

OPT Series Transit Time Photoelectric Sensors

Rectangular Plastic Distance Sensors



OPT2010, OPT2015, OPT2019

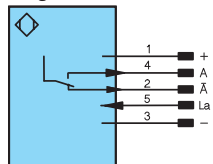
- Diffuse and Retro-reflective (Transit time) laser distance measurement sensors
- Analog and switching outputs available
- Measured value independent of material, color, and brightness
- Class 1 and 2 lasers available (safety label included with Class 2 lasers)
- M12 quick-disconnect and pigtail versions; order cable separately
- Mounting hardware included

OPT Series Photoelectric Sensors Selection Chart										
Part Number	Price	Working Range m [ft]	Laser Class	Function	Measurement Rate	Resolution	Output State	Connection	Wiring	Dims (mm)
Diffuse (Transit Time)										
OPT2010	\$269.00	0 - 3 [0 - 9.84]	1	Switching	1kHz	Hysteresis < 15mm	Complementary (N.O./N.C.) PNP	5-pin M12 quick-disconnect	Diagram 1	50 x 50 x 50
OPT2011	\$318.00	0.05 - 3.05 [0.16 - 10.01]		Measuring /	500/s [2ms]	1mm [0.04 in]	Analog 4-20 mA or 0-10 VDC	4-pin M12 quick-disconnect	Diagram 2	
OPT2012	\$345.00	0.2 - 6.2 [0.66 - 20.34]		Switching	1-100/s [10ms]	1-12 mm [0.04 - 0.47 in]		Switching PNP/NPN (N.O./N.C.)	8-pin M12 quick-disconnect	Diagram 3
OPT2013	\$605.00	0.1 - 10.1 [0.33 - 33.14]	2	Switching	1-100/s [10ms]	1-12 mm [0.04 - 0.47 in]	Switching PNP/NPN (N.O./N.C.)	4-pin M12 quick-disconnect	Diagram 4	55 x 81 x 30
OPT2014	\$361.00							4-pin M12 quick-disconnect	Diagram 3	
OPT2016	\$269.00	0 - 1 [0 - 3.28]	1	Switching	1kHz	Hysteresis < 20mm	Complementary (N.O./N.C.) PNP	4-pin M8 quick-disconnect	Diagram 5	22 x 32 x 12
OPT2017	\$269.00							4-pin M12 quick-disconnect, 200mm [7.87 in] cable		
OPT2018	\$269.00							4-pin M8 quick-disconnect, 200mm [7.87 in] cable		
OPT2019	\$269.00							Pigtail, 2m [6.5 ft] cable		
Retro-Reflective (Transit Time)										
OPT2015*	\$713.00	0.2 - 100.2 [0.66 - 328.74]	1	Measuring/Switching	1-100/s [10ms]	4-20 mm [0.16 - 0.79 in]	Analog 4-20 mA or 0-10 VDC Switching PNP/NPN (N.O./N.C.)	8-pin M12 quick-disconnect	Diagram 4	55 x 81 x 30

*Requires purchase of OPT2030 reflector (see Accessories). <50m sensing distance requires 1 reflector. 50-100m sensing distance requires 4 reflectors.

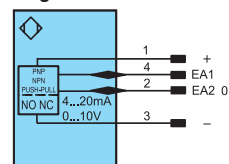
Wiring Diagrams

Diagram 1



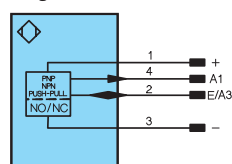
+ Supply Voltage "+"
- Supply Voltage "0 V"
A Switching output (NO)
A-bar Switching output (NC)
La Emitted light can be switched off

Diagram 2



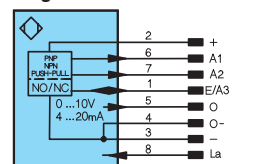
+ Supply Voltage "+"
- Supply Voltage "0 V"
O Analog output
EA1/ EA2 Output/Input programmable

Diagram 3



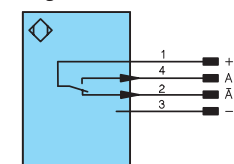
+ Supply Voltage "+"
- Supply Voltage "0 V"
E/A3 Input/Output programmable
A1 Switching Output (NO)

Diagram 4



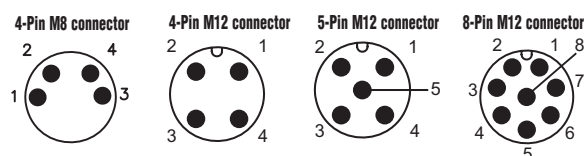
+ Supply Voltage "+"
- Supply Voltage "0 V"
La Emitted light can be switched off
O Analog output
O-bar Ground for the Analog output
E/A3 Input/Output programmable
A1/A2 Switching Output (NO)

Diagram 5



+ Supply Voltage "+"
- Supply Voltage "0 V"
A Switching output (NO)
A-bar Switching output (NC)

Connectors



Note: Class 2 power source required

Switching Element Function		
	Thru-Beam and Reflective Models	Diffuse Models
Light-on	N.C.	N.O.
Dark-on	N.O.	N.C.

