

W 190 L High Grade: Application-based Laser Tech- nology, 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.

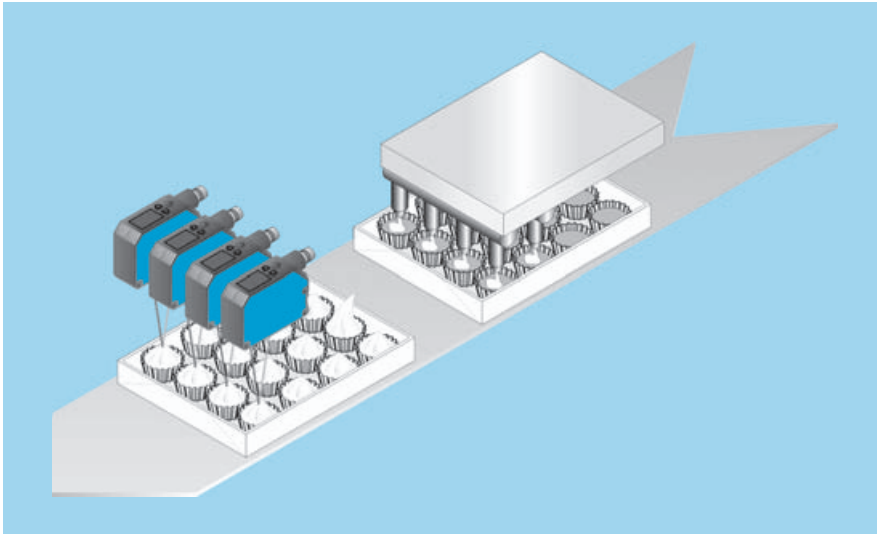
Two versions are available: for applications operating under standard conditions, e.g. foil/film, or for applications with increased requirements, e.g. thin-walled bottles.

	Photoelectric proximity switches BGS/FGS
	Photoelectric reflex switches

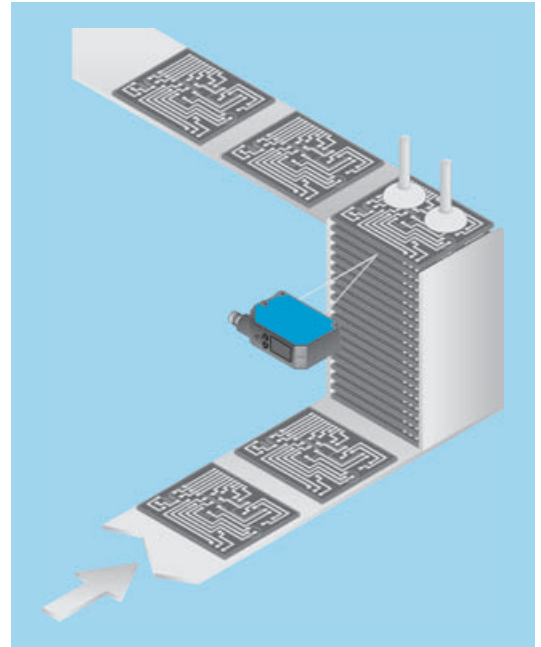
Do your customers require reliable sensors suitable for demanding applications, using Laser Technology?

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

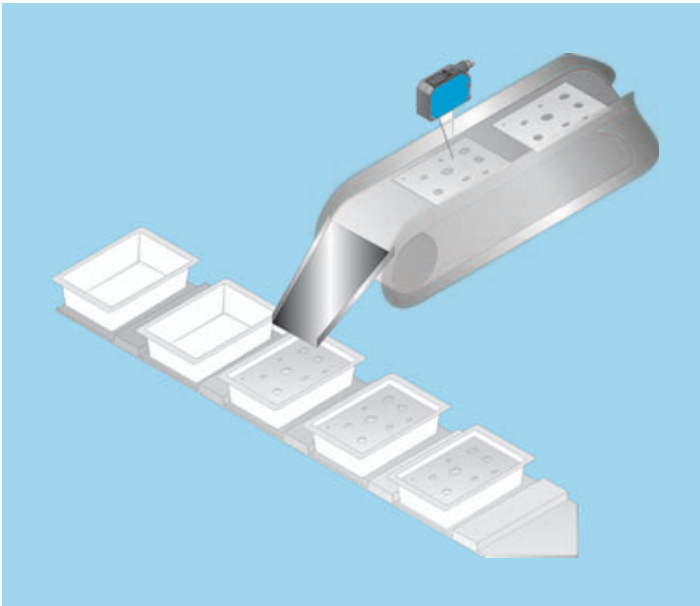
SICK



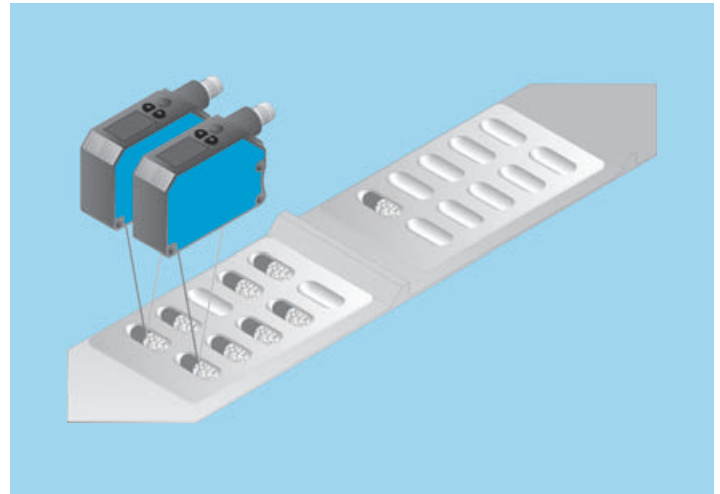
▲ WTB 190TL: 2-point teach-in, FGS mode, level control.
Sector: Packaging industry.



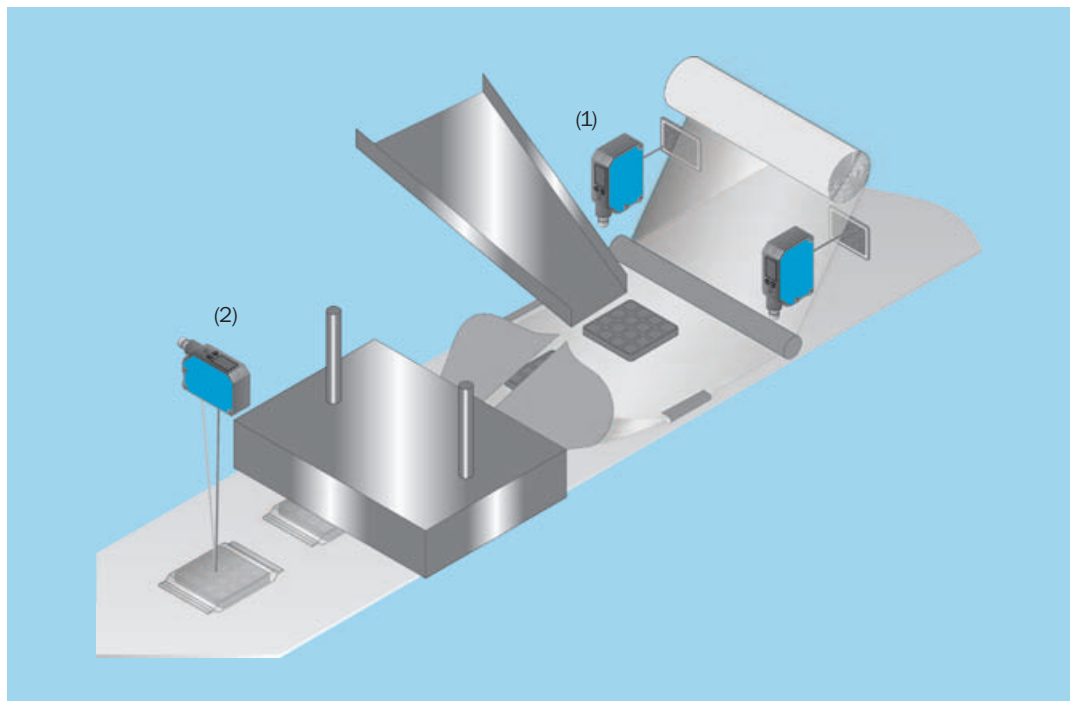
► WTB 190TL: Position teach-in, BGS mode, checking presence.
Sector: Electronic and semiconductor industry.



