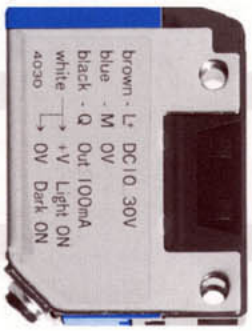
W 170 Series
Photoelectric Switches

WS/WE 170		**7 m**
WL 170		**0.01 to 2.5 m** **0.1 to 0.5 m**
WT 170		**10 to 400 mm** **10 to 90 mm**



Complete »miniature photoelectric switch family« in robust, stainless steel/plastic enclosure.

Through-beam photoelectric switch with high range; slotted masks and polarisation filter attachments available as accessories.

Photoelectric reflex switch with polarisation filter for trouble-free detection of reflective objects.

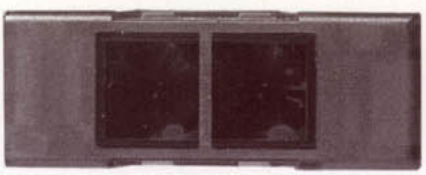
Photoelectric reflex switch with enhanced sensitivity for detection of transparent or small objects.

Photoelectric proximity switch, »energy type« with high scanning range.

Photoelectric proximity switch, »focused optics« type, with enhanced sensitivity and background suppression.

All versions are equipped with a visible red-light transmitter LED.

Optional connecting cables or connector socket M 8, 4-pole.



Precision optical system for high switching accuracy.

PNP or NPN switching output 100 mA. Protected against short-circuits, overload and reverse polarity. With standard switch-on period.

Optional switching output Q or $\overline{Q}$ with control line.

All versions with UL approval.

User-friendly sensitivity indicator.

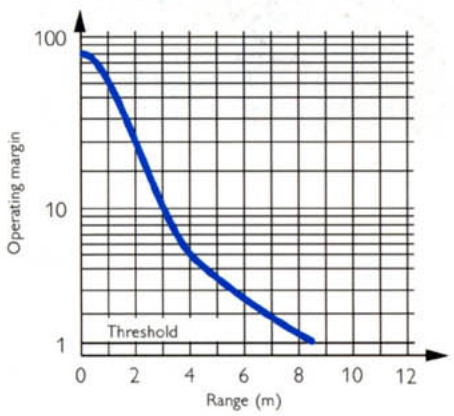
SICK
optic
electronic

Scanning Range

7 m

Features:

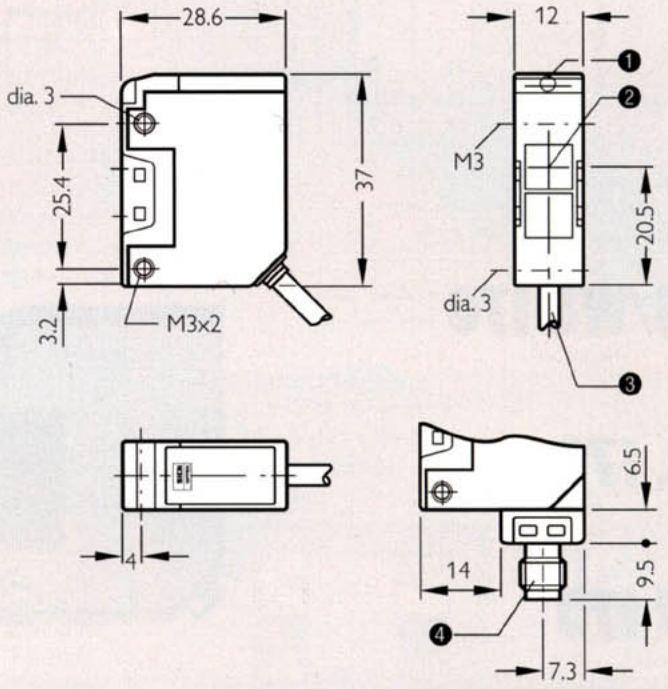
- Robust stainless steel/plastic housing
- Switching output protected against short-circuits and overload
- Red-light transmitter LED
- Reverse polarity protected
- Easy to adjust (with red receiver display)
- Test input for device and system test
- Light/dark setting – switchover via control line
- UL approval
- Connecting cable or connector socket M 8, 4-pole
- Polarisation filter attachments (accessories) for reducing mutual interference when using more than one WS/WE 170 unit