OPT Series Transit Time Photoelectric Sensors

OPT Series Transit Time Photoelectric Sensors Specifications											
	OPT2016	OPT2017	OPT2018	OPT2019	OPT2010	OPT2011	OPT2012	OPT2013	OPT2014	OPT2015	
Type	Diffuse (Transit time)									*Retro-Reflective	
Sensing distance – m [in]	1 [39.37]			3 [118.11]		3.05 [120.08]		6.2 [244.09]		10.1 [397.64]	100.2 [3944.90]
Light spot diameter (at maximum range)	< 15mm			9mm			< 12mm		< 20mm		80mm @ 40m < 200mm @ 100m
Laser class (EN 60825-1)	Class 1 Red Laser			Class 1 Red Laser			Class 2 Red Laser		Class 1 Red Laser		
Emission	680nm			660nm							
Sensitivity	Adjustable via Potentiometer			Adjustable via Teach							
Output type	PNP N.O./N.C.				Programmable: Analog 4-20 mA/0-10 VDC, N.O./N.C. PNP/NPN						
Current output max load	N/A				500Ω						
Operating voltage	10-30 VDC				18-30 VDC						
No load supply current	< 30mA			< 50mA		< 70mA		< 100mA			
Operating (load) current	100mA			200mA		100mA		200mA			
Voltage drop	< 2.5 V (switching outputs)										
Measurement rate	N/A				500/s		1-100/s				
Switching frequency	1000Hz				250Hz		50Hz				
Linearity	< 2.5%			NA			0.2 %		0.05%		
Short-circuit protection	Yes										
Operating temperature	-40°C to 50°C [-40°F to 122°F]			-40°C to 60°C [-40°F to 140°F]		-40°C to 50°C [-40°F to 122°F]		-25°C to 60°C [13°F to 140°F]			
Protection degree (DIN 40050)	IP67			IP68							
LED indicators - switching status	Yellow				Screen Display						
LED indicators - power	Green				Screen Display						
Housing material	Polycarbonate										
Lens material	Poly(methyl methacrylate) (PMMA)										
Shock/vibration	Tested according to EN 60068-2-6 / EN 60068-2-27										
Tightening torque	0.5 N-m (mounting screws)										
Weight (cable/connector)	8g [0.28 oz]	22g [0.78 oz]	16g [0.56 oz]	48g [1.69 oz]	37g [1.31 oz]	43g [1.52 oz]	81g [2.86 oz]	82g [2.89 oz]	80g [2.82 oz]	82g [2.89 oz]	
Connectors	4-pin M8	4-pin M12	4-pin M8	Pigtail	5-pin M12	4-pin M12		8-pin M12	4-pin M12	8-pin M12	
Agency approvals	CE, cULUS, E189727, RoHS										
*Requires purchase of OPT2030 reflector (see Accessories). <50m sensing distance requires 1 reflector. 50-100m sensing distance requires 4 reflectors.											

IMPORTANT NOTE

The Laser Classification Systems for the standards IEC (EN) 60825-1 defines the following safety classes:

Class 1

This class is eye-safe under all operating conditions.

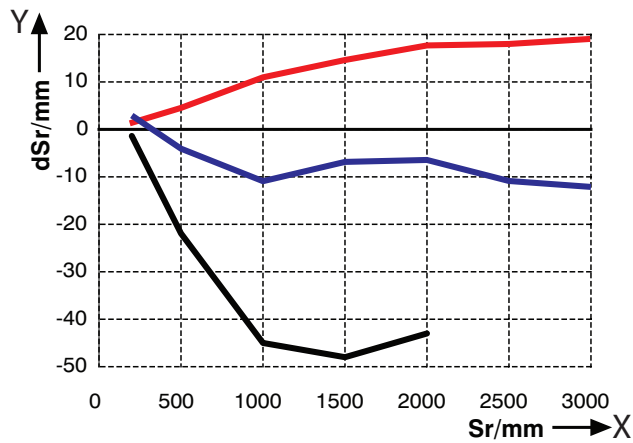
Class 2

These are visible lasers. This class is safe for accidental viewing under all operating conditions. However, it may not be safe for a person who deliberately stares into the laser beam for longer than 0.25 seconds, by overcoming their natural aversion response to the very bright light.

