

W12-2: Fantastic performance – years of experience

	Photoelectric proximity switches, FGS
	Photoelectric proximity switches, BGS
	Photoelectric proximity switches, energetic



The WL12 G "glass photoelectric switch" designed for filling systems used in the beverage industry, represents more than just a technical advance. This intelligent sensor needs to be configured just once using the teach-in method and then it is able to adapt its switching threshold to increasing contamination continuously and fully automatically during operation. As a result, transparent objects, e.g. transparent films or filled PET mineral water bottles, can now be detected much more reliably.

Continual cleaning and realignment are, therefore, a thing of the past. Monitoring the flow of bottles, and bottle counting, has been made possible while simultaneously minimising maintenance requirements.

Further advantages:

- The Teflon-coated version for use in, for example, the beverage industry.
- IP 69K assures reliable operation even when high pressure cleaning equipment is being used.
- The Series W12-2 sensors fulfil the test requirements of



certifies that material resistance tests with cleaning agents and disinfectants in common use in the foodprocessing sector, were successfully completed.

	Photoelectric reflex switches
	Through-beam photoelectric switches
	Photoelectric switches with fibre-optic cable
Proximity mode	
	Photoelectric switches with fibre-optic cable
Through-beam mode	

The W12-2 series of photoelectric switches is in use all over the world. The key advantage for the user is the wealth of experience gained from the previous W12 series. The W12-2 series is backed by years of know-how gained from many thousands of applications.

A sturdy metal housing protects the WT12-2 photoelectric proximity switch, the WL12-2 photoelectric reflex switch and the WS/WE12-2 through-beam photoelectric switch. Rotatable plugs provide flexibility of location and cable installation. Features such as foreground and background suppression, ASI interface, fibre-optic cable versions, insensitivity to ambient light and mutual interference when units are installed close together, are all device standards.

▼ WL12-2 photoelectric reflex switch monitors correct positioning in a construction process.

► Photoelectric proximity switches WT12-2 with background suppression detect product supply in a packaging machine.



► Photoelectric proximity switch WT12-2 with background suppression ensures correct set-up of coffee packages in fully-automatic packaging machines.



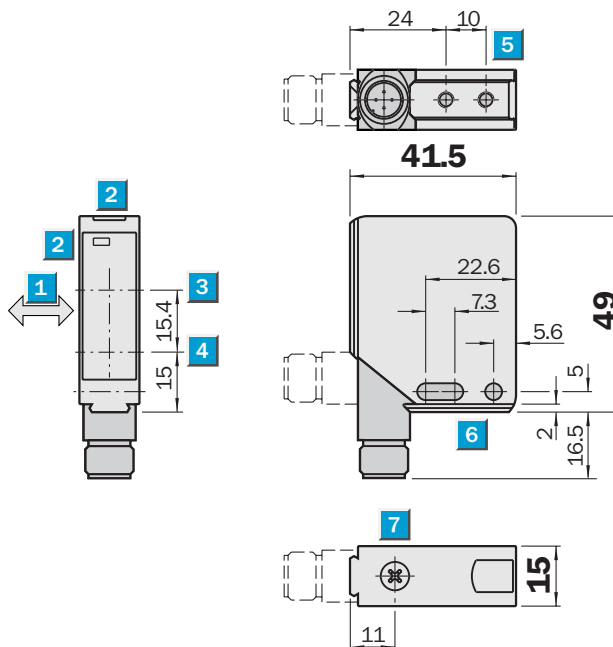
▲ Reliable detection of transparent objects like e.g. thin-walled PET bottles with WL12-2G photoelectric reflex switch.

Scanning distance
35 ... 100 mm

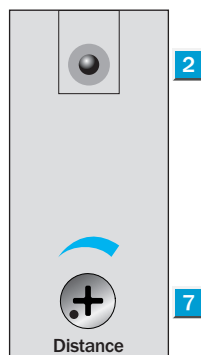
Photoelectric proximity switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°, or 2 m cable
- Adjustable foreground suppression; ideal for applications with critical surfaces

Dimensional drawing



Adjustments possible

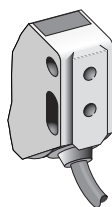


- 1 Standard direction of the material being scanned
- 2 LED signal strength indicator
- 3 Optical axis receiver
- 4 Optical axis sender
- 5 M4 threaded mounting hole - 4 mm deep
- 6 Mounting holes \varnothing 4.2 mm
- 7 Scanning distance adjustment

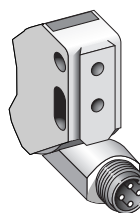
Connection type

WT12-2N140
WT12-2P140

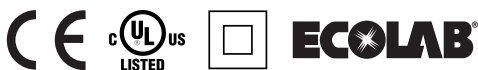
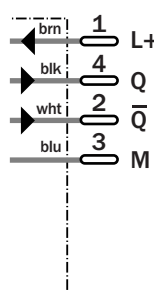
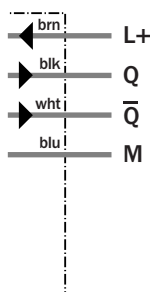
WT12-2N440
WT12-2P440



4 x 0.25 mm²



M12, 4-pin



See chapter Accessories

Connector, M12, 4-pin

Mounting systems

Technical data		WT12-2	N140	N440	P140	P440						
Operating distance	35 ... 100 mm											
Light source, light type	LED, Red light ¹⁾											
Light spot diameter	3 x 3 mm at 60 mm distance											
Supply voltage V_s	10 ... 30 V DC ²⁾											
Ripple	$\leq 5 V_{pp}$ ³⁾											
Power consumption	$\leq 40 \text{ mA}^4)$											
	$\leq 30 \text{ mA}^4)$											
Switching outputs	NPN antivalent											
	PNP antivalent											
Output current I_a max	$\leq 100 \text{ mA}$											
Response time	$\leq 330 \mu\text{s}^5)$											
Switching frequency	1,500 Hz ⁶⁾											
Connection type	Cable, 2 m ⁷⁾											
	Connector, M12, 4-pin											
VDE protection class	$\square^8)$											
Circuit protection	V_s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression											
Enclosure rating	IP 67, IP 69K											
Ambient temperature operation	-40 °C ... +60 °C											
Ambient temperature storage	-40 °C ... +75 °C											
Weight	Approx. 200 g											
	Approx. 120 g											
Housing material	Zinc die-cast ⁹⁾											

¹⁾ Average service life 100,000 h

at $T_a = +25 \text{ °C}$

²⁾ Limit values

³⁾ may not exceed or fall short of

V_s tolerances

⁴⁾ without load

⁵⁾ Signal transit time with resistive load

⁶⁾ with light/dark ratio 1:1

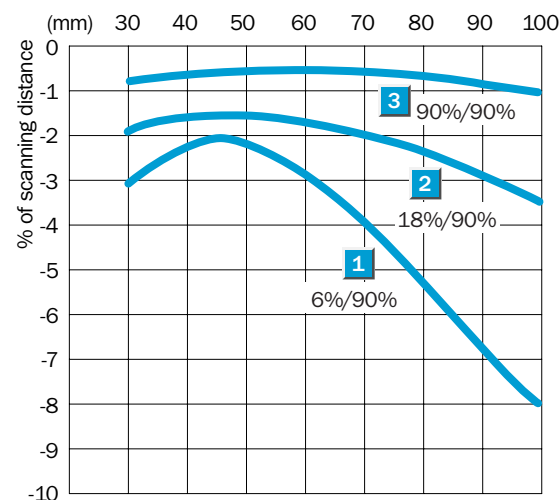
⁷⁾ do not bend below 0 °C

⁸⁾ Reference voltage 50 V DC

⁹⁾ Teflon-coated housing available

on request

Scanning distance



Order information

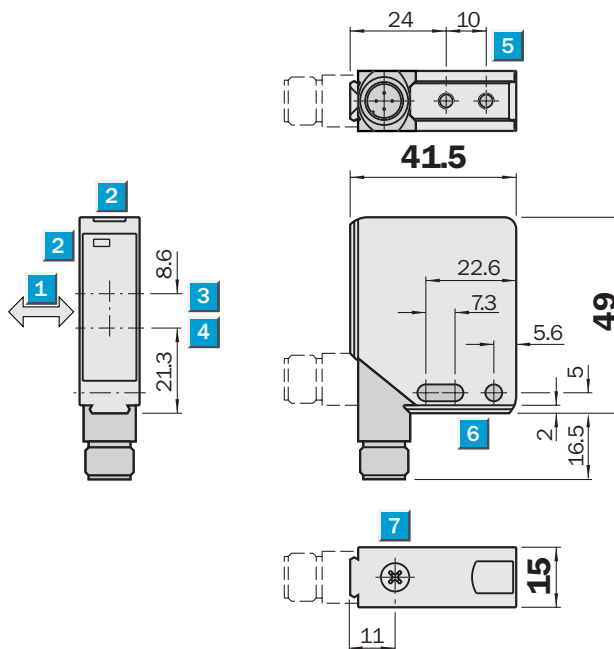
Type	Order no.
WT12-2N140	1 016 145
WT12-2N440	1 016 146
WT12-2P140	1 016 148
WT12-2P440	1 016 150

Scanning distance
20 ... 250 mm

Photoelectric proximity switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°, or 2 m/5 m cable
- Adjustable background suppression

