fiber optic cables.



Avoid contact with petroleum or organic solvents.



Excessive pulling will lead to severe damage.



Refer to General Notes Relating to Product Information
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## Specifications for Glass Fiber Optic Cables

(with Model Numbers L...)

| | PVC Sheathing | Stainless Steel Sheathing | Silicone Sheathing |
|---|---|---|---|
| **Protection (IEC)** | IP67 | IP40 | IP67 |
| **Bending Radius** | ≤ 30 mm | ≤ 20 mm | ≤ 25 mm |
| **Working Temperature Range** | -58 °F to +248 °F | -58 °F to +572 °F | -58 °F to +356 °F |

## Minimum Bend Radius for HPF and FE Cables

To help prevent possible damage to fiber optic cables, do not exceed the minimum bend radius.

| | |
|---|---|
| **Glass Stainless Steel Sheathing Cables** | 1 inch (25 mm) |
| **Glass PVC Sheathing Cables** | 0.75 inch (19 mm) |
| **Plastic Cables - 1 mm diameter core** | 1 inch (25 mm) |
| **Plastic Cables - 0.5 mm diameter core** | 0.5 inch (12.5 mm) |

## Temperature Ranges for HPF and FE Cables

| | |
|---|---|
| Plastic Fiber Optic Sensor Head | -22 °F to +158 °F (-30 °C to +70 °C) |
| Plastic Cable | -22 °F to +158 °F (-30 °C to +70 °C) |
| Plastic Cable Lens Accessories | -22 °F to +158 °F (-30 °C to +70 °C) |
| Glass Cable (PVC Sheathing) | -40 °F to +250 °F (-40 °C to +120 °C) |
| Glass Cable (Stainless Steel Sheathing) | -40 °F to +450 °F (-40 °C to +232 °C) |
| Glass Cable (High Temperature) | -40 °F to +900 °F (-40 °C to +482 °C) |
| Glass Cable End Tips | -40 °F to +585 °F (-40 °C to +307 °C) |
| Glass Cable for SU18, SU19, SU17.1, and ML17-LL (Stainless Steel Sheathing) | -67 °F to +392 °F (-55 °C to +200 °C) |
| Glass Cable for SU18, SU19, SU17.1, and ML17-LL (PVC Sheathing) | -67 °F to +149 °F (-55 °C to +65 °C) |

**Note:** SU19 Series sensing ranges are reduced by 50% in high-speed or glass modes.



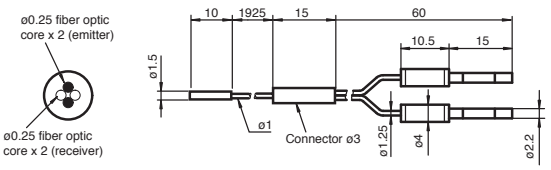
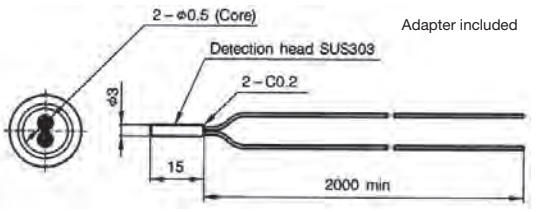
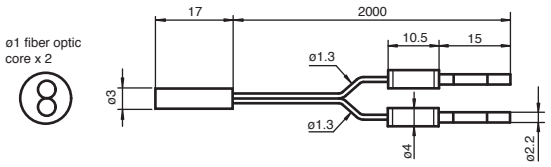
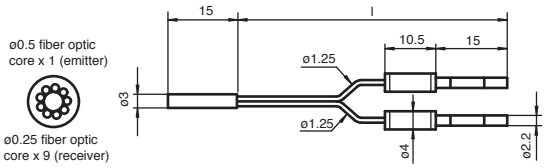
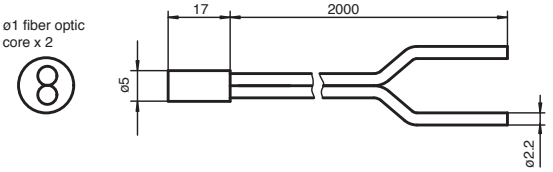
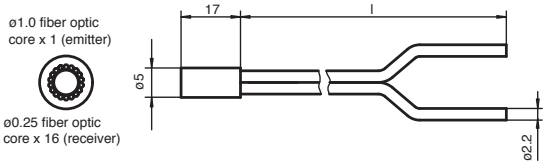

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# Plastic Fiber Optic Cables

## Diffuse Plastic Fiber Optic Cables
**for SU18, SU19, SU17.1, ML17-LL, and MHP-FR Sensors**

### Nonthreaded Cylindrical

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| KLR-C04-1.0-2.0-K133 | 2 m | 1 mm | PVC | SU18 High Power | 25 mm |  |
| | | | | SU18 High Speed | 7 mm | |
| | | | | SU19 | 7 mm | |
| | | | | SU17.1 | 21 mm | |
| | | | | ML17-LL | 4 mm | |
| | | | | MHP-FR | not compatible | |
| HPF-D005-H | 2 m | 1.0 mm | Black polyethylene | SU18 High Power | 118 mm |  |
| | | | | SU18 High Speed | 14 mm | |
| | | | | SU19 | 14 mm | |
| | | | | SU17.1 | 100 mm | |
| | | | | ML17-LL | 18 mm | |
| | | | | MHP-FR | not compatible | |
| KLR-C02-1.3-2.0-K86 | 2 m | 1.3 mm | PVC | SU18 High Power | 280 mm |  |
| | | | | SU18 High Speed | 80 mm | |
| | | | | SU19 | 80 mm | |
| | | | | SU17.1 | 238 mm | |
| | | | | ML17-LL | 45 mm | |
| | | | | MHP-FR | not compatible | |
| KLR-C09-1.25-2.0-K77 | 2 m | 1.25 mm | PVC | SU18 High Power | 110 mm |  |
| | | | | SU18 High Speed | 30 mm | |
| | | | | SU19 | 30 mm | |
| | | | | SU17.1 | 94 mm | |
| | | | | ML17-LL | 18 mm | |
| | | | | MHP-FR | not compatible | |
| KLR-C02-2.2-2.0-K85 | 2 m | 2.2 mm | PVC | SU18 High Power | 280 mm |  |
| | | | | SU18 High Speed | 80 mm | |
| | | | | SU19, | 80 mm | |
| | | | | SU17.1 | 238 mm | |
| | | | | ML17-LL | 45 mm | |
| | | | | MHP-FR | 18 mm | |
| KLR-C16-2.2-2.0-K72 | 2 m | 2.2 mm | PVC | SU18 High Power | 300 mm |  |
| | | | | SU18 High Speed | 85 mm | |
| | | | | SU19 | 85 mm | |
| | | | | SU17.1 | 255 mm | |
| | | | | ML17-LL | 48 mm | |
| | | | | MHP-FR | 20 mm | |



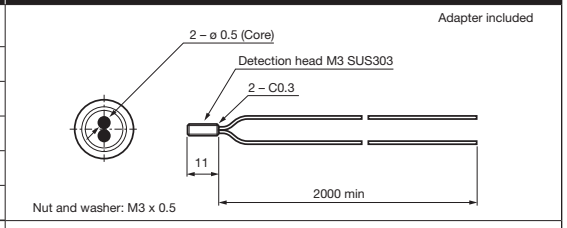
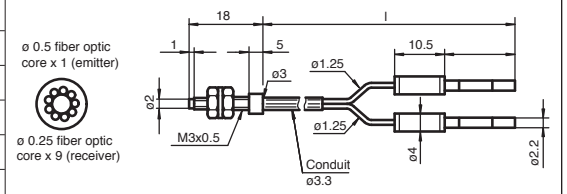
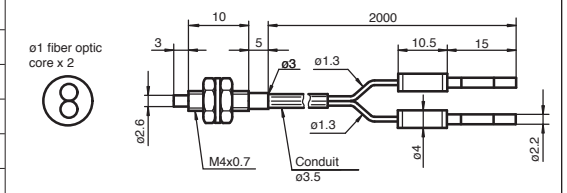
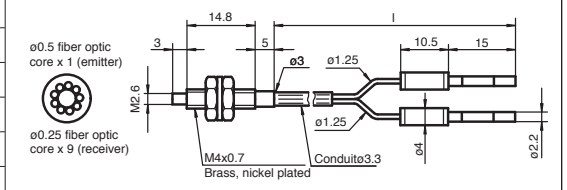
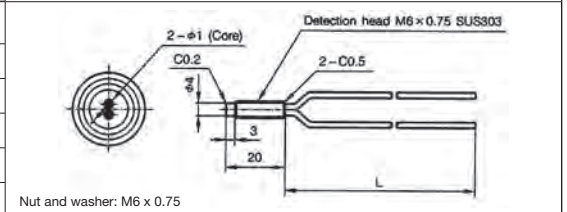
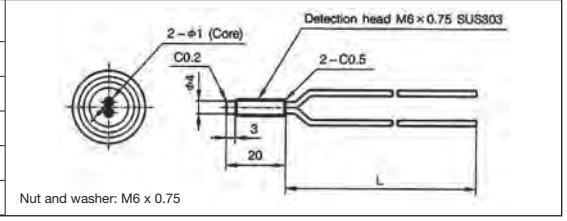
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# Plastic Fiber Optic Cables

## Diffuse Plastic Fiber Optic Cables
### for SU18, SU19, SU17.1, ML17-LL, and MHP-FR Sensors



**Threaded Cylindrical**

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| HPF-D004-H | 2 m | 1.0 mm | Black polyethylene | SU18 High Power | 118 mm |  |
| | | | | SU18 High Speed | 16 mm | |
| | | | | SU19 | 16 mm | |
| | | | | SU17.1 | 100 mm | |
| | | | | ML17-LL | 13 mm | |
| | | | | MHP-FR | not compatible | |
| KLR-C09-1.25-2.0-K76 | 2 m | 1.25 mm | PVC | SU18 High Power | 100 mm |  |
| | | | | SU18 High Speed | 30 mm | |
| | | | | SU19 | 30 mm | |
| | | | | SU17.1 | 85 mm | |
| | | | | ML17-LL | 16 mm | |
| | | | | MHP-FR | not compatible | |
| KLR-C02-1.3-2.0-K84 | 2 m | 1.3 mm | PVC | SU18 High Power | 280 mm |  |
| | | | | SU18 High Speed | 80 mm | |
| | | | | SU19 | 80 mm | |
| | | | | SU17.1 | 238 mm | |
| | | | | ML17-LL | 45 mm | |
| | | | | MHP-FR | not compatible | |
| KLR-C09-1.25-2.0-K74 | 2 m | 1.25 mm | PVC | SU18 High Power | 100 mm |  |
| | | | | SU18 High Speed | 30 mm | |
| | | | | SU19 | 30 mm | |
| | | | | SU17.1 | 85 mm | |
| | | | | ML17-LL | 16 mm | |
| | | | | MHP-FR | not compatible | |
| HPF-D002-H | 2 m | 2.2 mm | Black polyethylene | SU18 High Power | 471 mm |  |
| | | | | SU18 High Speed | 66 mm | |
| | | | | SU19 | 66 mm | |
| | | | | SU17.1 | 400 mm | |
| | | | | ML17-LL | 60 mm | |
| | | | | MHP-FR | 18 mm | |
| HPF-D002-HL5 | 5 m | 2.2 mm | Black polyethylene | SU18 High Power | 471 mm |  |
| | | | | SU18 High Speed | 50 mm | |
| | | | | SU19 | 50 mm | |
| | | | | SU17.1 | 400 mm | |
| | | | | ML17-LL | 60 mm | |
| | | | | MHP-FR | 18 mm | |

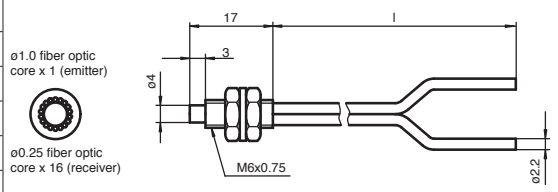
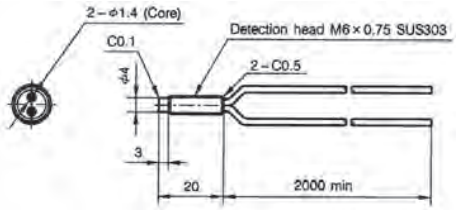
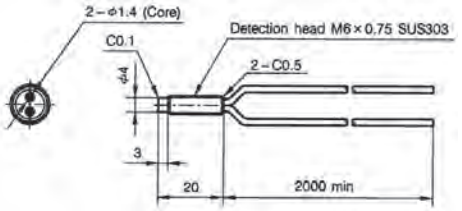


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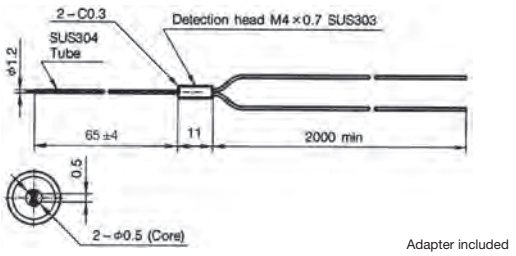
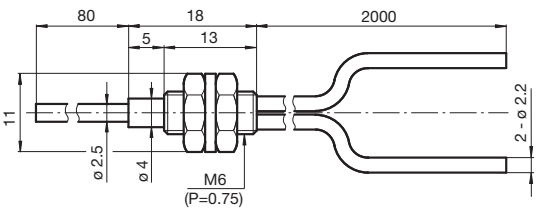
# Plastic Fiber Optic Cables

## Diffuse Plastic Fiber Optic Cables
**for SU18, SU19, SU17.1, ML17-LL, and MHP-FR Sensors**

### Threaded Cylindrical (cont.)

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| KLR-C16-2.2-2.0-K71 | 2 m | 2.2 mm | PVC | SU18 High Power | 300 mm |  |
| | | | | SU18 High Speed | 85 mm | |
| | | | | SU19 | 85 mm | |
| | | | | SU17.1 | 255 mm | |
| | | | | ML17-LL | 48 mm | |
| | | | | MHP-FR | 20 mm | |
| HPF-D001-H | 2 m | 2.2 mm | Black polyethylene | SU18 High Power | 647 mm |  |
| | | | | SU18 High Speed | 88 mm | |
| | | | | SU19 | 88 mm | |
| | | | | SU17.1 | 550 mm | |
| | | | | ML17-LL | 85 mm | |
| | | | | MHP-FR | 33 mm | |
| HPF-D001-HL03 | 3 m | 2.2 mm | Black polyethylene | SU18 High Power | 647 mm |  |
| | | | | SU18 High Speed | 88 mm | |
| | | | | SU19 | 88 mm | |
| | | | | SU17.1 | 550 mm | |
| | | | | ML17-LL | 85 mm | |
| | | | | MHP-FR | 33 mm | |

### Bendable Probe

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| HPF-D006 | 2 m | 1 mm | Black polyethylene | SU18 High Power | 122 mm |  |
| | | | | SU18 High Speed | 23 mm | |
| | | | | SU19 | 23 mm | |
| | | | | SU17.1 | 104 mm | |
| | | | | ML17-LL | 20 mm | |
| | | | | MHP-FR | not compatible | |
| KLR 00-2.2-2.0-K57 | 2 m | 2.2 mm | PVC | SU18 High Power | 210 mm |  |
| | | | | SU18 High Speed | 60 mm | |
| | | | | SU19 | 60 mm | |
| | | | | SU17.1 | 179 mm | |
| | | | | ML17-LL | 34 mm | |
| | | | | MHP-FR | 6 mm | |



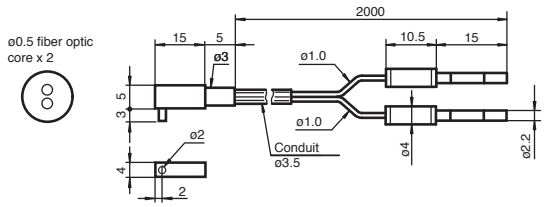
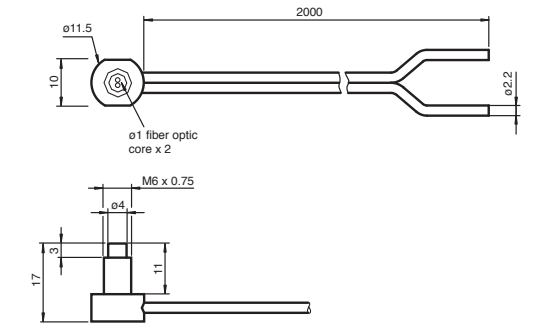
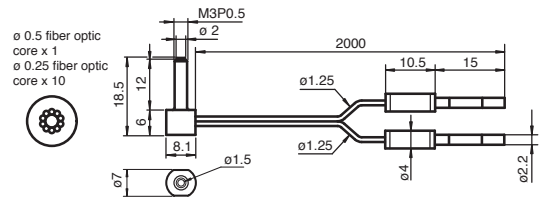
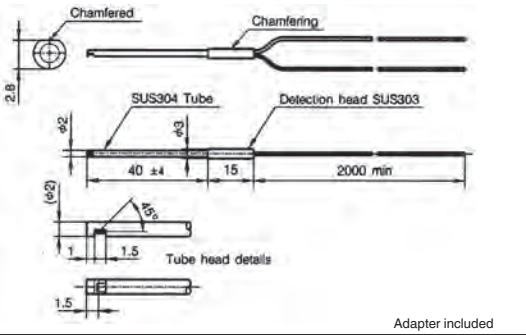
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# Plastic Fiber Optic Cables

## Diffuse Plastic Fiber Optic Cables
### for SU18, SU19, SU17.1, ML17-LL, and MHP-FR Sensors



**Side-view/Periscope**

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| KHR-C02-1.0-2.0-K132 | 2 m | 1 mm | PVC | SU18 High Power | 52 mm |  |
| | | | | SU18 High Speed | 15 mm | |
| | | | | SU19 | 15 mm | |
| | | | | SU17.1 | 44 mm | |
| | | | | ML17-LL | 8 mm | |
| | | | | MHP-FR | not compatible | |
| KHR-C02-2.2-2.0-K131 | 2 m | 2.2 mm | PVC | SU18 High Power | 210 mm |  |
| | | | | SU18 High Speed | 60 mm | |
| | | | | SU19 | 60 mm | |
| | | | | SU17.1 | 179 mm | |
| | | | | ML17-LL | 34 mm | |
| | | | | MHP-FR | 14 mm | |
| KLR-C10-1.25-2.0-K144 | 2 m | 1.25 mm | PVC | SU18 High Power | 95 mm |  |
| | | | | SU18 High Speed | 30 mm | |
| | | | | SU19 | 30 mm | |
| | | | | SU17.1 | 81 mm | |
| | | | | ML17-LL | 15 mm | |
| | | | | MHP-FR | not compatible | |
| HPF-D011 | 2 mm | 1.0 mm | Black polyethylene | SU18 High Power | 45 mm |  |
| | | | | SU18 High Speed | 27 mm | |
| | | | | SU19 | 27 mm | |
| | | | | SU17.1 | 38 mm | |
| | | | | ML17-LL | 6 mm | |
| | | | | MHP-FR | not compatible | |

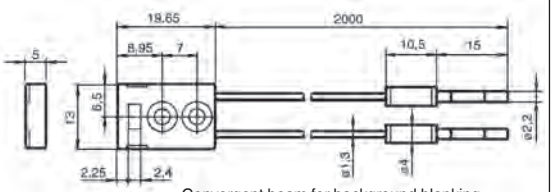
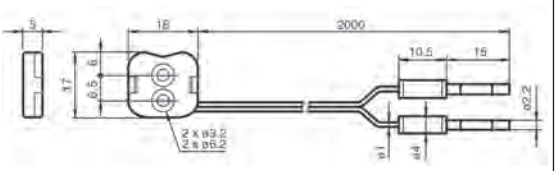
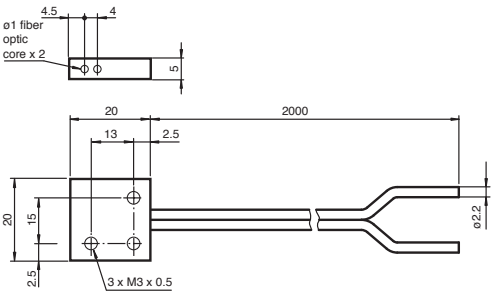


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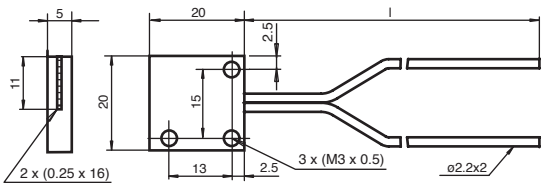
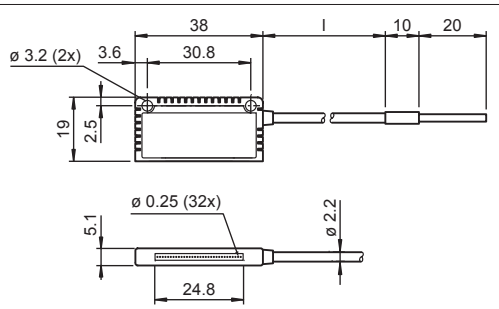
# Plastic Fiber Optic Cables

## Diffuse Plastic Fiber Optic Cables
**for SU18, SU19, SU17.1, ML17-LL, and MHP-FR Sensors**

### Rectangular

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| KLR-C02-1.3-2.0-K130 | 2 m | 1.3 mm | PVC | SU18 High Power | 8 mm |  Convergent beam for background blanking |
| | | | | SU18 High Speed | 8 mm | |
| | | | | SU19 | 8 mm | |
| | | | | SU17.1 | 8 mm | |
| | | | | ML17-LL | 8 mm | |
| | | | | MHP-FR | not compatible | |
| KHR-C02-1.0-2.0-K129 | 2 m | 1 mm | PVC | SU18 High Power | 10 mm |  Convergent beam for background blanking |
| | | | | SU18 High Speed | 10 mm | |
| | | | | SU19 | 10 mm | |
| | | | | SU17.1 | 10 mm | |
| | | | | ML17-LL | 10 mm | |
| | | | | MHP-FR | not compatible | |
| KHR-A02-2.2-2.0-K127 | 2 m | 2.2 mm | PVC | SU18 High Power | 175 mm |  |
| | | | | SU18 High Speed | 50 mm | |
| | | | | SU19 | 50 mm | |
| | | | | SU17.1 | 149 mm | |
| | | | | ML17-LL | 28 mm | |
| | | | | MHP-FR | 12 mm | |

### Array

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| KLR-A32-2.2-2.0-K83 | 2 m | 2.2 mm | PVC | SU18 High Power | 120 mm |  |
| | | | | SU18 High Speed | 35 mm | |
| | | | | SU19 | 35 mm | |
| | | | | SU17.1 | 102 mm | |
| | | | | ML17-LL | 19 mm | |
| | | | | MHP-FR | 8 mm | |
| KLR-A32-2.2-2.0-K141 | 2 m | 2.2 mm | PVC | SU18 High Power | 120 mm |  |
| | | | | SU18 High Speed | 35 mm | |
| | | | | SU19 | 35 mm | |
| | | | | SU17.1 | 102 mm | |
| | | | | ML17-LL | 19 mm | |
| | | | | MHP-FR | 8 mm | |



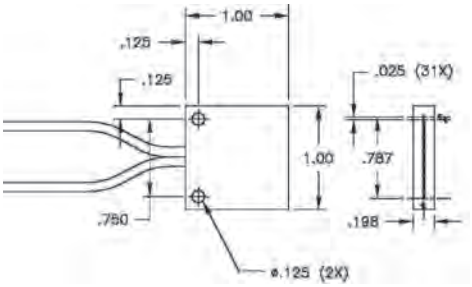
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# Plastic Fiber Optic Cables

## Diffuse Plastic Fiber Optic Cables
**for SU18, SU19, SU17.1, ML17-LL, and MHP-FR Sensors**



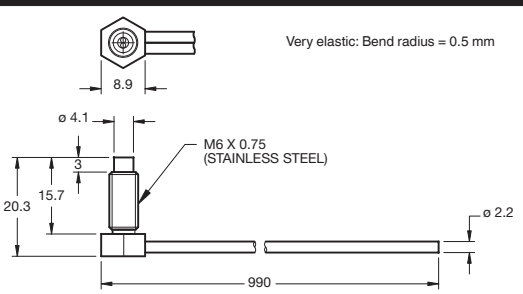
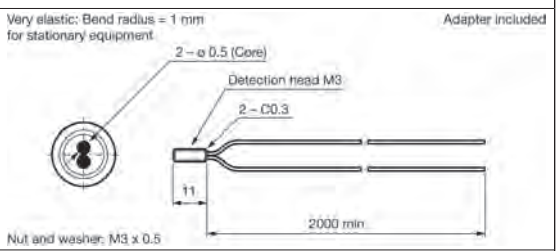
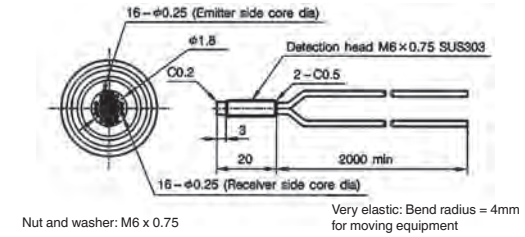
### Array (cont.)

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| HPF-D032 | 2 m | 2.2 mm | Plastic | SU18 High Power | 191 mm |  |
| | | | | SU18 High Speed | 46 mm | |
| | | | | SU19 | 46 mm | |
| | | | | SU17.1 | 162 mm | |
| | | | | ML17-LL | 52 mm | |
| | | | | MHP-FR | 21 mm | |



(Inches)

### High Flex Cable

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| HPF-D070-H | 2 m | 2.2 mm | Black polyethylene | SU18 High Power | 214 mm |  |
| | | | | SU18 High Speed | 34 mm | |
| | | | | SU19 | 34 mm | |
| | | | | SU17.1 | 182 mm | |
| | | | | ML17-LL | 46 mm | |
| | | | | MHP-FR | 12 mm | |
| HPF-D029 | 2 m | 1.0 mm | Black polyethylene | SU18 High Power | 29 mm |  |
| | | | | SU18 High Speed | 5 mm | |
| | | | | SU19 | 5 mm | |
| | | | | SU17.1 | 25 mm | |
| | | | | ML17-LL | 11 mm | |
| | | | | MHP-FR | not compatible | |
| HPF-D012 | 2 m | 2.2 mm | Black polyethylene | SU18 High Power | 294 mm |  |
| | | | | SU18 High Speed | 47 mm | |
| | | | | SU19 | 47 mm | |
| | | | | SU17.1 | 250 mm | |
| | | | | ML17-LL | 51 mm | |
| | | | | MHP-FR | 18 mm | |








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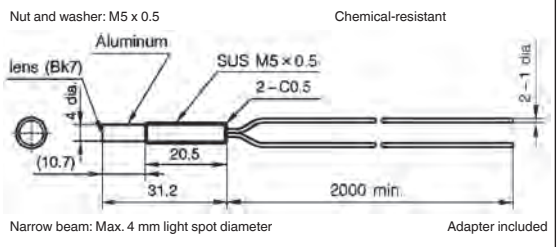
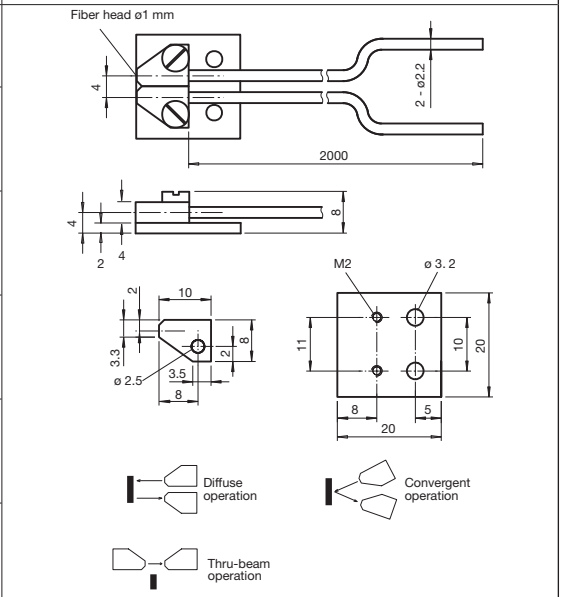
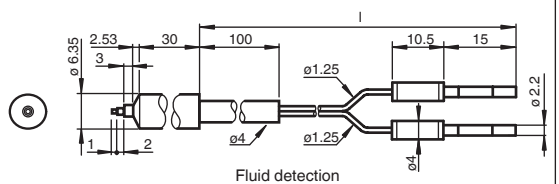
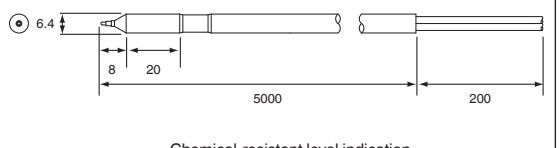
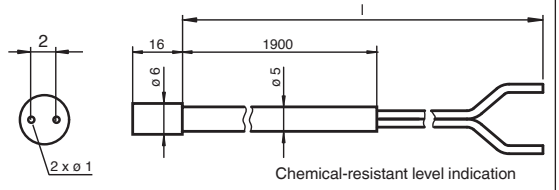
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# Plastic Fiber Optic Cables

## Diffuse Plastic Fiber Optic Cables

**for SU18, SU19, SU17.1, ML17-LL, and MHP-FR Sensors**

### Specialty Versions

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| HPF-D025 | 2 m | 1.0 mm | Black polyethylene | SU18 High Power | 29 mm |  |
| | | | | SU18 High Speed | 29 mm | |
| | | | | SU19 | 29 mm | |
| | | | | SU17.1 | 17 mm | |
| | | | | ML17-LL | 29 mm | |
| | | | | MHP-FR | not compatible | |
| KLR 00-2.2-2.0-K40 | 2 m | 2.2 mm | PVC | SU18 High Power | 274 mm |  |
| | | | | SU18 High Speed | 44 mm | |
| | | | | SU19 | 44 mm | |
| | | | | SU17.1 | 233 mm | |
| | | | | ML17-LL | 52 mm | |
| | | | | MHP-FR | 19 mm | |
| KLR-C02-1.25-2.0-K147 | 2 m | 1.25 mm | PTFE | SU18 High Power | N/A |  |
| | | | | SU18 High Speed | N/A | |
| | | | | SU19 | N/A | |
| | | | | SU17.1 | N/A | |
| | | | | ML17-LL | N/A | |
| | | | | MHP-FR | not compatible | |
| HPF-D027-L05 | 5 m | 2.2 mm | Fluorine | SU18 High Power | N/A |  |
| | | | | SU18 High Speed | N/A | |
| | | | | SU19 | N/A | |
| | | | | SU17.1 | N/A | |
| | | | | ML17-LL | N/A | |
| | | | | MHP-FR | N/A | |
| HPF-D014 | 2 m | 2.2 mm | Fluorine | SU18 High Power | 224 mm |  |
| | | | | SU18 High Speed | 36 mm | |
| | | | | SU19 | 36 mm | |
| | | | | SU17.1 | 109 mm | |
| | | | | ML17-LL | 36 mm | |
| | | | | MHP-FR | 15 mm | |



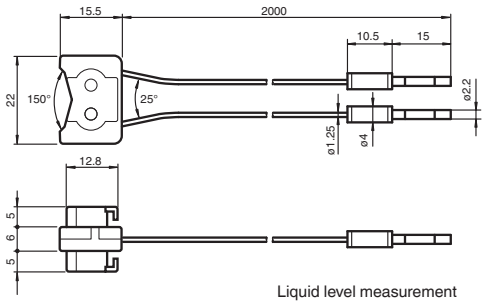
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# Plastic Fiber Optic Cables

## Diffuse Plastic Fiber Optic Cables

**for SU18, SU19, SU17.1, ML17-LL, and MHP-FR Sensors**

### Specialty Versions (cont.)

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| KLR-C02-1.25-2.0-K128 | 2 m | 1.25 mm | PVC | SU18 High Power | 26 mm |  |
| | | | | SU18 High Speed | 26 mm | |
| | | | | SU19 | 26 mm | |
| | | | | SU17.1 | 26 mm | |
| | | | | ML17-LL | 26 mm | |
| | | | | MHP-FR | not compatible | |

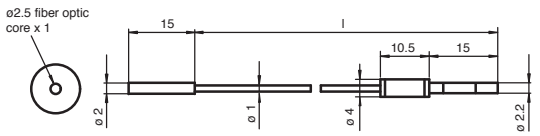
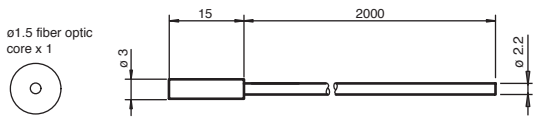

Liquid level measurement

All thru-beam mode plastic fiber optic cables are sold as pairs.

