

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



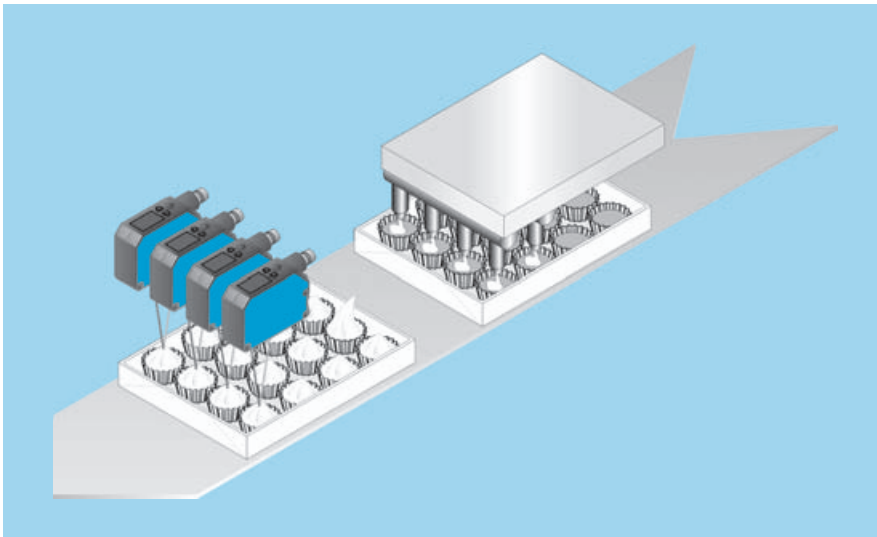
time delays up to 10 seconds, can be activated. The Teach-in function, available at the push of a button or remotely, permits simple and highly effective sensing and range adjustment. Menu prompting is provided via the clear numeric display. All programming functions may be disabled to prevent unintentional adjustments. The option of a rotating M8 connector or 2 m cable version is available as standard, as is the compact, industry-standard plastic housing which permits the use of the device even in harsh environments.

What's available?
 WTB 190TL: high resolution utilises CMOS technology. Ideal for the reliable detection of objects with reflective surfaces. Background suppression (BGS) or foreground suppression (FGS) can be programmed.
 WLG 190T: ideal for detecting transparent objects, e.g. PET bottles.
 Two versions are available: for applications operating under standard conditions, e.g. foil/film, or for applications with increased requirements, e.g. thin-walled bottles.

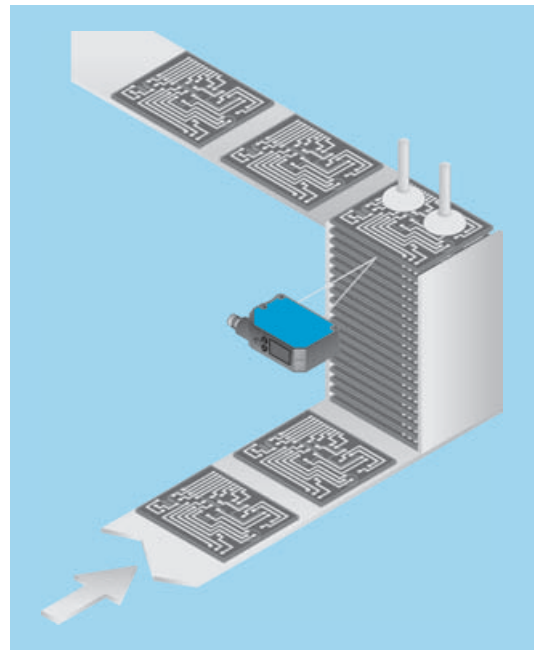
Do your customers require reliable sensors suitable for demanding applications, using Laser Technology?
 WLG 190TL and WTB 190TL sensors are reliable, user friendly and very accurate. The sensors have red-light laser diodes, which conform to Protection Class 2. The precise visible light spot allows fast and accurate alignment of the sensors even to the smallest target. The sensors' fast response times make them ideal for most high-speed applications. Light or dark switching can be programmed or, if the application so requires, a timer function with

	Photoelectric proximity switches
	Photoelectric reflex switches

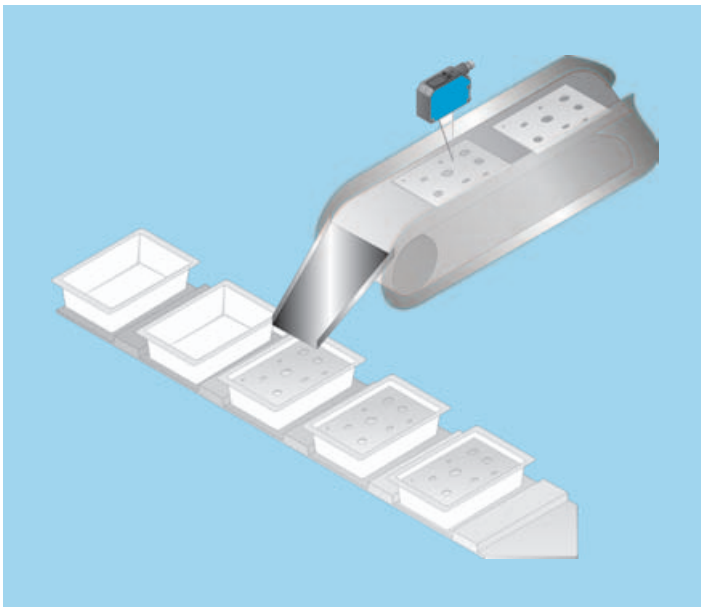




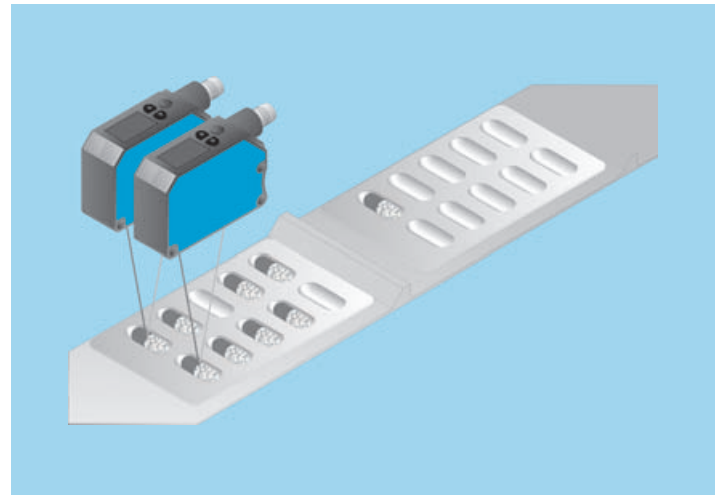
▲ WTB 190TL: 2 point Teach-in, FGS mode, level control.
Sector: packaging industry



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



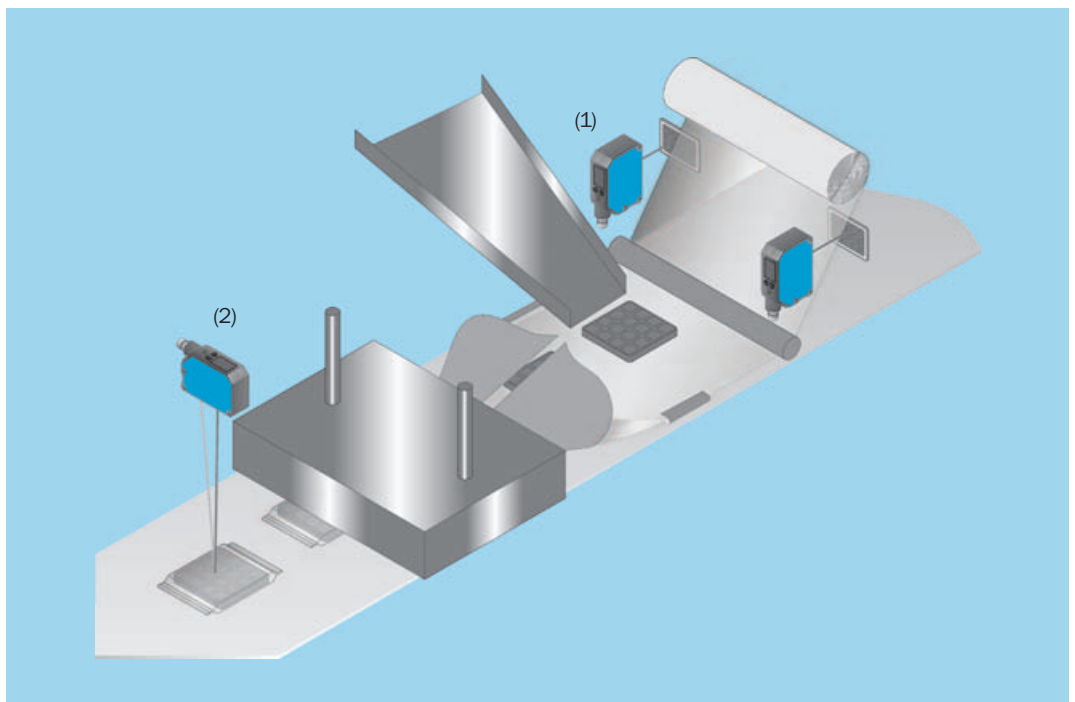
▲ WTB 190TL: 2 point Teach-in, FGS mode, detection of cheese slices.
Sector: food industry

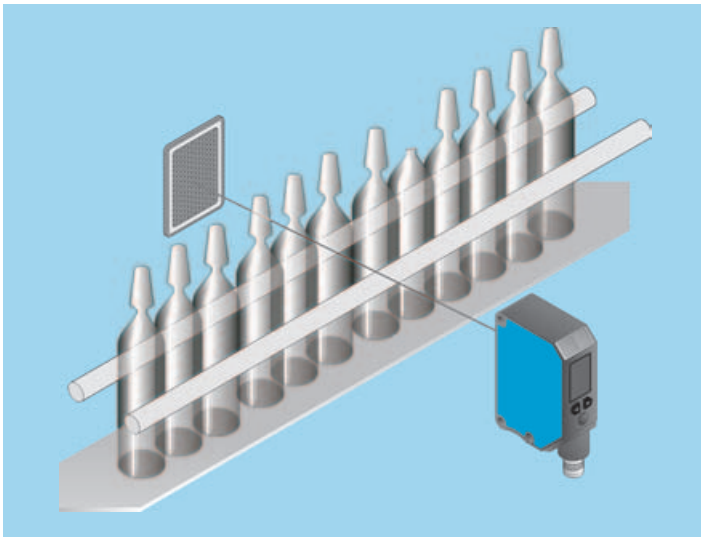


▲ WTB 190TL: 2 point Teach-in, FGS mode, detection of gelatine capsules in blister packs.
Sector: pharmaceutical industry.

