

# UK1 Series Ultrasonic Sensors

## M18 (18 mm) plastic – Discrete or analog output

- 15 to 30 VDC
- Discrete models available with adjustable sensitivity
- Analog output models available
- Models available with analog and discrete switching outputs
- Complete overload protection
- IP67 rated
- LED status indicators
- Mounting hex nuts included
- Purchase cable for M12 plug separately
- Lifetime warranty



M12 Quick Disconnect



2m Output Cable

UK 1A Series Ultrasonic Discrete or Analog Output Sensor Selection Chart						
Part Number	Price	Sensing Range	Output State	Connection	Wiring	Function
<b>UK1A-EN-0E</b>	\$99.00	50 to 400 mm (1.97 to 15.75 in)	NPN, NO/NC selectable	M12 quick disconnect	Diagram 1	1
<b>UK1A-EN-0A</b>	\$104.00		NPN, NO/NC selectable	2m output cable	Diagram 1	1
<b>UK1A-EP-0E</b>	\$99.00		PNP, NO/NC selectable	M12 quick disconnect	Diagram 2	1
<b>UK1A-EP-0A</b>	\$104.00		PNP, NO/NC selectable	2m output cable	Diagram 2	1
<b>UK1A-E1-0E</b>	\$105.00		0 to 10 VDC analog output	M12 quick disconnect	Diagram 3	2
<b>UK1A-E1-0A</b>	\$110.00		0 to 10 VDC analog output	2m output cable	Diagram 3	2
<b>UK1A-E2-0E</b>	\$105.00		4 to 20 mA analog output	M12 quick disconnect	Diagram 3	2
<b>UK1A-E2-0A</b>	\$110.00		4 to 20 mA analog output	2m output cable	Diagram 3	2
<b>UK1A-E3-0E</b>	\$105.00		NPN, 2 NO/NC selectable	M12 quick disconnect	Diagram 4	3
<b>UK1A-E3-0A</b>	\$110.00		NPN, 2 NO/NC selectable	2m output cable	Diagram 4	3
<b>UK1A-E4-0E</b>	\$109.00		4 to 20 mA analog output, NPN, NO/NC selectable	M12 quick disconnect	Diagram 5	4
<b>UK1A-E4-0A</b>	\$114.00		4 to 20 mA analog output, NPN, NO/NC selectable	2m output cable	Diagram 5	4
<b>UK1A-E5-0E</b>	\$105.00		PNP, 2 NO/NC selectable	M12 quick disconnect	Diagram 6	3
<b>UK1A-E5-0A</b>	\$110.00		PNP, 2 NO/NC selectable	2m output cable	Diagram 6	3
<b>UK1A-E6-0E</b>	\$109.00		4 to 20 mA analog output, PNP, NO/NC selectable	M12 quick disconnect	Diagram 7	4
<b>UK1A-E6-0A</b>	\$114.00		4 to 20 mA analog output, PNP, NO/NC selectable	2m output cable	Diagram 7	4
<b>UK1A-E7-0E</b>	\$109.00		0 to 10 VDC analog output, PNP, NO/NC selectable	M12 quick disconnect	Diagram 7	4
<b>UK1A-E7-0A</b>	\$114.00		0 to 10 VDC analog output, PNP, NO/NC selectable	2m output cable	Diagram 7	4
<b>UK1A-E9-0E</b>	\$109.00		0 to 10 VDC analog output, NPN, NO/NC selectable	M12 quick disconnect	Diagram 5	4
<b>UK1A-E9-0A</b>	\$114.00		0 to 10 VDC analog output, NPN, NO/NC selectable	2m output cable	Diagram 5	4