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

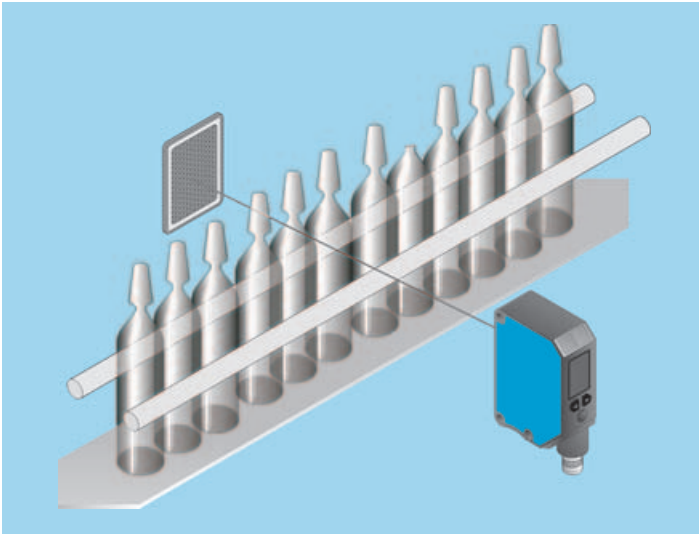


▲ WTB 190TL: 2-point teach-in, FGS mode, detection of gelatine capsules in blister packs.
Sector: Pharmaceutical industry.

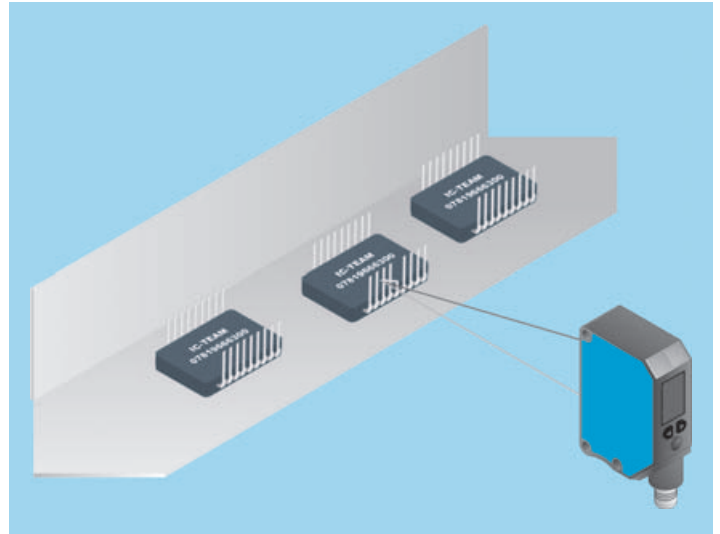


► WLG 190 T (1): Edge control of transparent packaging material.
Sector: Packaging industry.

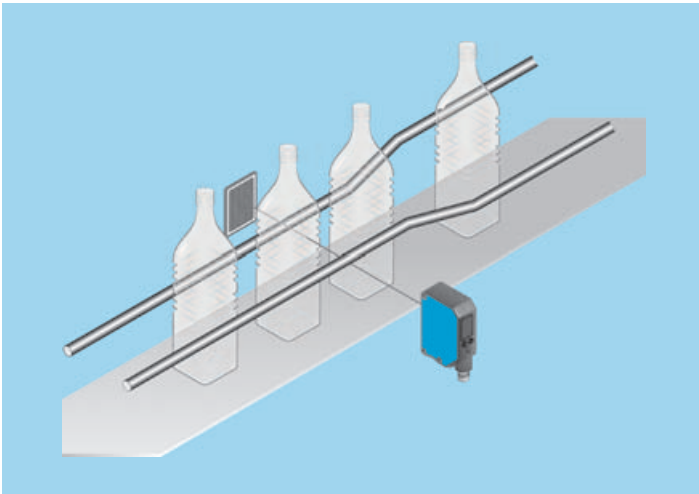
► WTB 190 TL (2): 2-point teach-in, FGS mode, product detection, correct thickness of packs.
Sector: Packaging industry.



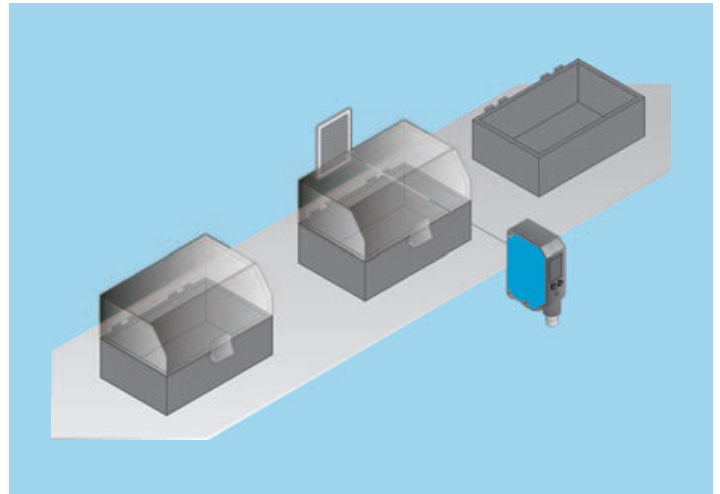
▲ WLG 190T: Ampoule syringes and breakage test.
Sector: Pharmaceutical industry.



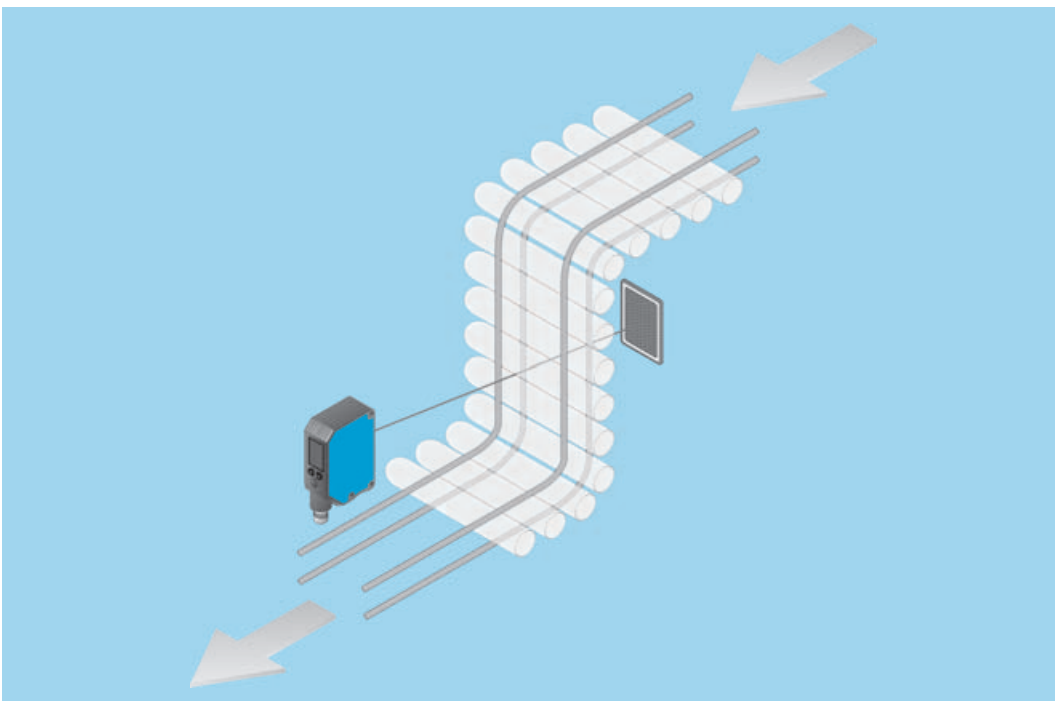
▲ WTB 190TL: 1-point teach-in, BGS mode, detecting or counting the IC pins.
Sector: Electronics.



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



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

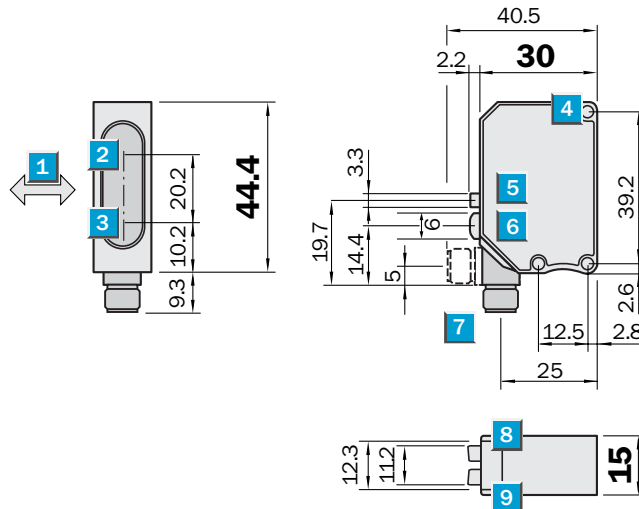


◀ WLG 190T: Detection of thin-walled glass ampoules.
Sector: Pharmaceutical industry.

