

PHOTOELECTRIC STANDARD SENSORS

2008 Edition





Photoelectric sensors are in the forefront of modern production automation. Their reliability impacts the entire system – from efficient day to day operation to product quality.

VISOLUX

With the VISOLUX brand, Pepperl+Fuchs offers one of the largest lines of modern photoelectric sensors on the market. This includes sensors for typical automation tasks like detection, recognition, and positioning to more application specific sensors for, distance measurement, data transmission, and image processing.

VISOLUX Sensors – they also include photoelectric safety sensors for the protection of personnel. The contact-free safety systems have many useful applications.



The convenient and safe operation of doors, gates, and elevators is the main focus of door and elevator sensors.

VISO+ is the symbol for a new generation of photoelectric standard sensors with the features you need today.

- They guarantee reliable operation even under unfavourable conditions.
- They allow for greater effectiveness, from commissioning to fault detection to storage.
- They have a flexible design which satisfies a wide variety of application specific requirements.



VISO+

VISO+ stands for a decisive step forward in development – cost effective with maximum efficiency.

VISO+ – Sensors with this symbol have the following features:

- Especially bright displays visible over a long distance
- LED green for Power-On, short-circuit and low voltage
- Resistance to interference from external HF light
- Protected against mutual interferences
- Modern output stages

MINIATURE SENSORS

small and precise



VISO+



ECOLAB



ML4.1/ML4.2 Series

ML6 Series

ML7/ML71 Series

Highlights

- Excellent background suppression
- Minimum black/white difference
- Powerful push-pull output
- Glass lens
- Metal reinforced mounting holes

- Precise background suppression and small black/white difference
- Small, sharp light spot
- Various fixed and adjustable sensing ranges
- Plastic lens
- Metal reinforced mounting holes

- Light outlet on side: ML7, frontal: ML71
- Automatic setup via Teach-In
- Resistant to detergents and disinfectants
- IP69K steam jet resistance
- 2 point scanning method

General Technical Data

Dimensions H x W x D	13.9 mm x 31.4 mm x 18 mm	13.9 mm x 31.4 mm x 18 mm	11 mm x 31 mm x 23 mm
Connection type	4-pin, M8 connector / fixed cable	4-pin, M8 connector / fixed cable	4-pin, M8 connector / fixed cable / pigtail
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 / short-circuit / pre-fault / under voltage	Power on / switching state / pre-fault under voltage	Power on / switching state / pre-fault short-circuit
Output type	Push-pull	2 push-pull / 2 PNP / 1 NPN	1 NPN / 1 PNP / 2 push-pull
Switching type	Electr. light on / dark on		Light on / dark on
Protection category	IP65 (ML4.1) / IP 67 (ML4.2)	IP67	IP67 / IP69k

Thru-beam sensors

Sensing range	2.5 m		3.5 m
Light type	Visible red light		Visible red light
Features			

Retro-reflective sensors

Sensing range	400 mm	3 m / 6 m	3.5 m / 7.6 m
Light type	Visible red light	Visible red light	Visible red light
Features	Polarization filter	Teach-In / polarization filter / clear glass detection	Teach-In / polarization filter / clear glass detection

Diffuse mode sensors

Sensing range:	400 mm		200 mm
Light type	Visible red light		Visible red light
Features			Teach-In

Diffuse mode sensors with background suppression

Sensing 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
Light type	Visible red light / infrared light	Visible red light	Visible red light / infrared light
Features		Adjustable sensing range / mechanically adjustable / background suppression	Adjustable sensing range / mechanically adjustable background suppression



ML8 Series

- Special version for warehousing and conveying technology
- Available with M8 connector or pigtail
- No control elements

11 mm x 31 mm x 23 mm

4-pin, M8 connector / fixed cable / pigtail

10 V DC ... 30 V DC

Switching state / pre-fault

1 PNP / 1 NPN / push-pull

Light on / dark on

IP67

4.5 m

Visible red light

Transmitter deactivation input

0.65 m / 3.5 m / 7.6 m

Visible red light

Polarization filter / clear glass detection / 2 switching state indicators

200 mm

Visible red light

2 switching state indicators

140 mm/350 mm

Visible red light / infrared light

Adjustable sensing range / background suppression



ML9 Series

- Very high switching frequency and switch point accuracy
- Automatic setup via Teach-In
- 2 point scanning method

11 mm x 38 mm x 23 mm

4-pin, M8 connector / pigtail / fixed cable

10 V DC ... 30 V DC

Switching state / pre-fault

1 PNP / 1 NPN / push-pull

Light on / dark on

IP67

6 m

Visible red light

Polarization filter / clear glass detection / Teach-In

50 mm, adjustable

Visible red light

50 mm, adjustable

Visible red light

Teach-In



ML17 Series

- Versatile mounting with M18 thread and slotted holes
- Adjustable sensitivity and sensing range
- Robust, water-tight plastic housing

15 mm x 34.5 mm x 31 mm

4-pin, M8 connector / 4-pin, M12 connector / pigtail / fixed cable

10 V DC ... 30 V DC

Power on / switching state

2 push-pull / 2 PNP / 2 NPN

Light on / dark on

IP67

20 m

Infrared

Polarization filter / adjustable sensitivity / fiber optic sensor

450 mm

Infrared light

Adjustable sensing range

50 mm / 100 mm / 150 mm

Visible red light

Visible red light



MLV12 Series

- Increased stability due to rugged diecast metal housing frame
- Minimum black/white difference
- Very high switching frequency

15 mm x 41.5 mm x 49 mm

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

10 V DC ... 30 V DC

Power on / switching state / pre-fault / short-circuit

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

Mech. light on / dark on

IP67

25 m

Visible red light / infrared light

Teach-In / light on / dark on switching, alignment aid / test input

5.6 m / 9 m / 21 m

Visible red light / infrared light / laser

Polarization filter / clear glass detection / Teach-In / adjustable sensitivity / light on / dark on switching / test input

100 mm / 250 mm

Visible red light / infrared light

Adjustable sensing range / light on / dark on switching / background suppression



MLV40/MLV41 Series

- Compact housing, robust metal housing
- Precise background suppression up to 350 mm adjustable small black/white difference
- 2 devices in one: diffuse mode sensor or diffuse mode sensor for clear glass detection
- High switching frequencies

