

	Photoelectric proximity switches BGS/FGS
	Photoelectric reflex switches

# W 190 L High Grade: Application-based Laser Technology, the optimum solution for demanding applications



objects or foils provide a secure switching signal. Automatic switching threshold tracking ensures high availability and long maintenance intervals in industrial environments.

Through the configuration menu, the **WTB 190TL photoelectric proximity switch** with CMOS receiver line enables flexible selection of the operating and Teach-in modes. Foreground and background suppression modes are available.

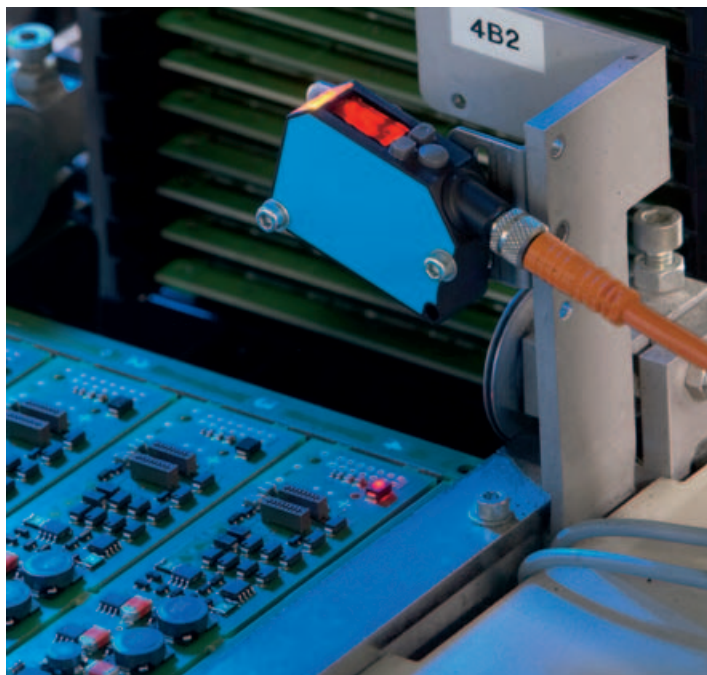
**D**emanding tasks with customised functionality of the sensor are typical requirements. With the W 190TL series of laser sensors, we have a convincing answer.

The sensors can be configured via a function menu with display and have a red light laser of protection class 2. This ensures a precise, clearly visible light spot which enables fast and exact alignment even for smallest objects.

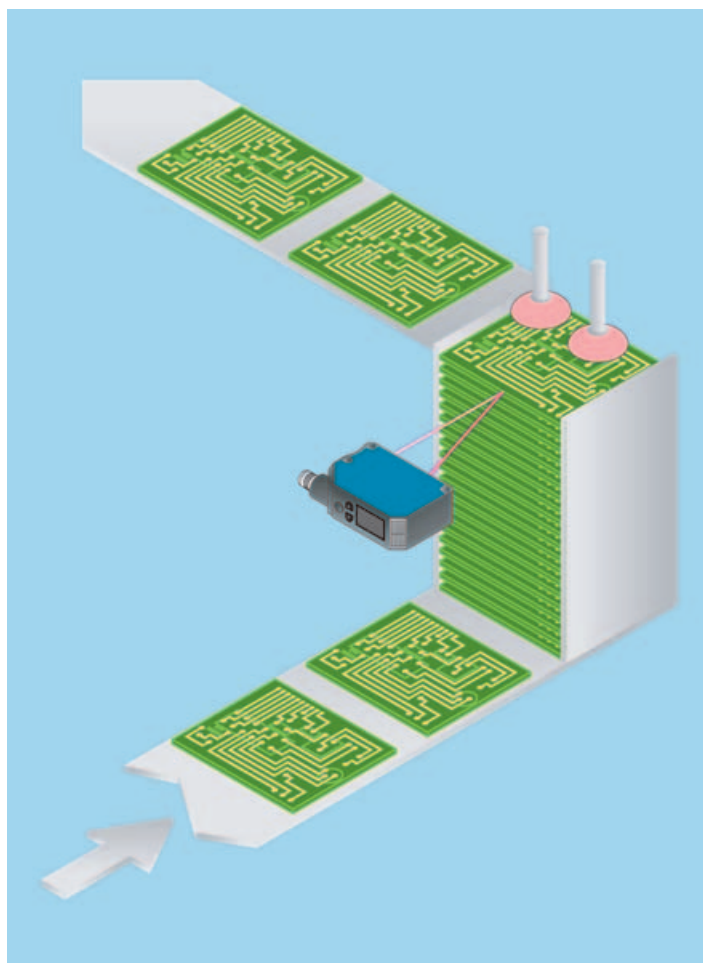
The **WLG 190T photoelectric reflex switch** is one of the most powerful sensors for transparent objects. Even highly transparent