## Thru-beam Plastic Fiber Optic Cables

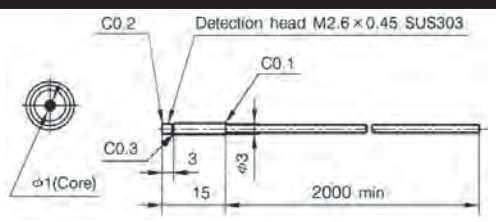
**for SU18, SU19, SU17.1, ML17-LL, and MHP-FR Sensors**

### Nonthreaded Cylindrical

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| KLE-C01-1.0-2.0-K105 | 2 m | 1 mm | PVC | SU18 High Power | 80 mm |  |
| | | | | SU18 High Speed | 20 mm | |
| | | | | SU19 | 20 mm | |
| | | | | SU17.1 | 68 mm | |
| | | | | ML17-LL | 13 mm | |
| | | | | MHP-FR | not compatible | |
| KLE-C01-2.2-2.0-K117 | 2 m | 2.2 mm | PVC | SU18 High Power | 1360 mm |  |
| | | | | SU18 High Speed | 400 mm | |
| | | | | SU19 | 400 mm | |
| | | | | SU17.1 | 1156 mm | |
| | | | | ML17-LL | 218 mm | |
| | | | | MHP-FR | 90 mm | |



### Threaded Cylindrical

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| HPF-T004-H | 2 m | 2.2 mm | Black polyethylene | SU18 High Power | 1294 mm |  |
| | | | | SU18 High Speed | 190 mm | |
| | | | | SU19 | 190 mm | |
| | | | | SU17.1 | 1100 mm | |
| | | | | ML17-LL | 263 mm | |
| | | | | MHP-FR | 90 mm | |






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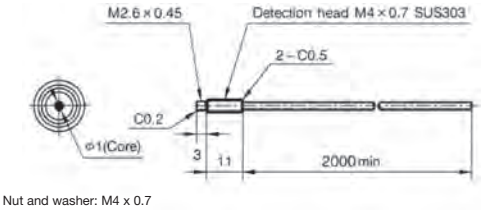
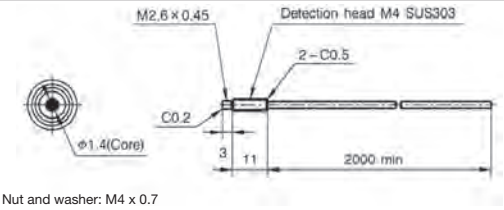
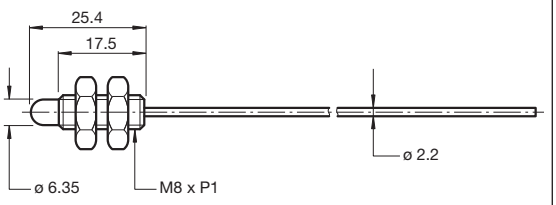
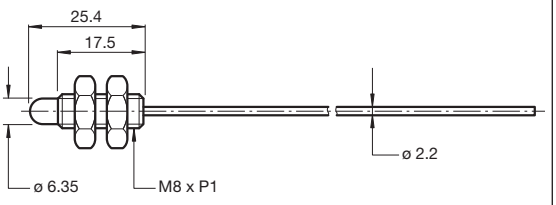
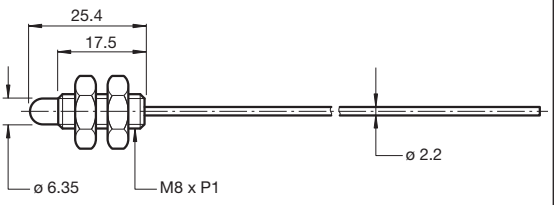
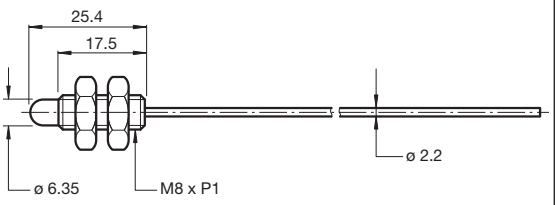
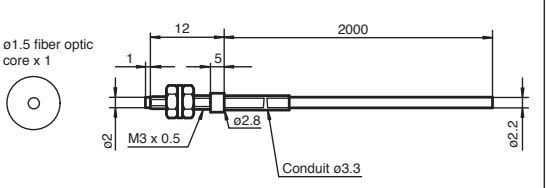
# Plastic Fiber Optic Cables

## Thru-beam Plastic Fiber Optic Cables

**for SU18, SU19, SU17.1, ML17-LL, and MHP-FR Sensors**

All thru-beam mode plastic fiber optic cables are sold as pairs.

**Threaded Cylindrical (cont.)**

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| HPF-T003 | 2 m | 2.2 mm | Black polyethylene | SU18 High Power | 1294 mm |  |
| | | | | SU18 High Speed | 213 mm | |
| | | | | SU19 | 213 mm | |
| | | | | SU17.1 | 1100 mm | |
| | | | | ML17-LL | 123 mm | |
| | | | | MHP-FR | 63 mm | |
| HPF-T001 | 2 m | 2.2 mm | Black polyethylene | SU18 High Power | 2470 mm |  |
| | | | | SU18 High Speed | 370 mm | |
| | | | | SU19 | 370 mm | |
| | | | | SU17.1 | 2100 mm | |
| | | | | ML17-LL | 363 mm | |
| | | | | MHP-FR | 170 mm | |
| FEF-PLT1 | 1 m | 2.2 mm | Black polyethylene | SU18 High Power | 25620 mm |  |
| | | | | SU18 High Speed | 2867 mm | |
| | | | | SU19 | 2867 mm | |
| | | | | SU17.1 | 10488 mm | |
| | | | | ML17-LL | 3528 mm | |
| | | | | MHP-FR | 1300 mm | |
| FEF-PLT1-L2 | 2 m | 2.2 mm | Black polyethylene | SU18 High Power | 22859 mm |  |
| | | | | SU18 High Speed | 2558 mm | |
| | | | | SU19 | 2558 mm | |
| | | | | SU17.1 | 19430 mm | |
| | | | | ML17-LL | 3148 mm | |
| | | | | MHP-FR | 1160 mm | |
| FEF-PLT1-L5 | 5 m | 2.2 mm | Black polyethylene | SU18 High Power | 15853 mm |  |
| | | | | SU18 High Speed | 1774 mm | |
| | | | | SU19 | 1774 mm | |
| | | | | SU17.1 | 13475 mm | |
| | | | | ML17-LL | 2183 mm | |
| | | | | MHP-FR | 804 mm | |
| FEF-PLT1-L10 | 10 m | 2.2 mm | Black polyethylene | SU18 High Power, | 6503 mm |  |
| | | | | SU18 High Speed, | 1049 mm | |
| | | | | SU19 | 1049 mm | |
| | | | | SU17.1 | 5530 mm | |
| | | | | ML17-LL | 1291 mm | |
| | | | | MHP-FR | 476 mm | |
| KLE-C01-2.2-2.0-K116 | 2 m | 2.2 mm | PVC | SU18 High Power | 1500 mm |  |
| | | | | SU18 High Speed | 450 mm | |
| | | | | SU19 | 450 mm | |
| | | | | SU17.1 | 1275 mm | |
| | | | | ML17-LL | 241 mm | |
| | | | | MHP-FR | 99 mm | |



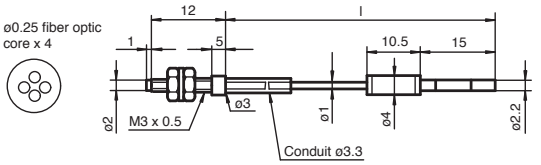
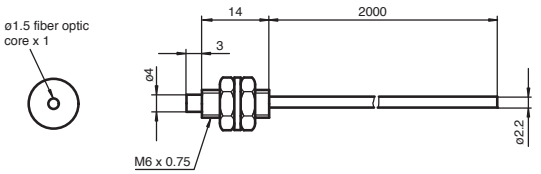
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# Plastic Fiber Optic Cables

All thru-beam mode plastic fiber optic cables are sold as pairs.

## Thru-beam Plastic Fiber Optic Cables
**for SU18, SU19, SU17.1, ML17-LL, and MHP-FR Sensors**

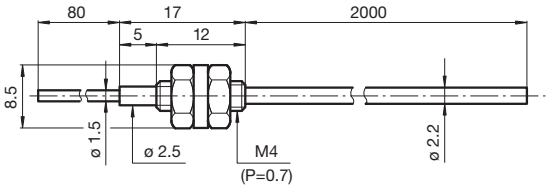
### Threaded Cylindrical (cont.)

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| KLE-C04-1.0-2.0-K104 | 2 m | 1 mm | PVC | SU18 High Power | 300 mm |  |
| | | | | SU18 High Speed | 70 mm | |
| | | | | SU19 | 70 mm | |
| | | | | SU17.1 | 255 mm | |
| | | | | ML17-LL | 48 mm | |
| | | | | MHP-FR | not compatible | |
| KLE-C01-2.2-2.0-K115 | 2 m | 2.2 mm | PVC | SU18 High Power | 1500 mm |  |
| | | | | SU18 High Speed | 450 mm | |
| | | | | SU19 | 450 mm | |
| | | | | SU17.1 | 1275 mm | |
| | | | | ML17-LL | 241 mm | |
| | | | | MHP-FR | 99 mm | |



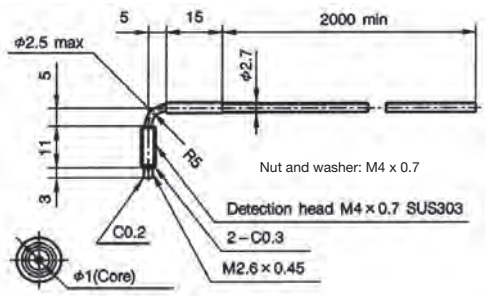
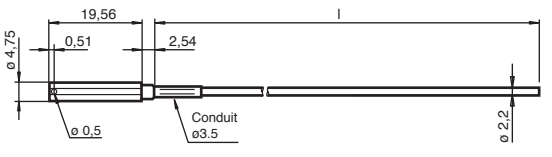


### Bendable Probe

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| KLE 00-2.2-2.0-K55 | 2 m | 2.2 mm | PVC | SU18 High Power | 872 mm |  |
| | | | | SU18 High Speed | 228 mm | |
| | | | | SU19 | 228 mm | |
| | | | | SU17.1 | 1208 mm | |
| | | | | ML17-LL | 157 mm | |
| | | | | MHP-FR | 74 mm | |



### Side-view/Periscope

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| HPF-T010 | 2 m | 2.2 mm | Black polyethylene | SU18 High Power | 964 mm |  |
| | | | | SU18 High Speed | 150 mm | |
| | | | | SU19 | 150 mm | |
| | | | | SU17.1 | 820 mm | |
| | | | | ML17-LL | 116 mm | |
| | | | | MHP-FR | 73 mm | |
| KHE-C01-2.2-2.0-K136 | 2 m | 2.2 mm | PVC | SU18 High Power | 200 mm |  |
| | | | | SU18 High Speed | 50 mm | |
| | | | | SU19 | 50 mm | |
| | | | | SU17.1 | 170 mm | |
| | | | | ML17-LL | 32 mm | |
| | | | | MHP-FR | 13 mm | |







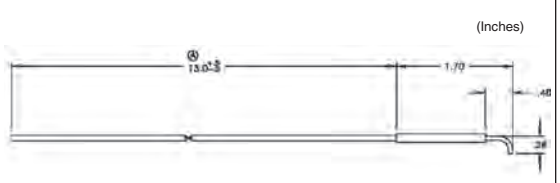
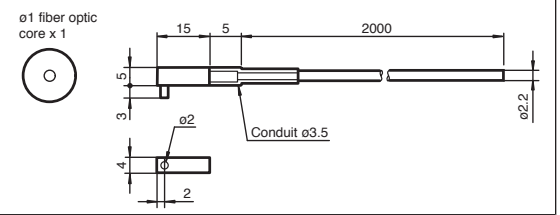
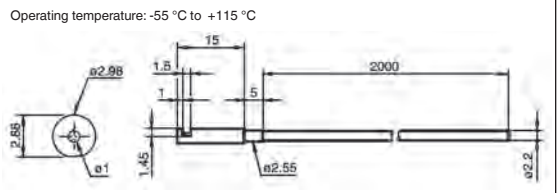
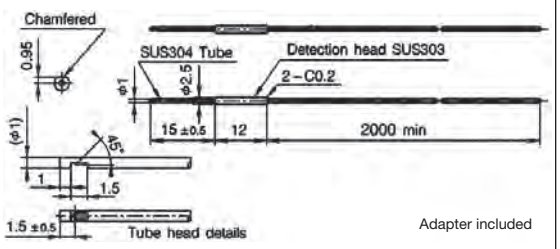

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# Plastic Fiber Optic Cables

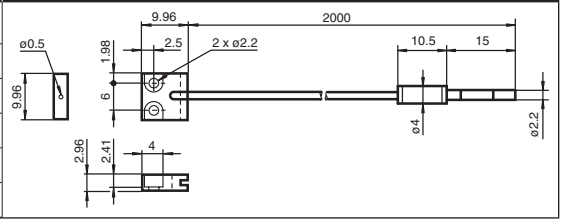
## Thru-beam Plastic Fiber Optic Cables
**for SU18, SU19, SU17.1, ML17-LL, and MHP-FR Sensors**

All thru-beam mode plastic fiber optic cables are sold as pairs.

### Side-view/Periscope (cont.)

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| HPF-T050 | 330 mm | 2.2 mm | Plastic | SU18 High Power | 953 mm |  |
| | | | | SU18 High Speed | 153 mm | |
| | | | | SU19 | 153 mm | |
| | | | | SU17.1 | 810 mm | |
| | | | | ML17-LL | 153 mm | |
| | | | | MHP-FR | not compatible | |
| KHE-C01-2.2-2.0-K140 | 2 m | 2.2 mm | PVC | SU18 High Power | 600 mm |  |
| | | | | SU18 High Speed | 150 mm | |
| | | | | SU19 | 150 mm | |
| | | | | SU17.1 | 510 mm | |
| | | | | ML17-LL | 96 mm | |
| | | | | MHP-FR | 39 mm | |
| KHTE-C01-2.2-2.0-K118 | 2 m | 2.2 mm | PVC | SU18 High Power | 475 mm |  |
| | | | | SU18 High Speed | 115 mm | |
| | | | | SU19 | 115 mm | |
| | | | | SU17.1 | 404 mm | |
| | | | | ML17-LL | 76 mm | |
| | | | | MHP-FR | 31 mm | |
| HPF-T007 | 2 m | 1.0 mm | Black polyethylene | SU18 High Power | 171 mm |  |
| | | | | SU18 High Speed | 28 mm | |
| | | | | SU19 | 28 mm | |
| | | | | SU17.1 | 145 mm | |
| | | | | ML17-LL | 41 mm | |
| | | | | MHP-FR | not compatible | |

### Rectangular

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| KHE-A01-1.0-2.0-K138 | 2 m | 1 mm | PVC | SU18 High Power | 100 mm |  |
| | | | | SU18 High Speed | 25 mm | |
| | | | | SU19 | 25 mm | |
| | | | | SU17.1 | 85 mm | |
| | | | | ML17-LL | 16 mm | |
| | | | | MHP-FR | not compatible | |



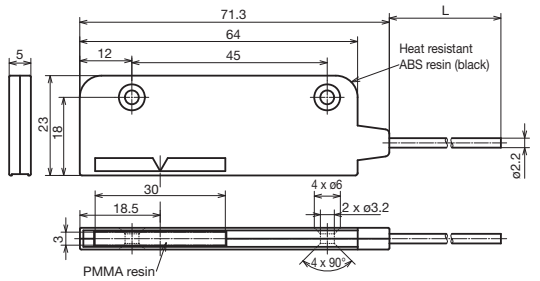
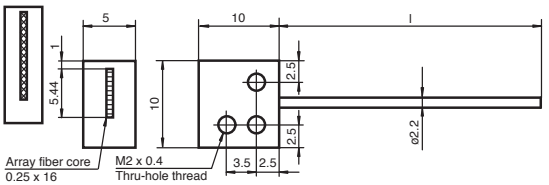
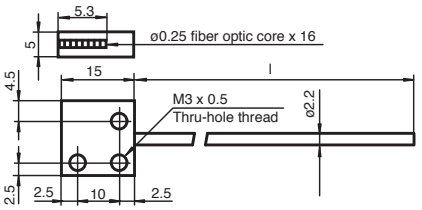
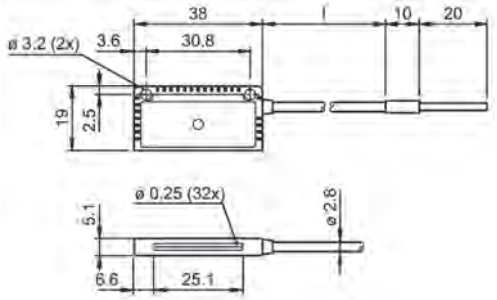
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# Plastic Fiber Optic Cables

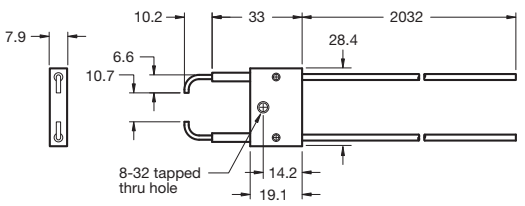
All thru-beam mode plastic fiber optic cables are sold as pairs.

## Thru-beam Plastic Fiber Optic Cables
**for SU18, SU19, SU17.1, ML17-LL, and MHP-FR Sensors**

### Array

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| HPF-T021WT | 2 m | 2.2 mm | PVC | SU18 High Power | 4235 mm |  |
| | | | | SU18 High Speed | 682 mm | |
| | | | | SU19 | 682 mm | |
| | | | | SU17.1 | 3600 mm | |
| | | | | ML17-LL | 568 mm | |
| | | | | MHP-FR | 54 mm | |
| KLE-A16-2.2-2.0-K109 | 2 m | 2.2 mm | PVC | SU18 High Power | 420 mm |  |
| | | | | SU18 High Speed | 100 mm | |
| | | | | SU19 | 100 mm | |
| | | | | SU17.1 | 357 mm | |
| | | | | ML17-LL | 67 mm | |
| | | | | MHP-FR | 28 mm | |
| KLE-A16-2.2-2.0-K110 | 2 m | 2.2 mm | PVC | SU18 High Power | 420 mm |  |
| | | | | SU18 High Speed | 100 mm | |
| | | | | SU19 | 100 mm | |
| | | | | SU17.1 | 357 mm | |
| | | | | ML17-LL | 67 mm | |
| | | | | MHP-FR | 28 mm | |
| KLE-A32-2.8-2.0-K142 | 2 m | 2.2 mm | PVC | SU18 High Power | 140 mm |  |
| | | | | SU18 High Speed | 35 mm | |
| | | | | SU19 | 35 mm | |
| | | | | SU17.1 | 119 mm | |
| | | | | ML17-LL | 22 mm | |
| | | | | MHP-FR | 9 mm | |

### Slot

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| HPF-T022-H | 2 m | 2.2 mm | Black polyethylene | SU18 High Power | 10.7 mm |  |
| | | | | SU18 High Speed | 10.7 mm | |
| | | | | SU19 | 10.7 mm | |
| | | | | SU17.1 | 10.7 mm | |
| | | | | ML17-LL | 10.7 mm | |
| | | | | MHP-FR | 10.7 mm | |



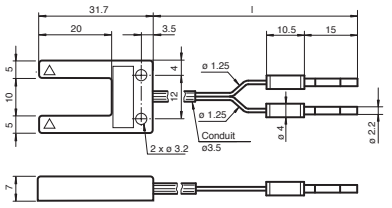
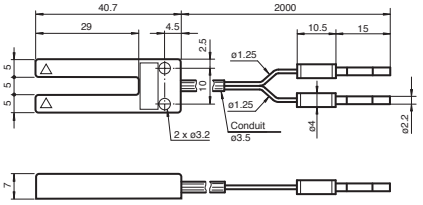

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# Plastic Fiber Optic Cables

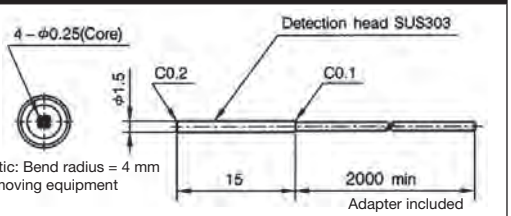
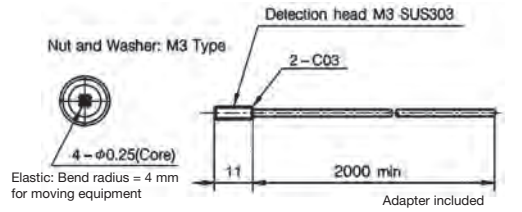
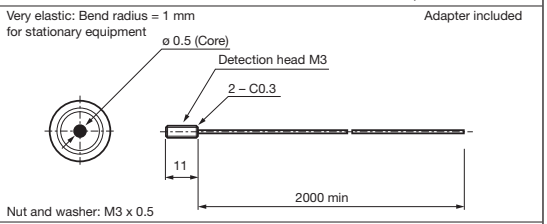
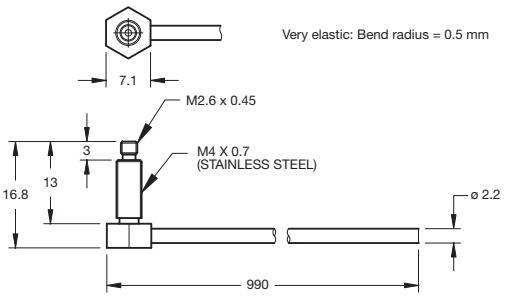
## Thru-beam Plastic Fiber Optic Cables
**for SU18, SU19, SU17.1, ML17-LL, and MHP-FR Sensors**

All thru-beam mode plastic fiber optic cables are sold as pairs.

### Slot (cont.)

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| KLE-C02-1.25-2.0-K135 | 2 m | 1.25 mm | PVC | SU18 High Power | 10 mm |  |
| | | | | SU18 High Speed | 10 mm | |
| | | | | SU19 | 10 mm | |
| | | | | SU17.1 | 10 mm | |
| | | | | ML17-LL | 10 mm | |
| | | | | MHP-FR | not compatible | |
| KLE-C02-1.25-2.0-K134 | 2 m | 1.25 mm | PVC | SU18 High Power | 5 mm |  |
| | | | | SU18 High Speed | 5 mm | |
| | | | | SU19 | 5 mm | |
| | | | | SU17.1 | 5 mm | |
| | | | | ML17-LL | 5 mm | |
| | | | | MHP-FR | not compatible | |

### High Flex Cable

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| HPF-T009 | 2 m | 1.0 mm | Black polyethylene | SU18 High Power | 194 mm |  |
| | | | | SU18 High Speed | 63 mm | |
| | | | | SU19 | 63 mm | |
| | | | | SU17.1 | 165 mm | |
| | | | | ML17-LL | 57 mm | |
| | | | | MHP-FR | not compatible | |
| HPF-T008 | 2 m | 1.0 mm | Black polyethylene | SU18 High Power | 194 mm |  |
| | | | | SU18 High Speed | 31 mm | |
| | | | | SU19 | 31 mm | |
| | | | | SU17.1 | 165 mm | |
| | | | | ML17-LL | 49 mm | |
| | | | | MHP-FR | not compatible | |
| HPF-T024 | 2 m | 1.0 mm | Black polyethylene | SU18 High Power | 165 mm |  |
| | | | | SU18 High Speed | 27 mm | |
| | | | | SU19 | 27 mm | |
| | | | | SU17.1 | 140 mm | |
| | | | | ML17-LL | 26 mm | |
| | | | | MHP-FR | not compatible | |
| HPF-T070-H | 990 mm | 2.2 mm | Black polyethylene | SU18 High Power | 957 mm |  |
| | | | | SU18 High Speed | 154 mm | |
| | | | | SU19 | 154 mm | |
| | | | | SU17.1 | 813 mm | |
| | | | | ML17-LL | 164 mm | |
| | | | | MHP-FR | 67 mm | |



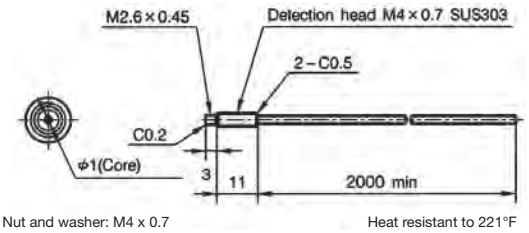
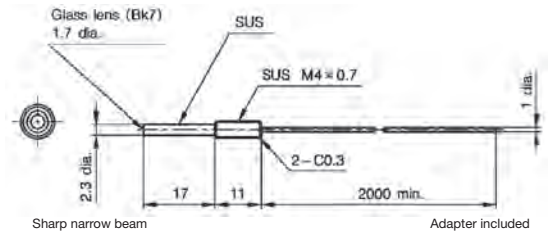
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# Plastic Fiber Optic Cables

All thru-beam mode plastic fiber optic cables are sold as pairs.

## Thru-beam Plastic Fiber Optic Cables
**for SU18, SU19, SU17.1, ML17-LL, and MHP-FR Sensors**

### Specialty Versions

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| HPF-T012 | 2 m | 2.2 mm | Black polyethylene | SU18 High Power | 788 mm |  |
| | | | | SU18 High Speed | 127 mm | |
| | | | | SU19 | 127 mm | |
| | | | | SU17.1 | 670 mm | |
| | | | | ML17-LL | 118 mm | |
| | | | | MHP-FR | 59 mm | |
| HPF-T023 | 2 m | 1.0 mm | Black polyethylene | SU18 High Power | 4205 mm |  |
| | | | | SU18 High Speed | 677 mm | |
| | | | | SU19 | 677 mm | |
| | | | | SU17.1 | 3400 mm | |
| | | | | ML17-LL | 467 mm | |
| | | | | MHP-FR | not compatible | |

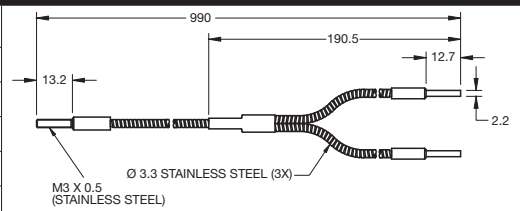
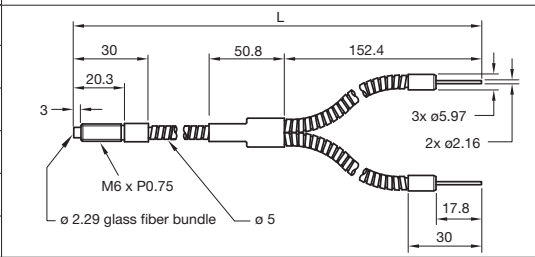




# Glass Fiber Optic Cables

## Diffuse Mode Glass Fiber Optic Cables
**SU18, SU19, SU17.1 and ML17-LL Sensors**

### Threaded Cylindrical

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| LMR 00-1.5-1.0-K154 | 990 mm | 2.2 mm | Stainless Steel | SU18 High Power | 185 mm |  |
| | | | | SU18 High Speed | 30 mm | |
| | | | | SU19 | 30 mm | |
| | | | | SU17.1 | 157 mm | |
| | | | | ML17-LL | 109 mm | |
| | | | | MHP-FR | not compatible | |
| LMR 00-2.0-1.0-K156 | 1 m | 2.29 mm | Stainless Steel | SU18 High Power | 190 mm |  |
| | | | | SU18 High Speed | 116 mm | |
| | | | | SU19 | 116 mm | |
| | | | | SU17.1 | 152 mm | |
| | | | | ML17-LL | 86 mm | |
| | | | | MHP-FR | not compatible | |






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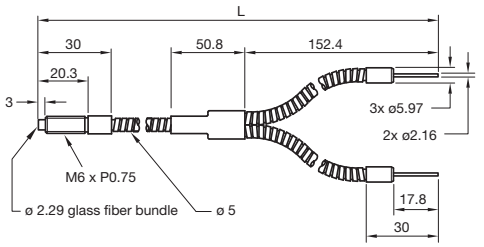
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# Glass Fiber Optic Cables

## Diffuse Mode Glass Fiber Optic Cables

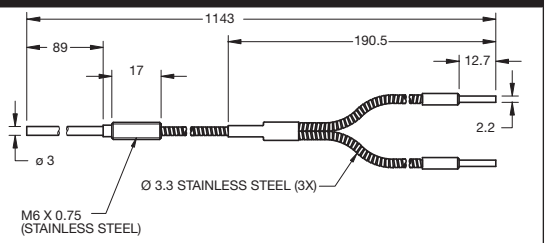
**SU18, SU19, SU17.1 and ML17-LL Sensors**

### Threaded Cylindrical (cont.)

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| LMR 00-2.0-2.0-K156 | 2 m | 2.29 mm | Stainless Steel | SU18 High Power | 190 mm |  |
| | | | | SU18 High Speed | 116 mm | |
| | | | | SU19 | 116 mm | |
| | | | | SU17.1 | 152 mm | |
| | | | | ML17-LL | 86 mm | |
| | | | | MHP-FR | not compatible | |

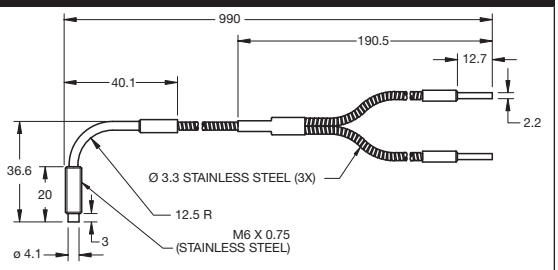
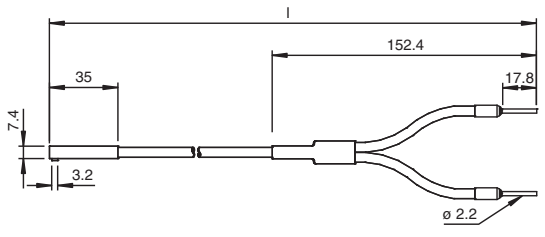


### Bendable Probe

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| LMR 00-1.5-1.1-K155 | 1143 mm | 2.2 mm | Stainless Steel | SU18 High Power | 160 mm |  |
| | | | | SU18 High Speed | 76 mm | |
| | | | | SU19 | 76 mm | |
| | | | | SU17.1 | 136 mm | |
| | | | | ML17-LL | 85 mm | |
| | | | | MHP-FR | not compatible | |



### Side-view / Periscope

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| LMR 00-1.5-1.0-K157 | 990 mm | 2.2 mm | Stainless Steel | SU18 High Power | 160 mm |  |
| | | | | SU18 High Speed | 76 mm | |
| | | | | SU19 | 76 mm | |
| | | | | SU17.1 | 136 mm | |
| | | | | ML17-LL | 85 mm | |
| | | | | MHP-FR | not compatible | |
| LCR 00-2.0-0.9-K158 | 914 mm | 2 mm | PVC | SU18 High Power | 190 mm |  |
| | | | | SU18 High Speed | 116 mm | |
| | | | | SU19 | 116 mm | |
| | | | | SU17.1 | 152 mm | |
| | | | | ML17-LL | 86 mm | |
| | | | | MHP-FR | not compatible | |





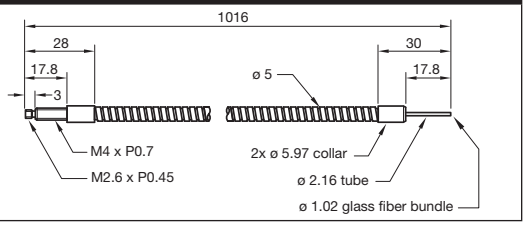
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# Glass Fiber Optic Cables

Sold individually. To complete a thru-beam pair, two units are required.