13.6 mm x 56.5 mm x 31 mm

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

10 V DC ... 30 V DC

Power on / switching state / pre-fault / short-circuit under voltage

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

Electr. light on / dark on

IP67

10 m

Infrared light

6.5 m

Visible red light

Polarization filter / clear glass detection / Teach-In / adjustable contrast detection levels / adjustable sensitivity / light on dark on switching / fiber optic sensor

500 mm

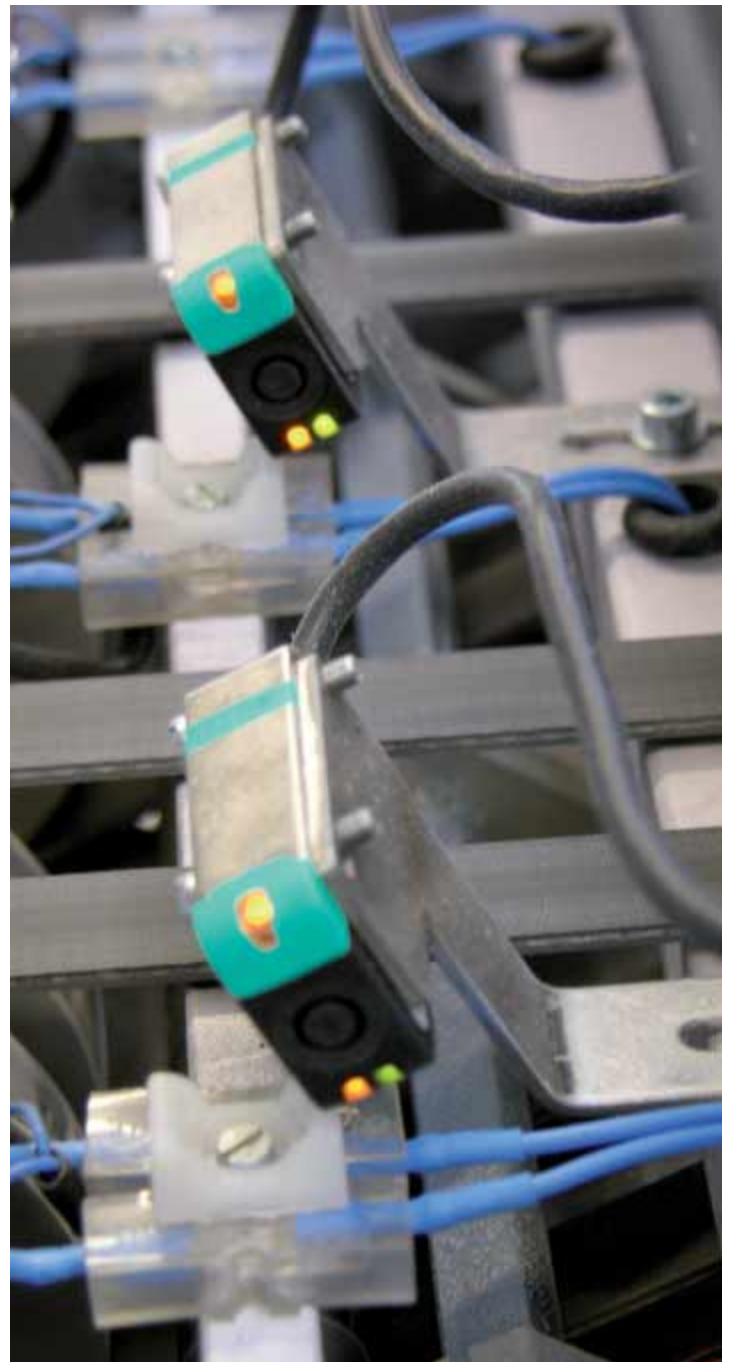
Infrared light

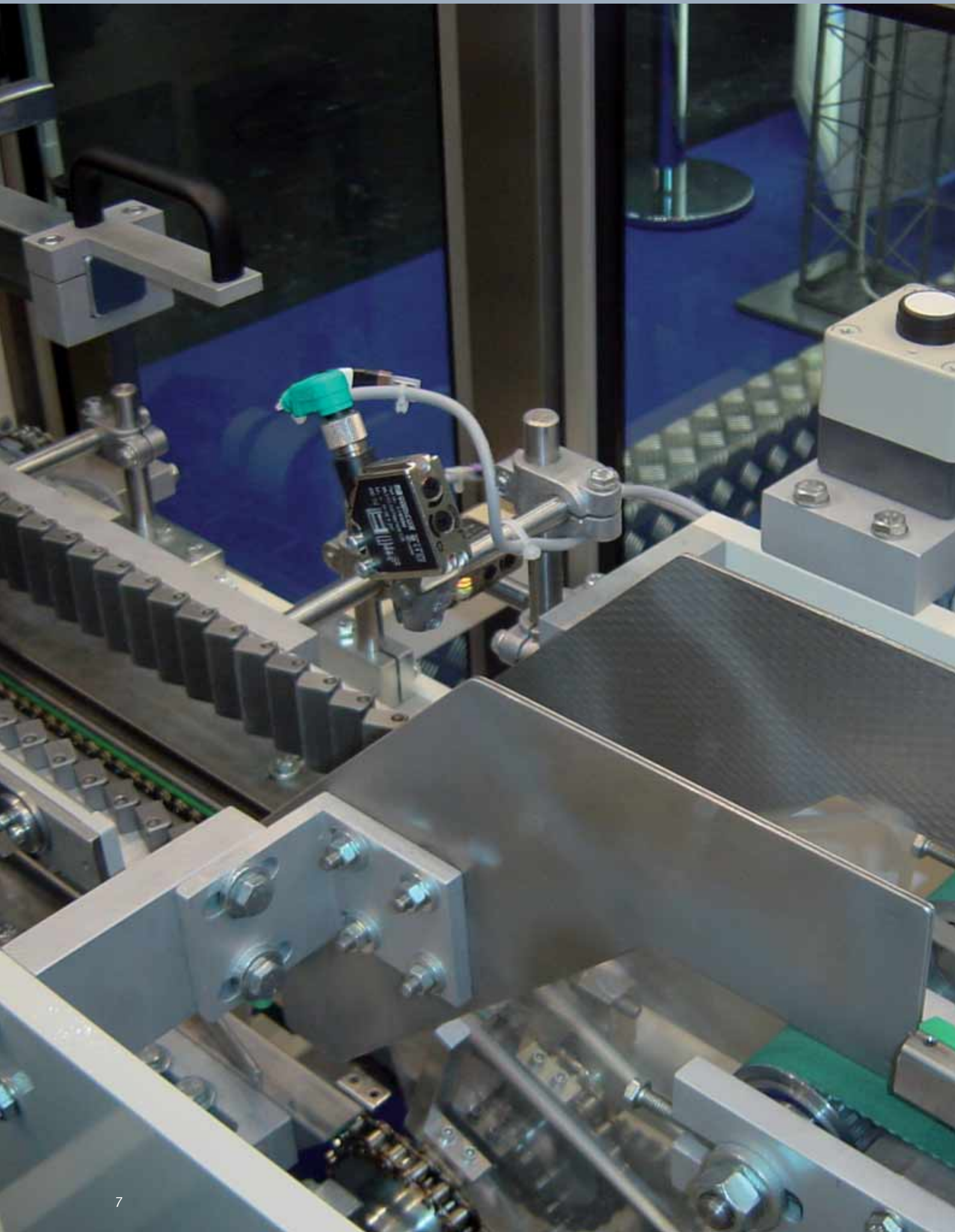
Adjustable sensing range

350 mm

Visible red light / infrared light

Adjustable sensing range / mechanically adjustable background suppression / light on dark on switching





RECTANGULAR STANDARD DESIGNS

proven
and
reliable



	23 Series	28 Series	29 Series	31 Series
Highlights	<ul style="list-style-type: none"> Adjustable background suppression Very good black/white difference 	<ul style="list-style-type: none"> Robust plastic housing with dovetail and hole mounting options Yellow flashing LEDs on front and back of device 	<ul style="list-style-type: none"> Cost effective series Double push-pull output 	<ul style="list-style-type: none"> Visible red light High ambient light limit Highly functional compact housing AC/DC and DC models Double push-pull output
Dimensions H x W 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	4-pin, M12 connector / 4-pin, M18 connector / 7-pin surface mounted connector / terminal compartment	5-pin, M12 connector / 4-pin, M18 connector / fixed cable / terminal compartment	4-pin, M12 connector	4-pin, M12 connector / 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
Output type	2 PNP / 1 NPN / relay	Push-pull / 2 PNP / 1 PNP and 1 NPN / relay	2 push-pull	2 push-pull / relay
Switching type	Mech. light on / dark on	Mech. light on / dark on	Light on / dark on	Light on / dark on
Protection category	IP65	IP67	IP65	IP67
Thru-beam sensors				
Sensing range		40 m / 90 m / 400 m		43 m
Light type		Visible red light / laser		Visible red light
Features		Alignment aid / timer functions / adjustable sensitivity / light on / dark on switching		Test input
Retro-reflective sensors				
Sensing range		7 m / 17 m / 21 m / 42 m	11 m	12 m
Light type		Visible red light / laser	Visible red light	Visible red light
Features		Polarization filter / foreground suppression / clear glass detection / timer functions / adjustable sensitivity / light on / dark on switching	Polarization filter / foreground suppression	Polarization filter
Diffuse mode sensors				
Sensing range:			2000 mm ...	1200 mm / 30000 mm
Light type			Visible red light	Visible red light
Features			Adjustable sensing range	Adjustable sensing range, background suppression
Diffuse mode sensors with background suppression				
