



Enhanced 50 Series Thru-beam Photoelectric Sensors

- Long sensing distances
- 13 models available
- Fiberglass-reinforced plastic housing
- Field of view: 2.4°
- Cable wires or mini/micro connector termination
- NPN/PNP, Solid-State Relay, or SPDT EM Relay outputs
- IP67 rated



1151E-6504 1251E-6504



1151E-6517 1251E-6517

Note: Cutler-Hammer parts available for sale to North America locations only.

Enhanced 50 Series Thru-beam Photoelectric Sensors Selection Chart

Part Number	Price	Voltage Range	Sensing Range	Optimum Range	Sensing Beam	Thru-Beam Component	Output Type	Connection Type	Cable Part Number				
1151E-6517	\$73.00	10 - 40 VDC	500 ft. (152 m)	0.1 to 250 ft. (0.03 to 77 m)	Infrared	Source/Emitter	N/A	6-foot cable (300V)	pre-wired 6 ft. (1.8 m)				
1251E-6517	\$66.00					Detector/Receiver	NPN/PNP 250 mA						
1151E-6547	\$73.00					Source/Emitter	N/A	4-pin Euro (Micro) DC connector	CSDS4A4CY2202				
1251E-6547	\$66.00					Detector/Receiver	NPN/PNP 250 mA						
1151E-6507	\$73.00					Source/Emitter	N/A	4-pin Mini connector	CSMS4A4CY1602				
1251E-6507	\$61.00					Detector/Receiver	NPN/PNP 250 mA						
1151E-6513	\$73.00					12 - 240 VDC 24 - 240 VAC	500 ft. (152 m)	0.1 to 250 ft. (0.03 to 77 m)	Infrared	Source/Emitter	N/A	6-foot cable (300V)	pre-wired 6 ft. (1.8 m)
1251E-6513	\$72.00									Detector/Receiver	Solid-state relay 300 mA @ 240 VAC/VDC		
1151E-6543	\$73.00									Source/Emitter	N/A	4-pin Micro AC connector	CSAS4F4CY2202
1251E-6543	\$72.00									Detector/Receiver	Solid-state relay 300 mA @ 240 VAC/VDC		
1151E-6504	\$73.00									Source/Emitter	N/A	4-pin Mini connector	CSMS4A4CY1602
1251E-6503	\$73.00									Detector/Receiver	Solid-state relay 300 mA @ 240 VAC/VDC		
1251E-6504	\$71.00									Detector/Receiver	SPDT EM relay 3A @ 120 VAC	5-pin Mini connector	CSMS5A5CY1602

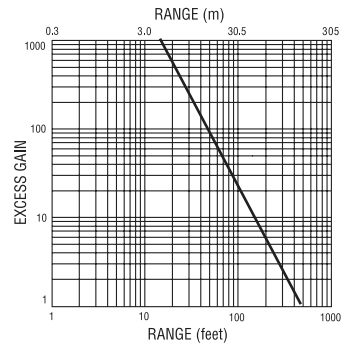
Note: Purchase one source and one detector for a complete set.

WIRING DIAGRAM (Pin numbers are for reference only. Rely on pin location when wiring.)

