# PHOTOELECTRIC STANDARD SENSORS

Edition 2006

PEPPERL+FUCHS
VISOLUX

# Photoelectric standard sensors

Photoelectric sensors are in the forefront of modern production automation. Their reliability is decisive in the functionality of the overall system. Their characteristics have decisive influence on their cost, cost-effectiveness and quality.

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With the VISOLUX brand, Pepperl+Fuchs offers one of the largest lines of modern photoelectric sensors on the market. This includes standard sensors in a wide variety of designs for typical automation tasks like detection, recognition or positioning. The high-end sensors are suitable for demanding detection tasks such as reading of barcodes, measurement of distances, data transmission using light, or industrial image processing.

VISOLUX Sensors – they also include safety sensors for the protection of personnel. The contact-free safety systems are usable in many applications.

The convenient and simultaneously safe operation of doors, gates, and elevators is the topic of industry-specific door and elevator sensors.

# The sensors with the decisive plus

**VISO+** is the symbol for a new generation of photoelectric standard sensors with precisely the feature set you need today.

- They guarantee reliable operation even under unfavourable conditions.
- They allow rational use, from commissioning to fault detection to storage.
- They have a flexible design in order to satisfy a wide spectrum of application requirements.

**VISO+** stands for a decisive step forward in development which combines increased functionality with maximum cost-effectiveness.

VISO+ – All devices with this symbol fulfil these decisive plus points:

- **Especially bright, easily visible display LEDs**
- **LED green for POWER-ON**
- **Resistance to interference from external HF light**
- **Protected against mutual interaction**
- **Modern output stages such as push-pull or AS Interface 2.11**

*small and precise*

| | SERIES ML4.1/ML4.2 | SERIES ML6-8-H | SERIES ML7/ML71 |
|---|---|---|---|
| Highlights | ■ Precise background suppression<br>■ Minimum black/white difference<br>■ Miniature design<br>■ Powerful push-pull output<br>■ Optical surface made of glass<br>■ Mounting holes with metal reinforcement | ■ Excellent background suppression and minimum black/white difference<br>■ Small, sharp light spot<br>■ Various fixed scanning ranges and one adjustable version additional LED display behind front panel<br>■ Antivalent push-pull output stage<br>■ Mounting holes with metal reinforcement | ■ Light outlet on side: ML7 or front: ML71<br>■ Flexible mounting with three mounting holes and elongated hole (slot)<br>■ LED flashing green in case of short circuit |
| **General technical data** | | | |
| **Dimensions W x H x D** | 13.9 mm x 25.4 mm x 18 mm | 13.9 mm x 31.4 mm x 18 mm | 11 mm x 31 mm x 23 mm |
| **Connection type** | M8 connector, 4-pin, fixed cable | M8 connector, 4-pin / fixed cable | M8 connector, 4-pin / fixed cable / 200 mm fixed cable with M12 connector, 4-pin |
| **Operating voltage** | 10 V DC ... 30 V DC | 10 V DC ... 30 V DC | 10 V DC ... 30 V DC |
| **Function indicator** | Power-On / switching state / Pre-fault / undervoltage | Power-On / switching state / pre-fault Undervoltage | Power-On / switching state / pre-fault |
| **Switch output** | Push-pull | 2 push-pull outputs | 1 NPN / 1 PNP |
| **Switching type** | Electr. light/dark on switching | | Light on/dark on |
| **Protection class** | IP 65 (ML4.1) / IO67 (ML42) | IP 67 | IP 67 |
| **Single-path light beam switches** | | | |
| **Detection range** | 2.5 m | | 4.5 m |
| **Type of light** | Red light | | Red light |
| **Custom equipment** | | | TEACH-IN |
| **Reflex light beam switches** | | | |
| **Detection range** | 400 mm | | 2.8 m |
| **Type of light** | Red light | | Red light |
| **Custom equipment** | Polarisation filter | | TEACH-IN; Polarisation filter |
| **Direct detection light scanners** | | | |
| **Scanning range** | 400 mm | | 200 mm |
| **Type of light** | Red light | | Red light |
| **Custom equipment** | | | TEACH-IN |
| **Direct detection light scanners with background suppression** | | | |
| **Scanning range** | 20 mm / 40 mm / 60 mm / 80 mm | 20 mm / 40 mm / 60 mm / 80 mm / 120 mm / 150 mm | 140 mm / 350 mm |
| **Type of light** | Red light / Infrared light | Red light / Infrared light | Red light / Infrared light |
| **Custom equipment** | | Detection range adjustment / mechanically adjustable background suppression | Detection range adjustment / mechanically adjustable background suppression |

## Series ML8

- Miniature light tree, specially for warehousing and conveyor systems
- Versions with M8 connector or pigtail
- No operating components
- Yellow function indicator behind front panel
- Flexible mounting with three mounting holes and elongated hole (slot)

11 mm x 31 mm x 23 mm

M8 connector, 4-pin / pigtail:
Fixed cable 300 mm with M12 connector, 4-pin

10 V DC ... 30 V DC

Switching state / pre-fault

1 PNP / 1 NPN / 2 push-pull outputs

Light on/dark on

IP 67

0.65 m / 2.8 m / 4.5 m

Red light

Polarisation filter / clear glass detection / 2 switching state displays

200 mm

Red light

2 switching state displays

140 mm / 350 mm

Red light / Infrared light

Detection range adjustment

## Series ML17

- Frontal mounting with M18 thread, alternatively with lateral bores
- Connection variants with M8 connector, M12 connector, fixed cable or pigtail
- Adjustable sensitivity or sensing range
- Robust, water-tight plastic housing

15 mm x 34.5 mm x 31 mm

M8 connector, 4-pin / M12 connector, 4-pin / pigtail: fixed cable 150 mm with M12 connector, 4-pin / fixed cable

10 V DC ... 30 V DC

Power-On / switching state

1 push-pull output / 2 PNP / 2 NPN

Electr. light/dark on switching

IP 67

5 m / 9 m

Red light

Polarisation filter / sensitivity adjustment

450 mm

Infrared light

Detection range adjustment

## Series MLV12

- Yellow flashing function indicator on front and back of device
- LED flashing green in case of short circuit
- Robust housing - water-tight and impact-resistant with dovetail mounting and through holes