Sensing range:	350 mm / 500 mm / 1000 mm / 2000 mm	400 mm / 700 mm / 2000 mm	1200 mm	
Light type	Visible red light / infrared light	Visible red light / infrared light / laser	Visible red light	
Features	Timer functions / adjustable sensing range / light on / dark on switching	Timer functions / adjustable sensing range / light on / dark on switching	Adjustable sensing range	



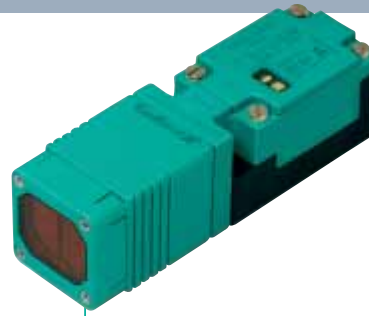
32 Series

- Compact style with front mount option, useful for warehousing and conveyor applications
- Protected against mutual interference



39 Series

- Proven series with excellent optical performance
- Light on / dark on switching



M Series

- Sensor head adjustable in 15° increments
- Protected against mutual interference



SBL-8-H Series

- Congested track scanner, enables mounting between conveyor rollers
- Low black-white difference
- Cascadable
- Versions with pneumatic valve available

22 mm x 72.2 mm x 45.6 mm	25 mm x 64 mm x 75 mm	30 mm x 30 mm x 102 mm	18 mm x 100 mm x 46 mm
4-pin, M12 connector	4-pin, M12 connector / terminal compartment	Terminal compartment	M12 connector / fixed cable / pigtail
10 V DC ... 30 V DC	10 V DC ... 30 V DC / 12 V AC/DC ... 240 V AC/DC	10 V DC ... 30 V DC / 6 V DC ... 20 V DC	24 V DC
Switching state / pre-fault	Switching state / pre-fault	Power on / switching state / pre-fault	Switching state
1 PNP / 2 PNP	1 PNP / 1 NPN / relay	1 NPN / 1 PNP	1 NPN / 1 PNP
Light on / dark on	Mech. light on / dark on	Light on / dark on	Light on / dark on
IP65	IP67	IP67	IP65
20 m / 45 m	30 m		
Visible red light	Infrared light		
ATEX approval for Zones 2 and 22 / light on / dark on switching / test input	Timer functions / adjustable sensitivity / light on / dark on switching		
	9 m / 25 m	2 m / 3 m	
7 m / 8 m / 14 m / 15 m	Visible red light	Visible red light	
Visible red light Polarization filter / foreground suppression / ATEX approval for Zones 2 and 22	Polarization filter / timer functions / adjustable sensitivity / light on / dark on switching	Polarization filter / ATEX approval for Zones 1 and 20 / light on / dark on programmable / programmable timer functions	
800 mm	800 mm / 2000 mm	300 mm / 500 mm	
Infrared light	Infrared light	Infrared light	
Adjustable sensing range	Timer functions / adjustable sensing range / light on / dark on switching	ATEX approval for Zones 1 and 20 / adjustable sensing range / light on / dark on programmable / programmable timer functions	
400 mm / 800 mm	500 mm	100 mm	15 mm ... 600 mm / 40 mm ... 900 mm
Infrared light	Infrared light	Infrared light	Infrared light
Adjustable sensing range / ATEX approval for Zones 2 and 22	Adjustable sensing range / light on / dark on switching	Adjustable sensing range / light on / dark on programmable programmable timer functions	Adjustable on delay and off delay / pneumatic valve / connection option for external valve / cascadable