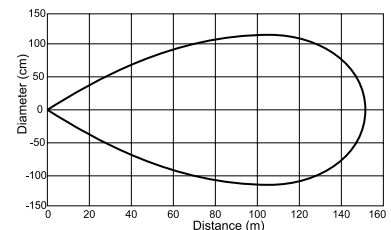
Operating Voltage	Models	Cable Models	Mini-Connector Models (Face View Male Shown)	Micro and Euro (Micro) Connector Models (Face View Male Shown)
10 - 40V DC	Thru-Beam Source / Emitter	BR (+) BK Test BU (-)	Test (+) (-)	Test (+) (-)
	Thru-Beam Detector/Receiver	BR (+) WH Load BK Load BU (-)	PNP Load (-) NPN Load (+)	Load (+) (-) PNP
12 - 240V DC or 24 - 240V AC Solid-State Relay	Thru-Beam Source / Emitter	BR L1 (+) BU L2 (-)	L2 (-) L1 (+)	L2 (-) L1 (+)
	Thru-Beam Detector/Receiver	BR L1 (+) WH Isolated AC/DC Output BK Isolated AC/DC Output BU L2 (-)	Out L2 (-) L1 (+)	Out L2 (-) L1 (+)
12 - 240V DC or 24 - 240V AC SPDT EM Relay	Thru-Beam Source / Emitter	BR L1 (+) BU L2 (-)	L2 (-) L1 (+)	L2 (-) L1 (+)
	Thru-Beam Detector/Receiver	BR L1 (+) BK Load N.C. Out OR CCM WH Load N.C. Out BU L2 (-)	N.C. Out L2 (-) L1 (+) CCM	L1 (+) L2 (-) CCM N.C.

① Connect load to appropriate output for either sinking or sourcing operation.
② Connecting the test input to 0 VDC allows you to switch the light source off for troubleshooting while leaving the sensor under power.

Characteristic curve chart



Spot dimension chart





Enhanced 50 Series Photoelectric Sensors Selection Guide

Overview

The Enhanced 50 family of high performance photoelectric sensors offers outstanding features, flexibility and durability at an incredible price. Choose from a wide selection of Thru-beam, Polarized Reflex, Diffuse and even Clear

Object models all designed in a rugged, industry standard, rectangular package. Each model comes with a variety of input options for maximum flexibility across many voltage ratings. Cabling choices include built-in mini-connector, micro-connector, pigtail micro-connector or a 6 ft. integrated cable.

Other convenient features included are Dark-On/Light-On selectability and Gain adjustment, available on all models. Use the Selection Guide below to find the sensor model that best suits your requirements.



Enhanced 50 Photoelectric Sensors Specifications by Model Type

Specifications	Thru-Beam	Diffuse	Polarized Reflex	Clear Object Detector
Voltage Range	10 - 40 VDC 12 - 240 VDC 24 - 240 VAC	10 - 40 VDC 12 - 240 VDC 24 - 240 VAC	10 - 40 VDC 12 - 240 VDC 24 - 240 VAC	10 - 40 VDC 12 - 240 VDC 24 - 240 VAC
Sensing Range	500 ft. (152 m)	10 ft. (3 m)	16 ft. (4.9 m)	45 in. (1.2 m)
Optimum Power	0.1 to 250 ft. (0.03 to 77 m)	1 to 60 in. (25 to 1520 mm)	0.5 to 8 ft. (0.2 to 2.5 m)	1 to 24 in. (25 to 610 mm)
Sensing Beam	Infrared	Infrared	Visible Red	Visible Red
Output Types	NPN/PNP 250 mA, Solid-state relay 300 mA @ 240 VAC/VDC, SPDT EM relay 3 A @ 120 VAC	NPN/PNP 250 mA, Solid-state relay 300 mA @ 240 VAC/VDC, SPDT EM relay 3 A @ 120 VAC	NPN/PNP 250 mA, Solid-state relay 300 mA @ 240 VAC/VDC, SPDT EM relay 3 A @ 120 VAC	NPN/PNP 250 mA, Solid-state relay 300 mA @ 240 VAC/VDC, SPDT EM relay 3 A @ 120 VAC