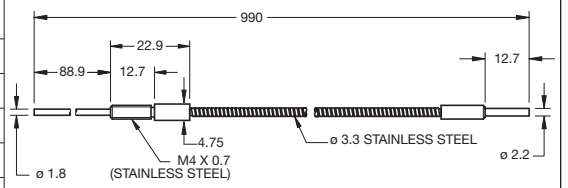
## Thru-Beam Mode Glass Fiber Optic Cables
## for SU18, SU19, SU17.1 and ML17-LL Sensors

### Threaded Cylindrical

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| LME 00-1.0-1.0-K151 | 1 m | 1.02 mm | Stainless Steel | SU18 High Power | 892 mm |  |
| | | | | SU18 High Speed | 144 mm | |
| | | | | SU19 | 144 mm | |
| | | | | SU17.1 | 616 mm | |
| | | | | ML17-LL | 197 mm | |
| | | | | MHP-FR | not compatible | |

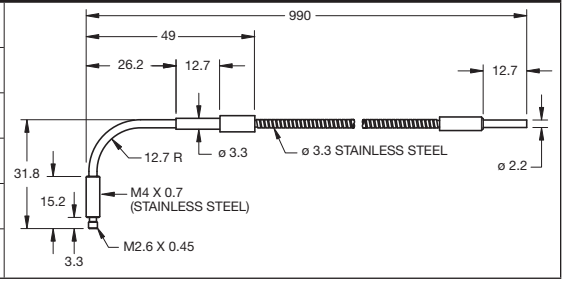


### Bendable Probe

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| LME 00-1.2-1.0-K150 | 990 mm | 2.2 mm | Stainless Steel | SU18 High Power | 892 mm |  |
| | | | | SU18 High Speed | 144 mm | |
| | | | | SU19 | 144 mm | |
| | | | | SU17.1 | 616 mm | |
| | | | | ML17-LL | 197 mm | |
| | | | | MHP-FR | not compatible | |

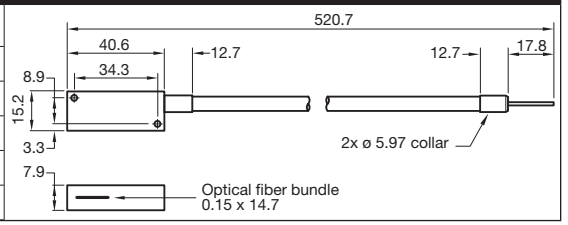


### Side-view /Periscope

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| LME 00-1.2-1.0-K153 | 990 mm | 2.2 mm | Stainless Steel | SU18 High Power | 892 mm |  |
| | | | | SU18 High Speed | 144 mm | |
| | | | | SU19 | 144 mm | |
| | | | | SU17.1 | 616 mm | |
| | | | | ML17-LL | 197 mm | |
| | | | | MHP-FR | not compatible | |



### Array

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| LCE 00-1.6-0.5-K152 | 520.7 mm | 2.2 mm | PVC | SU18 High Power | 2681 mm |  |
| | | | | SU18 High Speed | 432 mm | |
| | | | | SU19 | 432 mm | |
| | | | | SU17.1 | 761 mm | |
| | | | | ML17-LL | 246 mm | |
| | | | | MHP-FR | not compatible | |





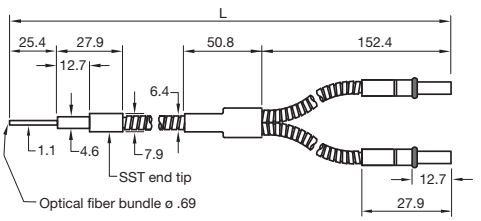
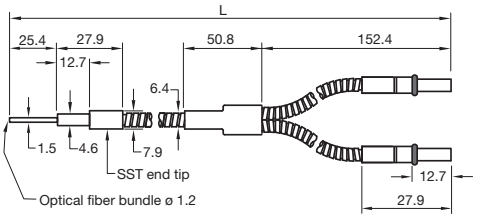
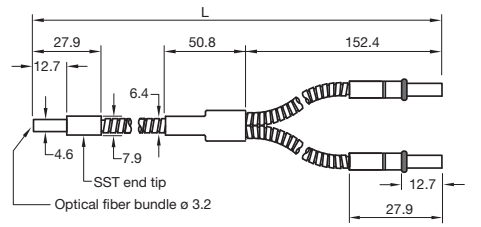
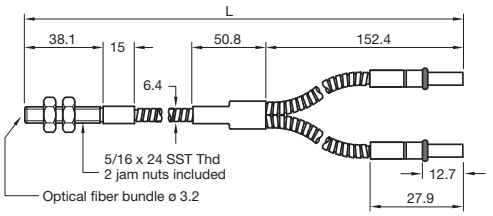
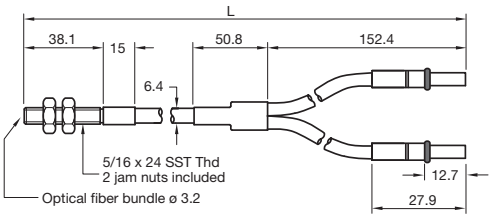

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# Glass Fiber Optic Cables

## Diffuse Mode Glass Fiber Optic Cables
**for RL(K)61-LL, MPG and MHP-F Sensors**

### Cylindrical Sensing Head

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| FE-BHS1S-3* | 3 ft | 0.69 mm | Stainless Steel | MHP-F Visible Red | 5 mm |  |
| | | | | MHP-F Infrared | 11 mm | |
| FE-BHS1S-5 | 5 ft | | | RL(K)61-LL | 20 mm | |
| | | | | MPG Infrared | 23 mm | |
| FE-BHS3S-3* | 3 ft | 1.2 mm | Stainless Steel | MHP-F Visible Red | 10 mm |  |
| | | | | MHP-F Infrared | 30 mm | |
| FE-BHS3S-5 | 5 ft | | | RL(K)61-LL | 46 mm | |
| | | | | MPG Infrared | 51 mm | |
| FE-BFS6S-3* | 3 ft | 3.2 mm | Stainless Steel | MHP-F Visible Red | 48 mm |  |
| | | | | MHP-F Infrared | 95 mm | |
| FE-BFS6S-5 | 5 ft | | | RL(K)61-LL | 170 mm | |
| | | | | MPG Infrared | 190 mm | |
| FE-BTS6S-3* | 3 ft | 3.2 mm | Stainless Steel | MHP-F Visible Red | 45 mm |  |
| FE-BTS6S-3HT† | | | | MHP-F Infrared | 90 mm | |
| FE-BTS6S-5 | 5 ft | | | RL(K)61-LL | 160 mm | |
| FE-BTS6S-5HT† | | | | MPG Infrared | 180 mm | |
| FE-BTS6M-3* | 3 ft | 3.2 mm | PVC | MHP-F Visible Red | 45 mm |  |
| | | | | MHP-F Infrared | 90 mm | |
| FE-BTS6M-5 | 5 ft | | | RL(K)61-LL | 160 mm | |
| | | | | MPG Infrared | 180 mm | |











* Sensing ranges based on this model.
† High-temperature model.



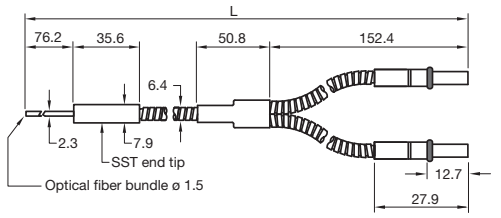
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# Glass Fiber Optic Cables

## Diffuse Mode Glass Fiber Optic Cables
**for RL(K)61-LL, MPG and MHP-F Sensors**

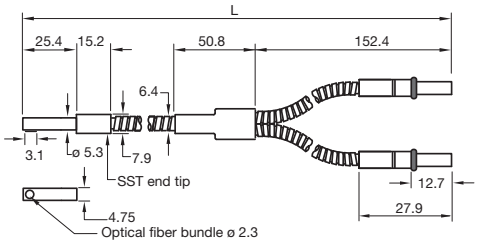
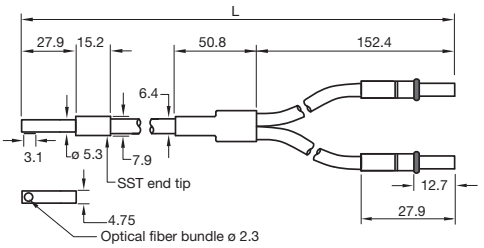


### Bendable Sensing Tip

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| FE-BPS4S-3* | 3 ft | 1.5 mm | Stainless Steel | MHP-F Visible Red | 12 mm |  |
| | | | | MHP-F Infrared | 39 mm | |
| FE-BPS4S-5 | 5 ft | | | RL(K)61-LL | 69 mm | |
| | | | | MPG Infrared | 77 mm | |



### Side View/Periscope Sensing Head

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| FE-BNSRA5S-3* | 3 ft | 2.3 mm | Stainless Steel | MHP-F Visible Red | 32 mm |  |
| | | | | MHP-F Infrared | 62 mm | |
| FE-BNSRA5S-5 | 5 ft | | | RL(K)61-LL | 155 mm | |
| | | | | MPG Infrared | 170 mm | |
| FE-BNSRA5M-3 | 3 ft | 2.3 mm | PVC | MHP-F Visible Red | 32 mm |  |
| | | | | MHP-F Infrared | 62 mm | |
| | | | | RL(K)61-LL | 155 mm | |
| | | | | MPG Infrared | 170 mm | |





* Sensing ranges based on this model.

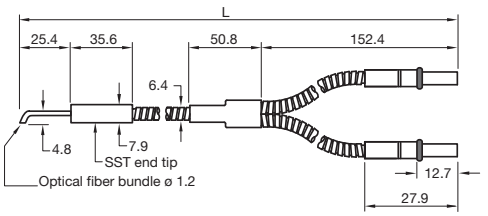
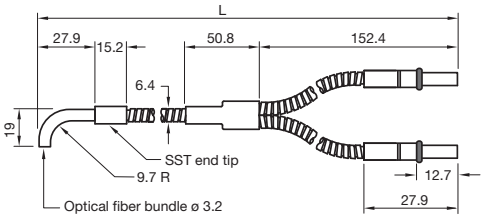
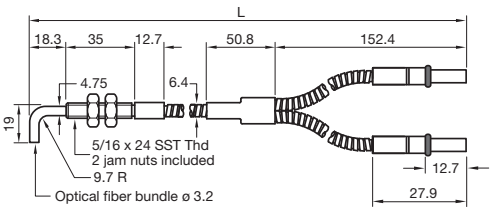
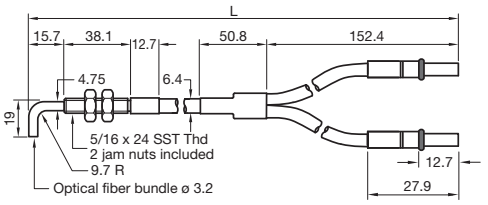
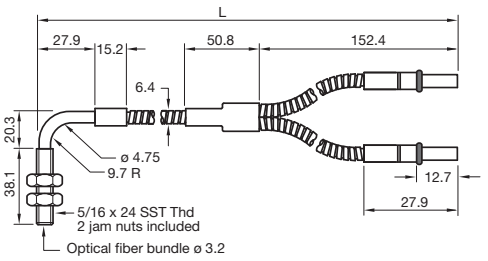

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# Glass Fiber Optic Cables

## Diffuse Mode Glass Fiber Optic Cables
**for RL(K)61-LL, MPG and MHP-F Sensors**

### Right Angle Sensing Head

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| FE-BHSRA3S-3* | 3 ft | 1.2 mm | Stainless Steel | MHP-F Visible Red | 6 mm |  |
| | | | | MHP-F Infrared | 12 mm | |
| FE-BHSRA3S-5 | 5 ft | | | RL(K)61-LL | 27 mm | |
| | | | | MPG Infrared | 30 mm | |
| FE-BAS6S-3* | 3 ft | 3.2 mm | Stainless Steel | MHP-F Visible Red | 45 mm |  |
| | | | | MHP-F Infrared | 97 mm | |
| FE-BAS6S-5 | 5 ft | | | RL(K)61-LL | 160 mm | |
| | | | | MPG Infrared | 180 mm | |
| FE-BTSAS6S-3* | 3 ft | 3.2 mm | Stainless Steel | MHP-F Visible Red | 36 mm |  |
| | | | | MHP-F Infrared | 80 mm | |
| FE-BTSAS6S-5 | 5 ft | | | RL(K)61-LL | 155 mm | |
| | | | | MPG Infrared | 170 mm | |
| FE-BTSAS6M-3* | 3 ft | 3.2 mm | PVC | MHP-F Visible Red | 36 mm |  |
| | | | | MHP-F Infrared | 80 mm | |
| FE-BTSAS6M-5 | 5 ft | | | RL(K)61-LL | 155 mm | |
| | | | | MPG Infrared | 170 mm | |
| FE-BASTS6S-3* | 3 ft | 3.2 mm | Stainless Steel | MHP-F Visible Red | 52 mm |  |
| | | | | MHP-F Infrared | 100 mm | |
| FE-BASTS6S-5 | 5 ft | | | RL(K)61-LL | 170 mm | |
| | | | | MPG Infrared | 190 mm | |











* Sensing ranges based on this model.



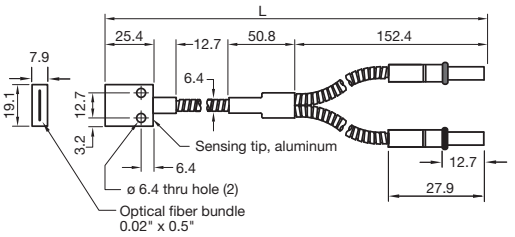
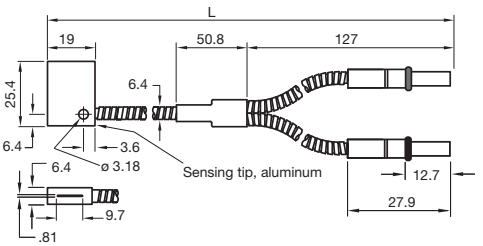
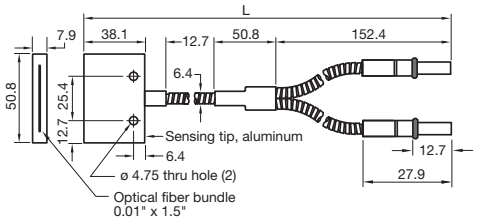
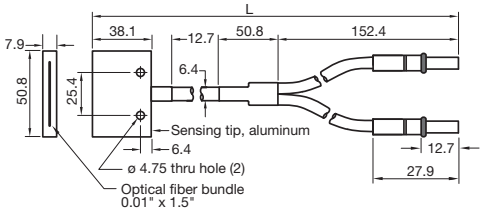
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# Glass Fiber Optic Cables

## Diffuse Mode Glass Fiber Optic Cables
**for RL(K)61-LL, MPG and MHP-F Sensors**



### Array Sensing Head

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| FE-BRL6S-3* | 3 ft | 0.02" x 0.5" | Stainless Steel | MHP-F Visible Red | 42 mm |  |
| | | | | MHP-F Infrared | 92 mm | |
| FE-BRL6S-5 | 5 ft | | | RL(K)61-LL | 190 mm | |
| | | | | MPG Infrared | 212 mm | |
| FE-BRL6S-3RA* | 3 ft | 0.81 mm x 9.7 mm | Stainless Steel | MHP-F Visible Red | 40 mm |  |
| | | | | MHP-F Infrared | 86 mm | |
| FE-BRL6S-5RA | 5 ft | | | RL(K)61-LL | 190 mm | |
| | | | | MPG Infrared | 210 mm | |
| FE-BRL7S-3* | 3 ft | 0.01" x 1.5" | Stainless Steel | MHP-F Visible Red | 46 mm |  |
| | | | | MHP-F Infrared | 104 mm | |
| FE-BRL7S-5 | 5 ft | | | RL(K)61-LL | 205 mm | |
| | | | | MPG Infrared | 230 mm | |
| FE-BRL7M-3 | 3 ft | 0.01" x 1.5" | PVC | MHP-F Visible Red | 46 mm |  |
| | | | | MHP-F Infrared | 104 mm | |
| | | | | RL(K)61-LL | 205 mm | |
| | | | | MPG Infrared | 230 mm | |

* Sensing ranges based on this model.



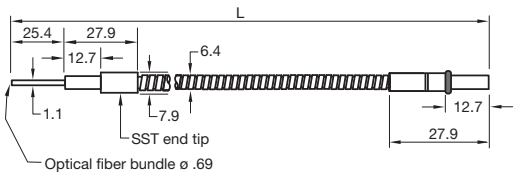
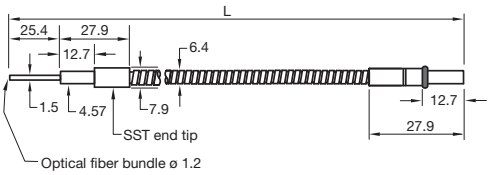
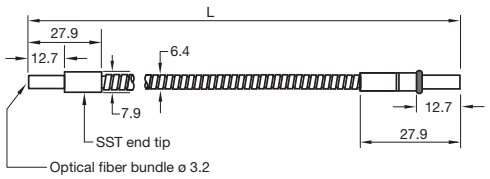
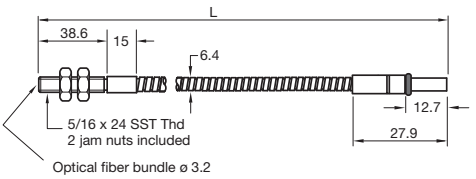
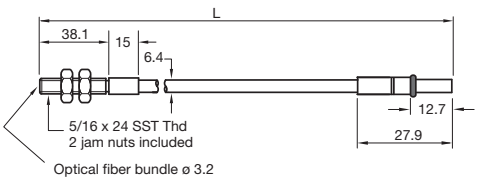
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# Glass Fiber Optic Cables

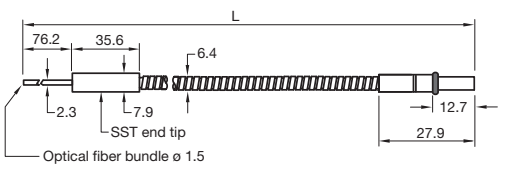
## Thru-Beam Mode Glass Fiber Optic Cables
**for RL(K)61-LL, MPG and MHP-F Sensors**

Sold individually. To complete a thru-beam pair, two units are required.

### Cylindrical Sensing Head

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| FE-IHS1S-3* | 3 ft | 0.69 mm | Stainless Steel | MHP-F Visible Red | 90 mm |  |
| | | | | MHP-F Infrared | 210 mm | |
| FE-IHS1S-5 | 5 ft | | | RL(K)61-LL | 460 mm | |
| | | | | MPG Infrared | 510 mm | |
| FE-IHS3S-3* | 3 ft | 1.2 mm | Stainless Steel | MHP-F Visible Red | 95 mm |  |
| | | | | MHP-F Infrared | 220 mm | |
| FE-IHS3S-5 | 5 ft | | | RL(K)61-LL | 470 mm | |
| | | | | MPG Infrared | 520 mm | |
| FE-IFS6S-3* | 3 ft | 3.2 mm | Stainless Steel | MHP-F Visible Red | 320 mm |  |
| | | | | MHP-F Infrared | 770 mm | |
| FE-IFS6S-5 | 5 ft | | | RL(K)61-LL | 470 mm | |
| | | | | MPG Infrared | 1300 mm | |
| FE-ITS6S-3* | 3 ft | 3.2 mm | Stainless Steel | MHP-F Visible Red | 300 mm |  |
| FE-ITS6S-3HT† | | | | MHP-F Infrared | 825 mm | |
| FE-ITS6S-5 | 5 ft | | | RL(K)61-LL | 1305 mm | |
| FE-ITS6S-5HT† | | | | MPG Infrared | 1450 mm | |
| FE-ITS6M-3* | 3 ft | 3.2 mm | PVC | MHP-F Visible Red | 300 mm |  |
| | | | | MHP-F Infrared | 825 mm | |
| FE-ITS6M-5 | 5 ft | | | RL(K)61-LL | 1305 mm | |
| | | | | MPG Infrared | 1450 mm | |

### Bendable Sensing Tip

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| FE-IPS4S-3* | 3 ft | 1.5 mm | Stainless Steel | MHP-F Visible Red | 190 mm |  |
| | | | | MHP-F Infrared | 560 mm | |
| FE-IPS4S-5 | 5 ft | | | RL(K)61-LL | 900 mm | |
| | | | | MPG Infrared | 1000 mm | |

* Sensing ranges based on this model.
† High temperature model.



Refer to General Notes Relating to Product Information
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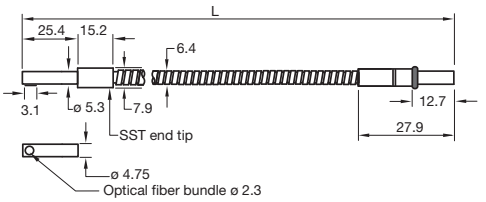
## Glass Fiber Optic Cables

Sold individually. To complete a thru-beam pair, two units are required.

### Thru-Beam Mode Glass Fiber Optic Cables
**for RL(K)61-LL, MPG and MHP-F Sensors**

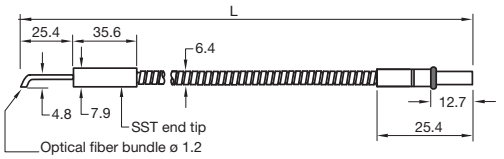
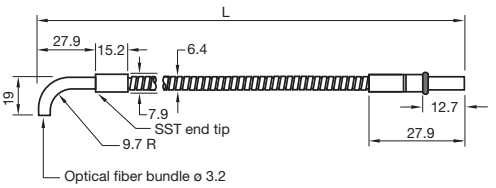
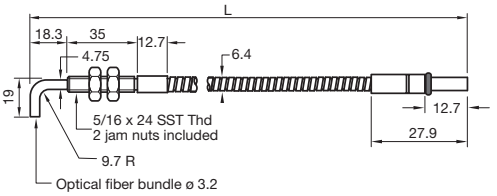
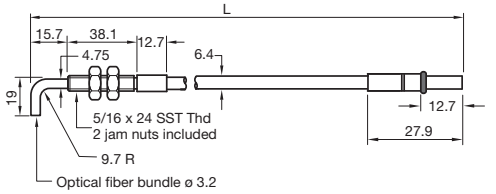
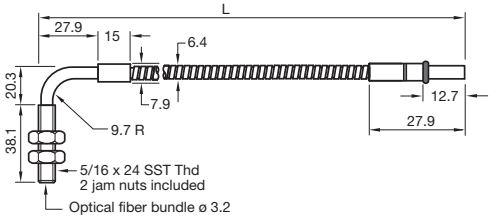


#### Side View/Periscope Sensing Head

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| FE-INSRA5S-3* | 3 ft | 2.3 mm | Stainless Steel | MHP-F Visible Red | 180 mm |  |
| | | | | MHP-F Infrared | 400 mm | |
| FE-INSRA5S-5 | 5 ft | | | RL(K)61-LL | 730 mm | |
| | | | | MPG Infrared | 810 mm | |



#### Right Angle Sensing Head

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| FE-IHSRA3S-3* | 3 ft | 1.2 mm | Stainless Steel | MHP-F Visible Red | 90 mm |  |
| | | | | MHP-F Infrared | 190 mm | |
| FE-IHSRA3S-5 | 5 ft | | | RL(K)61-LL | 485 mm | |
| | | | | MPG Infrared | 540 mm | |
| FE-IAS6S-3* | 3 ft | 3.2 mm | Stainless Steel | MHP-F Visible Red | 340 mm |  |
| | | | | MHP-F Infrared | 950 mm | |
| FE-IAS6S-5 | 5 ft | | | RL(K)61-LL | 1305 mm | |
| | | | | MPG Infrared | 1450 mm | |
| FE-ITSAS6S-3* | 3 ft | 3.2 mm | Stainless Steel | MHP-F Visible Red | 260 mm |  |
| | | | | MHP-F Infrared | 660 mm | |
| FE-ITSAS6S-5 | 5 ft | | | RL(K)61-LL | 1150 mm | |
| | | | | MPG Infrared | 1280 mm | |
| FE-ITSAS6M-3* | 3 ft | 3.2 mm | PVC | MHP-F Visible Red | 260 mm |  |
| | | | | MHP-F Infrared | 660 mm | |
| FE-ITSAS6M-5 | 5 ft | | | RL(K)61-LL | 1150 mm | |
| | | | | MPG Infrared | 1280 mm | |
| FE-IASTS6S-3* | 3 ft | 3.2 mm | Stainless Steel | MHP-F Visible Red | 300 mm |  |
| | | | | MHP-F Infrared | 800 mm | |
| FE-IASTS6S-5 | 5 ft | | | RL(K)61-LL | 1170 mm | |
| | | | | MPG Infrared | 1300 mm | |











* Sensing ranges based on this model.


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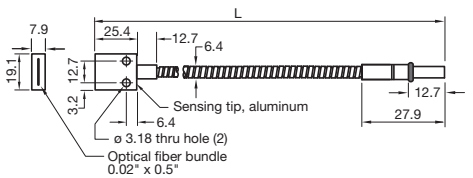
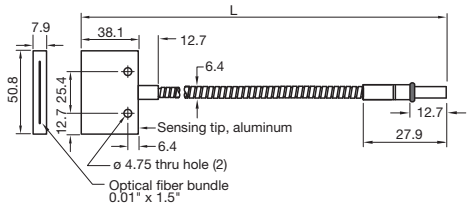
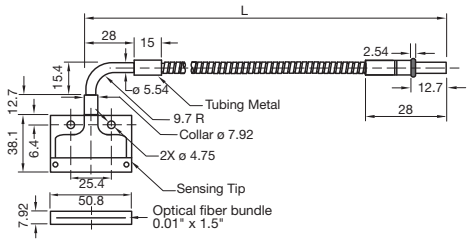
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# Glass Fiber Optic Cables

## Thru-Beam Mode Glass Fiber Optic Cables
**for RL(K)61-LL, MPG and MHP-F Sensors**

Sold individually. To complete a thru-beam pair, two units are required.

### Array Sensing Head

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| FE-IRL6S-3* | 3 ft | 0.02" x 0.5" | Stainless Steel | MHP-F Visible Red | 280 mm |  |
| | | | | MHP-F Infrared | 700 mm | |
| FE-IRL6S-5 | 5 ft | | | RL(K)61-LL | 1080 mm | |
| | | | | MPG Infrared | 1200 mm | |
| FE-IRL7S-3* | 3 ft | 0.01" x 1.5" | Stainless Steel | MHP-F Visible Red | 310 mm |  |
| | | | | MHP-F Infrared | 750 mm | |
| FE-IRL7S-5 | 5 ft | | | RL(K)61-LL | 1125 mm | |
| | | | | MPG Infrared | 1250 mm | |
| FE-IRL7S-3R | 3 ft | 0.01" x 1.5" | Stainless Steel | MHP-F Visible Red | 300 mm |  |
| | | | | MHP-F Infrared | 740 mm | |
| | | | | RL(K)61-LL | 1080 mm | |
| | | | | MPG Infrared | 1200 mm | |



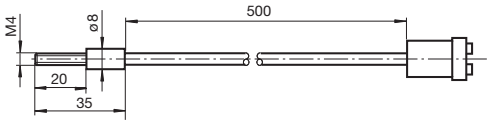
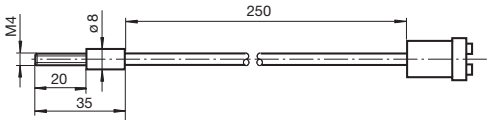
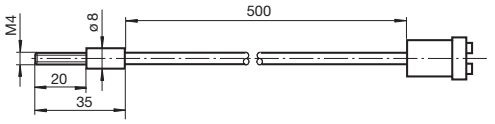
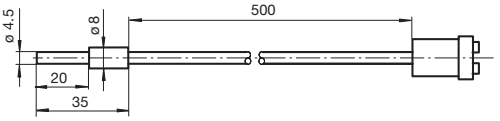
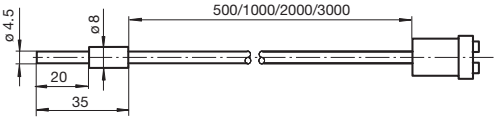
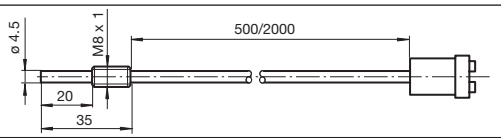
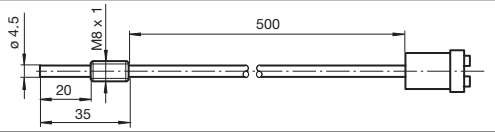
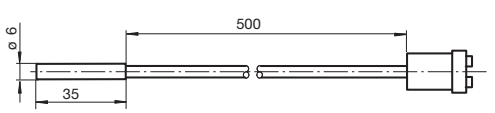
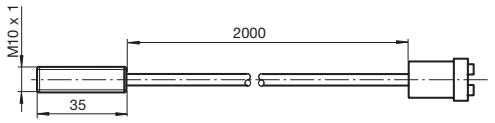
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## Glass Fiber Optic Cables

### Diffuse Mode Glass Fiber Optic Cables
**for OCT300-M1K and VL18LL Sensors**



**Cylindrical Sensing Head (cont.)**

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| LMR 18-1.1-0.5-K3 | 0.5 m | 1.1 mm | Stainless Steel | OJ500-M1K | 24 mm |  |
| | | | | OCT500-M1A | 24 mm | |
| | | | | OCT300-M1K | 9 mm | |
| | | | | VL18LL | 5 mm | |
| LMR 18-2.3-0.25-K3 | 0.25 m | 2.3 mm | Stainless Steel | OJ500-M1K | 85 mm |  |
| | | | | OCT500-M1A | 85 mm | |
| | | | | OCT300-M1K | 37 mm | |
| | | | | VL18LL | 25 mm | |
| LMR 18-2.3-0.5-K3 | 0.5 m | 2.3 mm | Stainless Steel | OJ500-M1K | 85 mm |  |
| | | | | OCT500-M1A | 85 mm | |
| | | | | OCT300-M1K | 37 mm | |
| | | | | VL18LL | 25 mm | |
| LCR 18-3.2-0.5-K1 | 0.5 m | 3.2 mm | PVC | OJ500-M1K | 300 mm |  |
| | | | | OCT500-M1A | 300 mm | |
| | | | | OCT300-M1K | 85 mm | |
| | | | | VL18LL | variable | |
| LMR 18-3.2-0.5-K1 | 0.5 m | 3.2 mm | Stainless Steel | OJ500-M1K | 153 mm |  |
| LMR 18-3.2-1.0-K1* | 1 m | | | OCT500-M1A | 153 mm | |
| LMR 18-3.2-2.0-K1 | 2 m | | | OCT300-M1K | 62 mm | |
| LMR 18-3.2-3.0-K1 | 3 m | | | VL18LL | 43 mm | |
| LCR 18-3.2-0.5-K2* | 0.5 m | 3.2 mm | PVC | OJ500-M1K | 185 mm |  |
| | | | | OCT500-M1A | 185 mm | |
| LCR 18-3.2-2.0-K2 | 2 m | | | OCT300-M1K | 74 mm | |
| | | | | VL18LL | 44 mm | |
| LMR 18-2.3-0.5-K2 | 0.5 m | 2.3 mm | Stainless Steel | OJ500-M1K | 80 mm |  |
| | | | | OCT500-M1A | 80 mm | |
| | | | | OCT300-M1K | 30 mm | |
| | | | | VL18LL | 23 mm | |
| LMR 18-2.3-0.5-K7 | 0.5 m | 2.3 mm | Stainless Steel | OJ500-M1K | 80 mm |  |
| | | | | OCT500-M1A | 80 mm | |
| | | | | OCT300-M1K | 30 mm | |
| | | | | VL18LL | 23 mm | |
| LMR 18-3.2-2.0-K4 | 2 m | 3.2 mm | Stainless Steel | OJ500-M1K | 173 mm |  |
| | | | | OCT500-M1A | 173 mm | |
| | | | | OCT300-M1K | 65 mm | |
| | | | | VL18LL | 40 mm | |

* Sensing ranges based on this model.

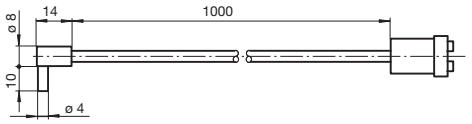
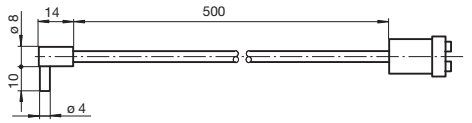
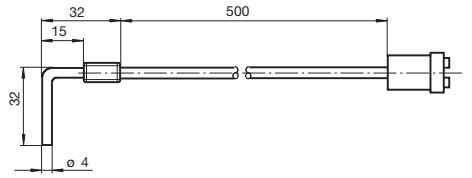

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# Glass Fiber Optic Cables

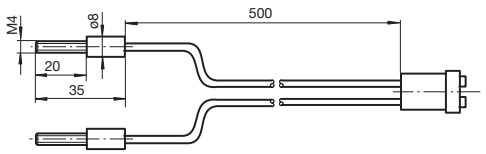
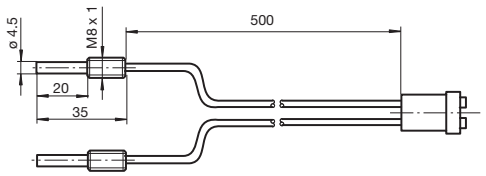
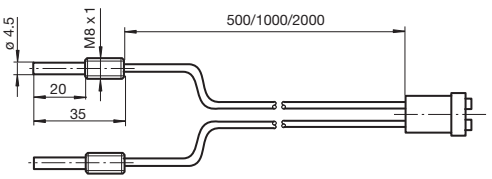
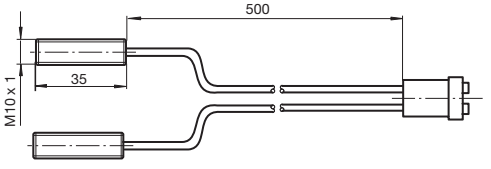
## Diffuse Mode Glass Fiber Optic Cables
**for OCT300-M1K and VL18LL Sensors**

### Right Angle Sensing Head

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| LCR 18-2.7-1.0-K9 | 1 m | 2.7 mm | PVC | OJ500-M1K | 95 mm |  |
| | | | | OCT500-M1A | 95 mm | |
| | | | | OCT300-M1K | 38 mm | |
| | | | | VL18LL | 25 mm | |
| LMR 18-2.7-0.5-K9 | 0.5 m | 2.7 mm | Stainless Steel | OJ500-M1K | 95 mm |  |
| | | | | OCT500-M1A | 95 mm | |
| | | | | OCT300-M1K | 38 mm | |
| | | | | VL18LL | 25 mm | |
| LSR 18-2.3-0.5-K12 | 0.5 m | 2.3 mm | Silicone | OJ500-M1K | 75 mm |  |
| | | | | OCT500-M1A | 75 mm | |
| | | | | OCT300-M1K | 30 mm | |
| | | | | VL18LL | 21 mm | |

## Thru-Beam Mode Glass Fiber Optic Cables
**for OCT300-M1K and VL18LL Sensors**

### Cylindrical Sensing Head

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| LME 18-2.3-0.5-K3 | 0.5 m | 2.3 mm | Stainless Steel | OJ500-M1K | 1300 mm |  |
| | | | | OCT500-M1A | 1300 mm | |
| | | | | OCT300-M1K | 410 mm | |
| | | | | VL18LL | 360 mm | |
| LCE 18-2.3-0.5-K2 | 0.5 m | 2.3 mm | PVC | OJ500-M1K | 1300 mm |  |
| | | | | OCT500-M1A | 1300 mm | |
| | | | | OCT300-M1K | 410 mm | |
| | | | | VL18LL | 360 mm | |
| LME 18-2.3-0.5-K2 | 0.5 m | 2.3 mm | Stainless Steel | OJ500-M1K | 1300 mm |  |
| LME 18-2.3-1.0-K2* | 1 m | | | OCT500-M1A | 1300 mm | |
| | | | | OCT300-M1K | 410 mm | |
| LME 18-2.3-2.0-K2 | 2 m | | | VL18LL | 360 mm | |
| LME 18-2.3-0.5-K4 | 0.5 m | 2.3 mm | Stainless Steel | OJ500-M1K | 1300 mm |  |
| | | | | OCT500-M1A | 1300 mm | |
| | | | | OCT300-M1K | 410 mm | |
| | | | | VL18LL | not compatible | |

* Sensing ranges based on this model.