THREADED SENSORS

functional
and simple
to install



CE



CE

KT10 Series

GLV12 Series

GLV30 Series

Highlights

- Miniature design in M4 stainless steel threaded housing
- Signal converters SU10 or SU11 are suitable for operation

- M12 threaded housing made of nickel-plated brass
- Visible red light source for easy alignment

- M30 threaded plastic housing
- Short design

General Technical Data

Dimensions $\varnothing \times L$	M4 x 25 mm	M12 x 55 mm / M12 x 65 mm	M30 x 89 mm
Connection type	Fixed cable	4-pin, M12 connector / fixed cable	4-pin, M12 connector
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
Output type	1 NPN and 1 PNP *	1 NPN / 1 PNP	2 PNP
Switching type	Mech. light on / dark on*	Electr. light on / dark on	Electr. light on / dark on
Protection category	IP65	IP67	IP67

Thru-beam sensors

Sensing range	1500 mm	5 m	
Light type	Infrared light	Visible red light	
Features		Adjustable sensitivity	

Retro-reflective sensors

Sensing range		1200 mm / 2500 mm	
Light type		Visible red light	
Features		Polarization filter / adjustable sensitivity	

Diffuse mode sensors

Sensing range:	80 mm	200 mm	2500 mm
Light type	Infrared light	Visible red light	Infrared light
Features		Adjustable sensing range	Adjustable sensing range

Diffuse mode sensors with background suppression

Sensing range:	9 mm		150 mm
Light type	Infrared light		Infrared light
Features			

* only in combination with SU10 or SU11 signal transformers





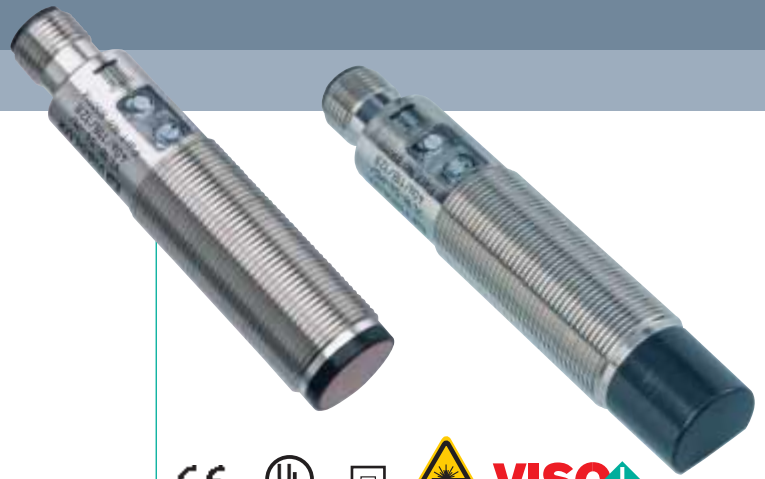
GLV18 Series

- M18 threaded plastic housing
- Compact footprint: 40 mm
- Economical product design
- Mounting hardware included
- Highly visible LEDs



18GM60 Series

- Robust M18 threaded nickel-plated brass housing
- Short 60 mm design
- Dual-color LED
- High switching frequency



VL18/VT18 Series

- M18 threaded nickel-plated brass straight or right-angled housings
- Easily accessible controls
- Adjustable background suppression

M18 x 40 mm / M18 x 57 mm

4-pin, M12 connector / fixed cable

10 V DC ... 30 V DC

Switching state

1 NPN / 1 PNP

Light on / dark on

IP67

20 m

Visible red light

4.5 m / 5.5 m / 6.5 m / 9 m

Visible red light

200 mm / 400 mm / 450 mm

Visible red light

Adjustable sensing range

M18 x 60 mm

4-pin, M12 connector / fixed cable

10 V DC ... 30 V DC

Power on / switching state / pre-fault

1 NPN / 1 PNP

Electr. light on / dark on

IP67

10 m

Infrared light

Adjustable sensitivity

4 m

Visible red light

Polarization filter / adjustable sensitivity

200 mm / 500 mm

Infrared light

Adjustable sensing range

M18 x 65 mm / M18 x 78 mm

4-pin, M12 connector

10 V DC ... 30 V DC

Power on / switching state / pre-fault / short-circuit

Push-pull / 1 PNP / 1 NPN

Mech. light on / dark on

IP67

85 m

Laser

Focussable optics / adjustable sensitivity / light on / dark on switch

4 m / 18 m / 20 m

Visible red light / laser

Polarization filter / adjustable sensitivity / light on / dark on switch

400 mm

Visible red light / laser

Adjustable sensing range / light on / dark on switch

120 mm

Visible red light

Adjustable sensing range / light on / dark on switch



FIBER OPTIC SENSORS

flexible with
extensive
line of
fiber optic
cables



CE cULus



CE cULus VISO+



Highlights

SU18 Series

- Thin housing suitable for DIN rail mounting
- Four Teach-In options
- Three operating modes
- Quick response time

MLV41-LL

- Rugged metal miniature housing for use in rough industrial environments
- Quick clamp connection for glass fiber optic cables
- Setup via potentiometer
- Short response time

ML17-LL

- Compact design
- Robust, water-tight plastic housing
- Quick attachment of plastic fiber optic cables
- 360° high visibility LEDs visibility

General Technical Data

	SU18 Series	MLV41-LL	ML17-LL
Dimensions W x H x D or ø x L	9 mm x 34.5 mm x 62.3 mm	31 mm x 56.5 mm x 13.6 mm	29.3 mm x 15 mm x 34.5 mm
Connection type	Fixed cable / pigtail	4-pin, M12 connector / M8 connector / fixed cable	M12 connector / M8 connector / fixed cable / pigtail
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 / short-circuit / under voltage / pre-fault	Power on / switching state / short-circuit / under voltage / pre-fault	Switching state
Output type	1 PNP / 1 NPN / push-pull	1 PNP / 1 NPN / 2 PNP / 2 push-pull	2 push-pull
Switching frequency	Standard Mode: 3 kHz / High Speed Mode: 6 kHz / High resolution: 500 Hz	1000 Hz	500 Hz
Switching type	Electr. light on / dark on	Mechanical light on / dark on	Electrical light on / dark on
Protection category	IP50	IP67	IP67
Features	Pre-fault output external Teach-In / adjustable sensitivity via potentiometer or Teach-In / timer functions	Adjustable sensitivity / light on / dark on switch / pre-fault output / test input	Adjustable sensitivity
Fiber optic type	Plastic fiber optic	Glass fiber optic	Plastic fiber optic
Light emitter	Visible red light	Visible red light / infrared light	Visible red light
Fiber optic adapter form	00	04	00