Enhanced 50 Photoelectric Sensors Specifications by Input Type

Specifications	AC/DC EM Relay Models	AC/DC Solid-State Relay Models	DC Only Models
Input Voltage	12 - 240 VDC 24 - 240 VAC	12 - 240 VDC 24 - 240 VAC	10 - 40 VDC
Light/Dark Operation	Switch selectable		
Operating Temperature	-13° to 131°F (-25° to 55°C)		
Humidity	95% relative humidity, non-condensing		
Case Material	Fiberglass reinforced plastic		
Lens Material	Acrylic		
Vibration	IEC 60947-5-2 part 7.4.2		
Shock	IEC 60947-5-2 part 7.4.1		
Protection	Output short circuit and overcurrent protection, reverse polarity protection		
Enclosure Ratings	IP67		
Agency Approvals	IEC IP67, cCSAus, UL508 (CSA File 224447)	IEC IP67, cCSAus, UL508 (CSA File 224447)	IEC IP67, cCSAus, UL508 (CSA File 224447)
Output Load	3A @ 120 VAC 3A @ 28 VAC 3A @ 240 VAC	300 mA @ 240 VAC/VDC	250 mA
Response Time	15 ms	2 ms	
No Load Current Draw	<30 mA		
Leakage Current (max.)	—	1 mA @ 240 VAC	<10 µA
Indicator LEDs	Thru-Beam Source All Others: Red: Power Green: Output Yellow: Power Red: Alignment		

EATON Enhanced 50 Series Cutler-Hammer Photoelectric Sensors

Application Guide

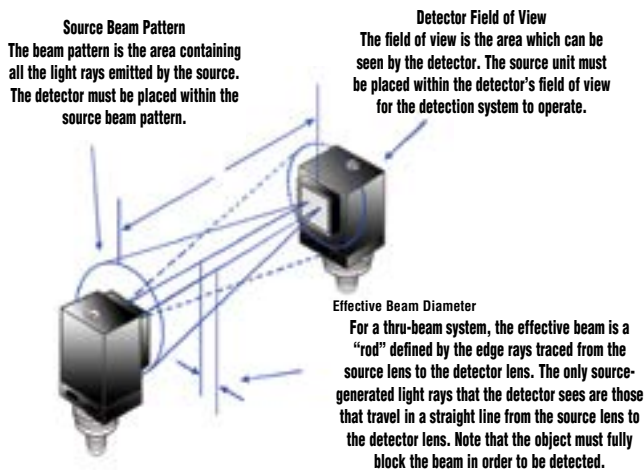
The Enhanced 50 Series Photoelectric Sensors are a great fit for applications such as material handling, packaging, wrapping and sortation.

This family of sensors, with its four basic models (Thru-beam, Polarized Reflex, Diffuse and Clear Object), meets the needs for almost any sensing requirement, including harsh environments with excessive dust or high temperature.

Follow the application guide below to choose the best sensor model for your application.

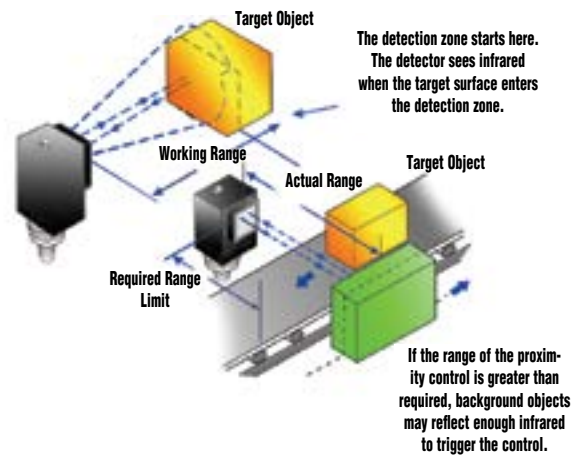
Thru-Beam

- Most accurate
- Longest sensing range
- Most reliable
- Must be installed in two points on system: emitter and receiver
- More costly



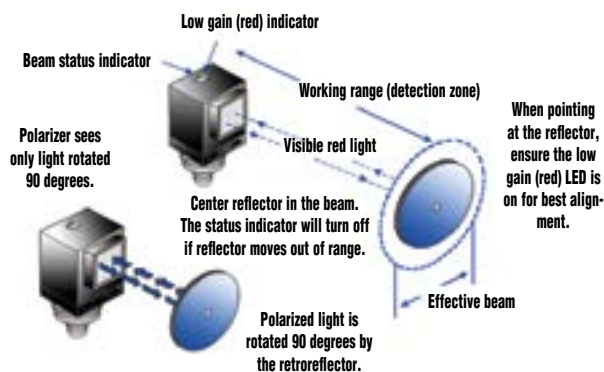
Diffuse

- Lower cost
- Install at one point
- Less accurate than Thru-Beam or Polarized Reflex
- More setup time involved