	Scanning distance
	100 ... 270 mm
Photoelectric proximity switches	

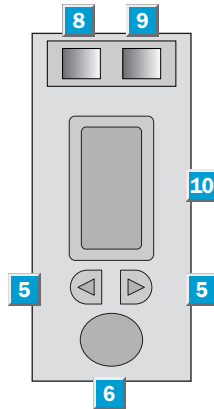
- Laser LED, visible red light, Class 2
- Scanning distance adjustment by teach-in function
- Programmable background or foreground suppression
- Programmable output: light/dark switching
- Numeric display with menu prompts

Dimension illustration



Setting options

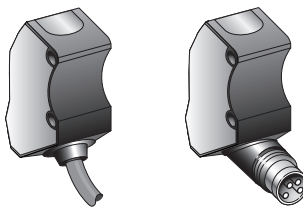
All types



- 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

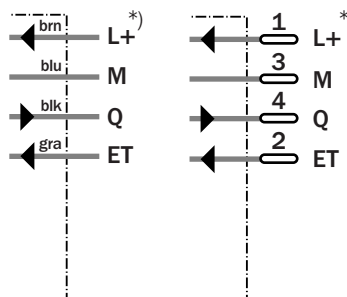
Connection types

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

CE III CDRH
Accession Number
0 31 22 45



Laser class 2



Accessories

Connectors

Mounting systems

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

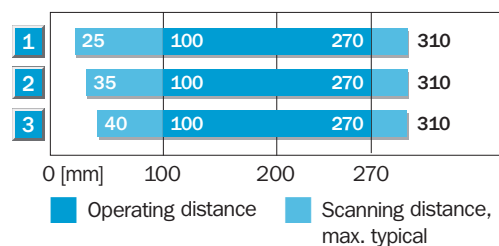
¹⁰⁾ Do not bend below 0 °C

¹¹⁾ Reference voltage 50 V DC

¹²⁾ A = V_S connections reverse-polarity protected

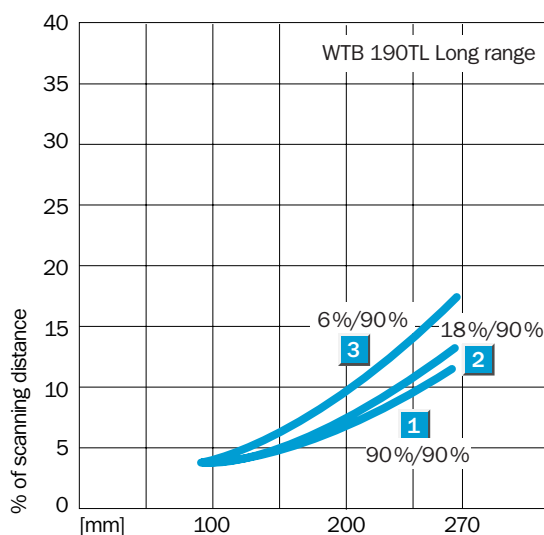
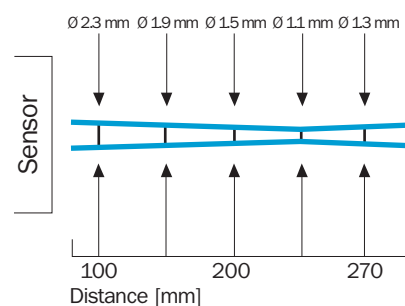
B = Output Q short-circuit protected

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^{*)}

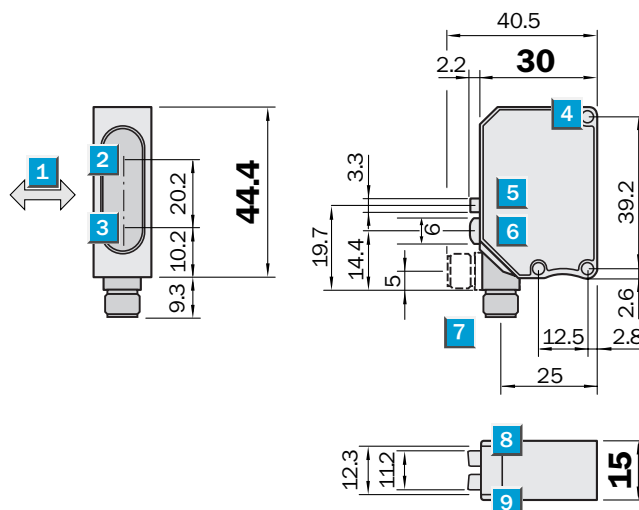
Type	Order no.
WTB 190TL-P 162	6 026 545
WTB 190TL-P 460	6 026 546
WTB 190TL-N 162	6 026 543
WTB 190TL-N 460	6 026 544

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

	Scanning distance 40 ... 100 mm
	Photoelectric proximity switches

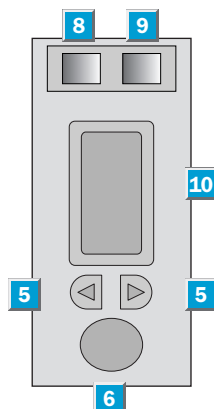
- Laser LED, visible red light, Class 2
- Scanning distance adjustment by teach-in function
- Programmable background or foreground suppression
- Programmable output: light/dark switching
- Numeric display with menu prompts

Dimension illustration



Setting options

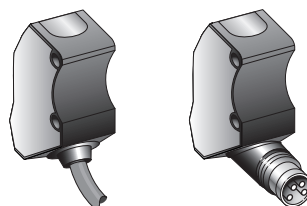
All types



- 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

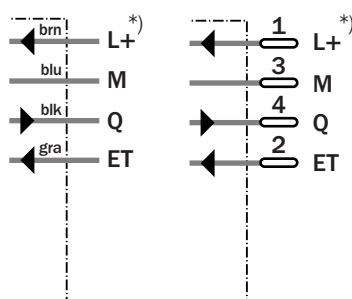
Connection types

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



4 x 0.18 mm²

4-pin, M8



*) Adjustment via External Teach (ET)
PNP → L+
NPN → M



Accessories

Connectors
Mounting systems

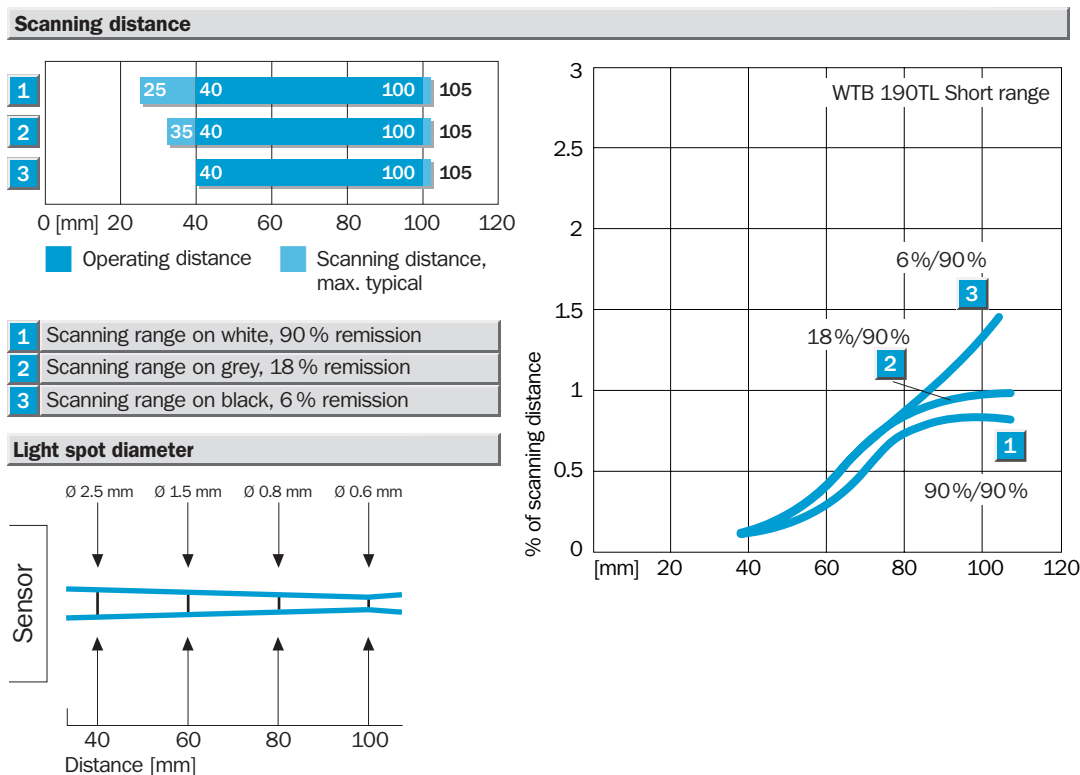
Technical data		WTB 190TL-	P 132	P 430	N 132	N 430						
Scanning distance, adjustable	40 ... 100 mm ¹⁾											
Device function mode	BGS ²⁾ or FGS ³⁾ , programmable											
Scanning distance, adjustable	Teach-in, External Teach (ET)											
	Teach-in via button, menu guided											
Threshold, 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