# UK1 Series Ultrasonic Sensors

UK 1C Series Ultrasonic Discrete or Analog Output Sensor Selection Chart						
Part Number	Price	Sensing Range	Output State	Connection	Wiring	Function
<b>UK1C-EN-0E</b>	\$112.00	100 to 900 mm (3.94 to 35.43 in)	NPN, NO/NC selectable	M12 quick disconnect	Diagram 1	1
<b>UK1C-EN-0A</b>	\$117.00		NPN, NO/NC selectable	2m output cable	Diagram 1	1
<b>UK1C-EP-0E</b>	\$112.00		PNP, NO/ NC selectable	M12 quick disconnect	Diagram 2	1
<b>UK1C-EP-0A</b>	\$117.00		PNP, NO/NC selectable	2m output cable	Diagram 2	1
<b>UK1C-E1-0E</b>	\$115.00		0 to 10 VDC analog output	M12 quick disconnect	Diagram 3	2
<b>UK1C-E1-0A</b>	\$120.00		0 to 10 VDC analog output	2m output cable	Diagram 3	2
<b>UK1C-E2-0E</b>	\$115.00		4 to 20 mA analog output	M12 quick disconnect	Diagram 3	2
<b>UK1C-E2-0A</b>	\$120.00		4 to 20 mA analog output	2m output cable	Diagram 3	2
<b>UK1C-E3-0E</b>	\$115.00		NPN, 2 NO/NC selectable	M12 quick disconnect	Diagram 4	3
<b>UK1C-E3-0A</b>	\$120.00		NPN, 2 NO/NC selectable	2m output cable	Diagram 4	3
<b>UK1C-E4-0E</b>	\$119.00		4 to 20 mA analog output, NPN, NO/NC selectable	M12 quick disconnect	Diagram 5	4
<b>UK1C-E4-0A</b>	\$124.00		4 to 20 mA analog output, NPN, NO/NC selectable	2m output cable	Diagram 5	4
<b>UK1C-E5-0E</b>	\$115.00		PNP, 2 NO/ NC selectable	M12 quick disconnect	Diagram 6	3
<b>UK1C-E5-0A</b>	\$120.00		PNP, 2 NO/ NC selectable	2m output cable	Diagram 6	3
<b>UK1C-E6-0E</b>	\$119.00		4 to 20 mA analog output, PNP, NO/NC selectable	M12 quick disconnect	Diagram 7	4
<b>UK1C-E6-0A</b>	\$124.00		4 to 20 mA analog output, PNP, NO/NC selectable	2m output cable	Diagram 7	4
<b>UK1C-E7-0E</b>	\$119.00		0 to 10 VDC analog output, PNP, NO/NC selectable	M12 quick disconnect	Diagram 7	4
<b>UK1C-E7-0A</b>	\$124.00		0 to 10 VDC analog output, PNP, NO/NC selectable	2m output cable	Diagram 7	4
<b>UK1C-E9-0E</b>	\$119.00		0 to 10 VDC analog output, NPN, NO/NC selectable	M12 quick disconnect	Diagram 5	4
<b>UK1C-E9-0A</b>	\$124.00		0 to 10 VDC analog output, NPN, NO/NC selectable	2m output cable	Diagram 5	4

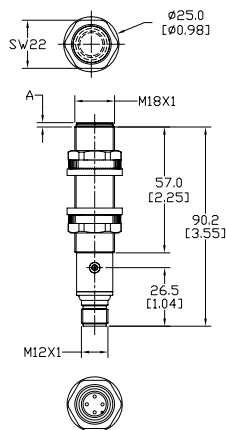
UK 1D Series Ultrasonic Discrete or Analog Output Sensor Selection Chart						
Part Number	Price	Sensing Range	Output State	Connection	Wiring	Function
<b>UK1D-EN-0E</b>	\$122.00	150 to 1600 mm (5.90 to 62.99 in)	NPN, NO/NC selectable	M12 quick disconnect	Diagram 1	1
<b>UK1D-EN-0A</b>	\$127.00		NPN, NO/NC selectable	2m output cable	Diagram 1	1
<b>UK1D-EP-0E</b>	\$122.00		PNP, NO/ NC selectable	M12 quick disconnect	Diagram 2	1
<b>UK1D-EP-0A</b>	\$127.00		PNP, NO/NC selectable	2m output cable	Diagram 2	1
<b>UK1D-E1-0E</b>	\$125.00		0 to 10 VDC analog output	M12 quick disconnect	Diagram 3	2
<b>UK1D-E1-0A</b>	\$130.00		0 to 10 VDC analog output	2m output cable	Diagram 3	2
<b>UK1D-E2-0E</b>	\$125.00		4 to 20 mA analog output	M12 quick disconnect	Diagram 3	2
<b>UK1D-E2-0A</b>	\$130.00		4 to 20 mA analog output	2m output cable	Diagram 3	2
<b>UK1D-E3-0E</b>	\$125.00		NPN, 2 NO/NC selectable	M12 quick disconnect	Diagram 4	3
<b>UK1D-E3-0A</b>	\$130.00		NPN, 2 NO/NC selectable	2m output cable	Diagram 4	3
<b>UK1D-E4-0E</b>	\$129.00		4 to 20 mA analog output, NPN, NO/NC selectable	M12 quick disconnect	Diagram 5	4
<b>UK1D-E4-0A</b>	\$134.00		4 to 20 mA analog output, NPN, NO/NC selectable	2m output cable	Diagram 5	4
<b>UK1D-E5-0E</b>	\$125.00		PNP, 2 NO/ NC selectable	M12 quick disconnect	Diagram 6	3
<b>UK1D-E5-0A</b>	\$130.00		PNP, 2 NO/ NC selectable	2m output cable	Diagram 6	3
<b>UK1D-E6-0E</b>	\$129.00		4 to 20 mA analog output, PNP, NO/NC selectable	M12 quick disconnect	Diagram 7	4
<b>UK1D-E6-0A</b>	\$134.00		4 to 20 mA analog output, PNP, NO/NC selectable	2m output cable	Diagram 7	4
<b>UK1D-E7-0E</b>	\$129.00		0 to 10 VDC analog output, PNP, NO/NC selectable	M12 quick disconnect	Diagram 7	4
<b>UK1D-E7-0A</b>	\$134.00		0 to 10 VDC analog output, PNP, NO/NC selectable	2m output cable	Diagram 7	4
<b>UK1D-E9-0E</b>	\$129.00		0 to 10 VDC analog output, NPN, NO/NC selectable	M12 quick disconnect	Diagram 5	4
<b>UK1D-E9-0A</b>	\$134.00		0 to 10 VDC analog output, NPN, NO/NC selectable	2m output cable	Diagram 5	4