15 mm x 41.5 mm x 49 mm

M8 connector, 4-pin, rotatable 90° / M12 connector, 5-pin, rotatable 90° / fixed cable

10 V DC ... 30 V DC

Power-On / switching state / pre-fault

Push-pull / 2 PNP / 1 PNP and 1 NPN

Mech. light/dark on switching

IP 67

25 m

Red light / Infrared light

TEACH-IN, light/dark on changeover switch, alignment aid / test input

4 m / 7 m / 21 m

Red light / Infrared light / Laser light

Polarisation filter / clear glass detection / TEACH-IN / sensitivity adjustment / light/dark on changeover switch / test input

100 mm/250 mm

Red light / Infrared light

Detection range adjustment / light/dark on changeover switch

## Series MLV40/MLV41

- Low housing depth, robust metal housing
- Precise background suppression adjustable up to 350 mm, small black/white difference
- 2 devices in one: Reflex light beam switch or reflex light beam switch for clear glass detection
- High switching frequencies
- Antivalent push-pull output stage

13.6 mm x 56.5 mm x 31 mm

M12 connector, 5-pin / M8 connector, 4-pin / Fixed cable

10 V DC ... 30 V DC

Power-On / switching state / pre-fault
Undervoltage

2 push-pull outputs / 1 push-pull output / PNP / NPN / 1 PNP and 1 NPN

Electr. light/dark on switching

IP 67

10 m

Infrared light

5 m

Red light

Polarisation filter / clear glass detection / teach-In / adjustment of contrast detection steps / sensitivity adjustment / light/dark on changeover switch

500 mm

Infrared light

Detection range adjustment

350 mm

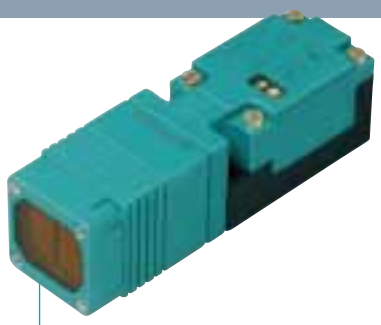
Red light / Infrared light

Scanning range adjustment / mechanically adjustable background suppression / light/dark on changeover switch

# Cubical standard designs

tried and reliable

| | SERIES 23 | SERIES 28 | SERIES 29 | SERIES 31 |
|---|---|---|---|---|
| **Highlights** | ■ All devices with adjustable background suppression<br>■ Very good black/white difference | ■ Robust plastic housing with dovetail mounting and through holes<br>■ Yellow flashing function indicator on front and back of device | ■ Series with excellent price/performance ratio<br>■ Double push-pull end stage | ■ Visible red light<br>■ Resistance to external light<br>■ Optimum optical performance data despite low housing depth<br>■ Universal voltage or low voltage devices<br>■ Double push-pull output |
| **General technical data** | | | | |
| **Dimensions W x H x D** | 26.8 mm x 91 mm x 67.6 mm | 25.8 mm x 88 mm x 54.3 mm / 25.8 mm x 88 mm x 65.5 mm | 25.8 mm x 88 mm x 54.3 mm | 18 mm x 64 mm x 35 mm |
| **Connection type** | M12 connector, 4-pin / M18 connector, 4-pin / custom connector 7-pin / terminal compartment | M12 connector, 5-pin / M12 connector, 5-pin, rotatable 90° / M18 connector, 4-pin / fixed cable / terminal compartment | M12 connector, 4-pin | M12 connector, 4-pin / fixed cable |
| **Operating voltage** | 10 V DC ... 30 V DC / 12 V AC / DC ... 240 V AC / DC | 10 V DC ... 30 V DC / 12 V AC / DC ... 240 V AC / DC | 10 V DC ... 30 V DC | 10 V DC ... 30 V DC / 12 V AC / DC ... 240 V AC / DC |
| **Function indicator** | Switching state | Power-On / switching state / pre-fault | Switching state | Power-On / switching state / pre-fault |
| **Switch output** | 2 PNP / 1 NPN / Relay | Push-pull / 2 PNP / 1 PNP and 1 NPN/ relay | 2 push-pull | 2 push-pull / relays |
| **Switching type** | Mech. light/dark on switching | Mech. light/dark on switching | Light on/dark on | Light on/dark on |
| **Protection class** | IP 65 | IP 67 | IP 65 | IP 67 |
| **Single-path light beam switches** | | | | |
| **Detection range** | | 40 m / 90 m / 400 m | | 43 m |
| **Type of light** | | Red light / laser light | | Red light |
| **Custom equipment** | | Alignment aid / time functions / sensitivity adjustment / light/dark on changeover switch | | Test input |
| **Reflex light beam switches** | | | | |
| **Detection range** | | 5 m / 12 m / 16 m / 42 m | 11 m | 1200 mm |
| **Type of light** | | Red light / laser light | Red light | Red light |
| **Custom equipment** | | Polarisation filter / foreground masking / clear glass detection / time functions / sensitivity adjustment / light/dark on changeover switch | Polarisation filter / foreground masking | Polarisation filter |
| **Direct detection light scanners** | | | | |
| **Scanning range** | | | 2000 mm | 1200 mm / 300 mm |
| **Type of light** | | | Red light | Red light |
| **Custom equipment** | | | Detection range adjustment<br>1200 mm | Sensing range adjustment, backgro suppression |
| **Direct detection light scanners with background suppression** | | | Red light | |
| **Scanning range** | 350 mm / 500 mm/ 1000 mm / 2000 mm | Cable version, 400 mm … 700 2000 mm | Detection range adjustment | |
| **Type of light** | Red light / Infrared light | Red light / Infrared light / laser light | | |
| **Custom equipment** | Time functions / detection range adjustment / light/dark on changeover switch | Time functions / detection range adjustment / light/dark on changeover switch | | |



## SERIES 32

- Compact style with possibility of frontal mounting, specially for warehousing and conveyor systems
- Protected against mutual interaction