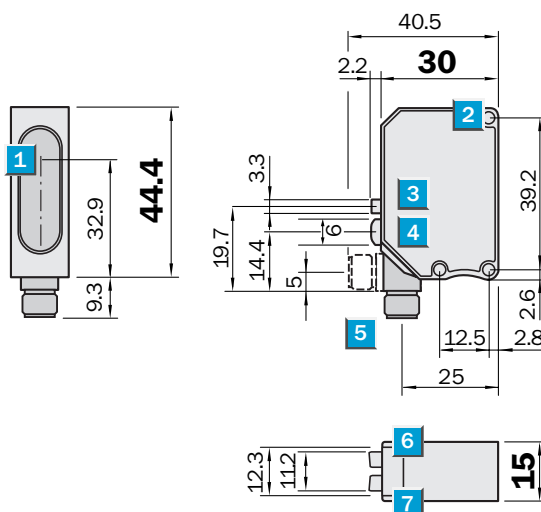
Order information ^{*)}	
Type	Order no.
WTB 190TL-P 132	6 026 541
WTB 190TL-P 430	6 026 542
WTB 190TL-N 132	6 026 539
WTB 190TL-N 430	6 026 540

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

	Scanning range 0.01 ... 5.5 m
Photoelectric reflex switches	

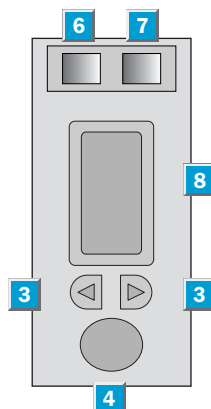
- Laser LED, visible red light, Class 2
- Sensitivity setting by teach-in
- Precision auto-collimated optics
- Programmable output:
light/dark switching
- Numeric display with menu prompts

Dimension illustration



Setting options

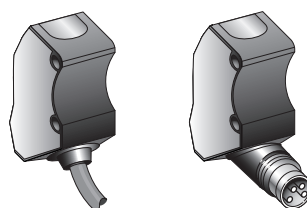
All types



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

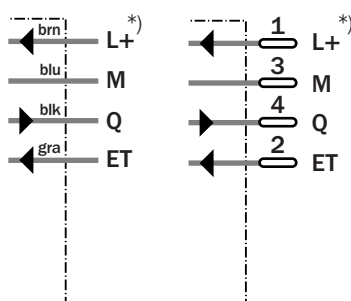


Accessories

Connectors
Mounting systems
Reflectors

4 x 0.18 mm²

4-pin, M8



*) Sensitivity control via External Teach (ET)

PNP → L+

NPN → M

Technical data		WLG 190T-	P 122	P 420	N 122	N 420						
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⁾	± 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 $T_A = +25$ °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

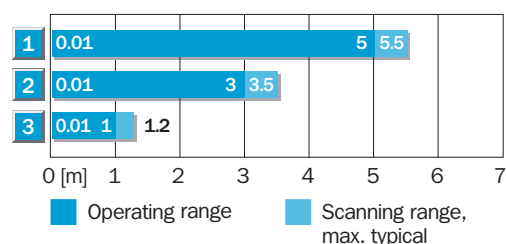
⁸⁾ Do not bend below 0 °C

⁹⁾ Reference voltage 50 V DC

¹⁰⁾ A = V_s connections reverse-polarity protected

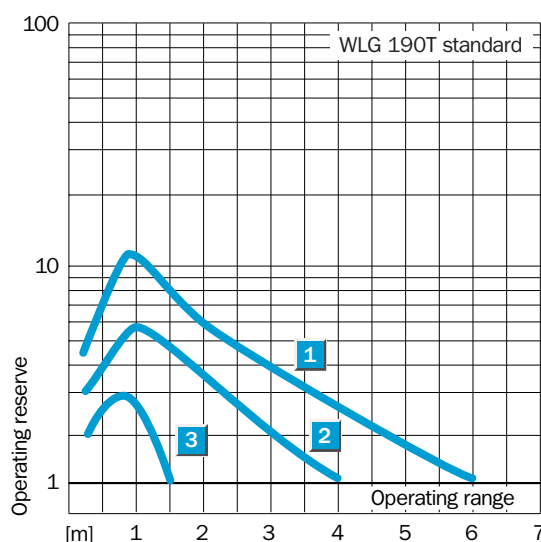
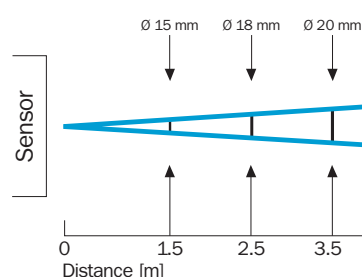
B = Output Q short-circuit protected

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^{*)}

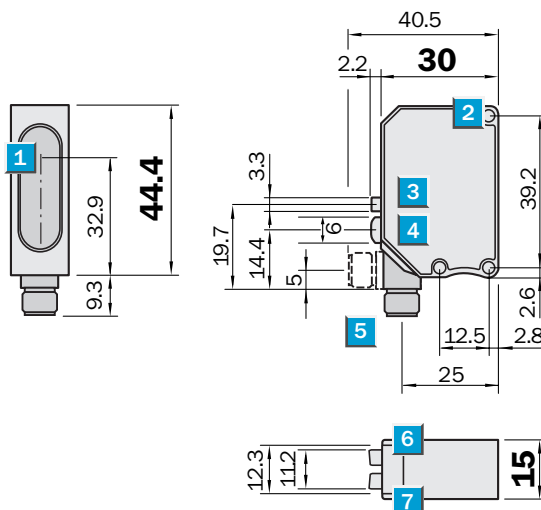
Type	Order no.
WLG 190T-P 122	6 022 827
WLG 190T-P 420	6 022 830
WLG 190T-N 122	6 022 823
WLG 190T-N 420	6 022 826

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

	Scanning range 0.01 ... 1.8 m
Photoelectric reflex switches	

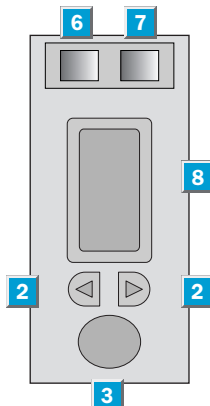
- Laser LED, visible red light, Class 2
- Sensitivity setting by teach-in
- Precision auto-collimated optics
- Programmable output:
light/dark switching
- Numeric display with menu prompts

Dimension illustration



Setting options

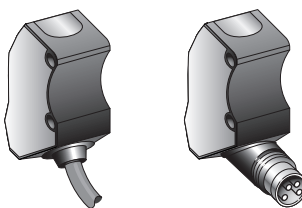
All types



- 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

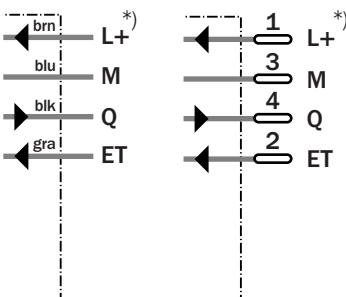
Connection types

WLG 190T-P 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



Accessories

Connectors
Mounting systems
Reflectors

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

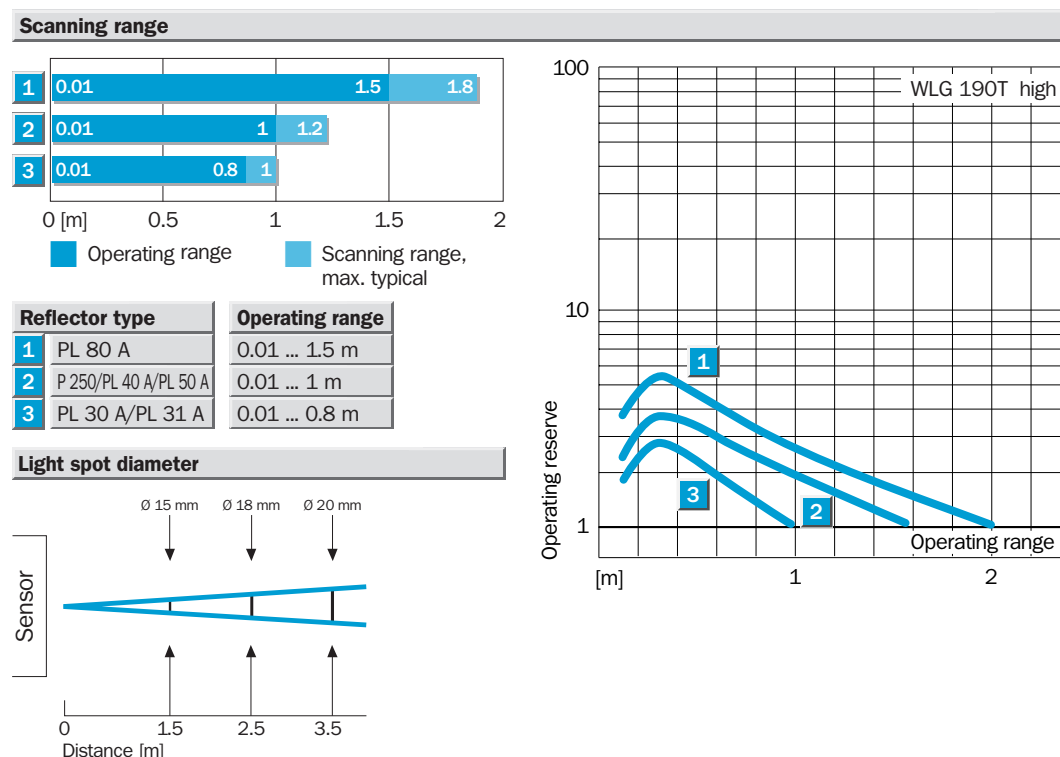
⁷⁾ With light/dark ratio 1:1

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



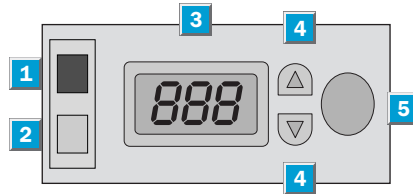
Order information ^{*)}	
Type	Order no.
WLG 190T-P 112	6 026 537
WLG 190T-P 410	6 026 538
WLG 190T-N 112	6 026 535
WLG 190T-N 410	6 026 536