**Further configurable functions of the W 190L High Grade series:**

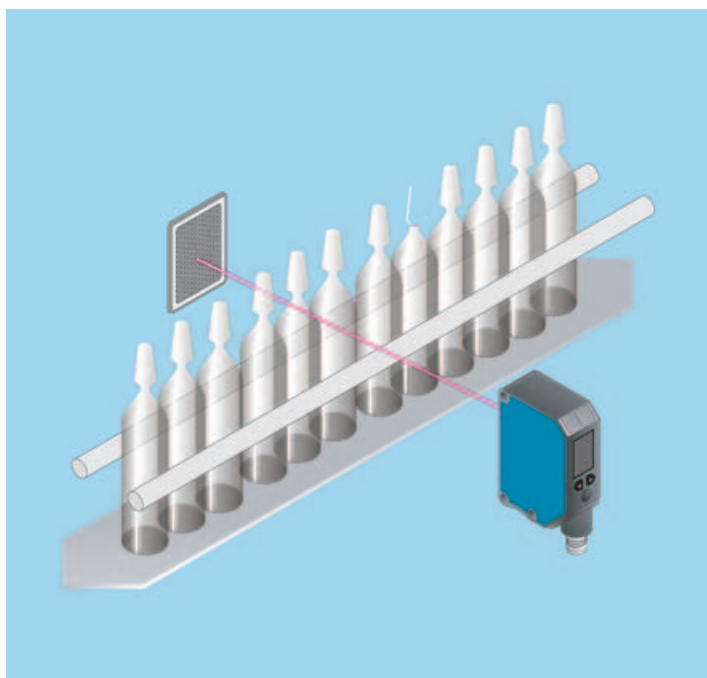
- On/off delay up to 10 s;
- one shot signal,
- light-/dark switching,
- External Teach-in or Teach-in by keystroke,
- Exact adjustment of the switching threshold down to the last digit,
- keylock.



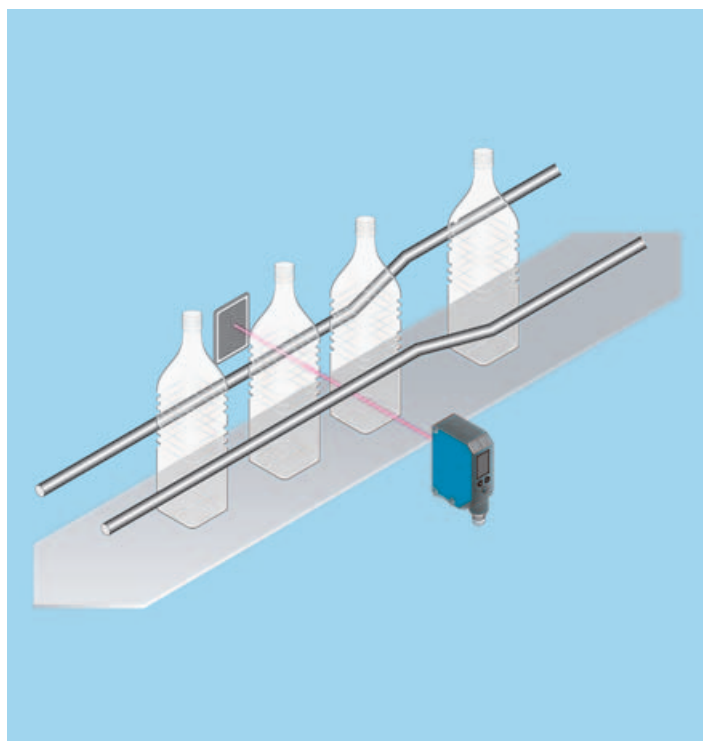
▲ WTB 190TL: Precise presence check for small components.



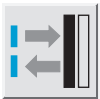
▲ WTB 190TL: Position Teach-in, BGS mode, checking presence.  
Sector: Electronic and semiconductor industry.



▲ WLG 190T: Ampoule syringes and breakage test.  
Sector: Pharmaceutical industry.



▲ WLG 190T: Transparent bottles.  
Sector: Bottling.

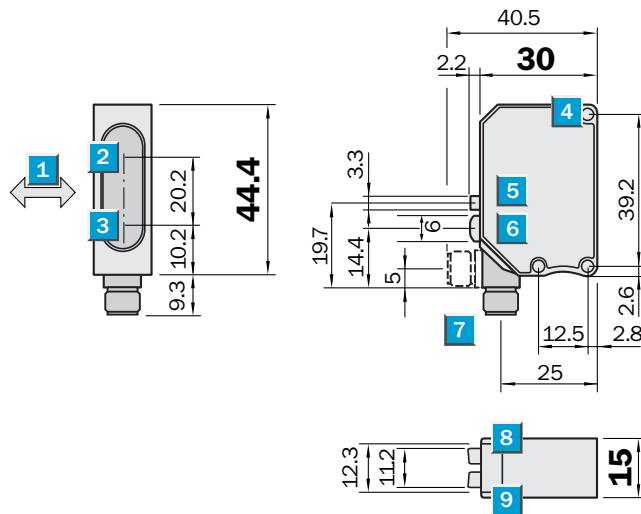


**Scanning distance**  
100 ... 270 mm

Photoelectric proximity switches

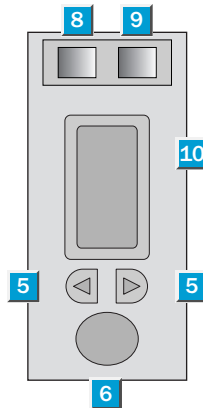
- Laser LED, visible red light, Class 2
- Scanning distance adjustment by Teach-in function
- Programmable background or foreground suppression
- Programmable output: light/dark switching
- Numeric display with menu prompts