Fiber optic connection





CE cUL_{us} □ VISO+

VL18-LL

- M18 threaded, nickel-plated brass housing
- Easily accessible controls
- Green flashing LED for short-circuit

M18 x 79 mm

4-pin, M12 connector

10 V DC ... 30 V DC

Power on / switching state / pre-fault

Push-pull / 1 NPN / 1 PNP

500 Hz

Mech. light on / dark on

IP67

Adjustable sensitivity / light on / dark on

Glass fiber optic

Visible red light

18



CE

GLV30-LL

- M30 threaded, nickel-plated brass housing
- Measurement output 2 V ... 6 V

M30 x 84 mm

4-pin, M12 connector

10 V DC ... 30 V DC

Switching state

1 PNP

80 Hz

Mech. light on / dark on

IP65

Adjustable sensitivity / light on / dark on

Glass fiber optic

Infrared light

18/30



CE Ex

M-LL

- 5-way rotatable head
- Versions with AS Interface certification and ATEX approval for Zones 1 and 20

30 mm x 30 mm x 102 mm

Terminal compartment

10 V DC ... 30 V DC

Switching state / pre-fault

1 NPN

100 Hz / 200 Hz / 1500 Hz

Mech. light on / dark on

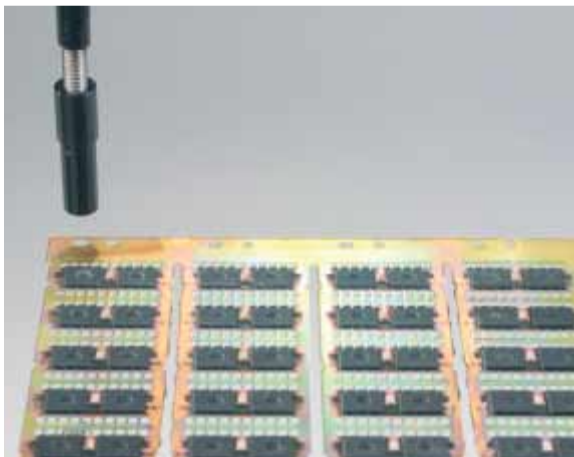
IP67

Adjustable sensitivity / light on / dark on

Glass fiber optic

Infrared light

18



**glass
and
plastic fiber cables**

with different sheathing
and a large selection of
optic heads



Standard fiber optic cable lengths:
500 mm, 1000 mm or 2000 mm
Other lengths available

Glass fiber cables	Plastic fiber cables
K2 	K81 
K11 	K75 
WCo 	K78 
K12 	K101 
K14 	K71 
WC1-.. 	K82 
K10 	K106 
K13 	K108 
K3 	K101 
G.. 	K113 
K9 	K102 
Zo 	K111 

different profiles
and variable
lengths



Highlights

General Technical Data

	PR Series	LG 96 Series	PLVScan Series
	<ul style="list-style-type: none"> Compact light grid with 16 beams crossed or parallel Suitable for the detection of transparent objects 	<ul style="list-style-type: none"> High-resolution light grid with 96 beams for height control Suitable for the detection of small parts and objects that are not position-guided Detects any object regardless of shape Not sensitive to ambient light 	<ul style="list-style-type: none"> Light grids for profile control Separate outputs for height monitoring Adjustable beam crossover Various field heights
Number of beams	16	96	8 / 16 / 24 / 32 / 40 / 48 / 56 / 64
Field height	102 mm	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
Resolution	2 mm	5 mm	10 mm
Beam spacing	6.5 mm / 33 mm	5 mm	20 mm / 42.5 mm / 48.5 mm
Sensing range	500 mm / 1500 mm	300 mm ... 600 mm	6 m / 12 m
Operating voltage:	24 V DC ... 28 V DC	20 V DC ... 28 V DC	15 V DC ... 30 VDC / 20 V DC ... 30 V DC
Light type	Infrared light	Infrared light	Infrared light
Function indicator	Power on, switching state	Power on, switching state	Power on, switching state, pre-fault
Protection category	IP65	IP54	IP50 / IP65
Output type	1 PNP	1 PNP	2 PNP beam field & 4 PNP height monitoring outputs / 2 PNP beam field and 1 PNP for RS232 interface monitoring
Switching type	Dark on	Dark on	Light on / dark on
Dimensions H x D x L	41.7 mm x 50 mm x 115.7 mm	20 mm x 627 mm x 40 mm	38 mm x 45 mm x field height + 913 mm
Housing	Plastic	Black anodized aluminum	Aluminum
Connection type	Fixed cable / 7-pin connector	Fixed cable / 60 mm cable with 12-pin M12 connector (pigtail)	Terminal compartment / M16 connector
Features	Calibration input / automatic calibration	Calibration input / automatic calibration	Timer functions / test input / function input for RS232 interface / adjustable sensing range with potentiometer / programmable beam configuration / software programmable



FORK AND FRAME SENSORS



GL2, GL3, GL5 Series

GL10 ... 220 Series

Highlights

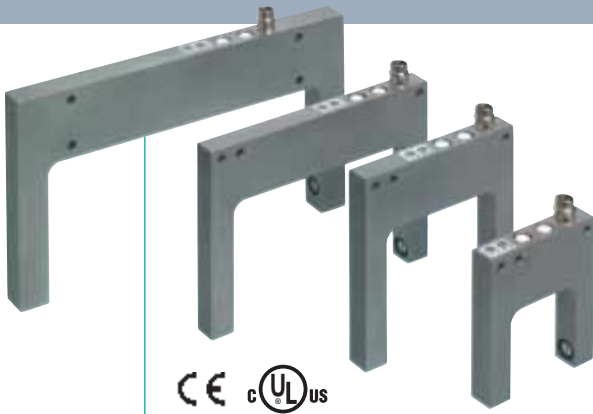
- Miniature design fork sensors
- Optimized for small part detection
- Clearly visible LED function display
- High switching frequency