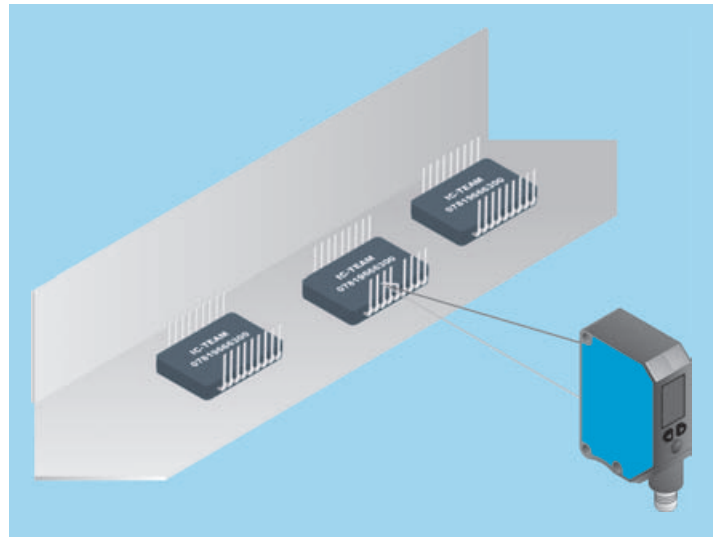
► WLG 190 T (1): Edge control of transparent packaging material.
Sector: packaging industry.

► WTB 190 TL (2): 2 point Teach-in, FGS mode, product detection, correct thickness of packs.
Sector: packaging industry.

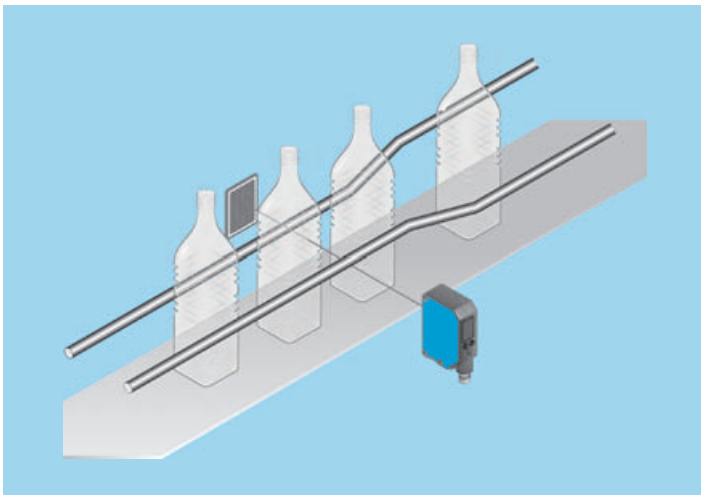




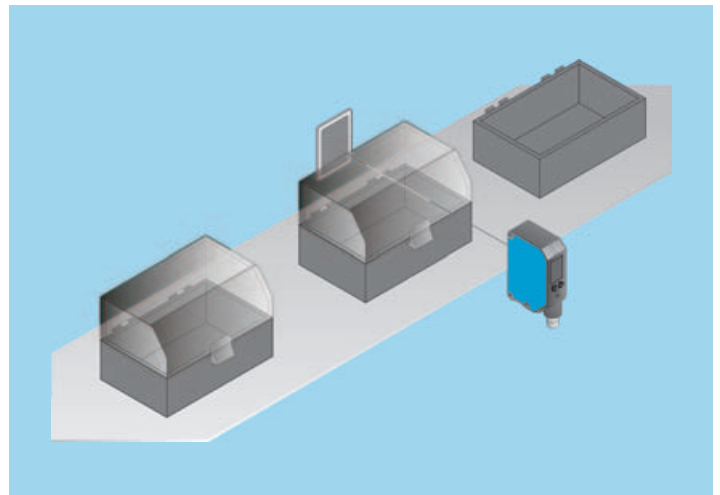
▲ WLG 190T: Ampoule syringes and breakage test.
Sector: pharmaceutical industry.



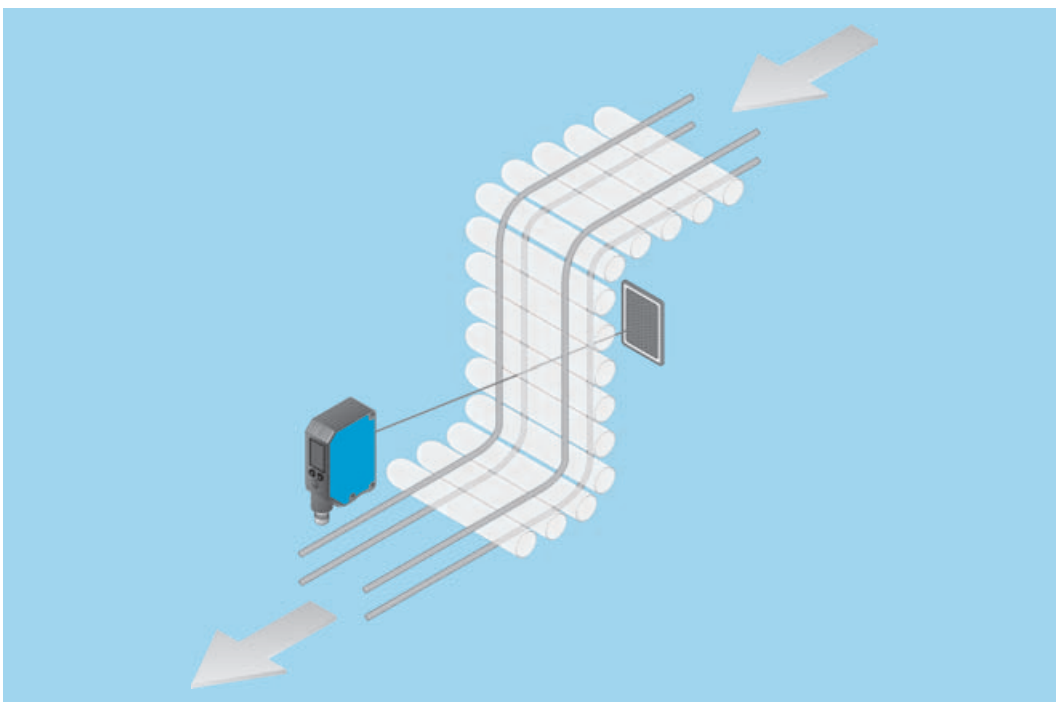
▲ WTB 190TL: 1 point Teach-in, BGS mode, detecting or counting the IC pins.
Sector: electronics.



▲ WLG 190T: Transparent bottles.
Sector: pharmaceutical industry.


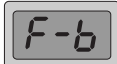


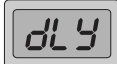








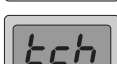
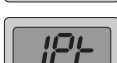
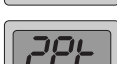
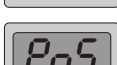
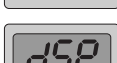
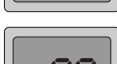
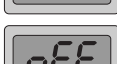
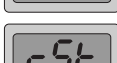
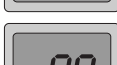
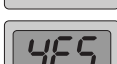
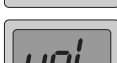


▲ WLG 190T: Detecting whether multi-part objects are assembled correctly.
In this example: Is the transparent lid on the head?
Sector: packaging industry.

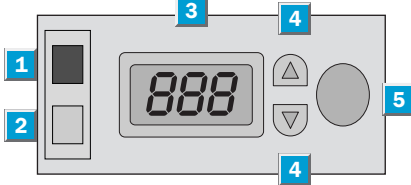


◀ WLG 190T: Detection of thin-walled glass ampoules.
Sector: pharmaceutical industry.

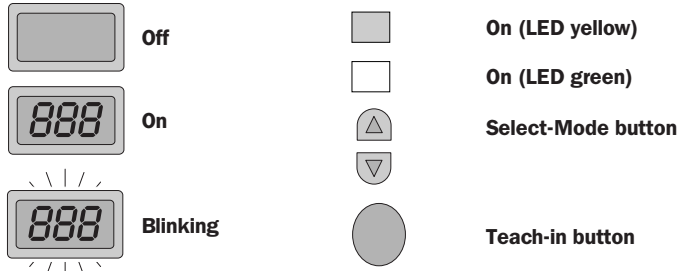
Description of operating panel and functions

-  SEL
Select
-  F-b
FGS/BGS
-  FGS
FGS/Foreground suppression
-  bGS
BGS/Background suppression
-  dLY
Delay
-  oFF
No Timer
-  ond
ON Delay
-  oFd
OFF Delay
-  onE
ONE shot
-  L d
Light ON/Dark ON
-  Lon
Light ON
-  don
Dark ON
-  SEn
Sensitivity
-  tch
Teaching type
-  1Pt
1-point Teach-in
-  2Pt
2-point Teach-in
-  PoS
Position Teach-in
-  dSP
Display
-  on
Display on
-  oFF
Display off
-  rSt
Reset
-  no
Unreset
-  YES
Reset
-  unL
Unlock

