

# OPT Short Range (CMOS) Series Photoelectric Sensors



OPT2001

## 50 x 50 mm rectangular plastic - DC

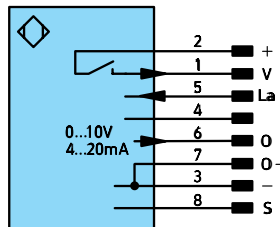
- Diffuse (Reflex) laser distance measurement sensors with CMOS technology
- Analog and switching outputs available
- Measured value independent of material, color, and brightness
- Class 1 and 2 lasers available (safety label included with Class 2 lasers)
- High resolution down to 8  $\mu\text{m}$  - (analog scalable down to 5 mm range)
- High speed response times down to 660  $\mu\text{s}$
- M12 quick-disconnect; order cable separately
- Mounting hardware included



OPT Series Photoelectric Sensors Selection Chart										
Part Number	Price	Sensing Range	Laser Class	Measurement Rate	Resolution	Output State	Logic	Connection	Wiring	Characteristic Curves
<b>Diffuse (Reflex)</b>										
OPT2001	\$629.00	30-80 mm [1.18 - 3.15 in]	2	1500/s (660 $\mu\text{s}$ )	<8 $\mu\text{m}$	Analog 4-20 mA or 0-10 V	—	8-pin M12 quick-disconnect	Diagram 1	See Characteristic Curve
OPT2002	\$629.00		1	1000/s (1000 $\mu\text{s}$ )			—			
OPT2003	\$629.00	40-160 mm [1.57 - 6.30 in]	2	1500/s (660 $\mu\text{s}$ )	<20 $\mu\text{m}$		—			
OPT2004	\$629.00		1	1000/s (1000 $\mu\text{s}$ )			—			
OPT2005	\$629.00	50-350 mm [1.97 - 13.80 in]	2	800/s (1250 $\mu\text{s}$ )	<50 $\mu\text{m}$		—			
OPT2006	\$629.00		1	500/s (2000 $\mu\text{s}$ )			—			
OPT2007	\$319.00	0 - 660 mm [0 - 25.98 in] working range 60-660 mm [2.36 - 25.98 in] adjustable range	1	100 Hz switching	Hysteresis <1 % of range	Selectable (N.O., N.C.)	5-wire, con- figurable as PNP, NPN, or Push-Pull	5-pin M12 quick-disconnect	Diagram 2	—

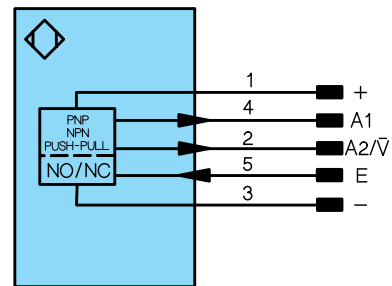
## Wiring Diagrams

Diagram 1



- + Supply Voltage "+"
- V Contamination/Error output (NO)
- O Analog output
- O- Ground for the analog output
- Supply Voltage "0 V"
- S Shielding
- La Emitted Light disengageable

Diagram 2



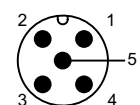
- + Supply Voltage "+"
- Supply Voltage "0 V"
- A1/A2 Switching output (NO)
- $\nabla$  Contamination Warning/  
Error Output (NC)
- E Input (Teach Input, Emitted light can  
be switched off)



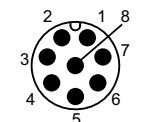
PRODUCT MANUAL AVAILABLE VIA DOWNLOAD AT  
[WWW.AUTOMATIONDIRECT.COM](http://WWW.AUTOMATIONDIRECT.COM)

