OPT Series Contrast Sensors

Overview and Selection

Features

- White light emission
- 12–40 mm sensing distance
- 10–30 VDC supply voltage
- -25–60°C [-13°–140°F] temperature range
- NPN or PNP
- 5kHz or 25kHz switching frequency
- Plastic housing
- Teach-in sensitivity adjustment
- 4-pin M8 or 8-pin M12 quick-disconnect
- IP67
- Purchase cable separately
- Mounting brackets also available

Part Number	Price	Sensing Range	Spot Dimension	Switching Frequency	Output State	Logic	Connection	Wiring	Dimensions
OPT2024	$100.00	12 - 18 mm [0.47 - 0.71 in]	1.5 x 2.5 mm	5kHz	NO	PNP	4-pin M12 quick-disconnect	Diagram 1	Figure 1
OPT2025	$100.00					NPN		Diagram 2	
OPT2026	$185.00	12 - 16 mm [0.47 - 0.63 in]	0.7 x 2mm	25kHz	NO and NC Complementary	PNP	8-pin M12 quick-disconnect	Diagram 3	Figure 2
OPT2027	$185.00					NPN			
OPT2028	$185.00	30 - 40 mm [1.18 - 1.57 in]	1.4 x 4mm			PNP			
OPT2029	$185.00					NPN			

The title row of the table reads: **OPT Series Contrast Sensors Selection Chart**

Wiring diagrams

Diagram 1

Diagram 2

Connectors

4-Pin M12 connector   8-Pin M12 connector
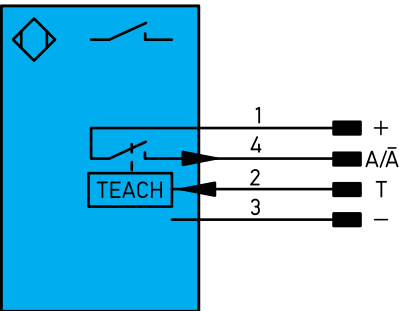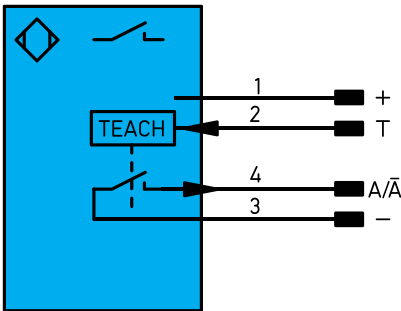
Diagram 3
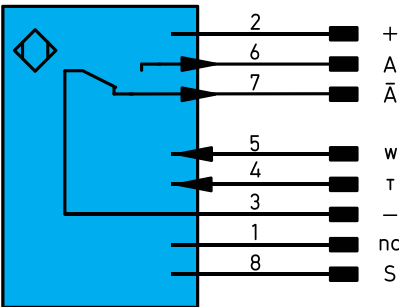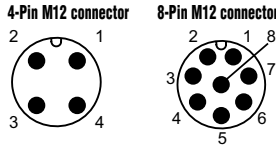
Legend	
+	Supply Voltage +
-	Supply Voltage 0V
A	Switching Output (NO)
Ā	Switching Output (NC)
A/Ā	Switching Output (NO/NC)
T	Teach Input
W	Trigger Input
nc	Not connected
S	Shielding

OPT Series Contrast Sensors

Specifications

OPT Series Contrast Sensors Specifications						
	OPT2024	OPT2025	OPT2026	OPT2027	OPT2028	OPT2029
Sensing distance	12 - 18 mm [0.47 - 0.71 in]		12 - 16 mm [0.47 - 0.63 in]		30 - 40 mm [1.18 - 1.57 in]	
Spot diameter	1.5 x 2.5 mm		0.7 x 2 mm		1.4 x 4 mm	
Spot orientation	Vertical					
Emission	White light LED 400 to 700 nm					
Sensitivity	Teach in via pushbutton					
Output	PNP	NPN	PNP	NPN	PNP	NPN
Output type	NO		NO/NC Complementary			
Operating voltage	10–30 VDC					
No-load supply current	< 30mA		< 50mA			
Operation (load) current	200mA	100mA	200mA	100mA	200mA	100mA
Voltage drop	< 2.5 V		1.5 V			
Switching frequency	5kHz		25kHz			
Response time	100μs		20μs			
Temperature drift	< 2%		< 1%			
On/Off delay	20ms (off delay only)		0 to 100 ms			
Reverse polarity protection	Yes					
Short circuit protection	Yes					
Temperature range	-25 to 60°C [-13 to 140°F]					
Degree of protection	IP67					
Housing material	Plastic					
Shock	EN60068-2-27					
Vibration	EN60068-2-6					
Connection	4-pin M12		8-pin M12			
Agency Approval	CE cULus E189727					

Note: To obtain the most current agency approval information– see the Agency Approval Checklist section on the specific part number's web page.