- Seven different fork widths in diecast zinc housing
- Very high resolution and switching frequency
- Connectable in series, protected against mutual interference
- High EMC
- Ambient light resistant

General Technical Data

Fork widths	1.8 mm / 3.15 mm / 5 mm	10 mm / 20 mm / 30 mm / 50 mm 80 mm / 121 mm / 220 mm
Fork depths	6.6 mm / 8.5 mm	17 mm / 35 mm / 55 mm / 60 mm
Minimum target size	0.2 mm x 2.6 mm / 0.8 mm x 1.8 mm	0.05 mm / 0.3 mm / 0.5 mm
Connection type	4-pin flat cable / fixed cable	M8 connector
Operating voltage:	5 V DC ... 30 V DC	10 V DC ... 30 V DC
Light type	Infrared light	Visible red light / infrared light / laser
Function indicator	Switching state	Switching state
Features	None	Adjustable sensitivity / light on / dark on switch
Output type	1 NPN / 2 NPN / 2 PNP	1 PNP
Switching type	Electr. light on / dark on	Mech. light on / dark on
Protection category	IP40	IP65 / IP67





GLE Series

- Fork-type sensors in stainless steel housing
- Very high resolution and switching frequency
- Connectable in series, no mutual interference
- High EMC
- Ambient light resistant



RAL Series

- Frame sensors in robust aluminum housing
- High resolution
- Adjustable timer functions

30 mm / 50 mm / 80 mm / 121 mm

35 mm / 55 mm / 60 mm

0.5 mm

M8 connector

10 V DC ... 30 V DC

Visible red light / infrared light

Switching state

Adjustable sensitivity / light on / dark on

1 PNP

Mech. light on / dark on

IP67

50 mm / 70 mm / 100 mm / 150 mm

46 mm / 98 mm / 150 mm

0.5 mm / 0.8 mm / 1.5 mm / 3 mm

M8 connector

24 V DC

Infrared light

Switching state

Adjustable sensitivity / adjustable timer

1 PNP

Electr. light on / dark on

IP67



PRINT MARK CONTRAST AND COLOR SENSORS

recognize and differentiate



Highlights

DK12

- Contrast sensors for print mark detection
- 50 ms response time, suitable for extremely fast scanning processes
- Two Teach-In modes: static and dynamic

DF12

- Smallest color sensor for print mark detection on different colored backgrounds
- Three independent colors taught to one sensor
- Variable tolerance steps per channel

DK10

- Contrast sensor for the fast detection of even the smallest print marks
- Longer range contrast sensing
- 30 μ s response time

General Technical Data

	DK12	DF12	DK10
Dimensions H x W x D	15 mm x 41.5 mm x 49 mm	15 mm x 41.5 mm x 49 mm	33 mm x 85.6 mm x 61 mm
Housing material	Frame: zinc; Body: glass fiber reinforced plastic	Frame: zinc; Body: glass fiber reinforced plastic	Glass fiber reinforced plastic, PC
Sensing range:	11 mm	11 mm	DK10: 9.5 mm / 25 mm DK10-LAS: 300 mm / 800 mm
Light spot projection	Rectangular, 1 mm x 3 mm	Rectangular, 1 mm x 3 mm	rectangular: 1 mm x 4 mm / 2 mm x 8.5 mm / point-shaped: 0.8 mm / 2 mm / 10 mm
Connection type	M12 connector, 90° rotatable	M12 connector, 90° rotatable	M12 connector / pigtail
Operating voltage:	10 V DC ... 30 V DC	10 V DC ... 30 V DC	10 V DC ... 30 V DC
Light type	Green, red, or blue LED	Green, red, or blue LED	Green, red, or blue LED
Function indicator	Power on / switching state / short-circuit / Teach-In state	Power on / switching state / short-circuit / under voltage / Teach-In state	Switching state
Output type	2 push-pull	3 push-pull	1 PNP / NPN / push-pull
Switching type	Electr. light on / dark on	–	Mech. light on / dark on
Protection category	IP67	IP67	IP67
Teach-In method	Static and dynamic	–	–
Features	Teach-In / external Teach-In input / timer functions / multiple light spot orientations	Teach-In / external Teach-In input / selectable color tolerances / timer functions	Adjustable sensitivity / light on / dark on / analog output / timer functions / multiple light spot orientations





CE

DK20/DKE20/DK21/DKE21

- Contrast sensors for the fast detection of print marks
- Dual lens position
- Automatic selection of best of three color light sources
- 30 µs response time

33 mm x 85.6 mm x 61 mm

DK: Glass fiber reinforced plastic, PC/DKE: Stainless Steel

9.5 mm / 25 mm / 50 mm

rectangular: 1 mm x 4 mm / 2 mm x 8.5 mm / 3 mm x 16 mm / point-shaped: 1.5 mm / 3 mm

M12 connector

10 V DC ... 30 V DC

Green, red, or blue LED

Switching state

1 PNP / NPN / push-pull

Mech. light on / dark on

IP67

dynamic or static

Teach-In / external Teach-In input / timer functions / multiple light spot orientations



CE

DF20/DFE20

- Color sensor for the detection of print marks on different colored backgrounds
- Dual lens position
- 30 µs response time

33 mm x 85.6 mm x 61 mm

DF: Glass fiber reinforced plastic, PC/DFE: Stainless Steel

9.5 mm / 25 mm

rectangular: 1 mm x 4 mm / 2 mm x 8.5 mm / point-shaped: 1.5 mm

M12 connector

10 V DC ... 30 V DC

Green, red, or blue LED

Switching state / pre-fault

1 PNP / NPN

–

IP67

static

Teach-In / external Teach-In input / timer functions / multiple light spot orientations



CE

DK34/DK35

- Contrast sensors for the fast detection of print marks
- High accuracy for precise positioning operations
- Teach-In procedure for automatic threshold value setting
- 30 µs response time