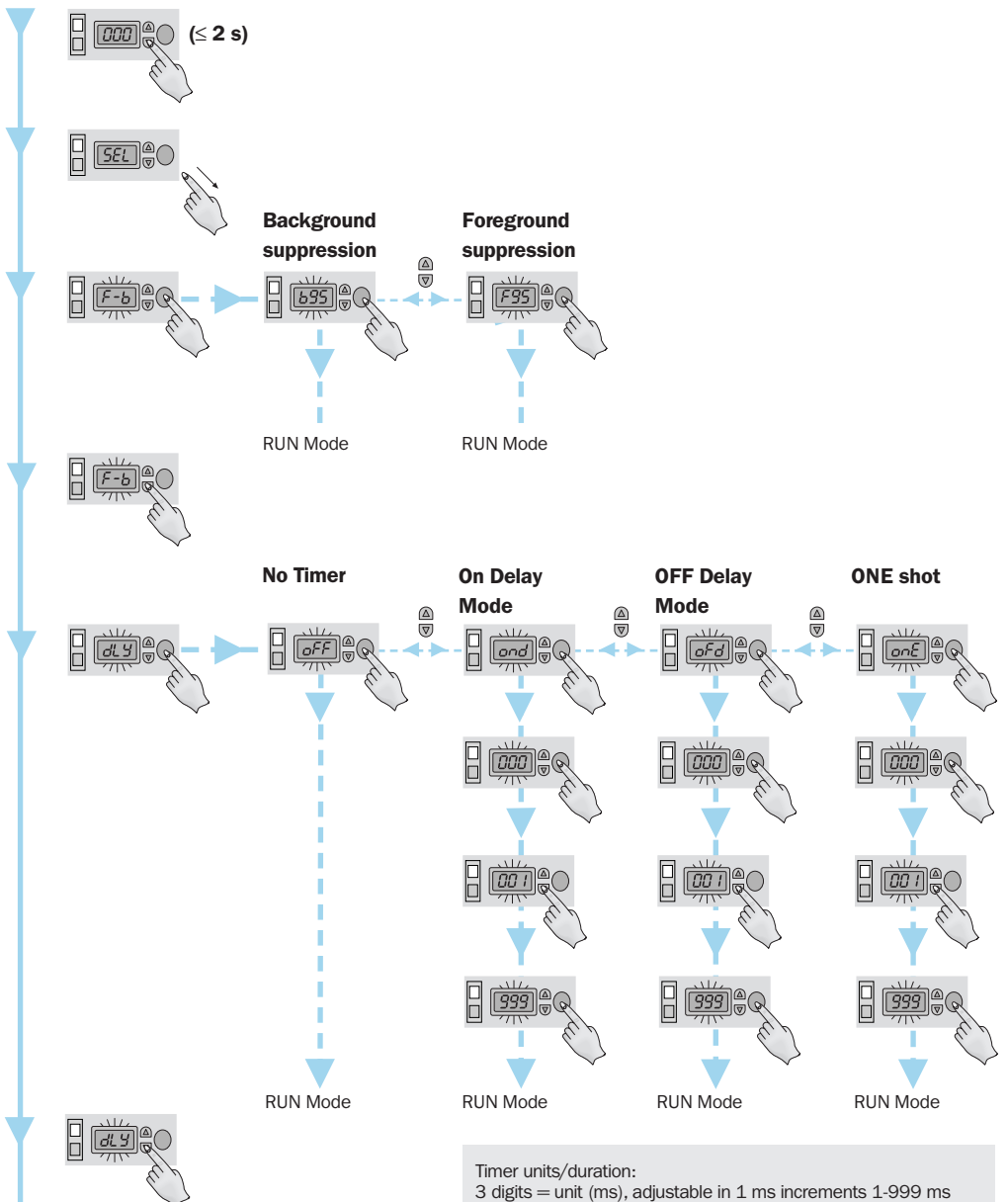
Display



- 1** Status indicator LED, green: Laser on
- 2** Status indicator LED, yellow: output active
- 3** Numerical display
- 4** +/- button; select mode button
- 5** Teach-in button



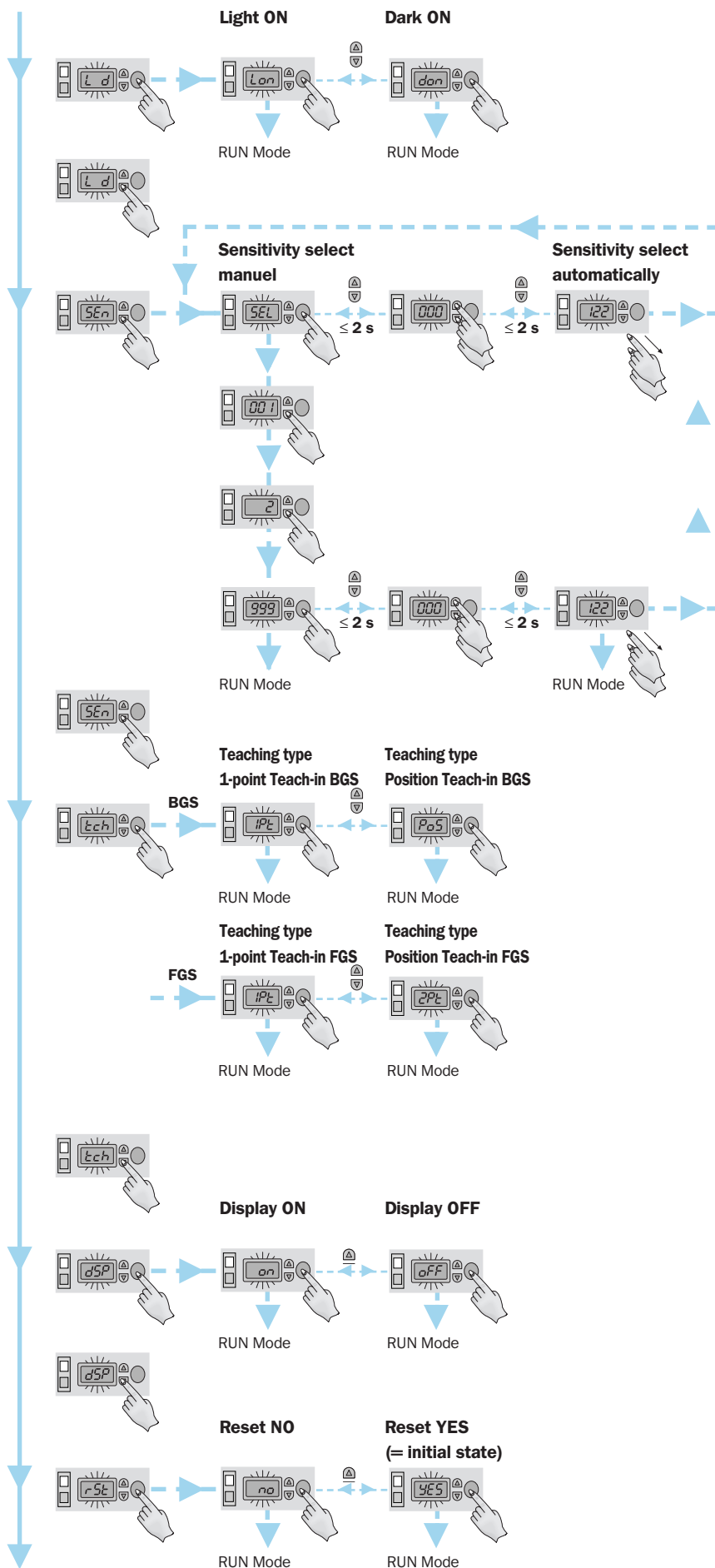
Setting Mode, Timer, L/D, Display



Timer units/duration:
 3 digits = unit (ms), adjustable in 1 ms increments 1-999 ms
 2 digits = unit (s), adjustable in 1 s increments 1-0 s

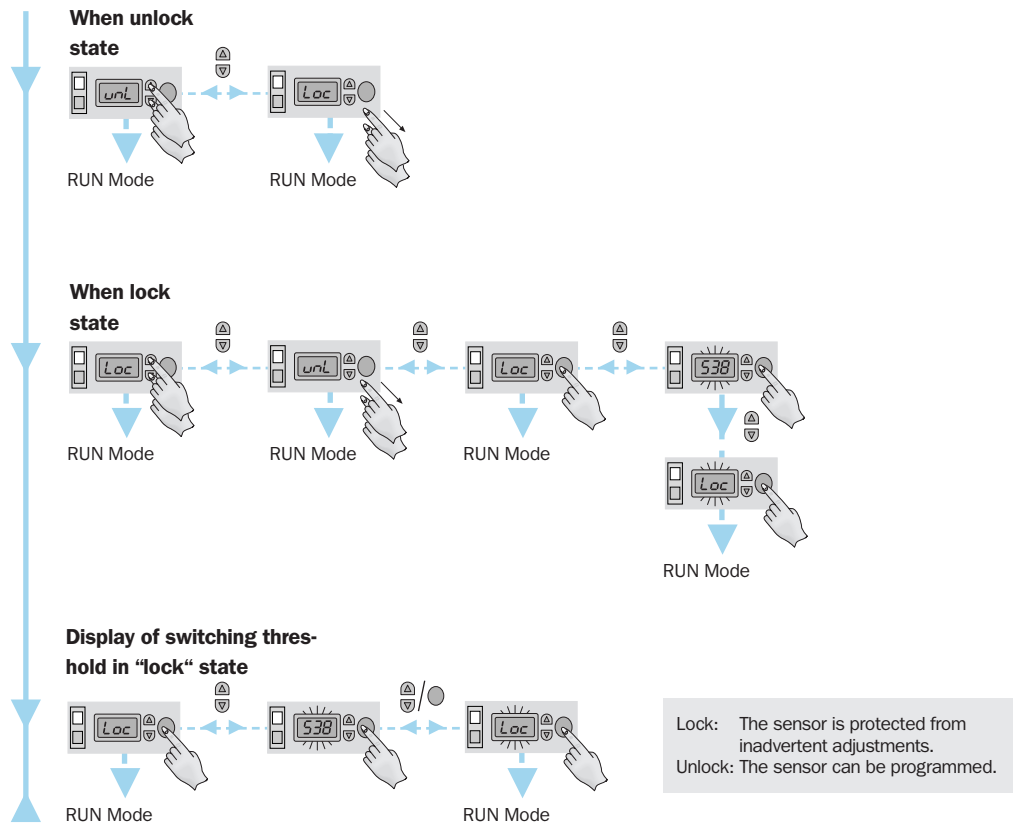
Description of operating panel and functions