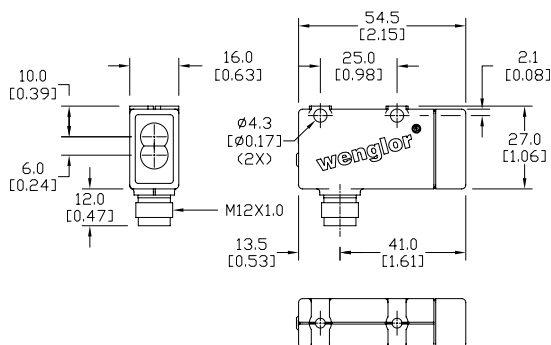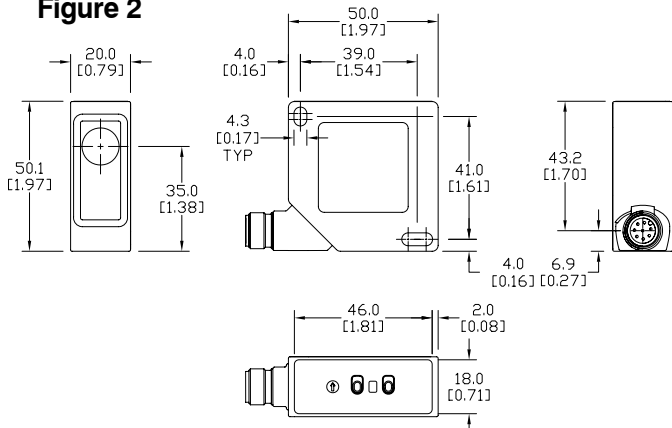## Dimensions mm [inches]

Figure 1

Figure 2

See our website: www.AutomationDirect.com for complete Engineering drawings.

Contrast Print Mark Sensors

Contrast sensors bridge the gap between photo-electric sensors and vision systems when a very fast and precise detection response time is needed; they are designed to detect slight differences of similar colors. Photoelectric sensors only detect the amount of reflected light, while contrast or print mark sensors detect differences in the frequency of the reflected light, often corresponding to a "target color" and a "background color".

The sensor typically uses a threshold that is halfway between the target and the background, and reflected light above the threshold triggers one state, while anything below the threshold triggers the opposite state.

Some contrast sensors (such as our Datalogic models) emit RGB (Red, Green, Blue) light, and the built-in receiver evaluates the reflected light. Datalogic contrast sensors automatically select the optimal color light source for an application based on the colors of the target and background - usually determined using the "teach function". Other contrast sensors (such as our Wenglor line) emit white light and evaluate the reflected light in a similar fashion. The Wenglor sensors also use a teach-in function for setting the target and background colors.

