Ready-to-fit and Standard-compliant - Cat. 3D/3G Photoelectric Switches for Explosive Areas

The Category 3D/3G photoelectric switches from SICK are equipped with a metal housing. This housing meets the demanding requirements of the Standard and therefore offers a ready-to-fit solution in respect of the standard.

Product range:

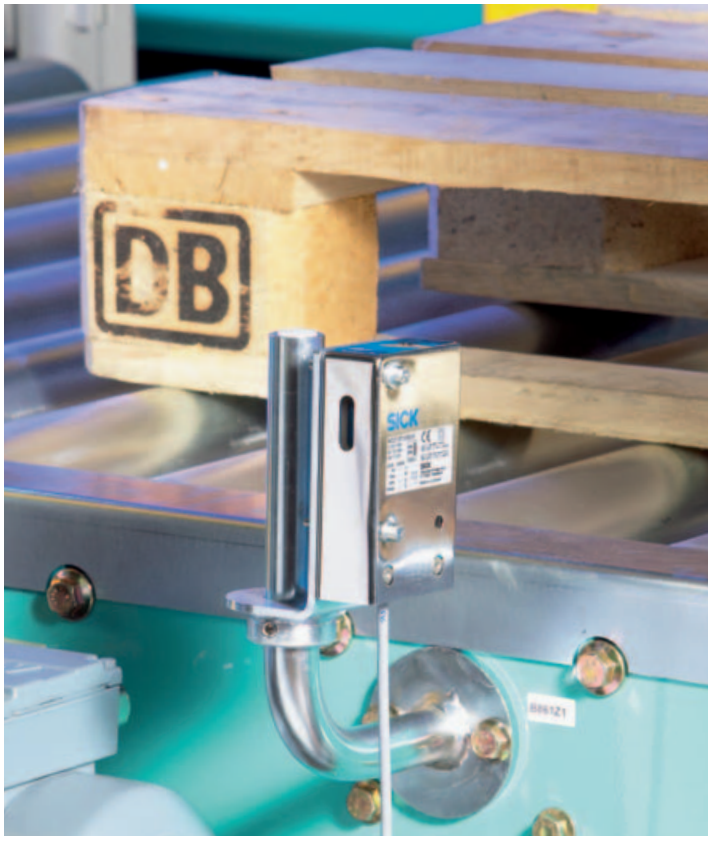
- **W18-3Ex:** Compact dimensions, accurate background suppression, insensitive to optical interference, sensor range up to 1,000 mm and up to 7m as a photoelectric reflex switch,
- **W27-3Ex:** Complete range of photoelectric switches: scanning distance up to 1,500 mm, range up to 14 m on a reflector and 35 m as a through-beam photoelectric switch,
- **WTR2Ex:** Economical solution for scanning distances up to 900 mm,
- **WL24-2Ex:** The powerful photoelectric switch with a range of up to 22 m.

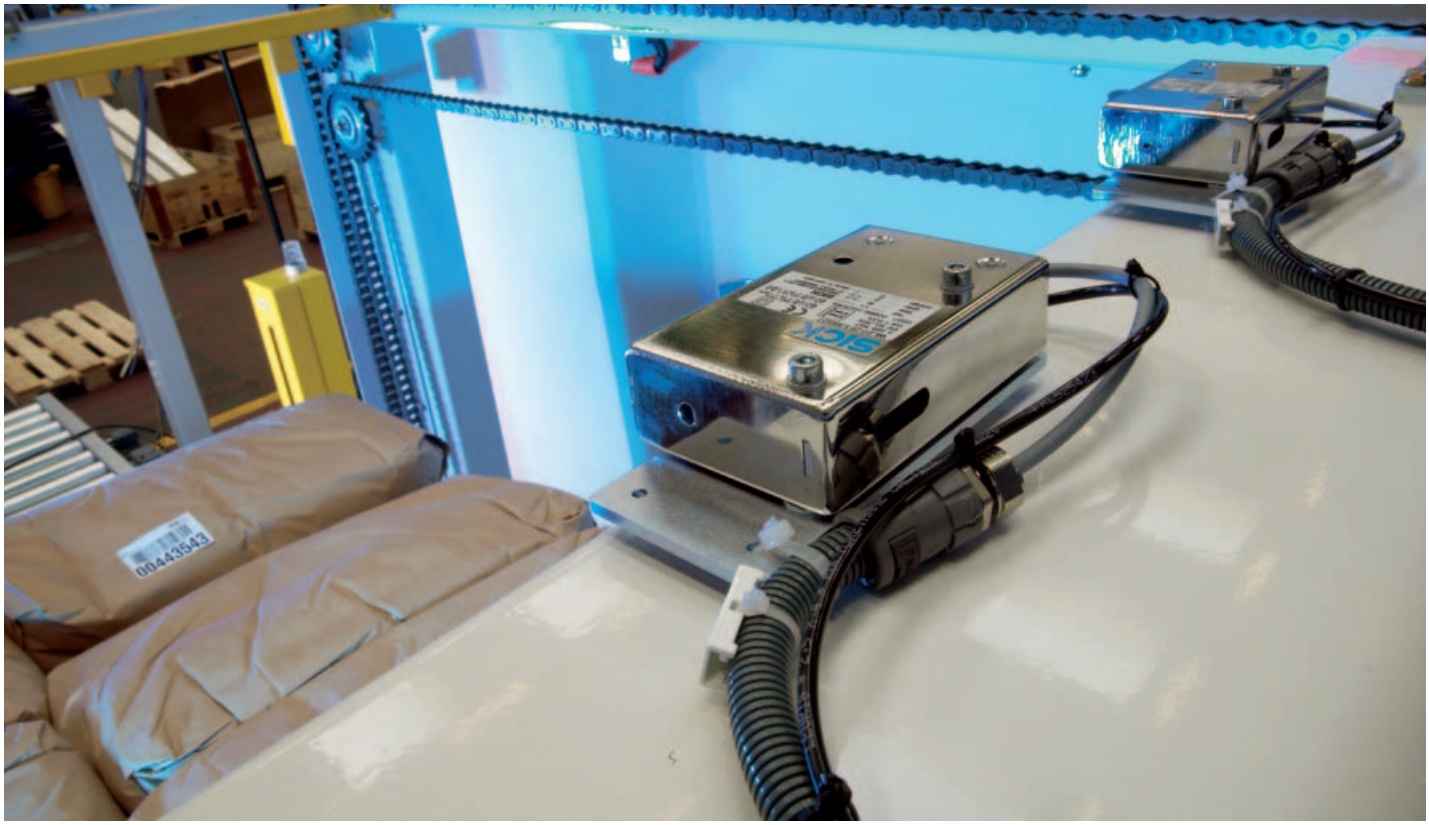
"Ex" series modules are designed for explosive areas in ignition protection Type "n" according to EN 50021. Hence, they conform to Categories 3G and 3D, based on the new 94/9/EC (ATEX) Directive, and can be used in the areas "Zone 2 (gas)" and "Zone 22 (non-conductive dust)".