Setting Mode, Timer, L/D, Display



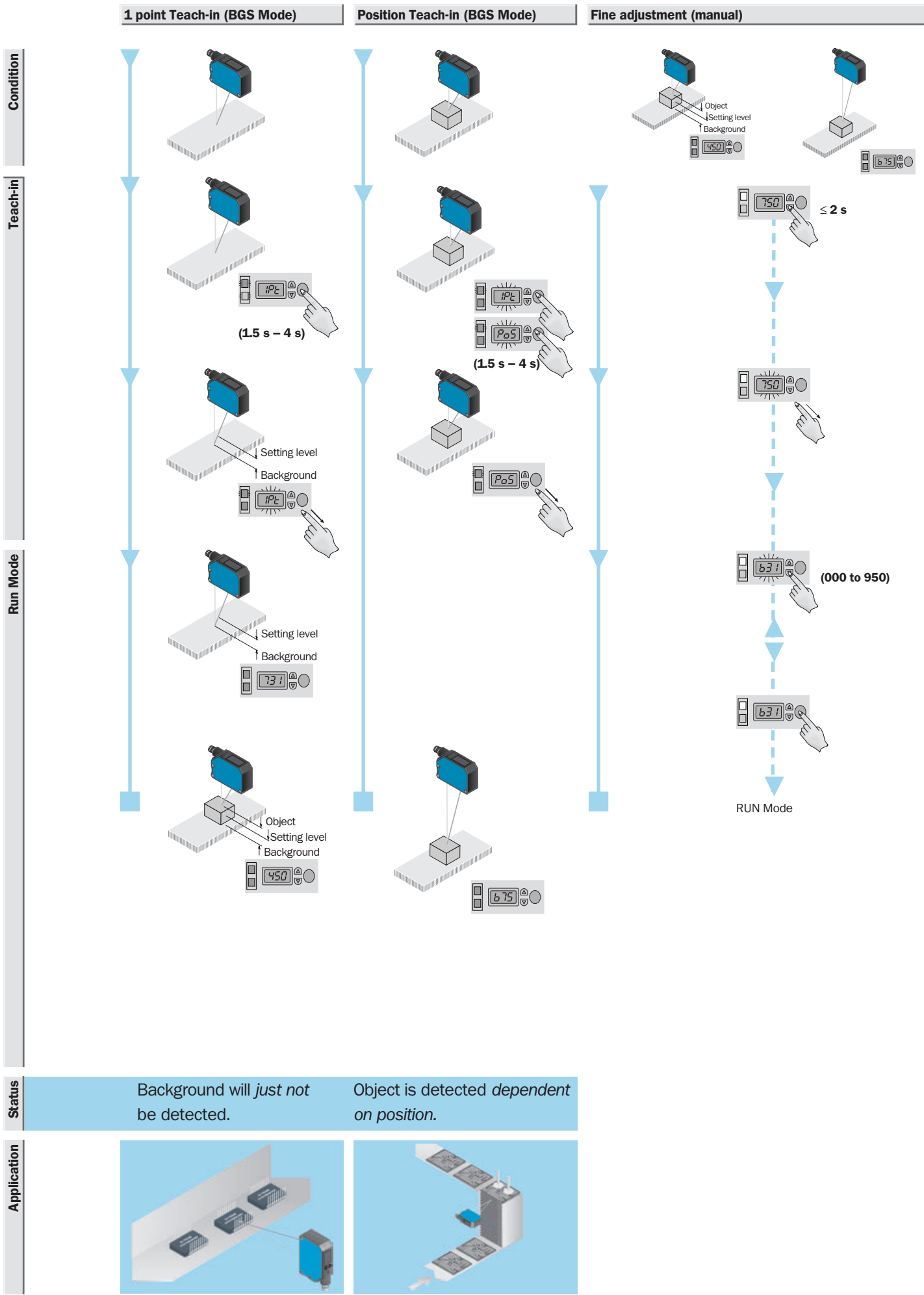
Description of operating panel and functions

Setting Mode, Lock/Unlock



Factory default

	BGS/Background suppression
	oFF No Timer
	Lon Light ON
	SEn Sensitivity
	1Pt 1 point Teach-in
	on Display on



Condition

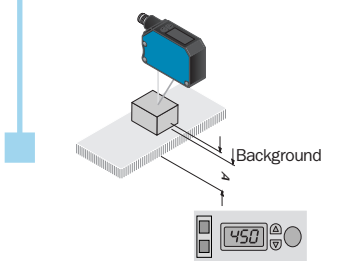
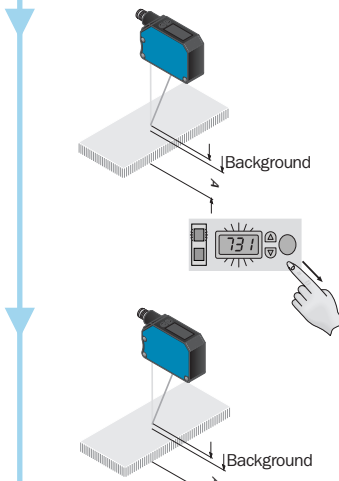
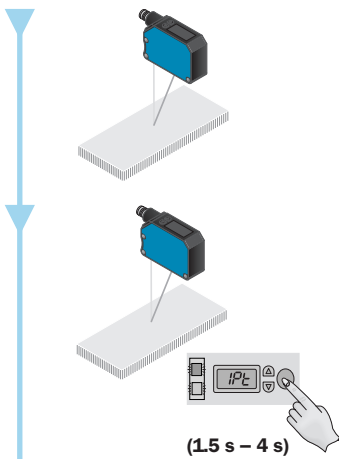
Teach-in

Run Mode

Status

Application

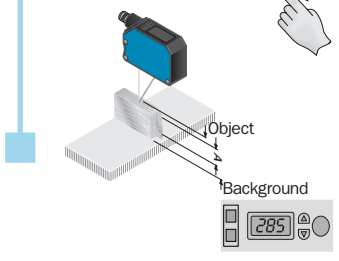
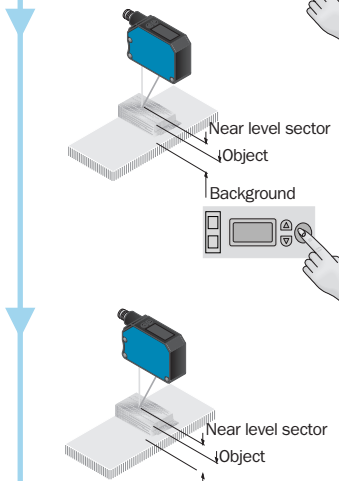
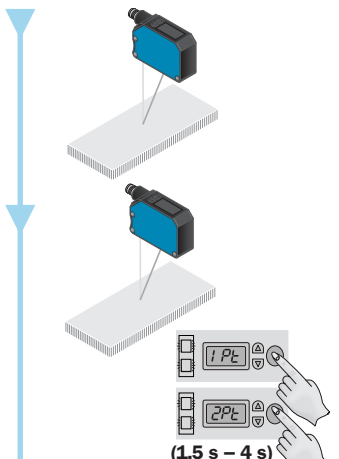
1 point Teach-in (FGS Mode)



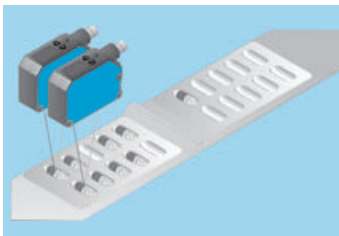
Object in "A" area is detected.



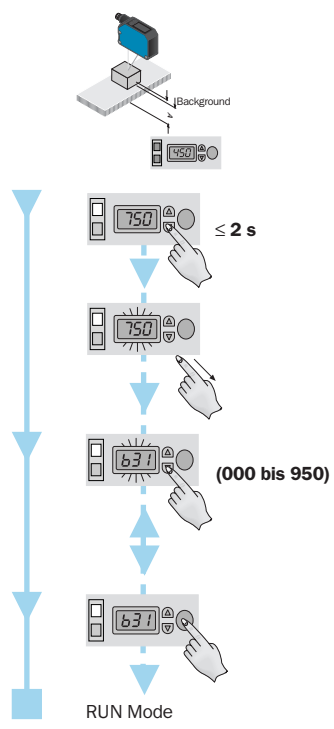
2 point Teach-in (FGS Mode)



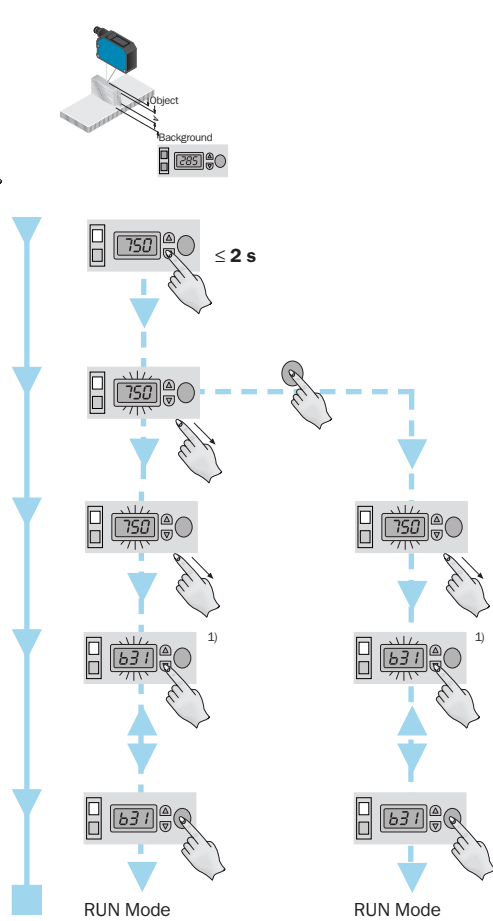
Sensing range "A" between the two levels taught. Objects before or after range "A" are not detected.



**Fine adjustment (manual)
1 point Teach-in (FGS Mode)**













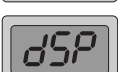
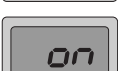
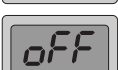
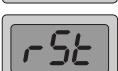
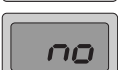





**Fine adjustment (manual)
2 point Teach-in (FGS Mode)**

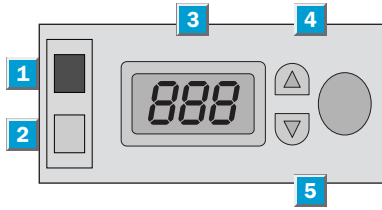


¹⁾ While the display flashes, the switching threshold at close range can be set from 050 to 930 and, at long range, from 070 to 950.