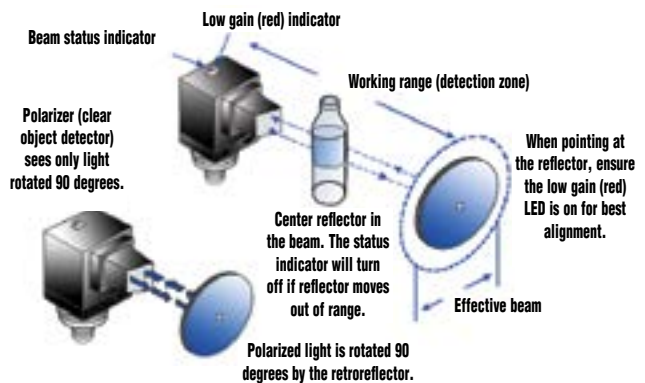
Polarized Reflex

- Lower cost than Thru-Beam
- Longer sensing range than Diffuse
- Very reliable
- Must be installed in two points on system: sensor and reflector



Clear Object Detector

- Most reliable for sensing transparent objects
- Must be installed in two points on system: sensor and reflector.
- Short sensing distance: 45 inches max.



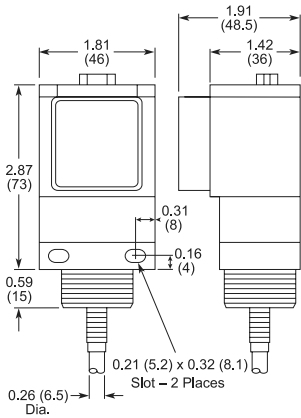


Enhanced 50 Series Photoelectric Sensors Dimensions

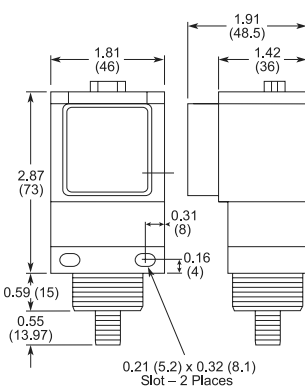
Sensor Dimensions

(inches (mm))

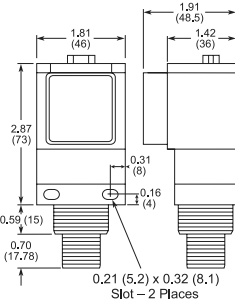
Cable and Pigtail Connector* Version



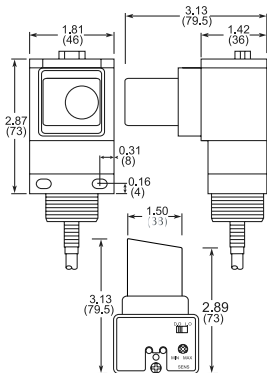
AC/DC Micro or Euro (Micro) Connector Versions



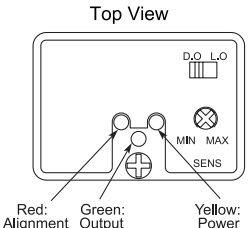
Mini Connector Versions



Clear Object Versions (Cable Version Shown)



* Pigtail length: 7.5" nominal

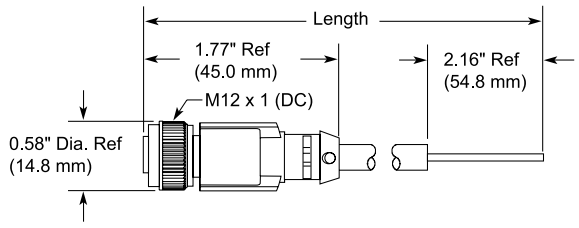


Connector Cables Dimensions

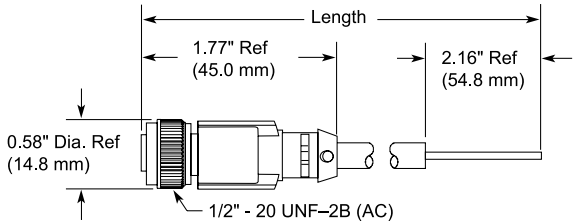
(in/mm)