**Dimensional drawing**



**Adjustments possible**

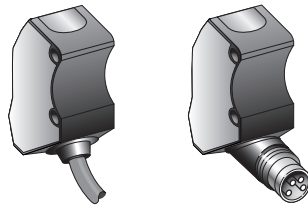
All types



- 1 Standard direction of the material being scanned
- 2 Centre of optical axis, sender
- 3 Centre of optical axis, receiver
- 4 Mounting holes,  $\varnothing$  approx. 3.1 mm
- 5 +/- button; select mode button
- 6 Teach-in button
- 7 Plug 4-pin, M8, 90° rotatable or cable 2 m, 4-wire
- 8 Status indicator LED, green: Laser on
- 9 Status indicator LED, yellow: output active
- 10 Numerical display

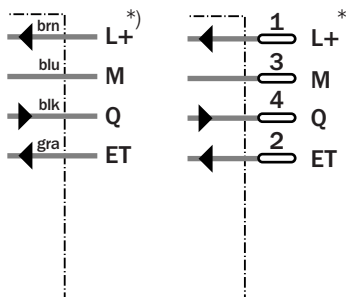
**Connection types**

WTB 190TL-P 162	WTB 190TL-P 460
WTB 190TL-N 162	WTB 190TL-N 460



4 x 0.18 mm<sup>2</sup>

4-pin, M8



\*) Adjustment via External Teach (ET)

PNP → L+

NPN → M



CE III CDRH  
Accession Number  
0 31 22 45

Laser class 2



**See chapter Accessories**

Cables and connectors

Mounting systems

Technical data		WTB 190TL-	P 162	P 460	N 162	N 460
<b>Scanning distance, adjustable</b>	100 ... 270 mm <sup>1)</sup>					
<b>Device function mode</b>	BGS <sup>2)</sup> or FGS <sup>3)</sup> , programmable					
<b>Scanning distance, adjustable</b>	Teach-in, External Teach (ET)					
	Teach-in via button, menu guided					
<b>Threshold, precise setting</b>	Manually adjustable					
<b>Light source<sup>4)</sup></b>	Laser, red light; class 2					
Light spot diameter	1.5 mm at distance of 200 mm					
<b>Supply voltage V<sub>S</sub></b>	10 ... 30 V DC <sup>5)</sup>					
Ripple <sup>6)</sup>	± 10 %					
Current consumption <sup>7)</sup>	Max. 40 mA					
<b>Switching outputs</b>	PNP					
	NPN					
Output current I <sub>A</sub> max.	< 100 mA					
Switching type	Light-/dark-switching, programmable					
Response time <sup>8)</sup>	1.5 ms					
Switching frequency max. <sup>9)</sup>	300/s					
<b>Timer mode (dLY)</b>	0 ... 10 s, programmable					
<b>Timer function</b>	Nor: normal Mode					
	OnD: On Delay Mode, on delay					
	OFd: Off Delay Mode, off delay					
	OnE: One Shot Mode, one shot					
<b>Numerical display monitoring</b>	Threshold, distance, mode selection					
<b>Connection types</b> Cable	4-wire <sup>10)</sup>					
Plug	4-pin, M8					
<b>VDE protection class<sup>11)</sup></b>	⚡					
<b>Circuit protection<sup>12)</sup></b>	A, B					
<b>Enclosure rating</b>	IP 67					
<b>Ambient temperature</b>	Operation -10 ... +40 °C					
	Storage -20 ... +60 °C					
<b>Weight</b>	With cable 2 m approx. 200 g					
	With plug approx. 120 g					
<b>Housing material</b>	Housing: ABS; optic: PMMA					

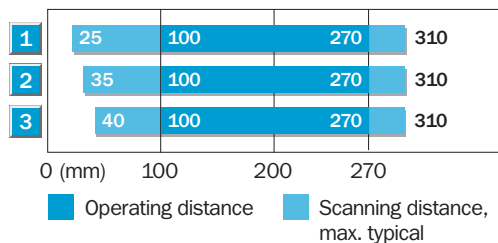
- 1) Object with 90 % reflectance (with reference to standard white according to DIN 5033)
- 2) Background suppression
- 3) Foreground suppression

- 4) Average service life 50,000 h at T<sub>A</sub> = + 25 °C
- 5) Limit values
- 6) Must be within V<sub>S</sub> tolerances
- 7) Without load

- 8) With resistive load
- 9) With light/dark ratio 1:1
- 10) Do not bend below 0 °C
- 11) Reference voltage 50 V DC