WS/WE 170

WS 170-D 132
WE 170-P/N 132

Dimensions in mm



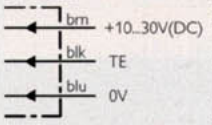
WS 170-D 430
WE 170-P/N 430

❶ Red reception display
❷ Transmission axis (WS transmitter)/receiver axis (WE receiver)
❸ Connecting lead
❹ Connector socket M 8, 4-pole

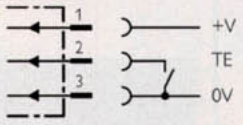
See accessories for line sockets and cable couplers.
Retaining bracket in scope of supply, see accessories.
Slotted mask BL-170-10 and polarisation filter attachments BL-170 pole-f., see accessories.

Connection diagram

WS 170 -D 132

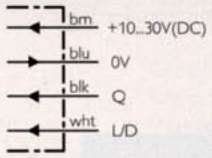


WS 170 -D 430

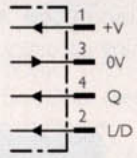


brn	blu	blk	wht
brown	blue	black	white

WE 170 -P/N 132



WE 170 -P/N 430



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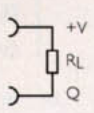
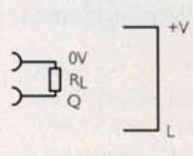


P



L/D = control line

light switching

dark switching

WS/WE 170
Through-beam photoelectric switch

Type WS/WE 170	Transmitter WS 170	Receiver WE 170-N -P	
Part-No.	see table		
Operating range (RW)	0 to 7 m		
Light spot diameter	approx. 440 mm at a distance of 7 m		
Light transmitter	LED, red-light	–	
Supply voltage V_S [1]	10 to 30 V DC		
Current consumption (no load)	≦ 20 mA	≦ 30 mA	
Max. residual ripple [2]	± 10 %		
Light receiver switching type [3]	–	light/dark switchover via control lead	
Switching outputs open collector		NPN	PNP
Signal voltage HIGH		approx. V_S	V_S – (≦ 1.5 V)
Signal voltage LOW		≦ 1.5 V	approx. 0 V
Max. output current	≦ 100 mA		
Test input T_E	Transmitter cut-off 0 V		
Response time; switching frequency		1 ms max.; 500/s min.	
VDE protection class	III		
Type of protection (IEC 144)	IP 67		
Protection circuits [4]	A, B	A, B, C, D	
Ambient operating temperature T_U	– 25 to + 55 °C		
Storage temperature T_L	– 40 to + 70 °C		
Connecting cable	2 m, 3 x 0.2 mm², ø 4.0 mm	2 m, 4 x 0.2 mm², ø 4.0 mm	
Connector socket	M 8, 4-pole		
Weight	25 g with connector socket, 66 g with 2 m lead		

1) Limit values
2) Must not exceed or fall below V_S tolerances
3) Control line open
   NPN: light / PNP: dark switching
   Control line + V: light /
   Control line 0 V: dark switching
4) A = V_S connections non-interchangeable
   B = Inputs/outputs non-interchangeable
   C = Spurious pulse suppression
   D = Outputs short-circuit and overcurrent-protected

Selection table

	Switching output	
	NPN	PNP
with connecting cable 2 m		
Type	WS/WE 170-N 132	WS/WE 170-P 132
Part-No.	6 010 183	6 010 181
with connector socket M 8-4 pole		
Type	WS/WE 170-N 430	WS/WE 170-P 430
Part-No.	6 010 184	6 010 182

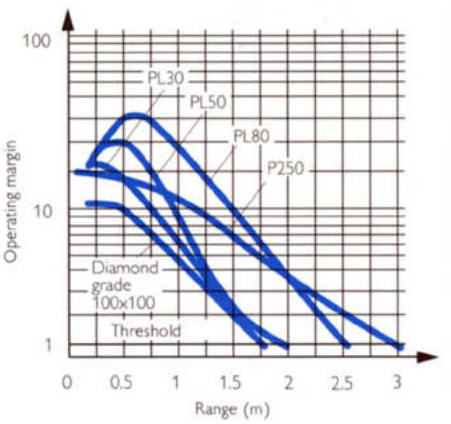
Important: Part-No. includes transmitter and receiver!