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

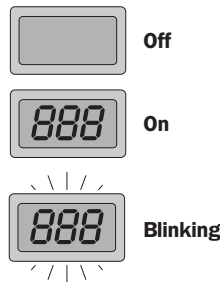
Description of operating panel and functions

SEL	SEL Select
F-b	F-b FGS/BGS
F95	F95 FGS/Foreground suppression
b95	b95 BGS/Background suppression
dLY	dLY Delay
oFF	oFF No Timer
ond	ond ON Delay
oFd	oFd OFF Delay
onE	onE ONE shot
L d	L d Light ON/Dark ON
Lon	Lon Light ON
don	don Dark ON
SEn	SEn Sensitivity
tch	tch Teaching type
1Pt	1Pt 1-point teach-in
2Pt	2Pt 2-point teach-in
Pos	Pos Position teach-in
dSP	dSP Display
on	on Display on
oFF	oFF Display off
rSt	rSt Reset
no	no Unreset
YES	YES Reset
unL	unL Unlock

Display

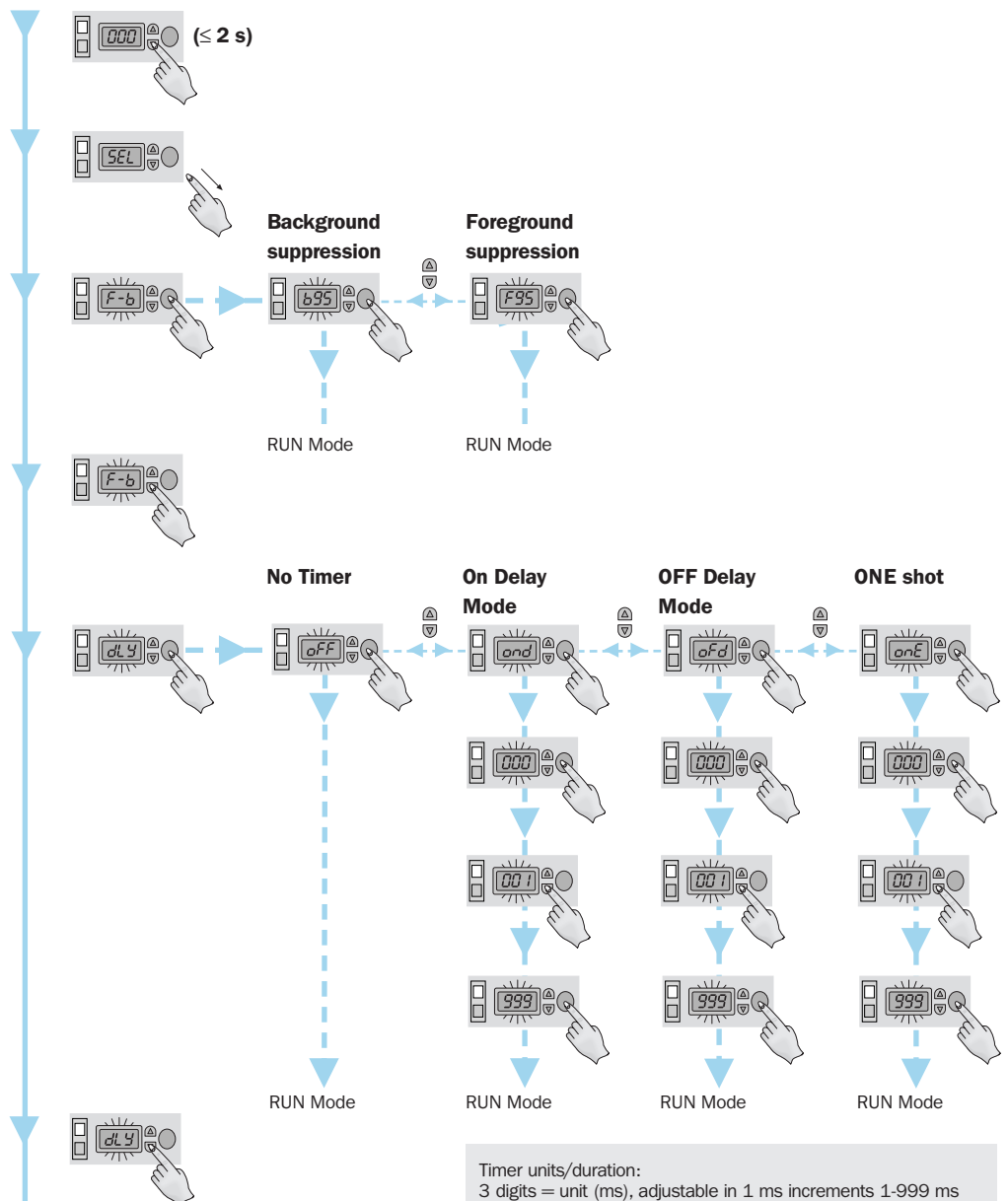


- 1** Status indicator LED, green: Laser on
- 2** Status indicator LED, yellow: output active
- 3** Numerical display
- 4** +/- buttons; select mode buttons
- 5** Teach-in button



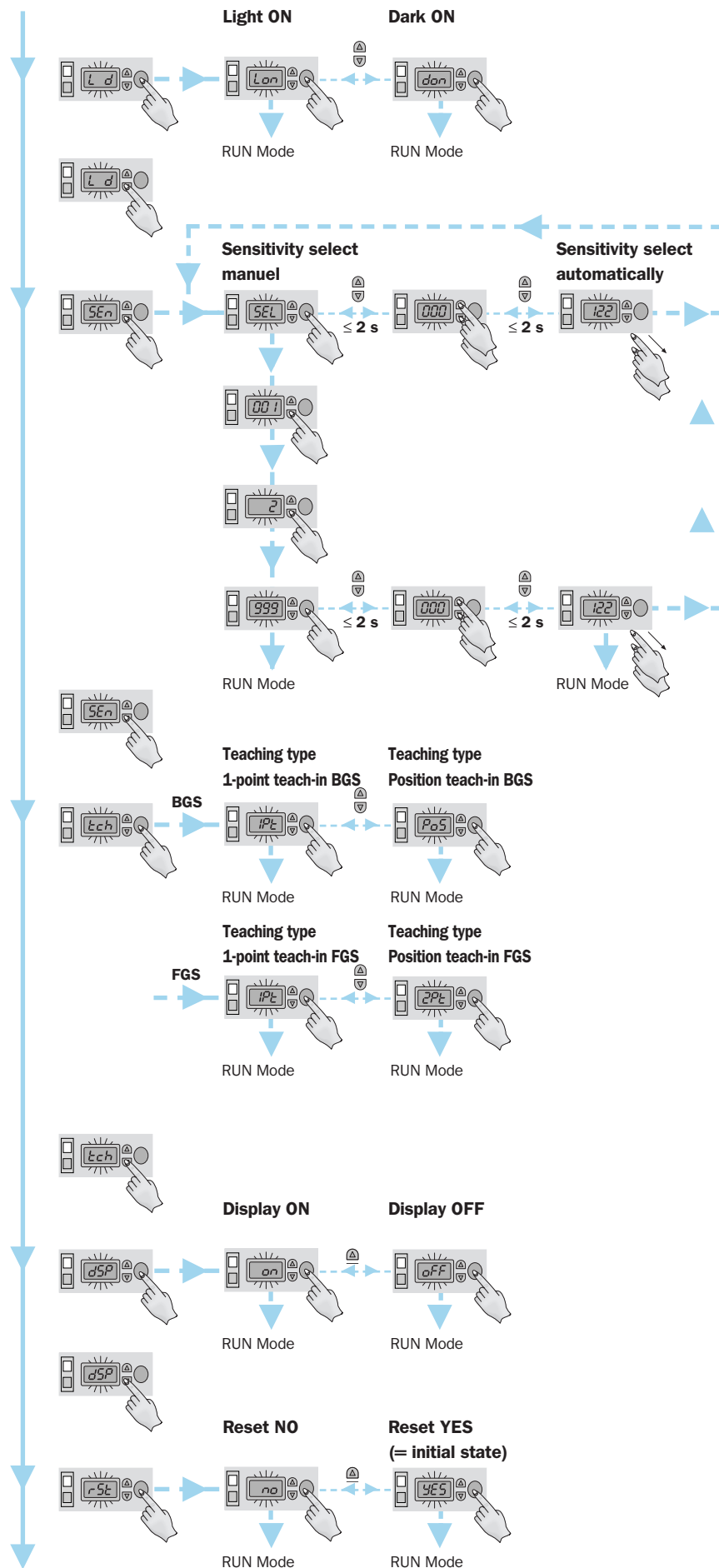
- On (LED yellow)**
- On (LED green)**
- Select-Mode button**
- Select-Mode button**
- Teach-in button**