While detecting print marks (lines or boxes of solid color in the margins of printed material) as shown in the image on the right is one typical application, there are many other applications: presence detection of tamper-proof seals, shrink-wrap seals, inserts, labels, or even barcode stickers (without needing to read the actual bar code).
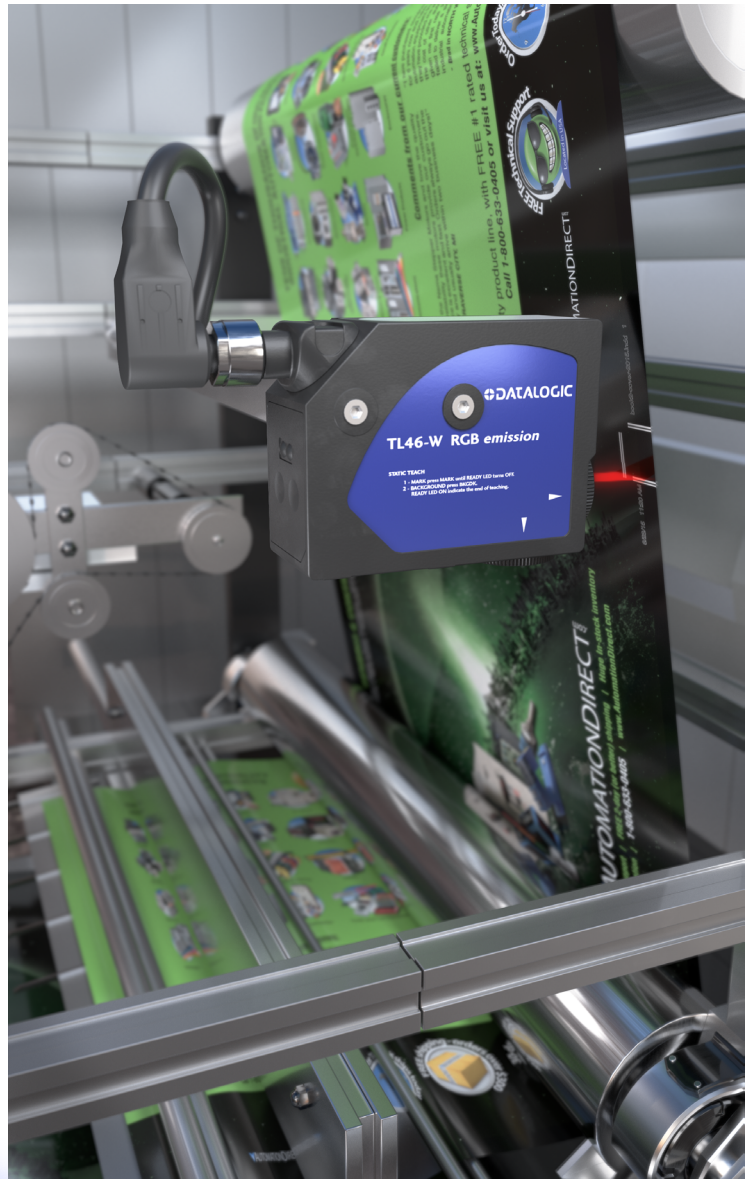
- RGB or white light emission
- Vertical or horizontal spot orientation
- 6 - 40mm sensing distance
- Selectable Light On / Dark On output state
- NPN or PNP logic
- Switching frequencies from 5-50kHz
- Teach-in sensitivity adjustment
- IP67 or IP67/IP69K rating
- 2-year warranty

Accessories for OPT2024-OPT2025 Photoelectric Sensors

Right-Angle Mounting Brackets

Mounting bracket, right angle, steel and nickel plated. For use with OPT2024-OPT2025 photoelectric sensors.

Mounting Brackets for OPT Series Photoelectric Sensors				
Part Number	Price	Description	Qty.	Weight
OPT2034	$5.75	Right-angle mounting bracket, vertical adjustment, steel and nickel plated. For use with OPT2024 & OPT2025 photoelectric sensors.	1	38g [1.3404 oz]
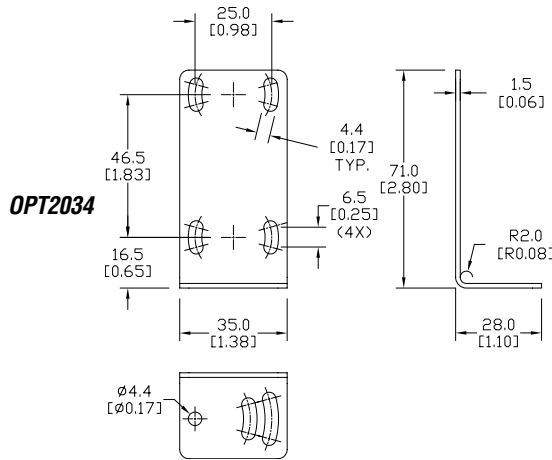
OPT2034

Right-angle Swivel Mounting Systems

Mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 12mm rod mount. For use with OPT2024-OPT2025 photoelectric sensors. Available in all 304 stainless steel or with an aluminum mounting head and 304 stainless steel mounting plate.