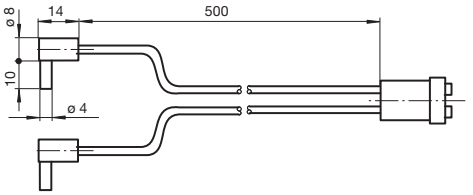
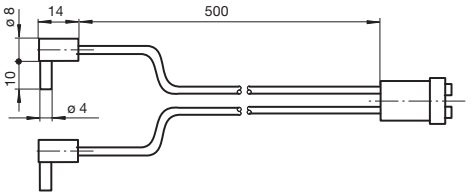
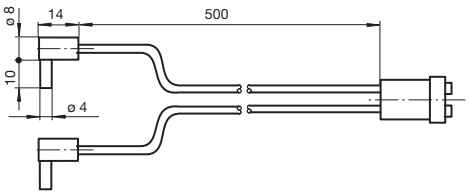
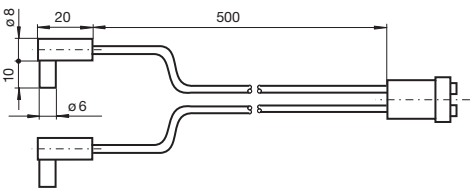
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## Glass Fiber Optic Cables

### Thru-Beam Mode Glass Fiber Optic Cables
**for OCT300-M1K and VL18LL Sensors**



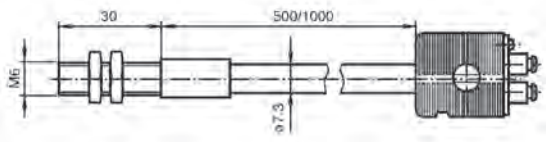
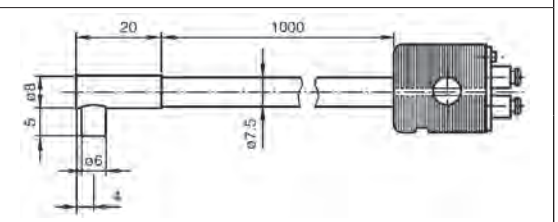
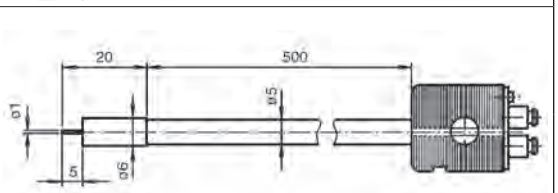
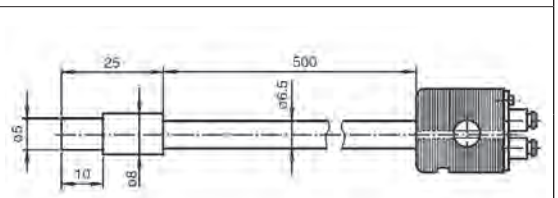
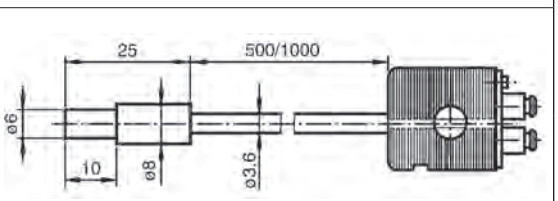
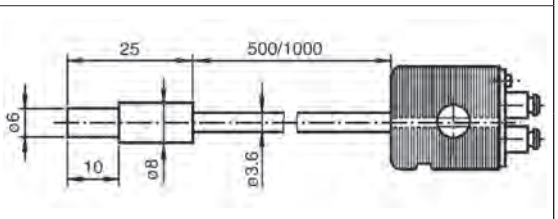
**Right Angle Sensing Head**

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| LCE 18-2.3-0.5-K9 | 0.5 m | 2.3 mm | PVC | OJ500-M1K | 830 mm |  |
| | | | | OCT500-M1A | 830 mm | |
| | | | | OCT300-M1K | 240 mm | |
| | | | | VL18LL | 240 mm | |
| LSE 18-1.1-0.5-K9 | 0.5 m | 1.1 mm | Silicone | OJ500-M1K | 275 mm |  |
| | | | | OCT500-M1A | 275 mm | |
| | | | | OCT300-M1K | 97 mm | |
| | | | | VL18LL | 89 mm | |
| LME 18-1.9-0.5-K9 | 0.5 m | 1.9 mm | Stainless Steel | OJ500-M1K | 1050 mm |  |
| | | | | OCT500-M1A | 1050 mm | |
| | | | | OCT300-M1K | 310 mm | |
| | | | | VL18LL | 270 mm | |
| LME 18-2.3-0.5-K10 | 0.5 m | 2.3 mm | Stainless Steel | OJ500-M1K | 830 mm |  |
| | | | | OCT500-M1A | 830 mm | |
| | | | | OCT300-M1K | 308 mm | |
| | | | | VL18LL | not compatible | |


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## Glass Fiber Optic Cables

### Diffuse Mode Glass Fiber Optic Cables
**for MLV41-LL-IR and MLV41-LL-RT Sensors**

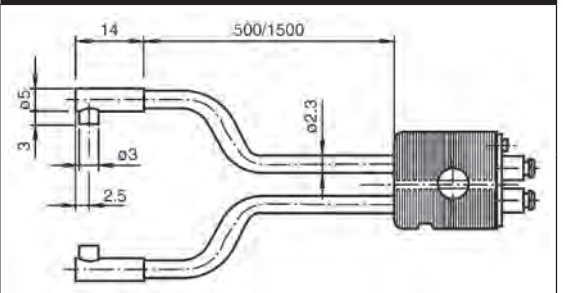
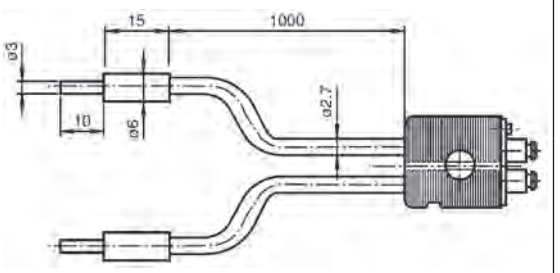
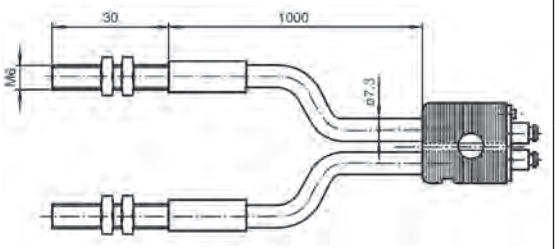
| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| LLR 04-1.6-0.5-G | 0.5 m | 1.6 mm | Metal-Silicone | MLV41-LL-IR | 90 mm |  |
| | | | | MLV41-LL-RT | 40 mm | |
| LLR 04-1.9-1.0-WC5 | 1.0 m | 1.9 mm | Metal-Silicone | MLV41-LL-IR | 100 mm |  |
| | | | | MLV41-LL-RT | 50 mm | |
| LMR 04-0.5-0.5-Z1 | 0.5 m | 0.5 mm | Metal | MLV41-LL-IR | 7 mm |  |
| | | | | MLV41-LL-RT | 6 mm | |
| LMR 04-1.9-0.5-Z1 | 0.5 m | 1.9 mm | Metal | MLV41-LL-IR | 90 mm |  |
| | | | | MLV41-LL-RT | 40 mm | |
| LCR 04-1.6-0.5-Z1 | 0.5 m | 1.6 mm | PVC | MLV41-LL-IR | 80 mm |  |
| | | | | MLV41-LL-RT | 40 m | |
| LCR 04-1.6-1.0-Z1 | 1.0 m | 1.6 mm | PVC | MLV41-LL-IR | 100 mm |  |
| | | | | MLV41-LL-RT | 50 mm | |



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## Glass Fiber Optic Cables

### Thru-Beam Mode Glass Fiber Optic Cables
**for MLV41-LL-IR and MLV41-LL-RT Sensors**

| Model Number | Cable Length | Fiber Diameter | Sheathing Material | Compatible Sensors | Sensing Range | Dimensions (mm) |
|---|---|---|---|---|---|---|
| LCE 04-1.1-0.5-WC3 | 0.5 m | 1.1 mm | PVC | MLV41-LL-IR | 100 mm |  |
| | | | | MLV41-LL-RT | 50 mm | |
| LCE 04-1.6-1.0-Z1 | 1.0 m | 1.6 mm | PVC | MLV41-LL-IR | 280 mm |  |
| | | | | MLV41-LL-RT | 80 mm | |
| LLE 04-1.6-1.0-G | 1.0 m | 1.6 mm | Metal-Silicone | MLV41-LL-IR | 280 mm |  |
| | | | | MLV41-LL-RT | 40 mm | |




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# Fiber Optic Cables Accessories

## Accessories for Plastic Fiber Optic Cables

(Dimensions in mm)

**MHP-FOA**
One-piece adapter that allows use of 2.2 mm diameter plastic fiber optic cables with MHP-FR sensors.



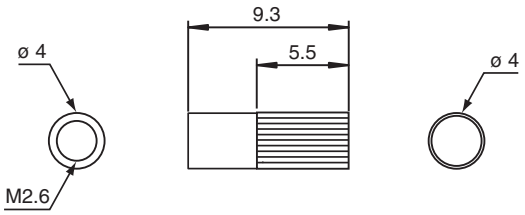
**PFA-1MM**
This adapter must be used to ensure proper connection of all 1 mm bundle diameter plastic fiber optic cables. Sold individually. Two units are required for a fiber optic cable.
Adapter included with all 1 mm bundle diameter fiber optic cables.



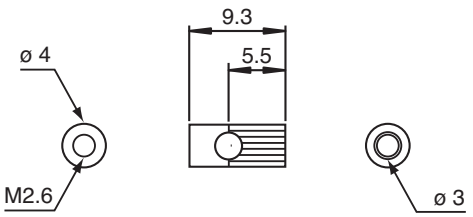
**KL-CUT2**
Plastic fiber optic cable cutter.



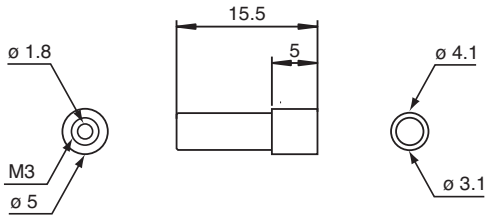
**K-LA01**
Lens for M2.6 threaded tip thru-beam plastic fiber optics, stainless steel, increases operating distance. Sold individually.



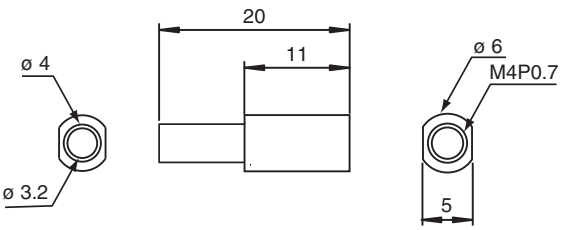

**K-LA02**
Right–angled lens for M2.6 threaded tip thru-beam plastic fiber optics, stainless steel. Sold individually.



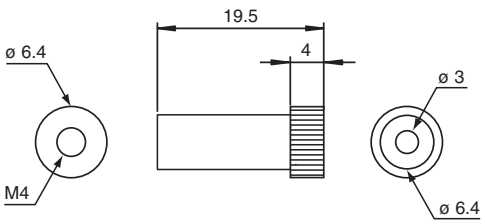

**K-LA03**
Lens for M3 threaded tip diffuse plastic fiber optics, plastic. Focuses light spot to 0.5 mm diameter.




**K-LA04**
Lens for M4 threaded tip diffuse plastic fiber optics, plastic. Focuses light spot to 0.7 mm diameter.




**K-LA06**
Collimation lens for M4 threaded tip diffuse fiber optics, plastic. Increases operating range up to eight times.






Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

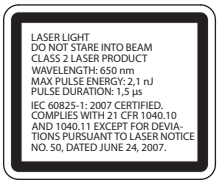
| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Test input | ✔ |
| Light source | laser diode |
| Light type | modulated visible red light |
| Laser class | 2 |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 55 mA |
| Switching type | light/dark on switchable |
| Switching current | max. 200 mA |
| Response time | 30 µs |
| Test input | emitter deactivation with +Ub |
| Ambient temperature | -10 ... 50 °C (14 ... 122 °F) |
| Material | |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | glass |
| Protection degree | IP67 |
| Connection | M12 x 1 connector, 5-pin |



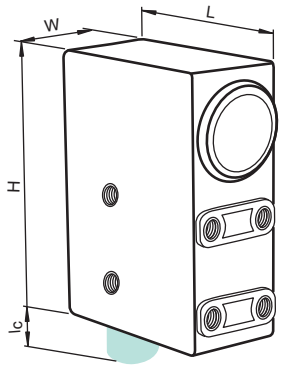
| Model Number | | DK10-LAS/35/49 | DK10-LAS/35/79b | DK10-LAS/76a/110/124 | DK10-LAS/76a/79b/110/124 |
|---|---|---|---|---|---|
| 4-in-1 output | ✔ | | ● | ● | ● |
| Analog output | ✔ | | ● | | ● |
| Detection range | 3 ... 300 mm | | | ● | ● |
| | 3 ... 800 mm | ● | ● | | |
| Light spot representation | approx. 0.8 mm at a distance of 300 mm | | | ● | ● |
| | approx. 2 mm at a distance of 800 mm | ● | ● | | |
| Signal output | Push-pull (4-in-1) output, short-circuit protected, reverse polarity protected | | ● | ● | ● |
| | 1 PNP and 1 NPN short-circuit protected, open collector, synchronized-switching | ● | | | |
| Measurement output | Analog output 0.3 ... 10 mA | | ● | | ● |
| **Approvals and Certificates** | | | | | |
| UL approval | cULus Listed , Class 2 power source | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | |
| **Dimensions** | | | | | |
| Length L [mm] | | | 60.8 | | |
| Width W [mm] | | | 33 | | |
| Height H [mm] | | | 85.6 | | |
| Connector length $l_c$ [mm] | | | 19 | | |

## Properties

- Suitable for very small print marks
- Rectangular full-size housing
- Plastic housing
- Discrete and analog outputs
- Connector version
- Laser red light




**Note:** For detailed Laser specifications refer to the data sheet at www.pepperl-fuchs.us




## Accessories

**These and more accessories can be found in chapter 10**
**See pages from 970 ... for cordsets  See pages 1066 ... for mounting accessories**

| | |
|---|---|
| **V15-G-5M-PVC** | Female cordset, M12, 5-pin, PVC cable, straight |
| **OMH-DK** | Right-Angled Mounting Bracket |
| **OMH-DK-1** | Flat Mounting Bracket |

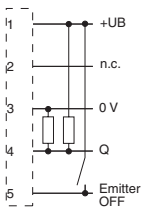
## Electrical Connection

❍ = light on, ● = dark on



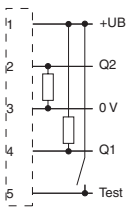
DK10-LAS/76a/110/124

Option 76a/110



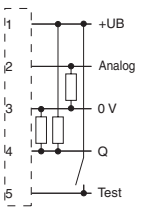

DK10-LAS/35/49

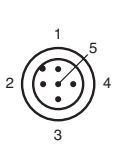
Option 49




DK10-LAS/35/79b
DK10-LAS/76a/79b/110/124

Option 79b/110




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |



## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | DK10-LAS-54/76/110/124 |
|---|---|
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| 4-in-1 output | ✔ |
| Test input | ✔ |
| Threshold detection range | 12 m |
| Effective detection range | 0 ... 10 m |
| Reference target | reflector REF-C110-2 |
| Light source | laser diode |
| Light type | modulated visible red light |
| Laser class | 2 |
| Light spot representation | approx. 10 mm at a distance of 10 m |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 55 mA |
| Switching type | light/dark on switchable |
| Signal output | Push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching current | max. 200 mA |
| Response time | 30 µs |
| Test input | emitter deactivation with +Ub |
| Ambient temperature | -10 ... 50 °C (14 ... 122 °F) |
| Material | |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | glass |
| Protection degree | IP67 |
| Connection | M12 x 1 connector, 5-pin |

| Approvals and Certificates | |
|---|---|
| UL approval | cULus Listed , Class 2 power source |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 60.8 |
| Width W [mm] | 33 |
| Height H [mm] | 85.6 |
| Connector length $l_c$ [mm] | 19 |

## Properties

- Suitable for very small print marks
- Rectangular full-size housing
- Plastic housing
- Discrete output
- Connector version
- Laser red light

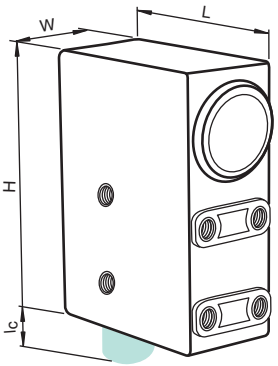
LASER LIGHT
DO NOT STARE INTO BEAM
CLASS 2 LASER PRODUCT
WAVELENGTH: 650 nm
MAX PULSE ENERGY: 2,1 nJ
PULSE DURATION: 1,5 µs
IEC 60825-1: 2007 CERTIFIED.
COMPLIES WITH 21 CFR 1040.10
AND 1040.11 EXCEPT FOR DEVIATIONS PURSUANT TO LASER NOTICE
NO. 50, DATED JUNE 24, 2007.

**Note:** For detailed Laser specifications refer to the data sheet at www.pepperl-fuchs.us

## Accessories

**These and more accessories can be found in chapter 10**
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-DK** | Right-Angled Mounting Bracket |
| **OMH-DK-1** | Flat Mounting Bracket |
| **REF-C110-2** | Reflector |
| **V15-G-5M-PVC** | Female cordset, M12, 5-pin, PVC cable, straight |
| **V15-W-5M-PVC** | Female cordset, M12, 5-pin, PVC cable, angled |



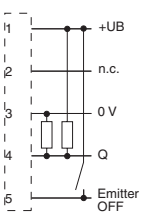

## Electrical Connection

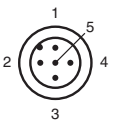
❍ = light on, ● = dark on



DK10-LAS-54/76/110/124

Option 76a/110




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |



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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| | |
|---|---|
| **General Data** | |
| Static TEACH-IN | ✔ |
| Dynamic TEACH-IN | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Function input | ✔ |
| Sensor range | 11 mm ± 2 mm |
| Light source | 3 LEDs (R,G,B) |
| Light type | Visible green/red/blue, modulated light |
| Teach-In | static and dynamic TEACH-IN |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 80 mA |
| Switching type | light/dark on electrically switchable |
| Signal output | 2 Push-pull (4-in-1) outputs, complementary, short-circuit proof, reverse polarity protected |
| Switching current | max. 100 mA |
| Response time | 50 µs |
| Function input | Ext. Teach-In input (ET) |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | Frame: nickel plated, die cast zinc,<br>Laterals: glass-fiber reinforced plastic PC |
| Optical face | Plastic pane |
| Protection degree | IP67 |
| Connection | Metal connector, M12, 5-pin, 90° rotatable |



| Model Number | | DK12-11/124/136 | DK12-11/A/124/136 |
|---|---|---|---|
| Light spot representation | 1 mm x 3 mm, light spot parallel to housing | ● | |
| | 3 mm x 1 mm, light spot perpendicular to housing | | ● |
| **Approvals and Certificates** | | | |
| Protection class | II | ● | ● |
| UL approval | cULus Listed , Class 2 power source | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |

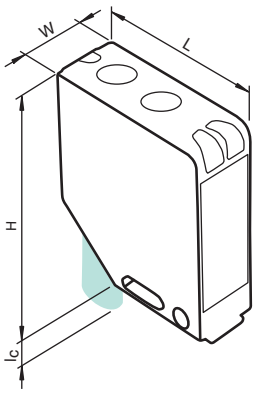
| **Dimensions** | |
|---|---|
| Length L [mm] | 41.5 |
| Width W [mm] | 15 |
| Height H [mm] | 49 |
| Connector length $l_c$ [mm] | 16 / 0 |

## Properties

- Suitable for contrast evaluation
- Rectangular compact housing
- Die-cast zinc frame housing
- Discrete output
- Connector version
- Visible green / red / blue light

## Benefits

- Detection of the smallest contrasts
- Accurate registration mark detection without color jitter




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **V15-G-5M-PVC** | Female cordset, M12, 5-pin, PVC cable, straight |
| **V15-W-5M-PVC** | Female cordset, M12, 5-pin, PVC cable, angled |
| **OMH-MLV12-HWK** | Mounting bracket |
| **OMH-MLV12-HWG** | Mounting bracket |
| **OMH-K01** | Mounting bracket |
| **OMH-06** | Mounting bracket |

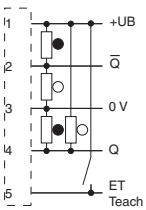
## Electrical Connection

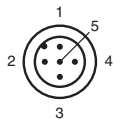
❍ = light on, ● = dark on



DK12-11/124/136
DK12-11/A/124/136

Option 124/136




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |





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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

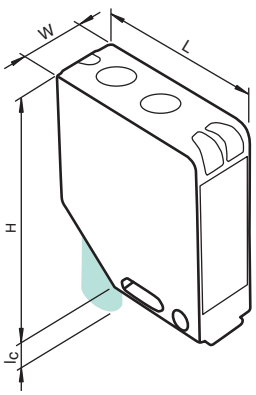
| Model Number | DK12-11-IO/92/136 |
|---|---|
| Static TEACH-IN | ✔ |
| Dynamic TEACH-IN | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Sensor range | 11 mm ± 2 mm |
| Light source | 3 LEDs (R,G,B) |
| Light type | Visible green/red/blue, modulated light |
| Light spot representation | 1 mm x 3 mm , light spot parallel to housing |
| Teach-In | static and dynamic TEACH-IN |
| Operating voltage | 10 ... 30 V DC / when operating in IO-Link mode: 18 ... 30 V |
| No-load supply current | ≤ 60 mA at 24 V supply voltage |
| Interface type | IO-Link |
| Mode | COM 2 (38.4 kBaud) |
| Switching type | light/dark on electrically switchable |
| Signal output | 2 Push-pull (4 in 1) outputs, complementary, short-circuit proof, reverse polarity protected |
| Switching current | max. 100 mA |
| Response time | 40 µs |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | Frame: nickel plated, die cast zinc, Laterals: glass-fiber reinforced plastic PC |
| Optical face | Plastic pane |
| Protection degree | IP67 |
| Connection | 4-pin, M12 metal connector , can be rotated 90° |
| |  |
| **Approvals and Certificates** | |
| Protection class | II |
| UL approval | cULus Listed , Class 2 power source |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |
| **Dimensions** | |
| Length L [mm] | 41.5 |
| Width W [mm] | 15 |
| Height H [mm] | 49 |
| Connector length $l_c$ [mm] | 16 / 0 |

## Properties

- Suitable for contrast evaluation
- Rectangular compact housing
- Die-cast zinc frame housing
- Discrete output with IO-Link
- Connector version
- Visible green / red / blue light

## Benefits

- Detection of the smallest contrasts
- Accurate registration mark detection without color jitter
- Easily adapts to the application by the standard communication IO-Link interface




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **IO-Link-Master-USB DTM** | Communication DTM for use of IO-Link-Master |
| **PACTware 4.X** | FDT frame application |
| **IODD Interpreter** | Software for the integration of IODDs in a frame application (e. g. PACTware) |
| **IO-Link-Master01-USB** | IO-Link Master |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |
| **OMH-MLV12-HWK** | Mounting bracket |
| **OMH-MLV12-HWG** | Mounting bracket |
| **OMH-K01** | Mounting bracket |
| **OMH-06** | Mounting bracket |

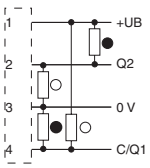
## Electrical Connection

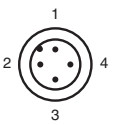
❍ = light on, ● = dark on



DK12-11-IO/92/136

Option IO/92/136
Option IO/95/136




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

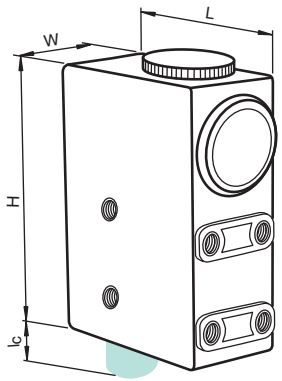
| | | | | |
|---|---|---|---|---|
| **General Data** | | | | |
| Static TEACH-IN | ✔ | | | |
| Light/dark adjustment | ✔ | | | |
| 4-in-1 output | ✔ | | | |
| Function input | ✔ | | | |
| Sensor range | 25 mm +/- 6 mm | | | |
| Light source | LED | | | |
| Light type | Visible green/red/blue, modulated light | | | |
| Teach-In | static TEACH-IN | | | |
| Operating voltage | 10 ... 30 V DC | | | |
| No-load supply current | ≤ 70 mA | | | |
| Switching type | light/dark on switchable, results from the order of the TEACH-IN | | | |
| Signal output | Push-pull (4 in 1) output, short-circuit protected, reverse polarity protected | | | |
| Switching current | max. 200 mA | | | |
| Response time | 30 µs | | | |
| Function input | TEACH-IN input | | | |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) | | | |
| Material | | | | |
| Housing | PC (glass-fiber-reinforced Makrolon) | | | |
| Optical face | glass | | | |
| Protection degree | IP67 | | | |
| Connection | M12 x 1 connector, 5-pin | | | |
| **Model Number** | | DK20-25/110/124 | DK20-25/A/110/124 | DK20-25/B/110/124 |
| Light spot representation | Light spot diameter 3 mm | | | ● |
| | 2 mm x 8.5 mm, light spot parallel to housing | ● | | |
| | 2 mm x 8.5 mm, light spot perpendicular to housing | | ● | |
| **Approvals and Certificates** | | | | |
| UL approval | cULus Listed , Class 2 power source | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |
| **Dimensions** | | | | |
| Length L [mm] | | | 60.8 | |
| Width W [mm] | | | 33 | |
| Height H [mm] | | | 85.6 | |
| Connector length $l_c$ [mm] | | | 19 | |

## Properties

- Suitable for contrast evaluation
- Rectangular full-size housing
- Plastic housing
- Discrete output
- Connector version
- Visible green / red / blue light

## Benefits

- Interchangable dual lens for mounting flexibility




## Accessories

**These and more accessories can be found in chapter 10**
**See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories**

| | |
|---|---|
| **V15-G-5M-PVC** | Female cordset, M12, 5-pin, PVC cable, straight |
| **V15-W-5M-PVC** | Female cordset, M12, 5-pin, PVC cable, angled |
| **OMH-DK** | Right-Angled Mounting Bracket |
| **OMH-DK-1** | Flat Mounting Bracket |

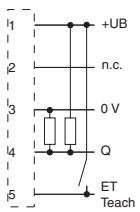
## Electrical Connection

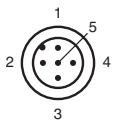
❍ = light on, ● = dark on



DK20-25/A/110/124
DK20-25/B/110/124
DK20-25/110/124

Option 110




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |





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## Properties

- Suitable for contrast evaluation
- Rectangular full-size housing
- Plastic housing
- Discrete and analog outputs
- Connector version
- Visible green / red / blue light

## Benefits

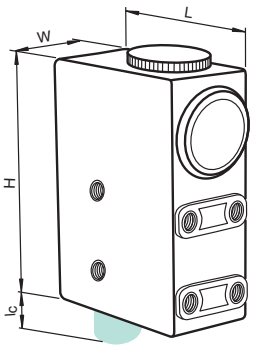
- Interchangable dual lens for mounting flexibility

## Additional Products

In this series, we offer the following additional products:

**DKE20-9,5/110/124**
Technical data like DK20-9,5/110/124 but:
Housing: Stainless steel






## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Static TEACH-IN | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Function input | ✔ |
| Sensor range | 9.5 mm +/-3 mm |
| Light source | LED |
| Light type | Visible green/red/blue, modulated light |
| Teach-In | static TEACH-IN |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 70 mA |
| Switching type | light/dark on switchable, results from the order of the TEACH-IN |
| Signal output | Push-pull output, short-circuit protected, reverse polarity protected |
| Switching current | max. 200 mA |
| Response time | 30 µs |
| Function input | TEACH-IN input |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | glass |
| Protection degree | IP67 |
| Connection | M12 x 1 connector, 5-pin |



| Model Number | | DK20-9,5/110/124 | DK20-9,5/A/110/124 | DK20-9,5/B/110/124 | DK20-9,5/79B/110/124 | DK20-9,5/B/79B/110/124 |
|---|---|---|---|---|---|---|
| Analog output | ✔ | | | | ● | ● |
| Light spot representation | 1 mm x 4 mm, light spot parallel to housing | ● | | | ● | |
| | 1 mm x 4 mm, light spot perpendicular to housing | | ● | | | |
| | Light spot diameter 1.5 mm | | | ● | | ● |
| Measurement output | Analog output 0.3 ... 10 mA, (RL ≤ 600 Ohm) | | | | ● | ● |
| **Approvals and Certificates** | | | | | | |
| UL approval | cULus Listed , Class 2 power source | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | |

| Dimensions | |
|---|---|
| Length L [mm] | 60.8 |
| Width W [mm] | 33 |
| Height H [mm] | 85.6 |
| Connector length $l_c$ [mm] | 19 |

## Accessories

**These and more accessories can be found in chapter 10**
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **V15-G-5M-PVC** | Female cordset, M12, 5-pin, PVC cable, straight |
| **V15-W-5M-PVC** | Female cordset, M12, 5-pin, PVC cable, angled |
| **OMH-DK** | Right-Angled Mounting Bracket |
| **OMH-DK-1** | Flat Mounting Bracket |

## Electrical Connection

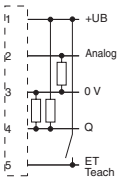
❍ = light on, ● = dark on



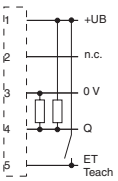
DK20-9,5/79B/110/124
DK20-9,5/B/79B/110/124

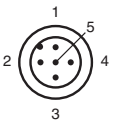
DKE20-9,5/110/124
DK20-9,5/A/110/124
DK20-9,5/B/110/124
DK20-9,5/110/124

Option 79b/110




Option 110




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |



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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Static TEACH-IN | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Function input | ✔ |
| Sensor range | 50 mm |
| Light source | LED |
| Light type | modulated visible red light |
| Light spot representation | 3 mm x 16 mm , light spot parallel to housing |
| Teach-In | static TEACH-IN |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 70 mA |
| Switching type | light/dark on switchable, results from the order of the TEACH-IN |
| Signal output | Push-pull output, short-circuit protected, reverse polarity protected |
| Switching current | max. 200 mA |
| Response time | 30 µs |
| Function input | TEACH-IN input |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | glass |
| Protection degree | IP67 |
| Connection | M12 x 1 connector, 5-pin |



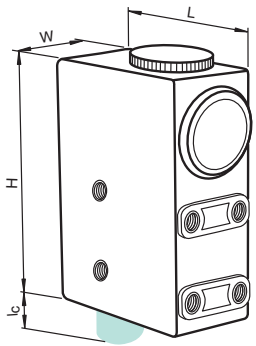
| Model Number | | DK20/35B | DK20/35B/79B |
|---|---|---|---|
| Analog output | ✔ | | ● |
| Measurement output | Analog output 0.3 ... 10 mA, (RL ≤ 600 Ohm) | | ● |
| **Approvals and Certificates** | | | |
| UL approval | cULus Listed , Class 2 power source | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |
| **Dimensions** | | | |
| Length L [mm] | | 60.8 | |
| Width W [mm] | | 33 | |
| Height H [mm] | | 85.6 | |
| Connector length $l_c$ [mm] | | 19 | |

## Properties

- Suitable for contrast evaluation
- Rectangular full-size housing
- Plastic housing
- Discrete and analog outputs
- Connector version
- Visible red light

## Benefits

- Interchangable dual lens for mounting flexibility




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **V15-G-5M-PVC** | Female cordset, M12, 5-pin, PVC cable, straight |
| **V15-W-5M-PVC** | Female cordset, M12, 5-pin, PVC cable, angled |
| **OMH-DK** | Right-Angled Mounting Bracket |
| **OMH-DK-1** | Flat Mounting Bracket |

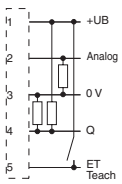
## Electrical Connection

❍ = light on, ● = dark on



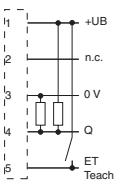
DK20/35B/79B

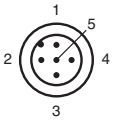
Option 79b/110




DK20/35B

Option 110




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |




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CE

## Properties

- Suitable for contrast evaluation
- Rectangular full-size housing
- Plastic housing
- Discrete output
- Connector version
- Visible green / red / blue light

## Benefits

- Interchangable dual lens for mounting flexibility

## Technical Data

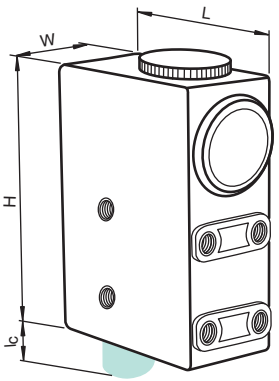
*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| | |
|---|---|
| **General Data** | |
| Dynamic TEACH-IN | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Function input | ✔ |
| Sensor range | 25 mm +/- 6 mm |
| Light source | LED |
| Light type | Visible green/red/blue, modulated light |
| Teach-In | Dynamic Teach-In |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 60 mA |
| Signal output | Push-pull (4 in 1) output, short-circuit protected, reverse polarity protected |
| Switching current | max. 200 mA |
| Response time | 30 µs |
| Function input | TEACH-IN input |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | glass |
| Protection degree | IP67 |
| Connection | M12 x 1 connector, 5-pin |



| Model Number | | DK21-25/110/124 | DK21-25/B/110/124 |
|---|---|---|---|
| Light spot representation | Light spot diameter 3 mm | | ● |
| | 2 mm x 8.5 mm, light spot parallel to housing | ● | |
| **Approvals and Certificates** | | | |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |

| **Dimensions** | |
|---|---|
| Length L [mm] | 60.8 |
| Width W [mm] | 33 |
| Height H [mm] | 85.6 |
| Connector length $l_c$ [mm] | 19 |




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **V15-G-5M-PVC** | Female cordset, M12, 5-pin, PVC cable, straight |
| **V15-W-5M-PVC** | Female cordset, M12, 5-pin, PVC cable, angled |
| **OMH-DK** | Right-Angled Mounting Bracket |
| **OMH-DK-1** | Flat Mounting Bracket |