Scanning Range

0.01 to 2.5 m

Features:

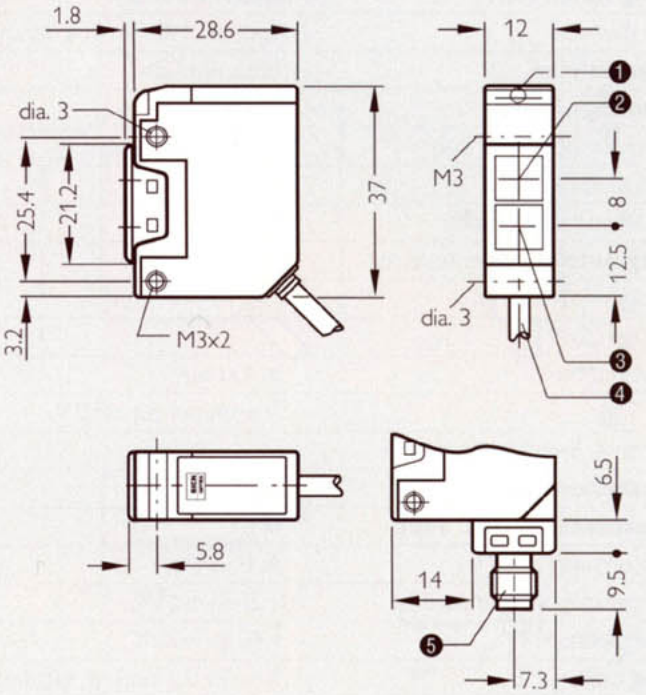
- Polarisation filter ensures that objects with reflective surfaces are also detected
- Robust stainless steel/plastic housing
- Switching output protected against short-circuits and overload
- Red-light transmitter LED
- Non-interchangeable
- Easy to adjust (with red receiver display)
- Light/dark setting – switchover via control line
- UL approval
- Connecting cable or connector socket M 8, 4-pole



WL 170

WL 170-P/N 132

Dimensions in mm



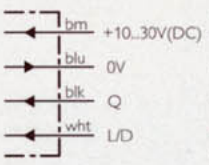
WL 170-P/N 430

❶ Red reception display
❷ Reception axis
❸ Transmission axis
❹ Connecting cable
❺ Connector socked M 8, 4-pole

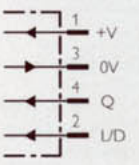
See accessories for line sockets and cable couplers.
Retaining bracket in scope of supply, see accessories.

Connection diagram

WL 170 -P/N 132



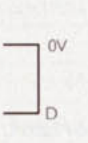
WL 170 -P/N 430



N

P

light switching



dark switching

L/D = control line

brn	blu	blk	wht
brown	blue	black	white

WL 170
Photoelectric reflex switch with polarisation filter

Type WL 170	-N	-P
Part-No.	see table	
Typical max. scanning range	0.01 to 3.1 m	
Operating range (RW) with reflector P 250	0.01 to 2.5 m	
Light spot diameter	approx. 200 mm at distance of 2.5 m	
Light transmitter	LED, visible red light	
Supply voltage V_S [1]	10 to 30 V DC	
Current consumption (no load)	≦ 30 mA	
Max. residual ripple [2]	± 10 %	
Light receiver switching type [3]	Light/dark switchover via control lead	
Polarisation filter	Yes	
Switching outputs, open collector	NPN	PNP
Signal voltage HIGH	approx. V_S	V_S – (≦ 1.5 V)
Signal voltage LOW	≦ 1.5 V	approx. 0 V
Max. output current	≦ 100 mA	
Response time; switching frequency	0.7 ms max.; 700/s min.	
VDE Protection class	III	
Type of protection (IEC 144)	IP 67	
Protection circuits [4]	A, B, C, D	
Ambient operating temperature T_U	– 25 to + 55 °C	
Storage temperature T_L	– 40 to + 70 °C	
Connecting lead	2 m, 4 x 0.2 mm², ø 4.0 mm	
Connector socket	M 8-4 pole	
Weight	25 g with connector socket, 66 g with 2 m lead	

1) Limit values
2) Must not exceed or fall below V_S tolerances
3) Control line open
NPN: light / PNP: dark switching
Control line + V: light /
Control line 0 V: dark switching
4) A = V_S connections non-interchangeable
B = Inputs/outputs non-interchangeable
C = Spurious pulse suppression
D = Outputs short-circuit and overcurrent-protected