Micro Style Connector Cables

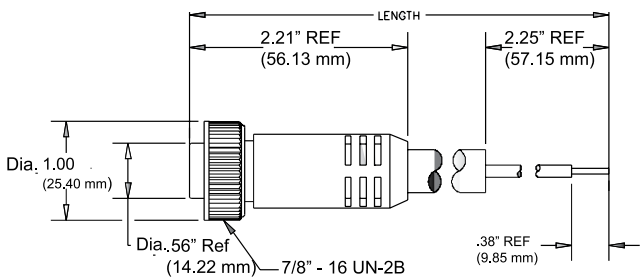
M12 x 1 (DC) connector cable



1/2" - 20 UNF-2B (AC) connector cable



Mini Style Connector Cables



DFT Series Fiber Photoelectric Amplifiers

Compact rectangular plastic DIN-rail mount with Teach function - DC



- 4 models available
- DIN-rail mounting
- Bargraph signal-strength indicator
- NPN or PNP, Light-on/Dark-on selectable outputs
- Red LED with visible spot
- IP64 rated



DFT Series Fiber Photoelectric Amplifier Selection Chart							
Part Number	Price	Sensing Range	Output State	Logic	Connection	Wiring	Dimensions
DFT-AN-1A	\$132.00	Optical fiber dependent	N.O./N.C. selectable	NPN	2m (6.5') axial cable	Diagram 1	Figure 1
DFT-AN-1F	\$132.00				M8 (8mm) connector	Diagram 1	Figure 2
DFT-AP-1A	\$132.00			PNP	2m (6.5') axial cable	Diagram 2	Figure 1
DFT-AP-1F	\$132.00				M8 (8mm) connector	Diagram 2	Figure 2

Dimensions

(mm)

Figure 1

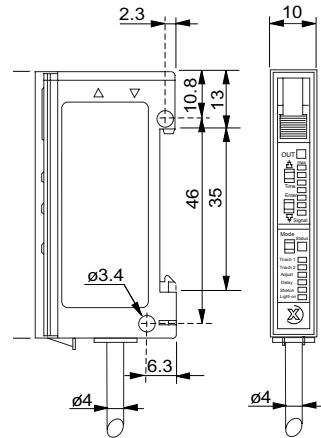
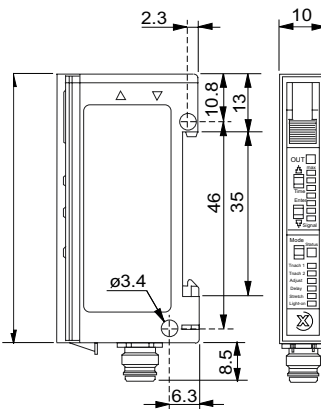


Figure 2



Specifications		
Type	DFT-AN-1*	DFT-AP-1*
Sensing Distance	See Optical Fibers Table	
Light Spot Diameter	N/A	
Emission	red (680nm)	
Sensitivity	Dual Teach function	
Output Type	NPN Light On or Dark On Selectable Output delay or stretch programmable	PNP Light On or Dark On Selectable Output delay or stretch programmable
Operating Voltage	10-30VDC	
No-Load Supply Current	≤25mA	
Operating (Load) Current	≤200mA	
Off-state (Leakage) Current	≤0.1mA	
Voltage Drop	2V maximum at 200mA	
Switching Frequency	1.5kHz	
Ripple	≤20%	
Time Delay Before Availability (tv)	80ms	
Short-Circuit Protection	Yes (switch autoresets after overload is removed)	
Operating Temperature	-25° to +55° C (-13° to 131° F)	
Protection Degree	IEC IP64	
LED Indicators -Switching Status	Yellow (output energized)	
Housing Material	PBT	
Lens Material	Acrylic	
Shock/Vibration	See terminology section	
Tightening Torque	N/A	
Weight (cable/connector)	68g (2.39oz) / 17g (0.60oz)	
Connectors	2m (6.5') axial cable; M8 (8mm) connector	
Agency Approvals	UL file E328811	