Dimensional drawing



Adjustments possible



- 1 Standard direction of the material being scanned
- 2 LED signal strength indicator
- 3 Optical axis receiver
- 4 Optical axis sender
- 5 M4 threaded mounting hole - 4 mm deep
- 6 Mounting holes \varnothing 4.2 mm
- 7 Scanning distance adjustment



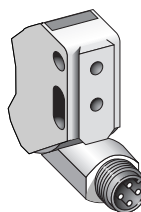
Connection type

WT12-2N130
WT12-2P130
WT12-2P830

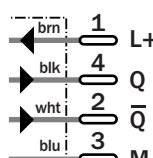
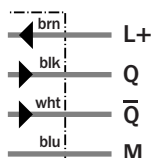
WT12-2N430
WT12-2P430



4 x 0.25 mm²

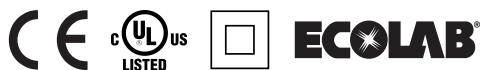


M12, 4-pin



See chapter Accessories

Connector, M12, 4-pin
Mounting systems



Technical data		WT12-2	N130	N430	N830	P130	P430	P830				
Operating distance	20 ... 250 mm											
Adjustment of operating distance	Potentiometer											
Light source, light type	LED, Red light ¹⁾											
Light spot diameter	10 mm at 200 mm distance											
	10 mm											
Supply voltage V_s	10 ... 30 V DC ²⁾											
Ripple	≤ 5 V _{pp} ³⁾											
Power consumption	≤ 40 mA ⁴⁾											
	≤ 30 mA ⁴⁾											
Switching outputs	NPN antivalent											
	PNP antivalent											
Output current I _{a,max}	≤ 100 mA											
Response time	≤ 330 μs ⁵⁾											
Switching frequency	1,500 Hz ⁶⁾											
Connection type	Cable, PVC, 2 m ⁷⁾											
	Connector, M12, 4-pin											
	Cable, PVC, 5 m ⁷⁾											
VDE protection class	□ ⁸⁾											
Circuit protection	V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression											
	V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression / Outputs overcurrent and short-circuit protected											
Enclosure rating	IP 67, IP 69K											
Ambient temperature operation	-40 °C ... +60 °C											
Ambient temperature storage	-40 °C ... +75 °C											
Weight	Approx. 200 g											
	Approx. 120 g											
	Approx. 280 g											
Housing material	Zinc die-cast ⁹⁾											

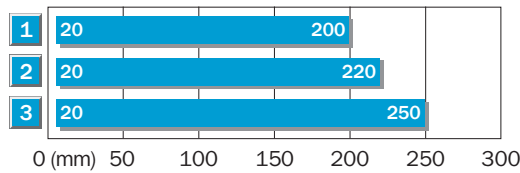
¹⁾ Average service life 100,000 h at T_a = +25 °C
²⁾ Limit values

³⁾ may not exceed or fall short of V_s tolerances
⁴⁾ without load

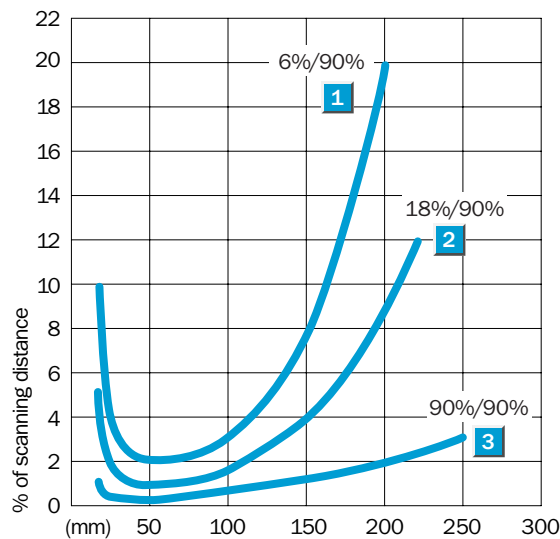
⁵⁾ Signal transit time with resistive load
⁶⁾ with light/dark ratio 1:1
⁷⁾ do not bend below 0 °C

⁸⁾ Reference voltage 50 V DC
⁹⁾ Teflon-coated housing available on request

Scanning distance



- 1 Scanning distance on black, 6 % remission
- 2 Scanning distance on grey, 18 % remission
- 3 Scanning distance on white, 90 % remission



Order information	
Type	Order no.
WT12-2N130	1 016 122
WT12-2N430	1 016 125
WT12-2N830	1 016 123
WT12-2P130	1 016 129
WT12-2P430	1 016 134
WT12-2P830	1 016 130

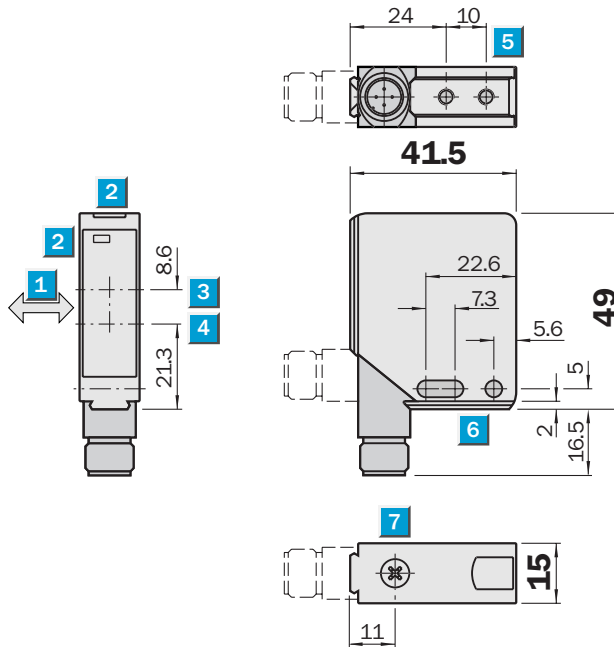
Scanning distance
20 ... 250 mm

Photoelectric proximity switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°
- With integrated AS-i chip
- Adjustable background suppression



Dimensional drawing



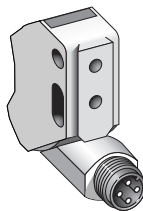
Adjustments possible



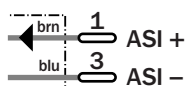
- 1 Standard direction of the material being scanned
- 2 LED signal strength indicator
- 3 Optical axis receiver
- 4 Optical axis sender
- 5 M4 threaded mounting hole - 4 mm deep
- 6 Mounting holes \varnothing 4.2 mm
- 7 Scanning distance adjustment

Connection type

WT12-2Z430



M12, 4-pin



See chapter Accessories

Connector, M12, 4-pin

Mounting systems

Technical data		WT12-2	Z430											
Operating distance	20 ... 250 mm													
Adjustment of operating distance	Potentiometer													
Light source, light type	LED, Red light ¹⁾													
Light spot diameter	10 mm at 200 mm distance													
Supply voltage V_s	26.5 ... 31.5 V DC ²⁾													
Power consumption	$\leq 35 \text{ mA}^3)$													
Response time	$\leq 330 \mu\text{s}^4)$													
Switching frequency	1,500 Hz ⁵⁾													
Test input sender off	TE to 0 V													
Alarm output	Pre-failure signalling output													
Connection type	Connector, M12, 4-pin													
VDE protection class	□ ⁶⁾													
Circuit protection	V_s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression													
Enclosure rating	IP 67, IP 69K													
AS Interface profile	S 1.1													
Ambient temperature operation	-25 °C ... +60 °C													
Ambient temperature storage	-40 °C ... +75 °C													
Weight	Approx. 120 g													
Housing material	Zinc die-cast ⁷⁾													

¹⁾ Average service life 100,000 h at $T_a = +25 \text{ °C}$

²⁾ Limit values
³⁾ without load

⁴⁾ Signal transit time with resistive load
⁵⁾ with light/dark ratio 1:1

⁶⁾ Reference voltage 50 V DC
⁷⁾ Teflon-coated housing available on request

Assignment of data bits (Host level)

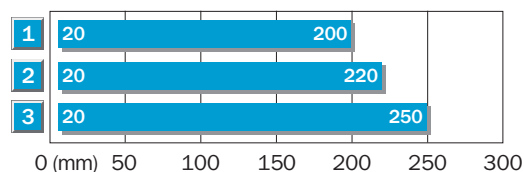
D ₀	Switching state	0 If light interrupted	Input
	Mode: light-switching	1 If light received	
D ₁	Alarm	0 Active	Input
		1 Inactive	
D ₂	NC	0	Input
		1	
D ₃	Test function	0 Sender ON	Output
		1 Sender OFF	

Assignment of parameter bits (Host level)

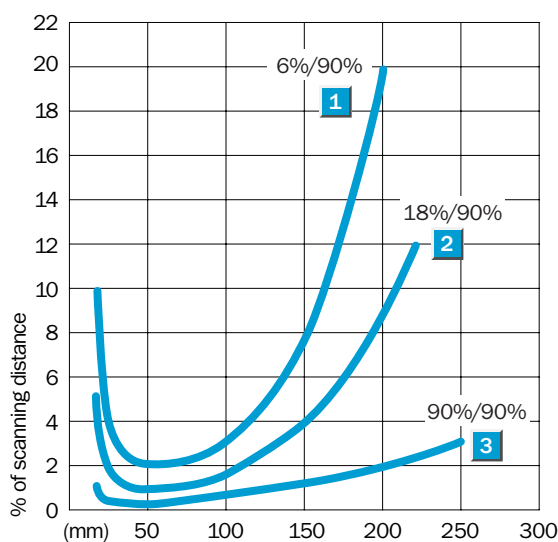
P ₀ *	NC	0	Parameter
		1	
P ₁ *	Light-/dark-switching	0 Dark-switching	Parameter
		1 Light-switching	
P ₂ *	NC	0	Parameter
		1	
P ₃ *	NC	0	Parameter
		1	