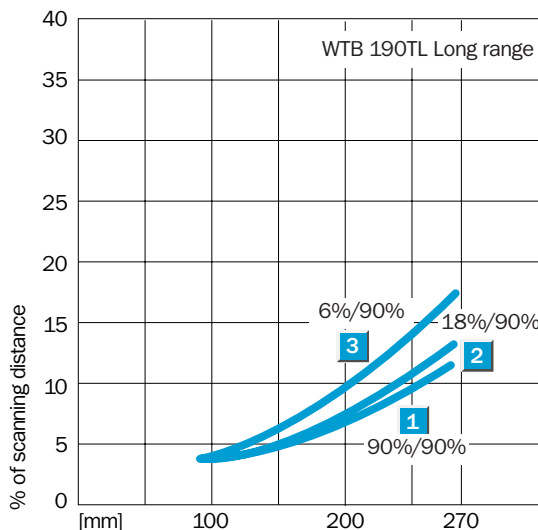
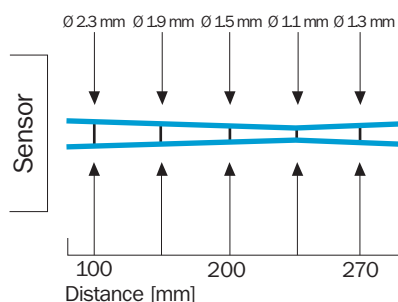
- 12) A = V<sub>S</sub> connections reverse-polarity protected
- B = Output Q short-circuit protected

**Scanning distance**



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

**Light spot diameter**



**Order information\*)**

Type	Order no.
WTB 190TL-P 162	6 026 545
WTB 190TL-P 460	6 026 546
WTB 190TL-N 162	6 026 543
WTB 190TL-N 460	6 026 544

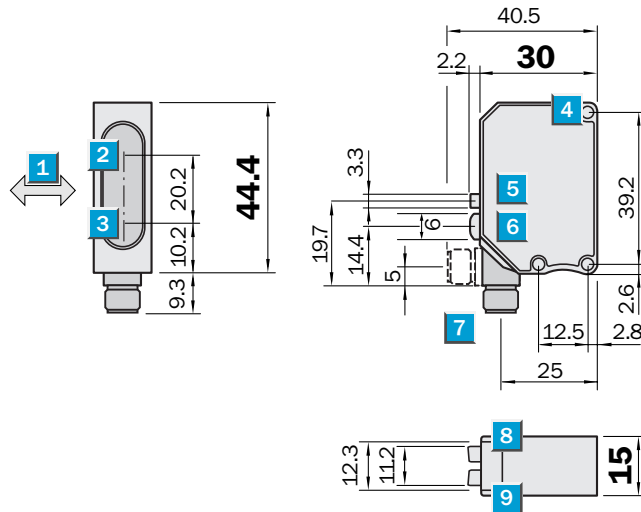
\*) Equipment model with 5 m PVC cable or M8 plug, 3-pin on request

**Scanning distance**  
40 ... 100 mm

Photoelectric proximity switches

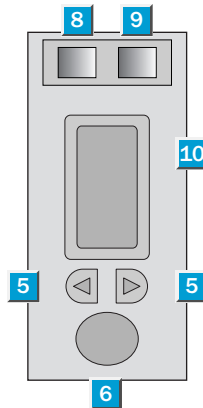
- Laser LED, visible red light, Class 2
- Scanning distance adjustment by Teach-in function
- Programmable background or foreground suppression
- Programmable output: light/dark switching
- Numeric display with menu prompts

**Dimensional drawing**



**Adjustments possible**

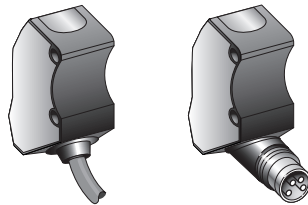
All types



- Standard direction of the material being scanned
- Centre of optical axis, sender
- Centre of optical axis, receiver
- Mounting holes,  $\varnothing$  approx. 3.1 mm
- +/- button; select mode button
- Teach-in button
- Plug 4-pin, M8, 90° rotatable or cable 2 m, 4-wire
- Status indicator LED, green: Laser on
- Status indicator LED, yellow: output active
- Numerical display

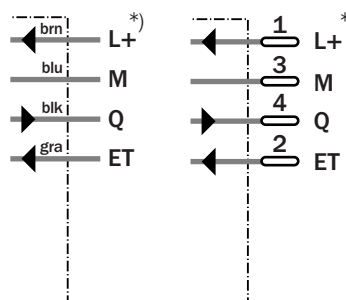
**Connection types**

WTB 190TL-P 132	WTB 190TL-P 430
WTB 190TL-N 132	WTB 190TL-N 430



4 x 0.18 mm<sup>2</sup>

4-pin, M8



\*) Adjustment via External Teach (ET)