In addition to limit values for temperature, performance or UV resistance, the Standard stipulates a mechanical strength which cannot be achieved with standard sensors.

► Filling of building material.

▼ WTB27-3Ex photoelectric proximity switch detects the presence of pallets.





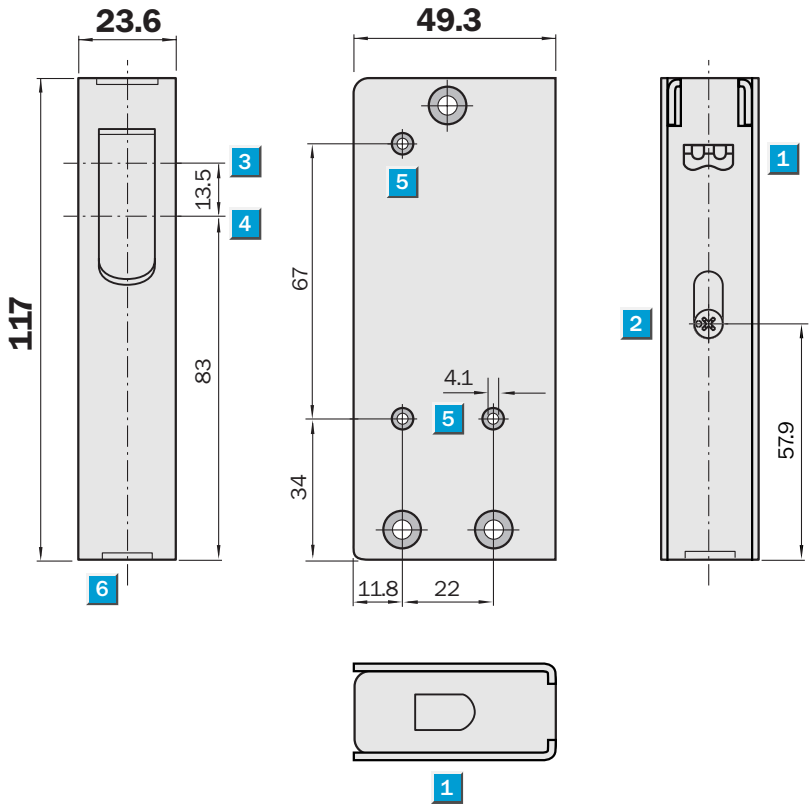
▲ Smart solution: WTB27-3Ex photoelectric proximity switch and protection housing.

Scanning distance
50 ... 1,000 mm

Photoelectric proximity switch

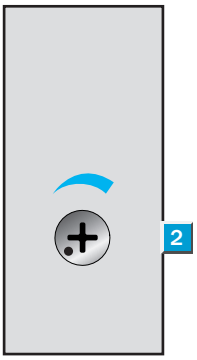
- Ready-to-fit, Standard-compliant design: sensor + protective housing
- Complies with Categories 3D and 3G according to 94/9/EC (ATEX) Directive
- Accurate background suppression
- Insensitive to optical interference

Dimensional drawing



Adjustments possible

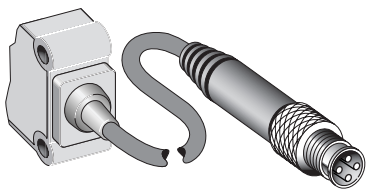
WT18X-3P920



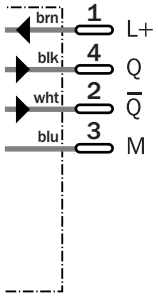
1 Status indicator LEDs
2 Scanning distance adjustment
3 Middle of optical axis, sender
4 Middle of optical axis, receiver
5 Mounting holes Ø 4.1 mm
6 Connector

Connection type

WT18X-3P920



M12, 4-pin



See chapter Accessories

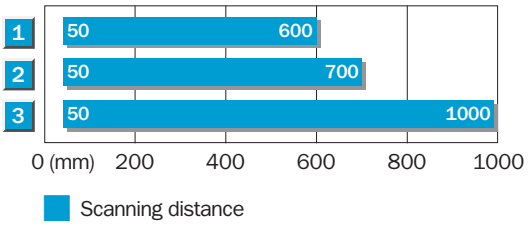
Connector, M12, 4-pin

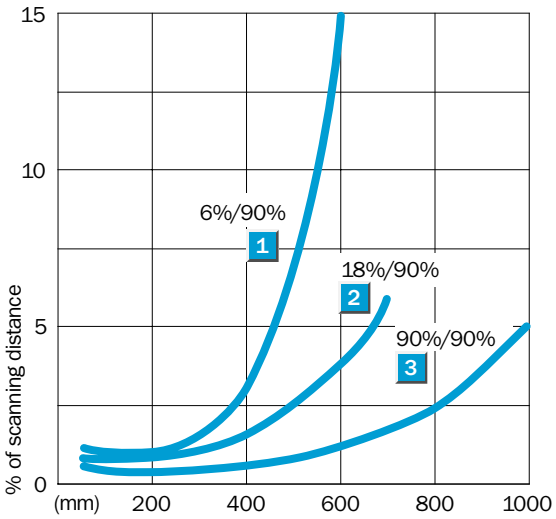
Mounting systems

	WT18X-3	P920
Scanning distance typ. max.	50 ... 1,000 mm[1]	
Adjustment of operating distance	Potentiometer	
Light source, light type	LED, infrared light[2]	
Light spot diameter	30 mm at 600 mm distance	
Supply voltage V_S	DC 10 ... 30 V[3]	
Ripple	< 5 V_{ss}[4]	
Power consumption	< 45 mA[5]	
Switching outputs	PNP antivalent	
Output current $I_a$max	< 100 mA	
Response time	< 700 µs[6]	
Switching frequency	700 Hz[7]	
Connection type	Cable with plug, M12, 4-pin, 290 mm[8]	
Ex marking (ATEX)	EX II 3G EEx nA II T4 X EX II 3D IP67 T70 °C[9]	
VDE protection class	⧈[10]	
Circuit protection	V_S connections reverse-polarity protected / All outputs short-circuit protected / Interference suppression	
Enclosure rating	IP 67	
Ambient temperature operation	-20 °C ... +50 °C	
Ambient temperature storage	-40 °C ... +75 °C	
Weight	Approx. 300 g	
Housing material	ABS / stainless steel 1.4301	