22 mm x 72.2 mm x 45.6 mm

M12 connector, 4-pin

10 V DC ... 30 V DC

Switching state / pre-fault

1 PNP / 2 PNP

light/dark on switching

IP 65

20 m / 45 m

Red light

ATEX approval for Zones 2 and 22 / light/dark on changeover switch / test input

7 m / 8 m / 14 m / 15 m

Red light

Polarisation filter / foreground masking / ATEX approval for Zones 2 and 22

800 mm

Infrared light

Detection range adjustment

400 mm / 800 mm

Infrared light

Detection range adjustment / ATEX approval for Zones 2 and 22

## SERIES 39

- Tried and tested sensor series with very good optical performance data
- Light/dark on changeover switch

25 mm x 64 mm x 75 mm

M12 connector, 4-pin / terminal compartment

10 V DC ... 30 V DC / 12 V AC / DC ... 240 V AC / DC

Switching state / pre-fault

1 NPN / 1 PNP / Relay

Mech. light/dark on switching

IP 67

30 m

Infrared light

Time functions / sensitivity adjustment / light/dark on changeover switch

9 m / 25 m

Red light

Polarisation filter / time functions / sensitivity adjustment / light/dark on changeover switch

800 mm / 2000 mm

Infrared light

Time functions / detection range adjustment / light/dark on changeover switch

500 mm

Infrared light

Detection range adjustment / light/dark on changeover switch

## VARIKONT L SERIES

- Active range rotatable in 15° steps without changing the installation
- Removable terminal compartment

40 mm x 40 mm x 55.5 mm

M12 connector, 4-pin

10 V DC ... 30 V DC

Switching state / pre-fault

1 NPN / 1 PNP

Electr. light/dark on switching

IP 67

6 m

Red light

Polarisation filter / sensitivity adjustment

200 mm / 400 mm

Red light / Infrared light

Detection range adjustment / optical fibre connection

200 mm

Red light

Detection range adjustment / switching point adjustment

## SERIES VARIKONT M

- Active range rotatable in 5 directions without changing the installation
- Protected against mutual interaction

30 mm x 30 mm x 102 mm

Terminal compartment

10 V DC ... 30 V DC / 6 V AC / DC ... 20 V AC / DC

Power-On / switching state / pre-fault

1 NPN / 1 PNP

light/dark on switching

IP 67

2 m / 3 m

Red light

Polarisation filter / ATEX approval for Zones 20 and 1 / programmable switch for light/dark on switch and time functions

300 mm / 500 mm

Infrared light

ATEX approval for Zones 20 and 1 / detection range adjustment / programmable switch for light/dark on switch and time functions / fibre optic connection

100 mm

Infrared light

Detection range adjustment / programmable switch for light/dark on switch and time functions

*functional and simple to install*

| | SERIES KT10 | SERIES GLV12 | SERIES GLV30 |
|---|---|---|---|
| **Highlights** | ■ Miniature design in M4 stainless steel threaded housing<br>■ For operation, signal transformers SU10 or SU11 suitable | ■ M12 nickel plated brass threaded housing<br>■ Red light for better alignment | ■ M30 plastic threaded housing<br>■ Short design |
| **General technical data** | | | |
| **Dimensions ø x L** | M4 x 25 mm | M12 x 55 mm / M12 x 65 mm | M30 x 89 mm |
| **Connection type** | Fixed cable | M12 connector, 4-pin / fixed cable | M12 connector, 4-pin |
| **Operating voltage** | 10 V DC ... 30 V DC * | 10 V DC ... 30 V DC | 24 V DC |
| **Function indicator** | Switching state / pre-fault * | Switching state | Switching state |
| **Switch output** | 1 NPN and 1 PNP * | 1 NPN / 1 PNP | 2 PNP |
| **Switching type** | Mech. light/dark on switching* | Electr. light/dark on switching | Electr. light/dark on switching |
| **Protection class** | IP65 | IP 67 | IP 67 |
| **Single-path light beam switches** | | | |
| **Detection range** | 1500 mm | 5 m | |
| **Type of light** | Infrared light | Red light | |
| **Custom equipment** | | Sensitivity adjustment | |
| **Reflex light beam switches** | | | |
| **Detection range** | | 1200 m / 2500 m | |
| **Type of light** | | Red light | |
| **Custom equipment** | | Polarisation filter / sensitivity adjustment | |
| **Direct detection light scanners** | | | |
| **Scanning range** | 80 mm | 200 mm | 2500 mm |
| **Type of light** | Infrared light | Red light | Infrared light |
| **Custom equipment** | | Detection range adjustment | Detection range adjustment |
| **Direct detection light scanners with background suppression** | | | |
| **Scanning range** | 9 mm | | 150 mm |
| **Type of light** | Infrared light | | Infrared light |
| **Custom equipment** | | | |

* only in combination with SU10 or SU11 signal transformers

## Series CP18

- Patented M18 plastic housing
- Short design

| | |
|---|---|
| M18 x 55 mm | |
| M12 connector, 4-pin / fixed cable | |
| 10 V DC ... 30 V DC | |
| Switching state | |
| 1 NPN / 1 PNP | |
| Light on / dark on | |
| IP 67 | |
| | |
| 30 m | |
| Infrared light | |
| | |
| | |
| 4 m | |
| Infrared light | |
| | |
| | |
| 100 mm / 200 mm / 400 mm | |
| Infrared light | |
| | |
| | |
| | |
| | |
| | |

## Series 18GM60

- Robust M18 threaded housing
- Dual-colour indicator LED

| | |
|---|---|
| M18 x 60 mm | |
| M12 connector, 4-pin / fixed cable | |
| 10 V DC ... 30 V DC | |
| Power-On / switching state / pre-fault | |
| 1 NPN / 1 PNP | |
| Electr. light/dark on switching | |
| IP 67 | |
| | |
| 10 m | |
| Infrared light | |
| Sensitivity adjustment | |
| | |
| 4 m | |
| Red light | |
| Polarisation filter / sensitivity adjustment | |
| | |
| 200 mm/500 mm | |
| Infrared light | |
| Detection range adjustment | |
| | |
| | |
| | |
| | |