PNP → L+

NPN → M



CE III CDRH  
Accession Number  
0 31 22 45



**See chapter Accessories**

Cables and connectors

Mounting systems



Technical data		WTB 190TL-	P 132	P 430	N 132	N 430
<b>Scanning distance, adjustable</b>	40 ... 100 mm <sup>1)</sup>					
<b>Device function mode</b>	BGS <sup>2)</sup> or FGS <sup>3)</sup> , programmable					
<b>Scanning distance, adjustable</b>	Teach-in, External Teach (ET)					
	Teach-in via button, menu guided					
<b>Threshold, precise setting</b>	Manually adjustable					
<b>Light source<sup>4)</sup></b>	Laser, red light; class 2					
Light spot diameter	0.8 mm at distance of 80 mm					
<b>Supply voltage V<sub>S</sub></b>	10 ... 30 V DC <sup>5)</sup>					
Ripple <sup>6)</sup>	± 10 %					
Current consumption <sup>7)</sup>	Max. 40 mA					
<b>Switching outputs</b>	PNP					
	NPN					
Output current I <sub>A</sub> max.	< 100 mA					
Switching type	Light-/dark-switching, programmable					
Response time <sup>8)</sup>	1.5 ms					
Switching frequency max. <sup>9)</sup>	300/s					
<b>Timer mode (dLY)</b>	0 ... 10 s, programmable					
<b>Timer function</b>	Nor: normal Mode					
	OnD: On Delay Mode, on delay					
	OFd: Off Delay Mode, off delay					
	OnE: One Shot Mode, one shot					
<b>Numerical display monitoring</b>	Threshold, distance, mode selection					
<b>Connection types</b> Cable	4-wire <sup>10)</sup>					
	Plug	4-pin, M8				
<b>VDE protection class<sup>11)</sup></b>	⚡					
<b>Circuit protection<sup>12)</sup></b>	A, B					
<b>Enclosure rating</b>	IP 67					
<b>Ambient temperature</b>	Operation -10 ... +40 °C					
	Storage -20 ... +60 °C					
<b>Weight</b>	With cable 2 m approx. 200 g					
	With plug approx. 120 g					
<b>Housing material</b>	Housing: ABS; optic: PMMA					

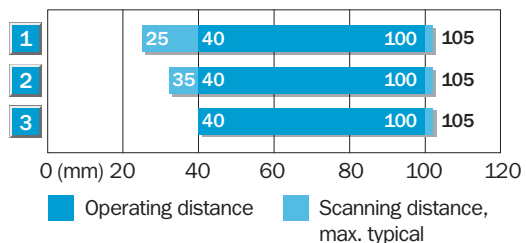
1) Object with 90 % reflectance (with reference to standard white according to DIN 5033)  
 2) Background suppression  
 3) Foreground suppression

4) Average service life 50,000 h at T<sub>A</sub> = +25 °C  
 5) Limit values  
 6) Must be within V<sub>S</sub> tolerances  
 7) Without load

8) With resistive load  
 9) With light/dark ratio 1:1  
 10) Do not bend below 0 °C  
 11) Reference voltage 50 V DC

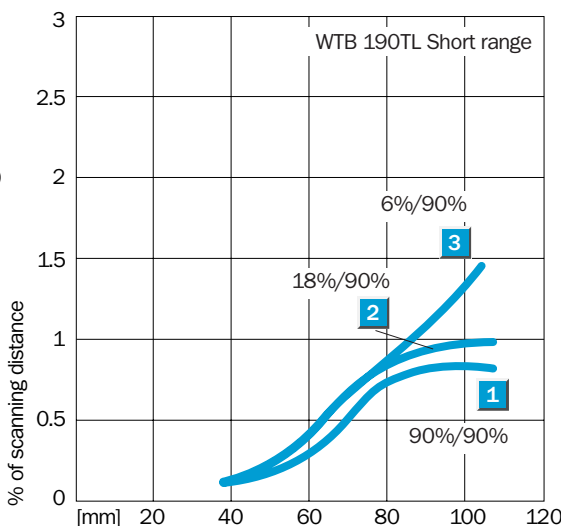
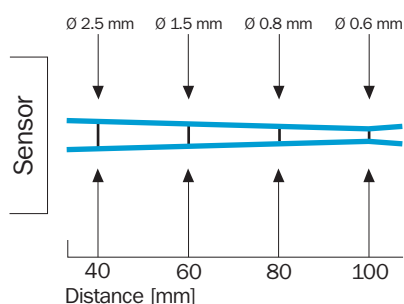
12) A = V<sub>S</sub> connections reverse-polarity protected  
 B = Output Q short-circuit protected

**Scanning distance**



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

**Light spot diameter**



**Order information\*)**

Type	Order no.
WTB 190TL-P 132	6 026 541
WTB 190TL-P 430	6 026 542
WTB 190TL-N 132	6 026 539
WTB 190TL-N 430	6 026 540

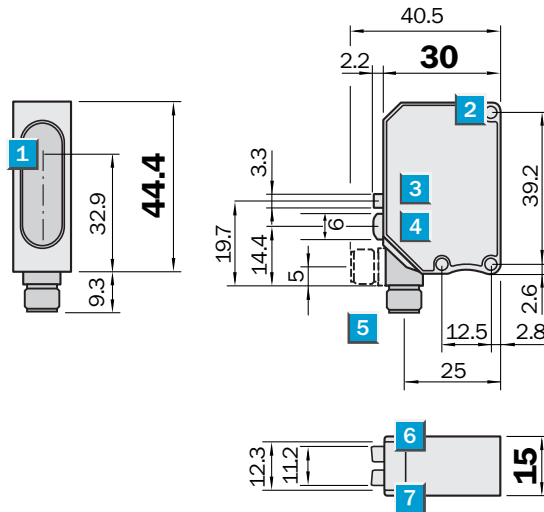
\*) Equipment model with 5 m PVC cable or M8 plug, 3-pin on request