Selection table

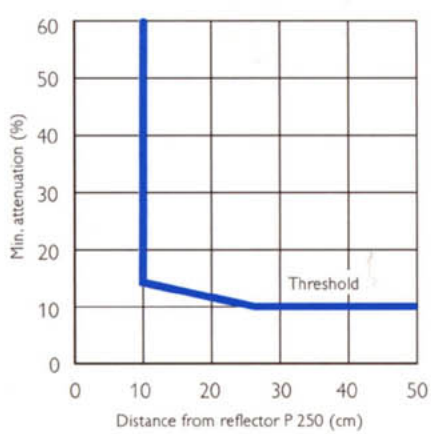
	Switching output	
	NPN	PNP
with connecting cable 2 m		
Type	WL 170-N 132	WL 170-P 132
Part-No.	6 010 191	6 010 189
with connector socket M 8-4 pole		
Type	WL 170-N 430	WL 170-P 430
Part-No.	6 010 192	6 010 190

Scanning Range

0.1 to 0.5 m

Features:

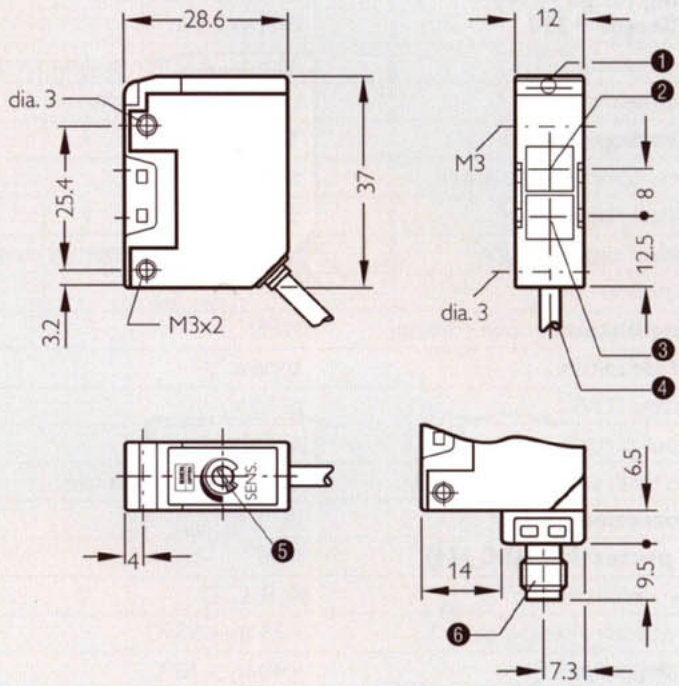
- Detection of glass, transparent foils or small parts (min. attenuation ≧ 20%)
- Focused optics system
- LED light transmitter, visible red light
- Variable sensitivity
- Robust stainless steel/plastic enclosure
- Switching output protected against short-circuits and overload
- Reverse polarity protected
- Easy to adjust (with red receiver display)
- Light/dark setting – switchover via control line
- UL approval
- Connecting cable or connector socket M 8, 4-pole



WL 170

WL 170 -P/N 122

Dimensions in mm



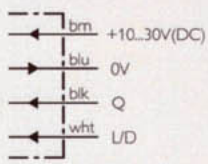
WL 170 -P/N 420

❶ Red reception display
❷ Reception axis
❸ Transmission axis
❹ Connecting cable
❺ Sensitivity selector (270°)
❻ Connector socket M 8, 4-pole

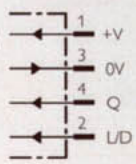
See accessories for line sockets and cable couplers.
Retaining bracket in scope of supply, see accessories.