* Default setting = 1

Scanning distance



- 1 Scanning distance on black, 6 % remission
- 2 Scanning distance on grey, 18 % remission
- 3 Scanning distance on white, 90 % remission



Order information	
Type	Order no.
WT12-2Z430	1 016 136

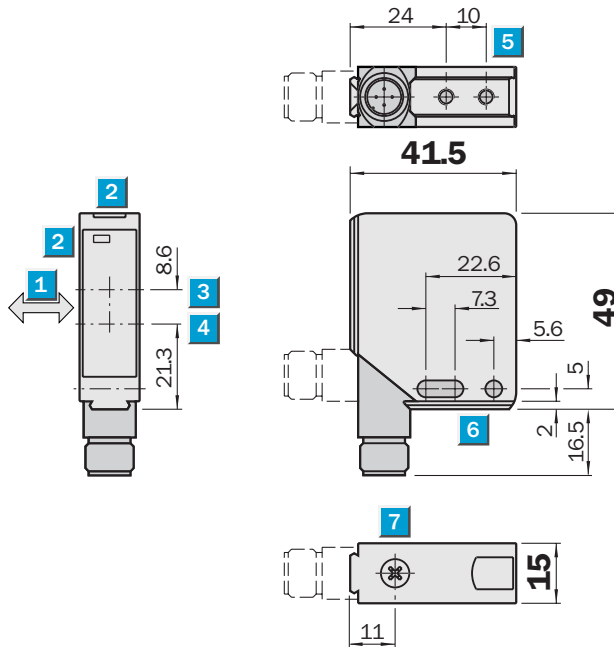
Scanning distance
20 ... 250 mm

Photoelectric proximity switch

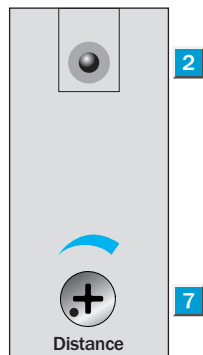
- Infrared light
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°, or 2 m/3 m cable
- Adjustable background suppression



Dimensional drawing



Adjustments possible

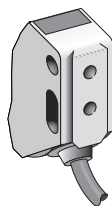


- 1 Standard direction of the material being scanned
- 2 LED signal strength indicator
- 3 Optical axis receiver
- 4 Optical axis send
- 5 M4 threaded mounting hole - 4 mm deep
- 6 Mounting holes \varnothing 4.2 mm
- 7 Scanning distance adjustment

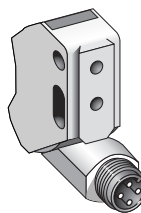
Connection type

- WT12-2N110
- WT12-2N710
- WT12-2P110
- WT12-2P710

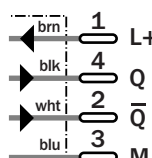
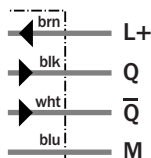
- WT12-2N410
- WT12-2P410



4 x 0.25 mm²



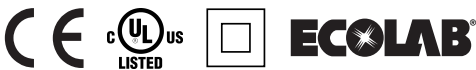
M12, 4-pin



See chapter Accessories

Connector, M12, 4-pin

Mounting systems



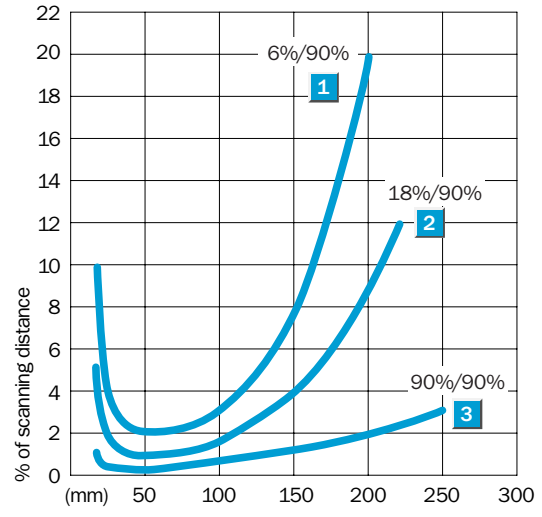
Technical data		WT12-2	N110	N410	N710	P110	P410	P710				
Operating distance	20 ... 250 mm											
Adjustment of operating distance	Potentiometer											
Light source, light type	LED, Infrared light ¹⁾											
Light spot diameter	10 mm ar 200 mm distance											
	10 mm at 200 mm distance											
Supply voltage V_s	10 ... 30 V DC ²⁾											
Ripple	≤ 5 V _{pp} ³⁾											
Power consumption	≤ 50 mA ⁴⁾											
	≤ 40 mA ⁴⁾											
Switching outputs	NPN antivalent											
	PNP antivalent											
Output current I _a max	≤ 100 mA											
Response time	≤ 330 μs ⁵⁾											
Switching frequency	1,500 Hz ⁶⁾											
Connection type	Cable, PVC, 2 m ⁷⁾											
	Connector, M12, 4-pin											
	Cable, PVC, 3 m ⁷⁾											
VDE protection class	□ ⁸⁾											
Circuit protection	V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression											
	V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression / Outputs overcurrent and short-circuit protected											
Enclosure rating	IP 67, IP 69K											
Ambient temperature operation	-40 °C ... +60 °C											
Ambient temperature storage	-40 °C ... +75 °C											
Weight	Approx. 200 g											
	Approx. 120 g											
	Approx. 250 g											
Housing material	Zinc die-cast ⁹⁾											

¹⁾ Average service life 100,000 h at T_a = +25 °C
²⁾ Limit values
³⁾ may not exceed or fall short of V_s tolerances
⁴⁾ without load
⁵⁾ Signal transit time with resistive load
⁶⁾ with light/dark ratio 1:1
⁷⁾ do not bend below 0 °C
⁸⁾ Reference voltage 50 V DC
⁹⁾ Teflon-coated housing available on request

Scanning distance



- 1 Scanning distance on black, 6 % remission
- 2 Scanning distance on grey, 18 % remission
- 3 Scanning distance on white, 90 % remission



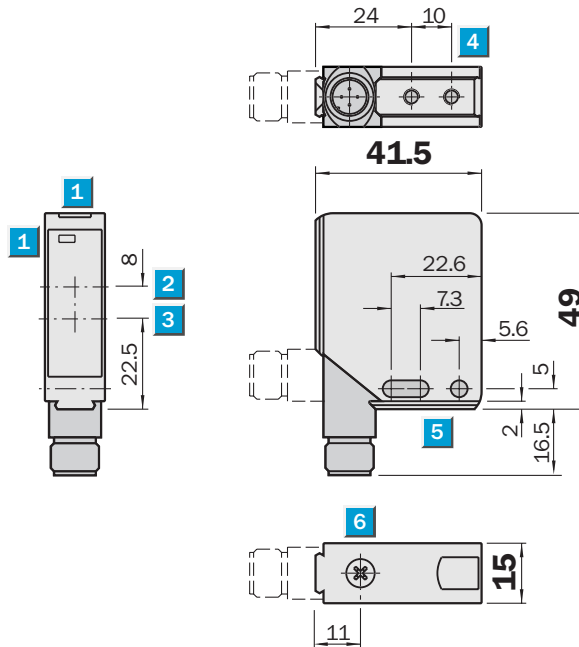
Order information	
Type	Order no.
WT12-2N110	1 016 118
WT12-2N410	1 016 124
WT12-2N710	1 016 121
WT12-2P110	1 016 126
WT12-2P410	1 016 131
WT12-2P710	1 016 128

Scanning distance
10 ... 1,000 mm

Photoelectric proximity switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°, or 2 m cable
- Energetic proximity switch, scanning distance adjustable; ideal for standard applications

Dimensional drawing



Adjustments possible



- 1 LED signal strength indicator
- 2 Optical axis receiver
- 3 Optical axis sender
- 4 M4 threaded mounting hole - 4 mm deep
- 5 Mounting holes \varnothing 4.2 mm
- 6 Scanning distance adjustment



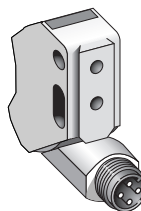
Connection type

WT12-2N150
WT12-2P150

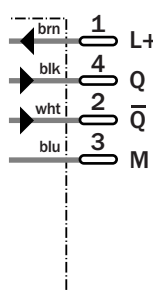
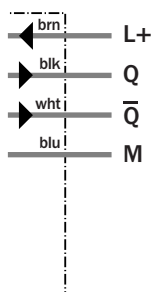
WT12-2N450
WT12-2P450