33 mm x 85.6 mm x 61 mm

Glass fiber reinforced plastic, PC

9.5 mm

Rectangular, 1 mm x 4 mm

M12 connector

10 V DC ... 30 V DC

Green, red, or blue LED

Switching state / pre-fault

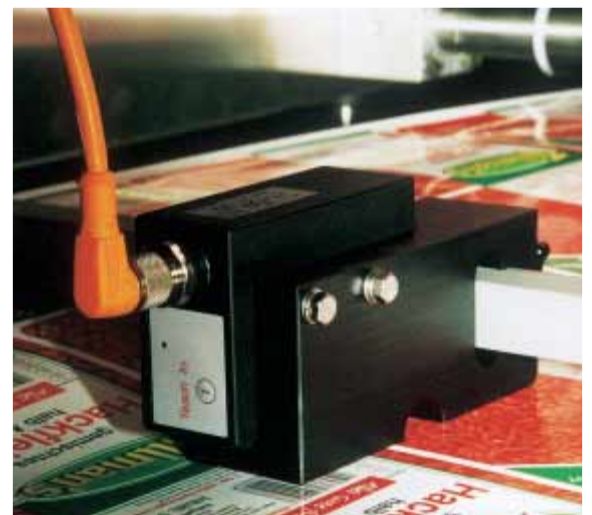
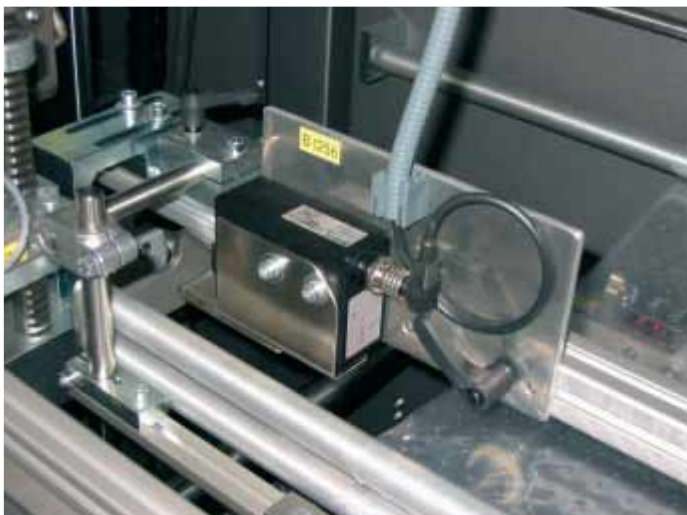
Push-pull

Light on / dark on via Teach-In

IP67

dynamic or static

Teach-In / external Teach-In input / timer functions



COLOR SENSORS



Highlights

VCS110

- Color sensor for glass or plastic fiber optic cables
- Simple 3-step push-button programming
- Program up to 10 different colors on one device

VCS210

- Color sensor for glass fiber optic cables
- Reliable automated color recognition
- Simple operation via software
- Extremely fast response time
- 255 color Teach-In

General Technical Data

Dimensions H x W x D	110 mm x 135 mm x 50 mm	36 mm x 36 mm x 90 mm
Housing material	Anodized aluminum	Anodized aluminum
Sensing range:	max. 100 mm	9.5 mm / 25 mm
Light spot projection	approx. 5 mm ... 60 mm (dependent on the fiber optic used)	–
Connection type	M12 connector	M9 connector
Operating voltage:	18 V DC ... 30 V DC	18 V DC ... 28 V DC
Light type	White light LED	White light LED
Function indicator	Power on / switching state per color channel / adjustment aid	via software
Output type	4 PNP / 5 PNP	8 push-pull, 1 control output and 2 control inputs
Protection category	IP65	IP65
Features	Transmitter deactivation input / tamper-proof keypad / Teach-In	Interfaces: RS232, USB / 2 x trigger inputs



VISION SENSORS – "VISION POSSIBLE"



VOS110-POS

- Compact system for position detection
- M30 housing with integrated camera and lighting
- Detects the position of an index hole
- Accurate to ± 0.1 mm



VOS120-FFPL

- Compact system for fine compartment positioning
- Camera with integrated illumination
- Detects the position of an index hole
- Accurate to ± 1 mm
- Large field of view



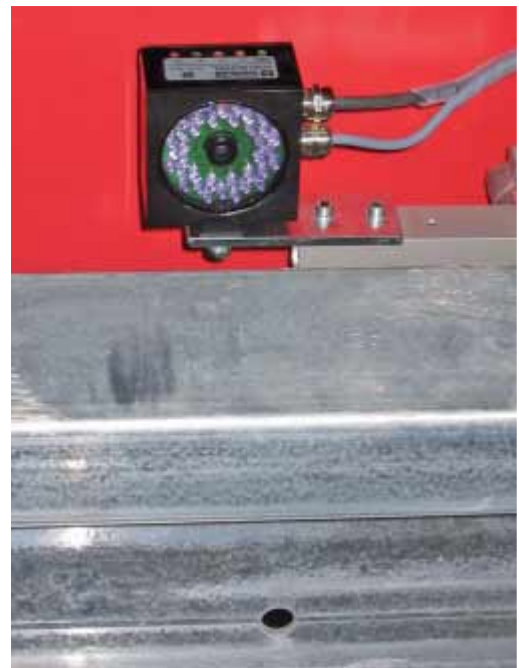
VOS300

- Multi-purpose vision sensor
- Checks for up to five characteristics
- Five selectable evaluation methods
- Automatic mode without PC

Highlights

General Technical Data

Working distance	30 mm ... 100 mm	200 mm ... 500 mm	20 mm ... 500 mm
Field of view	max. 40 x 30 mm	± 20 mm in x and y direction	8 mm x 6 mm ... 150 mm x 20 mm
Processing time	10/s	10/s	40 ms ... 500 ms
Optical resolution	0.1 mm ... 0.25 mm/pixel	Depending on lens used	12 μ m/pixel ... 240 μ m/pixel
Light type	White light	White light or infrared light	White light
Operating voltage:	24 V DC $\pm 10\%$	24 V DC $\pm 20\%$	24 V DC $\pm 10\%$
Interface	RS232	Power on	RS422 / Ethernet
Protection category	IP 54	IP 54	IP 65 / IP 67
Dimensions	M30 x 110 mm	70 mm x 70 mm x 45 mm	65 mm x 45 mm x 45 mm
Connection type	12-pin, M12 round connector	5-pin, M12 connector and 4-pin, M12 jack	2 x 8-pin, M12 connector and 1 x 4-pin, M12 connector
Housing material	Stainless Steel	Anodized aluminum	Anodized aluminum and plastic