Connection diagram

WL 170 -P/N 122

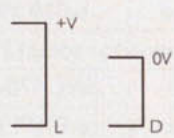


WL 170 -P/N 420



N

P



L/D = control line

light switching dark switching

brn	blu	blk	wht
brown	blue	black	white

WL 170
Photoelectric reflex switch for transparent objects

Type WL 170	-N	-P
Part-No.	see table	
Typical max. scanning range	0.1 to 0.56 m	
Operating range (RW) with reflector P 250	0.1 to 0.5 m	
Threshold	from 20% light attenuation onwards, variable	
Light spot diameter	approx. 30 mm at a distance of 0.5 m; approx. 5 mm in focal point at 90 mm	
Light transmitter	LED, visible red light	
Supply voltage V_S [1]	10 to 30 V DC	
Current consumption (no load)	≦ 30 mA	
Max. residual ripple [2]	± 10 %	
Light receiver switching type [3]	Light/dark switchover via control lead	
Polarisation filter	No	
Switching outputs, open collector	NPN	PNP
Signal voltage HIGH	approx. V_S	V_S – (≦ 1.5 V)
Signal voltage LOW	≦ 1.5 V	approx. 0 V
Max. output current	≦ 100 mA	
Response time; switching frequency	0.7 ms max.; 700/s min.	
VDE protection class	III	
Type of protection (IEC 144)	IP 67	
Protection circuits [4]	A, B, C, D	
Ambient operating temperature T_U	– 25 to + 55 °C	
Storage temperature T_L	– 40 to + 70 °C	
Connecting lead	2 m, 4 x 0.2 mm², ø 4.0 mm	
Connector socket	M 8-4 pole	
Weight	25 g with connector socket, 66 g with 2 m lead	

1) Limit values
2) Must not exceed or fall below V_S tolerances
3) Control line open
NPN: light / PNP: dark switching
Control line + V: light /
Control line 0 V: dark switching
4) A = V_S connections non-interchangeable
B = Inputs/outputs non-interchangeable
C = Spurious pulse suppression
D = Outputs short-circuit and overcurrent-protected

Selection table

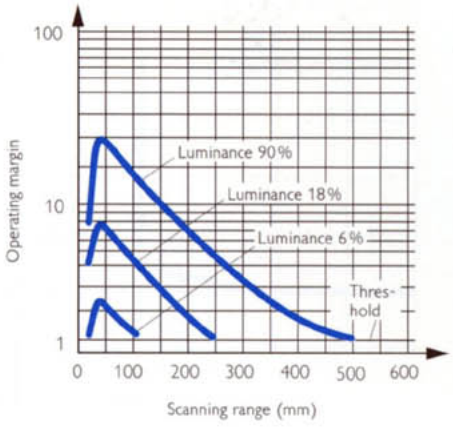
	Switching output	
	NPN	PNP
with connecting cable 2 m		
Type	WL 170-N 122	WL 170-P 122
Part-No.	6 010 187	6 010 185
with connector socket M 8-4 pole		
Type	WL 170-N 420	WL 170-P 420
Part-No.	6 010 188	6 010 186

Scanning range

10 to 400 mm

Features:

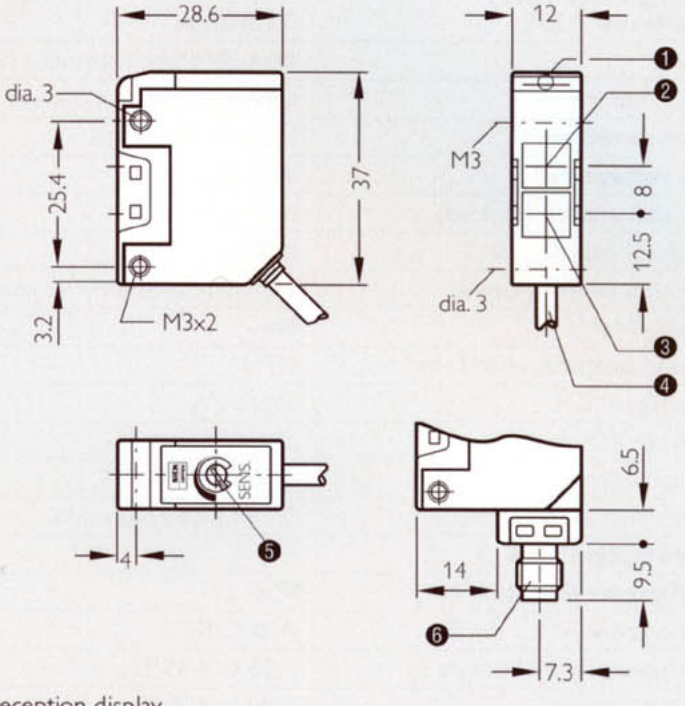
- Energetic sensor for standard applications
- Variable sensitivity (270°)
- LED light transmitter, visible red light
- Robust stainless steel/plastic enclosure
- Switching output protected against short-circuits and overload
- Reverse polarity protected
- Easy to adjust (with red receiver display)
- Light/dark setting – switchover via control line
- UL approval
- Connecting cable or connector socket M 8, 4-pole