4 x 0.25 mm²



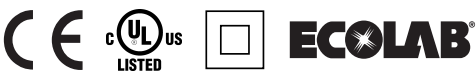
M12, 4-pin



See chapter Accessories

Connector, M12, 4-pin

Mounting systems



Technical data		WT12-2	N150	N450	P150	P450						
Scanning distance typ. max.	10 ... 1,000 mm											
Operating distance	80 ... 800 mm											
Adjustment of operating distance	Potentiometer											
Light source, light type	LED, Red light ¹⁾											
Light spot diameter	30 mm at 600 mm distance											
Supply voltage V_s	10 ... 30 V DC ²⁾											
Ripple	$\leq 5 V_{pp}$ ³⁾											
Power consumption	$\leq 40 mA$ ⁴⁾											
	$\leq 30 mA$ ⁴⁾											
Switching outputs	NPN antivalent											
	PNP antivalent											
Output current I_a max	$\leq 100 mA$											
Response time	$\leq 330 \mu s$ ⁵⁾											
Switching frequency	1,500 Hz ⁶⁾											
Connection type	Cable, 2 m ⁷⁾											
	Connector, M12, 4-pin											
VDE protection class	\square ⁸⁾											
Circuit protection	V_s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression											
Enclosure rating	IP 67, IP 69K											
Ambient temperature operation	-40 °C ... +60 °C											
Ambient temperature storage	-40 °C ... +75 °C											
Weight	Approx. 200 g											
	Approx. 120 g											
Housing material	Zinc die-cast ⁹⁾											

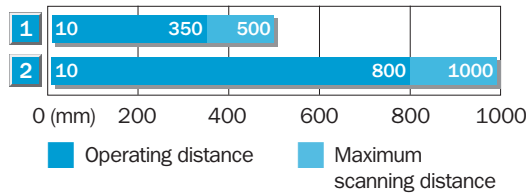
¹⁾ Average service life 100,000 h at $T_a = +25 \text{ °C}$
²⁾ Limit values

³⁾ may not exceed or fall short of V_s tolerances
⁴⁾ without load

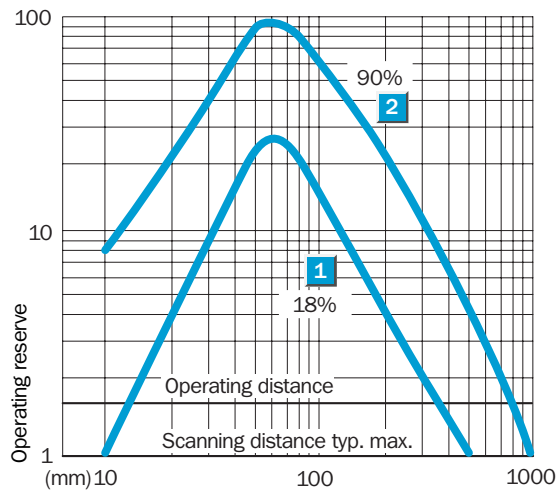
⁵⁾ Signal transit time with resistive load
⁶⁾ with light/dark ratio 1:1
⁷⁾ do not bend below 0 °C

⁸⁾ Reference voltage 50 V DC
⁹⁾ Teflon-coated housing available on request

Scanning distance



- 1 Scanning distance on grey, 18 % remission
- 2 Scanning distance on white, 90 % remission



Order information	
Type	Order no.
WT12-2N150	1 016 138
WT12-2N450	1 016 139
WT12-2P150	1 016 140
WT12-2P450	1 016 142

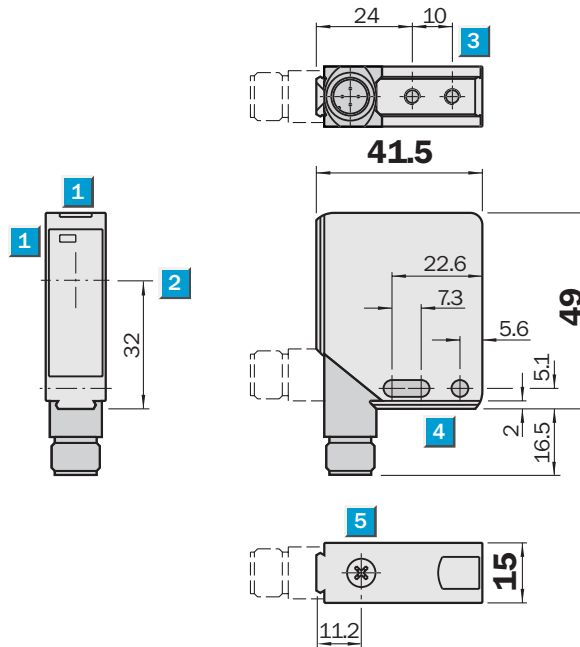
Scanning range
0 ... 7 m

Photoelectric reflex switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°, or 2 m/3 m cable
- Adjustable sensitivity; optimum adaptation to application



Dimensional drawing



Adjustments possible

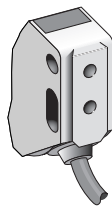


- 1 LED signal strength indicator
- 2 Centre of optical axis
- 3 M4 threaded mounting hole - 4 mm deep
- 4 Mounting holes \varnothing 4.2 mm
- 5 Sensitivity adjustment

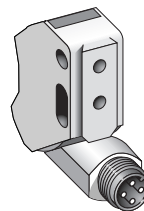
Connection type

- WL12-2N120
- WL12-2N130
- WL12-2N730
- WL12-2P120
- WL12-2P130

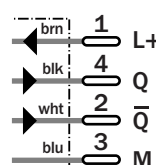
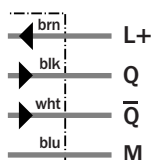
- WL12-2N420
- WL12-2N430
- WL12-2P420
- WL12-2P430



4 x 0.25 mm²

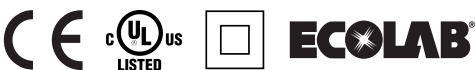


M12, 4-pin



See chapter Accessories

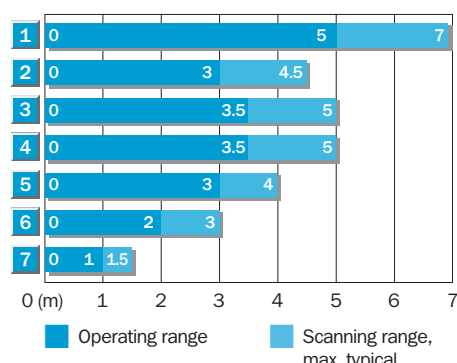
- Connector, M12, 4-pin
- Mounting systems
- Reflectors



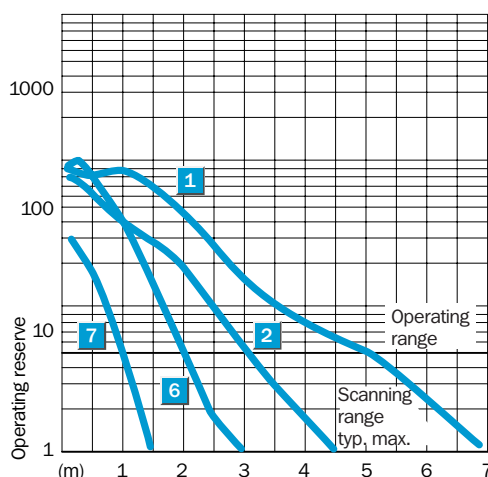
Technical data		WL12-2	N120	N130	N420	N430	N730	P120	P130	P420	P430	P730
Scanning range typ. max.	0 ... 2 m											
	0 ... 7 m											
Scanning range, recommended	0 ... 1 m											
	0 ... 5 m											
Relating to	Reflector PL80A ¹⁾											
	Reflector PL80A ²⁾											
Sensitivity adjustment	Potentiometer											
Light source, light type	LED, Red light ³⁾											
Light spot diameter	2 mm at 90 mm distance											
	80 mm at 3 m distance											
Polarisation filter	✓											
Supply voltage V_s	10 ... 30 V DC ⁴⁾											
Ripple	≤ 5 V _{pp} ⁵⁾											
Power consumption	≤ 40 mA ⁶⁾											
	≤ 30 mA ⁶⁾											
Switching outputs	NPN antivalent											
	PNP antivalent											
Output current I _a max	≤ 100 mA											
Response time	≤ 330 μs ⁷⁾											
Switching frequency	1,500 Hz ⁸⁾											
Connection type	Cable, 2 m ⁹⁾											
	Connector, M12, 4-pin											
	Cable, 3 m ⁹⁾											
VDE protection class	□ ¹⁰⁾											
Circuit protection	V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression											
Enclosure rating	IP 67, IP 69K											
Ambient temperature operation	-40 °C ... +60 °C											
Ambient temperature storage	-40 °C ... +75 °C											
Weight	Approx. 200 g											
	Approx. 120 g											
	Approx. 230 g											
Housing material	Zinc die-cast ¹¹⁾											

1) Focus = 90 mm
 2) Focus = infinite
 3) Average service life 100,000 h at T_a = +25 °C
 4) Limit values
 5) may not exceed or fall short of V_s tolerances
 6) without load
 7) Signal transit time with resistive load
 8) with light/dark ratio 1:1
 9) do not bend below 0 °C
 10) Reference voltage 50 V DC
 11) Teflon-coated housing available on request

Scanning range and operating reserve



Reflector type	Operating range
1 PL 80 A	0 ... 5.0 m
2 C 110	0 ... 3.0 m
3 PL 50 A	0 ... 3.5 m
4 PL 40 A	0 ... 3.5 m
5 PL 30 A	0 ... 3.0 m
6 PL 20 A	0 ... 2.0 m
7 Reflective tape	0 ... 1.0 m