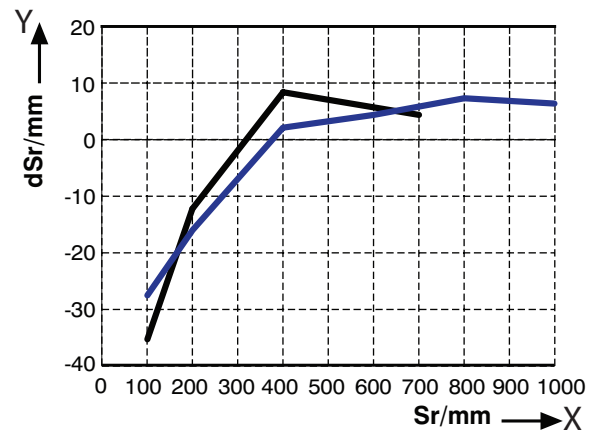
OPT Series Transit Time Photoelectric Sensors

Characteristic Curves

OPT2010



**OPT2016, OPT2017
OPT2018, OPT2019**



Sr = Switching Distance

dSr = Switching Distance Change

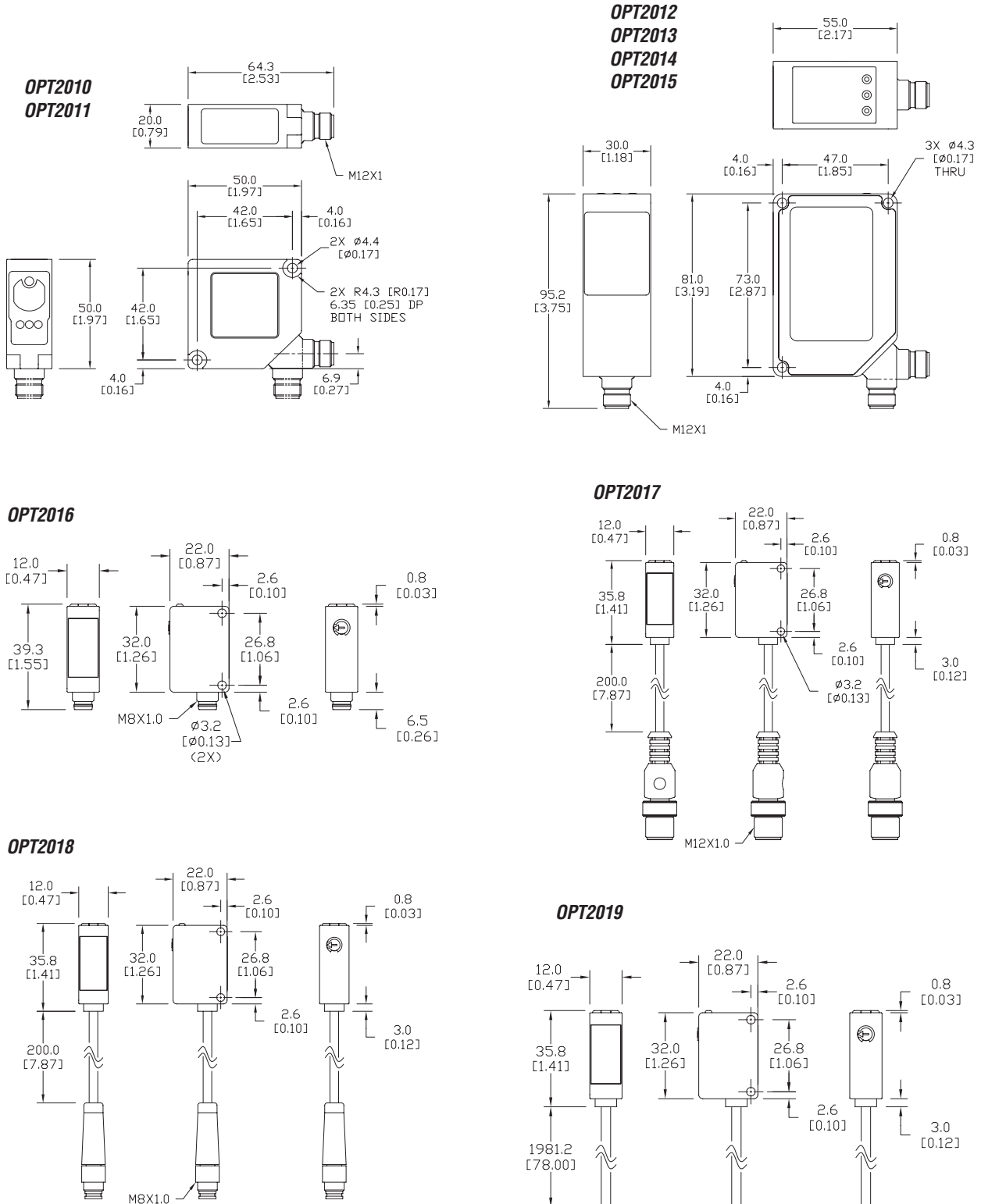
- black 6 % remission
- blue 18 % remission
- Brushed aluminum