# UK1 Series Ultrasonic Sensors

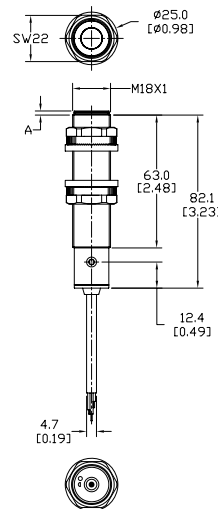
UK 1F Series Ultrasonic Discrete or Analog Output Sensor Selection Chart						
Part Number	Price	Sensing Range	Output State	Connection	Wiring	Function
<b>UK1F-EN-0E</b>	\$135.00	200 to 2200 mm (7.87 to 86.61 in)	NPN, NO/NC selectable	M12 quick disconnect	Diagram 1	1
<b>UK1F-EN-0A</b>	\$140.00		NPN, NO/NC selectable	2m output cable	Diagram 1	1
<b>UK1F-EP-0E</b>	\$135.00		PNP, NO/ NC selectable	M12 quick disconnect	Diagram 2	1
<b>UK1F-EP-0A</b>	\$140.00		PNP, NO/NC selectable	2m output cable	Diagram 2	1
<b>UK1F-E1-0E</b>	\$139.00		0 to 10 VDC analog output	M12 quick disconnect	Diagram 3	2
<b>UK1F-E1-0A</b>	\$144.00		0 to 10 VDC analog output	2m output cable	Diagram 3	2
<b>UK1F-E2-0E</b>	\$139.00		4 to 20 mA analog output	M12 quick disconnect	Diagram 3	2
<b>UK1F-E2-0A</b>	\$144.00		4 to 20 mA analog output	2m output cable	Diagram 3	2
<b>UK1F-E3-0E</b>	\$139.00		NPN, 2 NO/NC selectable	M12 quick disconnect	Diagram 4	3
<b>UK1F-E3-0A</b>	\$144.00		NPN, 2 NO/NC selectable	2m output cable	Diagram 4	3
<b>UK1F-E4-0E</b>	\$144.00		4 to 20 mA output, NPN, NO/NC selectable	M12 quick disconnect	Diagram 5	4
<b>UK1F-E4-0A</b>	\$149.00		4 to 20 mA output, NPN, NO/NC selectable	2m output cable	Diagram 5	4
<b>UK1F-E5-0E</b>	\$139.00		PNP, 2 NO/ NC selectable	M12 quick disconnect	Diagram 6	3
<b>UK1F-E5-0A</b>	\$144.00		PNP, 2 NO/ NC selectable	2m output cable	Diagram 6	3
<b>UK1F-E6-0E</b>	\$144.00		4 to 20 mA analog output, PNP, NO/NC selectable	M12 quick disconnect	Diagram 7	4
<b>UK1F-E6-0A</b>	\$149.00		4 to 20 mA analog output, PNP, NO/NC selectable	2m output cable	Diagram 7	4
<b>UK1F-E7-0E</b>	\$144.00		0 to 10 VDC analog output, PNP, NO/NC selectable	M12 quick disconnect	Diagram 7	4
<b>UK1F-E7-0A</b>	\$149.00		0 to 10 VDC analog output, PNP, NO/NC selectable	2m output cable	Diagram 7	4
<b>UK1F-E9-0E</b>	\$144.00		0 to 10 VDC analog output, NPN, NO/NC selectable	M12 quick disconnect	Diagram 5	4
<b>UK1F-E9-0A</b>	\$149.00		0 to 10 VDC analog output, NPN, NO/NC selectable	2m output cable	Diagram 5	4