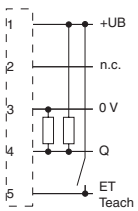
## Electrical Connection

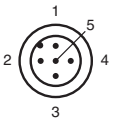
❍ = light on, ● = dark on



DK21-25/B/110/124
DK21-25/110/124

Option 110




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |



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CE

## Properties

- Suitable for contrast evaluation
- Rectangular full-size housing
- Plastic housing
- Discrete output
- Connector version
- Visible green / red / blue light

## Benefits

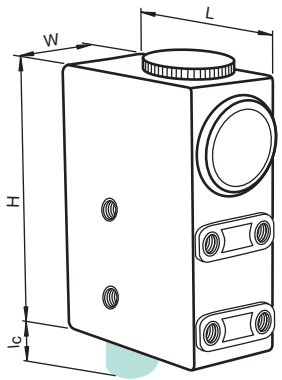
- Interchangable dual lens for mounting flexibility

## Additional Products

In this series, we offer the following additional products:

**DKE21-9,5/110/124**
Technical data like DK21-9,5/110/124
but:
Housing: Stainless steel






## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Dynamic TEACH-IN | ✔ |
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Function input | ✔ |
| Sensor range | 9.5 mm +/-3 mm |
| Light source | LED |
| Light type | Visible green/red/blue, modulated light |
| Teach-In | Dynamic Teach-In |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 60 mA |
| Signal output | Push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching current | max. 200 mA |
| Response time | 30 µs |
| Function input | TEACH-IN input |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | glass |
| Protection degree | IP67 |
| Connection | M12 x 1 connector, 5-pin |



| Model Number | | DK21-9,5/110/124 | DK21-9,5/A/110/124 |
|---|---|---|---|
| Light spot representation | 1 mm x 4 mm, light spot parallel to housing | ● | |
| | 1 mm x 4 mm, light spot perpendicular to housing | | ● |
| **Approvals and Certificates** | | | |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |
| **Dimensions** | | | |
| Length L [mm] | | 60.8 | |
| Width W [mm] | | 33 | |
| Height H [mm] | | 85.6 | |
| Connector length $l_c$ [mm] | | 19 | |

## Accessories

**These and more accessories can be found in chapter 10**
**See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories**

| | |
|---|---|
| **V15-G-5M-PVC** | Female cordset, M12, 5-pin, PVC cable, straight |
| **V15-W-5M-PVC** | Female cordset, M12, 5-pin, PVC cable, angled |
| **OMH-DK** | Right-Angled Mounting Bracket |
| **OMH-DK-1** | Flat Mounting Bracket |

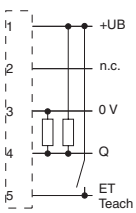
## Electrical Connection

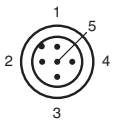
❍ = light on, ● = dark on



DKE21-9,5/110/124
DK21-9,5/A/110/124
DK21-9,5/110/124

Option 110




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |





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CE

## Properties

- Suitable for contrast evaluation
- Rectangular full-size housing
- Plastic housing
- Discrete output
- Connector version
- Visible green / red / blue light

## Benefits

- Detection of the smallest contrasts

## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

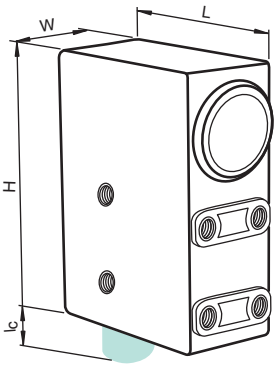
| General Data | |
|---|---|
| Light/dark adjustment | ✔ |
| 4-in-1 output | ✔ |
| Function input | ✔ |
| Sensor range | 9.5 mm ± 3 mm |
| Light source | LED |
| Light type | Visible green/red/blue, modulated light |
| Light spot representation | rectangular 1 mm x 4 mm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 75 mA |
| Signal output | Push-pull (4-in-1) output, short-circuit protected, reverse polarity protected |
| Switching type | light/dark on switchable, results from the order of the TEACH-IN |
| Switching current | max. 200 mA |
| Response time | 30 µs |
| Function input | TEACH-IN input |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | glass |
| Protection degree | IP67 |
| Connection | M12 x 1 connector, 5-pin |



| Model Number | | DK34-9,5/110/124 | DK35-9,5/110/124 |
|---|---|---|---|
| Static TEACH-IN | ✔ | ● | |
| Dynamic TEACH-IN | ✔ | | ● |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 60.8 |
| Width W [mm] | 33 |
| Height H [mm] | 85.6 |
| Connector length $l_c$ [mm] | 19 |




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **V15-G-5M-PVC** | Female cordset, M12, 5-pin, PVC cable |
| **V15-W-5M-PVC** | Female cordset, M12, 5-pin, PVC cable |
| **OMH-DK** | Right-Angled Mounting Bracket |
| **OMH-DK-1** | Flat Mounting Bracket |

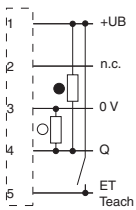
## Electrical Connection

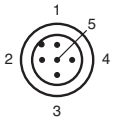
❍ = light on, ● = dark on



DK34-9,5/110/124
DK35-9,5/110/124

Option 110




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |



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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Timer function | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Light source | LED |
| Light type | modulated UV light |
| Teach-In | Incremental or automatic |
| Operating voltage | 10 ... 30 V DC |
| Switching type | light on / dark on |
| Signal output | 1 PNP and 1 NPN short-circuit protected, reverse polarity protected |
| Switching current | 150 mA |
| Material | |
| Housing | Polycarbonate |
| Optical face | Acrylic |
| Protection degree | IP67 |
| Connection | 150 mm, PVC cable with M12 x 1 connector, 5 pin |



## Properties

- Suitable for luminescence evaluation
- Rectangular compact housing
- Plastic housing
- Discrete output
- Pigtailed connector version
- Ultraviolet light

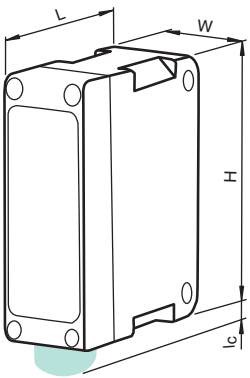
## Benefits

- Detection of invisible marks and/or marks on irregular surfaces
- Small focal point detects small parts

| Model Number | | DK50-UV-190/115b/147 | DK50-UV-254/115b/147 | DK50-UV-330/115b/147 | DK50-UV-609/115b/147 |
|---|---|---|---|---|---|
| Detection range | 0 ... 190 mm | ● | | | |
| | 0 ... 254 mm | | ● | | |
| | 0 ... 330 mm | | | ● | |
| | 50.8 ... 609.6 mm | | | | ● |
| Light spot representation | 2.2 mm at 25.4 mm sensor range | ● | | | |
| | 3.25 mm at 50.8 mm sensor range | | ● | | |
| | 4.1 mm at 101.6 mm sensor range | | | ● | |
| | 25.4 mm at 203 mm sensor range | | | | ● |
| No-load supply current | 50 mA | ● | ● | ● | |
| | 65 mA | | | | ● |
| Response time | 200 µs | ● | ● | ● | |
| | 750 µs | | | | ● |
| Ambient temperature | -15 ... 55 °C (5 ... 131 °F) | | | | ● |
| | -15 ... 70 °C (5 ... 158 °F) | ● | ● | ● | |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 55.5 |
| Width W [mm] | 22.6 |
| Height H [mm] | 64.9 |
| Connector length $l_c$ [mm] | 7 |




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-DK50** | Right-Angled Mounting Bracket |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

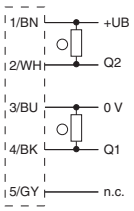
## Electrical Connection

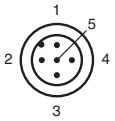
❍ = light on, ● = dark on



DK50-UV-254/115b/147
DK50-UV-190/115b/147
DK50-UV-330/115b/147
DK50-UV-609/115b/147

Option 115b/147




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |




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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Timer function | ✔ |
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Analog output | ✔ |
| Light source | LED |
| Light type | modulated UV light |
| Teach-In | Incremental or automatic |
| Operating voltage | 10 ... 30 V DC |
| Switching type | light on / dark on |
| Signal output | 1 PNP and 1 NPN short-circuit protected, reverse polarity protected |
| Switching current | 150 mA |
| Response time | Discrete Output 200 µs<br>Analog output 1 ms |
| Measurement output | 0 - 5 V DC<br>$R_{min}$ = 1 kΩ |
| Material | |
| Housing | Polycarbonate |
| Optical face | Acrylic |
| Protection degree | IP67 |
| Connection | 150 mm pigtail , quick disconnect type M12 (micro) |



| Model Number | | DK50-UV-190/79d/115b/147 | DK50-UV-254/79d/115b/147 | DK50-UV-330/79d/115b/147 | DK50-UV-609/79d/115b/147 |
|---|---|---|---|---|---|
| Detection range | 0 ... 190 mm | ● | | | |
| | 0 ... 254 mm | | ● | | |
| | 0 ... 330 mm | | | ● | |
| | 50.8 ... 609.6 mm | | | | ● |
| Light spot representation | 2.2 mm at 25.4 mm sensor range | ● | | | |
| | 3.25 mm at 50.8 mm sensor range | | ● | | |
| | 4.1 mm at 101.6 mm sensor range | | | ● | |
| | 25.4 mm at 203 mm sensor range | | | | ● |
| No-load supply current | 50 mA | ● | ● | ● | |
| | 65 mA | | | | ● |
| Ambient temperature | -15 ... 55 °C (5 ... 131 °F) | | | | ● |
| | -15 ... 60 °C (5 ... 140 °F) | ● | ● | ● | |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

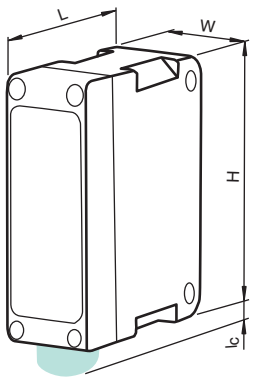
| Dimensions | |
|---|---|
| Length L [mm] | 55.5 |
| Width W [mm] | 22.6 |
| Height H [mm] | 64.9 |
| Connector length $l_c$ [mm] | 7 |

## Properties

- Suitable for luminescence evaluation
- Rectangular compact housing
- Plastic housing
- Discrete and analog outputs
- Pigtailed connector version
- Ultraviolet light

## Benefits

- Detection of invisible marks and/or marks on irregular surfaces
- Small focal point detects small parts




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-DK50** | Right-Angled Mounting Bracket |
| **V15-G-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, straight |
| **V15-W-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, angled |

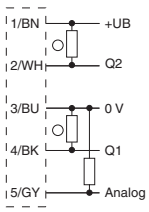
## Electrical Connection

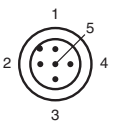
❍ = light on, ● = dark on



DK50-UV-190/79d/115b/147
DK50-UV-254/79d/115b/147
DK50-UV-330/79d/115b/147
DK50-UV-609/79d/115b/147

Option 79d/115b/147



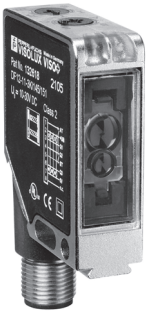




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |



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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | DF12-11-3K/145/151 |
|---|---|
| Static TEACH-IN | ✔ |
| Function input | ✔ |
| 4-in-1 output | ✔ |
| Sensor range | 11 mm ± 2 mm |
| Light source | 3 LEDs (R,G,B) |
| Light type | Visible green/red/blue, modulated light |
| Light spot representation | 1 mm x 3 mm |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 40 mA |
| Signal output | 3 Push-pull (4-in-1) outputs, short-circuit proof, reverse polarity protected |
| Switching current | max. 100 mA |
| Response time | 1 ms |
| Function input | Ext. Teach-In input (ET)<br>Ext. blanking-input (AT) |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | Frame: nickel plated, die cast zinc,<br>Laterals: glass-fiber reinforced plastic PC |
| Optical face | Plastic pane |
| Protection degree | IP67 |
| Connection | 8-pin, M12 metal connector, 90° convertible (use V19 type connection cable ) |



| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 41.5 |
| Width W [mm] | 15 |
| Height H [mm] | 49 |
| Connector length $l_c$ [mm] | 16 / 0 |

## Properties

- Suitable for color evaluation
- Rectangular compact housing
- Die-cast zinc frame housing
- Discrete output
- Connector version
- Visible green / red / blue light

## Benefits

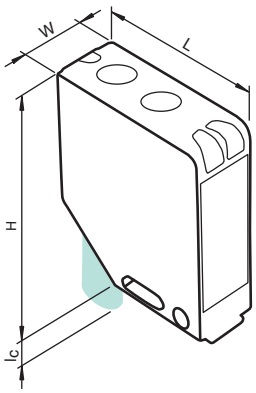
- Up to three different colors and tolerances can be stored
- One output for each color

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets  See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-MLV12-HWK** | Mounting bracket |
| **OMH-MLV12-HWG** | Mounting bracket |
| **OMH-K01** | Mounting bracket |
| **OMH-06** | Mounting bracket |
| **V19-G-5M-PVC** | Female cordset, M12, 8-pin, PVC cable, straight |
| **V19-G-15M-PVC** | Female cordset, M12, 8-pin, PVC cable, straight |
| **V19-G-2M-PUR ABG** | Female cordset, M12, 8-pin, shielded, PUR cable, straight |
| **V19-G-3M-PUR ABG** | Female cordset, M12, 8-pin, shielded, PUR cable, straight |
| **V19-G-10M-PUR-ABG** | Female cordset, M12, 8-pin, shielded, PUR cable, straight |



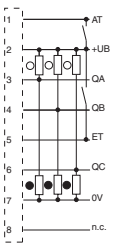

## Electrical Connection

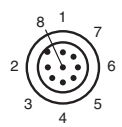
❍ = light on, ● = dark on



DF12-11-3K/145/151

Option /145/151




Wire colors

| | | |
|---|---|---|
| 1 | WH | (white) |
| 2 | BN | (brown) |
| 3 | GN | (green) |
| 4 | YE | (yellow) |
| 5 | GY | (gray) |
| 6 | PK | (pink) |
| 7 | BU | (blue) |
| 8 | RD | (red) |




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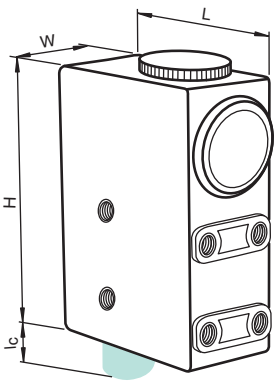
CE

## Properties

- Suitable for color evaluation
- Rectangular full-size housing
- Plastic housing
- Discrete output
- Connector version
- Visible green / red / blue light

## Benefits

- Interchangable dual lens for mounting flexibility




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Function input | ✔ |
| Static TEACH-IN | ✔ |
| Light source | 3 LEDs (R,G,B) |
| Light type | Visible green/red/blue, modulated light |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 55 mA |
| Switching type | light on NPN and PNP for detected color |
| Signal output | 1 PNP and 1 NPN short-circuit protected, open collector, synchronized-switching |
| Switching current | max. 200 mA |
| Response time | 300 µs |
| Function input | TEACH-IN input |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Material | |
| Housing | PC (glass-fiber-reinforced Makrolon) |
| Optical face | glass |
| Protection degree | IP67 |
| Connection | M12 x 1 connector, 5-pin |



| Model Number | | DF20/49/124 | DF20/B/49/124 | DF20/35A/49/124 |
|---|---|---|---|---|
| Sensor range | 9.5 mm ± 2 mm | ● | ● | |
| | 25 mm ± 4mm | | | ● |
| Light spot representation | Light spot diameter 1.5 mm | | ● | |
| | rectangular 1 mm x 4 mm | ● | | |
| | rectangular 2 mm x 8.5 mm | | | ● |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 60.8 |
| Width W [mm] | 33 |
| Height H [mm] | 85.5 |
| Connector length $l_c$ [mm] | 19 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **V15-G-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, straight |
| **V15-W-2M-PUR** | Female cordset, M12, 5-pin, PUR cable, angled |
| **OMH-DK-1** | Mounting bracket |
| **OMH-DK** | Mounting bracket |

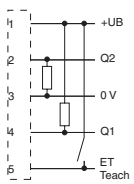
## Electrical Connection

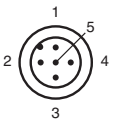
❍ = light on, ● = dark on



DF20/49/124
DF20/B/49/124
DF20/35A/49/124

Option 49/124




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |



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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Function input | ✔ |
| Static TEACH-IN | ✔ |
| Number of color channels | max. 10 |
| Sensor range | max. 100 mm |
| Light source | LED |
| Light type | modulated white light |
| Light spot representation | approx. 5 mm ... 60 mm (depends on sensor range and fiberoptic cable) |
| Operating voltage | 18 ... 30 V DC |
| No-load supply current | max. 100 mA |
| Switching type | light on PNP for detected color |
| Switching current | max. 200 mA per output |
| Response time | 4 ms |
| Function input | Trigger, keyboard disable |
| Ambient temperature | -10 ... 50 °C (14 ... 122 °F) |
| Housing | aluminum |
| Optical face | Fiberoptics |
| Protection degree | IP65 |
| Connection | M12 connector, 8-pin and M12 connector, 5 pin |



| Model Number | | VCS110-5K | VCS110-10K |
|---|---|---|---|
| Signal output | 4 PNP, short-circuit proof, binary coded, assigned to the value memory slots | | ● |
| | 5 PNP, short-circuit proof, each with two assigned value memory slots<br>The last activated channel is exported. | ● | |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

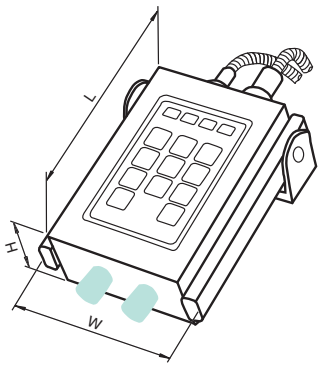
| Dimensions | |
|---|---|
| Length L [mm] | 133 |
| Width W [mm] | 109 |
| Height H [mm] | 48 |
| Connector length $l_c$ [mm] | 0 |

## Properties

- Suitable for color evaluation
- Suitable for use with glass fiber optics
- Discrete output
- Connector version
- Visible white light

## Benefits

- Up to ten different colors and tolerances can be stored
- Tamper-proof keypad




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets  See pages 1066 ... for mounting accessories

| | |
|---|---|
| **V17-G-2M-PUR** | Female cordset, M12, 8-pin, PVC cable, straight |
| **V15-G-2M-PUR** | Female cordset, M12, 5-pin, PVC cable, straight |
| **LMR 05-4,0/3*2,3-0,5-Z1** | Glass fiber optics, 500 mm cable length |
| **LMR 05-4,0/3*2,3-1,0-Z1** | Glass fiber optics, 1000 mm cable length |
| **LMR 05-4,0/3*2,3-2,0-Z1** | Glass fiber optics, 2000 mm cable length |
| **LLR 05-22-1,0-Z1(M4)** | Glass fiber optics, 1000 mm cable length |

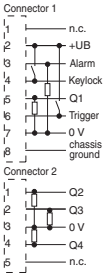
## Electrical Connection

❍ = light on, ● = dark on



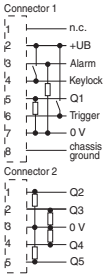
VCS110-10K

Option -10K




VCS110-5K

Option -5K

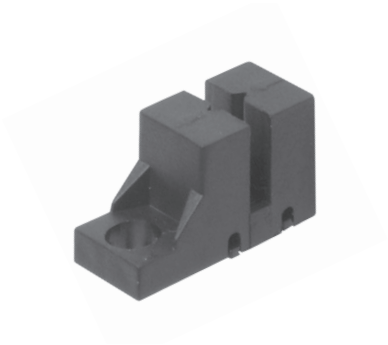






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CE

## Properties

- Single beam type
- Rectangular nano housing
- Plastic housing
- DC sensor
- Discrete output
- Cable version
- Infrared light

## Technical Data

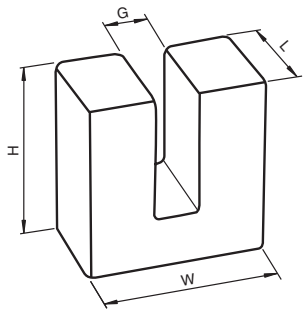
*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | GL2-P/153 |
|---|---|
| Fork width | 1.8 mm |
| Light source | IRED , 940 nm |
| Light type | IRED |
| Target size | 0.2 x 2.6 mm |
| Operating voltage | 5 ... 30 V DC |
| Signal output | 1 NPN , photo transistor |
| Switching current | 20 mA |
| Ambient temperature | -40 ... 85 °C (-40 ... 185 °F) |
| Housing | PC |
| Protection degree | IP30 |
| Connection | 610 mm, PVC cable , Individual colored wires |



| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 6.3 |
| Width W [mm] | 15.2 |
| Height H [mm] | 9.1 |
| Fork width G [mm] | 1.8 |



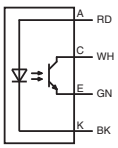

## Electrical Connection

❍ = light on, ● = dark on



GL2-P/153

GL2-*
GL3-*






Refer to General Notes Relating to Product Information
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GL3-U


GL3-T


GL3-P


GL3-L

CE

## Properties

- Single beam type
- Rectangular nano housing
- Plastic housing
- DC sensor
- Discrete output
- Cable version
- Infrared light

## Technical Data

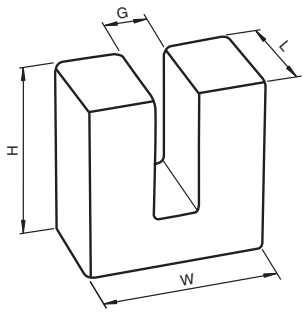
*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Fork width | 3.15 mm |
| Light source | IRED , 940 nm |
| Light type | IRED |
| Operating voltage | 5 ... 30 V DC |
| Signal output | 1 NPN , photo transistor |
| Switching current | 20 mA |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| Housing | PC |
| Protection degree | IP30 |
| Connection | 610 mm, PVC cable , Individual colored wires |



| Model Number | GL3-L/153 | GL3-P/153 | GL3-T/153 | GL3-U/153 |
|---|---|---|---|---|
| **Dimensions** | | | | |
| Length L [mm] | 6.35 | | | |
| Width W [mm] | 18.4 | | 23.6 | 24.7 |
| Height H [mm] | 10.8 | | | |
| Fork width G [mm] | 3.15 | | | |

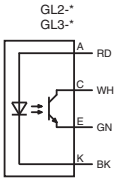
| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |




## Electrical Connection

❍ = light on, ● = dark on


GL3-L/153
GL3-P/153
GL3-T/153
GL3-U/153







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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Light/dark adjustment | ✔ |
| Fork width | 3 mm |
| Light source | LED |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 45 mA |
| Signal output | 1 NPN and 1 PNP<br>Short circuit and overload protected<br>Reverse polarity protected |
| Switching type | light/dark on |
| Switching current | max. 150 mA |
| Switching frequency | 5 kHz |
| Ambient temperature | -40 ... 70 °C (-40 ... 158 °F) |
| Material | |
| Housing | Thermoplastic PPS |
| Optical face | zylex |
| Protection degree | IP66 |

| Model Number | | GLD3-RT/115/147 | GLD3-RT/115b/123/147 | GLD3-RT/95/147 |
|---|---|---|---|---|
| Teach-In | ✔ | | ● | |
| Connection | fixed cable 150 mm with M12 x 1 male connector, 4 pin | | ● | |
| | M8 x 1 connector, 4-pin | | | ● |
| | 2 m fixed cable | ● | | |
| | |  |  |  |

| Approvals and Certificates | | | | |
|---|---|---|---|---|
| UL approval | cULus | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | |

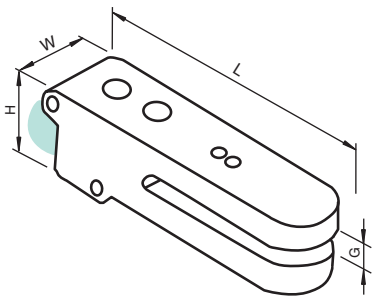
| Dimensions | |
|---|---|
| Length L [mm] | 92 |
| Width W [mm] | 25 |
| Height H [mm] | 27 |
| Fork width G [mm] | 3 |

## Properties

- Single beam type
- Rectangular compact housing
- Plastic housing
- DC sensor
- Discrete output
- Cable, pigtailed connector and connector versions
- Visible red light

## Benefits

- Special sensor for label detection
- One-touch automatic set-up for easy alignment
- Detection of some transparent labels




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, straight |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable, angled |

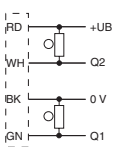
## Electrical Connection

❍ = light on, ● = dark on

GLD3-RT/115/147



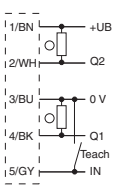
Option /115/147





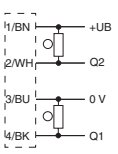

GLD3-RT/115b/123/147

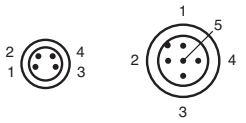
Option /115b/123/147




GLD3-RT/95/147

Option /95/147



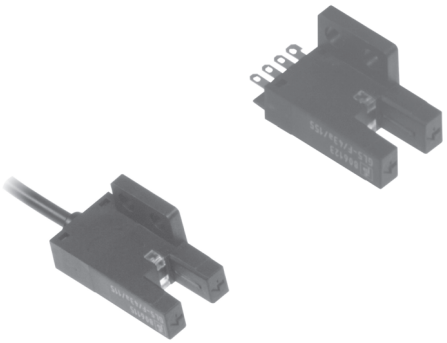




Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Light/dark adjustment | ✔ |
| Fork width | 5 mm |
| Light source | IRED |
| Light type | Infrared, continuous light , 940 nm |
| Target size | 0.8 x 1.8 mm |
| Operating voltage | 5 ... 24 V DC |
| No-load supply current | max. 20 mA |
| Switching type | light/dark on |
| Switching current | max. 50 mA |
| Switching frequency | max. 5 kHz |
| Repeat accuracy | 0.03 mm |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Housing | PBT |
| Protection degree | IP40 |

| Model Number | | GL5-F/28a/115 | GL5-F/43a/115 | GL5-F/28a/155 | GL5-F/43a/155 |
|---|---|---|---|---|---|
| Signal output | 2 NPN complementary , overvoltage protected | ● | | ● | |
| | 2 PNP complementary , overvoltage protected | | ● | | ● |
| Connection | 4-pin flat connector | | | ● | ● |
| | 2 m PVC cable, 4 x 0.09 mm² | ● | ● | | |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | | |
|---|---|---|
| Length L [mm] | 26.2 | 22.2 |
| Width W [mm] | 6.4 | |
| Height H [mm] | 13.4 | |
| Fork width G [mm] | 5 | |

## Properties

- Single beam type
- Rectangular nano housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and solder pin versions
- Infrared light

## Benefits

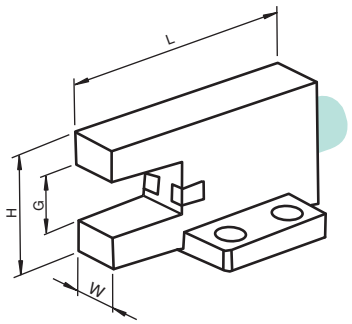
- High positioning accuracy

## Accessories

These and more accessories can be found in chapter 10

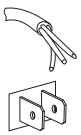
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CBL SET GL5** | Connection cable for GL5 series |

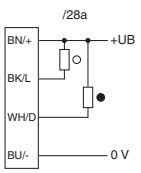



## Electrical Connection

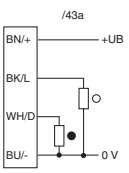
❍ = light on, ● = dark on



GL5-F/28a/115
GL5-F/28a/155




GL5-F/43a/115
GL5-F/43a/155

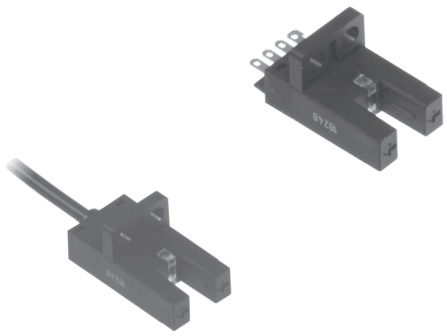






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CE

## Properties

- Single beam type
- Rectangular nano housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and solder pin versions
- Infrared light

## Benefits

- High positioning accuracy

## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Light/dark adjustment | ✔ |
| Fork width | 5 mm |
| Light source | IRED |
| Light type | Infrared, continuous light , 940 nm |
| Target size | 0.8 x 1.8 mm |
| Operating voltage | 5 ... 24 V DC |
| No-load supply current | max. 20 mA |
| Switching type | light/dark on |
| Switching current | max. 50 mA |
| Switching frequency | max. 5 kHz |
| Repeat accuracy | 0.03 mm |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Housing | PBT |
| Protection degree | IP40 |

| Model Number | | GL5-J/28a/115 | GL5-J/43a/115 | GL5-J/28a/155 | GL5-J/43a/155 |
|---|---|---|---|---|---|
| Signal output | 2 NPN complementary , overvoltage protected | ● | | ● | |
| | 2 PNP complementary , overvoltage protected | | ● | | ● |
| Connection | 4-pin flat connector | | | ● | ● |
| | 2 m PVC cable, 4 x 0.09 mm² | ● | ● | | |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

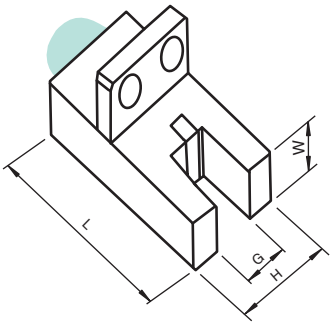
| Dimensions | | |
|---|---|---|
| Length L [mm] | 26.2 | 22.2 |
| Width W [mm] | 6.4 | |
| Height H [mm] | 13.4 | |
| Fork width G [mm] | 5 | |

## Accessories

**These and more accessories can be found in chapter 10**

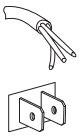
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CBL SET GL5** | Connection cable for GL5 series |

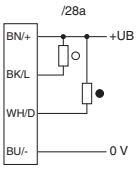



## Electrical Connection

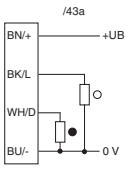
❍ = light on, ● = dark on



GL5-J/28a/115
GL5-J/28a/155

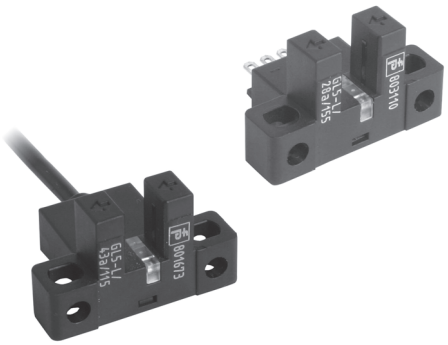



GL5-J/43a/115
GL5-J/43a/155






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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Light/dark adjustment | ✔ |
| Fork width | 5 mm |
| Light source | IRED |
| Light type | Infrared, continuous light , 940 nm |
| Target size | 0.8 x 1.8 mm |
| Operating voltage | 5 ... 24 V DC |
| No-load supply current | max. 20 mA |
| Switching type | light/dark on |
| Switching current | max. 50 mA |
| Switching frequency | max. 5 kHz |
| Repeat accuracy | 0.03 mm |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Housing | PBT |
| Protection degree | IP40 |

| Model Number | | GL5-L/28a/115 | GL5-L/43a/115 | GL5-L/28a/155 | GL5-L/43a/155 |
|---|---|---|---|---|---|
| Signal output | 2 NPN complementary , overvoltage protected | ● | | ● | |
| | 2 PNP complementary , overvoltage protected | | ● | | ● |
| Connection | 4-pin flat connector | | | ● | ● |
| | 2 m PVC cable, 4 x 0.09 mm² | ● | ● | | |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 15.5 |
| Width W [mm] | 6.4 |
| Height H [mm] | 13.4 |
| Fork width G [mm] | 5 |

## Properties

- Single beam type
- Rectangular nano housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and solder pin versions
- Infrared light

## Benefits

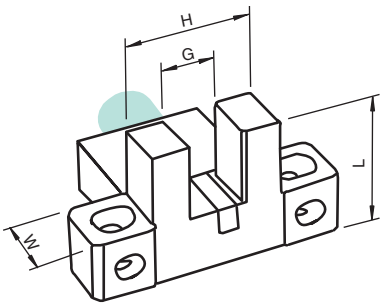
- High positioning accuracy

## Accessories

These and more accessories can be found in chapter 10

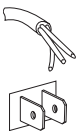
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CBL SET GL5** | Connection cable for GL5 series |

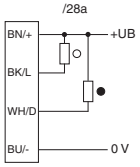



## Electrical Connection

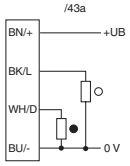
❍ = light on, ● = dark on



GL5-L/28a/115
GL5-L/28a/155




GL5-L/43a/115
GL5-L/43a/155

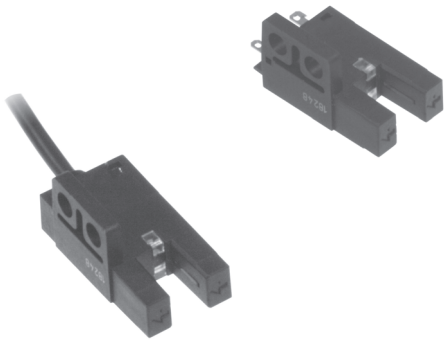






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CE

## Properties

- Single beam type
- Rectangular nano housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and solder pin versions
- Infrared light