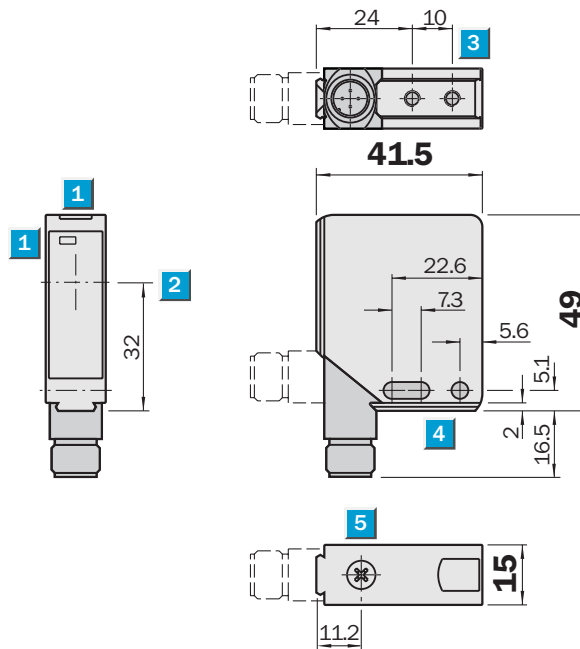
Order information	
Type	Order no.
WL12-2N120	1 016 084
WL12-2N130	1 016 085
WL12-2N420	1 016 091
WL12-2N430	1 016 092
WL12-2N730	1 016 088
WL12-2P120	1 016 095
WL12-2P130	1 016 096
WL12-2P420	1 016 101
WL12-2P430	1 016 102
WL12-2P730	1 016 098

Scanning range
0 ... 7 m

Photoelectric reflex switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°, or 2 m cable
- Adjustable sensitivity; optimum adaptation to application

Dimensional drawing



Adjustments possible



- 1 LED signal strength indicator
- 2 Centre of optical axis
- 3 M4 threaded mounting hole - 4 mm deep
- 4 Mounting holes \varnothing 4.2 mm
- 5 Sensitivity adjustment



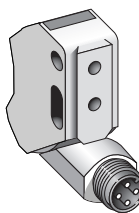
Connection type

- WL12-2N180
- WL12-2N190
- WL12-2N490
- WL12-2P180
- WL12-2P190

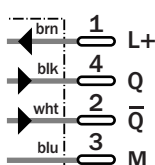
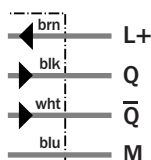
- WL12-2N480
- WL12-2P480
- WL12-2P490



4 x 0.25 mm²

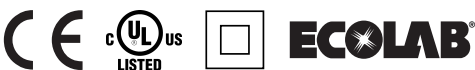


M12, 4-pin



See chapter Accessories

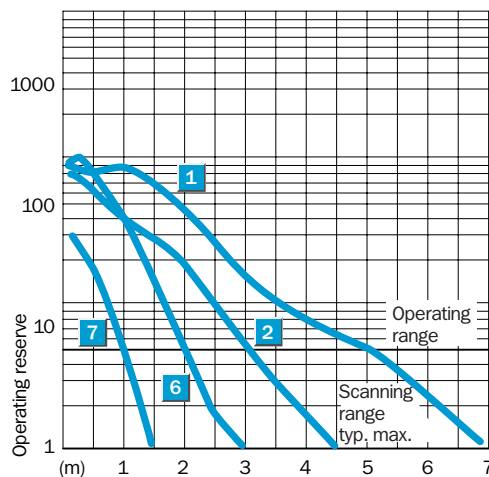
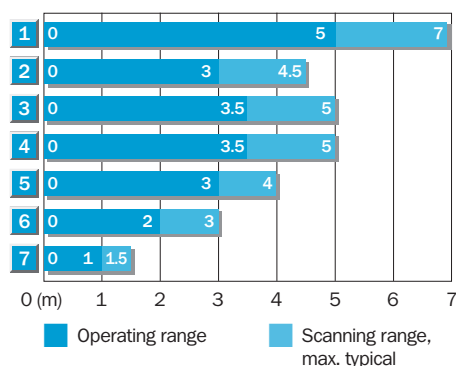
- Connector, M12, 4-pin
- Mounting systems
- Reflectors



Technical data		WL12-2	N180	N190	N480	N490	P180	P190	P480	P490
Scanning range typ. max.	0 ... 7 m									
	0 ... 2 m									
Scanning range, recommended	0 ... 5 m									
	0 ... 1 m									
Relating to	Reflector PL80A ¹⁾									
	Reflector PL80A ²⁾									
Sensitivity adjustment	Potentiometer									
Light source, light type	LED, Red light ³⁾									
Light spot diameter	80 mm at 3 m distance									
	2 mm at 90 mm distance									
Supply voltage V_s	10 ... 30 V DC ⁴⁾									
Ripple	≤ 5 V _{pp} ⁵⁾									
Power consumption	≤ 40 mA ⁶⁾									
	≤ 30 mA ⁶⁾									
Switching outputs	NPN antivalent									
	PNP antivalent									
Output current I _a max	100 mA									
Response time	≤ 330 μs ⁷⁾									
Switching frequency	1,500 Hz ⁸⁾									
Connection type	Cable, 2 m ⁹⁾									
	Connector, M12, 4-pin									
VDE protection class	□ ¹⁰⁾									
Circuit protection	V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression									
Enclosure rating	IP 67, IP 69K									
Ambient temperature operation	-40 °C ... +60 °C									
Ambient temperature storage	-40 °C ... +75 °C									
Weight	Approx. 200 g									
	Approx. 120 g									
Housing material	Zinc die-cast ¹¹⁾									


1) Focus = infinite
 2) Focus = 90 mm
 3) Average service life 100,000 h at T_a = +25 °C
 4) Limit values may not exceed or fall short of V_s tolerances without load
 5) Limit values may not exceed or fall short of V_s tolerances without load
 6) without load
 7) Signal transit time with resistive load with light/dark ratio 1:1
 8) with light/dark ratio 1:1
 9) do not bend below 0 °C
 10) Reference voltage 50 V DC
 11) Teflon-coated housing available on request

Scanning range and operating reserve



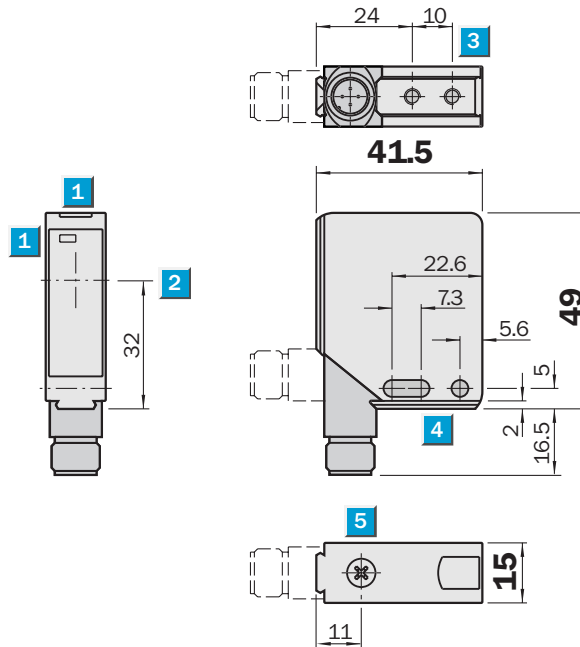
Reflector type	Operating range
1 PL 80 A	0 ... 5.0 m
2 C 110	0 ... 3.0 m
3 PL 50 A	0 ... 3.5 m
4 PL 40 A	0 ... 3.5 m
5 PL 30 A	0 ... 3.0 m
6 PL 20 A	0 ... 2.0 m
7 Reflective tape	0 ... 1.0 m

Order information	
Type	Order no.
WL12-2N180	1 016 089
WL12-2N190	1 016 090
WL12-2N480	1 016 093
WL12-2N490	1 016 094
WL12-2P180	1 016 099
WL12-2P190	1 016 100
WL12-2P480	1 016 106
WL12-2P490	1 016 107


Scanning range
 0 ... 7 m
Photoelectric reflex switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°
- Integrated AS-i chip
- Adjustable sensitivity; optimum adaptation to application

Dimensional drawing



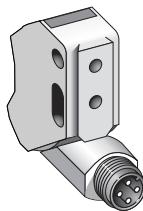
Adjustments possible



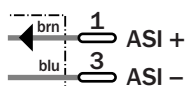
- 1 LED signal strength indicator
- 2 Centre of optical axis
- 3 M4 threaded mounting hole - 4 mm deep
- 4 Mounting holes \varnothing 4.2 mm
- 5 Sensitivity adjustment