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

Wiring diagrams

Diagram 1

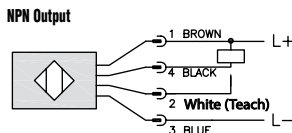
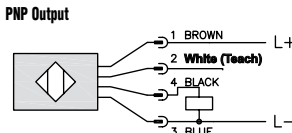
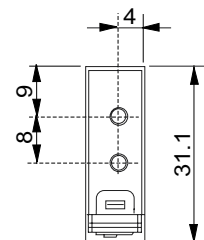
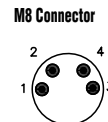


Diagram 2



Connector



DFP Series Fiber Photoelectric Amplifiers



Compact rectangular plastic
DIN-rail mount- DC

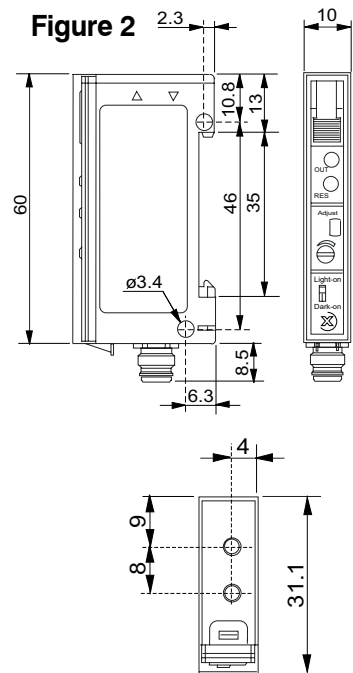
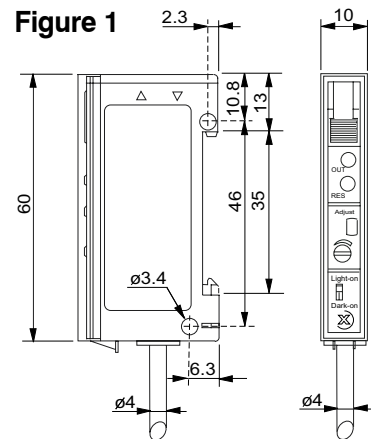
- 4 models available
- DIN-rail mounting
- 12-turn potentiometer sensitivity setting with illuminated scale
- NPN or PNP, Light-on/Dark-on selectable outputs
- Red LED with visible spot
- IP64 rated



DFP Series Fiber Photoelectric Amplifier Selection Chart							
Part Number	Price	Sensing Range	Output State	Logic	Connection	Wiring	Dimensions
DFP-AN-1A	\$83.00	Optical fiber dependent	N.O./N.C. selectable	NPN	2m (6.5') axial cable	Diagram 1	Figure 1
DFP-AN-1F	\$83.00				M8 (8mm) connector	Diagram 1	Figure 2
DFP-AP-1A	\$83.00			PNP	2m (6.5') axial cable	Diagram 2	Figure 1
DFP-AP-1F	\$83.00				M8 (8mm) connector	Diagram 2	Figure 2

Dimensions

(mm)