## Series VL18

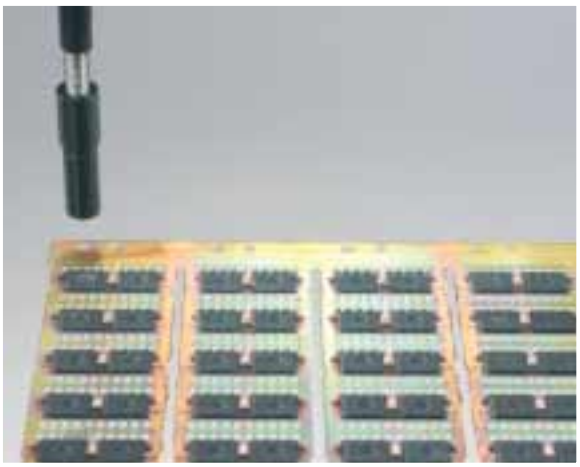
- M18 nickel-plated brass threaded housing with light outlet to side or front
- Easy-to-use control panel
- LED flashing green in case of short circuit

| | |
|---|---|
| M18 x 65 mm / M18 x 78 mm | |
| M12 connector, 4-pin | |
| 10 V DC ... 30 V DC | |
| Power-On / switching state / pre-fault | |
| Push-pull / 1 PNP / 1 NPN | |
| Mech. light/dark on switching | |
| IP 67 | |
| | |
| 85 m | |
| Laser light | |
| Focussible optics / sensitivity adjustment / light/dark on changeover switch | |
| | |
| 4 m / 18 m | |
| Red light / Laser light | |
| Polarisation filter / sensitivity adjustment / light/dark on changeover switch | |
| | |
| 400 mm | |
| Red light / Laser light | |
| Detection range adjustment / light/dark on changeover switch | |
| | |
| 120 mm | |
| Red light | |
| Detection range adjustment / light/dark on changeover switch | |

# Flexible with extensive line of fibre optics

| | Series SU15 | MLV40-LL |
|---|---|---|
| **Highlights** | ■ Ergonomic design and configuration over keypad simplifies installation and operation<br>■ Very high-performance red transmission LED | ■ Robust die-cast aluminium housing<br>■ Simple manipulation with fibre optic adapter with quick clamp connection |
| **General technical data** | | |
| **Dimensions B x H x T or ø x L** | 12 mm x 35.5 mm x 59 mm | 13.6 mm x 62.3 mm x 31 mm |
| **Connection type** | M8 connector, 4-pin / fixed cable | M12 connector, 4-pin / fixed cable |
| **Operating voltage** | 10 V DC ... 30 V DC | 10 V DC ... 30 V DC |
| **Function indicator** | Power-On / switching state / pre-fault / Teach-In | Switching state / pre-fault |
| **Switch output** | 1 PNP / 1 NPN / 2 PNP / 2 NPN | 2 PNP / 2 NPN / 1 NPN und 1 PNP |
| **Switching frequency** | 1500 Hz | 100 Hz |
| **Switching type** | Electr. light/dark on switching | Light on / dark on / electr. light/dark on switching |
| **Protection class** | IP 65 | IP 65 |
| **Specifications / particular features** | DIN rail mounting / time functions / TEACH IN / digital display / parameterisation via optical interface | Sensitivity adjustment |
| **Version** | | |
| **Connection for glass fibre optics** | | |
| **Light transmitter** | SU15-G | MLV40-LL-RT / MLV40-LL-IR |
| **Fibre optic adapter form** | Red light 660 nm | Red light / Infrared light |
| **Version** | 06 | 04 |
| **Connection for plastic fibre optics** | | |
| **Light transmitter** | SU15.1 K | |
| **Fibre optic adapter form** | Red light 660 nm | |

| VL18-LL | GLV30-LL | VARIKONT M-LL |
|---|---|---|
| ■ M18 nickel plated brass threaded housing<br>■ Easy-to-use control panel<br>■ LED flashing green in case of short circuit | ■ M30 nickel plated brass threaded housing<br>■ Measurement output 2 V ... 6 V | ■ Active range rotatable in 5 directions without changing the installation<br>■ Versions with AS Interface certification and ATEX approval for Zones 20 and 1 |
| M18 x 79 mm | M30 x 84 mm | 30 mm x 30 mm x 102 mm |
| M12 connector, 4-pin | M12 connector, 4-pin | Terminal compartment |
| 10 V DC ... 30 V DC | 10 V DC ... 30 V DC | 10 V DC ... 30 V DC |
| Power-On / switching state / pre-fault | Switching state | Switching state / pre-fault |
| Push-pull / 1 NPN / 1 PNP | 1 PNP | 1 NPN |
| 500 Hz | 80 Hz | 100 Hz / 200 Hz / 1500 Hz |
| Mech. light/dark on switching | Mech. light/dark on switching | Mech. light/dark on switching |
| IP 67 | IP 65 | IP 67 |
| Sensitivity adjustment / light/dark on changeover switch | Sensitivity adjustment / light/dark on changeover switch | Sensitivity adjustment / light/dark on changeover switch |
| VL18LL-M | GLV30-LL | VariKont M |
| Red light | Infrared light | Infrared light |
| 18 | 18/30 | 18 |



# Fork-type photoelectric sensors

## Series GL

Highlights

- Seven different fork widths in robust aluminium housings
- High switching frequency
- Very short response times
- Optimised for small part detection

General technical data

| | |
|---|---|
| **Fork widths** | 10 mm / 20 mm / 30 mm / 50 mm / 80 mm / 121 mm / 220 mm |
| **Fork depths** | 17 mm / 35 mm / 55 mm / 60 mm |
| **Obstacle size** | 0.3 mm / 0.5 mm / 2 mm |
| **Connection type** | M8 connector, 3-pin |
| **Operating voltage** | 10 V DC ... 30 V DC |
| **Type of light** | Red light / Infrared light |
| **Function indicator** | Switching state |
| **Operating components** | Sensitivity adjustment / light/dark on changeover switch |
| **Switch output** | 1 PNP |
| **Switching type** | Mech. light/dark on switching |
| **Protection class** | IP67 |

