

# Photoelectric Sensors



**At a glance:**

- Smallest fully self-contained photoelectric proximity switch on the market
- Long operating distances
- Standardized sizes: Ø 4 mm smooth and M5 threaded
- Glass window, therefore scratch resistant and easy to clean
- Excellent resistance to environmental influences thanks to fully vacuum-potted electronics and optical parts
- High degree of protection: IP 67

**Construction**

The devices are built into stainless-steel housings, and fully potted under vacuum. The optical part works with parabolic mirrors (no lenses), which allows for full potting without degradation of the optical characteristics, thus providing the best long-term reliability in difficult environments. The electronic module uses chip-on-board technology on a ceramic-free substrate, and is therefore insensitive to shock and deformation.

**Technical data:**

(according to IEC 60947-5-2)

|                           |                      |
|---------------------------|----------------------|
| Hysteresis                | 10 % typ.            |
| Supply voltage range UB   | 10 ... 30 VDC        |
| Max. ripple content       | 20 %                 |
| Output current            | 100 mA max.          |
| Output voltage drop       | 2.0 V max. at 100 mA |
| Max. switching frequency  | 250 Hz               |
| Switching time (↑ and ↓)  | 2.5 msec             |
| Max. ambient light:       |                      |
| halogen                   | 5,000 Lux            |
| sun                       | 10,000 Lux           |
| Ambient temperature range | 0 ... +55 °C         |
| Degree of protection      | IP 67                |
| EMC protection:           |                      |
| IEC 60255-5               | 1 kV                 |
| IEC 61000-4-2             | Level 2              |
| IEC 61000-4-3             | Level 3              |
| IEC 61000-4-4             | Level 2              |

**Power-ON reset**

Operation of the output is inhibited until the power supply requirements are met. This prevents unwanted switching of the output during power-ON.

**Data sheets**

Detailed data sheets with additional technical information are available for all models.

**Delivery package**

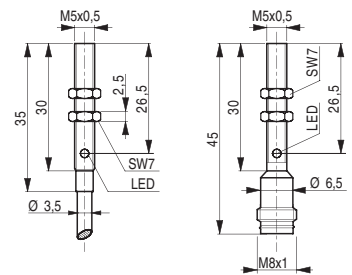
Photoelectric proximity switch, 2 fixing nuts (for size M5), instructions.

**SAFETY CAUTION:** The devices in this catalog must not be used in applications where the safety of people is dependent on their functioning.

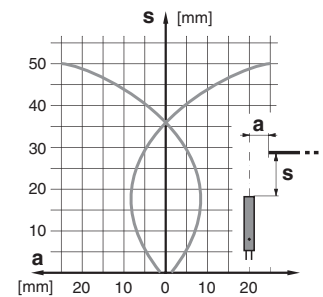
**M5**  
**Diffuse sensor,**  
**energetic**  
**50 mm**



**Dimensions:**



**Response curve:**



**Sensitivity setting**

The sensitivity is factory adjusted, and can not be modified by the user.

**Protection**

The switches are protected against over loads, short-circuits and all possible wire reversals. Furthermore, protection against over voltages caused by inductive loads on the output and against voltage spikes on the power supply lines are built in. Malfunctions or destruction caused by electrostatic discharges, fast transients, or HF fields, are prevented by appropriate technology.

**LED**

The LED (yellow) lights up when the output is switched. The LED flashes if the receiver does not receive enough light (excess light) for reliable operation.

**Connection**

Switches with 2 m PVC cable 3 x 0.14 mm<sup>2</sup> (type 2) or 3-pole S8 connector are standard. Other cable types or lengths are available on request. Suitable connecting cables are listed on page 21.

**Excess light control**

If the switch is detecting an object, but not enough light (excess light) is available at the receiver's sensing face, the LED flashes. As a result, alignment is made much easier. Moreover, eventual dirt on the sensing face is indicated early. Cleaning is therefore possible before proper operation is impaired, thus increasing system viability

|                                |                    |
|--------------------------------|--------------------|
| <b>Operating Distance</b>      | <b>50 mm</b>       |
| Standard Target                | 100 x 100 mm white |
| No-load supply current         | 15 mA typ.         |
| Emitter                        | IR LED 880 nm      |
| Weight (cable/connector model) | 35 / 4 g           |
| Part ref:                      |                    |
| PNP light-ON/cable             | LS PTK1050303      |
| PNP light-ON/connector S8      | LS PTS1050303      |
| Wiring (page 24)               | Diagram            |

**At a glance:**

- Smallest fully self-contained photoelectric proximity switches on the market
- Cylindrical light beam
- Well-defined operating range
- Standardized sizes: Ø 4 mm smooth and M5 threaded
- Sapphire window, therefore scratch resistant and easy to clean
- Excellent resistance

to environmental influences thanks to fully vacuum-potted electronics and optical parts

**Construction**

The devices are built into stainless-steel housings, and fully potted under vacuum. The optical part combines reflectors with spherical lenses, which allows for full potting without degradation of the optical characteristics, thus providing the best long-term reliability in difficult environments. The electronic module uses chip-on-board technology on a ceramic-free substrate, and is therefore insensitive to shock and deformation.