## Benefits

- High positioning accuracy

## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Light/dark adjustment | ✔ |
| Fork width | 5 mm |
| Light source | IRED |
| Light type | Infrared, continuous light , 940 nm |
| Target size | 0.8 x 1.8 mm |
| Operating voltage | 5 ... 24 V DC |
| No-load supply current | max. 20 mA |
| Switching type | light/dark on |
| Switching current | max. 50 mA |
| Switching frequency | max. 5 kHz |
| Repeat accuracy | 0.03 mm |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Housing | PBT |
| Protection degree | IP40 |

| Model Number | | GL5-R/28a/115 | GL5-R/43a/115 | GL5-R/28a/155 | GL5-R/43a/155 |
|---|---|---|---|---|---|
| Signal output | 2 NPN complementary , overvoltage protected | ● | | ● | |
| | 2 PNP complementary , overvoltage protected | | ● | | ● |
| Connection | 4-pin flat connector | | | ● | ● |
| | 2 m PVC cable, 4 x 0.09 mm² | ● | ● | | |
| | |  | |  | |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

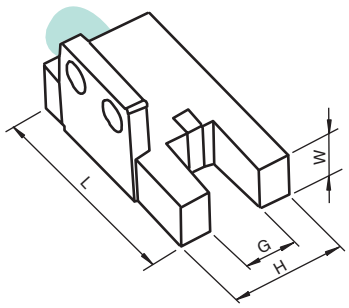
| Dimensions | | |
|---|---|---|
| Length L [mm] | 26.2 | 22.2 |
| Width W [mm] | 6.4 | |
| Height H [mm] | 13.4 | |
| Fork width G [mm] | 5 | |

## Accessories

**These and more accessories can be found in chapter 10**

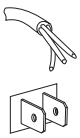
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CBL SET GL5** | Connection cable for GL5 series |

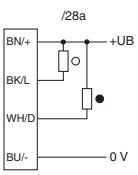



## Electrical Connection

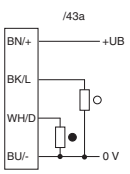
❍ = light on, ● = dark on



GL5-R/28a/115
GL5-R/28a/155

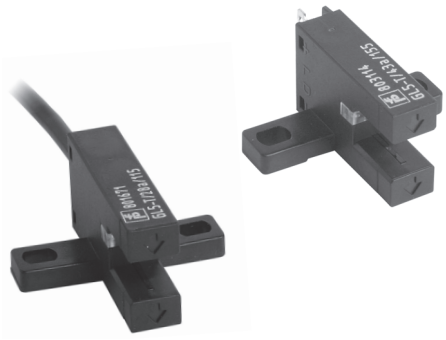



GL5-R/43a/115
GL5-R/43a/155






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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Light/dark adjustment | ✔ |
| Fork width | 5 mm |
| Light source | IRED |
| Light type | Infrared, continuous light , 940 nm |
| Target size | 0.8 x 1.8 mm |
| Operating voltage | 5 ... 24 V DC |
| No-load supply current | max. 20 mA |
| Switching type | light/dark on |
| Switching current | max. 50 mA |
| Switching frequency | max. 5 kHz |
| Repeat accuracy | 0.03 mm |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Housing | PBT |
| Protection degree | IP40 |

| Model Number | | GL5-T/28a/115 | GL5-T/43a/115 | GL5-T/28a/155 | GL5-T/43a/155 |
|---|---|---|---|---|---|
| Signal output | 2 NPN complementary , overvoltage protected | ● | | ● | |
| | 2 PNP complementary , overvoltage protected | | ● | | ● |
| Connection | 4-pin flat connector | | | ● | ● |
| | 2 m PVC cable, 4 x 0.09 mm² | ● | ● | | |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | | |
|---|---|---|
| Length L [mm] | 26.2 | 22.2 |
| Width W [mm] | 6.4 | |
| Height H [mm] | 13.4 | |
| Fork width G [mm] | 5 | |

## Properties

- Single beam type
- Rectangular nano housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and solder pin versions
- Infrared light

## Benefits

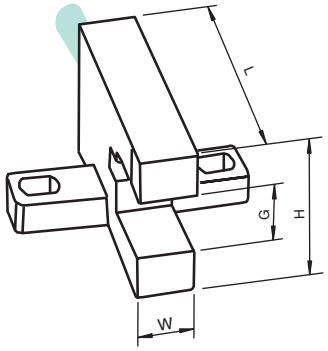
- High positioning accuracy

## Accessories

**These and more accessories can be found in chapter 10**

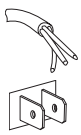
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CBL SET GL5** | Connection cable for GL5 series |

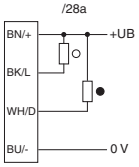



## Electrical Connection

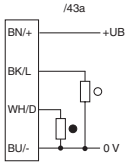
❍ = light on, ● = dark on



GL5-T/28a/115
GL5-T/28a/155




GL5-T/43a/115
GL5-T/43a/155

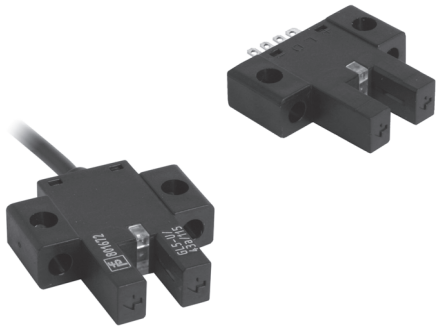






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CE

## Properties

- Single beam type
- Rectangular nano housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and solder pin versions
- Infrared light

## Benefits

- High positioning accuracy

## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Light/dark adjustment | ✔ |
| Fork width | 5 mm |
| Light source | IRED |
| Light type | Infrared, continuous light , 940 nm |
| Target size | 0.8 x 1.8 mm |
| No-load supply current | max. 20 mA |
| Switching type | light/dark on |
| Switching current | max. 50 mA |
| Switching frequency | max. 5 kHz |
| Repeat accuracy | 0.03 mm |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Housing | PBT |
| Protection degree | IP40 |

| Model Number | | GL5-U/28a/115 | GL5-U/43a/115 | GL5-U/28a/155 | GL5-U/43a/155 |
|---|---|---|---|---|---|
| Operating voltage | 5 ... 24 V DC | ● | | ● | ● |
| | 5 ... 24 V DC, class 2 | | ● | | |
| Signal output | 2 NPN complementary , overvoltage protected | ● | | ● | |
| | 2 PNP complementary , overvoltage protected | | ● | | ● |
| Connection | 4-pin flat connector | | | ● | ● |
| | 2 m PVC cable, 4 x 0.09 mm² | ● | ● | | |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

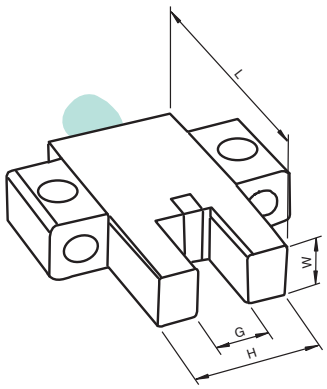
| Dimensions | | |
|---|---|---|
| Length L [mm] | 26.2 | 22.2 |
| Width W [mm] | 6.4 | |
| Height H [mm] | 13.4 | |
| Fork width G [mm] | 5 | |

## Accessories

**These and more accessories can be found in chapter 10**

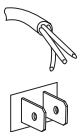
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CBL SET GL5** | Connection cable for GL5 series |

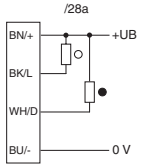



## Electrical Connection

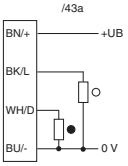
❍ = light on, ● = dark on



GL5-U/28a/115
GL5-U/28a/155

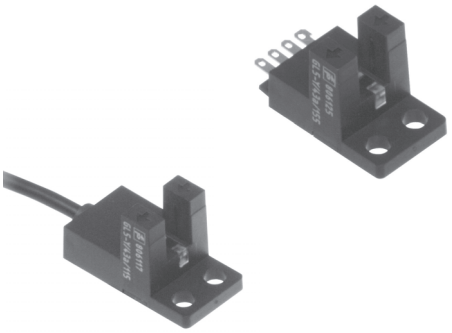



GL5-U/43a/115
GL5-U/43a/155






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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Light/dark adjustment | ✔ |
| Fork width | 5 mm |
| Light source | IRED |
| Light type | Infrared, continuous light , 940 nm |
| Target size | 0.8 x 1.8 mm |
| Operating voltage | 5 ... 24 V DC |
| No-load supply current | max. 20 mA |
| Switching type | light/dark on |
| Switching current | max. 50 mA |
| Switching frequency | max. 5 kHz |
| Repeat accuracy | 0.03 mm |
| Ambient temperature | -25 ... 55 °C (-13 ... 131 °F) |
| Housing | PBT |
| Protection degree | IP40 |

| Model Number | | GL5-Y/28a/115 | GL5-Y/43a/115 | GL5-Y/28a/155 | GL5-Y/43a/155 |
|---|---|---|---|---|---|
| Signal output | 2 NPN complementary , overvoltage protected | ● | | ● | |
| | 2 PNP complementary , overvoltage protected | | ● | | ● |
| Connection | 4-pin flat connector | | | ● | ● |
| | 2 m PVC cable, 4 x 0.09 mm² | ● | ● | | |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 15.5 |
| Width W [mm] | 6.4 |
| Height H [mm] | 13.4 |
| Fork width G [mm] | 5 |

## Properties

- Single beam type
- Rectangular nano housing
- Plastic housing
- DC sensor
- Discrete output
- Cable and solder pin versions
- Infrared light

## Benefits

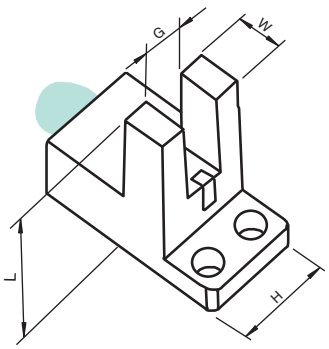
- High positioning accuracy

## Accessories

**These and more accessories can be found in chapter 10**

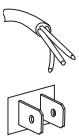
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **CBL SET GL5** | Connection cable for GL5 series |

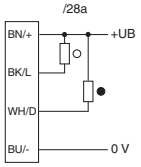



## Electrical Connection

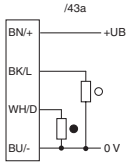
❍ = light on, ● = dark on



GL5-Y/28a/115
GL5-Y/28a/155




GL5-Y/43a/115
GL5-Y/43a/155







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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Light source | LED , 640 nm pulsing |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 30 mA |
| Switching type | light/dark on |
| Switching current | max. 100 mA |
| Switching frequency | 2000 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC |
| Optical face | plastic |
| Protection degree | IP67 |
| Connection | M8 connector, 3-pin |

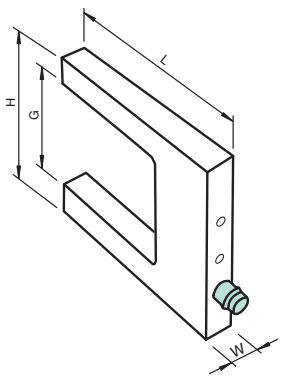


| Model Number | | GLP30-RT/40b/102/156 | GLP30-RT/40b/103/156 | GLP50-RT/40b/102/156 | GLP50-RT/40b/103/156 | GLP80-RT/40b/102/156 | GLP80-RT/40b/103/156 | GLP120-RT/40b/102/156 | GLP120-RT/40b/103/156 |
|---|---|---|---|---|---|---|---|---|---|
| Fork width | 120 mm | | | | | | | ● | ● |
| | 30 mm | ● | ● | | | | | | |
| | 50 mm | | | ● | ● | | | | |
| | 80 mm | | | | | ● | ● | | |
| Signal output | 1 NPN short-circuit protected, reverse polarity protected, open collector | ● | | ● | | ● | | ● | |
| | 1 PNP, short-circuit protected, reverse polarity protected, open collector | | ● | | ● | | ● | | ● |
| **Approvals and Certificates** | | | | | | | | | |
| UL approval | cULus | ● | ● | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | | | |

| Dimensions | | | | | |
|---|---|---|---|---|---|
| Length L [mm] | 59.5 | 79.5 | | | |
| Width W [mm] | 10 | | | | |
| Height H [mm] | 50 | 70 | 100 | 140 | |
| Fork width G [mm] | 30 | 50 | 80 | 120 | |

## Properties

- Single beam type
- Rectangular compact housing
- Plastic housing
- DC sensor
- Discrete output
- Connector version
- Visible red light




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-K03** | dove tail mounting clamp |
| **V3-GM-BK2M-PUR-U** | Female cordset, M8, 3-pin, PUR cable, straight |
| **V3-WM-BK2M-PUR-U** | Female cordset, M8, 3-pin, PUR cable, angled |

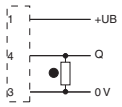
## Electrical Connection

❍ = light on, ● = dark on



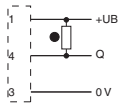
GLP120-RT/40b/103/156
GLP30-RT/40b/103/156
GLP50-RT/40b/103/156
GLP80-RT/40b/103/156

Option 40b/103/156




GLP120-RT/40b/102/156
GLP30-RT/40b/102/156
GLP50-RT/40b/102/156
GLP80-RT/40b/102/156

Option 40b/102/156







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

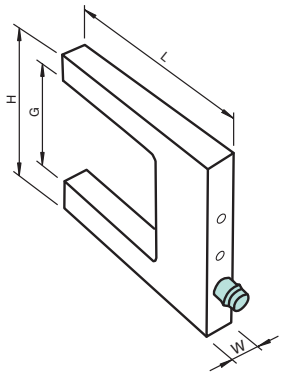
| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Light source | LED , 640 nm pulsing |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC |
| No-load supply current | ≤ 30 mA |
| Switching type | light/dark on |
| Switching current | max. 100 mA |
| Switching frequency | 2000 Hz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | PC |
| Optical face | plastic |
| Protection degree | IP67 |
| Connection | M8 connector, 4-pin |



## Properties

- Single beam type
- Rectangular compact housing
- Plastic housing
- DC sensor
- Discrete output
- Connector version
- Infrared light

| Model Number | | GLP30-RT/40b/102/123/143 | GLP30-RT/40b/103/123/143 | GLP50-RT/40b/102/123/143 | GLP50-RT/40b/103/123/143 | GLP80-RT/40b/102/123/143 | GLP80-RT/40b/103/123/143 | GLP120-RT/40b/102/123/143 | GLP120-RT/40b/103/123/143 |
|---|---|---|---|---|---|---|---|---|---|
| Fork width | 120 mm | | | | | | | ● | ● |
| | 30 mm | ● | ● | | | | | | |
| | 50 mm | | | ● | ● | | | | |
| | 80 mm | | | | | ● | ● | | |
| Signal output | 1 NPN short-circuit protected, reverse polarity protected, open collector | ● | | ● | | ● | | ● | |
| | 1 PNP, short-circuit protected, reverse polarity protected, open collector | | ● | | ● | | ● | | ● |
| **Approvals and Certificates** | | | | | | | | | |
| UL approval | cULus | ● | ● | ● | ● | ● | ● | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | | | | | | | |
| **Dimensions** | | | | | | | | | |
| Length L [mm] | | 59.5 | | 79.5 | | | | | |
| Width W [mm] | | 10 | | | | | | | |
| Height H [mm] | | 50 | | 70 | | 100 | | 140 | |
| Fork width G [mm] | | 30 | | 50 | | 80 | | 120 | |




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-K03** | dove tail mounting clamp |
| **V31-GM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, straight |
| **V31-WM-BK2M-PUR-U** | Female cordset, M8, 4-pin, PUR cable, angled |

## Electrical Connection

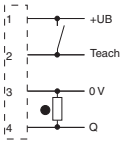
❍ = light on, ● = dark on



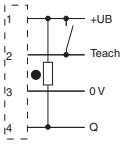
GLP120-RT/40b/103/123/143
GLP30-RT/40b/103/123/143
GLP50-RT/40b/103/123/143
GLP80-RT/40b/103/123/143

GLP120-RT/40b/102/123/143
GLP30-RT/40b/102/123/143
GLP50-RT/40b/102/123/143
GLP80-RT/40b/102/123/143

Option /40b/102/123/143




Option /40b/102/123/143







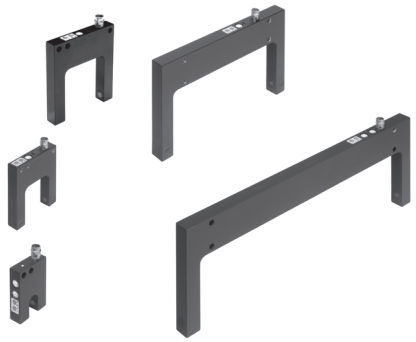
Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Light source | LED |
| Light type | modulated visible red light |
| Operating voltage | 10 ... 30 V DC, class 2 |
| No-load supply current | ≤ 15 mA |
| Signal output | 1 PNP, short-circuit protected, open collector |
| Switching type | light/dark on |
| Switching current | max. 100 mA |
| Switching frequency | 3 kHz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Protection degree | IP67 |
| Connection | M8 connector, 3-pin |



| Model Number | | GL10-RT/32/40a/98a | GL20-RT/32/40a/98a | GL30-RT/32/40a/98a | GL40-RT/32/40a/98a | GL50-RT/32/40a/98a | GL80-RT/32/40a/98a | GL121-RT/32/40a/98a | GL220-RT/32/40a/98a |
|---|---|---|---|---|---|---|---|---|---|
| Fork width | 10 mm | ● | | | | | | | |
| | 20 mm | | ● | | | | | | |
| | 30 mm | | | ● | | | | | |
| | 40 mm | | | | ● | | | | |
| | 50 mm | | | | | ● | | | |
| | 80 mm | | | | | | ● | | |
| | 121 mm | | | | | | | ● | |
| | 220 mm | | | | | | | | ● |
| Target size | 0.3 mm | ● | ● | ● | ● | ● | ● | ● | |
| | 0.5 mm | | | | | | | | ● |
| Material | | | | | | | | | |
| Housing | black anodized aluminium | ● | ● | | ● | | | | ● |
| | powder coated diecast zinc | | | ● | | ● | ● | ● | |
| Optical face | glass | ● | ● | ● | ● | ● | ● | ● | ● |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

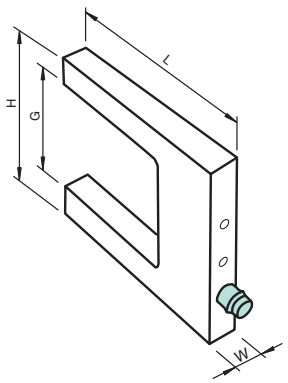
| Dimensions | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Length L [mm] | 46 | 46 | 60 | 70 | 80 | 80 | 90 | 90 |
| Width W [mm] | 10 | | | | | | 12 | |
| Height H [mm] | 30 | 40 | 50 | 60 | 70 | 100 | 145 | 244 |
| Fork width G [mm] | 10 | 20 | 30 | 40 | 50 | 80 | 121 | 220 |

## Properties

- Single beam type
- Rectangular compact housing
- Die-cast zinc and aluminium housing versions
- DC sensor
- Discrete output
- Connector version
- Visible red light

## Benefits

- Optimized for small part detection
- No cross-talk for side by side mounting
- Suitable for high speed processes




## Accessories

**These and more accessories can be found in chapter 10**
**See pages from 970 ... for cordsets  See pages 1066 ... for mounting accessories**

| | |
|---|---|
| **V3-GM-BK2M-PUR-U** | Female cordset, M8, 3-pin, PUR cable, straight |
| **V3-WM-BK2M-PUR-U** | Female cordset, M8, 3-pin, PUR cable, angled |

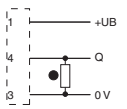
## Electrical Connection

❍ = light on, ● = dark on



GL10-RT/32/40a/98a
GL20-RT/32/40a/98a
GL30-RT/32/40a/98a
GL50-RT/32/40a/98a
GL80-RT/32/40a/98a
GL121-RT/32/40a/98a
GL220-RT/32/40a/98a
GL40-RT/32/40a/98a

Option 32/40a/98a





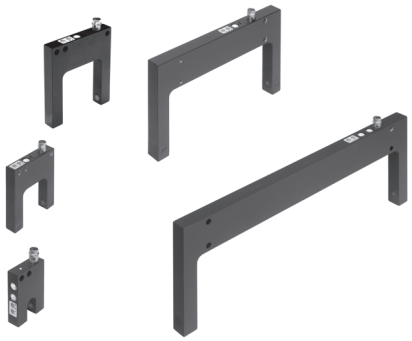


Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Sensitivity adjustment | ✔ |
| Light/dark switch | ✔ |
| Light type | modulated infrared light |
| Light source | IRED |
| Operating voltage | 10 ... 30 V DC, class 2 |
| No-load supply current | ≤ 15 mA |
| Signal output | 1 PNP, short-circuit protected, open collector |
| Switching type | light/dark on |
| Switching current | max. 100 mA |
| Switching frequency | 2 kHz |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Protection degree | IP67 |
| Connection | M8 connector, 3-pin |



| Model Number | | GL10-IR/32/40a/98a | GL20-IR/32/40a/98a | GL30-IR/32/40a/98a | GL40-IR/32/40a/98a | GL50-IR/32/40a/98a | GL80-IR/32/40a/98a | GL121-IR/32/40a/98a | GL220-IR/32/40a/98a |
|---|---|---|---|---|---|---|---|---|---|
| Fork width | 10 mm | ● | | | | | | | |
| | 20 mm | | ● | | | | | | |
| | 30 mm | | | ● | | | | | |
| | 40 mm | | | | ● | | | | |
| | 50 mm | | | | | ● | | | |
| | 80 mm | | | | | | ● | | |
| | 121 mm | | | | | | | ● | |
| | 220 mm | | | | | | | | ● |
| Target size | 0.3 mm | ● | ● | ● | ● | ● | ● | ● | |
| | 0.5 mm | | | | | | | | ● |
| Material | | | | | | | | | |
| Housing | black anodized aluminium | ● | ● | | ● | | | | ● |
| | powder coated diecast zinc | | | ● | | ● | ● | ● | |
| Optical face | glass | ● | ● | ● | ● | ● | ● | ● | ● |

| Approvals and Certificates | |
|---|---|
| CCC approval | Products with a maximum operating voltage of ≤36 V do not bear a CCC marking because they do not require approval. |

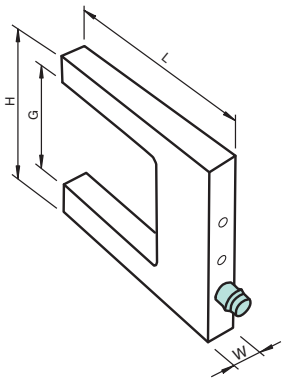
| Dimensions | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Length L [mm] | 46 | 46 | 60 | 70 | 80 | 80 | 90 | 90 |
| Width W [mm] | 10 | | | | | | 12 | |
| Height H [mm] | 30 | 40 | 50 | 60 | 70 | 100 | 145 | 244 |
| Fork width G [mm] | 10 | 20 | 30 | 40 | 50 | 80 | 121 | 220 |

## Properties

- Single beam type
- Rectangular compact housing
- Die-cast zinc and aluminium housing versions
- DC sensor
- Discrete output
- Connector version
- Infrared light

## Benefits

- Optimized for small part detection
- No cross-talk for side by side mounting
- Suitable for high speed processes




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets  See pages 1066 ... for mounting accessories

| | |
|---|---|
| **V3-GM-BK2M-PUR-U** | Female cordset, M8, 3-pin, PUR cable, straight |
| **V3-WM-BK2M-PUR-U** | Female cordset, M8, 3-pin, PUR cable, angled |

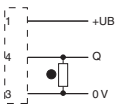
## Electrical Connection

❍ = light on, ● = dark on



GL20-IR/32/40a/98a
GL30-IR/32/40a/98a
GL50-IR/32/40a/98a
GL10-IR/32/40a/98a
GL80-IR/32/40a/98a
GL121-IR/32/40a/98a
GL220-IR/32/40a/98a
GL40-IR/32/40a/98a

Option 32/40a/98a







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



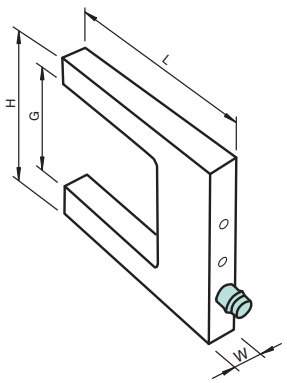
CE

## Properties

- Array type
- Rectangular compact housing
- Aluminium housing
- DC sensor
- Discrete output
- Connector version
- Infrared light

## Benefits

- Detecting randomly-positioned or falling objects
- Automatic suppression of stationary machine parts in the detection area




## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Timer function | ✔ |
| Sensitivity adjustment | ✔ |
| Light source | IRED |
| Light type | modulated infrared light |
| Operating voltage | 24 V DC ± 20 % |
| No-load supply current | < 70 mA |
| Signal output | 1 PNP output, short-circuit protected, protected from reverse polarity, open collector |
| Switching type | dark on |
| Switching current | 200 mA |
| Switching frequency | 5000 Hz |
| Repeat accuracy | 0.1 mm |
| Pulse extension | 0.1 ... 150 ms |
| Ambient temperature | -10 ... 60 °C (14 ... 140 °F) |
| Material | |
| Housing | black anodized aluminium |
| Optical face | glass |
| Protection degree | IP67 |
| Connection | M8 connector, 3-pin |



| Model Number | | RAL50-IR/32/98 | RAL70-IR/32/98 | RAL100-IR/32/98 | RAL150-IR/32/98 |
|---|---|---|---|---|---|
| Fork width | 50 mm | ● | | | |
| | 70 mm | | ● | | |
| | 100 mm | | | ● | |
| | 150 mm | | | | ● |
| active zone | 35 mm x 50 mm | ● | | | |
| | 70 mm x 64 mm | | ● | | |
| | 100 mm x 94 mm | | | ● | |
| | 150 mm x 144 mm | | | | ● |
| Resolution | 0.5 mm | ● | | | |
| | 1 mm | | ● | | |
| | 2 mm | | | ● | |
| | 3 mm | | | | ● |

| Dimensions | | | | | |
|---|---|---|---|---|---|
| Length L [mm] | 81 | 105 | 135 | 185 |
| Width W [mm] | 20 | | | |
| Height H [mm] | 90 | 110 | 140 | 190 |
| Fork width G [mm] | 50 | 70 | 100 | 150 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| V3-GM-BK2M-PUR-U | Female cordset, M8, 3-pin, PUR cable |
| V3-WM-BK2M-PUR-U | Female cordset, M8, 3-pin, PUR cable |

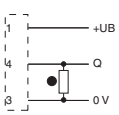
## Electrical Connection

❍ = light on, ● = dark on



RAL100-IR/32/98
RAL150-IR/32/98
RAL50-IR/32/98
RAL70-IR/32/98

Option 32/98





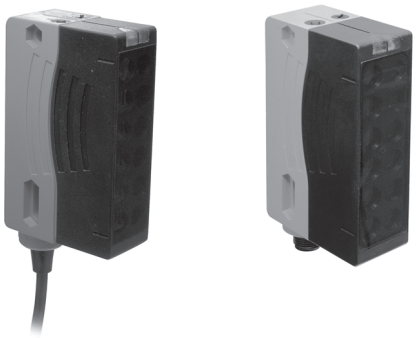


Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 3 | BU | (blue) |
| 4 | BK | (black) |



Refer to General Notes Relating to Product Information
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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Light/dark switch | ✔ |
| Teach-In | ✔ |
| 4-in-1 output | ✔ |
| Threshold detection range | 5.6 m |
| Effective detection range | 0 ... 4 m |
| Detection area height | typical 60 mm |
| Reference target | H85-2 reflector , Foil reflector OFR-100/100 |
| Light type | modulated visible red light , 625 nm |
| Operating voltage | 12 ... 30 V DC<br>Power from Class 2 Power Source |
| Signal output | 2 Push-pull (4 in 1) outputs, complementary, short-circuit proof, reverse polarity protected |
| Switching type | light/dark on, switchable |
| Switching current | max. 100 mA |
| Number of beams | 6 |
| Response time | 1 ms |
| Ambient temperature | -30 ... 60 °C (-22 ... 140 °F) |
| Material | |
| Housing | Plastic ABS |
| Optical face | Plastic pane |
| Protection degree | IP67 |

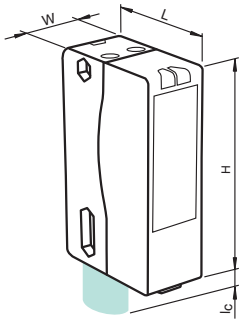
| Model Number | | RLG28-55/40a/115b/136 | RLG28-55/40a/73c/136 |
|---|---|---|---|
| Connection | 300 mm fixed cable with M12 x 1, 4-pin connector | ● | |
| | connector M12 x 1, 4-pin | | ● |
| **Approvals and Certificates** | | | |
| Protection class | II | ● | ● |
| UL approval | cULus Listed, Class 2 Power Source | ● | ● |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V | | |
| **Dimensions** | | | |
| Length L [mm] | | 54.4 | |
| Width W [mm] | | 25.8 | |
| Height H [mm] | | 90 | |
| Connector length $l_c$ [mm] | | 12 | 5.5 |

## Properties

- Retro-reflective area sensor
- Self-contained
- Resolution 12 mm
- Parallel light beams
- Discrete output
- Pigtailed connector and connector versions

## Benefits

- Reliable detection of the front edge of the object regardless of its shape and position
- Reliable detection of all surfaces regardless of the object texture
- Consistently detects objects as small as 12 mm within the entire detection area (60 mm)
- Use in low temperature environments down to -30°C




## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-05** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-07** | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
| **OMH-21** | Mounting bracket |
| **OMH-RLK29-HW** | Mounting bracket for rear wall mounting |
| **OMH-K01** | dove tail mounting clamp |
| **REF-H85-2** | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes |
| **V1-G-2M-PVC** | Female cordset, M12, 4-pin, PVC cable |
| **V1-G-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable |
| **V1-W-BK2M-PUR-U** | Female cordset, M12, 4-pin, PUR cable |

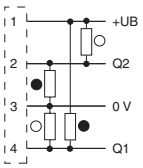
## Electrical Connection

❍ = light on, ● = dark on



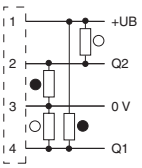
RLG28-55/40a/73c/136

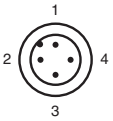
Option /73c/136




RLG28-55/40a/115b/136

Option /115b/136



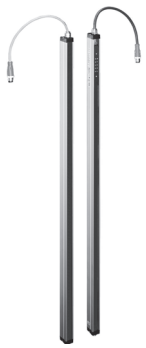

Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |





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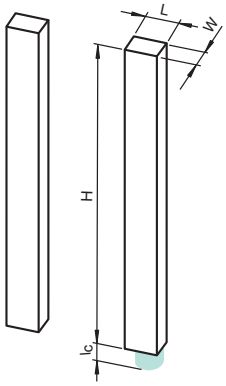
## Properties

- Emitter / receiver set
- Self-contained
- Resolution 8 mm
- Capable of 3-way beam crossover
- Discrete output and IO-Link
- Pigtailed connector

## Benefits

- Can uniquely identify an object or gap
- Software-free configuration via Touch-Field
- Standby mode reduces power consumption
- Versions for use in low temperature environments down to -30°C

To configure a specific model, please refer to the LGS8 data sheet on our website: **www.pepperl-fuchs.us**.




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | LGS8 Series |
|---|---|
| Light/dark adjustment | ✔ |
| Test / Teach-In / Function inputs | ✔ |
| 4-in-1 output | ✔ |
| Weak signal output | ✔ |
| Threshold detection range | Standard : 7.5 m (Option /35: 10 m) |
| Effective detection range | Standard : 0.3 ... 6 m (Option /35: 0.5 ... 8 m) |
| Light type | modulated infrared light , 850 nm |
| Field height | 100 mm ... 2100 mm in steps of 100 mm (see data sheet) |
| Beam spacing | 8.33 mm |
| Optical resolution | without beam crossover: 8 mm<br>with beam crossover: 4 mm within 25% and 75% of the range |
| Beam crossover | Factory setting: 3-way, deactivateable |
| Beam blanking | adjustable max. 2 fixed suppressible beam areas (blanking) |
| Number of beams | 13 ... 253, depending on field height (see data sheet) |
| Operating voltage | 18 ... 30 V DC |
| Interface type | IO-Link |
| Mode | COM 2 (38.4 kBaud) |
| Signal output | Switch output (detection field C/Q) 1 push-pull output, short-circuit protected, reverse polarity protected on pin 4 (receiver),<br>Height monitoring (H1, H2. H3) 3 Push-pull outputs, short-circuit proof, reverse polarity protected on pin 5, pin 6, pin 7 (receiver) |
| Switching type | Factory setting: dark ON , Switchable to light ON mode |
| Switching current | max. 100 mA |
| Response time | 3 ms ... 20 ms, depending on number of beams (see data sheet) |
| Timer function | Off-delay programmable from 0 ... 1.25 s in 5 ms steps (adjustment via IO-Link only) |
| Weak signal output | Stability Control (SC) 1 PNP, short-circuit protected, reverse polarity protected on pin 2 (receiver) |
| Test input | Emitter switch-off with +UB or 0 V at pin 4 (emitter) |
| Function input | Range input activation from 1.6 m (or 2 m in case of option /35)<br>Teach-in input for programming on pin 8 (receiver) |
| Ambient temperature | Standard : -10 ... 60 °C (14 ... 140 °F)<br>Option /146: -30 ... 60 °C (-22 ... 140 °F) |
| Material | |
| Housing | extruded aluminum section , Silver anodized |
| Optical face | Plastic pane , Polycarbonate |
| Protection degree | IP67 |
| Connection | Emitter: 200 mm connecting cable with 4-pin, M12x1 connector<br>Receiver: 200 mm connecting cable with 8-pin, M12 x 1 connector |



| Approvals and Certificates | |
|---|---|
| Protection class | III ( IEC 61140 ) |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 30.5 |
| Width W [mm] | 20 |
| Height H [mm] | 259 ... 2259 |
| Connector length $l_c$ [mm] | 25 |

## Accessories

**These and more accessories can be found in chapter 10**

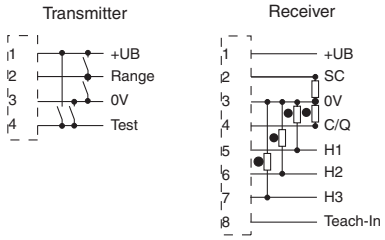
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

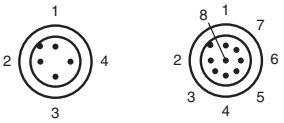
| | |
|---|---|
| **OMH-LGS-01** | Attachment aid for light grid series LGS |
| **OMH-SLCT-01** | Quick clamp and adjustment system |
| **OMH-SLCT-03** | Mounting bracket including adjustment |
| **OMH-SLCT-04** | Mounting bracket including adjustment (with loose bearing) |
| **OMH-SLCT-05** | Mounting bracket including adjustment |
| **AA SLCT-01** | Profile alignment aid |
| **V19-G-BK2M-PUR-U** | Female cordset M12, 8-pin, 2 m cable PUR, straight |
| **V1-G-BK2M-PUR-U** | Female cordset M12, 4-pin, 2 m cable PUR, straight |

## Electrical Connection

❍ = light on, ● = dark on








Refer to General Notes Relating to Product Information
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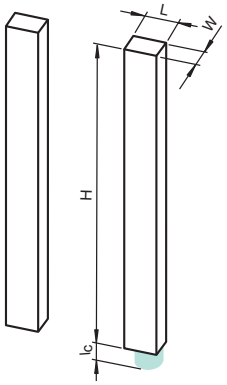
## Properties

- Emitter / receiver set
- Self-contained
- Resolution 17 mm
- Capable of 3-way beam crossover
- Discrete output and IO-Link
- Pigtailed connector

## Benefits

- Can uniquely identify an object or gap
- Software-free configuration via Touch-Field
- Standby mode reduces power consumption
- Versions for use in low temperature environments down to -30°C

To configure a specific model, please refer to the LGS17 data sheet on our website: **www.pepperl-fuchs.us**.