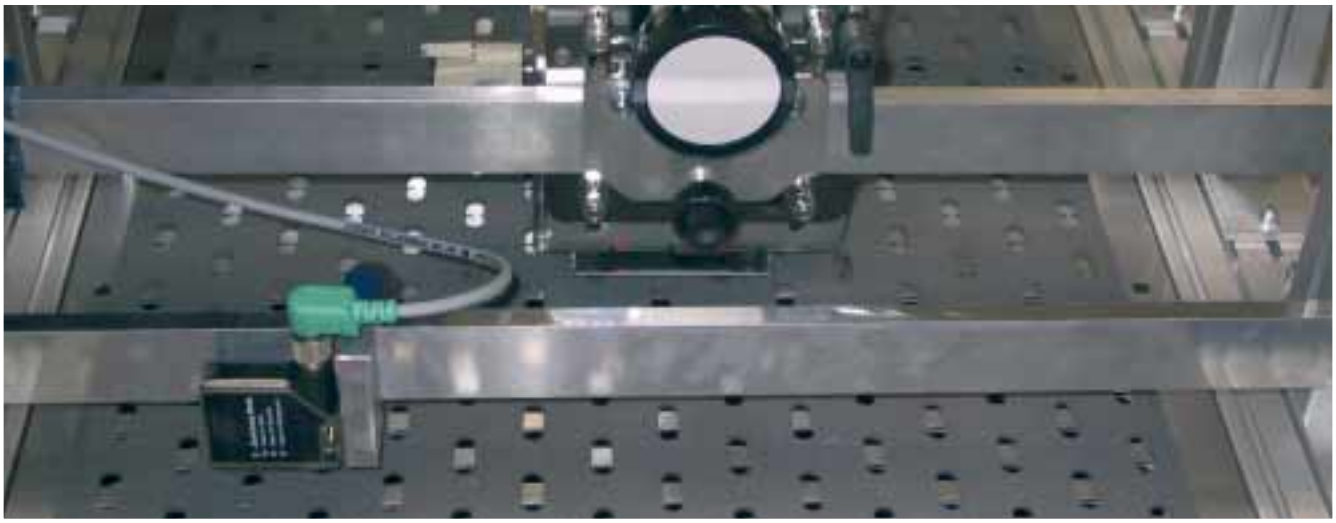
| | DF12 | DF20 | VCS110 |
|---|---|---|---|
| **Highlights** | ■ Print mark colour scanner for detection of arbitrary print marks on differently coloured backgrounds<br>■ Three colours learnable<br>■ Three tolerance levels per channel<br>■ Robust water-tight housing | ■ Print mark colour scanner for detection of arbitrary print marks on differently coloured backgrounds<br>■ Optics moveable by 90°<br>■ Robust water-tight plastic or stainless steel housing | ■ Simple learning with teach-in keypad<br>■ Up to 10 channels programmable |
| **General technical data** | | | |
| **Dimensions W x H x D** | 15 mm x 41.5 mm x 49 mm | 33 mm x 85.6 mm x 60.8 mm | 110 mm x 135 mm x 50 mm |
| **Housing material** | Frame: Die-cast nickel-plated zinc Side parts: PC glass-fibre-reinforced | DF20: Plastic<br>DFE20: Stainless steel | Aluminium |
| **Scanning range** | 11 mm | 9.5 mm/25 mm | 100 mm |
| **Light spot representation** | Rectangular, lengthwise to housing axis | Rectangular, lengthwise to housing axis / point-shaped | Depending on light guide used |
| **Connection type** | M12 connector, 8-pin | M12 connector, 5-pin | M12 connector, 8-pin and 5-pin |
| **Operating voltage** | 10 V DC ... 30 V DC | 10 V DC ... 30 V DC | 18 V DC ... 30 V DC |
| **Type of light** | Red, blue and green light | Red, blue and green light | White light |
| **Function indicator** | Power-On / switching state | Switching state / pre-fault | Power-On / switching state / Teach-In |
| **Switch output** | 1 x push-pull per channel (3-channel) | 1 NPN and 1 PNP | 5 PNP |
| **Protection class** | IP 67 | IP 67 | IP 65 |
| **Custom equipment** | Teach-In / selection of colour tolerance | Teach-In | Trigger / keyboard lock / Teach-In |

# Print mark scanner

## recognise and distinguish

| | DK10 | DK10-LAS | DK12 |
|---|---|---|---|
| **Highlights** | ■ Print mark scanner for quick detection of arbitrary print marks<br>■ Optics moveable by 90° | ■ Laser print mark scanner for detection of very small print marks<br>■ Large focus depth range from 3 mm to 300 mm | ■ Small print mark scanner for quick detection of arbitrary print marks<br>■ Teach-In static and dynamic in one unit |
| **General technical data** | | | |
| **Dimensions W x H x D** | 33 mm x 85.6 mm x 61 mm | 33 mm x 85.6 mm x 61 mm | 15 mm x 41.5 mm x 49 mm |
| **Housing material** | Plastic | Plastic | Frame: Die-cast zinc<br>Side parts: Plastic |
| **Scanning range** | 9.5 mm ± 3 mm | 300 mm / 800 mm | 11 mm |
| **Light spot representation** | Rectangular, across or parallel to housing axis | Rectangular, lengthwise to housing axis | Rectangular, lengthwise to housing axis |
| **Connection type** | M12 connector, 5-pin | M12 connector, 5-pin | M12 connector, 5-pin, rotatable 90° |
| **Operating voltage** | 10 V DC ... 30 V DC | 10 V DC ... 30 V DC | 10 V DC ... 30 V DC |
| **Type of light** | Green light | Laser light, Class 2 | Red, blue, and green light |
| **Function indicator** | Switching state | Switching state | Power-On / low voltage / switching state / pre-fault / Teach-In |
| **Switch output** | Push-pull | Push-pull / 1 NPN and 1 PNP | 2 push-pull outputs |
| **Switching type** | Mech. light/dark on switching | Mech. light/dark on switching | Electr. light/dark on switching |
| **Protection class** | IP 67 | IP 67 | IP 67 |
| **Teach-In process** | | | Static and dynamic |
| **Custom equipment** | Sensitivity adjustment / light/dark on changeover switch / analogue output / time functions | Sensitivity adjustment / light/dark on changeover switch / testing input / analogue output / time functions | Teach-In / external Teach input / time functions |