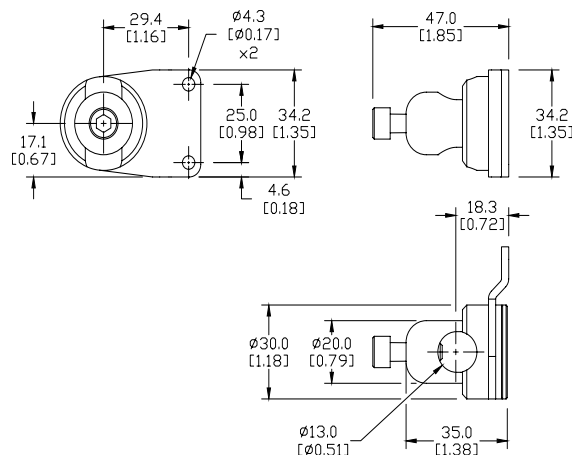| Accessories for 25mm Sensors					
Part Number	Price	Description	Mounting Head	Mounting Plate	Weight [lb]
OPT2124	$9.50	Mounting bracket, right-angle swivel, 360 vertical and horizontal adjustment, aluminum, 12mm rod mount. For use with OPT2024-OPT2025 photoelectric sensors.	Aluminum	304 Stainless Steel	0.15
OPT2125	$16.00	Mounting bracket, right-angle swivel, 360 vertical and horizontal adjustment, 304 stainless steel, 12mm rod mount. For use with 2OPT2024-OPT2025 photoelectric sensors.	304 Stainless Steel	304 Stainless Steel	0.27

Note: 304 Stainless steel mounting rods sold separately: OPT2109 (200mm length), OPT2110 (300mm length), and OPT2111 (500mm length).

Dimensions
mm [inches]

OPT2124, OPT2125

See our website: www.AutomationDirect.com for complete engineering drawings

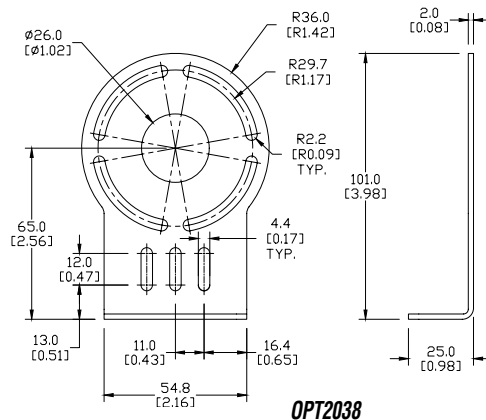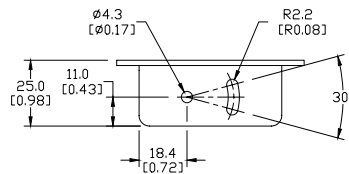# Accessories for OPT Series 50x50mm Photoelectric Sensors

Right-angle Brackets

Mounting bracket, right-angle, nickel-plated steel or 304 stainless steel.
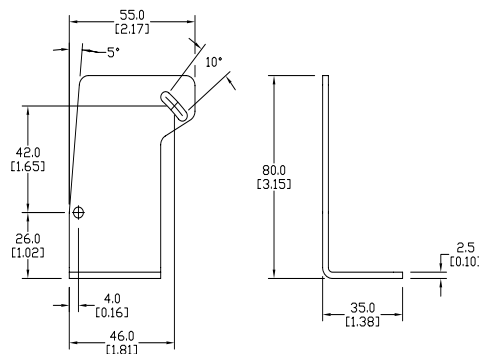For use with OPT series 50x50mm photoelectric sensors.

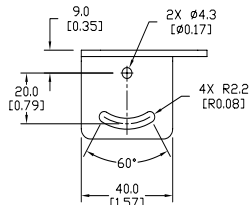| Accessories for OPT2001 - OPT2011 Sensors			
Part Number	Price	Description	Weight [lb]
OPT2031	$5.75	Mounting bracket, right-angle, nickel-plated brass. For use with OPT series 50x50mm photoelectric sensors.	0.24
OPT2038	$9.00	Mounting bracket, right-angle, vertical and horizontal adjustment, 304 stainless steel. For use with OPT series 50x50mm photoelectric sensors.	0.19

Dimensions

mm [inches]

OPT2038

OPT2031

Accessories for OPT Series 50x50mm Photoelectric Sensors

Right-angle Swivel Mounting Systems

Mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 12mm rod mount. For use with OPT series 50x50mm photoelectric sensors. Available in all stainless steel or with an aluminum head with a stainless steel mounting plate.

| Part Number	Price	Description	Mounting Head	Mounting Plate	Weight [lb]
OPT2122	$9.50	Mounting bracket, right-angle swivel, 360 vertical and horizontal adjustment, aluminum, 12mm rod mount. For use with OPT series 50x50mm photoelectric sensors.	Aluminum	304 Stainless Steel	0.19
OPT2123	$17.00	Mounting bracket, right-angle swivel, 360 vertical and horizontal adjustment, stainless steel, 12mm rod mount. For use with OPT series 50x50mm photoelectric sensors.	304 Stainless Steel	304 Stainless Steel	0.31

Note: 304 Stainless steel mounting rods sold separately: OPT2109 (200mm length), OPT2110 (300mm length), and OPT2111 (500mm length).