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | LGS17 Series |
|---|---|
| Light/dark adjustment | ✔ |
| Test / Teach-In / Function inputs | ✔ |
| 4-in-1 output | ✔ |
| Weak signal output | ✔ |
| Threshold detection range | Standard : 7.5 m (Option /35: 10 m) |
| Effective detection range | Standard : 0.3 ... 6 m (Option /35: 0.5 ... 8 m) |
| Light type | modulated infrared light , 850 nm |
| Field height | 100 mm ... 3200 mm in steps of 100 mm (see data sheet) |
| Beam spacing | 16.67 mm |
| Optical resolution | without beam crossover: 17 mm<br>with beam crossover: 8.5 mm within 25% and 75% of the range |
| Beam crossover | Factory setting: 3-way, deactivateable |
| Beam blanking | adjustable max. 2 fixed suppressible beam areas (blanking) |
| Number of beams | 7 ... 193, depending on field height (see data sheet) |
| Operating voltage | 18 ... 30 V DC |
| Interface type | IO-Link |
| Mode | COM 2 (38.4 kBaud) |
| Signal output | Switch output (detection field C/Q) 1 push-pull output, short-circuit protected, reverse polarity protected on pin 4 (receiver),<br>Height monitoring (H1, H2. H3) 3 Push-pull outputs, short-circuit proof, reverse polarity protected on pin 5, pin 6, pin 7 (receiver) |
| Switching type | Factory setting: dark ON , Switchable to light ON mode |
| Switching current | max. 100 mA |
| Response time | 2 ms ... 16 ms, depending on number of beams (see data sheet) |
| Timer function | Off-delay programmable from 0 ... 1.25 s in 5 ms steps (adjustment via IO-Link only) |
| Weak signal output | Stability Control (SC) 1 PNP, short-circuit protected, reverse polarity protected on pin 2 (receiver) |
| Test input | Emitter switch-off with +UB or 0 V at pin 4 (emitter) |
| Function input | Range input activation from 1.6 m (or 2 m in case of option /35)<br>Teach-in input for programming on pin 8 (receiver) |
| Ambient temperature | Standard : -10 ... 60 °C (14 ... 140 °F)<br>Option /146: -30 ... 60 °C (-22 ... 140 °F) |
| Material | |
| Housing | extruded aluminum section , Silver anodized |
| Optical face | Plastic pane , Polycarbonate |
| Protection degree | IP67 |
| Connection | Emitter: 200 mm connecting cable with 4-pin, M12x1 connector<br>Receiver: 200 mm connecting cable with 8-pin, M12 x 1 connector |



| Approvals and Certificates | |
|---|---|
| Protection class | III ( IEC 61140 ) |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 30.5 |
| Width W [mm] | 20 |
| Height H [mm] | 259 ... 3359 |
| Connector length $l_c$ [mm] | 25 |

## Accessories

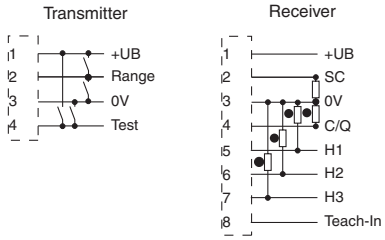
**These and more accessories can be found in chapter 10**
**See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories**

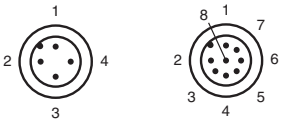
| | |
|---|---|
| **OMH-LGS-01** | Attachment aid for light grid series LGS |
| **OMH-SLCT-01** | Quick clamp and adjustment system |
| **OMH-SLCT-03** | Mounting bracket including adjustment |
| **OMH-SLCT-04** | Mounting bracket including adjustment (with loose bearing) |
| **OMH-SLCT-05** | Mounting bracket including adjustment |
| **AA SLCT-01** | Profile alignment aid |
| **V19-G-BK2M-PUR-U** | Female cordset M12, 8-pin, 2 m cable PUR, straight |
| **V1-G-BK2M-PUR-U** | Female cordset M12, 4-pin, 2 m cable PUR, straight |

## Electrical Connection

❍ = light on, ● = dark on



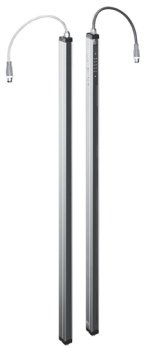






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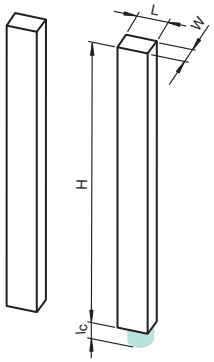
## Properties

- Emitter / receiver set
- Self-contained
- Resolution 25 mm
- Capable of 3-way beam crossover
- Discrete output and IO-Link
- Pigtailed connector

## Benefits

- Can uniquely identify an object or gap
- Software-free configuration via Touch-Field
- Standby mode reduces power consumption
- Versions for use in low temperature environments down to -30°C

To configure a specific model, please refer to the LGS25 data sheet on our website: **www.pepperl-fuchs.us**.




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | LGS25 Series |
|---|---|
| Light/dark adjustment | ✔ |
| Test / Teach-In / Function inputs | ✔ |
| 4-in-1 output | ✔ |
| Weak signal output | ✔ |
| Threshold detection range | Standard : 7.5 m (Option /35: 10 m) |
| Effective detection range | Standard : 0.3 ... 6 m (Option /35: 0.5 ... 8 m) |
| Light type | modulated infrared light , 850 nm |
| Field height | 100 mm ... 3200 mm in steps of 100 mm (see data sheet) |
| Beam spacing | 25 mm |
| Optical resolution | without beam crossover: 25 mm<br>with beam crossover: 12.5 mm within 25% and 75% of the range |
| Beam crossover | Factory setting: 3-way, deactivateable |
| Beam blanking | adjustable max. 2 fixed suppressible beam areas (blanking) |
| Number of beams | 4 ... 129, depending on field height (see data sheet) |
| Operating voltage | 18 ... 30 V DC |
| Interface type | IO-Link |
| Mode | COM 2 (38.4 kBaud) |
| Signal output | Switch output (detection field C/Q) 1 push-pull output, short-circuit protected, reverse polarity protected on pin 4 (receiver),<br>Height monitoring (H1, H2. H3) 3 Push-pull outputs, short-circuit proof, reverse polarity protected on pin 5, pin 6, pin 7 (receiver) |
| Switching type | Factory setting: dark ON , Switchable to light ON mode |
| Switching current | max. 100 mA |
| Response time | 2 ms ... 12 ms, depending on number of beams (see data sheet) |
| Timer function | Off-delay programmable from 0 ... 1.25 s in 5 ms steps (adjustment via IO-Link only) |
| Weak signal output | Stability Control (SC) 1 PNP, short-circuit protected, reverse polarity protected on pin 2 (receiver) |
| Test input | Emitter switch-off with +UB or 0 V at pin 4 (emitter) |
| Function input | Range input activation from 1.6 m (or 2 m in case of option /35)<br>Teach-in input for programming on pin 8 (receiver) |
| Ambient temperature | Standard : -10 ... 60 °C (14 ... 140 °F)<br>Option /146: -30 ... 60 °C (-22 ... 140 °F) |
| Material | |
| Housing | extruded aluminum section , Silver anodized |
| Optical face | Plastic pane , Polycarbonate |
| Protection degree | IP67 |
| Connection | Emitter: 200 mm connecting cable with 4-pin, M12x1 connector<br>Receiver: 200 mm connecting cable with 8-pin, M12 x 1 connector |



| Approvals and Certificates | |
|---|---|
| Protection class | III ( IEC 61140 ) |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 30.5 |
| Width W [mm] | 20 |
| Height H [mm] | 259 ... 3359 |
| Connector length $l_c$ [mm] | 25 |

## Accessories

**These and more accessories can be found in chapter 10**

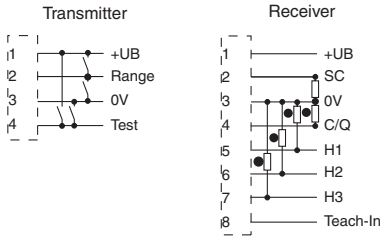
**See pages from 970 ... for cordsets** **See pages 1066 ... for mounting accessories**

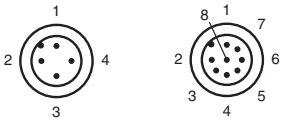
| | |
|---|---|
| **OMH-LGS-01** | Attachment aid for light grid series LGS |
| **OMH-SLCT-01** | Quick clamp and adjustment system |
| **AA SLCT-01** | Profile alignment aid |
| **OMH-SLCT-04** | Mounting bracket including adjustment (with loose bearing) |
| **OMH-SLCT-05** | Mounting bracket including adjustment |
| **OMH-SLCT-03** | Mounting bracket including adjustment |
| **V19-G-BK2M-PUR-U** | Female cordset M12, 8-pin, 2 m cable PUR, straight |
| **V1-G-BK2M-PUR-U** | Female cordset M12, 4-pin, 2 m cable PUR, straight |

## Electrical Connection

❍ = light on, ● = dark on

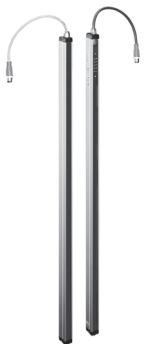







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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | LGS50 Series |
|---|---|
| Light/dark adjustment | ✔ |
| Test / Teach-In / Function inputs | ✔ |
| 4-in-1 output | ✔ |
| Weak signal output | ✔ |
| Threshold detection range | Standard : 7.5 m (Option /35: 10 m) |
| Effective detection range | Standard : 0.3 ... 6 m (Option /35: 0.5 ... 8 m) |
| Light type | modulated infrared light , 850 nm |
| Field height | 300 mm ... 3000 mm in steps of 300 mm (see data sheet) |
| Beam spacing | 50 mm |
| Optical resolution | without beam crossover: 50 mm<br>with beam crossover: 25 mm within 25% and 75% of the range |
| Beam crossover | Factory setting: 3-way, deactivateable |
| Beam blanking | adjustable max. 2 fixed suppressible beam areas (blanking) |
| Number of beams | 7 ... 61, depending on field height (see data sheet) |
| Operating voltage | 18 ... 30 V DC |
| Interface type | IO-Link |
| Mode | COM 2 (38.4 kBaud) |
| Signal output | Switch output (detection field C/Q) 1 push-pull output, short-circuit protected, reverse polarity protected on pin 4 (receiver),<br>Height monitoring (H1, H2. H3) 3 Push-pull outputs, short-circuit proof, reverse polarity protected on pin 5, pin 6, pin 7 (receiver) |
| Switching type | Factory setting: dark ON , Switchable to light ON mode |
| Switching current | max. 100 mA |
| Response time | 3 ms ... 8 ms, depending on number of beams (see data sheet) |
| Timer function | Off-delay programmable from 0 ... 1.25 s in 5 ms steps (adjustment via IO-Link only) |
| Weak signal output | Stability Control (SC) 1 PNP, short-circuit protected, reverse polarity protected on pin 2 (receiver) |
| Test input | Emitter switch-off with +UB or 0 V at pin 4 (emitter) |
| Function input | Range input activation from 1.6 m (or 2 m in case of option /35)<br>Teach-in input for programming on pin 8 (receiver) |
| Ambient temperature | Standard : -10 ... 60 °C (14 ... 140 °F)<br>Option /146: -30 ... 60 °C (-22 ... 140 °F) |
| Material | |
| Housing | extruded aluminum section , Silver anodized |
| Optical face | Plastic pane , Polycarbonate |
| Protection degree | IP67 |
| Connection | Emitter: 200 mm connecting cable with 4-pin, M12x1 connector<br>Receiver: 200 mm connecting cable with 8-pin, M12 x 1 connector |



| Approvals and Certificates | |
|---|---|
| Protection class | III ( IEC 61140 ) |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 30.5 |
| Width W [mm] | 20 |
| Height H [mm] | 459 ... 3159 |
| Connector length $l_c$ [mm] | 25 |

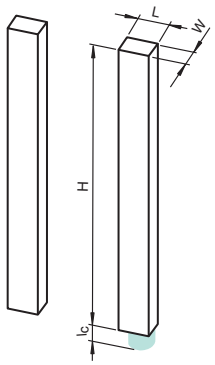
## Properties

- Emitter / receiver set
- Self-contained
- Resolution 50 mm
- Capable of 3-way beam crossover
- Discrete output and IO-Link
- Pigtailed connector

## Benefits

- Can uniquely identify an object or gap
- Software-free configuration via Touch-Field
- Standby mode reduces power consumption
- Versions for use in low temperature environments down to -30°C

To configure a specific model, please refer to the LGS50 data sheet on our website: **www.pepperl-fuchs.us**.




## Accessories

**These and more accessories can be found in chapter 10**

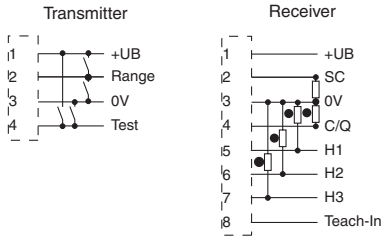
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

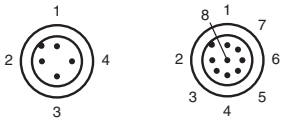
| | |
|---|---|
| **OMH-LGS-01** | Attachment aid for light grid series LGS |
| **OMH-SLCT-01** | Quick clamp and adjustment system |
| **OMH-SLCT-03** | Mounting bracket including adjustment |
| **OMH-SLCT-04** | Mounting bracket including adjustment (with loose bearing) |
| **OMH-SLCT-05** | Mounting bracket including adjustment |
| **AA SLCT-01** | Profile alignment aid |
| **V19-G-BK2M-PUR-U** | Female cordset M12, 8-pin, 2 m cable PUR, straight |
| **V1-G-BK2M-PUR-U** | Female cordset M12, 4-pin, 2 m cable PUR, straight |

## Electrical Connection

❍ = light on, ● = dark on



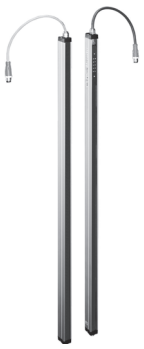







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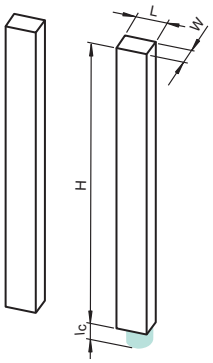
## Properties

- Emitter / receiver set
- Self-contained
- Resolution 100 mm
- Capable of 3-way beam crossover
- Discrete output and IO-Link
- Pigtailed connector

## Benefits

- Can uniquely identify an object or gap
- Software-free configuration via Touch-Field
- Standby mode reduces power consumption
- Versions for use in low temperature environments down to -30°C

To configure a specific model, please refer to the LGS100 data sheet on our website: **www.pepperl-fuchs.us**.




## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | LGS100 Series |
|---|---|
| Light/dark adjustment | ✔ |
| Test / Teach-In / Function inputs | ✔ |
| 4-in-1 output | ✔ |
| Weak signal output | ✔ |
| Threshold detection range | Standard : 7.5 m (Option /35: 10 m) |
| Effective detection range | Standard : 0.3 ... 6 m (Option /35: 0.5 ... 8 m) |
| Light type | modulated infrared light , 850 nm |
| Field height | 300 mm ... 3000 mm in steps of 300 mm (see data sheet) |
| Beam spacing | 100 mm |
| Optical resolution | without beam crossover: 100 mm<br>with beam crossover: 50 mm within 25% and 75% of the range |
| Beam crossover | Factory setting: 3-way, deactivateable |
| Beam blanking | adjustable max. 2 fixed suppressible beam areas (blanking) |
| Number of beams | 4 ... 31, depending on field height (see data sheet) |
| Operating voltage | 18 ... 30 V DC |
| Interface type | IO-Link |
| Mode | COM 2 (38.4 kBaud) |
| Signal output | Switch output (detection field C/Q) 1 push-pull output, short-circuit protected, reverse polarity protected on pin 4 (receiver),<br>Height monitoring (H1, H2. H3) 3 Push-pull outputs, short-circuit proof, reverse polarity protected on pin 5, pin 6, pin 7 (receiver) |
| Switching type | Factory setting: dark ON , Switchable to light ON mode |
| Switching current | max. 100 mA |
| Response time | 2 ms ... 6 ms, depending on number of beams (see data sheet) |
| Timer function | Off-delay programmable from 0 ... 1.25 s in 5 ms steps (adjustment via IO-Link only) |
| Weak signal output | Stability Control (SC) 1 PNP, short-circuit protected, reverse polarity protected on pin 2 (receiver) |
| Test input | Emitter switch-off with +UB or 0 V at pin 4 (emitter) |
| Function input | Range input activation from 1.6 m (or 2 m in case of option /35)<br>Teach-in input for programming on pin 8 (receiver) |
| Ambient temperature | Standard : -10 ... 60 °C (14 ... 140 °F)<br>Option /146: -30 ... 60 °C (-22 ... 140 °F) |
| Material | |
| Housing | extruded aluminum section , Silver anodized |
| Optical face | Plastic pane , Polycarbonate |
| Protection degree | IP67 |
| Connection | Emitter: 200 mm connecting cable with 4-pin, M12x1 connector<br>Receiver: 200 mm connecting cable with 8-pin, M12 x 1 connector |



| Approvals and Certificates | |
|---|---|
| Protection class | III ( IEC 61140 ) |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 30.5 |
| Width W [mm] | 20 |
| Height H [mm] | 459 ... 3159 |
| Connector length $l_c$ [mm] | 25 |

## Accessories

**These and more accessories can be found in chapter 10**

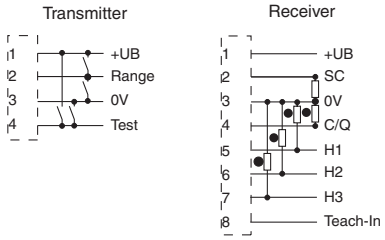
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

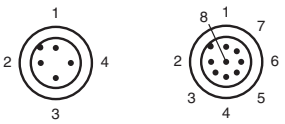
| | |
|---|---|
| **OMH-LGS-01** | Attachment aid for light grid series LGS |
| **OMH-SLCT-01** | Quick clamp and adjustment system |
| **OMH-SLCT-03** | Mounting bracket including adjustment |
| **OMH-SLCT-04** | Mounting bracket including adjustment (with loose bearing) |
| **OMH-SLCT-05** | Mounting bracket including adjustment |
| **AA SLCT-01** | Profile alignment aid |
| **V19-G-BK2M-PUR-U** | Female cordset M12, 8-pin, 2 m cable PUR, straight |
| **V1-G-BK2M-PUR-U** | Female cordset M12, 4-pin, 2 m cable PUR, straight |

## Electrical Connection

❍ = light on, ● = dark on








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## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| Model Number | AL2109-P-1820/40b/49/143 |
|---|---|
| Light/dark adjustment | ✔ |
| Effective detection range | 0 ... 3500 mm |
| Light type | modulated infrared light , 950 nm |
| Field height | 1800 mm |
| Beam spacing | 90 mm |
| Beam crossover | automatic, 3x/5x/7x (depending on distance between transmitter/receiver) |
| Beam blanking | Defective beams are faded out after 60 s. Deactivation of the light grid upon failure of 2 adjacent beams or more than 50 % of all beams |
| Number of beams | 61 ... 135 (dynamic) |
| Operating voltage | 11 ... 30 V DC |
| Signal output | 1 PNP and 1 NPN, short-circuit protected |
| Switching type | light/dark on selectable programmable |
| Switching current | 100 mA |
| Response time | < 100 ms |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | aluminum |
| Optical face | plastic |
| Protection degree | IP54 |
| Connection | Male connector, M8, 4-pin (2 female cordsets, 5 m in scope of delivery) |

| Approvals and Certificates | |
|---|---|
| UL approval | cULus Listed |
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 34.2 |
| Width W [mm] | 9 |
| Height H [mm] | 2000 |
| Connector length $l_c$ [mm] | 0 |

## Properties

- Emitter / receiver set
- Self-contained
- Resolution 90 mm
- Automatic beam crossover
- Discrete output
- Connector version

## Benefits

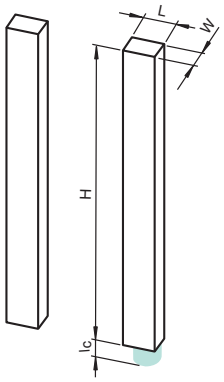
- Ultra low-profile for elevator and doorway monitoring
- Automatic adaptation of beam configuration for maximum resolution
- Triple beam crossing maintained at door closing condition
- Extremely high ambient light resistance

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **Mounting Set AL2109 back board** | Mounting aid |
| **Mounting Set AL2109 extension** | Mounting aid |
| **Mounting Set AL2109 lateral** | Mounting aid |
| **PS1/31** | Power supply/Power supply module |

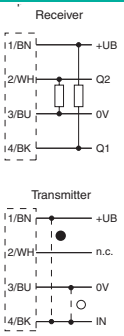



## Electrical Connection

❍ = light on, ● = dark on



AL2109-P-1820/40b/49/143







Wire colors in accordance with EN 60947-5-2

| | | |
|---|---|---|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |




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CE

## Properties

- Parallel interface (8 bit)
- Data rate up to 225 Baud
- Terminals
- Infrared light

## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Light type | modulated infrared light |
| Cycle time | 35 ms |
| No-load supply current | 40 mA |
| Data rate | 225 Bit/s |
| Data sampling blanking | Enable input emitter deactivation |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | Terluran, black |
| Optical face | glass |
| Protection degree | IP67 |
| Connection | 2 M16 cable glands, tension spring terminals in the terminal compartment |



| Model Number | | DAD15-8P | DAD15-8P-NPN | DAD15-8P/35 | DAD15-8P-NPN/35 |
|---|---|---|---|---|---|
| Threshold detection range | 2500 mm | ● | ● | | |
| | 5000 mm | | | ● | ● |
| Effective detection range | 0 ... 1500 mm | ● | ● | | |
| | 0 ... 2500 mm | | | ● | ● |
| Diameter of the light spot | approx. 1000 mm at 1.5 m | ● | ● | | |
| | approx. 500 mm at 1.5 m | | | ● | ● |
| Interface type | 8 bit parallel, bidirectional 10 inputs, PNP , 10 outputs, PNP | ● | | ● | |
| | 8 bit parallel, bidirectional 10 inputs, NPN ; 10 outputs, NPN | | ● | | ● |
| Operating voltage | 10 ... 30 V DC | | ● | | ● |
| | 10 ... 60 V DC | ● | | ● | |

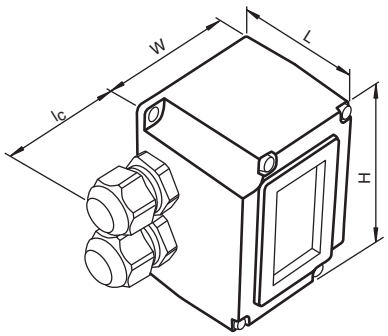
| Dimensions | |
|---|---|
| Length L [mm] | 51 |
| Width W [mm] | 56 |
| Height H [mm] | 76 |
| Connector length $l_c$ [mm] | 24 |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-DAD10** | Mounting bracket |



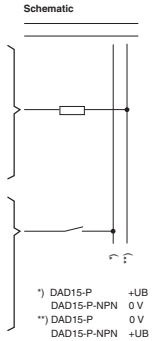

## Electrical Connection



DAD15-8P
DAD15-8P/35
DAD15-8P-NPN
DAD15-8P-NPN/35

| Pin | Function | Description |
|---|---|---|
| 1, 14 | 0 V | - Supply voltage |
| 2 | +UB | + Supply voltage |
| 3 | SYNC | Synchronization |
| 4 | REC | Receive indicator |
| 5 | D8OUT | Output data bit 8 |
| 6 | D7OUT | Output data bit 7 |
| 7 | D6OUT | Output data bit 6 |
| 8 | D5OUT | Output data bit 5 |
| 9 | D4OUT | Output data bit 4 |
| 10 | D3OUT | Output data bit 3 |
| 11 | D2OUT | Output data bit 2 |
| 12 | D1OUT | Output data bit 1 |
| 13, 25 | - | not connected |
| 15 | D8IN | Input data bit 8 |
| 16 | D7IN | Input data bit 7 |
| 17 | D6IN | Input data bit 6 |
| 18 | D5IN | Input data bit 5 |
| 19 | D4IN | Input data bit 4 |
| 20 | D3IN | Input data bit 3 |
| 21 | D2IN | Input data bit 2 |
| 22 | D1IN | Input data bit 1 |
| 23 | IN-Master/Slave | Master/Slave select |
| 24 | IN Enable | Input enable |

Schematic






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CE

## Properties

- Serial interface (RS 232, RS422, CL20 mA interface)
- Data rate up to 19.2 kBaud
- Connector version
- Visible red and infrared light versions

## Technical Data

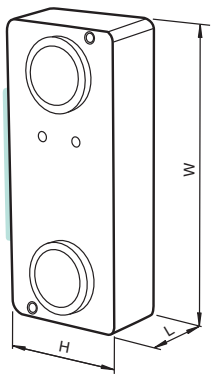
*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Response delay | 40 µs |
| Interface type | RS 232, RS 422, CL20 mA active/passive switchable |
| Operating voltage | 24 V DC ± 25 % |
| No-load supply current | 200 mA |
| Data rate | 0 ... 19.2 kBit/s |
| Operation frequency | F1 = 83 kHz F2 = 118 kHz |
| Data sampling blanking | Input for incoming data blanking with +24 V DC |
| Pre-fault indication output | 2 PNP-outputs, short-circuit protected, 30 V DC 0.1 A activated for single or sufficient stability control |
| Measurement output | +1.8 ... 5.8 V DC, max. 10 mA, simple stability control: 2.5 V triple stability control: 4.2 V |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Housing | aluminum |
| Protection degree | IP65 |
| Connection | 25-pin Sub-D connector |



| Model Number | | DAD30-W | DAD30 | DAD30-RT | DAD30/35 | DAD30-RT/35 |
|---|---|---|---|---|---|---|
| Threshold detection range | 20 m | ● | | | | |
| | 45 m | | ● | ● | | |
| | 150 m | | | | ● | ● |
| Effective detection range | 0 ... 15 m | ● | | | | |
| | 0 ... 30 m | | ● | ● | | |
| | 0 ... 100 m | | | | ● | ● |
| Light type | modulated infrared light | ● | ● | | ● | |
| | modulated visible red light | | | ● | | ● |
| Diameter of the light spot | 4200 mm at a distance of 15 m | ● | | | | |
| | 500 mm at a distance of 30 m | | ● | ● | | |
| | 1800 mm at a distance of 100 m | | | | ● | ● |
| Optical face | glass | ● | | | | |
| | plastic lens | | ● | ● | ● | ● |

| Dimensions | |
|---|---|
| Length L [mm] | 34 |
| Width W [mm] | 150 |
| Height H [mm] | 64 |



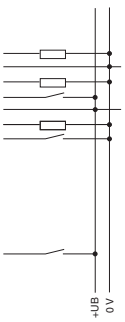

## Electrical Connection



DAD30
DAD30/35
DAD30-RT
DAD30-RT/35
DAD30-W

| Pin | Function | Description |
|---|---|---|
| 2 | RX232 | RS 232 input |
| 3 | TX232 | RS 232 output |
| 5 | TX-N | RS 422 Data- (A-output) |
| 6 | Alarm 1 | 1-fold stability control |
| 7 | 0 V | - supply voltage |
| 9 | Analog | Measure output |
| 10 | RX-DIS | Data blanking |
| 11 | +UB | + supply voltage |
| 12 | Alarm 2 | sufficient stability control |
| 13 | RX-DIS/TTL | Data disable |
| 14 | RX-P | RS 422 (B-input) |
| 15 | RX-N | RS 422 (A-input) |
| 16 | TX-P | RS 422 (B-output) |
| 17 | TX-N | RS 422 (A-output) |
| 18 | CL-IN+ | Current loop input |
| 19 | CL-IN- | Current loop input |
| 21 | CL-OUT- | Current loop output |
| 22 | TX-DIS | Emitter disable |
| 25 | CL-OUT+ | Current loop output |
| 1, 4, 5, 8, 20, 23, 24 | - | not connected |

Schematic







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CE

## Properties

- Serial interface (RS 232, RS422, CL20 mA interface)
- Data rate up to 19.2 kBaud
- Terminal compartment
- Visible red and infrared light versions

## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

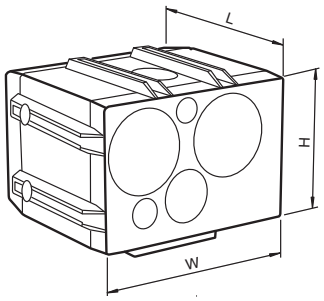
| General Data | |
|---|---|
| Response delay | 40 µs |
| Interface type | RS 232, RS 422, CL20 mA active/passive switchable |
| Operating voltage | 24 V DC ± 25 % |
| Data rate | 0 ... 19.2 kBit/s |
| Operation frequency | F1 = 83 kHz , F2 = 118 kHz |
| Data sampling blanking | emitter deactivation for $+U_B$, emitter deactivation TTL-compatible, receiver deactivation TTL-compatible |
| Pre-fault indication output | 2 PNP-outputs, short-circuit protected, 30 V DC 0.1 A activated for single or sufficient stability control |
| Measurement output | 2.5 ... 6 V DC, max. 10 mA , single stability control 3.5 V , sufficient stability control 5 V |
| Housing | aluminum |
| Optical face | plastic lenses, glass windows |
| Protection degree | IP65 |
| Connection | 4 x M16 cable glands , spring terminals in the terminal compartment |



| Model Number | | LS230-DA | LS230-DA-GUF | LS230-DA-RT |
|---|---|---|---|---|
| Threshold detection range | 230 m | | | ● |
| | 340 m | ● | ● | |
| Effective detection range | 0 ... 180 m | | | ● |
| | 0 ... 230 m | ● | ● | |
| Light source | IRED | ● | ● | |
| | LED | | | ● |
| Light type | modulated infrared light | ● | ● | |
| | red | | | ● |
| Diameter of the light spot | 6300 mm at a distance of 350 m | | | ● |
| | 8000 mm at a distance of 230 m | ● | ● | |
| No-load supply current | 250 mA | ● | | ● |
| | max. 1000 mA | | ● | |
| Ambient temperature | -20 ... 50 °C (-4 ... 122 °F) | ● | | ● |
| | -30 ... 50 °C (-22 ... 122 °F) with heated housing | | ● | |

| Approvals and Certificates | |
|---|---|
| CCC approval | CCC approval / marking not required for sensors rated ≤36 V |

| Dimensions | |
|---|---|
| Length L [mm] | 133 |
| Width W [mm] | 162 |
| Height H [mm] | 116 |



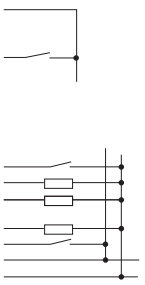

## Electrical Connection



LS230-DA
LS230-DA-GUF
LS230-DA-RT

| Pin | Function | Description |
|---|---|---|
| 1 | RX-P | RS 422 Data+ (B-input) |
| 2 | RX-N | RS 422 Data- (A-input) |
| 3, 6 | GNDI | Data Ground isolated |
| 4 | TX-P | RS 422 Data+ (B-output) |
| 5 | TX-N | RS 422 Data- (A-output) |
| 7 | RX-DIS | Disable TTL |
| 8 | RX232 | RS 232 input |
| 9 | TX232 | RS 232 output |
| 10 | CL-IN+ | 20 mA input |
| 11 | CL-IN- | 20 mA input |
| 12 | CL-OUT+ | 20 mA output |
| 13 | CL-OUT- | 20 mA output |
| 14 | TX-DIS- | Emitter disable TTL |
| 15 | Alarm 1 | 1-fold stability control |
| 16 | Alarm 2 | sufficient stability control |
| 17, 18 | - | not connected |
| 19 | Analog | measure output 2,5 V ... 6 V |
| 20 | TX-DIS | Emitter disable |
| 21, 22 | +UB | + supply voltage |
| 23, 24 | 0 V | - supply voltage (GND) |