## Dimensions

mm [inches]



DIMENSION TABLE	
DRAWING NO.	DIM A
UK1A and UK1C	1.0 [0.04]
UK1D	1.5 [0.06]
UK1F	2.5 [0.08]



DIMENSION TABLE	
DRAWING NO.	DIM A
UK1A and UK1C	1.0 [0.04]
UK1D	1.5 [0.06]
UK1F	2.5 [0.08]

# UK1 Series Ultrasonic Sensors

Specifications				
Model	UK1A	UK1C	UK1D	UK1F
Nominal Sensing Distance	50-400 mm (1.97 to 15.75 in)	100-900 mm (3.94 to 35.43 in)	150-1600 mm (5.90 to 62.99 in)	200-2200 mm (7.87 to 86.61 in)
Operating Distance (Sensing Range)	100-400 mm (3.94 to 15.75 in)	100-900 mm (3.94 to 35.43 in)	150-1600 mm (5.90 to 62.99 in)	200-2200 mm (7.87 to 86.61 in)
Output Type	See "Output State" column in selection chart			
Operating Voltage	15 to 30 VDC			
No-load Supply Current	≤50 mA			
Operating (Load) Current	100 mA			
Off-state (Leakage) Current	10 µA @ 30 VDC			
Analog Output	Voltage: minimum load is 3 kOhms / Current: maximum load is 500 Ohms at 24 VDC supply			
Voltage Drop	2.2 volts max @ 100 mA			
Switching Frequency	10 Hz	4 Hz	2 Hz	1 Hz
Repeat Accuracy	0.5%			
Time Delay Before Availability (tv)	≤500 ms; ≤900 ms (UK1*-E5/E3-0*)			
Reverse Polarity Protection	Yes			
Short-Circuit Protection	Yes			
Linearity Error	<1%			
Ultrasonic Frequency	400 kHz	300 kHz	230 kHz	200 kHz
Ultrasonic Beam Angle	±8°	±7°	±8°	±7°
Max. Response Time (digital output)	50 ms	125 ms	250 ms	500 ms
Sensitivity Adjustment	Yes, via teach-in button			
Input Voltage Transient Protection	Yes			
Operating Temperature	-20° to 60°C (-4° to 140°F)			
Temperature Compensation	Yes			
Protection Degree	IEC IP67			
Indication/Switch Status	Multi-function LED indicator			
Housing Material	Polybutylene Terephthalate (PBT)			
Shock/Vibration	See <a href="#">Proximity Sensor Terminology</a>			
Tightening Torque	1 Nm (0.737 lb-ft)			
Weight	35 g (1.23 oz) (plug exit) 88 g (3.10 oz) (cable exit)			
Connection	M12 (12 mm) connector or 2 m prewired output cable			
Agency Approvals	CE, cULus file E187310, RoHS			

## Wiring Diagrams

Diagram 1

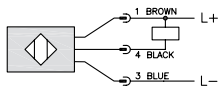


Diagram 2

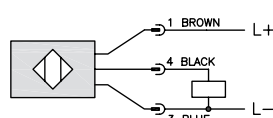


Diagram 3

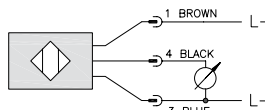


Diagram 4

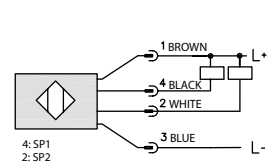


Diagram 5

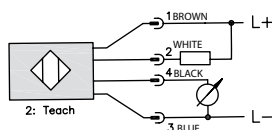


Diagram 6

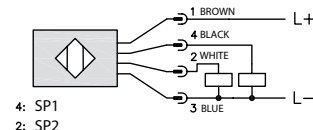
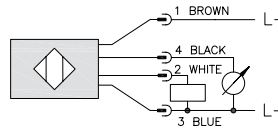
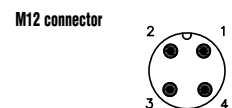