| DK20 / DK21 | DK34 / DK35 | RL-UV3 |
|---|---|---|
| ■ Print mark scanner for quick detection of arbitrary print marks<br>■ Optics moveable by 90° | ■ Print mark scanner for quick detection of arbitrary print marks<br>■ High switching precision for exact positioning tasks<br>■ High contrast resolution | ■ Direct detection light scanner for detection of fluorescent marks or materials<br>■ UV transmitter light |
| 33 mm x 85.6 mm x 61 mm | 33 mm x 85.6 mm x 61 mm | 35.7 mm x 85.7 mm x 63 mm |
| DK20 and DK21: Plastic<br>DKE20 and DKE21: Stainless steel | Plastic | Aluminium die-cast |
| 9.5 mm / 25 mm / 50 mm | 9.5 mm | 80 mm / 130 mm |
| Rectangular, across or parallel to housing axis / point-shaped | Rectangular, lengthwise to housing axis | Rectangular, lengthwise to housing axis |
| M12 connector, 5-pin | M12 connector, 5-pin | M12 connector, 4-pin / fixed cable |
| 10 V DC ... 30 V DC | 10 V DC ... 30 V DC | 22 V DC ... 26 V DC |
| Red, blue and green light | Red, blue and green light | UV light |
| Power-On / switching state / pre-fault / Teach-In | Power-On / switching state / pre-fault / Teach-In | Switching state |
| Push-pull / 1 NPN and 1 PNP | Push-pull | 1 PNP / 1 NPN |
| Via Teach-In function | Via Teach-In function | Light on/dark on |
| IP 67 | IP 67 | IP 67 |
| DK20 and DKE20: static<br>DK21 and DKE21: dynamic | DK34: static<br>DK35: dynamic | |
| Teach-In / external Teach input / time functions | Teach-In / external Teach input / time functions | Testing input /analogue output / sensitivity adjustment / light/dark on changeover switch |



# Different profile forms and variable lengths

CE

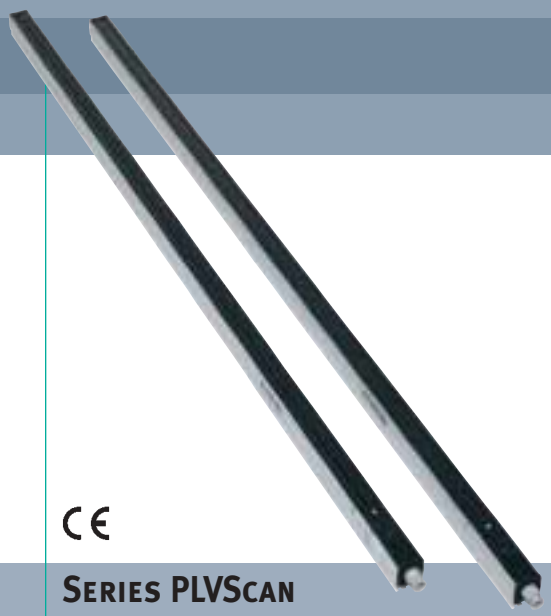
## Series PR

Highlights

- Compact light grid with 16 beams crossed or parallel
- Suitable for the detection of transparent objects

General technical data

| | |
|---|---|
| **Number of beams** | 16 |
| **Field height** | 102 mm |
| **Resolution** | 2 mm |
| **Beam spacing** | 6.5 mm / 33 mm |
| **Detection range** | 500 mm / 1500 mm |
| **Operating voltage** | 24 V DC ... 28 V DC |
| **Type of light** | Infrared light |
| **Function indicator** | Power-On, switching state |
| **Protection class** | IP 65 |
| **Signal output** | 1 PNP |
| **Switching type** | Dark on switching |
| **Dimensions W x D x L** | 41.7 mm x 50 mm x 115.7 mm |
| **Housing** | Plastic |
| **Connection type** | Fixed cable / connector, 7-pin |
| **Custom equipment** | Calibration input / automatic calibration |



## Series LG 96

- High-resolution light grid with 96 beams for height control
- Suitable for the detection of small parts and objects that are not position-guided
- Detection of any object forms
- Insensitive to external light

## Series PLVScan

- Light grids for profile control
- Separate outputs for height control and adjustable beam crossing
- Measuring variants

| | |
|---|---|
| 96 | 8 / 16 / 24 / 32 / 40 /48 / 56 / 64 |
| 480 mm | 300 mm / 340 mm / 640 mm / 728 mm / 918 mm / 1116 mm / 1320 mm / 1504 mm / 1660 mm / 1892 mm / 2000 mm / 2280 mm / 2340 mm / 2680 mm / 3056 mm |
| 5 mm | 10 mm |
| 5 mm | 20 mm / 42.5 mm / 48 mm |
| 300 mm ... 600 mm | 6 m / 12 m |
| 20 V DC ... 28 V DC | 15 V DC ... 30 VDC / 20 V DC ... 30 V DC |
| Infrared light | Infrared light |
| Power-On, switching state | Power-On, switching state, pre-fault |
| IP 54 | IP 50 / IP 65 |
| 1 PNP | 2 PNP for monitoring field and 4 PNP for height control / 2 PNP for monitoring field and 1 PNP for RS323 interface |
| Dark on switching | Light on/dark on |
| 20 mm x 627 mm x 40 mm | 38 mm x 45 mm x field height + 913 mm |
| Aluminium, black anodised | Aluminium |
| Pigtail: Fixed cable 60 mm with M12 connector, 12-pin | Terminal compartment / M16 connector |
| Calibration input / automatic calibration | Time functions / test input / function input for RS232 interface / potentiometer for adjustment of transmission power / configurable beam crossing / parameterisation using Windows software |