X	Distance to target [mm]
Y	Minimum distance between object and background [mm]

Typical curves based on Kodak white (90% remission)

OPT Series Transit Time Photoelectric Sensors

Dimensions mm [inches]



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Accessories for OPT2016 - OPT2019 Photoelectric Sensors

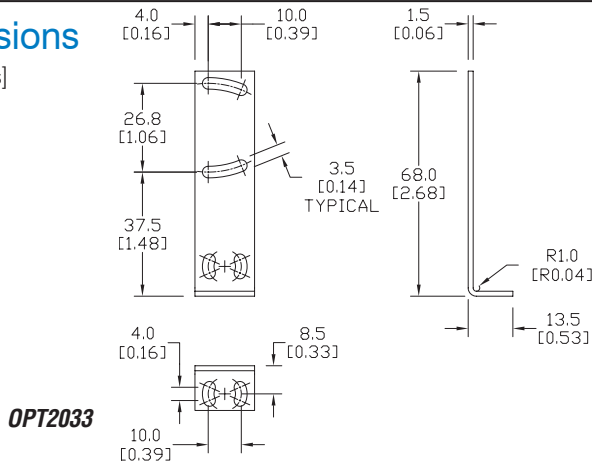
Right-Angle Mounting Brackets

Mounting bracket, right angle, vertical adjustment. For use with OPT series 32x12mm photoelectric sensors.

Mounting Brackets for OPT Series Photoelectric Sensors				
Part Number	Price	Description	Qty.	Weight
OPT2033	\$6.00	Wenglor mounting bracket, right-angle, vertical adjustment, nickel plated steel. For use with OPT series 32x12mm photoelectric sensors.	1	16g [0.564 oz]

Dimensions

mm [inches]



OPT2033

Right-angle Swivel Mounting Systems

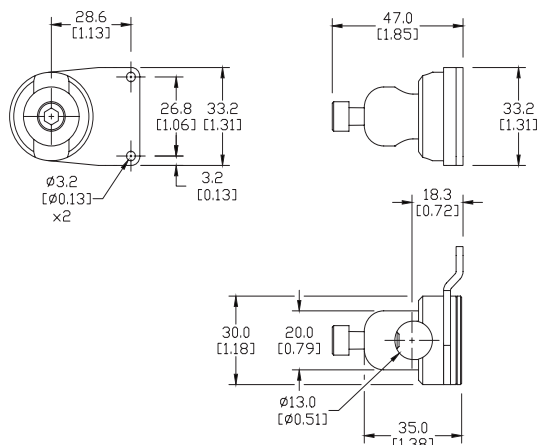
Mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, aluminum, 12mm rod mount. For use with OPT series 32x12mm photoelectric sensors.

Accessories for 26.8mm Sensors					
Part Number	Price	Description	Mounting Head	Mounting Plate	Weight [lb]
OPT2120	\$9.75	Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, aluminum, 12mm rod mount. For use with OPT series 32x12mm photoelectric sensors.	Aluminum	304 Stainless Steel	0.14
OPT2121	\$17.50	Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 304 stainless steel, 12mm rod mount. For use with OPT series 32x12mm 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]