Diagram 7



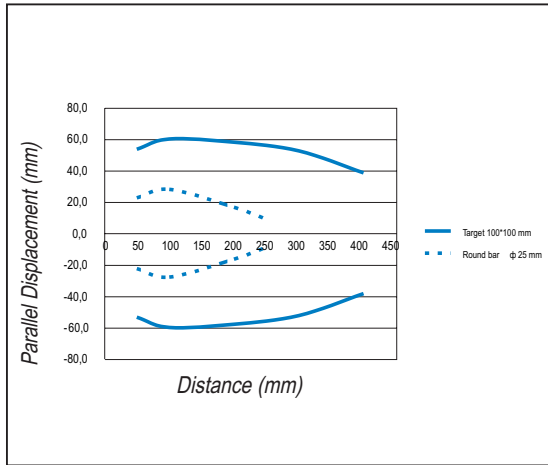
Connector



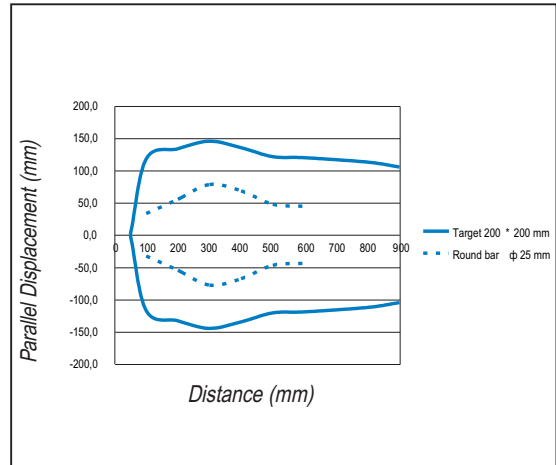
# UK1 Series Ultrasonic Sensors

## Characteristic Curves

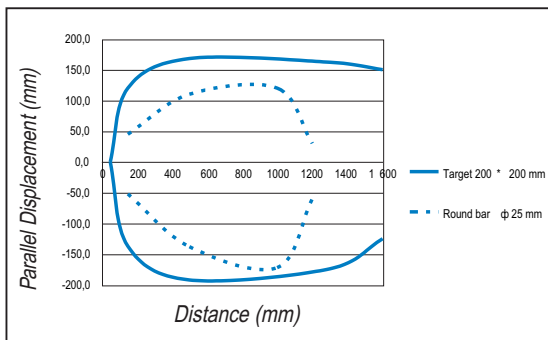
### UK1A models



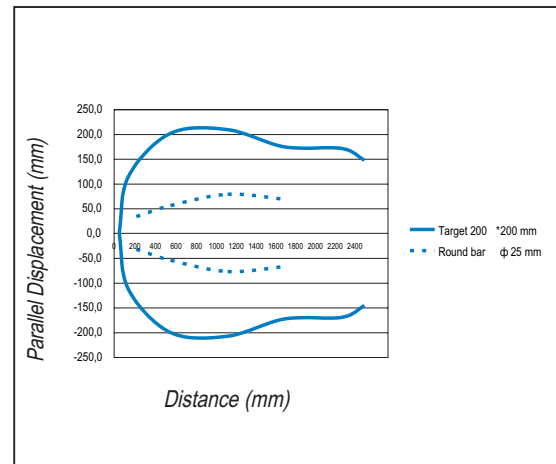
### UK1C models



### UK1D models



### UK1F models



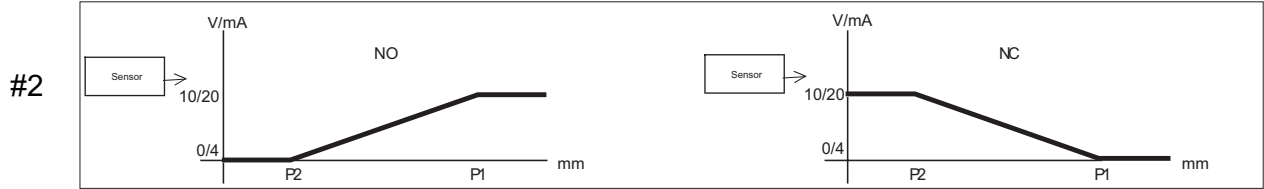
# UK1 Series Ultrasonic Sensors

## Functions

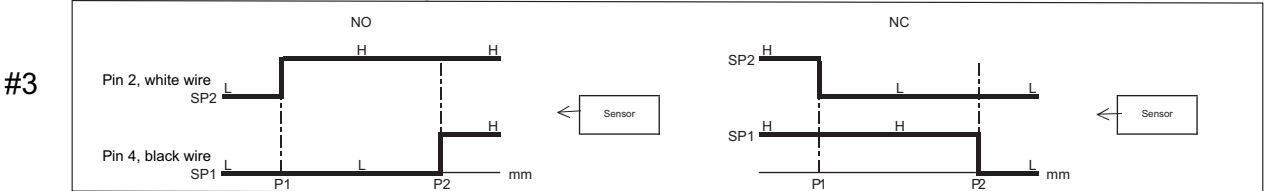
### Models with single digital output



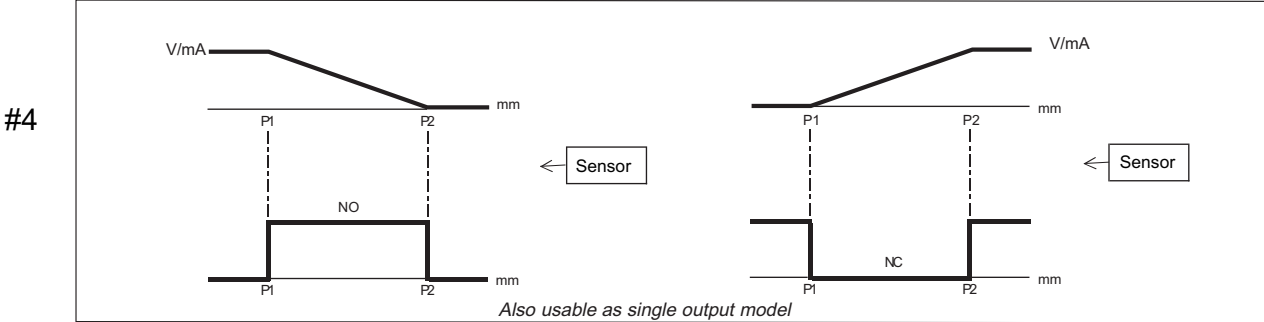
### Models with single analog output



### Models with double digital output



### Models with digital output + analog output



Note: P1 maximum selected working distance and first point to select  