**Scanning range**  
0.01 ... 5.5 m

Photoelectric reflex switches

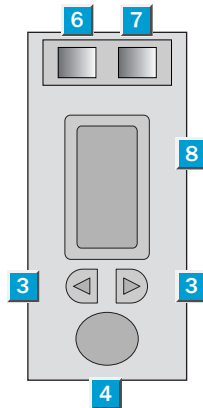
- Laser LED, visible red light, Class 2
- Sensitivity setting by Teach-in
- Precision auto-collimated optics
- Programmable output: light/dark switching
- Numeric display with menu prompts

**Dimensional drawing**



**Adjustments possible**

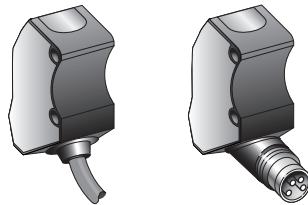
All types



- 1 Centre of optical axis
- 2 Mounting holes, Ø approx. 3.1 mm
- 3 +/- button; select mode button
- 4 Teach-in button
- 5 Plug 4-pin, M8, 90° rotatable or cable 2 m, 4-wire
- 6 Status indicator LED, green: Laser on
- 7 Status indicator LED, yellow: output active
- 8 Numerical display

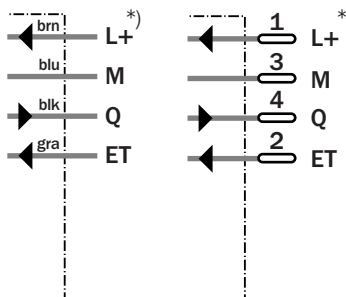
**Connection types**

WLG 190T-P 112	WLG 190T-P 410
WLG 190T-N 112	WLG 190T-N 410



4 x 0.18 mm<sup>2</sup>

4-pin, M8



\*) Sensitivity control via External Teach (ET)

PNP → L+

NPN → M



CE III CDRH  
Accession Number  
0 31 22 45

Laser class 2



**See chapter Accessories**

Cables and connectors

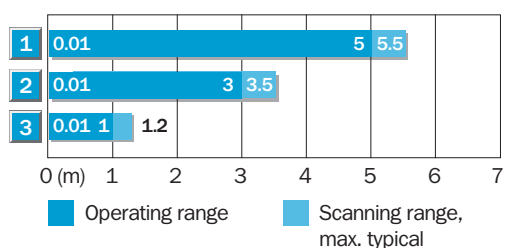
Mounting systems

Reflectors

Technical data		WLG 190T-	P 112	P 410	N 112	N 410
<b>Scanning range</b> , max. typ. on reflector <sup>1)</sup>	0.01 ... 5.5 m/P 250 F, adjustable					
<b>Sensitivity control</b>	Teach-in, External Teach (ET) Teach-in via button, menu guided					
<b>Fine adjustment</b>	Manually adjustable					
<b>Light source</b> <sup>2)</sup>	Laser, red light; class 2					
Light spot diameter	15 mm at distance of 1 m					
<b>Supply voltage</b> V <sub>S</sub>	10 ... 30 V DC <sup>3)</sup>					
Ripple <sup>4)</sup>	± 10 %					
Current consumption <sup>5)</sup>	Max. 40 mA					
<b>Switching outputs</b>	PNP NPN					
Output current I <sub>A</sub> max.	< 100 mA					
Switching type	Light-/dark-switching, programmable					
Response time <sup>6)</sup>	0.7; 2; 5 ms, programmable					
Switching frequency max. <sup>7)</sup>	700; 200; 100/s, programmable					
<b>Timer mode (dLY)</b>	0 ... 10 s, programmable					
<b>Timer function</b>	Nor: normal Mode Ond: On Delay Mode, on delay OFd: Off Delay Mode, off delay OnE: One Shot Mode, one shot					
<b>Numerical display monitoring</b>	Transmission, remission, threshold, distance, mode selection					
<b>Connection types</b> Cable	4-wire <sup>8)</sup>					
Plug	4-pin, M8					
<b>VDE protection class</b> <sup>9)</sup>	⚡					
<b>Circuit protection</b> <sup>10)</sup>	A, B					
<b>Enclosure rating</b>	IP 67					
<b>Ambient temperature</b>	Operation -10 ... +40 °C Storage -20 ... +60 °C					
<b>Weight</b>	With cable 2 m approx. 200 g With plug approx. 120 g					
<b>Housing material</b>	Housing: ABS; optic: PMMA					