[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, reverse-polarity protected operation in short-circuit protected network max. 8 A
[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] do not bend below 0 °C
[9] conformity with directives. Explosion prevention: Directive 94/9/EC
[10] Reference voltage 50 V DC

Scanning range





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

Ordering information

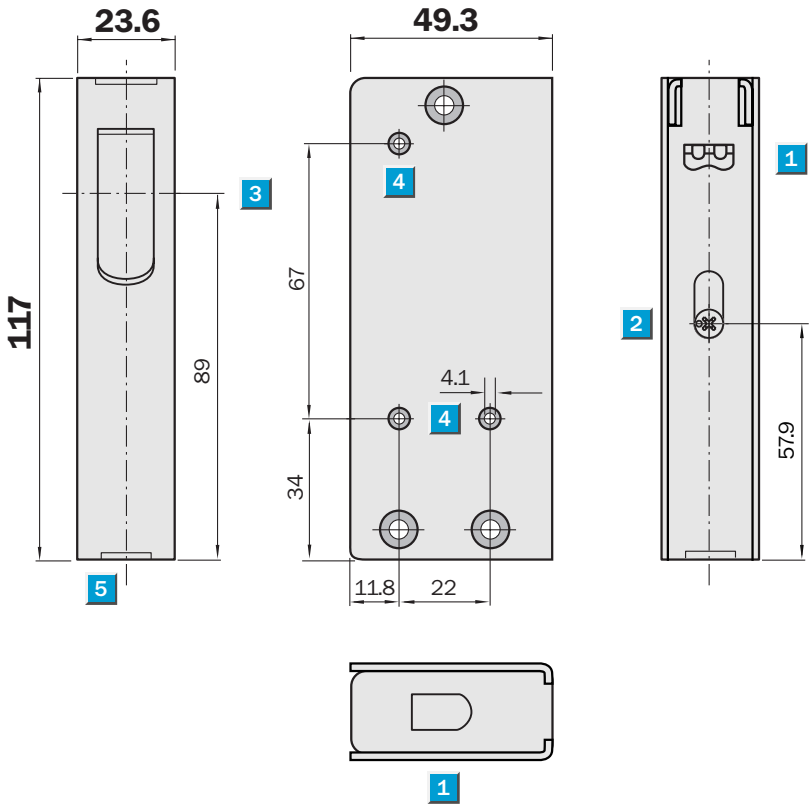
Type	Order no.
WT18X-3P920	1 029 901

Scanning range
0 ... 7 m

Photoelectric reflex switch

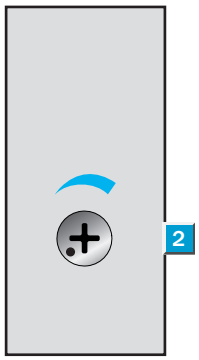
- Ready-to-fit, Standard-compliant design: sensor + protective housing
- Complies with Categories 3D and 3G according to 94/9/EC (ATEX) Directive
- Autocollimation principle
- Insensitive to optical interference

Dimensional drawing



Adjustments possible

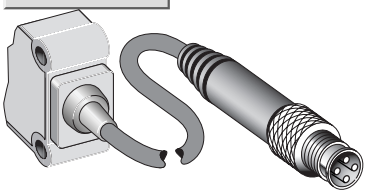
WL18X-3P930



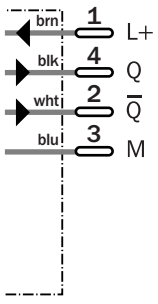
1 Status indicator LEDs
2 Sensitivity control
3 Middle of optical axis
4 Mounting holes Ø 4.1 mm
5 Connector

Connection type

WL18X-3P930



M12, 4-pin



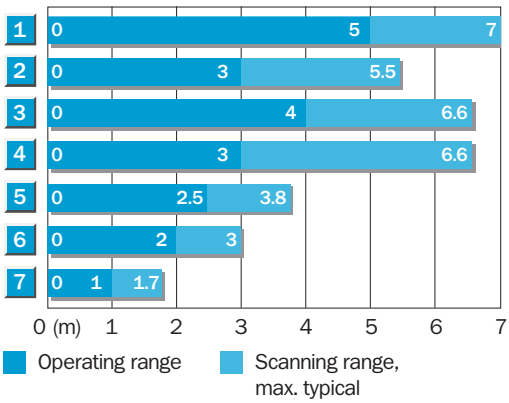
See chapter Accessories

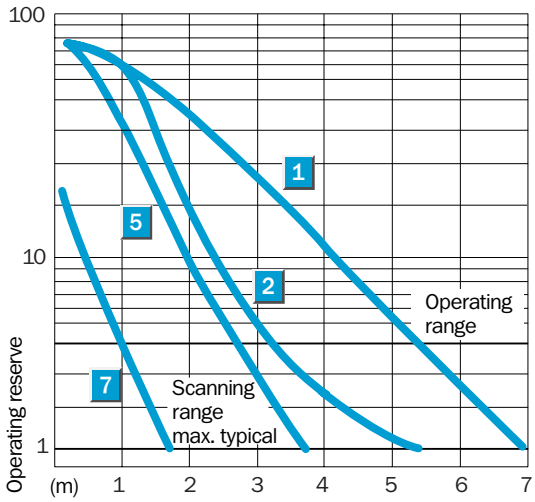
Connector, M12, 4-pin
Mounting systems
Reflectors