OPT2120, OPT2121

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

Accessories for OPT2012 - OPT2015 Photoelectric Sensors

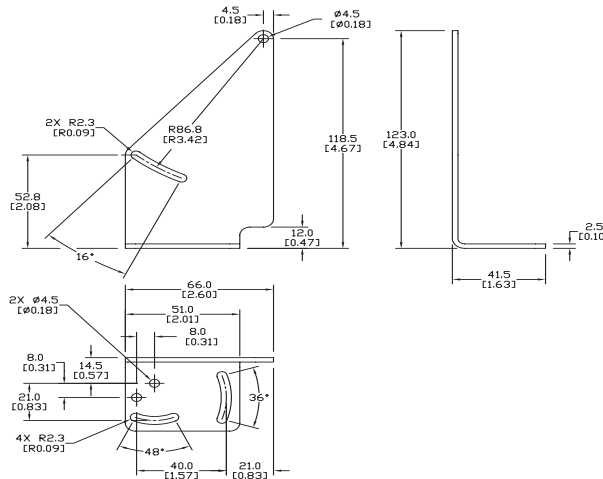
Right-angle Mounting Bracket

Mounting bracket, right-angle, nickel-plated brass. For use with OPT2012 - OPT2015 photoelectric sensors.

Accessories for OPT2012-OPT2015 Photoelectric Sensors			
Part Number	Price	Description	Weight (lb)
OPT2032	\$6.00	Wenglor mounting bracket, right-angle, nickel plated brass. For use with OPT2012 - OPT2015 photoelectric sensors.	0.36

Dimensions

mm [inches]



OPT2032

Right-angle Swivel Mounting Systems

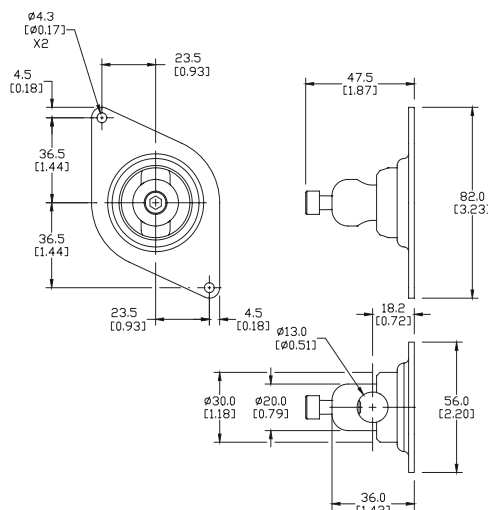
Mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 12mm rod mount. For use with OPT2012 - OPT2015 photoelectric sensors. Available in all stainless steel or with an aluminum head with a stainless steel mounting plate.

Accessories for OPT2012-OPT2015 Photoelectric Sensors					
Part Number	Price	Description	Mounting Head	Mounting Plate	Weight (lb)
OPT2126	\$9.75	Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, aluminum, 12mm rod mount. For use with OPT2012 - OPT2015 photoelectric sensors.	Aluminum	304 Stainless Steel	0.23
OPT2127	\$17.50	Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 304 stainless steel, 12mm rod mount. For use with OPT2012 - OPT2015 photoelectric sensors.	304 Stainless Steel	304 Stainless Steel	0.36

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

Dimensions

mm [inches]



OPT2126, OPT2127

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Mounting Rods

Mounting Rods

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

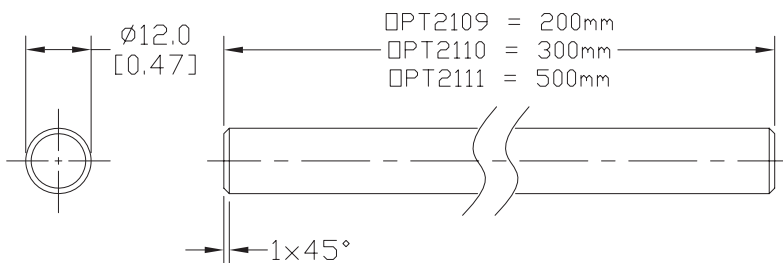
Mounting Rods for OPT2112-2127 Swivel Mounting Brackets			
Part Number	Price	Description	Weight lb (g)
OPT2109	\$11.00	Wenglor mounting rod, 12mm diameter, 200mm length, 304 stainless steel.	0.41 (185.97)
OPT2110	\$13.50	Wenglor mounting rod, 12mm diameter, 300mm length, 304 stainless steel.	0.60 (272.16)
OPT2111	\$17.50	Wenglor mounting rod, 12mm diameter, 500mm length, 304 stainless steel.	0.98 (444.52)