## Connectors

5-Pin M12 connector



8-Pin M12 connector

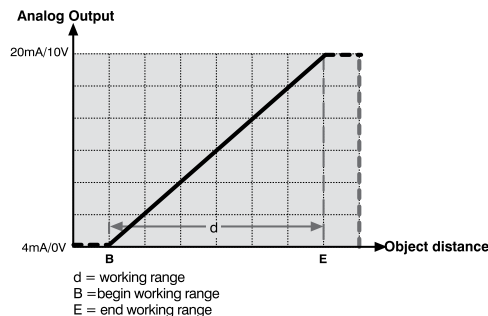


NOTE: CLASS 2 POWER SOURCE REQUIRED

# OPT Short Range (CMOS) Series Photoelectric Sensors

Specifications	OPT 2001	OPT 2002	OPT 2003	OPT 2004	OPT 2005	OPT 2006	OPT 2007
<b>Type</b>	Diffuse Reflex						
<b>Sensing Distance</b>	30-80 mm [1.18-3.15 in]	30-80 mm [1.18-3.15 in]	40-160 mm [1.57- 6.30 in]	40-160 mm [1.57- 6.30 in]	50-350 mm [1.97-13.78 in]	50-350 mm [1.97-13.78 in]	60-660 mm [2.36-25.98 in]
<b>Light Spot Diameter (at maximum range)</b>	1 x 2 mm [0.04 x 0.08 in]	0.7 x 1.4 mm [0.03 x 0.06 in]	1 x 2.5 mm [0.04 x 0.10 in]	0.9 x 1.8 mm [0.04 x 0.07 in]	1.5 x 4 mm [0.06 x 0.16 in]	1.4 x 3.1 mm [0.06 x 0.12 in]	2.0 x 5.5 mm [0.08 x 0.22 in]
<b>Emission</b>	Class 2 Red laser 660 Nm	Class 1 Red laser 660 Nm	Class 2 Red laser 660 Nm	Class 1 Red laser 660 Nm	Class 2 Red laser 660 Nm	Class 1 Red laser 660 Nm	Class 1 Red laser 655 Nm
<b>Sensitivity</b>	Adjustable via Teach						
<b>Output Type</b>	0-10 VDC or 4-20 mA; PNP error output						Complementary N.O./N.C. (Light-on, Dark-on) PNP or NPN
<b>Current Output Max Load</b>	500Ω						NA
<b>Voltage Output Min Load</b>	10 KΩ						NA
<b>Operating Voltage</b>	18-30 VDC						10-30 VDC
<b>No Load Supply Current</b>	<80 mA @ 24 VDC						<50 mA @24 VDC
<b>Operating (Load) Current</b>	max 200 mA						
<b>Off-state (Leakage) Current</b>	negligible						
<b>Voltage Drop</b>	<2.5V						<1.5V
<b>Measurement Rate/ Resolution</b>	1500/s (660 μs) @ 12 μm 600/s (1660 μs) @ 8 μm	1000/s (1000 μs) @ 12 μm 500/s (2000 μs) @ 8 μm	1500/s (660 μs) @ 30 μm 600/s (1660 μs) @ 20 μm	1000/s (1000 μs) @ 30 μm 500/s (2000 μs) @ 20 μm	800/s (1250 μs) @ 80 μm 400/s (2500 μs) @ 50 μm	500/s (2000 μs) @ 80 μm 250/s (4000 μs) @ 50 μm	NA
<b>Switching Frequency</b>	1.5 kHz	1.0 kHz	1.5 kHz	1.0 kHz	800 Hz	500 Hz	100 Hz
<b>Linearity</b>	0.1%				0.15%		NA
<b>Time Delay Before Availability (tv)</b>	NA						
<b>Short-Circuit Protection</b>	Yes						
<b>Operating Temperature</b>	-25°C to 50°C [13°F to 122°F]						-25°C to 60°C [13°F to 140°F]
<b>Protection Degree (DIN 40050)</b>	IEC IP67						IEC IP68
<b>LED Indicators - Switching Status</b>	Yellow						
<b>LED Indicators - Power</b>	Green						
<b>Housing Material</b>	Polycarbonate						
<b>Lens Material</b>	Poly(methyl methacrylate) (PMMA)						
<b>Shock/Vibration</b>	See <i>Terminology</i> section.						
<b>Tightening Torque</b>	0.5 N·m (mounting screws)						
<b>Weight (lbs) (cable/connector)</b>	0.2						
<b>Connectors</b>	M12 Quick Disconnect						
<b>Agency Approvals</b>	CE, cJULUS, E189727, RoHs						

## Characteristic Curves



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.