	WL18X-3	P930
Scanning range typ. max.	0 ... 7 m	
Relating to	Reflector PL80A	
Sensitivity adjustment	Potentiometer	
Light source, light type	LED, visible red light[1]	
Light spot diameter	40 mm at 2 m distance	
Angle of dispersion	1.5 °	
Polarisation filter	✓	
Supply voltage V_S	DC 10 ... 30 V[2]	
Ripple	< 5 V_{ss}[3]	
Power consumption	< 30 mA[4]	
Switching outputs	PNP antivalent	
Output current $I_a$max	< 100 mA	
Response time	500 µs[5]	
Switching frequency	1,000 Hz[6]	
Connection type	Cable with plug, M12, 4-pin, 290 mm[7]	
Ex marking (ATEX)	EX II 3D IP67 T70 °C EX II 3G EEx nA II T4 X[8]	
VDE protection class	⧈[9]	
Circuit protection	V_S connections reverse-polarity protected / All outputs short-circuit protected / Interference suppression	
Enclosure rating	IP 67	
Ambient temperature operation	-20 °C ... +50 °C	
Ambient temperature storage	-40 °C ... +75 °C	
Weight	Approx. 300 g	
Housing material	ABS / stainless steel 1.4301	
Included with delivery	Securing clip for connector	

[1] Average service life 100,000 h at T_a = +25 °C
[2] Limit values, reverse-polarity protected operation in short-circuit protected network max. 8 A
[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] Conformity with directives. Explosion prevention: Directive 94/9/EC
[9] Reference voltage 50 V DC

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 ... 4.0 m
4	PL 40 A	0 ... 3.0 m
5	PL 30 A	0 ... 2.5 m
6	PL 20 A	0 ... 2.0 m
7	Reflective tape Diamond Grade	0 ... 1.0 m

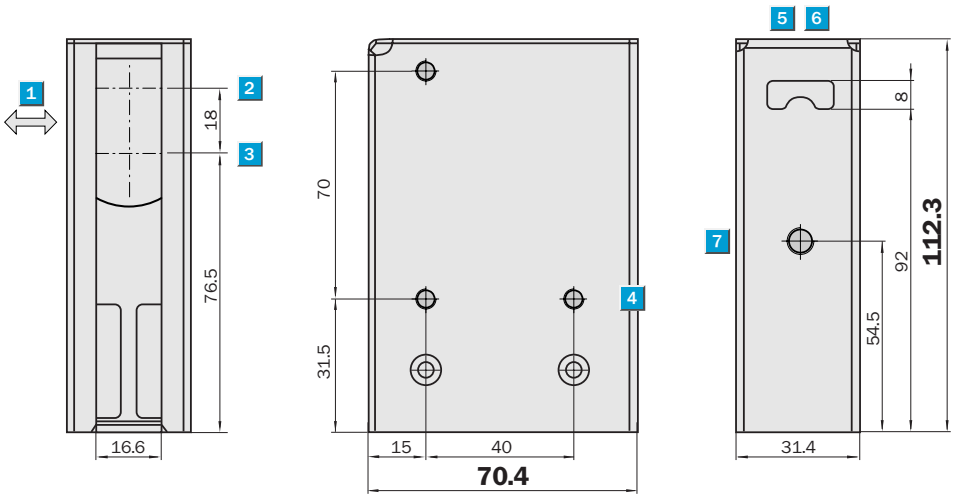
Ordering information	
Type	**Order no.**
WL18X-3P930	1 029 902

Scanning distance
30 ... 1,600 mm

Photoelectric proximity switch

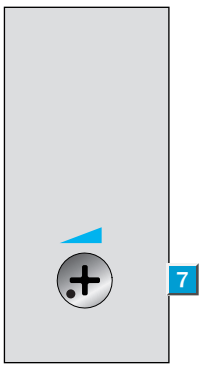
- Category 3D and 3G (ATEX)
- Standard-compliant: sensor + protective housing
- Infrared light, very long scanning distance
- Reliable in industrial environments; secure against the effects of ambient light, unwanted optical reflections and other sensors mounted adjacently

Dimensional drawing



Adjustments possible

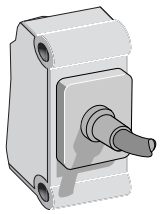
WTB27X-3P1811



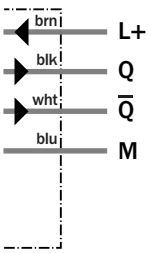
1 Standard direction of the material being scanned
2 Optical axis sender
3 Optical axis receiver
4 Mounting hole Ø 5.2 mm
5 LED indicator green; power on
6 LED indicator yellow; status of received light beam
7 Adjustment of operating distance: Poti

Connection type

WTB27X-3P1811



4 x 0.25 mm²

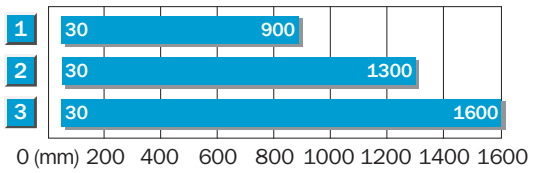


See chapter Accessories
Mounting systems

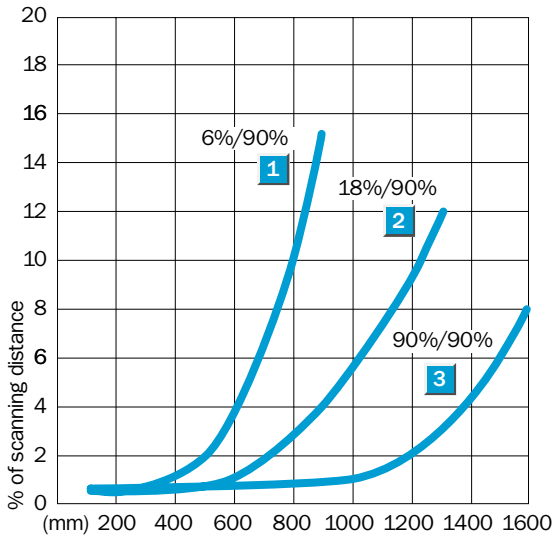
	WTB27X-3	P1811
Scanning distance typ. max.	30 ... 1,600 mm[1]	
Operating distance	100 ... 1,600 mm[1]	
Adjustment of operating distance	Potentiometer	
Light source, light type	LED, infrared light, 880 nm[2]	
Light spot diameter	Approx. 25 mm at 800 mm distance	
Supply voltage V_S	DC 10 ... 30 V[3]	
Ripple	≤ 5 V_{SS}[4]	
Power consumption	≤ 40 mA[5]	
Switching outputs	PNP antivalent	
Signal voltage PNP HIGH / LOW	> V_S - 2.5 V / approx. 0 V	
Output current $I_a$max	100 mA	
Response time	≤ 1.5 ms[6]	
Switching frequency	350 Hz[7]	
Connection type	Cable, PVC, 10 m[8]	
Ex marking (ATEX)	EX II 3D IP67 T70 °C EX II 3G EEx nA II T4 X[9]	
VDE protection class	⧈[10]	
Circuit protection	V_S connections reverse-polarity protected / All outputs short-circuit protected / Interference suppression	
Enclosure rating	IP 67	
Ambient temperature operation	-20 °C ... +50 °C	
Ambient temperature storage	-40 °C ... +75 °C	
Weight	Approx. 750 g	
Housing material	ABS / stainless steel 1.4301, PMMA	