Setting Mode, Timer, L/D, Display



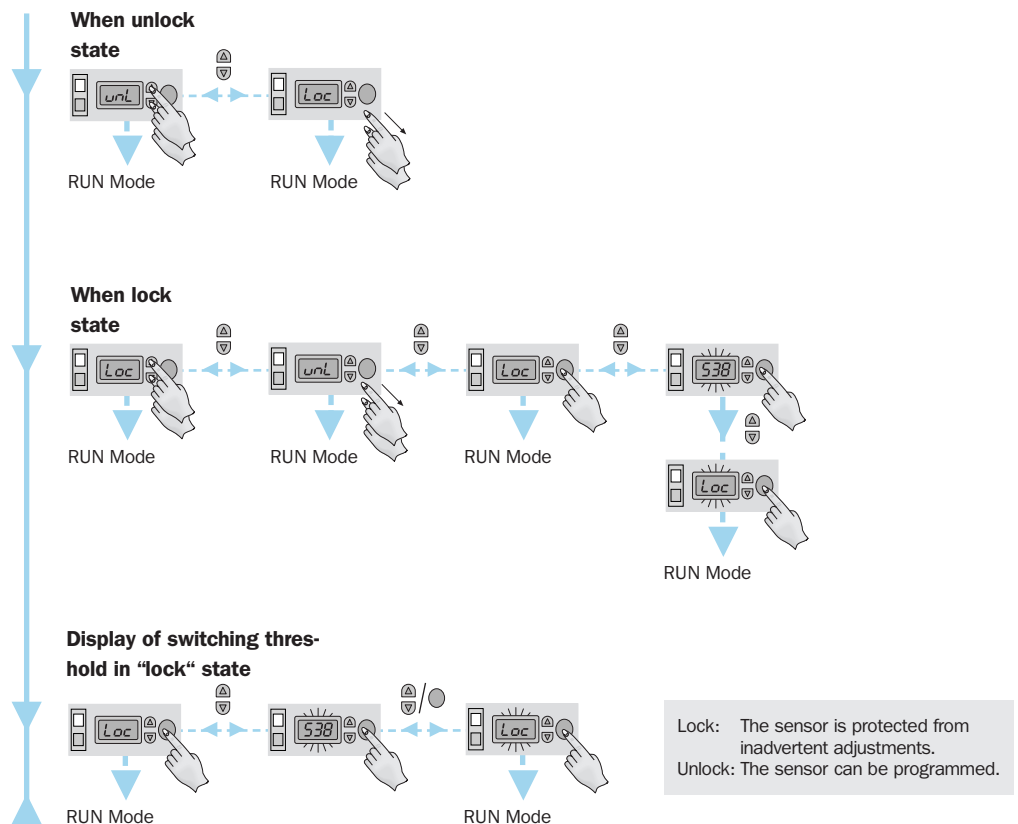
Description of operating panel and functions

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

	1-point teach-in (BGS Mode)	Position teach-in (BGS Mode)	Fine adjustment (manual)
Condition			
Teach-in			
Run Mode			
Status	Background will <i>just not</i> be detected.	Object is detected <i>dependent on position</i> .	
Application			

Condition

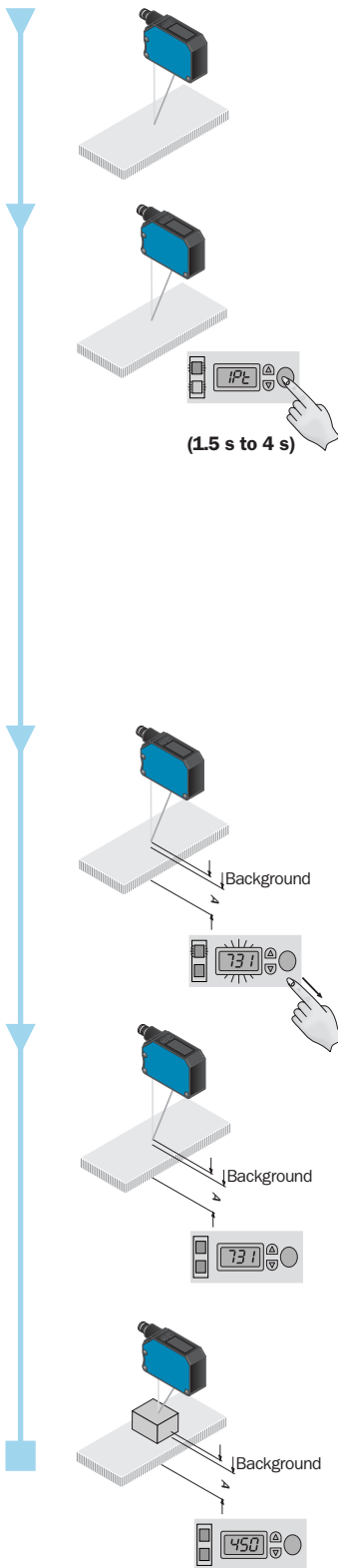
Teach-in

Run Mode

Status

Application

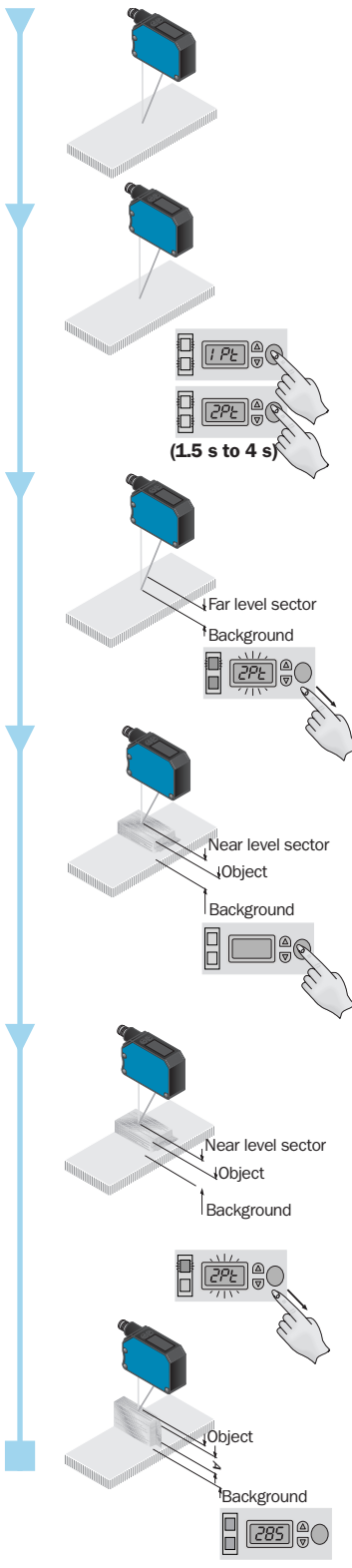
1 point teach-in (FGS Mode)



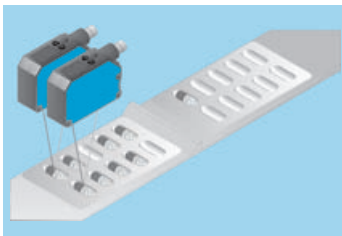
Object in "A" area is detected.



2 point teach-in (FGS Mode)

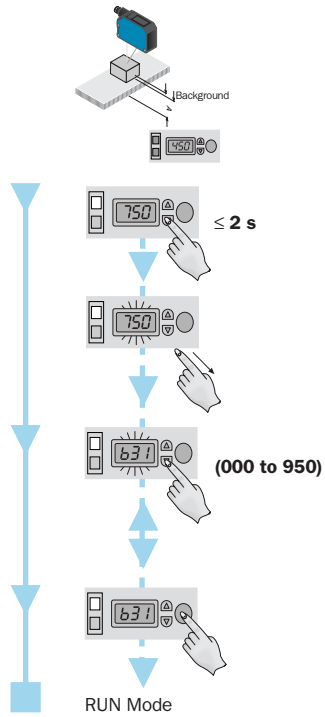


Sensing range "A" between the two levels taught. Objects before or after range "A" are not detected.