# Optical Data

wear-free and flexible

CE CE

| | DAD15-8P | DAD30 |
|---|---|---|
| **Highlights** | ■ Compact optical data coupler for 8-bit parallel data transmission<br>■ Very large opening angle | ■ Flat optical data coupler with three interfaces in one unit<br>■ Wide-angle version |
| **General technical data** | | |
| **Detection range** | 2.5 m / 5 m | 20 m / 45 m / 150 m |
| **Data rate** | 225 Bit/s | 0 kBit/s ... 19.2 kBit/s |
| **Interfaces** | 8-bit parallel, bidirectional, 10 PNP inputs and 10 PNP outputs / 8-bit parallel, bidirectional, 10 NPN inputs and 10 NPN outputs | RS 232, RS 422 and CL 20mA |
| **Operating voltage** | 10 V DC ... 60 V DC | 24 V DC +/-25 % |
| **Type of light** | Infrared light | Infrared light / red light |
| **Opening angle** | 8° / 20° | Transmitter: 1° and receiver: 5° / transmitter and receiver: 16° |
| **Function indicator** | Power-On / data flow | Switching state / pre-fault |
| **Protection class** | IP 67 | IP 65 |
| **Dimensions** | 76 mm x 56 mm x 53 mm | 150 mm x 64 mm x 50 mm |
| **Connection type** | 2 x M16 screw connections with spring terminals in terminal compartment | Sub-D connector, 25-pin, encapsulated |
| **Custom equipment** | Cascadable / sensitivity adjustment / function switch / test input | Alignment aid / DIP switch / measurement output / pre-fault output / wide-angle version / |

| LS230-DA | LS611-DA-P | LS610-DA-IBS |
|---|---|---|
| ■ Robust optical data coupler with three interfaces in one unit for high detection ranges<br>■ Simple alignment with integrated alignment LED and targeting scope | ■ Modern Profibus optical data coupler for detection ranges from 0 m<br>■ 1 : 1 communication<br>■ Light beam interruption with TVT (Telegram Verification Technology)<br>■ Plug connector | ■ Modern Interbus optical data coupler for detection ranges from 0 m<br>■ Plug connector |
| 230 m / 340 m / 450 m | 140 m / 260 m | 140 m / 260 m |
| 0 kBit/s ... 19.2 kBit/s | 0 kBit/s ... 1500 kBit/s, adjustable | 0 Mbit/s ... 2 Mbit/s |
| RS 232, RS 422 and CL 20mA | Profibus, galvanically isolated | RS422, galvanically isolated (Interbus) |
| 24 V DC +/-25 % | 18 V DC ... 30 V DC | 18 V DC ... 30 V DC |
| Infrared light / red light | Infrared light | Infrared light |
| Transmitter: 2° and receiver: 5° | 1.1° | 1.1° |
| Data flow / switching state / pre-fault | Data flow / signal strength / baud rate / operating modes / pre-fault | Data flow / signal strength / pre-fault |
| IP 65 | IP 65 | IP 65 |
| 162 mm x 116 mm x 133 mm | 170 mm x 90 mm x 171 mm | 170 mm x 90 mm x 171 mm |
| 4 x M16 screw connections with spring terminals in terminal compartment | 2 x M12 connectors, 5-pin and 1 x M12 connector, 4-pin | 2 x M12 connectors, 5-pin and 1 x M12 connector, 4-pin |
| Alignment LED and aiming telescope / band display / DIP switch / test input / measurement output / pre-fault output / 2 frequencies | Alignment aid / parameterisation via membrane keys / bar graph display / pre-fault output | Alignment aid / bar graph display / pre-fault output |

precise
reliable
flexible

| | Series VDM35 | Series VDM80 |
|---|---|---|
| Highlights | ■ Precise propagation time measurement<br>■ Simple alignment with integrated pilot laser<br>■ Device version for work on reflector and diffusely reflecting objects<br>■ 2 adjustable switch outputs<br>■ Insensitive to external light<br>■ Analogue output 4 ... 20 mA | ■ New expanded measurement range up to 150 m or 240 m<br>■ Extremely low temperature drift<br>■ Versatility in usage due to 8 measurement modes<br>■ Precise positioning due to high repeat accuracy<br>■ Easy alignment due to laser pointer and fine adjustment option |
| **General technical data** | | |
| **Measurement range** | 6 m / 30 m | 50 m / 150 m / 240 m |
| **Reference object** | Reflector / Kodak white | Reflector |
| **Type of light** | Laser light | Infrared light |
| **Operating voltage** | 18 V DC ... 30 V DC | 24 V DC +/-25 % |
| **Signal output** | 2 PNP | Interface type: Interbus / Profibus DP / SSI |
| **Measurement output** | Analogue output 4 ... 20 mA | Data rate: max. 1.5 Mbit/s |
| **Function indicator** | Power-On / switching state / operating mode | Switching state |
| **Protection class** | IP 67 | IP 65 |
| **Dimensions** | 93 mm x 95 mm x 42 mm | 70 mm x 307 mm x 70 mm |
| **Connection type** | M12 connector, 5-pin | Screw terminals |
| **Custom equipment** | Switching point adjustment / operating mode / analogue output | Alignment aid / adjustment of the measurement modes |

| | VOS110-FFPL | VOS120-FFPL |
|---|---|---|
| **Highlights** | ■ Compact system for fine compartment positioning in pallet warehouses<br>■ Camera with lighting in the M30 housing<br>■ Detects the position of an index bore<br>■ Accuracy of measurement +/- 1 mm | ■ Compact system for fine compartment positioning in pallet warehouses<br>■ Camera with integrated illumination<br>■ Detects the position of an index bore<br>■ Accuracy of measurement +/- 1 mm<br>■ High detection range |
| **General technical data** | | |
| **Object distance** | 100 mm ... 200 mm | 200 mm ... 500 mm |
| **Measurement range** | +/- 20 mm in x and y direction | +/- 20 mm in x and y direction |
| **Measurement rate** | 10/s | 10/s |
| **Optical resolution** | 0.15 mm | Depending on lens used |
| **Type of light** | White light | White light or infrared light |
| **Operating voltage** | 24 V DC +/-20% | 24 V DC +/-20% |
| **Function indicator** | - | Power-on |
| **Protection class** | IP 54 | IP 54 |
| **Dimensions** | M30 x 110 mm | 70mm x 70 mm x 45 mm |
| **Connection type** | 12-pin round connector M16 | M12 connector, 5-pin and M12 socket, 4-pin |