[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, reverse-polarity protected operation in short-circuit protected network max. 8 A
[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] do not bend below 0 °C
[9] conformity with directives. Explosion prevention: Directive 94/9/EC
[10] Reference voltage 50 V DC

Scanning distance



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



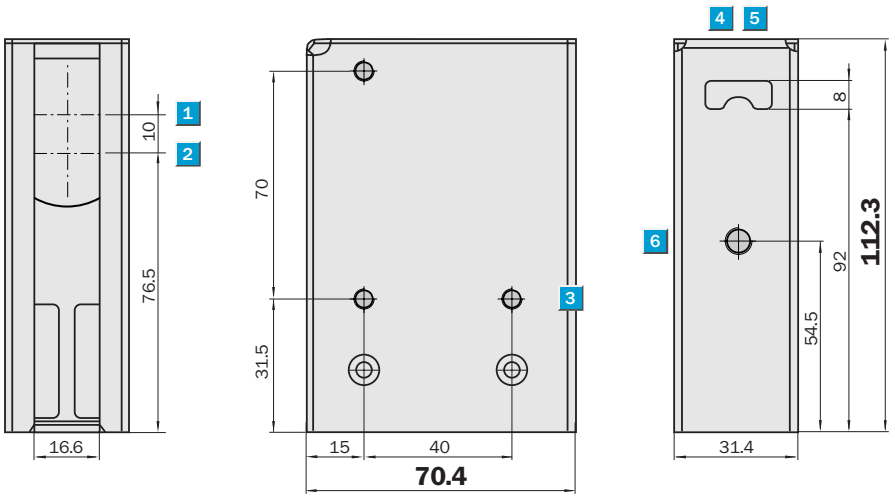
Ordering information	
Type	**Order no.**
WTB27X-3P1811	1 027 988

Scanning range
0.1 ... 15 m

Photoelectric reflex switch

- Category 3D and 3G (ATEX)
- Standard-compliant: sensor + protective housing
- Red light for easier alignment
- Long range, high operating reserve

Dimensional drawing



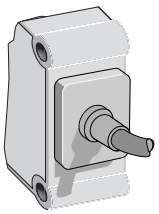
Adjustments possible

WL27X-3P1831

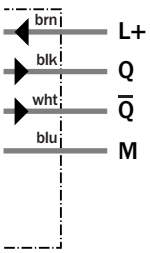
1 Optical axis sender
2 Optical axis receiver
3 Mounting hole Ø 5.2 mm
4 LED indicator green; power on
5 LED indicator yellow; status of received light beam
6 Sensitivity adjustment: Poti

Connection type

WL27X-3P1831



4 x 0.25 mm²



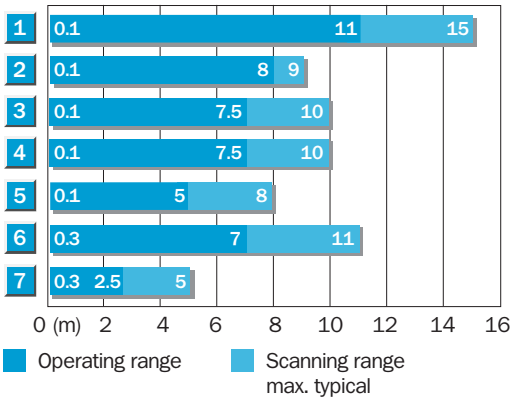
See chapter Accessories

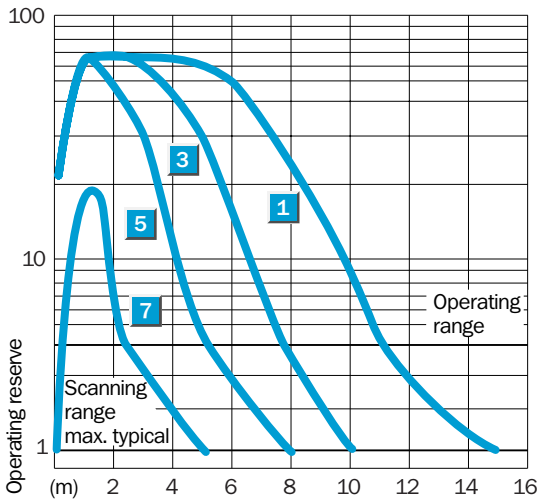
Mounting systems
Reflectors

	WL27X-3	P1831
Scanning range typ. max.	0.1 ... 15 m	
Scanning range, recommended	0.1 ... 11 m	
Relating to	Reflector PL80A	
Sensitivity adjustment	Potentiometer	
Light source, light type	LED, red light, 660 nm[1]	
Light spot diameter	Approx. 220 mm at 10 m distance	
Angle of dispersion	Approx. 1.5 °	
Polarisation filter	✓	
Supply voltage V_S	DC 10 ... 30 V[2]	
Ripple	≤ 5 V_{ss}[3]	
Power consumption	≤ 30 mA[4]	
Switching outputs	PNP antivalent	
Signal voltage PNP HIGH / LOW	> V_S - 2.5 V / approx. 0 V	
Output current $I_a$max	100 mA	
Response time	≤ 500 µs[5]	
Switching frequency	1,000 Hz[6]	
Connection type	Cable, PVC, 10 m[7]	
Ex marking (ATEX)	EX II 3D IP67 T70 °C EX II 3G EEx nA II T4 X[8]	
VDE protection class	⧈[9]	
Circuit protection	V_S connections reverse-polarity protected / All outputs short-circuit protected / Interference suppression	
Enclosure rating	IP 67	
Ambient temperature operation	-20 °C ... +50 °C	
Ambient temperature storage	-40 °C ... +75 °C	
Weight	Approx. 750 g	
Housing material	ABS / stainless steel 1.4301, PMMA	