Connection type

WL12-2Z430



M12, 4-pin



See chapter Accessories

Connector, M12, 4-pin

Mounting systems

Technical data		WL12-2	Z430								
Scanning range typ. max.	0 ... 7 m										
Scanning range, recommended	0 ... 5 m										
Relating to	Reflector PL80A										
Sensitivity adjustment	Potentiometer										
Light source, light type	LED, Red light ¹⁾										
Light spot diameter	80 mm at 3 m distance										
Polarisation filter	✓										
Supply voltage V_s	26.5 ... 31.6 V DC ²⁾										
Power consumption	≤ 35 mA ³⁾										
Response time	≤ 330 μs ⁴⁾										
Switching frequency	1,500 Hz ⁵⁾										
Test input sender off	TE to 0 V										
Alarm output	Pre-failure signalling output										
Connection type	Connector, M12, 4-pin										
VDE protection class	□ ⁶⁾										
Circuit protection	V _s connections reverse-polarity protected / Interference suppression										
Enclosure rating	IP 67, IP 69K										
AS Interface profile	S 1.1										
Ambient temperature operation	-25 °C ... +60 °C										
Ambient temperature storage	-40 °C ... +75 °C										
Weight	Approx. 120 g										
Housing material	Zinc die-cast ⁷⁾										

¹⁾ Average service life 100,000 h at T_a = +25 °C

²⁾ Limit values
³⁾ without load

⁴⁾ Signal transit time with resistive load
⁵⁾ with light/dark ratio 1:1

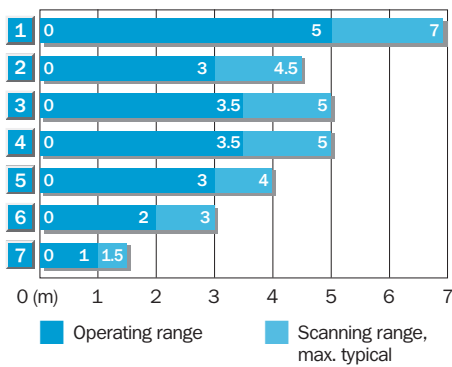
⁶⁾ Reference voltage 50 V DC
⁷⁾ Teflon-coated housing available on request

Assignment of data bits		(Host level)	
D ₀	Switching state	0 If light interrupted	Input
	Mode: light-switching	1 If light received	
D ₁	Alarm	0 Active	Input
		1 Inactive	
D ₂	NC	0	Input
		1	
D ₃	Test function	0 Sender ON	Output
		1 Sender OFF	

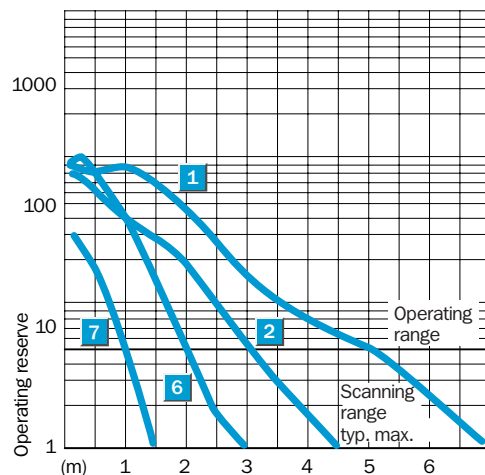
Assignment of parameter bits		(Host level)	
P ₀ *	NC	0	Parameter
		1	
P ₁ *	Light-/dark-switching	0 Dark-switching	Parameter
		1 Light-switching	
P ₂ *	NC	0	Parameter
		1	
P ₃ *	NC	0	Parameter
		1	

* Default setting = 1

Scanning range and operating reserve



Reflector type	Operating range
1 PL 80 A	0 ... 5.0 m
2 C 110	0 ... 3.0 m
3 PL 50 A	0 ... 3.5 m
4 PL 40 A	0 ... 3.5 m
5 PL 30 A	0 ... 3.0 m
6 PL 20 A	0 ... 2.0 m
7 Reflective tape	0 ... 1.0 m



Order information	
Type	Order no.
WL12-2Z430	1 016 108

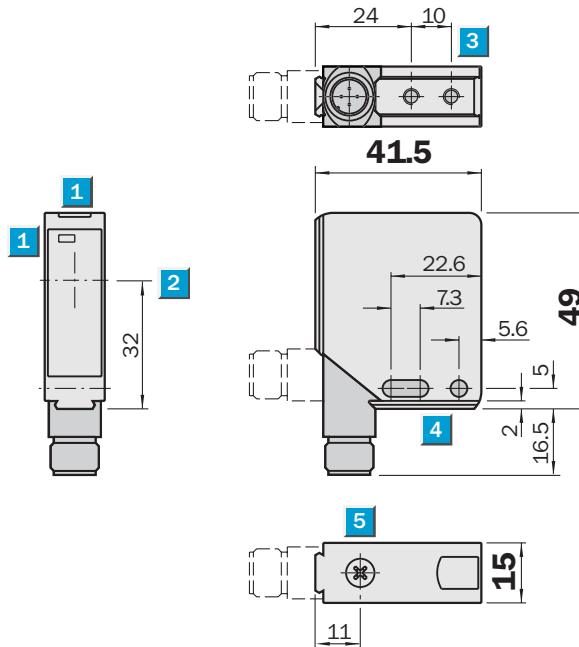
Scanning range
0 ... 3 m

Photoelectric reflex switch

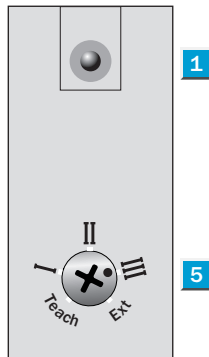
- Red light; consequently, fast alignment is possible
- Reliable detection of transparent objects
- Innovative microprocessor technology allows continuous adaptation of the switching threshold on contamination
- Operating range can be preselected via rotary switch or external cable



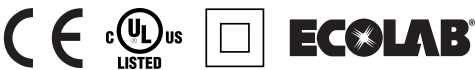
Dimensional drawing



Adjustments possible



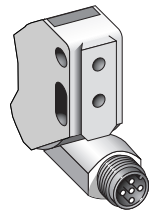
- 1 LED signal strength indicator
- 2 Centre of optical axis
- 3 M4 threaded mounting hole - 4 mm deep
- 4 Mounting holes \varnothing 4.2 mm
- 5 Function selector



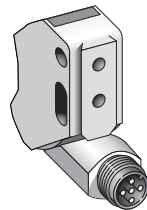
Connection type

WL12G-N530
WL12G-P510
WL12G-P530

WL12G-V530
WL12G-W530



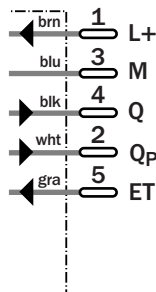
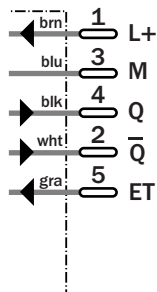
M12, 5-pin



M12, 5-pin

See chapter Accessories

- Connector, M12, 5-pin
- Mounting systems
- Reflectors



Technical data		WL12G-N	530	510	530	530	530						
Scanning range typ. max.	0 ... 3 m												
Scanning range, recommended	0 ... 2.7 m												
Relating to	Reflector PL80A												
Sensitivity adjustment	Potentiometer												
Light source, light type	LED, Red light ¹⁾												
	LED, Infrared light												
Light spot diameter	Approx. 8 x 13 mm at 200 mm distance												
Polarisation filter	✓												
Supply voltage V_s	10 ... 30 V DC ²⁾												
Ripple	$\leq 5 V_{pp}$ ³⁾												
Power consumption	$\leq 65 \text{ mA}$ ⁴⁾												
Switching outputs	NPN antivalent												
	PNP antivalent												
	PNP, Q and plausibility output												
	NPN, Q and plausibility output												
Switching mode	Light-switching												
Output current I_a max	100 mA												
	$\leq 100 \text{ mA}$												
Response time	$\leq 0.5 \text{ ms}$ ⁵⁾												
Switching frequency	1,000 Hz ⁶⁾												
Connection type	Connector, M12, 5-pin												
VDE protection class	□ ⁷⁾												
Circuit protection	V_s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression												
Enclosure rating	IP 67, IP 69K												
Ambient temperature operation	-25 °C ... +60 °C												
Ambient temperature storage	-40 °C ... +75 °C												
Weight	Approx. 120 g												
Housing material	Zinc die-cast ⁸⁾												

¹⁾ Average service life 100,000 h at $T_a = +25 \text{ °C}$
²⁾ Limit values

³⁾ May not exceed or fall short of V_s tolerances without load

⁵⁾ Signal transit time with resistive load
⁶⁾ with light/dark ratio 1:1
⁷⁾ Reference voltage 50 V DC

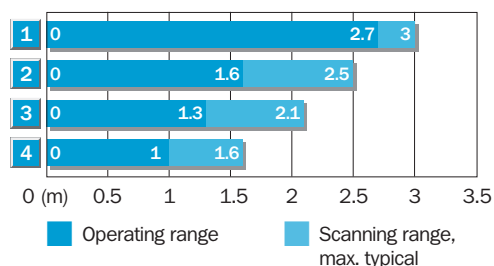
⁸⁾ Teflon-coated housing available on request

Operating range setting Set via rotary switch on device or via ET cable (+ V_s to ET)