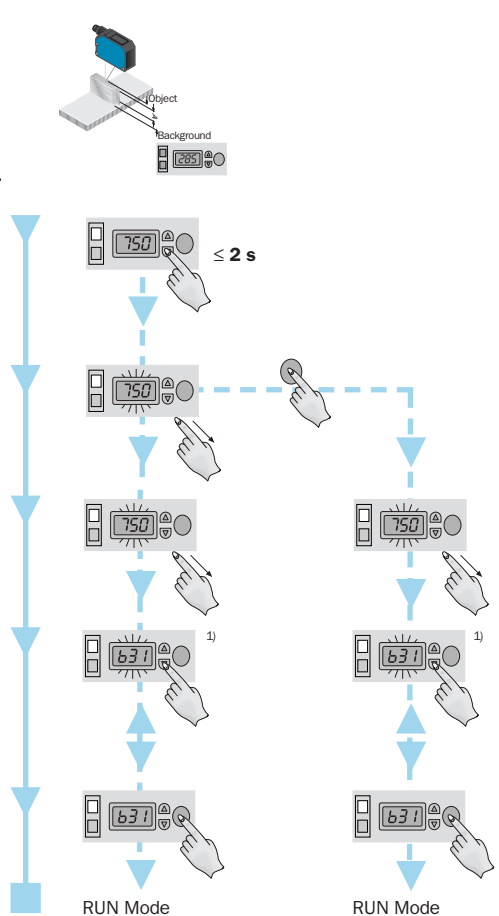
Fine adjustment (manual)

1 point teach-in (FGS Mode)



Fine adjustment (manual)

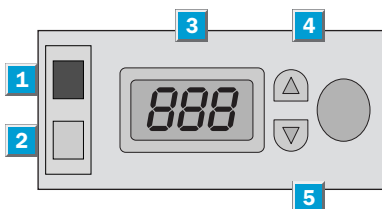
2 point teach-in (FGS Mode)



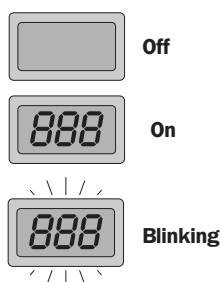
¹⁾ While the display flashes, the switching threshold at close range can be set from 050 to 930 and, at long range, from 070 to 950.

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 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

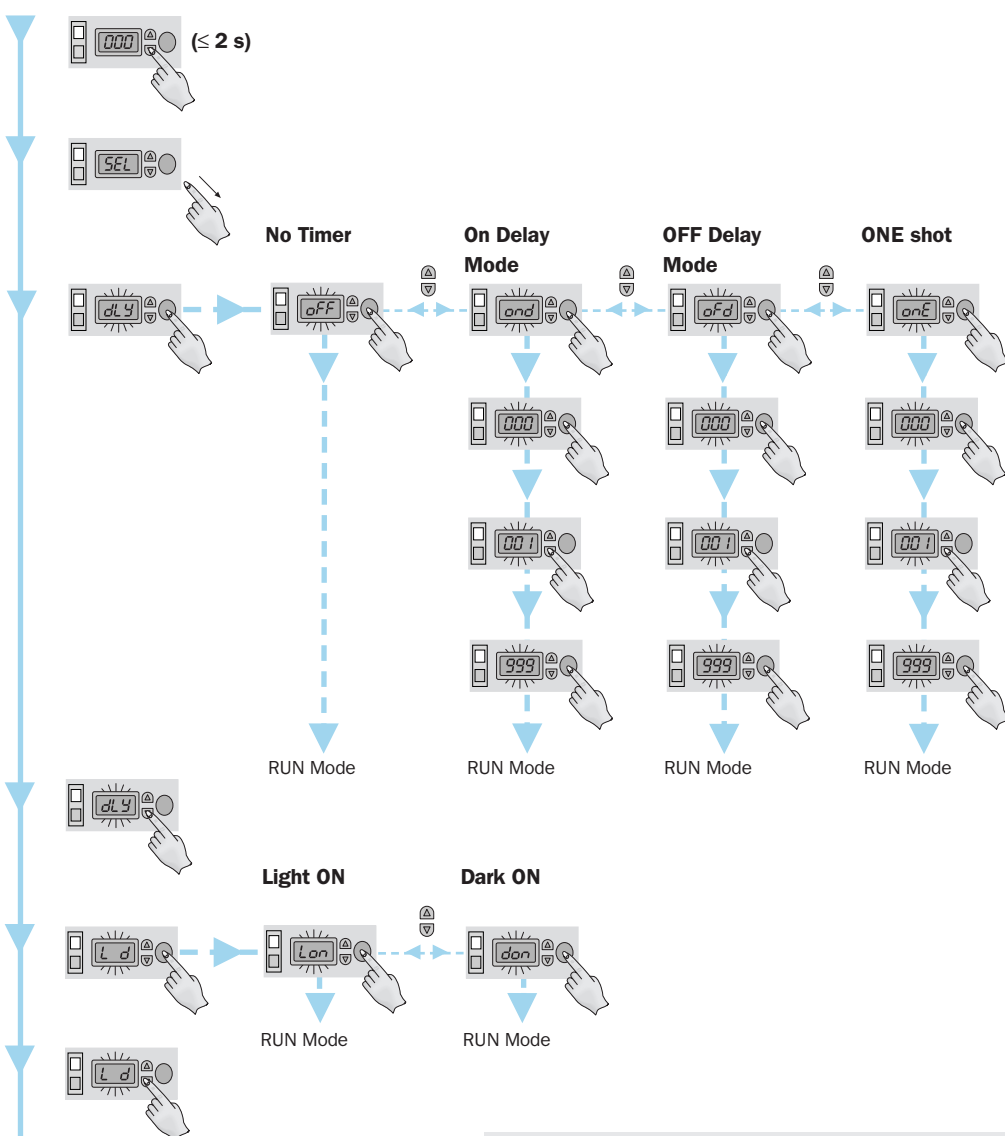
Display

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



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

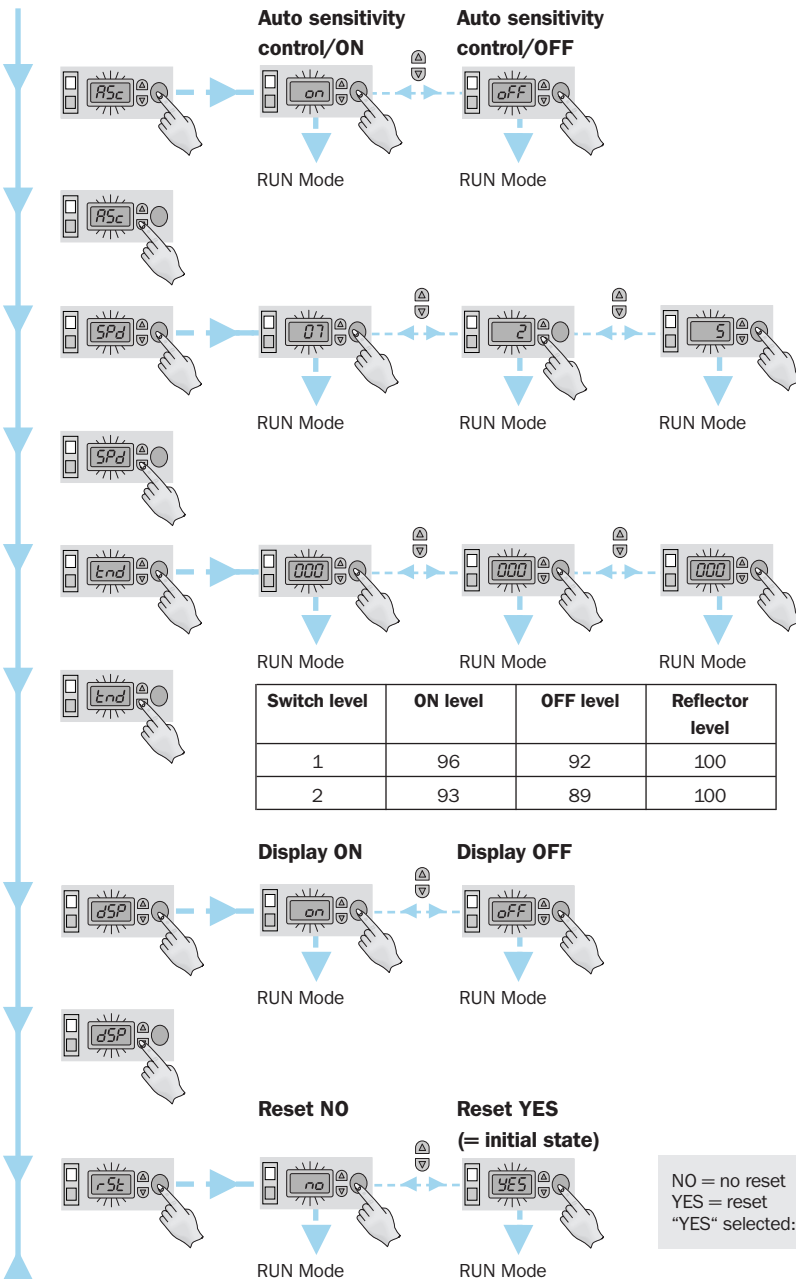
Setting Mode, Timer, L/D, Display



Timer units/duration:
3 digits = unit (ms), adjustable in 1 ms increments 1-999 ms
2 digits = unit (s), adjustable in 1 s increments 1-10 s