DISTANCE MEASURING DEVICES

precise
reliable
flexible



VDM18 Series

- Distance measurement sensors with triangulation technology
- Compact design
- High resolution
- Easy two-button Teach-In and clearly visible LED display

VDM35 Series

- Precise time-of-flight measurement
- Easy alignment using integrated class 2 visible red laser
- Available in diffuse and retro-reflective models
- 2 adjustable switching points
- Not sensitive to ambient light
- 4 ... 20 mA analog output

Highlights

General Technical Data

Sensing range	30 ... 100 mm / 80 mm ... 300 mm	6 m / 30 m
Reference object	Kodak white	Reflector / Kodak white
Resolution	< 0.1 % of the measuring range	–
Light type measurement laser	Red laser class 2	Infrared laser class 1
Operating voltage:	18 V DC ... 30 V DC	18 V DC ... 30 V DC
Signal output	2 independent PNP / 1 PNP	2 PNP
Measurement output	1 analog output	4 ... 20 mA analog output
Function indicator	Power on / switching state / operating mode / programming	Power on / switching state / operating mode
Interface	RS485 optional	–
Protection category	IP67	IP67
Dimensions	17 mm x 50 mm x 50 mm	93 mm x 95 mm x 42 mm
Connection type	5-pin, M12 connector / 8-pin, M12 connector	5-pin, M12 connector
Features	Analog output / interface / tamper-proof keypad / control input / integrated alignment aid	Adjustable switch points / operating modes / analog output





VDM54 Series

- Distance measurement devices with pulse/time-of-flight measurement
- Applications include monorail conveyors, including around turns
- Long range with high accuracy
- Large horizontal and vertical sensing range



VDM70 Series

- Distance measurement devices with pulse/time-of-flight measurement
- Highly functional compact housing allows use in tight spaces
- High sampling rate
- Easy three-button Teach-In and clearly visible LED display



VDM100 Series

- High precision distance measurement devices with pulse/time-of-flight measurement
- Ultra-fast data acquisition
- Simple four push button programming and clearly visible illuminated display
- Modern, lightweight, and robust design

0 m ... 4 m / 0 m ... 6 m

Reflector

–

Infrared laser class 1

18 V DC ... 30 V DC

2 PNP

RS485 optional

Power on / switching state / operating mode

RS485 optional

IP65

145 mm x 85 mm x 80 mm

5-pin, M12 connector / *-pin, M12 connector

Interface / adaptation for turns / integrated alignment aid

0.5 m ... 10 m / 0.5 m ... 250 m

Kodak white / reflector

0.1 mm or 0.125 mm

Infrared laser class 1

18 V DC ... 30 V DC

2 PNP

1 analog output

Power on / switching state / fault state

SSI / RS422

IP67

93 mm x 93 mm x 42 mm

12-pin, M16 connector

Integrated alignment aid

0.5 m ... 50 m / 9.3 m ... 150 m / 0.5 m ... 240 m

Reflector

0.1 mm, adjustable

Infrared laser class 1

18 V DC ... 30 V DC

2 separately configurable PNP inputs/outputs

–

Power on / switching state / fault signal / programming

SSI / Interbus / Profibus

IP65

170 mm x 140 mm x 100 mm

4-/5-pin, M12 connector / 5-pin, M12 jack

Interfaces / integrated alignment aid



OPTICAL DATA COUPLERS

wear-resistant
and flexible



CE

DAD15-8P

- Compact optical data coupler for 8-bit parallel data transmission
- Large operating angle



CE

DAD30

- Compact data coupler with three interfaces
- Wide operating angle versions

Highlights

General Technical Data

Sensing 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	RS232, RS422, and CL20 mA
Operating voltage:	10 V DC ... 60 V DC	24 V DC ± 25 %
Light type	Infrared light	Infrared light / visible red light
Beam angle	8° / 20°	Transmitter: 1° and receiver: 5° / transmitter and receiver: 16°
Function indicator	Power on / data flow	Switching state / pre-fault
Protection category	IP67	IP65
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	25-pin, encapsulated Sub D connector
Features	Cascadable / adjustable sensitivity / function switch / test input	Alignment aid / DIP switches / measurement output / pre-fault output / wide-angle version





CE

LS230-DA

- Robust data coupler with three interfaces for high sensing ranges
- Easy setup with integrated alignment LED and sight glass

230 m / 340 m / 450 m

0 kBit/s ... 19.2 kBit/s

RS232, RS422, and CL20 mA

24 V DC ± 25 %

Infrared light / visible red light

Transmitter: 2° and receiver: 5°

Data flow / switching state / pre-fault

IP65

162 mm x 116 mm x 133 mm

4 x M16 screw connections

Alignment LED and sight glass / band display / DIP switches / test input / measurement output / pre-fault output / 2 frequencies



CE



LS611-DA-P

- Modern PROFIBUS data coupler for sensing ranges from 0 m
- 1 : 1 communication
- No problem with TVT light beam interruption (Telegram Verification Technology)
- Plug connector

140 m / 260 m

0 kBit/s ... 1500 kBit/s, adjustable

PROFIBUS, galvanically isolated

18 V DC ... 30 V DC

Infrared light

1,1°

Data flow / signal strength / baud rate / operating modes / pre-fault

IP65

170 mm x 90 mm x 171 mm

2 x 5-pin, M12 connector for field bus connection and 1 x 4-pin, M12 connector for power supply

Alignment aid / programmable via touchpad / LED bar display / pre-fault output



CE



LS610-DA-IBS

- Modern Interbus data coupler for sensing ranges from 0 m
- Plug connector

140 m / 260 m

0 Mbit/s ... 2 Mbit/s

RS422, galvanically isolated (Interbus)

18 V DC ... 30 V DC

Infrared light

1,1°

Data flow / signal strength / pre-fault

IP65

170 mm x 90 mm x 171 mm

2 x 5-pin, M12 connector for field bus connection and 1 x 4-pin, M12 connector for power supply

Alignment aid / LED bar display / pre-fault output



FACTORY AUTOMATION – SENSING YOUR NEEDS



Pepperl+Fuchs sets the standard in quality and innovative technology for the world of automation. Our expertise, dedication, and heritage of innovation have driven us to develop the largest and most versatile line of industrial sensor technologies and interface components in the world. With our global presence, reliable service, and flexible production facilities, Pepperl+Fuchs delivers complete solutions for your automation requirements – wherever you need us.

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