[1] Average service life 100,000 h at T_a = +25 °C
[2] Limit values, reverse-polarity protected operation in short-circuit protected network max. 8 A
[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] conformity with directives. Explosion prevention: Directive 94/9/EC
[9] Reference voltage 50 V DC

Scanning range and operating reserve





	Reflector type	Operating range
1	PL 80 A	0.1 ... 11.0 m
2	PL 50 A	0.1 ... 8.0 m
3	PL 40 A	0.1 ... 7.5 m
4	PL 30 A	0.1 ... 7.5 m
5	PL 20 A	0.1 ... 5.0 m
6	C 110	0.3 ... 7.0 m
7	Reflective tape Diamond Grade	0.3 ... 2.5 m

Ordering information

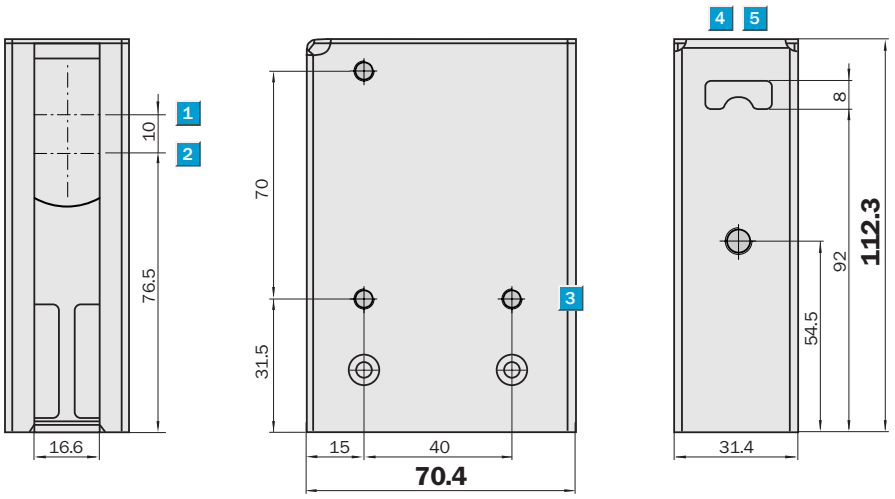
Type	Order no.
WL27X-3P1831	1 027 989

Scanning range
0 ... 35 m

Through-beam photoelectric switch

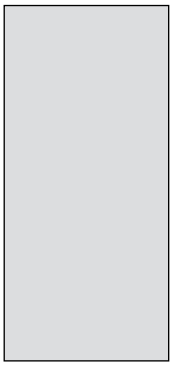
- Category 3D and 3G (ATEX)
- Standard-compliant: sensor + protective housing
- High intensity red light for easier alignment
- Long range, high operating reserve

Dimensional drawing



Adjustments possible

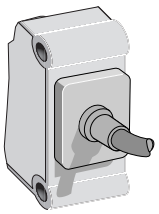
WSE27X-3P1830



1 Optical axis sender
2 Optical axis receiver
3 Mounting hole Ø 5.2 mm
4 LED indicator green; power on
5 LED indicator yellow; status of received light beam

Connection type

WSE27X-3P1830



4 x 0.25 mm²

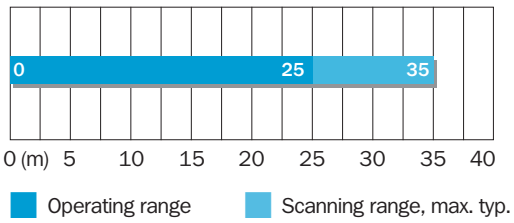
Sender		Receiver	
brn	L+	brn	L+
blk	TE	blk	Q
wht	NC	wht	$\overline{Q}$
blu	M	blu	M

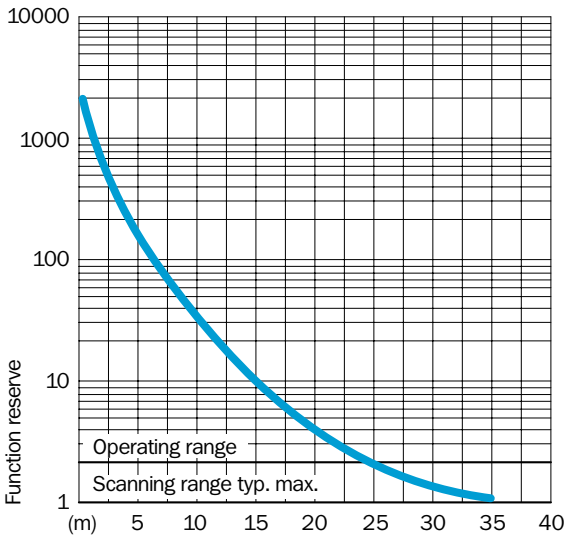
See chapter Accessories
Mounting systems

	WSE27X-3	P1830
Scanning range typ. max.	0 ... 35 m	
Scanning range, recommended	0 ... 25 m	
Light source, light type	LED, red light, 645 nm[1]	
Light spot diameter	Approx. 600 mm at 25 m distance	
Angle of dispersion	Approx. 1.5 °	
Angle of reception	Approx. 3 °	
Supply voltage V_S	DC 10 ... 30 V[2]	
Ripple	≤ 5 V_{SS}[3]	
Power consumption, sender	≤ 35 mA[4]	
Power consumption, receiver	≤ 20 mA[4]	
Switching outputs	PNP antivalent	
Signal voltage PNP HIGH / LOW	> V_S - 2.5 V / approx. 0 V	
Output current $I_a$max	100 mA	
Response time	≤ 500 µs[5]	
Switching frequency	1,000 Hz[6]	
Test input sender off	TE to 0 V	
Connection type	Cable, PVC, 10 m[7]	
Ex marking (ATEX)	EX II 3D IP67 T70 °C EX II 3G EEx nA II T4 X[8]	
VDE protection class	⧈[9]	
Circuit protection	V_S connections reverse-polarity protected / All outputs short-circuit protected / Interference suppression	
Enclosure rating	IP 67	
Ambient temperature operation	-20 °C ... +50 °C	
Ambient temperature storage	-40 °C ... +75 °C	
Weight	Approx. 1,500 g	
Housing material	ABS / stainless steel 1.4301, PMMA	