Description of operating panel and functions

Setting Mode, Timer, L/D, Display



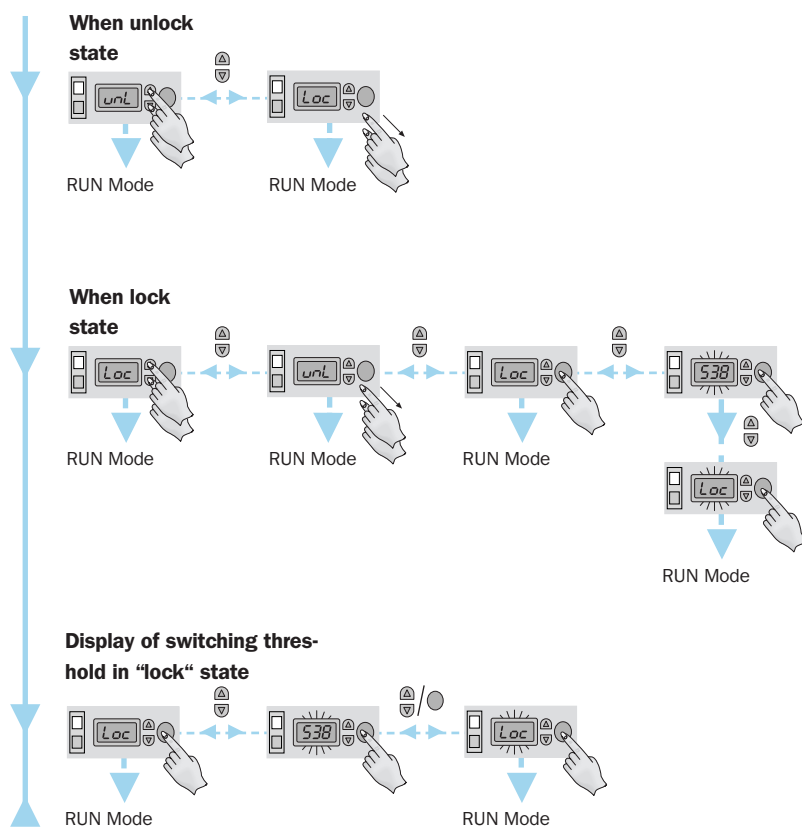
Factory default

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

Description of operating panel and functions

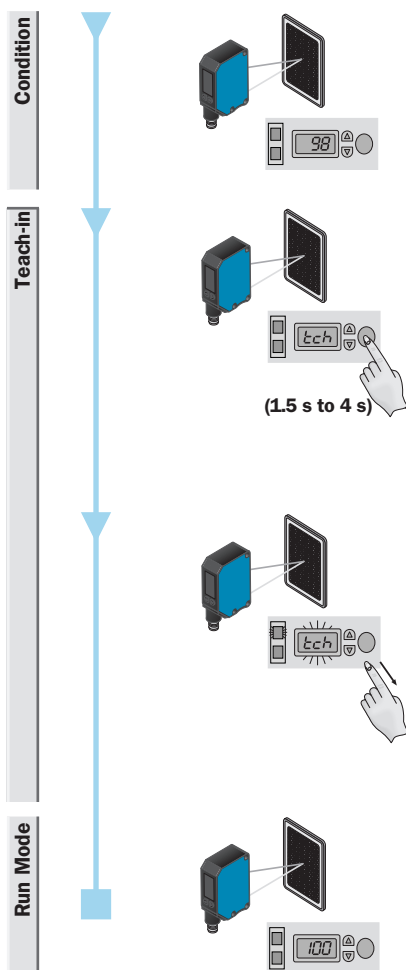
Setting Mode, Lock/Unlock

1-point teach-in

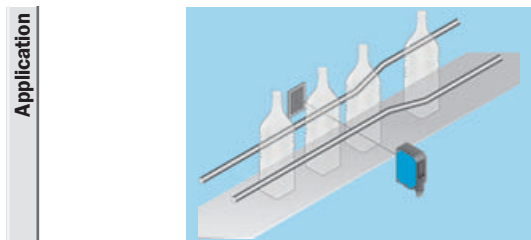


Lock: The sensor is protected from inadvertent adjustments.

Unlock: The sensor can be programmed.



Status	Reflector is detected without system reserve



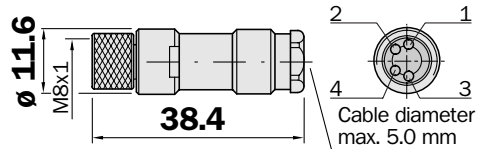
Dimensional drawings and order information

Contact assignment according to EN 50044

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

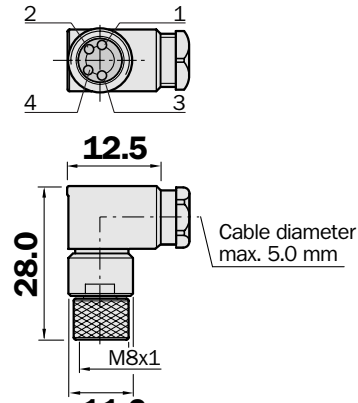
Female connector M8, 4-pin, straight

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



Female connector M8, 4-pin, right angle

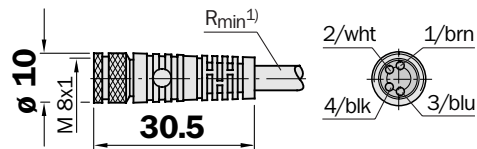
Type	Order no.
DOS-0804-W	6 009 975



Female connector M8, 4-pin, straight

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

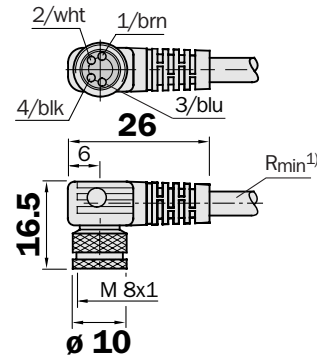
Type	Order no.	Cable length
DOL-0804-G02M	6 009 870	2 m
DOL-0804-G05M	6 009 872	5 m
DOL-0804-G10M	6 010 754	10 m



Female connector M8, 4-pin, right angle

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

Type	Order 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
 $R_{min} = 20 \times \text{cable diameter}$

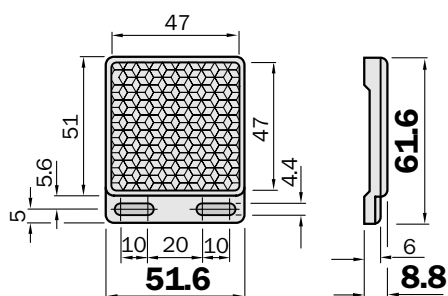
Dimensional drawings and order information

Reflectors

Plastic design for temperatures up to 65 °C

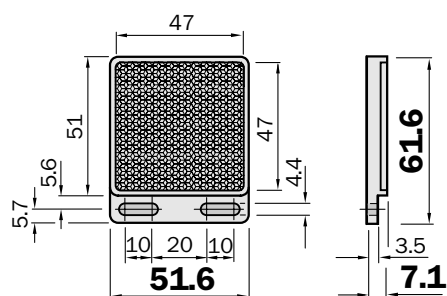
Reflector, 47 x 47 mm²

Type	Order no.
P 250	5 304 812

Reflector, 47 x 47 mm²

micro triple, 2 hole mounting

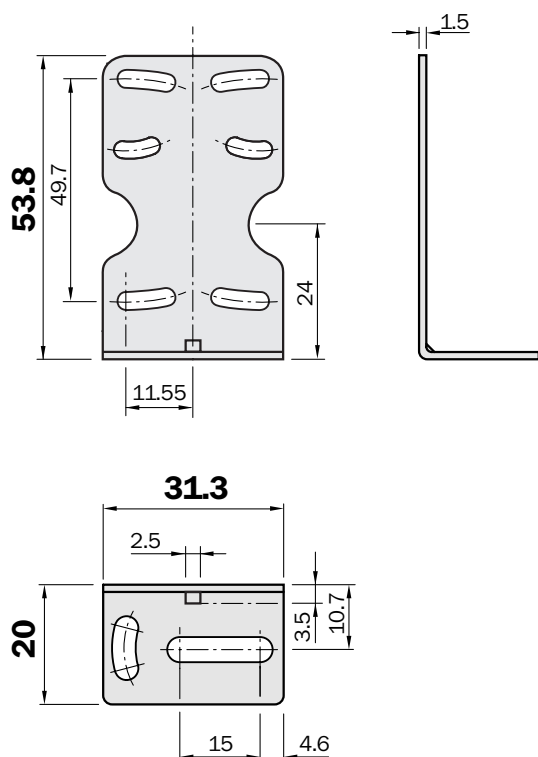
Type	Order no.
P 250 F	5 308 843



Mounting systems

Mounting bracket for W 190 L (included with delivery)

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



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