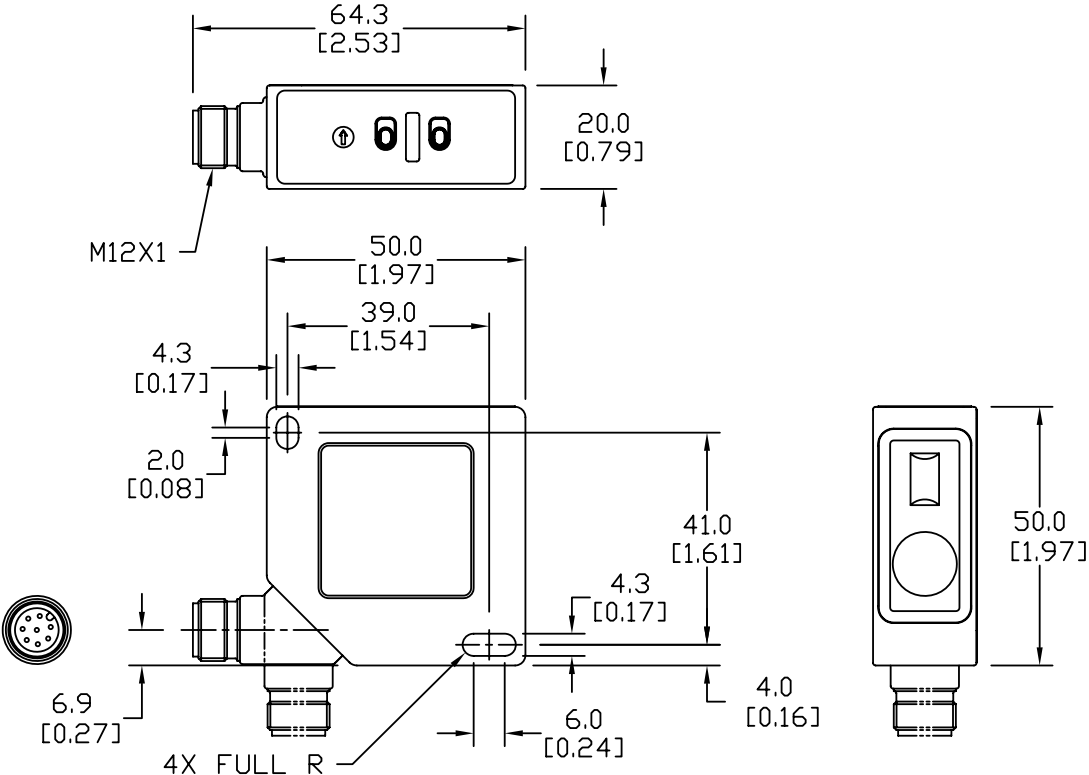
Class 2

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 s, by overcoming their natural aversion response to the very bright light.

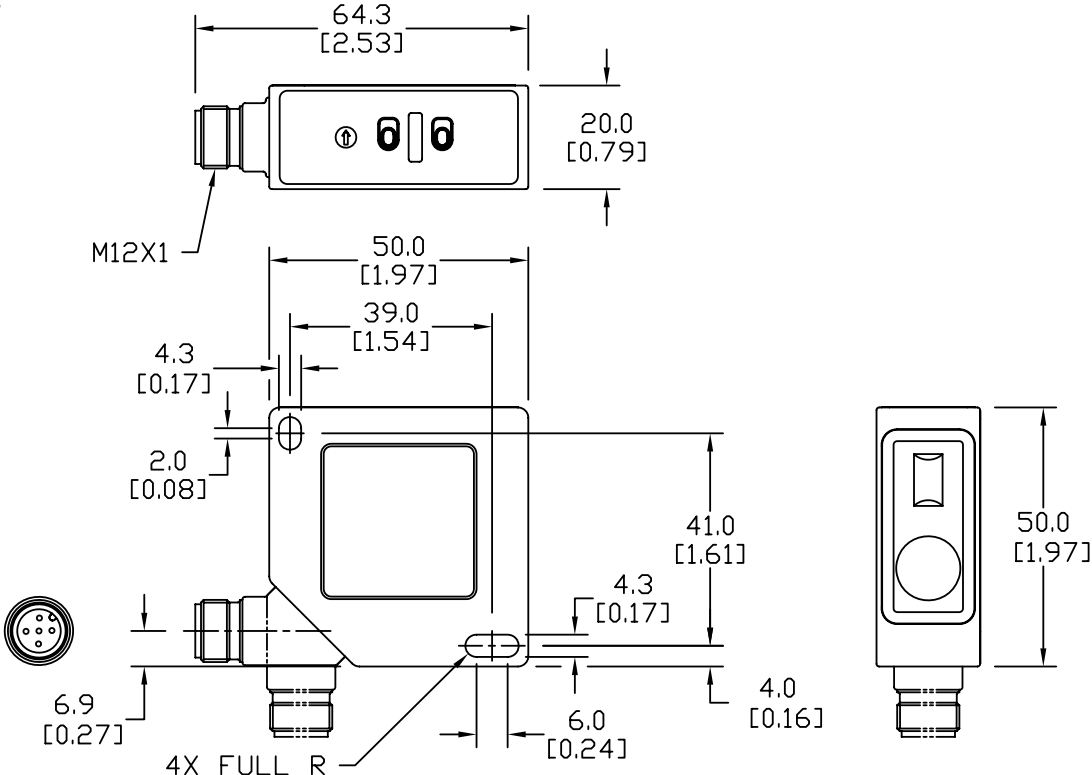
# OPT Short Range (CMOS) Series Photoelectric Sensors