[1] Average service life 100,000 h at T_a = +25 °C
[2] Limit values, reverse-polarity protected operation in short-circuit protected network max. 8 A
[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] conformity with directives. Explosion prevention: Directive 94/9/EC
[9] Reference voltage 50 V DC

Scanning range and function reserve





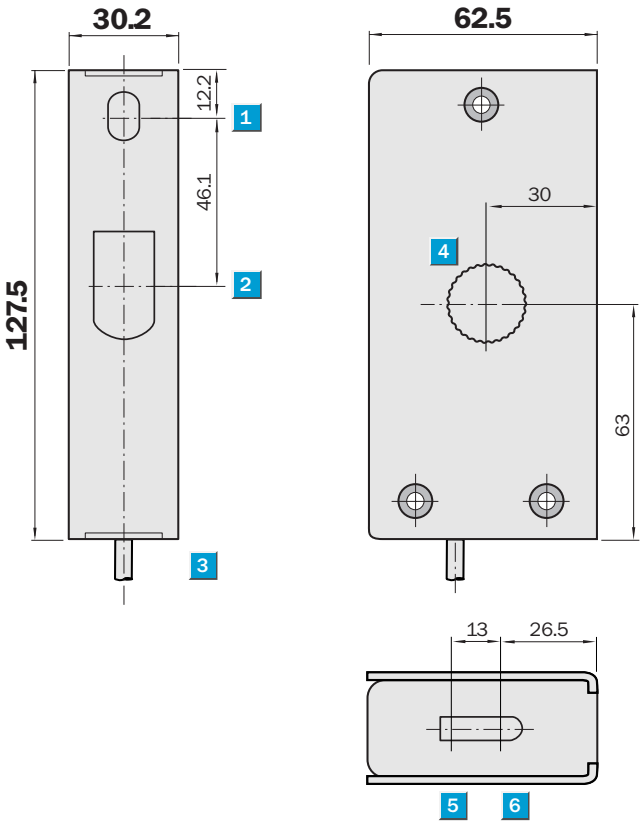
Ordering information	
Type	**Order no.**
WSE27X-3P1830	1 027 991

Scanning distance 300 ... 900 mm

Photoelectric proximity switch

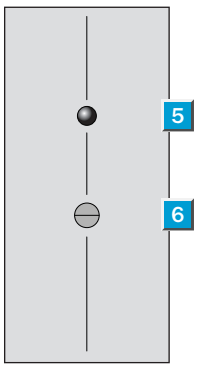
- Ready-to-fit, Standard-compliant design: sensor + protective housing
- Complies with Categories 3D and 3G according to 94/9/EC (ATEX) Directive
- Accurate background suppression
- Fixing hole for clamp holder

Dimensional drawing



Adjustments possible

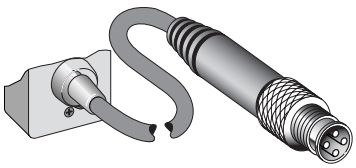
WTR2-P511S21



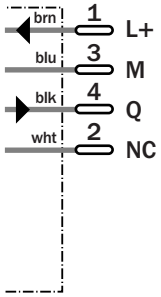
1 Middle optical axis, sender
2 Middle optical axis, receiver
3 Connection
4 Fixing hole for clamp holder
5 Reception display
6 Scanning distance adjustment

Connection type

WTR2-P511S21



M12, 4-pin



See chapter Accessories

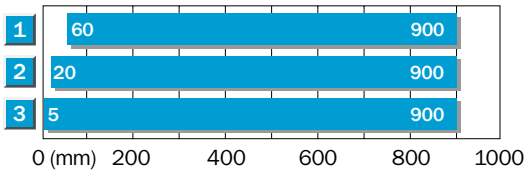
Connector, M12, 4-pin

Mounting systems

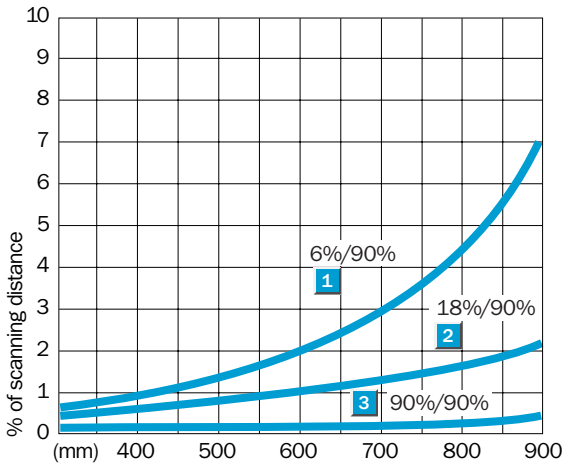
	WTR2-P5	11S21
Scanning distance typ. max.	300 ... 900 mm	
Light source, light type	LED, infrared light	
Light spot diameter	Approx. 40 mm	
Supply voltage V_S	DC 10 ... 30 V[1]	
Ripple	< 5 V_{ss}[2]	
Power consumption	≤ 25 mA[3]	
Switching outputs	PNP	
Switching mode	Light-switching	
Output current $I_a$max	100 mA	
Switching frequency	250 Hz	
Connection type	Cable with plug, M12, 4-pin, 270 mm[4]	
Ex marking (ATEX)	EX II 3D IP67 T70 °C[5]	
VDE protection class	⧈	
Circuit protection	In-/outputs short-circuit protected / All outputs short-circuit protected / Interference suppression	
Enclosure rating	IP 54	
Ambient temperature operation	-20 °C ... +50 °C	
Ambient temperature storage	-40 °C ... +75 °C	
Weight	Approx. 550 g	
Housing material	ABS / stainless steel 1.4301	
Included with delivery	Securing clip for connector	

[1] Limit values
[2] may not exceed or fall short of V_S tolerances
[3] without load
[4] do not bend below 0 °C
[5] conformity with directives. Explosion prevention: Directive 94/9/EC