WT 170

WT 170 -P/N 132

Dimensions in mm



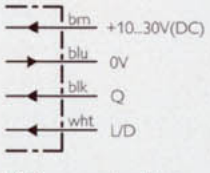
❶ Red reception display
❷ Reception axis
❸ Transmission axis
❹ Connecting lead
❺ Sensitivity selector (270°)
❻ Connector socket M 8, 4-pole

WT 170 -P/N 430

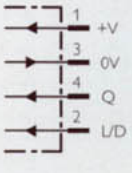
See accessories for line sockets and cable couplers.
Retaining bracket in scope of supply, see accessories

Connection diagram

WT 170 -P/N 132



WT 170 -P/N 430



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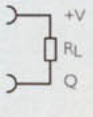

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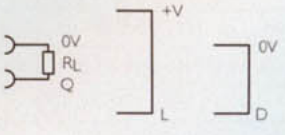


L/D = control line

light switching dark switching

brn	blu	blk	wht
brown	blue	black	white

WT 170
Photoelectric proximity switch energy type

Type WT 170	-N	-P
Part-No.	see table	
Scanning Range SR	10 ... 400 mm, based on standard white 90% luminance	
Light spot diameter	approx. 40 mm at a distance of 400 mm	
Beam angle	approx. 5°	
Light transmitter	LED, visible red light	
Supply voltage V_S [1]	10 to 30 V DC	
Current consumption (no load)	≦ 30 mA	
Max. residual ripple [2]	± 10 %	
Light receiver switching type [3]	Light/dark switchover via control lead	
Switching outputs open collector	NPN	PNP
Signal voltage HIGH	approx. V_S	V_S – (≦ 1.5 V)
Signal voltage LOW	≦ 1.5 V	approx. 0 V
Max. output current	≦ 100 mA	
Response time; switching frequency	0.7 ms max.; 700/s min.	
VDE protection class	III	
Type of protection (IEC 144)	IP 67	
Protection circuits [4]	A, B, C, D	
Ambient operating temperature T_U	– 25 to + 55 °C	
Storage temperature T_L	– 40 to + 70 °C	
Connecting lead	2 m, 4 x 0.2 mm², ø 4.0 mm	
Connector socket	M 8, 4 pole	
Weight	25 g with connector socket, 66 g with 2 m lead	

1) Limit values
2) Must not exceed or fall below V_S tolerances
3) Control line open
NPN: light / PNP: dark switching
Control line + V: light /
Control line 0 V: dark switching
4) A = V_S connections non-interchangeable
B = Inputs/outputs non-interchangeable
C = Spurious pulse suppression
D = Outputs short-circuit and overcurrent-protected

Selection table

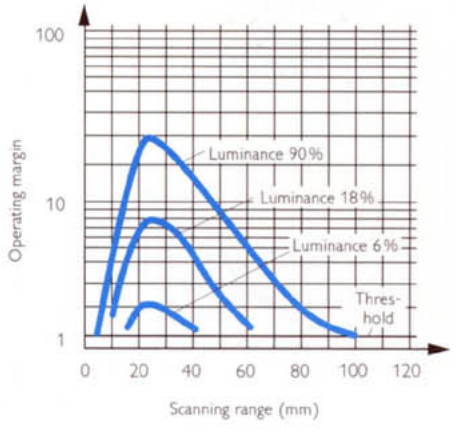
	Switching output	
	NPN	PNP
with connecting cable 2 m		
Type	WT 170-N 132	WT 170-P 132
Part-No.	6 010 199	6 010 197
with connector socket M 8, 4 pole		
Type	WT 170-N 430	WT 170-P 430
Part-No.	6 010 200	6 010 198

Scanning range

10 to 90 mm

Features:

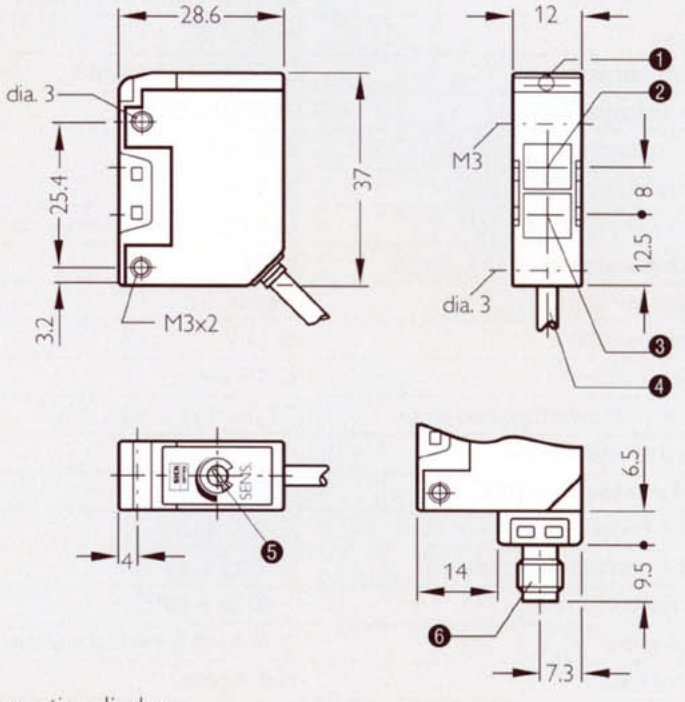
- Focused proximity switch with background suppression and high sensitivity
- Variable sensitivity (270°)
- LED light transmitter, visible red light
- Robust stainless steel/plastic enclosure
- Switching output protected against short-circuits and overload
- Reverse polarity protected
- Easy to adjust (with red receiver display
- Light/dark setting – switchover via control line
- UL approval
- Connecting cable or connector socket M 8, 4-pole



WT 170

WT 170 -P/N 112

Dimensions in mm



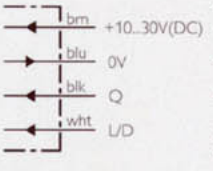
WT 170 -P/N 410

❶ Red reception display
❷ Reception axis
❸ Transmission axis
❹ Connecting lead
❺ Sensitivity selector (270°)
❻ Connector socket M 8, 4-pole

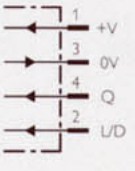
See accessories for line sockets and cable couplers.
Retaining bracket in scope of supply, see accessories.

Connection diagram

WT 170 -P/N 112

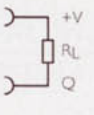


WT 170 -P/N 410

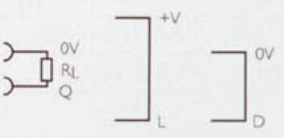


L/D = control line

N



P



light switching dark switching

brn	blu	blk	wht
brown	blue	black	white

WT 170
Photoelectric proximity switch with background suppression

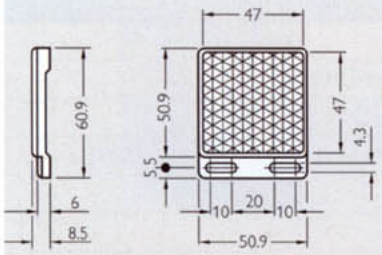
Type WT 170	-N	-P
Part-No.	see table	
Scanning range TW	10 to 90 mm, object with 90% luminance (as per DIN 5033)	
	15 to 35 mm, object with 6% luminance (as per DIN 5033)	
Background suppression	from approx. 120 mm onwards, background with 90% luminance (as per DIN 5033)	
Light spot diameter	approx. 3.5 mm at a distance of 40 mm	
Beam angle	focus 40 mm	
Light transmitter	LED, visible red light	
Supply voltage V_S [1]	10 to 30 V DC	
Current consumption (no load)	≦ 30 mA	
Max. residual ripple [2]	± 10 %	
Light receiver switching type [3]	Light/dark switchover via control lead	
Switching outputs open collector	NPN	PNP
Signal voltage HIGH	approx. V_S	V_S – (≦ 1.5 V)
Signal voltage LOW	≦ 1.5 V	approx. 0 V
Max. output current	≦ 100 mA	
Response time; switching frequency	0.7 ms max.; 700/s min.	
VDE protection class	III	
Type of protection (IEC 144)	IP 67	
Protection circuits [4]	A, B, C, D	
Ambient operating temperature T_U	– 25 to + 55 °C	
Storage temperature T_L	– 40 to + 70 °C	
Connecting lead	2 m, 4 x 0.2 mm², ø 4.0 mm	
Connector socket	M 8, 4-pole	
Weight	25 g with connector socket, 66 g with 2 m lead	

1) Limit values
2) Must not exceed or fall below V_S tolerances
3) Control line open
NPN: light / PNP: dark switching
Control line + V: light /
Control line 0 V: dark switching
4) A = V_S connections non-interchangeable
B = Inputs/outputs non-interchangeable
C = Spurious pulse suppression
D = Outputs short-circuit and overcurrent-protected