OPT2122, OPT2123

Dimensions

mm [inches]
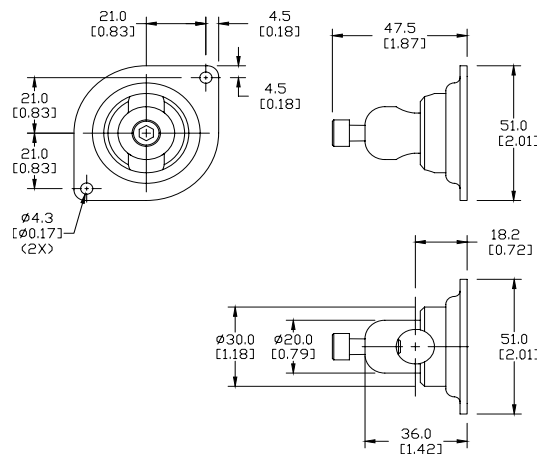
See our website: www.AutomationDirect.com for complete engineering drawings

Mounting Rods

Mounting Rods

304 Stainless steel rods for mounting swivel brackets OPT2112 - OPT2127. Available in three lengths: 200mm, 300mm, and 500mm. 12mm diameter.

Mounting Rods for OPT2112-2127 Swivel Mounting Brackets				
Part Number	Price	Description	Weight lb (g)	
OPT2109	$10.50	Mounting rod, 12mm diameter, 200mm length, 304 stainless steel.	0.41 (185.97)	
OPT2110	$13.00	Mounting rod, 12mm diameter, 300mm length, 304 stainless steel.	0.60 (272.16)	
OPT2111	$17.00	Mounting rod, 12mm diameter, 500mm length, 304 stainless steel.	0.98 (444.52)	

OPT2109, OPT2110, OPT2111

Dimensions

mm [inches]

Ø12.0 [0.47]

OPT2109 = 200mm
OPT2110 = 300mm
OPT2111 = 500mm

1×45°
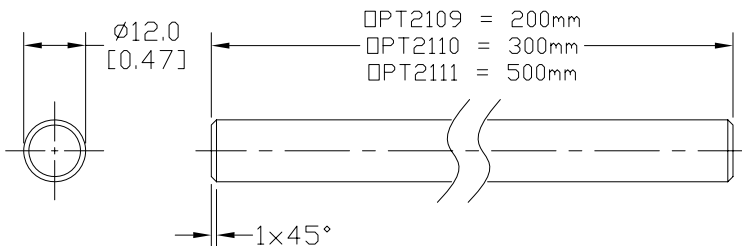
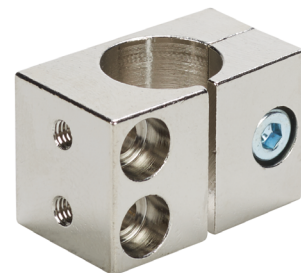## Right-angle Mounting Bracket

Mounting bracket, right-angle, nickel-plated brass. For use with 12mm mounting rods OPT2109, OPT2110 & OPT2111.

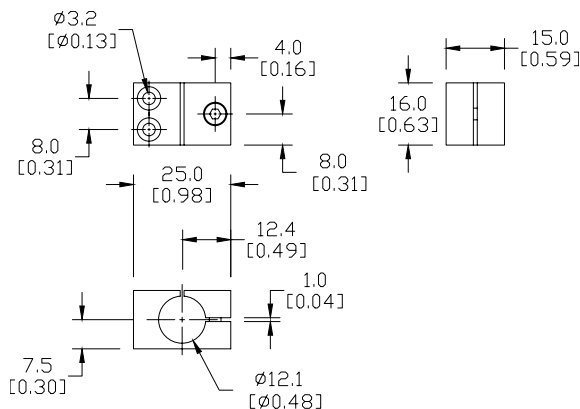| Accessories for 12mm Sensors				
Part Number	Price	Description	Weight lb (g)	
OPT2108	$13.00	Mounting bracket, right-angle, nickel-plated brass. For use with 12mm mounting rods OPT2109, OPT2110 & OPT2111.	0.07 (31.8)	

OPT2108

Dimensions

mm [inches]

Ø3.2 [Ø0.13]

4.0 [0.16]

15.0 [0.59]

16.0 [0.63]

8.0 [0.31]

25.0 [0.98]

8.0 [0.31]

12.4 [0.49]

1.0 [0.04]

7.5 [0.30]

Ø12.1 [Ø0.48]