Schematic





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## Technical Data

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.us*

| General Data | |
|---|---|
| Light type | modulated infrared light |
| Diameter of the light spot | 2 m at a distance of 100 m |
| Interface type | PROFIBUS, galvanically isolated |
| Operating voltage | 18 ... 30 V DC |
| No-load supply current | 200 mA |
| Data rate | 93.75; 187.5;(350); 500;1500 kBit/s , adjustable |
| Function input | Keylock, internal Pull-up resistor<br>keypad locked with 0 V |
| Pre-fault indication output | 1 PNP (switches if there is sufficient stability control) short-circuit protected, max. 200 mA |
| Housing | ABS / PC |
| Optical face | plastic |
| Protection degree | IP65 |
| Connection | 4-pin, M12x1 connector, standard (supply) ,<br>5-pin, M12x1 connector, B-coded (Bus In) ,<br>5-pin, M12x1 socket, B-coded (Bus Out/Termination) |



## Properties

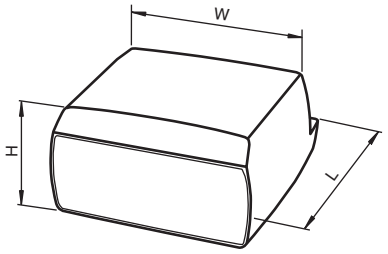
- PROFIBUS interface
- Data rate up to 1.5 MBaud
- Connector version
- Infrared light

## Benefits

- Integral alignment aid LED simplifies setup
- Easy installation due to quick clamp tool-less mounting
- LED bar display indicates signal strength

| Model Number | | LS610-DA-P/F1 | LS610-DA-P/F1/146 | LS610-DA-P/F2 | LS610-DA-P/F2/146 | LS610-DA-P/F1/35 | LS610-DA-P/F2/35 |
|---|---|---|---|---|---|---|---|
| Threshold detection range | 140 m | ● | ● | ● | ● | | |
| | 260 m | | | | | ● | ● |
| Effective detection range | 0 ... 120 m | ● | ● | ● | ● | | |
| | 0 ... 240 m | | | | | ● | ● |
| Operation frequency | F1 = 8.25 MHz | ● | ● | | | ● | |
| | F2 = 12.5 MHz | | | ● | ● | | ● |
| Ambient temperature | -10 ... 50 °C (14 ... 122 °F) | ● | | ● | | ● | ● |
| | -30 ... 50 °C (-22 ... 122 °F) , For use in dry cold | | ● | | ● | | |

| Dimensions | |
|---|---|
| Length L [mm] | 171 |
| Width W [mm] | 170 |
| Height H [mm] | 90 |



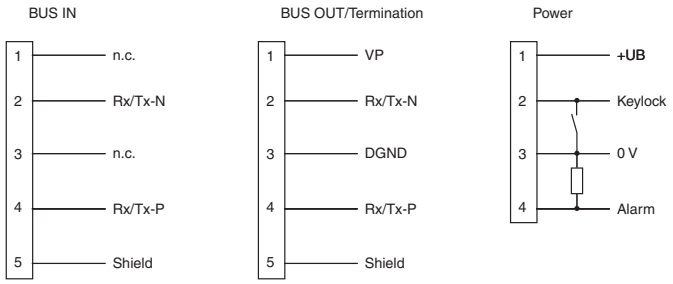

## Accessories

These and more accessories can be found in chapter 10
See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-LS610-05** | Mounting bracket for optical data coupler and distance measurement devices |
| **ICZ-TR-V15B** | Terminal resistor for PROFIBUS |
| **V15SB-G** | Cable connector, M12, for PROFIBUS, adjustable |
| **V15B-G** | Female cordset, M12, for PROFIBUS, adjustable |
| **V15-G-PG9** | Female cordset, M12, 5-pin, ready for assembly |
| **Protective cap LS610** | M12 protective cap set (connector + socket) for series LS610 / LS611 |
| **OMH-LS610-01** | Mounting bracket for optical data coupler |
| **OMH-LS610-03** | Mounting bracket with deviation mirror for optical data coupler |
| **OMH-LS610-02** | Direct mounting set consisting of 4 x M4 threaded inserts |

## Electrical Connection









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## Properties

- Ethernet interface
- Data rate 100 MBaud
- Connector version
- Visible red and infrared light versions

## Benefits

- Works with all Industrial Ethernet-protocols
- Plug and Play usability, no configuration required
- LED bar display indicates signal strength
- Fast transmission of even live video

## Technical Data

*For detailed data and product description refer to the data sheets at* ***www.pepperl-fuchs.us***

| General Data | |
|---|---|
| Threshold detection range | 180 m |
| Effective detection range | 0 ... 150 m |
| Light source | laser diode |
| Laser class | 1M |
| Diameter of the light spot | 1.5 m at a distance of 100 m |
| Interface type | 100 BASE-TX |
| Operating voltage | 18 ... 30 V DC |
| No-load supply current | 200 mA |
| Data rate | 100 MBit/s (Fast Ethernet) |
| Pre-fault indication output | 1 PNP, inactive when falling short of the stability control , short-circuit protected, max. 200 mA |
| Housing | ABS / PC |
| Optical face | plastic |
| Protection degree | IP65 |
| Connection | 4-pin, M12x1 connector, standard (supply) ,<br>8-pin M12x1 connector, service ,<br>M12x1 socket, 4-pin, D-coded (LAN) |



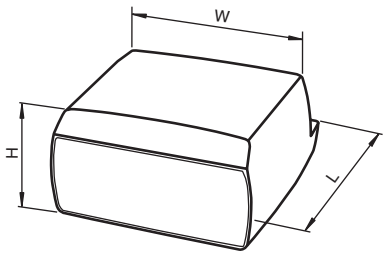
| Model Number | | LS680-DA-EN/F1 | LS680-DA-EN/F1/146 | LS680-DA-EN/F2 | LS680-DA-EN/F2/146 |
|---|---|---|---|---|---|
| Light type | modulated infrared light | ● | ● | | |
| | modulated visible red light | | | ● | ● |
| Ambient temperature | -10 ... 50 °C (14 ... 122 °F) | ● | | ● | |
| | -30 ... 50 °C (-22 ... 122 °F) | | ● | | ● |
| **Approvals and Certificates** | | | | | |
| UL approval | cULus Listed | ● | ● | ● | ● |
| **Dimensions** | | | | | |
| Length L [mm] | | 171 | | | |
| Width W [mm] | | 170 | | | |
| Height H [mm] | | 90 | | | |

## Accessories

**These and more accessories can be found in chapter 10**

See pages from 970 ... for cordsets See pages 1066 ... for mounting accessories

| | |
|---|---|
| **OMH-LS610-01** | Mounting bracket for optical data coupler |
| **OMH-LS610-02** | Direct mounting set consisting of 4 x M4 threaded inserts |
| **OMH-LS610-03** | Mounting bracket with deviation mirror for optical data coupler |
| **OMH-LS610-05** | Mounting bracket for optical data coupler and distance measurement devices |



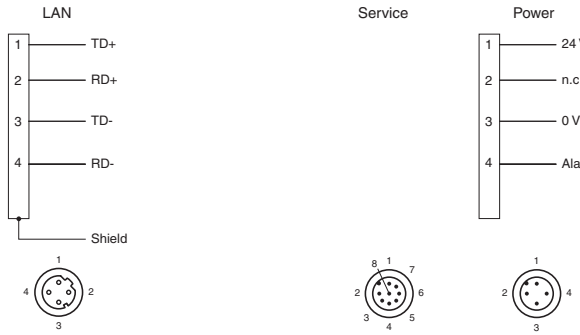

## Laser notice laser class 1M

- The irradiation can lead to irritation especially in a dark environment. Do not point at people!
- Caution: visible and invisible laser radiation, do not observe laser light with optical instruments such as magnifying glasses, microscopes, telescopes or binoculars!
- Maintenance and repairs should only be carried out by authorized service personnel!
- Attach the device so that the warning is clearly visible and readable.




## Electrical Connection








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## Model number



### REF-A17

Reflector, round ø 20.5 mm, self-adhesive

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | Diameter: 20.5 mm |
| Mounting | self-adhesive |

## Model number



### REF-A25

Reflector, round ø 25 mm, self-adhesive

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | Diameter: 25 mm |
| Mounting | self-adhesive |

## Model number



### REF-A35

Reflector, round ø 35 mm, self-adhesive

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | Diameter: 35 mm |
| Mounting | self-adhesive |

## Model number



### REF-A46

Reflector, round ø 46 mm, self-adhesive

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | Diameter: 46 mm |
| Mounting | self-adhesive |



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## Model number



### REF-S25

Reflector, round ø 25 mm, screw fixing M4

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | Diameter: 25 mm |
| Mounting | screw fixing |
| Scope of delivery: | includes M4 washer and nut |

## Model number



### REF-S42

Reflector, round ø 42 mm, screw fixing M5

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | Diameter: 42 mm |
| Mounting | screw fixing |
| Scope of delivery: | includes M5 washer and nut |

## Model number



### REF-CLIP25

Reflector, round ø 25.2 mm, snap-in

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | Diameter: 25.2 mm |
| Mounting | Snap-in |

## Model number



### REF-CLIP42

Reflector, round ø 42 mm, snap-in

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | Diameter: 42 mm |
| Mounting | Snap-in |



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## Model number



**REF-C60**

Reflector, round ø 58 mm, central mounting hole

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | Diameter: 58 mm |
| Mounting | mounting hole |

## Model number



**REF-C65**

Reflector, round ø 65 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | Diameter: 65 mm |
| Mounting | mounting hole |

## Model number



**FE-RR1**

Reflector, round ø 80.87 mm, central mounting hole

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | Diameter: 80.87 mm |
| Mounting | mounting hole |

## Model number



**REF-H33**

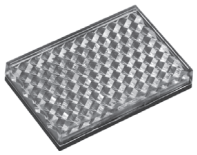
Reflector with screw fixing

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -25 ... 65 °C (-13 ... 149 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 33.3 mm x 12.8 mm x 11 mm |
| Mounting | M3 metal threaded insert |
| Note: | Mounting pattern matches that of ML100 Series. |


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## Model number



### REF-CLIP40

Reflector, rectangular 40 mm x 23.5 mm, snap-in

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 40 mm x 23.5 mm x 8 mm |
| Mounting | Snap-in |

## Model number

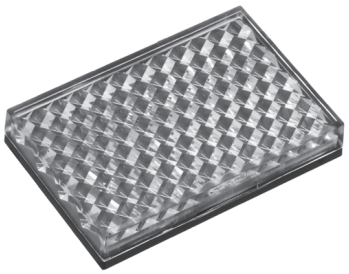


### REF-A48

Reflector, rectangular 48 mm x 32.5 mm, self-adhesive

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 48 mm x 32.5 mm x 8 mm |
| Mounting | self-adhesive |

## Model number



### REF-A80

Reflector, rectangular 80 mm x 50 mm, self-adhesive

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 80 mm x 50 mm x 7.2 mm |
| Mounting | self-adhesive |

## Model number



### REF-H60

Reflector, rectangular 40.5 mm x 60 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 60 mm x 40.5 mm x 7.5 mm |
| Mounting | mounting holes |



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## Model number



### REF-H85-2

Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 84.5 mm x 84.5 mm x 8.7 mm |
| Mounting | mounting holes |

## Model number

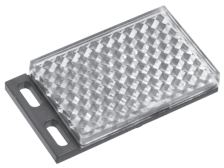


### REF-H40

Reflector, rectangular 47.5 mm x 23.5 mm, mounting holes, fixing strap

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 47.5 mm x 23.5 mm x 8 mm |
| Mounting | mounting holes |

## Model number



### REF-H48

Reflector, rectangular 32.5 mm x 57 mm, mounting holes, fixing strap

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 32.5 mm x 57 mm x 8 mm |
| Mounting | mounting holes |

## Model number



### REF-H50

Reflector, rectangular 51 mm x 51 mm, mounting holes, fixing strap

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 51 mm x 51 mm x 8 mm |
| Mounting | mounting holes |


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## Model number



### REF-H160

Reflector, rectangular 60 mm x 18 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 60 mm x 18 mm x 8.3 mm |
| Mounting | mounting holes |

## Model number



### REF-H72

Reflector, rectangular 72 mm x 19 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 72 mm x 19 mm x 8.5 mm |
| Mounting | mounting holes |

## Model number



### REF-H65

Reflector, rectangular 65 mm x 32.5 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 65 mm x 32.5 mm x 8.3 mm |
| Mounting | mounting holes |

## Model number



### REF-H75

Reflector, rectangular 75 mm x 34.5 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 75 mm x 34.5 mm x 7 mm |
| Mounting | mounting holes |



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## Model number



### REF-H54

Reflector, rectangular 54 mm x 12.5 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -40 ... 70 °C (-40 ... 158 °F) |
| **Mechanical specifications** | |
| Material | PMMA |
| Dimensions | 54 mm x 12.5 mm x 6.3 mm |
| Mounting | mounting holes |

## Model number



### REF-VR10

Reflector, rectangular 60 mm x 19 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 60 mm x 19 mm x 6 mm |
| Mounting | mounting holes |

## Model number

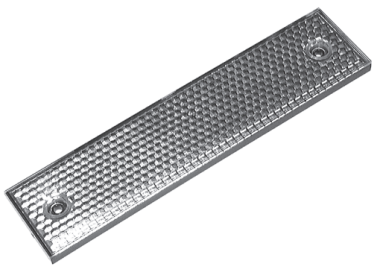


### REF-H50x100

Reflector, rectangular 122 mm x 49.5 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -40 ... 70 °C (-40 ... 158 °F) |
| **Mechanical specifications** | |
| Dimensions | 122 mm x 49.5 mm x 8.4 mm |
| Mounting | mounting holes |

## Model number



### REF-H180

Reflector, rectangular 180 mm x 40 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 180 mm x 40 mm x 7.4 mm |
| Mounting | mounting holes |



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## Model number

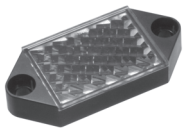


### REF-H100

Reflector, rectangular 122 mm x 99.35 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -40 ... 70 °C (-40 ... 158 °F) |
| **Mechanical specifications** | |
| Material | PMMA |
| Dimensions | 122 mm x 99.35 mm x 8.5 mm |
| Mounting | mounting holes |

## Model number



### REF-H32

Reflector, hexagonal 55 mm x 25 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 55 mm x 25 mm x 9 mm |
| Mounting | mounting holes |

## Model number



### FE-RR15

Reflector, hexagonal 55 mm x 35 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| **Mechanical specifications** | |
| Mounting | mounting holes |

## Model number



### REF-H51x72

Reflector, rectangular 51 mm x 72 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| **Mechanical specifications** | |
| Material | PMMA |
| Dimensions | 51 mm x 72 mm x 7.5 mm |
| Mounting | mounting holes |



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## Model number



### REF-MA21

Reflector with microstructure, round ø 21 mm, self-adhesive

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | Diameter: 21 mm |
| Mounting | self-adhesive |
| Note | Microstructure reflectors are recommended for use with laser retroreflective sensors. |

## Model number



### REF-MS21

Reflector with microstructure, round ø 21 mm, screw fixing M3

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | Diameter: 21 mm |
| Mounting | screw fixing |
| Note | Microstructure reflectors are recommended for use with laser retroreflective sensors. |
| Scope of delivery | Includes M3 washer and nut |

## Model number

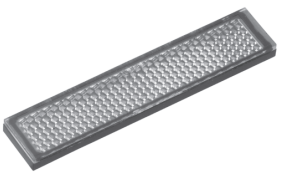


### REF-MCLIP21

Reflector with microstructure, round ø 21 mm, snap-in

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | Diameter: 21 mm |
| Mounting | Snap-in |
| Note | Microstructure reflectors are recommended for use with laser retroreflective sensors. |

## Model number



### REF-MA50

Reflector with microstructure, rectangular 10 mm x 50 mm, self-adhesive

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 10 mm x 50 mm x 5 mm |
| Mounting | self-adhesive |
| Note | Microstructure reflectors are recommended for use with laser retroreflective sensors. |


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## Model number

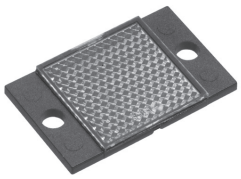


### REF-MH23

Reflector with microstructure, rectangular 23 mm x 13.8 mm, diagonal mounting hole

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 23 mm x 14 mm x 5 mm |
| Mounting | mounting holes |
| Note | Microstructure reflectors are recommended for use with laser retroreflective sensors. |

## Model number

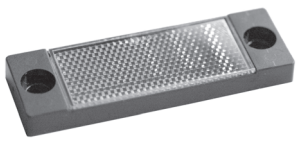


### REF-MH20

Reflector with microstructure, rectangular 32 mm x 20 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 32 mm x 20 mm x 3 mm |
| Mounting | mounting holes |
| Note | Microstructure reflectors are recommended for use with laser retroreflective sensors. |

## Model number

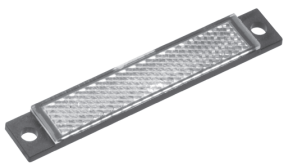


### REF-MVR10

Reflector with microstructure, rectangular 60 mm x 19 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 60 mm x 19 mm x 6 mm |
| Mounting | mounting holes |
| Note | Microstructure reflectors are recommended for use with laser retroreflective sensors. |

## Model number



### REF-MH56

Reflector with microstructure, rectangular 62 mm x 10 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 62 mm x 10 mm x 3.5 mm |
| Mounting | mounting holes |
| Note | Microstructure reflectors are recommended for use with laser retroreflective sensors. |



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## Model number



### REF-MH50

Reflector with microstructure, rectangular 50.9 mm x 50.9 mm, mounting holes, fixing strap

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 50.9 mm x 50.9 mm x 8.5 mm |
| Mounting | mounting holes |
| Note | Microstructure reflectors are recommended for use with laser retroreflective sensors. |

## Model number

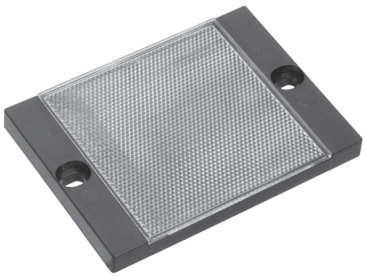


### REF-MH78

Reflector with microstructure, hexagonal 78 mm x 61 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 78 mm x 61 mm x 7 mm |
| Mounting | mounting holes |
| Note | Microstructure reflectors are recommended for use with laser retroreflective sensors. |

## Model number



### REF-MH82

Reflector with microstructure, rectangular 82 mm x 60 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 85 °C (-4 ... 185 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 82 mm x 60 mm 7.4 mm |
| Mounting | mounting holes |
| Note | Microstructure reflectors are recommended for use with laser retroreflective sensors. |


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## Model number



**RT1 X 2**

Reflective tape

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 82.22 °C (-4 ... 180 °F) |
| **Mechanical specifications** | |
| Dimensions | 1.0" x 2.0" (25.4 mm x 50.8 mm) |
| Mounting | self-adhesive |

## Model number



**RT1 X 100**

Reflective tape

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 82.22 °C (-4 ... 180 °F) |
| **Mechanical specifications** | |
| Dimensions | 1.0" x 100.0" (25.4 mm x 2540 mm) |
| Mounting | self-adhesive |

## Model number



**RT2 X 100**

Reflective tape

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 82.22 °C (-4 ... 180 °F) |
| **Mechanical specifications** | |
| Dimensions | 2.0" x 100.0" (50.8 mm x 2540 mm) |
| Mounting | self-adhesive |

## Model number



**RT3 X 100**

Reflective tape

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 82.22 °C (-4 ... 180 °F) |
| **Mechanical specifications** | |
| Dimensions | 3.0" x 100.0" (76.2 mm x 2540 mm) |
| Mounting | self-adhesive |



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## Model number



**FE-RR7-Sheet**

Reflective tape

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 80 °C (-4 ... 176 °F) |
| **Mechanical specifications** | |
| Material | F6000 |
| Dimensions | 50.8 mm x 25.4 mm |
| Mounting | self-adhesive |
| Note | Sheet of 18 reflectors. Not cuttable. Microstructure and corner-cube. |

## Model number

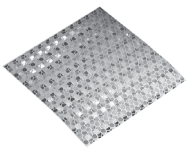


**FE-RR9**

Reflective tape

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 80 °C (-4 ... 176 °F) |
| **Mechanical specifications** | |
| Material | F6000 |
| Dimensions | 209.6 mm x 69.9 mm |
| Mounting | self-adhesive |
| Note | Not cuttable. Microstructure and corner-cube. |

## Model number

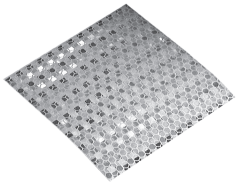


**OFR-70-2**

Reflective tape 70 mm x 70 mm

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| **Mechanical specifications** | |
| Material | F6000 |
| Dimensions | 70 mm x 70 mm |
| Mounting | self-adhesive |
| Scope of delivery | Bag of 10 reflectors |

## Model number



**OFR-100/100**

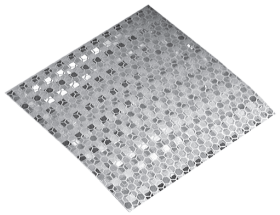
Reflective tape 100 mm x 100 mm

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| **Mechanical specifications** | |
| Material | F6000 |
| Dimensions | 100 mm x 100 mm |
| Mounting | self-adhesive |



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## Model number

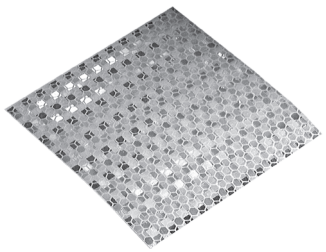


**OFR-250/250**

Reflective tape

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| **Mechanical specifications** | |
| Material | F6000 |
| Dimensions | 250 mm x 250 mm |
| Mounting | self-adhesive |

## Model number

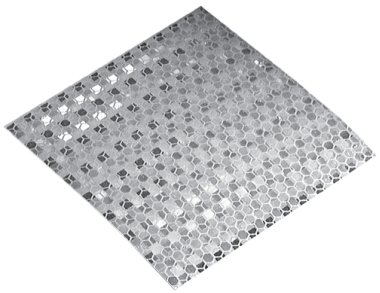


**OFR-500/500**

Reflective tape

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| **Mechanical specifications** | |
| Material | F6000 |
| Dimensions | 500 mm x 500 mm |
| Mounting | self-adhesive |

## Model number



**OFR-1000/1000**

Reflective tape 1000 mm x 1000 mm

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| **Mechanical specifications** | |
| Material | F6000 |
| Dimensions | 1000 mm x 1000 mm |
| Mounting | self-adhesive |

## Model number



**REF-MCLIP15HT**

Reflector with microstructure, round ø 15 mm, snap-in, high temperature applications

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 110 °C (-4 ... 230 °F) |
| **Mechanical specifications** | |
| Dimensions | Diameter: 15 mm |
| Mounting | Snap-in |
| Note | Microstructure reflectors are recommended for use with laser retroreflective sensors. |



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## Model number



### REF-CLIP50HT

Reflector, round ø 50 mm, snap-in, high temperature applications

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 110 °C (-4 ... 230 °F) |
| **Mechanical specifications** | |
| Dimensions | Diameter: 50 mm |
| Mounting | Snap-in |

## Model number



### REF-CH85HT

Reflector, round ø 85 mm, central mounting hole, high temperature applications

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -40 ... 140 °C (-40 ... 284 °F) |
| **Mechanical specifications** | |
| Material | Glass / HYTREL |
| Dimensions | Diameter: 82 mm |
| Mounting | mounting holes |

## Model number



### REF-H18x40HT

Reflector, rectangular 18.5 mm x 60 mm, mounting holes, high temperature applications

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 120 °C (-4 ... 248 °F) ; briefly (< 2 min) up to 160 °C (320 °F) |
| **Mechanical specifications** | |
| Material | PMMA |
| Dimensions | 18.5 mm x 60 mm x 7.1 mm |
| Mounting | mounting holes |

## Model number



### REF-H50HT

Reflector, rectangular 50.9 mm x 50.9 mm, mounting holes, fixing strap, high temperature applications

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 120 °C (-4 ... 248 °F);<br>briefly (< 2 min) up to 160 °C (320 °F) |
| **Mechanical specifications** | |
| Material | PMMA |
| Dimensions | 51.4 mm x 60.3 mm x 8.5 mm |
| Mounting | mounting holes |


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## Model number



### REF-H85HT

Reflector, rectangular 51 mm x 94 mm, mounting holes, high temperature resistant up to 500 °C

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -50 ... 500 °C (-58 ... 932 °F) |
| **Mechanical specifications** | |
| Material | Borosilicate glass |
| Dimensions | 51 mm x 94 mm |
| Mounting | mounting holes |

## Model number



### REF-H50x100HT

Reflector, rectangular 49.5 mm x 122 mm, mounting holes, high temperature applications

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 120 °C (-4 ... 248 °F) ; briefly (< 2 min) up to 160 °C (320 °F) |
| **Mechanical specifications** | |
| Material | PMMA |
| Dimensions | 122 mm x 49.5 mm x 8.4 mm |
| Mounting | mounting holes |

## Model number



### REF-H116HT

Reflector, rectangular 55.5 mm x 132 mm, mounting holes, high temperature applications

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -20 ... 110 °C (-4 ... 230 °F) |
| **Mechanical specifications** | |
| Dimensions | 55.5 mm x 132 mm x 9 mm |
| Mounting | mounting holes |

## Model number



### REF-HEATER120

Reflector, rectangular 120 mm x 51 mm, mounting holes, heatable 24 V DC

| | |
|---|---|
| **Electrical specifications** | |
| Operating voltage $U_B$ | 24 V DC |
| Power consumption $P_0$ | max. 4.8 W |
| **Ambient conditions** | |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| **Mechanical specifications** | |
| Connection | connector M12 x 1, 4-pin |
| Dimensions | 119 mm x 51.5 mm x 27 mm |
| Mounting | mounting holes |



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## Model number



### REF-S20F

Reflector, round ø 20 mm, screw fixing M4

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -25 ... 50 °C (-13 ... 122 °F) |
| **Mechanical specifications** | |
| Material | PES Eastman Tritan(TM) Copolyester TX1001 |
| Dimensions | Diameter: 20 mm |
| Mounting | screw fixing |
| Note | Resistant to some chemicals |
| Scope of delivery | Includes M4 washer and nut |

## Model number

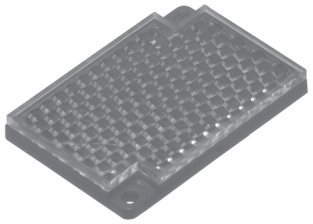


### REF-H20x40F

Reflector, rectangular 20 mm x 60 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -25 ... 50 °C (-13 ... 122 °F) |
| **Mechanical specifications** | |
| Material | PES Eastman Tritan(TM) Copolyester TX1001 |
| Dimensions | 60 mm x 20 mm x 6 mm |
| Mounting | mounting holes |
| Note | Certified by Ecolab as chemical-resistant with some common caustic cleaning agents and disinfectants.<br>High pressure washdown rated (IP69k). |

## Model number

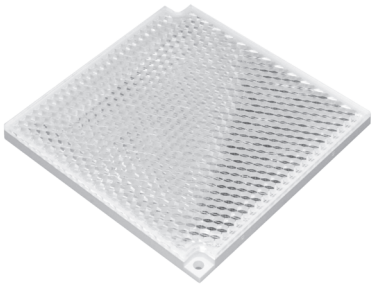


### REF-H60F

Reflector, rectangular 40.5 mm x 60 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -25 ... 50 °C (-13 ... 122 °F) |
| **Mechanical specifications** | |
| Material | PES Eastman Tritan(TM) Copolyester TX1001 |
| Dimensions | 60 mm x 41 mm x 8 mm |
| Mounting | mounting holes |
| Note | Certified by Ecolab as chemical-resistant with some common caustic cleaning agents. High pressure washdown rated (IP69k). |

## Model number



### REF-H100F

Reflector, rectangular 100 mm x 100 mm, mounting holes

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -25 ... 50 °C (-13 ... 122 °F) |
| **Mechanical specifications** | |
| Material | SC |
| Dimensions | 100 mm x 100 mm x 9.2 mm |
| Mounting | mounting holes |
| Note | High pressure washdown rated (IP69k). Resistant to some chemicals. |


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## Model number



**REF-250MMx250MM**

Reflective tape on metal plate 250 mm x 250 mm

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -30 ... 60 °C (-22 ... 140 °F) |
| **Mechanical specifications** | |
| Material | Reflective tape, Plate: aluminium |
| Dimensions | 250 mm x 250 mm |
| Mounting | mounting holes |

## Model number

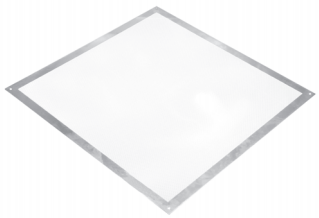


**REF-500MMx500MM**

Reflective tape on metal plate 500 mm x 500 mm

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -30 ... 60 °C (-22 ... 140 °F) |
| **Mechanical specifications** | |
| Material | Reflective tape, Plate: aluminium |
| Dimensions | 500 mm x 500 mm |
| Mounting | mounting holes |

## Model number

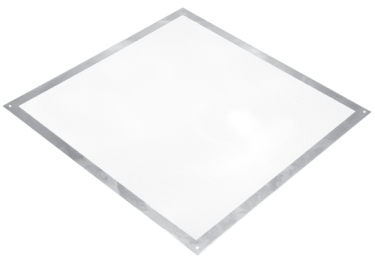


**REF-750MMx750MM**

Reflective tape on metal plate 750 mm x 750 mm

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -30 ... 60 °C (-22 ... 140 °F) |
| **Mechanical specifications** | |
| Material | Reflective tape, Plate: aluminium |
| Dimensions | 750 mm x 750 mm |
| Mounting | mounting holes |

## Model number



**REF-1000MMx1000MM**

Reflective tape on metal plate 1000 mm x 1000 mm

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -30 ... 60 °C (-22 ... 140 °F) |
| **Mechanical specifications** | |
| Material | Reflective tape, Plate: aluminium |
| Dimensions | 1000 mm x 1000 mm |
| Mounting | mounting holes |



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## Model number



### REF-VDM01

Reflector for distance measurement devices

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -30 ... 60 °C (-22 ... 140 °F) |
| **Mechanical specifications** | |
| Material | Reflective tape, PMMA reflectors plastic base |
| Dimensions | 500 mm x 500 mm |
| Mounting | mounting holes |

## Model number



### REF-VDM02

Reflector for distance measurement devices

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | -30 ... 60 °C (-22 ... 140 °F) |
| **Mechanical specifications** | |
| Material | Reflective tape, PMMA reflectors plastic base |
| Dimensions | 500 mm x 250 mm |
| Mounting | mounting holes |

## Model number



### ORR50G

Reflector, rectangular 50.9 mm x 60.9 mm, mounting holes, fixing strap and polarization filter

| | |
|---|---|
| **Ambient conditions** | |
| Ambient temperature | 0 ... 50 °C (32 ... 122 °F) |
| **Mechanical specifications** | |
| Material | PMMA/ABS |
| Dimensions | 51 mm x 61 mm x 8 mm |
| Mounting | mounting holes |
| Note | For use with very reflective materials. |


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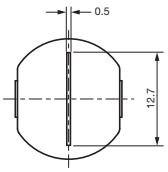
## Model number



**ML17-OA-05V**

Optical Aperture

| | |
|---|---|
| **Mechanical specifications** | |
| Material | Stainless steel |
| **Suitable series** | |
| Series | ML17 Thru-beam |



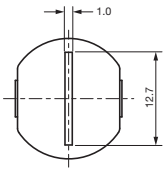

## Model number



**ML17-OA-10V**

Optical Aperture

| | |
|---|---|
| **Mechanical specifications** | |
| Material | Stainless steel |
| **Suitable series** | |
| Series | ML17 Thru-beam |



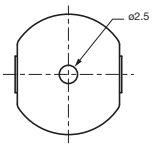

## Model number



**ML17-OA-25D**

Optical Aperture

| | |
|---|---|
| **Mechanical specifications** | |
| Material | Stainless steel |
| **Suitable series** | |
| Series | ML17 Thru-beam |



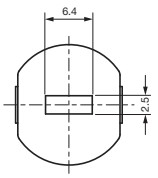

## Model number



**ML17-OA-25H**

Optical Aperture

| | |
|---|---|
| **Mechanical specifications** | |
| Material | Stainless steel |
| **Suitable series** | |
| Series | ML17 Thru-beam |






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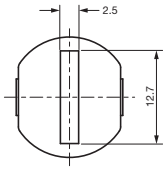
## Model number



**ML17-OA-25V**

Optical Aperture

| Mechanical specifications | |
|---|---|
| Material | Stainless steel |
| **Suitable series** | |
| Series | ML17 Thru-beam |




## Model number

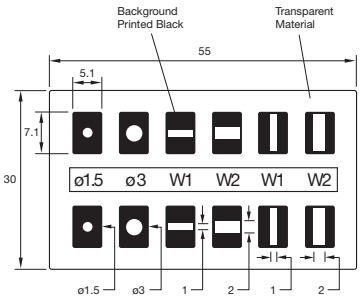


**ML17-OA-KIT**

One sample of each aperture ML17-OA-...

| Mechanical specifications | |
|---|---|
| Material | Stainless steel |
| **Suitable series** | |
| Series | ML17 Thru-beam |

## Model number




**ML3-U01**

Optical Aperture

| Suitable series | |
|---|---|
| Series | ML3 Thru-beam |

## Model number



**OSP 18 A**

90° optical deflector for sensors with M18 threaded housing

Open front for visible red light source sensors

**OSP 18 B**

90° optical deflector for sensors with M18 threaded housing

Closed front for infrared light source sensors

Suitable only for thru-beam sensors.


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