Scanning distance



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



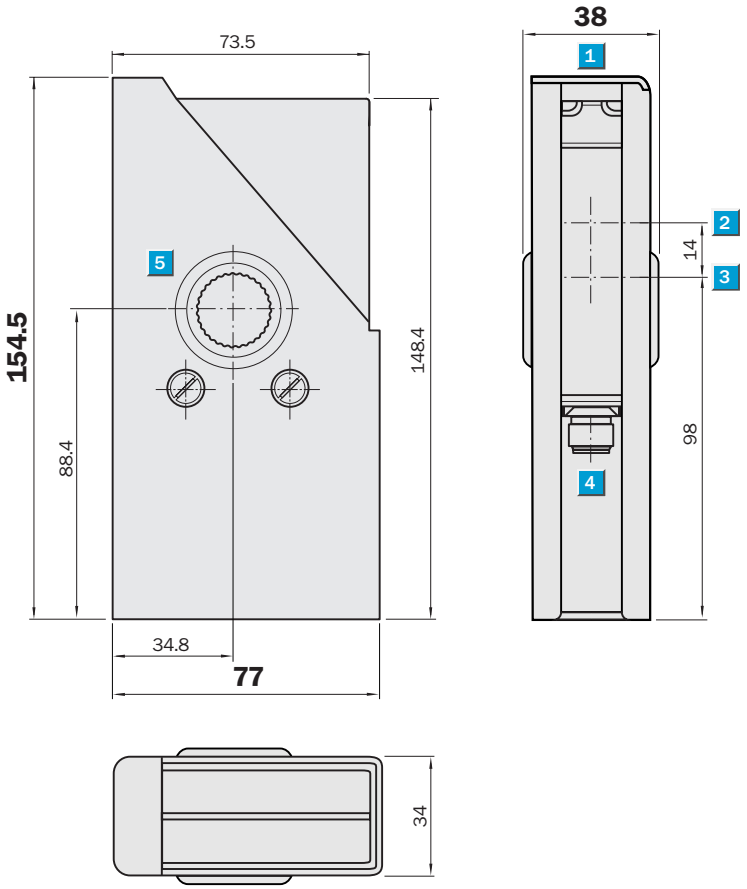
Ordering information	
Type	**Order no.**
WTR2-P511S21	1 029 241

Scanning range
0 ... 22 m

Photoelectric reflex switch

- Ready-to-fit, Standard-compliant design: sensor + protective housing
- Complies with Categories 3D and 3G according to 94/9/EC (ATEX) Directive
- Very large range
- Fixing hole for clamp holder

Dimensional drawing



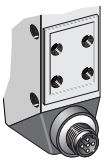
Adjustments possible

WL24-2V530S06

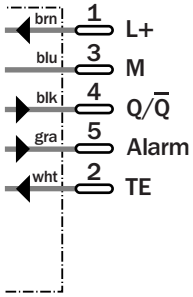
1 Reception display
2 Middle optical axis, sender
3 Middle optical axis, receiver
4 Connection
5 Fixing hole for clamp holder
6 Reception display
7 Sensitivity adjuster
8 Light/dark switch
9 NPN/PNP selector switch

Connection type

WL24-2V530S06



M12, 5-pin



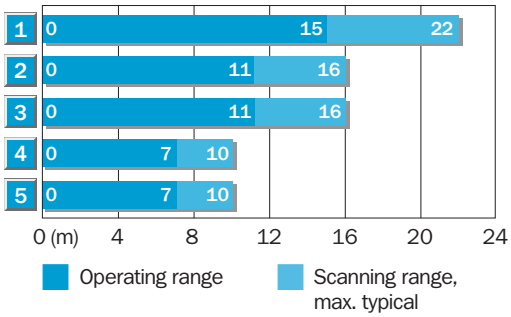
See chapter Accessories

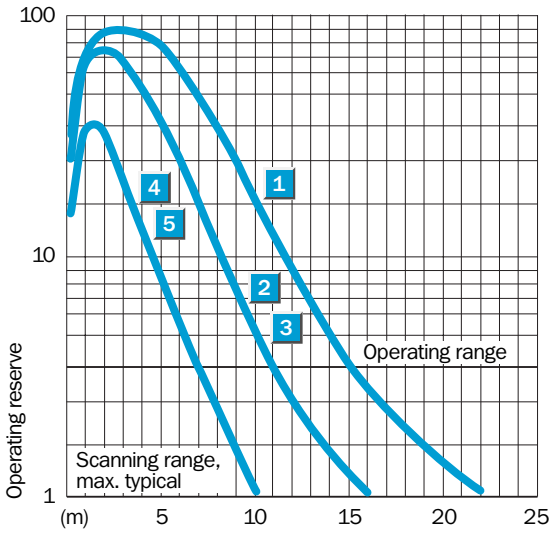
Connector, M12, 5-pin
Mounting systems
Reflectors

	WL24-2V530	S06
Scanning range typ. max.	0 ... 22 m	
Scanning range, recommended	0 ... 15 m	
Relating to	Reflector PL80A	
Light source, light type	LED, red light[1]	
Light spot diameter	Approx. 250 mm at 15 m distance	
Polarisation filter	✓	
Supply voltage V_S	DC 10 ... 30 V[2]	
Ripple	< 5 V_{ss}[3]	
Power consumption	≤ 50 mA[4]	
Switching outputs	PNP or NPN, Q or Q not	
Output current $I_a$max	100 mA	
Response time	≤ 500 µs[5]	
Switching frequency	1,000 Hz[6]	
Test input sender off	TE to 0 V	
Connection type	Connector, M12, 5-pin	
Ex marking (ATEX)	EX II 3D IP67 T70 °C EX II 3G EEx nA II T4 X[7]	
VDE protection class	⧈[8]	
Circuit protection	Vs connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference suppression	
Enclosure rating	IP 67	
Ambient temperature operation	-20 °C ... +50 °C	
Ambient temperature storage	-40 °C ... +75 °C	
Weight	Approx. 800 g	
Housing material	Zinc die-cast	

[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] conformity with directives. Explosion prevention: Directive 94/9/EC
[8] Reference voltage 50 V DC

Scanning range and operating reserve





Reflector type		Operating range
1	PL 80 A	0 ... 15.0 m
2	PL 50 A	0 ... 11.0 m
3	PL 40 A	0 ... 11.0 m
4	PL 30 A	0 ... 7.0 m
5	PL 20 A	0 ... 7.0 m

Ordering information	
Type	**Order no.**
WL24-2V530S06	1 027 613