**Technical data:**

(according to IEC 60947-5-2)

Hysteresis 10 % typ.  
Supply voltage range UB 10 ... 30 VDC  
Max. ripple content 20 %  
Output current 100 mA max.  
Output voltage drop 2.0 V max. at 100 mA

Max. switching frequency 250 Hz  
Switching time (↑ and ↓) 2.5 msec  
Max. ambient light:  
halogen 5,000 Lux  
sun 10,000 Lux  
Ambient temperature range 0 ... +55 oC

Degree of protection IP 67

**EMC protection:**

IEC 60255-5 1 kV  
IEC 61000-4-2 Level 2  
IEC 61000-4-3 Level 3  
IEC 61000-4-4 Level 2

**Sensitivity setting**

The sensitivity is factory adjusted and cannot be modified by the user.

**Protection**

The switches are protected against over loads, short-circuits and all possible wire reversals. Furthermore, protection against over-voltages caused by inductive loads on the output and against voltage spikes on the power supply lines are built in. Malfunctions or destruction caused by electrostatic discharges, fast-transients, or HF fields, are prevented by appropriate technology.

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**Power-ON reset**

Operation of the output is inhibited until the power supply requirements are met. This prevents unwanted switching of the output during power-ON.

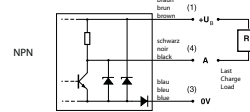
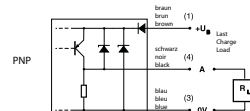
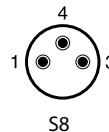
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Photoelectric proximity switch, 2 fixing nuts (for size M5), instructions.

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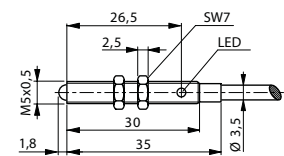


**M5**

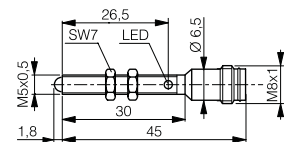
**Diffuse sensor,  
energetic**  
**20 mm**



**Dimensions:**

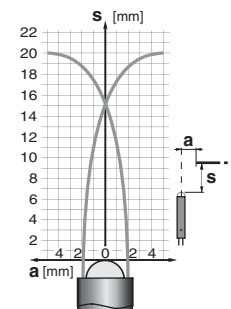


LTK-1050-30#-506



LTS-1050-30#-506

**Response curve:**

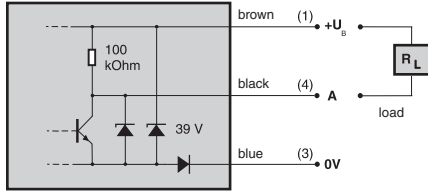


|                                |                    |
|--------------------------------|--------------------|
| <b>Operating Distance</b>      | <b>20 mm</b>       |
| Standard Target                | 100 x 100 mm white |
| No-load supply current         | 15 mA typ.         |
| Emitter                        | IR LED 880 nm      |
| Weight (cable/connector model) | 30 g               |
| Part ref:                      |                    |
| PNP light-ON/cable             | LS PTK1050303506   |
| PNP light-ON/connector S8      | LS PTS1050303506   |
| Wiring (page 24)               | Diagram 1          |

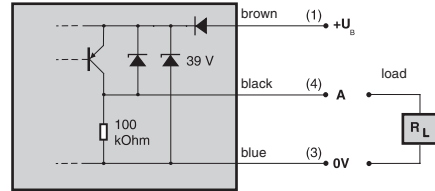
# Wiring diagrams

NPN light-ON / dark-ON output

Diagram 1

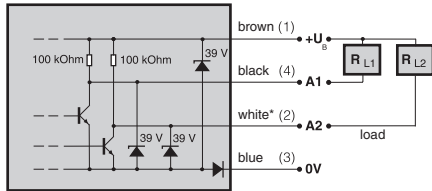


PNP light-ON / dark-ON output



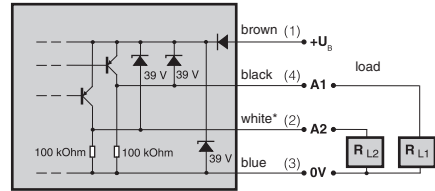
NPN changeover outputs  
NPN light-ON (/dark-ON) + excess-gain outputs

Diagram 2



\* pink for LFK-3#60-10#

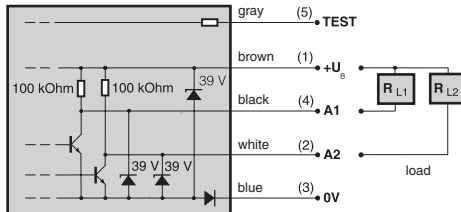
PNP changeover outputs  
PNP light-ON (/dark-ON) + excess-gain outputs



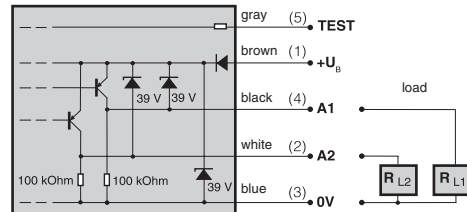
\* pink for LFK-3#60-10#

NPN with test input

Diagram 3



PNP with test input



Emitter of through-beam sensor

Diagram 4