Specifications		
Type	DFP-AN-1*	DFP-AP-1*
Sensing Distance	See Optical Fibers Table	
Light Spot Diameter	N/A	
Emission	red (680nm)	
Sensitivity	12-turn Potentiometer with illuminated scale	
Output Type	NPN Light On or Dark On Selectable	PNP Light On or Dark On Selectable
Operating Voltage	10-30VDC	
No-load Supply Current	≤15mA	
Operating (Load) Current	≤200mA	
Off-state (Leakage) Current	≤0.1mA	
Voltage Drop	2V maximum at 200mA	
Switching Frequency	1.5kHz	
Ripple	≤20%	
Time Delay Before Availability (tv)	300ms	
Short-Circuit Protection	Yes (switch autoresets after overload is removed)	
Operating Temperature	-25° to 55°C (-13° to 131°F)	
Protection Degree	IEC IP64	
LED Indicator - Switching Status	Pin 4 (black): switching status - yellow Pin 2 (pink): excess gain status - green	
Housing Material	PBT	
Lens Materials	Acrylic	
Shock/Vibration	See terminology section	
Tightening Torque	N/A	
Weight (cable/connector)	69g (2.44oz) / 18g (0.63oz)	
Connectors	2m (6.5') axial cable; M8 (8mm) connector	
Agency Approvals	UL file E32881	

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

Wiring diagrams

Diagram 1

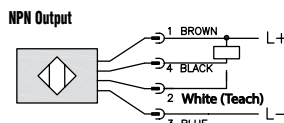
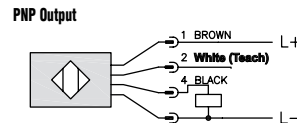
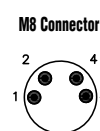


Diagram 2



Connector



Accessories for 50 Series Photoelectric Sensors

Mounting Brackets

Short, tall or ball-swivel style of mounting brackets are available. All styles allow 360° rotation of the sensor.

Note: Cutler-Hammer parts available for sale to North America locations only.

Accessories for Enhanced 50 Series Sensors			
Part Number	Price	Description	Weight [lb]
6150E-6501	\$5.75	Mounting bracket, right-angle, 1.5 inch vertical adjustment, nickel-plated steel. For use with CH Enhanced 50 Series sensor.	0.20
6150E-6502	\$7.25	Mounting bracket, right-angle, 3.5 inch vertical adjustment, nickel-plated steel. For use with CH Enhanced 50 Series sensor.	0.39
6150E-6503	\$7.25	Mounting bracket, right-angle ball swivel, 60 degree vertical and horizontal adjustment, plastic. For use with CH Enhanced 50 Series sensor. Ball swivel allows for ±30° sensor angle.	0.11



6150E-6501



6150E-6502

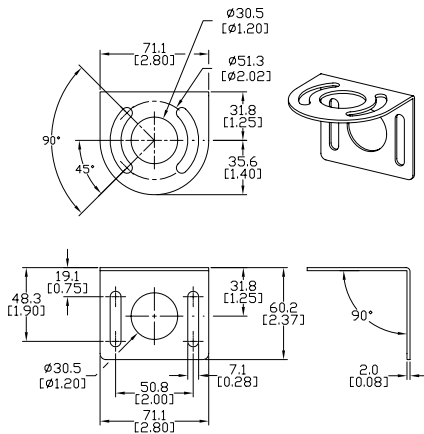


6150E-6503

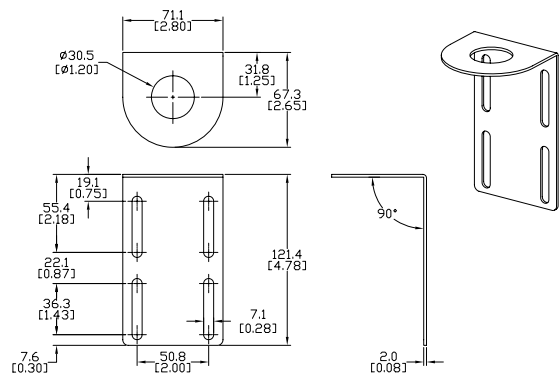
Dimensions

mm [inches]

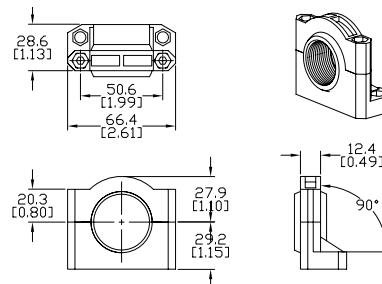
6150E-6501



6150E-6502



6150E-6503



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