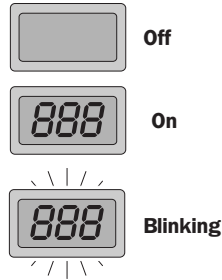
Description of operating panel and functions






-  SEL Select
-  dLY Delay
-  oFF No Timer
-  ond ON Delay
-  oFd OFF Delay
-  onE ONE shot
-  L d Light ON/Dark ON
-  Lon Light ON
-  don Dark ON
-  ASc/Auto sensitivity control
-  SPd Response time
-  tnd Tresh level
-  dSP Display
-  on Display on
-  oFF Display off
-  rSt Reset
-  no Unreset
-  YES Reset
-  unL Unlock
-  Loc Lock

Display

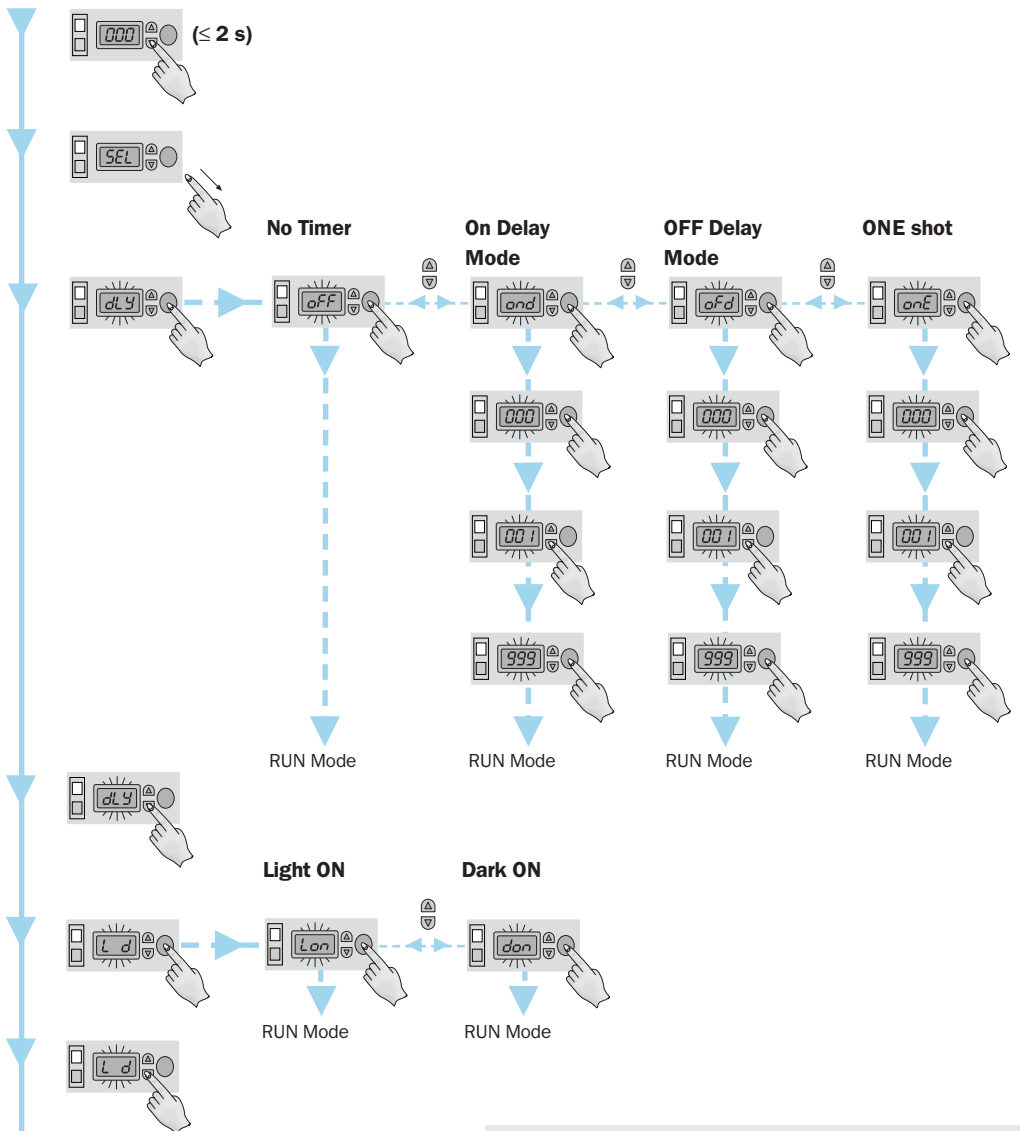


- 1** Status indicator LED, green: Laser on
- 2** Status indicator LED, yellow: output active
- 3** Numerical display
- 4** +/- button; select mode button
- 5** Teach-in button



-  On (LED yellow)
-  On (LED green)
-  Select-Mode button
-  Select-Mode button
-  Teach-in button

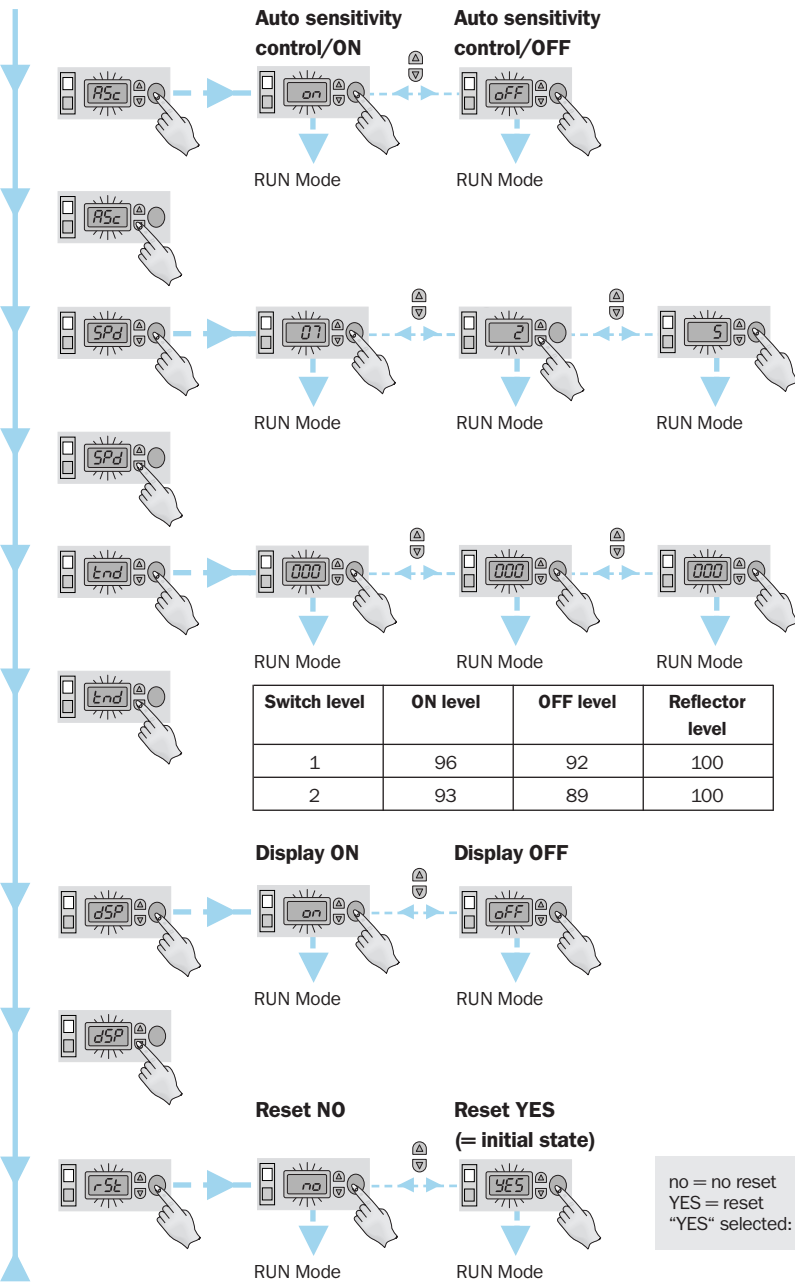
Setting Mode, Timer, L/D, Display



Timer units/duration:
 3 digits = unit (ms), adjustable in 1 ms increments 1-999 ms
 2 digits = unit (s), adjustable in 1 s increments 1-0 s

Description of operating panel and functions

Setting Mode, Timer, L/D, Display



no = no reset
 YES = reset
 "YES" selected: reset to Factory default

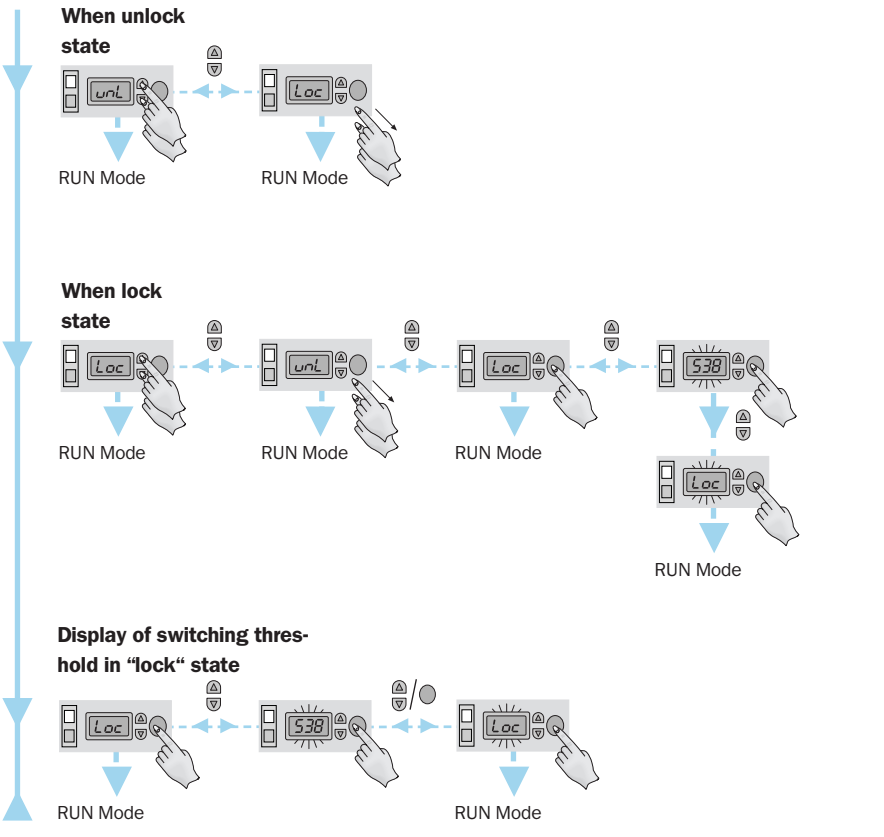
Factory default

- oFF
No Timer
- don
Dark ON
- oFF
Display off
- 05
0.5 ms
- 1Pt
1 point Teach-in
- on
Display on