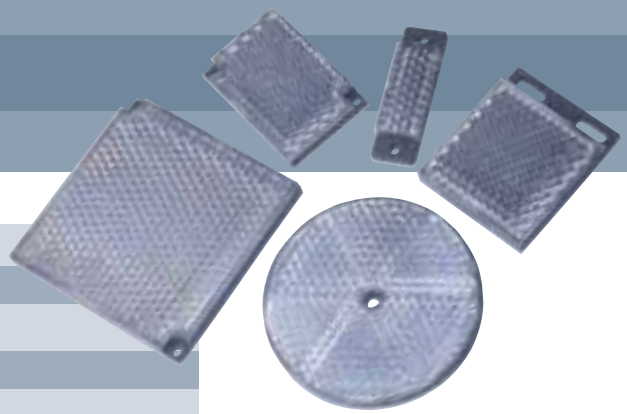
# Glass fibre optic and plastic fibre optic

with different sheeting and a large selection of optic heads

Length of fibre optic standard:
500 mm, 1000 mm or 2000 mm
Other lengths available on request

| Glass fibre optic | Plastic fibre optic |
|---|---|
| K2 | K81 |
| K11 | K75 |
| WC0 | K78 |
| K12 | K101 |
| K14 | K71 |
| WC1-.. | K82 |
| K10 | K106 |
| K13 | K108 |
| K3 | K101 |
| G.. | K113 |
| K9 | K102 |
| Z0 | K111 |

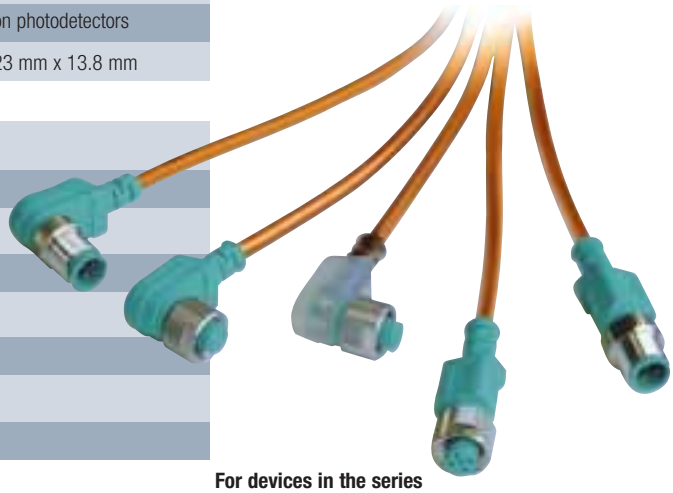
# Standard accessories



## Standard reflectors

| Order code | Description |
|---|---|
| **REFLECTOR H50** | Rectangular reflector 50.9 mm x 50.9 mm |
| **REFLECTOR H60** | Rectangular reflector 60 mm x 40.5 mm |
| **REFLECTOR H85** | Rectangular reflector 84.5 mm x 84.5 mm |
| **REFLECTOR H160** | Rectangular reflector 60 mm x 18 mm |
| **REFLECTOR C110-2** | Round reflector, diameter = 84 mm |
| **REFLECTOR ORR50G** | Rectangular reflector with polarisation filter for glass/membrane detection, 50 mm x 50 mm |
| **REFLECTOR VR10** | Rectangular reflector 60 mm x 19 mm |
| **OFR-100/100** | Reflective foil cutout 100 mm x 100 mm, suitable for polarisation photodetectors |
| **REFLECTOR MH23** | Reflector with microstructure, special for laser photodetectors, 23 mm x 13.8 mm |

## Standard connector cables



| | |
|---|---|
| **V3-GM-2M-PVC** | Straight plug connector, M8, 3-pin with 2m PVC cable |
| **V3-WM-2M-PVC** | Angle plug connector, M8, 3-pin with 2m PVC cable |
| **V31-GM-2M-PVC** | Straight plug connector, M8, 4-pin with 2m PVC cable |
| **V31-WM-2M-PVC** | Angle plug connector, M8, 4-pin with 2m PVC cable |
| **V1-G-2M-PVC** | Straight plug connector, M12, 4-pin with 2m PVC cable |
| **V1-W-2M-PVC** | Angle plug connector, M12, 4-pin with 2m PVC cable |
| **V15-G-2M-PVC** | Straight plug connector, M12, 5-pin with 2m PVC cable |
| **V15-W-2M-PVC** | Angle plug connector, M12, 5-pin with 2m PVC cable |

## Standard mounting accessories

| | | For devices in the series |
|---|---|---|
| **OMH-ML4.1** | Clamp | ML4.1, ML4.2, ML6 |
| **OMH-ML6** | Mounting bracket | ML4.2, ML6 |
| **OMH-ML7-01 installation kit** | Mounting set consisting of mounting bracket, fastening sheet, and fastening material | ML7, ML8 |
| **OMH-ML7-02 installation kit** | Mounting set consisting of mounting bracket, fastening sheet, and fastening material | ML71 |
| **OMH-01** | Mounting accessory for round steel 12 mm | DK12, DF12 |
| **OMH-K01** | Clamp for dovetail mount | DK12, DF12 |
| **OMH-K02** | Clamp narrow | MLV12, DK12, DF12 |
| **OMH-MLV12-HWG** | Large mounting bracket | DK12, DF12 |
| **OMH-MLV12-HWK** | Small mounting bracket | DK12, DF12 |
| **OMH-40** | Mounting bracket | MLV40, MLV41 |
| **OMH-21** | Mounting bracket | 23, 28, 29 |
| **OMH-22** | Mounting bracket for mounting on aluminium profile | 23, 28, 29, 32 |
| **OHMH-RLK29** | Mounting bracket | 28, 29 |
| **OMH-05** | Mounting accessory for round steel 12 mm | 23, 28, 29, 30, 32 |
| **OMH-RL31-01** | Mounting bracket | 31 |
| **OMH-03** | Mounting accessory for round steel 12 mm | RL39 |
| **OMH-RL39** | Mounting bracket | RL39 |
| **MH 04-3742A** | Mounting aid | Varikont-M |
| **OMH-02** | Mounting accessory for round steel 12 mm | Varikont-M |
| **BF 12** | Fixing flange | GLV12 |
| **OMH-VL18** | Fixing bracket with tabulating mechanism | VL18 |
| **BF 18** | Fixing flange | VL18, 18GM60 |
| **OMH-LS610-01** | Mounting device | LS610, LS611 |
| **OMH-DAD10** | Mounting bracket | DAD15 |
| **OMH-04** | Mounting set for round steel 12 mm or sheet 1.5 ... 3 mm, | VL18, 18GM60, CP18 |

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