OPT2109, OPT2110, OPT2111

Dimensions

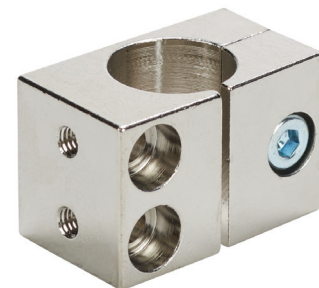
mm [inches]



Right-angle Mounting Bracket

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

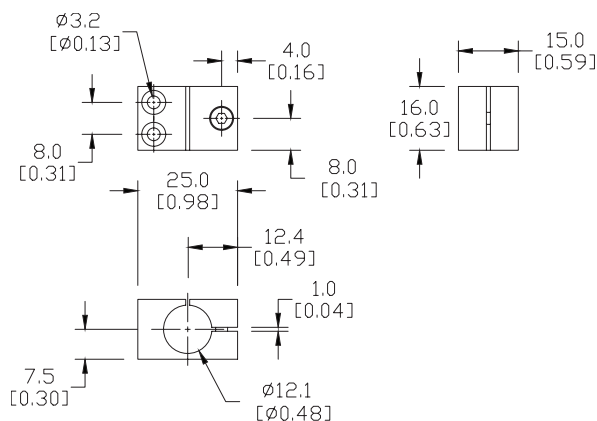
Accessories for 12mm Sensors			
Part Number	Price	Description	Weight lb (g)
OPT2108	\$13.50	Wenglor mounting bracket, right-angle, nickel plated brass. For use with 12mm mounting rods OPT2109, OPT2110 & OPT2111.	0.07 (31.8)



OPT2108

Dimensions

mm [inches]



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Reflectors

Reflector for Photoelectric Laser Sensor

Accessories for OPT Series Photoelectric Sensors			
Part Number	Price	Description	Weight [lb]
OPT2030	\$12.00	Reflector, square, 100 x 100mm. For use with photoelectric laser sensors.	0.20

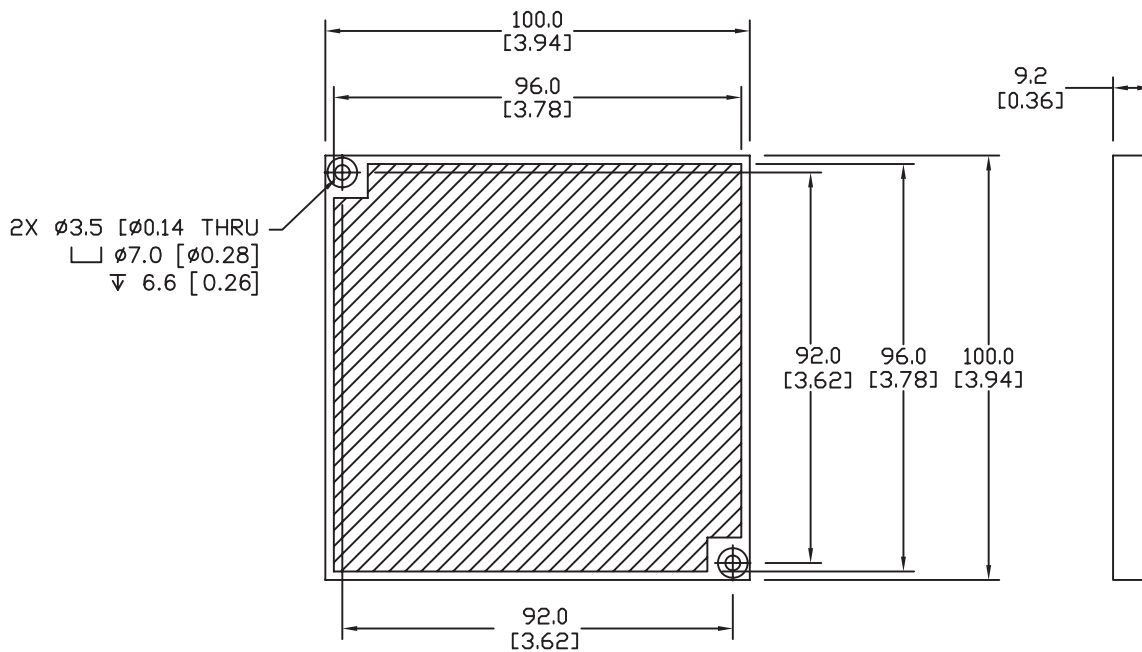
Note: OPT2015 requires purchase of OPT2030 reflector. <50m sensing distance requires 1 reflector. 50-100 m sensing distance requires 4 reflectors.



OPT2030

Dimensions

mm [inches]



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for complete engineering drawings