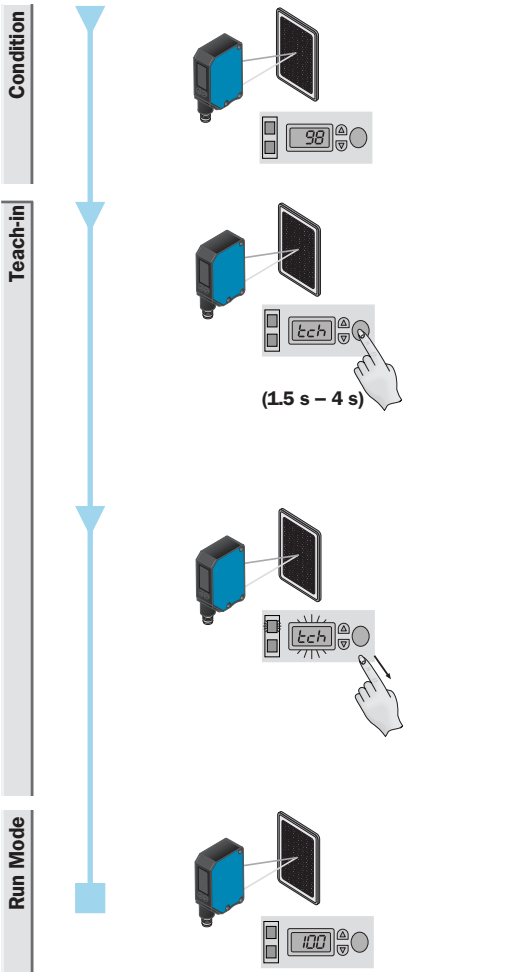
Description of operating panel and functions

Setting Mode, Lock/Unlock

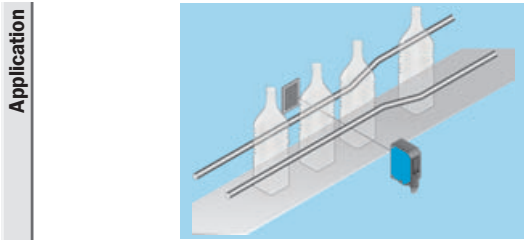
1 point Teach-in



Lock: The sensor is protected from inadvertent adjustments.
 Unlock: The sensor can be programmed.



Status Reflector is detected without system reserve

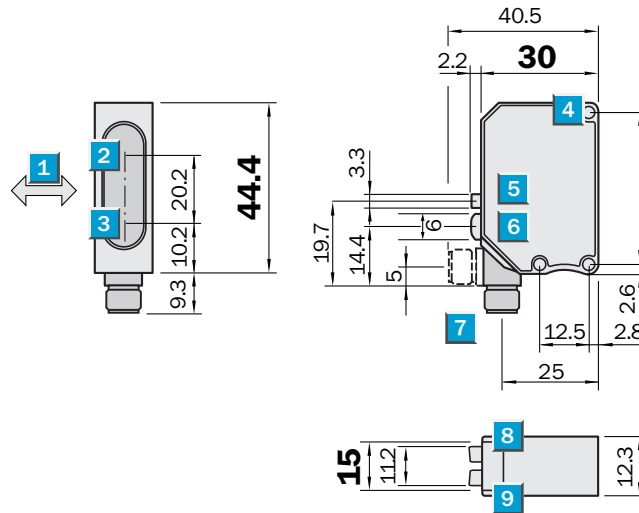


Scanning distance
100 ... 270 mm

Photoelectric proximity switches

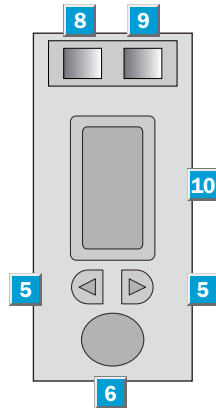
- Laser LED, visible red-light, Class 2
- Scanning distance adjustment by Teach-in function
- Programmable background or foreground suppression
- Programmable output: light/dark switching
- Numeric display with menu prompts

Dimension illustration



Setting options

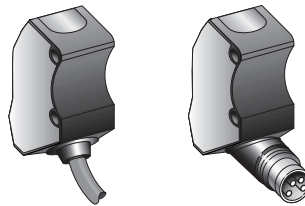
All types



- 1 Standard direction of the material being scanned
- 2 Centre of optical axis, sender
- 3 Centre of optical axis, receiver
- 4 Mounting holes, Ø 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

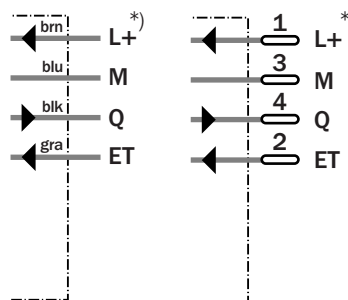
Connection types

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



4 x 0.18 mm²

4-pin, M8



*) Adjustment via External Teach (ET)

PNP → L+

NPN → M



Laser class 2

Accessories

Connectors

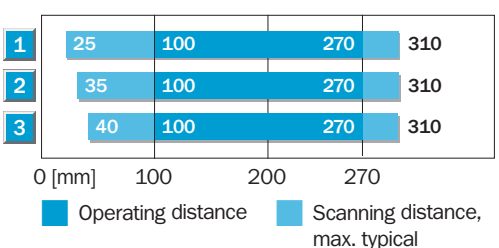
Mounting systems

Technical data	WTB 190TL-	P 162	P 460	N 162	N 460							
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Scanning distance, adjustable	100 ... 270 mm ¹⁾											
Device function mode	BGS ²⁾ or FGS ³⁾ , programmable											
Scanning distance, adjustable	Teach-in, External Teach (ET)											
	Teach-in via button, menu guided											
Threshold, precise setting	Manually adjustable											
Light source⁴⁾	Laser, red light; class 2											
Light spot diameter	1.5 mm at distance of 200 mm											
Supply voltage V_s	10 ... 30 V DC ⁵⁾											
Ripple ⁶⁾	± 10 %											
Current consumption ⁷⁾	Max. 40 mA											
Switching outputs	PNP											
	NPN											
Output current I _A max.	< 100 mA											
Switching type	Light-/dark-switching, programmable											
Response time ⁸⁾	1.5 ms											
Switching frequency max. ⁹⁾	300/s											
Timer mode (dLY)	0 ... 10 s, programmable											
Timer function	Nor: normal Mode											
	OnD: On Delay Mode, on delay											
	OFd: Off Delay Mode, off delay											
	OnE: One Shot Mode, one shot											
Numerical display monitoring	Threshold, distance, mode selection											
Connection types Cable	4-wire ¹⁰⁾											
Plug	4-pin, M8											
VDE protection class¹¹⁾	⊕											
Circuit protection¹²⁾	A, B											
Enclosure rating	IP 67											
Ambient temperature	Operation - 10...+ 40 °C											
	Storage - 20...+ 60 °C											
Weight	With cable 2 m approx. 200 g											
	With plug approx. 120 g											
Housing material	Housing: ABS; optic: PMMA											

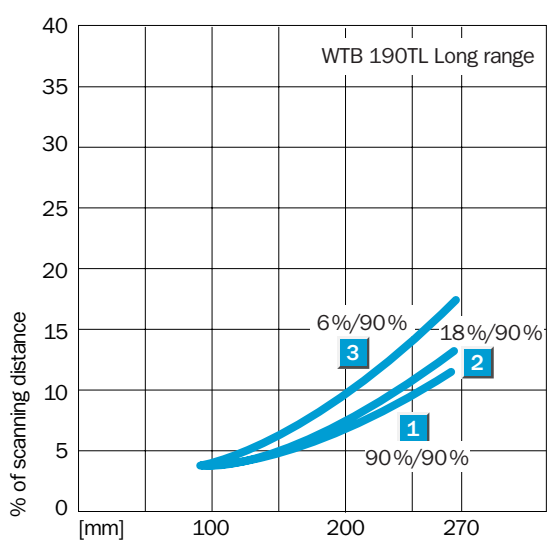
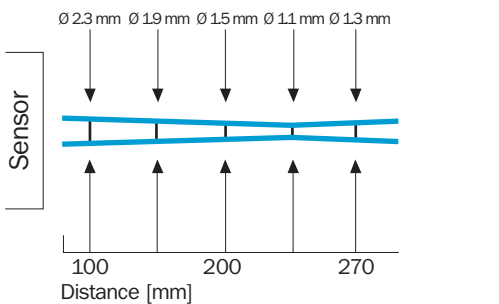
1) Object with 90 % reflectance (with reference to standard white according to DIN 5033)
 2) Background suppression
 3) Foreground suppression
 4) Average service life 50,000 h at T_A = + 25 °C
 5) Limit values
 6) Must be within V_s tolerances
 7) Without load
 8) With resistive load
 9) With light/dark ratio 1:1
 10) Do not bend below 0 °C
 11) Reference voltage 50 V DC
 12) A = V_s 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	Part 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

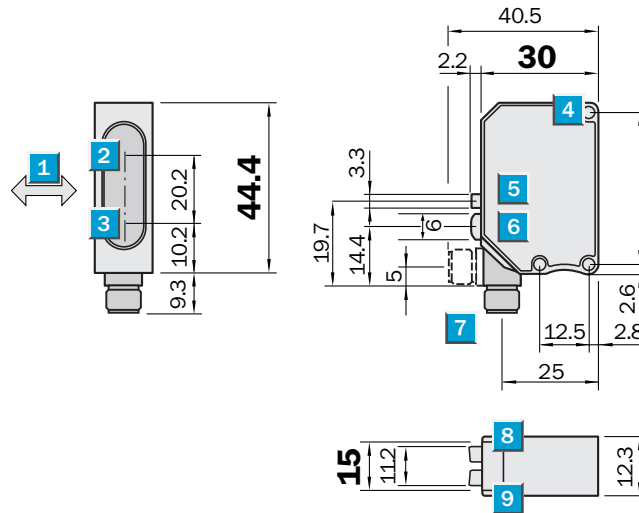
*) Equipment model with 5 m PVC cable or M8 plug, 3-pin on request