## Dimensions mm [inches]

**OPT2001**  
**OPT2002**  
**OPT2003**  
**OPT2004**  
**OPT2005**  
**OPT2006**



**OPT2007**



# Accessories for OPT Series 50x50mm Photoelectric Sensors

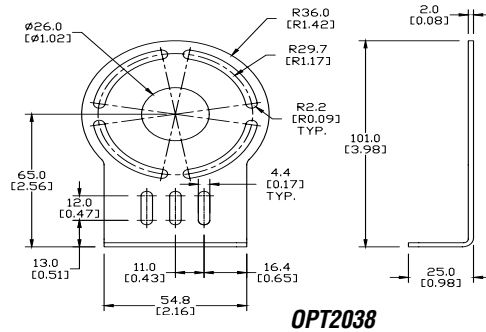
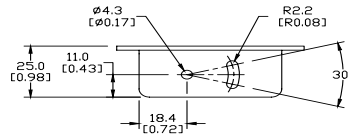
## Right-angle Brackets

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

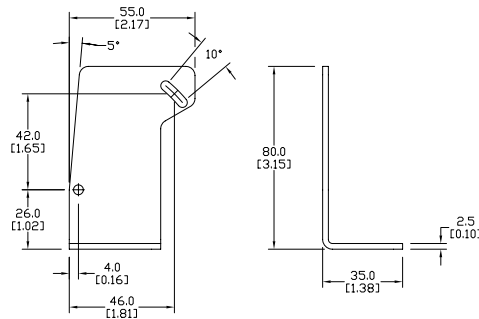
Accessories for OPT2001 - OPT2011 Sensors			
Part Number	Price	Description	Weight [lb]
<b>OPT2031</b>	\$5.50	Mounting bracket, right-angle, nickel-plated steel. For use with OPT series 50x50mm photoelectric sensors.	0.24
<b>OPT2038</b>	\$8.50	Mounting bracket, right-angle, vertical and horizontal adjustment, 304 stainless steel. For use with OPT series 50x50mm photoelectric sensors.	0.19

## Dimensions

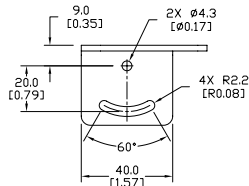
mm [inches]



**OPT2038**



**OPT2031**



**OPT2031**

See our website: [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete engineering drawings

# 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.

Accessories for OPT2001 - OPT2011 Sensors					
Part Number	Price	Description	Mounting Head	Mounting Plate	Weight [lb]
<b>OPT2122</b>	\$9.00	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
<b>OPT2123</b>	\$16.00	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

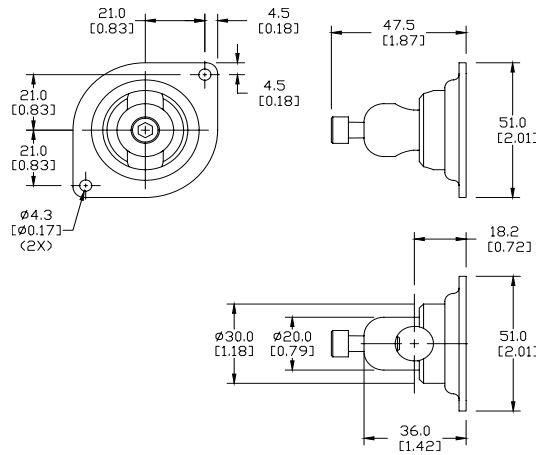
**Note:** 304 Stainless steel mounting rods sold separately: OPT2109 (200mm length), OPT2110 (300mm length), and OPT2111 (500mm length).



**OPT2122, OPT2123**

## Dimensions

mm [inches]



See our website: [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete engineering drawings