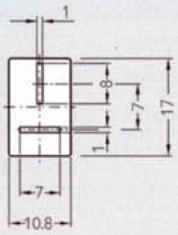
Selection table

	Switching output	
	NPN	PNP
with connecting cable 2 m		
Type	WT 170-N 112	WT 170-P 112
Part-No.	6 010 195	6 010 193
with connector socket M 8, 4-pole		
Type	WT 170-N 410	WT 170-P 410
Part-No.	6 010 196	6 010 194

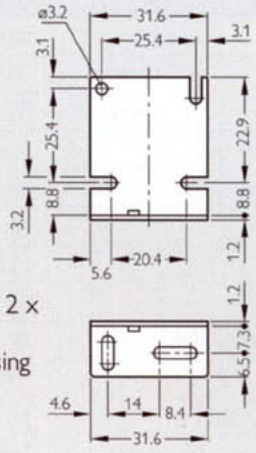
Accessories



Reflector PL 250 contained in scope of supply of WL 170
Part-No. 5 304 812

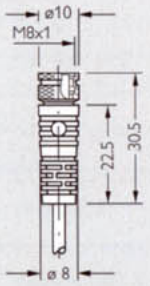


Slotted mask BL-17-10
Part-No. 5 305 687, scope of supply: 2 x
Mounted with self-adhesive back.
For detecting small objects or increasing the switching accuracy.

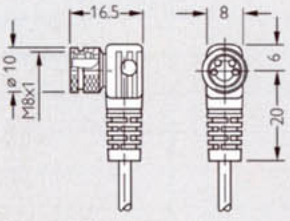


Retaining bracket
BF-W 170
Part-No. 5 305 686
for WS/WE 170,
WL 170 and WT 170
contained in scope of supply

Line sockets M 8, 4-pole, with screwed connection and connecting lead
Contact assignment as per EN 50044



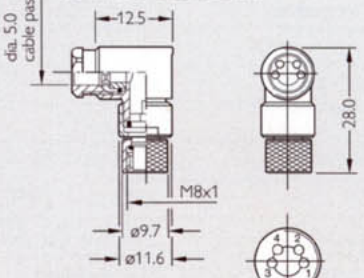
2 m: straight
6 009 870
5 m: straight
6 009 872



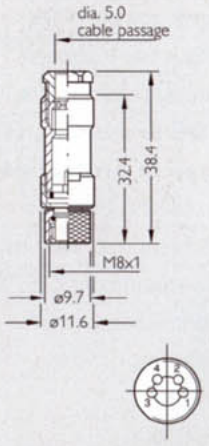
Line socket, offset
6 009 871 with 2 m lead
6 009 873 with 5 m lead

1 = brown
2 = white
3 = blue
4 = black

Line socket M 8, 4-pole preassembled for lead dia. 3.5 – 5 mm with screwed connection



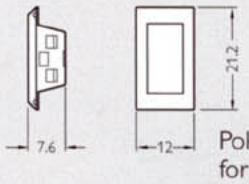
Line socket, straight:
Part-No. 6 009 975



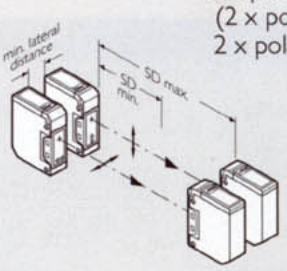
Line socket, straight:
Part-No. 6 009 974

Operating ranges and minimum lateral mounting distance for 2 x WS/WE 170

Accessories	Max. operating range	Min. lateral mounting distance	Min. mounting distance	Min. lateral mounting distance
Without attachments	7 m	> 450 mm	250 mm	< 125 mm
Slotted mask BL 170-10 Part-No. 5 305 687	1 m	> 60 mm	150 mm	< 30 mm
Polarisation filter attachment BL 170-Polf. Part-No. 5 305 688	3 m	No mutual interference	0 mm	No mutual interference
Slotted masks mounted with polarisation filters	0,5 m	No mutual interference	0 mm	No mutual interference



Polarisation filter attachments for horizontal and vertical polarisation BL-170-Polf.
Part-No. 5 305 688
Scope of supply: 4 x
(2 x polarisation in X axis,
2 x polarisation in Y axis)



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