Scanning distance
40 ... 100 mm

Photoelectric proximity switches

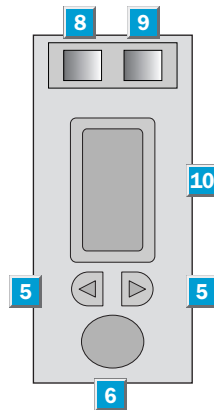
- Laser LED, visible red-light, Class 2
- Scanning distance adjustment by Teach-in function
- Programmable background or foreground suppression
- Programmable output: light/dark switching
- Numeric display with menu prompts

Dimension illustration



Setting options

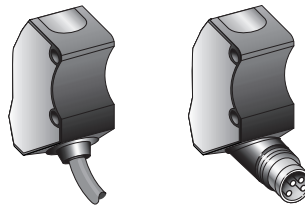
All types



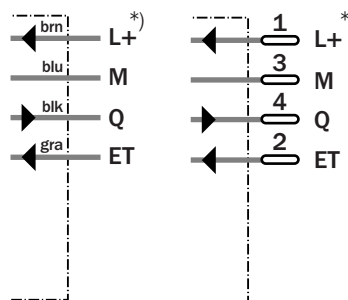
- 1 Standard direction of the material being scanned
- 2 Centre of optical axis, sender
- 3 Centre of optical axis, receiver
- 4 Mounting holes, \varnothing approx. 3.1 mm
- 5 +/- button; select mode button
- 6 Teach-in button
- 7 Plug 4-pin, M8, 90° rotatable or cable 2 m, 4-wire
- 8 Status indicator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

Connection types

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



4 x 0.18 mm ²	4-pin, M8
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*) Adjustment via External Teach (ET)

PNP → L+

NPN → M



Laser class 2

Accessories

Connectors

Mounting systems

Technical data		WTB 190TL-	P 132	P 430	N 132	N 430
Scanning distance, adjustable	40 ... 100 mm ¹⁾					
Device function mode	BGS ²⁾ or FGS ³⁾ , programmable					
Scanning distance, adjustable	Teach-in, External Teach (ET)					
	Teach-in via button, menu guided					
Threshold, precise setting	Manually adjustable					
Light source⁴⁾	Laser, red light; class 2					
Light spot diameter	0.8 mm at distance of 80 mm					
Supply voltage V_s	10 ... 30 V DC ⁵⁾					
Ripple ⁶⁾	± 10 %					
Current consumption ⁷⁾	Max. 40 mA					
Switching outputs	PNP					
	NPN					
Output current I _A max.	< 100 mA					
Switching type	Light-/dark-switching, programmable					
Response time ⁸⁾	1.5 ms					
Switching frequency max. ⁹⁾	300/s					
Timer mode (dLY)	0 ... 10 s, programmable					
Timer function	Nor: normal Mode					
	OnD: On Delay Mode, on delay					
	OFd: Off Delay Mode, off delay					
	OnE: One Shot Mode, one shot					
Numerical display monitoring	Threshold, distance, mode selection					
Connection types	Cable					
	Plug					
VDE protection class¹¹⁾	⊕					
Circuit protection¹²⁾	A, B					
Enclosure rating	IP 67					
Ambient temperature	Operation - 10...+ 40 °C					
	Storage - 20...+ 60 °C					
Weight	With cable 2 m approx. 200 g					
	With plug approx. 120 g					
Housing material	Housing: ABS; optic: PMMA					

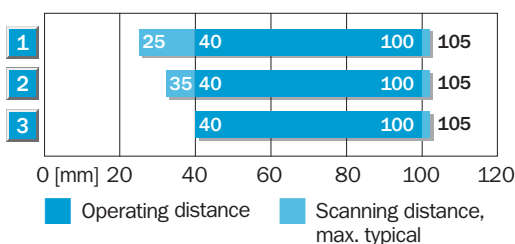
1) Object with 90 % reflectance (with reference to standard white according to DIN 5033)
 2) Background suppression
 3) Foreground suppression

4) Average service life 50,000 h at T_A = + 25 °C
 5) Limit values
 6) Must be within V_s 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

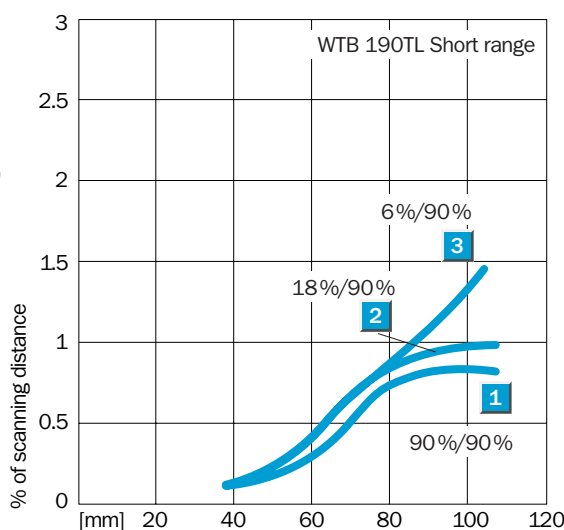
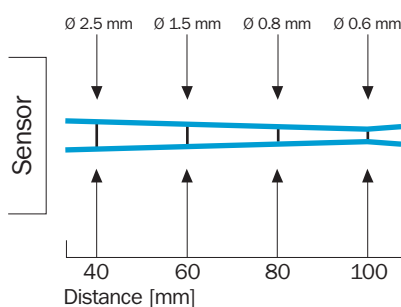
12) A = V_s connections reverse-polarity protected
 B = Output Q short-circuit protected

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*)

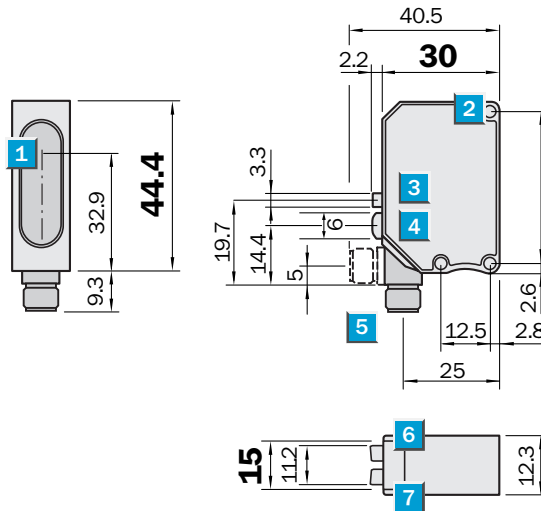
Type	Part no.
WTB 190TL-P 132	6 026 541
WTB 190TL-P 430	6 026 542
WTB 190TL-N 132	6 026 539
WTB 190TL-N 430	6 026 540

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

	Scanning range
	0.01 ... 5.5 m
Photoelectric reflex switches	

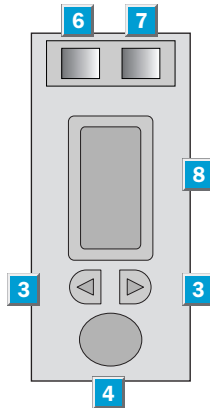
- Laser LED, visible red-light, Class 2
- Sensitivity setting by Teach-in
- Precision auto-collimated optics
- Programmable output: light/dark switching
- Numeric display with menu prompts

Dimension illustration



Setting options

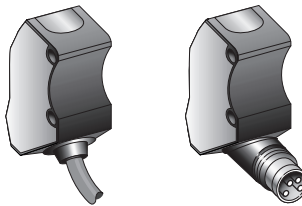
All types



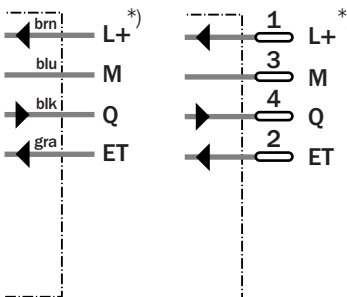
- 1 Centre of optical axis
- 2 Mounting holes, Ø approx. 3.1 mm
- 3 +/- button; select mode button
- 4 Teach-in button
- 5 Plug 4-pin, M8, 90° rotatable or cable 2 m, 4-wire
- 6 Status indicator LED, green: Laser on
- 7 Status indicator LED, yellow: output active
- 8 Numerical display

Connection types

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



4 x 0.18 mm² 4-pin, M8



*) Sensitivity control via External Teach (ET)

PNP → L+

NPN → M



Laser class 2

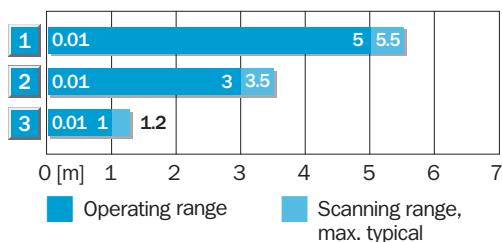
Accessories

- Connectors
- Reflectors
- Mounting systems

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

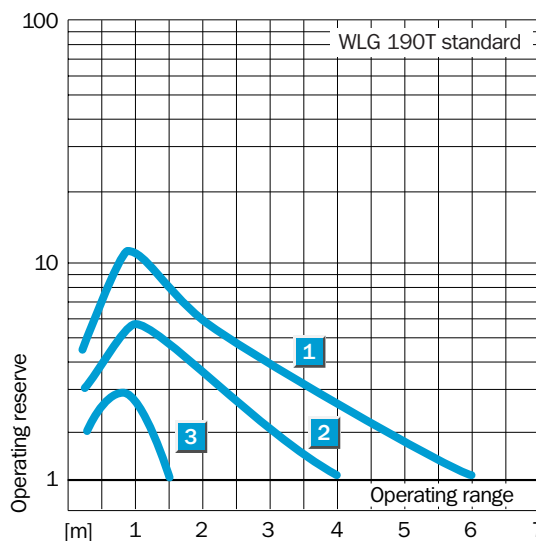
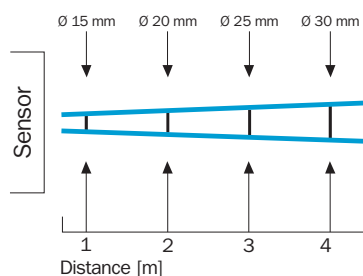
1) Reflector P 250 F included with delivery
 2) Average service life 50,000 h at $T_A = +25\text{ °C}$
 3) Limit values
 4) Must be within V_s tolerances
 5) Without load
 6) With resistive load
 7) With light/dark ratio 1:1
 8) Do not bend below 0 °C
 9) Reference voltage 50 V DC
 10) A = V_s connections 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^{*)}