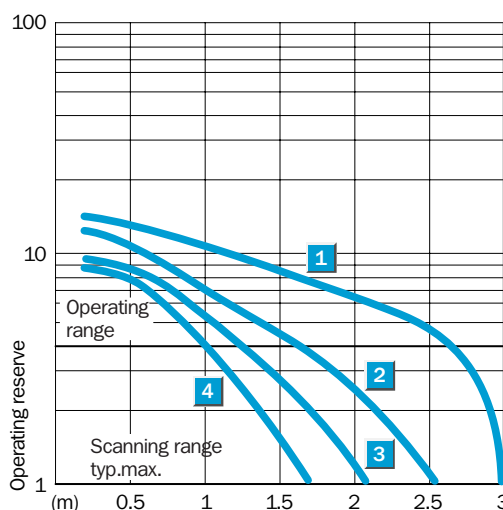
Mode I : 50 ms *	Mode II : 150 ms *	Mode III : 250 ms *
Switches at signal attenuation > 10%	Switches at signal attenuation > 18%	Switches at signal attenuation > 40%
Clean PET bottles	Clear-glass bottles	Coloured glass or non-transparent objects

* Pulse duration via ET (control cable), duration set via rotary switch approx. 2 s

Scanning range and operating reserve



Reflector type	Operating range
1 PL 80 A	0 ... 2.7 m
2 PL 40 A	0 ... 1.6 m
3 PL 30 A	0 ... 1.3 m
4 PL 20 A	0 ... 1.0 m



Order information	
Type	Order no.
WL12G-N530	1 016 309
WL12G-P510	1 016 738
WL12G-P530	1 016 289
WL12G-V530	1 016 310
WL12G-W530	1 016 311

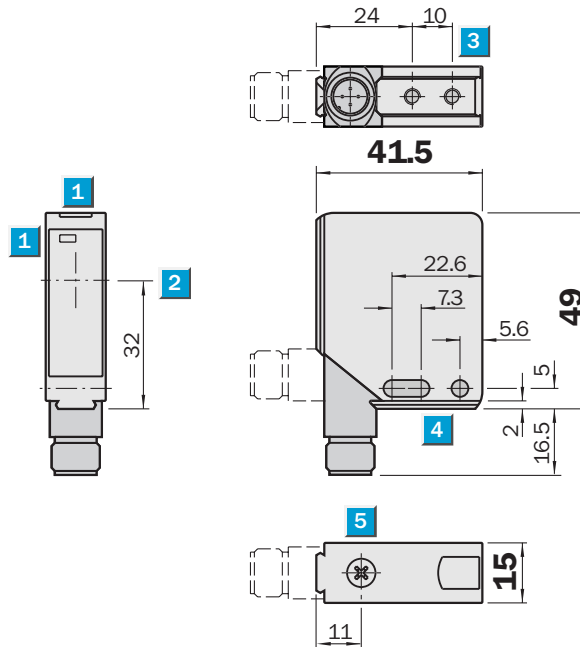
Scanning range
0 ... 4 m

Photoelectric reflex switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- Detection of glass and transparent films
- Adjustable sensitivity, optimum adaptation to application



Dimensional drawing



Adjustments possible

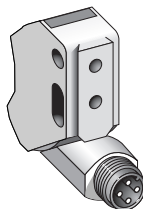


- 1 LED signal strength indicator
- 2 Centre of optical axis
- 3 M4 threaded mounting hole - 4 mm deep
- 4 Mounting holes \varnothing 4.2 mm
- 5 Sensitivity adjustment

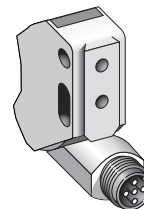
Connection type

WL12-2P460

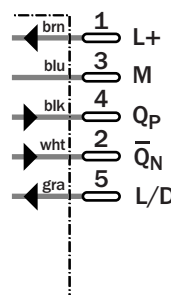
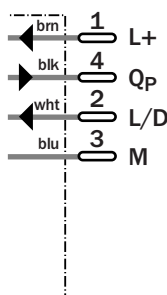
WL12-2B560



M12, 4-pin



M12, 5-pin



See chapter Accessories

Connector, M12, 4-pin
Connector, M12, 5-pin
Mounting systems
Reflectors

Technical data		WL12-2	B560	P460								
Scanning range typ. max.	0 ... 4 m											
Scanning range, recommended	0 ... 3.5 m											
Relating to	Reflector PL80A											
Sensitivity adjustment	Potentiometer											
Light source, light type	LED, Red light ¹⁾											
Light spot diameter	30 mm at 1.5 m distance											
Angle of dispersion	Approx. 1.5 °											
Polarisation filter	✓											
Supply voltage V_s	10 ... 30 V DC ²⁾											
Ripple	≤ 5 V _{pp} ³⁾											
Power consumption	≤ 30 mA ⁴⁾											
Switching outputs	Transistor outputs Qp and Qn											
	PNP antivalent											
Switching mode	Light-/dark-switching, switchable ⁵⁾											
Output current I _a max	100 mA											
Response time	≤ 330 μs ⁶⁾											
Switching frequency	1,500 Hz ⁷⁾											
Connection type	Connector, M12, 5-pin											
	Connector, M12, 4-pin											
VDE protection class	□ ⁸⁾											
Circuit protection	V _s connections reverse-polarity protected / Output QP and QN short-circuit protected / Interference suppression											
Enclosure rating	IP 67, IP 69K											
Ambient temperature operation	-40 °C ... +60 °C											
Ambient temperature storage	-40 °C ... +75 °C											
Weight	Approx. 120 g											
Housing material	Zinc die-cast ⁹⁾											

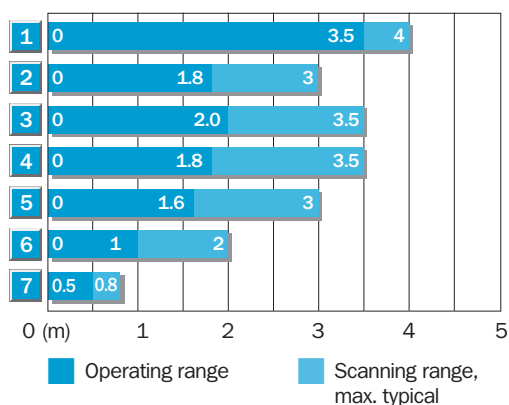
1) Average service life 100,000 h at T_a = +25 °C
 2) Limit values
 3) may not exceed or fall short of

V_s tolerances
 4) without load
 5) Control cable 0 V or open-circuited = light-switching. Control cable

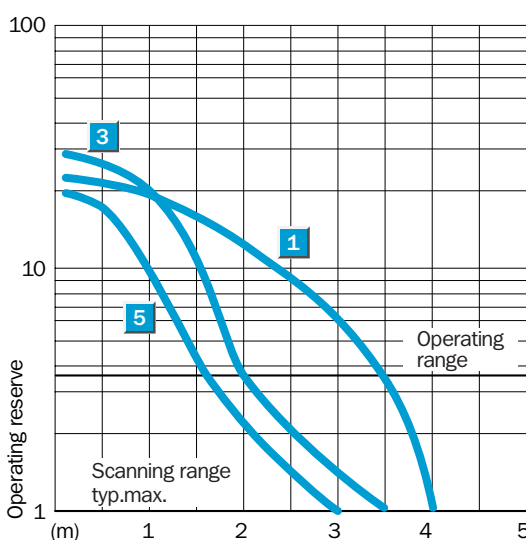
V_s = dark-switching
 6) Signal transit time with resistive load
 7) with light/dark ratio 1:1
 8) Reference voltage 50 V DC

9) Teflon-coated housing available on request

Scanning range and operating reserve



Reflector type	Operating range
1 PL 80 A	0 ... 3.5 m
2 C 110	0 ... 1.8 m
3 PL 50 A	0 ... 2.0 m
4 PL 40 A	0 ... 1.8 m
5 PL 30 A	0 ... 1.6 m
6 PL 20 A	0 ... 1.0 m
7 Reflective tape	0 ... 0.5 m



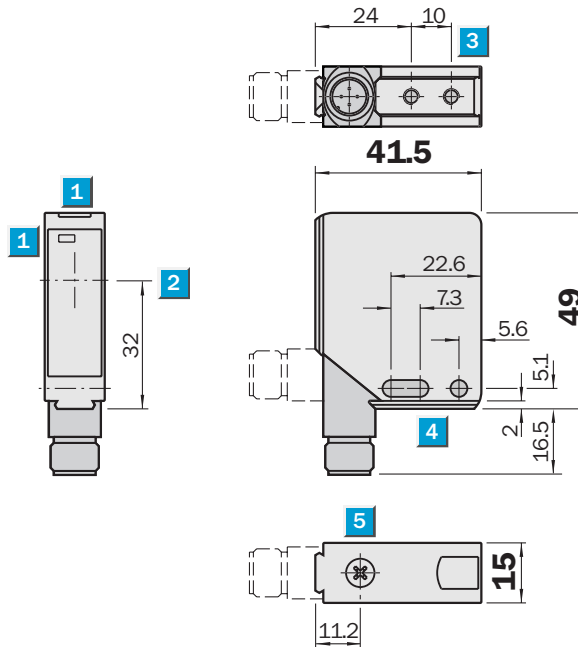
Order information	
Type	Order no.
WL12-2B560	1 016 080
WL12-2P460	1 016 105

Scanning range
0 ... 20 m

Through-beam photoelectric switch

- Red light; consequently, fast alignment is possible
- Insensitive to external light sources, i.e., increased operating reliability
- M12 plug rotatable by 90°, or 2 m cable
- Adjustable sensitivity; optimum adaptation to application