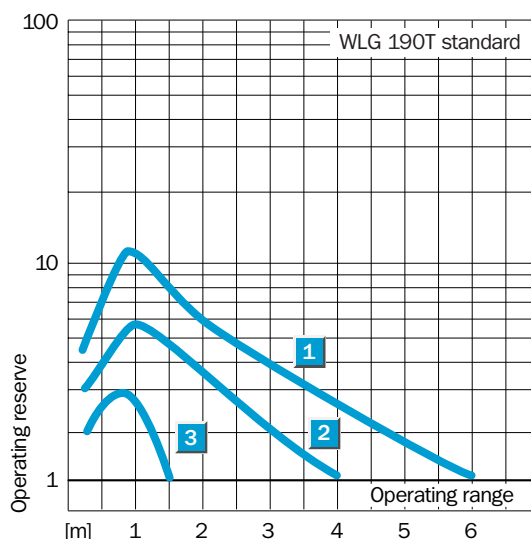
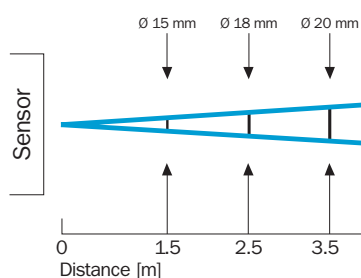
- 1) Reflector P 250 F included with delivery
- 2) Average service life 50,000 h at T<sub>A</sub> = + 25 °C
- 3) Limit values
- 4) Must be within V<sub>S</sub> tolerances
- 5) Without load
- 6) With resistive load
- 7) With light/dark ratio 1:1
- 8) Do not bend below 0 °C
- 9) Reference voltage 50 V DC
- 10) A = V<sub>S</sub> connections reverse-polarity protected  
B = Output Q short-circuit protected

**Scanning range**



Reflector type	Operating range
1 P 250 F	0.01 ... 5 m
2 PL 20 F	0.01 ... 3 m
3 PL 10 F	0.01 ... 1 m

**Light spot diameter**



**Order information \*)**

Type	Order no.
WLG 190T-P 112	6 026 537
WLG 190T-P 410	6 026 538
WLG 190T-N 112	6 026 535
WLG 190T-N 410	6 026 536

\*) Equipment model with 5 m PVC cable or M8 plug, 3-pin on request

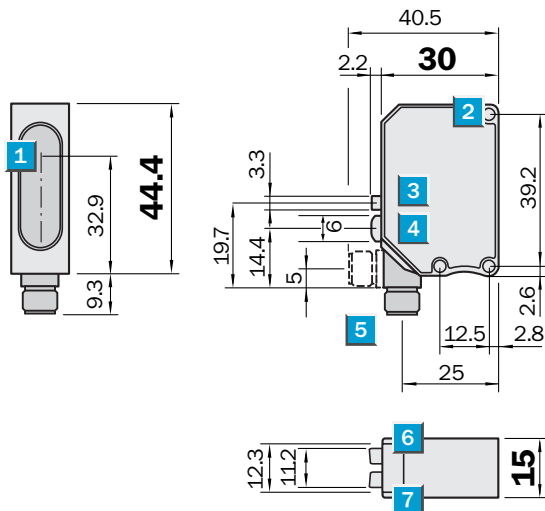


**Scanning range**  
0.01 ... 1.8 m

Photoelectric reflex switches

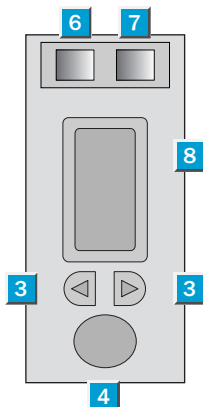
- Laser LED, visible red light, Class 2
- Sensitivity setting by Teach-in
- Precision auto-collimated optics
- Programmable output: light/dark switching
- Numeric display with menu prompts

**Dimensional drawing**



**Adjustments possible**

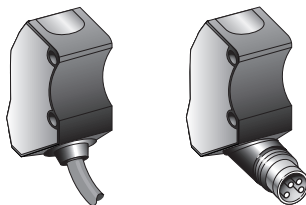
All types



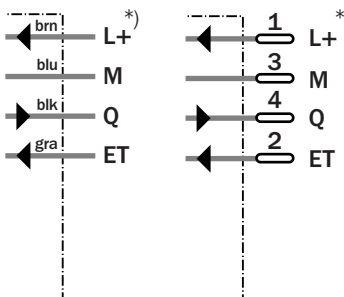
- 1 Centre of optical axis
- 2 Mounting holes, Ø approx. 3.1 mm
- 3 +/- button; select mode button
- 4 Teach-in button
- 5 Plug 4-pin, M8, 90° rotatable or cable 2 m, 4-wire
- 6 Status indicator LED, green: Laser on
- 7 Status indicator LED, yellow: output active
- 8 Numerical display

**Connection types**

WLG 190T-P 122	WLG 190T-P 420
WLG 190T-N 122	WLG 190T-N 420



4 x 0.18 mm <sup>2</sup>	4-pin, M8
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\*) Sensitivity control via External Teach (ET)