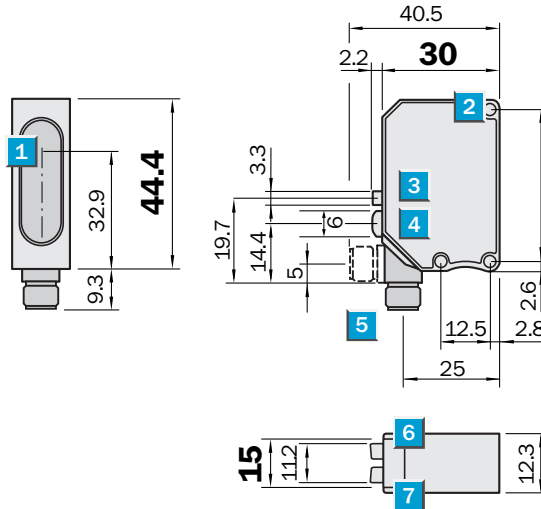
Type	Part no.
WLG 190T-P 112	6 026 537
WLG 190T-P 410	6 026 538
WLG 190T-N 112	6 026 535
WLG 190T-N 410	6 026 536

*) Equipment model with 5 m PVC cable or M 8 plug, 3-pin on request

	Scanning range
	0.01 ... 1.8 m
Photoelectric reflex switches	

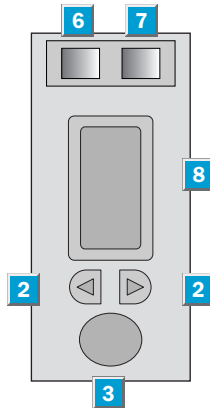
- Laser LED, visible red-light, Class 2
- Sensitivity setting by Teach-in
- Precision auto-collimated optics
- Programmable output: light/dark switching
- Numeric display with menu prompts

Dimension illustration



Setting options

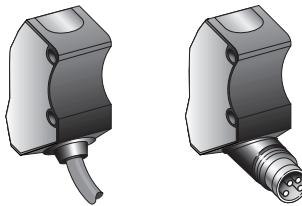
All types



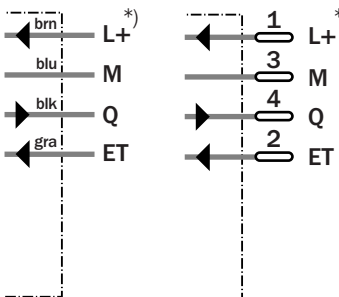
- 1 Mounting holes, Ø approx. 3.1 mm
- 2 +/- button; select mode button
- 3 Teach-in button
- 4 Plug 4-pin, M8, 90° rotatable or cable 2 m, 4-wire
- 5 Centre of optical axis
- 6 Status indicator LED, green: Laser on
- 7 Status indicator LED, yellow: output active
- 8 Numerical display

Connection types

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



4 x 0.18 mm² 4-pin, M8



*) Sensitivity control via External Teach (ET)

PNP → L+

NPN → M



Laser class 2

Accessories

- Connectors
- Reflectors
- Mounting systems

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

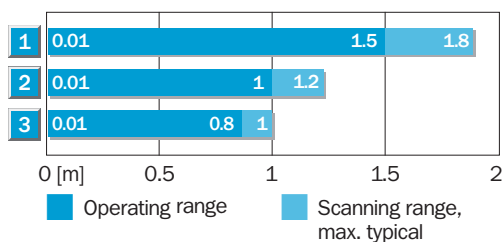
1) Reflector P 250 included with delivery
2) Average service life 50,000 h at T_A = + 25 °C
3) Limit values

4) Must be within V_s 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

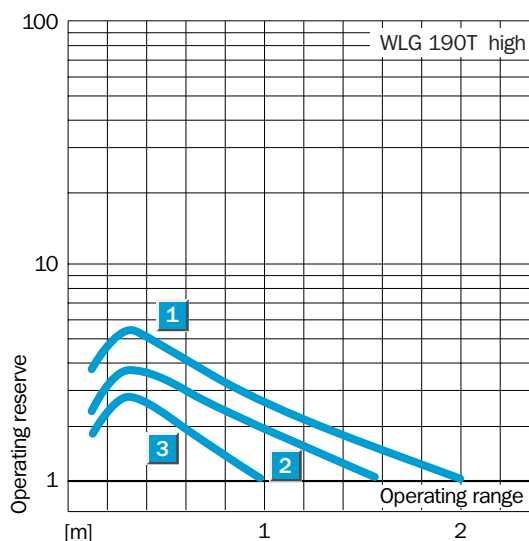
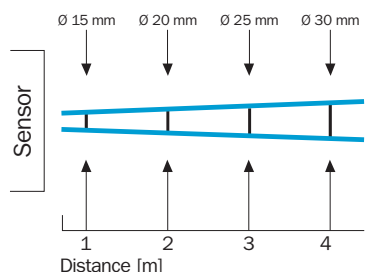
10) A = V_s connections reverse-polarity protected
B = Output Q short-circuit protected

Scanning range



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

Light spot diameter



Order information^{*)}

Type	Part 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 M 8 plug, 3-pin on request

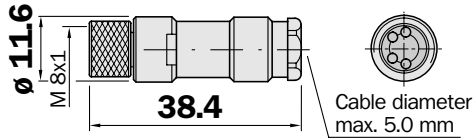
Dimensional drawings and order information

Contact assignment according to EN 50044

SENSICK screw-in system M8, 4-pin, enclosure rating IP 67

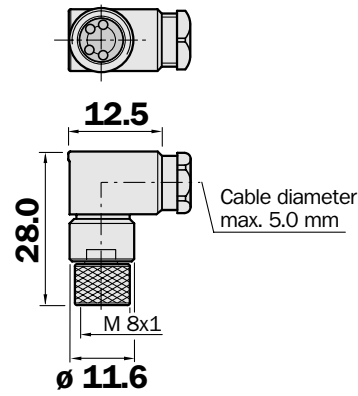
Female connector M8, 4-pin, straight

Type	Part no.
DOS-0804-G	6 009 974



Female connector M8, 4-pin, right angle

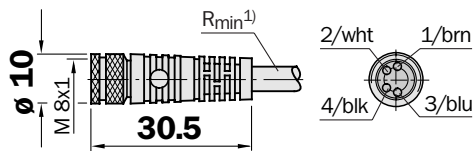
Type	Part no.
DOS-0804-W	6 009 975



Female connector M8, 4-pin, straight

Cable diameter 5 mm, 4 x 0.25 mm², sheath PVC

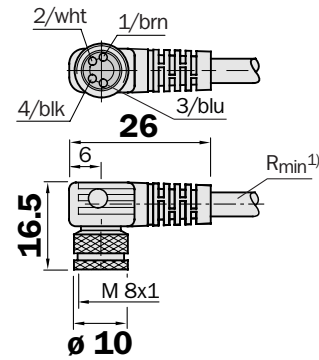
Type	Part no.	Cable length
DOL-0804-G02M	6 009 870	2 m
DOL-0804-G05M	6 009 872	5 m
DOL-0804-G10M	6 010 754	10 m



Female connector M8, 4-pin, right angle

Cable diameter 5 mm, 4 x 0.25 mm², sheath PVC

Type	Part no.	Cable length
DOL-0804-W02M	6 009 871	2 m
DOL-0804-W05M	6 009 873	5 m
DOL-0804-W10M	6 010 755	10 m



¹⁾ Minimum bend radius in dynamic use
 $R_{min} = 20 \times \text{cable diameter}$

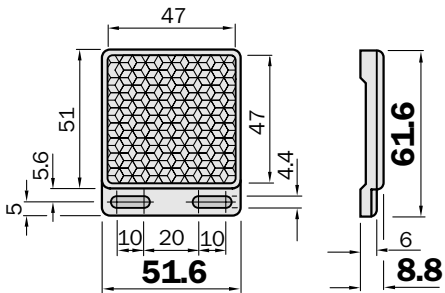
Dimensional drawings and order information

Reflectors

Plastic design for temperatures up to 65 °C

Reflector, 47 x 47 mm²

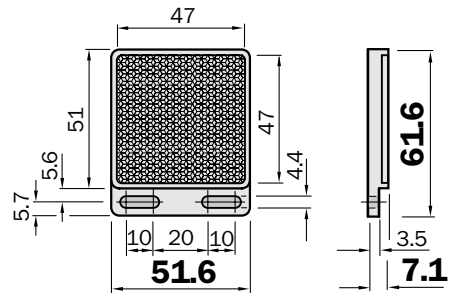
Type	Part no.
P 250	5 304 812



Reflector, 47 x 47 mm²

micro triple, 2 hole mounting

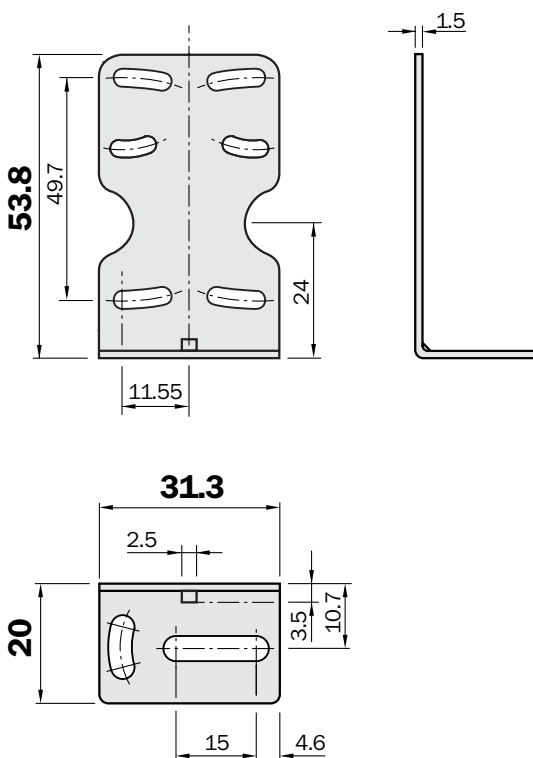
Type	Part no.
P 250 F	5 308 843



Mounting systems

Mounting bracket for W 190 L (included with delivery)

Type	Part no.
BEF-WK-W190	5 311 362



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in all major industrial nations.