Dimensional drawing



Adjustments possible



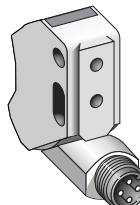
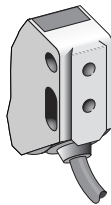
- 1 LED signal strength indicator
- 2 Centre of optical axis
- 3 M4 threaded mounting hole - 4 mm deep
- 4 Mounting holes \varnothing 4.2 mm
- 5 Sensitivity adjustment



Connection type

WS/WE12-2N130
WS/WE12-2P130

WS/WE12-2N430
WS/WE12-2P430

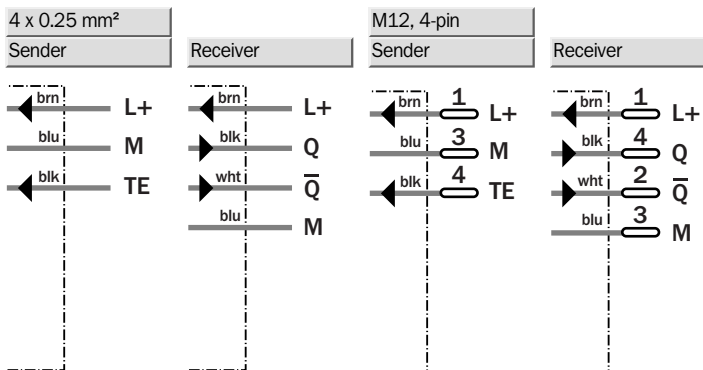


See chapter Accessories

Connector, M12, 4-pin

Masks

Mounting systems



Technical data		WS/WE12-2	N130	N430	P130	P430						
Scanning range typ. max.	0 ... 20 m											
Scanning range, recommended	0 ... 15 m											
Sensitivity adjustment	Potentiometer											
Light source, light type	LED, Red light ¹⁾											
Light spot diameter	Approx. 500 mm at 15 m distance											
Angle of dispersion	1.5 °											
Supply voltage V_s	10 ... 30 V DC ²⁾											
Ripple	≤ 5 V _{pp} ³⁾											
Power consumption, sender	≤ 30 mA ⁴⁾											
Power consumption, receiver	≤ 25 mA ⁴⁾											
	≤ 15 mA ⁴⁾											
Switching outputs	NPN antivalent											
	PNP antivalent											
Output current I _{a,max}	100 mA											
Response time	≤ 330 μs ⁵⁾											
Switching frequency	1,500 Hz ⁶⁾											
Test input sender off	TE to 0 V											
Connection type	Cable, 2 m ⁷⁾											
	Connector, M12, 4-pin											
VDE protection class	□ ⁸⁾											
Circuit protection	V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression											
Enclosure rating	IP 67, IP 69K											
Ambient temperature operation	-40 °C ... +60 °C											
Ambient temperature storage	-40 °C ... +75 °C											
Weight	Approx. 200 g											
	Approx. 120 g											
Housing material	Zinc die-cast ⁹⁾											

¹⁾ Average service life 100,000 h

at T_a = +25 °C

²⁾ Limit values

³⁾ may not exceed or fall short of

V_s tolerances

⁴⁾ without load

⁵⁾ Signal transit time with resistive load

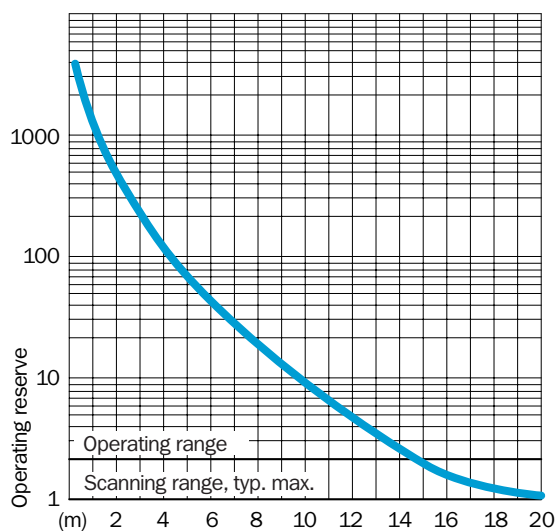
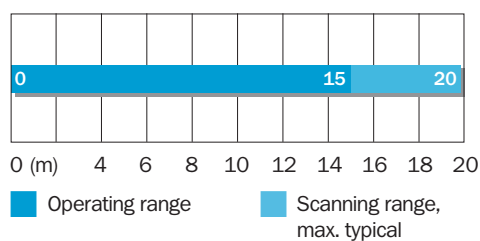
⁶⁾ with light/dark ratio 1:1

⁷⁾ do not bend below 0 °C

⁸⁾ Reference voltage 50 V DC

⁹⁾ Teflon-coated housing available on request

Scanning range and operating reserve



Order information

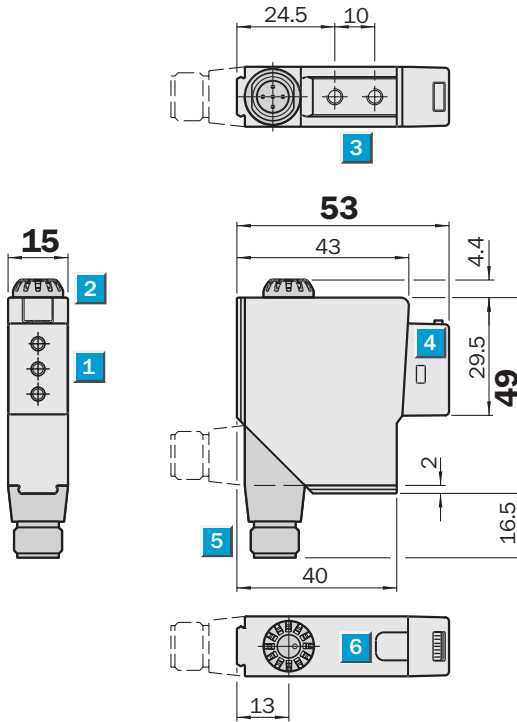
Type	Order no.
WS/WE12-2N130	1 016 154
WS/WE12-2N430	1 016 155
WS/WE12-2P130	1 016 156
WS/WE12-2P430	1 016 157

	Scanning distance 0 ... 280 mm
	Scanning range 0 ... 300 mm
Proximity switch with fibre optic cables	

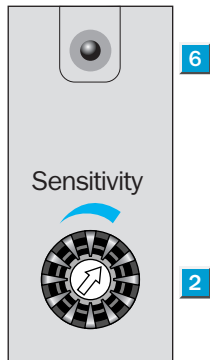
- Red, infrared or green light
- Plug-in fibre-optic cables
- Switch-selectable light-/dark-switching
- Adjustable sensitivity



Dimensional drawing



Adjustments possible

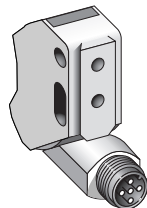


- 1 Connector for fibre-optic cable
- 2 Sensitivity control
- 3 M4 threaded mounting hole - 4 mm deep
- 4 Adapter
- 5 Plug not rotatable. Plug facing backwards on request
- 6 LED signal strength indicator

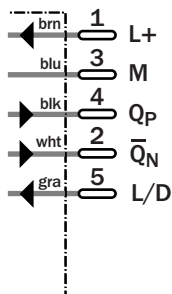


Connection type

WLL12-B5181
WLL12-B5281
WLL12-B5381
WLL12-B5481



M12, 5-pin



See chapter Accessories

- Adapter for fibre-optic cables
- Connector, M12, 5-pin
- Fibre-optic cables
- Mounting systems

Technical data		WLL12-B	5181	5281	5381	5481						
Scanning distance typ. max.	0 ... 280 mm ¹⁾											
	0 ... 60 mm ¹⁾											
Fibre-optic cable (proximity system)	LM/LT											
Scanning range typ. max.	0 ... 200 mm											
	0 ... 300 mm											
	0 ... 20 mm											
Fibre-optic cable (through-beam system)	LM/LT											
Light source, light type	LED, Red light ²⁾											
	LED, Infrared light ²⁾											
	LED, Green light ²⁾											
Supply voltage V_s	10 ... 30 V DC ³⁾											
Ripple	≤ 5 V _{pp} ⁴⁾											
Power consumption	≤ 35 mA ⁵⁾											
Switching outputs	PNP: Q/NPN: Q											
Switching mode	Light/dark-switching, switchable											
Output current I _{a,max}	100 mA											
Response time	360 μs ⁶⁾											
Switching frequency	1,300 Hz ⁷⁾											
Connection type	Connector, M12, 5-pin											
VDE protection class	□ ⁸⁾											
Circuit protection	V _s connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression											
Enclosure rating	IP 67											
Ambient temperature operation	-25 °C ... +60 °C											
Ambient temperature storage	-25 °C ... +70 °C											
Weight	Approx. 130 g											
Housing material	Zinc die-cast											

¹⁾ Object with 90 % remission (based on standard white to DIN 5033)

²⁾ Average service life 100,000 h

at T_a = +25 °C

³⁾ Limit values

⁴⁾ may not exceed or fall short of

V_s tolerances

⁵⁾ without load

⁶⁾ Signal transit time with resistive load

⁷⁾ with light/dark ratio 1:1

⁸⁾ Reference voltage 50 V DC

Order information

Type	Order no.
WLL12-B5181	1 011 677
WLL12-B5281	1 011 687
WLL12-B5381	1 011 688
WLL12-B5481	1 011 965