PNP → L+

NPN → M



CE III CDRH  
Accession Number  
0 31 22 45



**See chapter Accessories**

Cables and connectors

Mounting systems

Reflectors

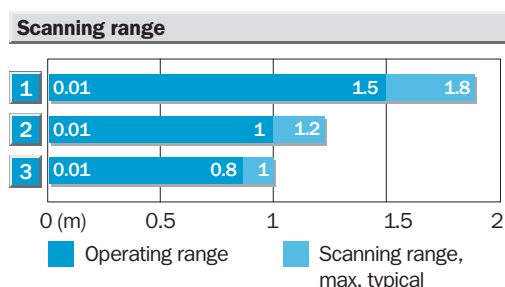
Technical data		WLG 190T-	P 122	P 420	N 122	N 420
<b>Scanning range</b> , max. typ. on reflector <sup>1)</sup>	0.01 ... 1.8 m/PL 80 A, adjustable					
<b>Scanning range</b> , max. typ. on reflector <sup>1)</sup>	0.01 ... 1.2 m/P 250, adjustable					
<b>Sensitivity control</b>	Teach-in, External Teach (ET) Teach-in via button, menu guided					
<b>Fine adjustment</b>	Manually adjustable					
<b>Light source</b> <sup>2)</sup>	Laser, red light; class 2					
Light spot diameter	15 mm at distance of 1 m					
<b>Supply voltage</b> V <sub>S</sub>	10 ... 30 V DC <sup>3)</sup>					
Ripple <sup>4)</sup>	± 10 %					
Current consumption <sup>5)</sup>	Max. 40 mA					
<b>Switching outputs</b>	PNP NPN					
Output current I <sub>A</sub> max.	< 100 mA					
Switching type	Light-/dark-switching, programmable					
Response time <sup>6)</sup>	0.7; 2; 5 ms, programmable					
Switching frequency max. <sup>7)</sup>	700; 200; 100/s					
<b>Timer mode (dLY)</b>	0 ... 10 s, programmable					
<b>Timer function</b>	Nor: normal Mode Ond: On Delay Mode, on delay OFd: Off Delay Mode, off delay OnE: One Shot Mode, one shot					
<b>Numerical display monitoring</b>	Transmission, remission, threshold, distance, mode selection					
<b>Connection types</b> Cable	4-wire <sup>8)</sup>					
Plug	4-pin, M8					
<b>VDE protection class</b> <sup>9)</sup>	⚡					
<b>Circuit protection</b> <sup>10)</sup>	A, B					
<b>Enclosure rating</b>	IP 67					
<b>Ambient temperature</b>	Operation -10 ... +40 °C Storage -20 ... +60 °C					
<b>Weight</b>	With cable 2 m approx. 200 g With plug approx. 120 g					
<b>Housing material</b>	Housing: ABS; optic: PMMA					

1) Reflector P 250 included with delivery  
2) Average service life 50,000 h at T<sub>A</sub> = + 25 °C  
3) Limit values

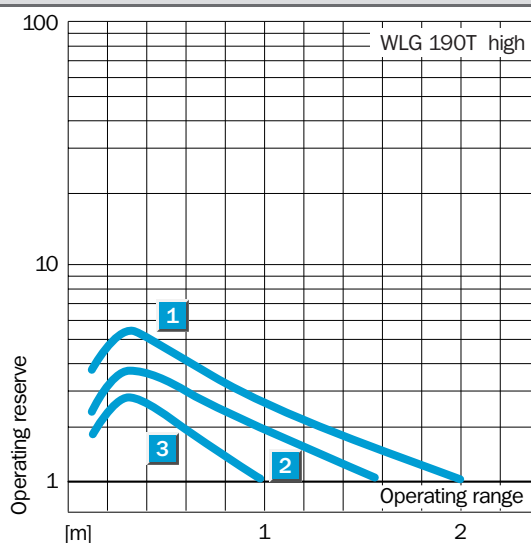
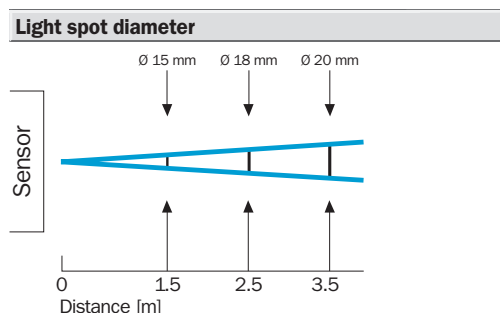
4) Must be within V<sub>S</sub> tolerances  
5) Without load  
6) With resistive load

7) With light/dark ratio 1:1  
8) Do not bend below 0 °C  
9) Reference voltage 50 V DC

10) A = V<sub>S</sub> connections reverse-polarity protected  
B = Output Q short-circuit protected



Reflector type	Operating range
1 PL 80 A	0.01 ... 1.5 m
2 P 250/PL 40 A/PL 50 A	0.01 ... 1 m
3 PL 30 A/PL 31 A	0.01 ... 0.8 m



**Order information \*)**

Type	Order no.
WLG 190T-P 122	6 022 827
WLG 190T-P 420	6 022 830
WLG 190T-N 122	6 022 823
WLG 190T-N 420	6 022 826

\*) Equipment model with 5 m PVC cable or M8 plug, 3-pin on request