 P2 minimum selected working distance and second point to select

# Accessories for 18mm Sensors

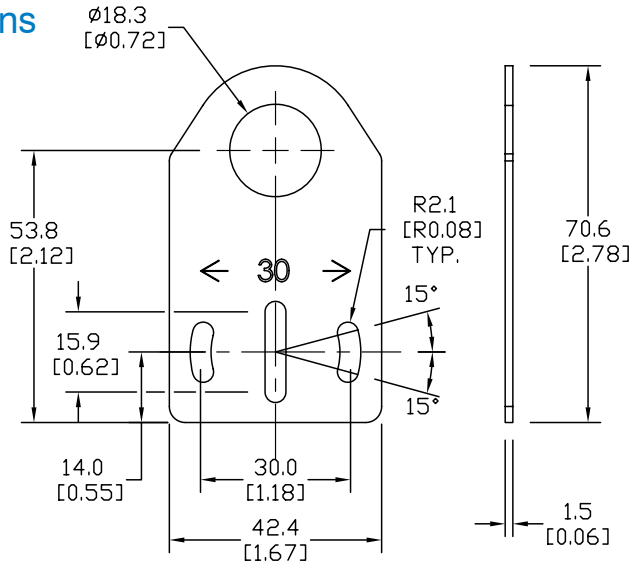
## Axial Mounting Bracket

Axial mounting bracket for use with 18mm sensors. Has two mounting holes (use 4mm screws) and allows for rotation of an optical axis for right-beam-angle-adaptor sensors. Hexagonal nuts not included.

Accessories for 18mm Sensors			
Part Number	Price	Description	Weight [lb]
ST18A	\$1.25	Mounting bracket, axial, zinc-plated steel. For use with 18mm sensors. 1/pk.	0.06
ST18A7W	\$6.00	Mounting bracket, axial, 316L stainless steel. For use with 18mm sensors. 1/pk.	0.06

### Dimensions

mm [inches]



ST18A

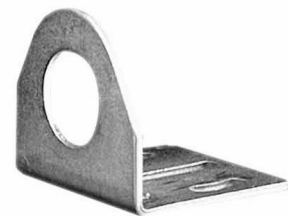
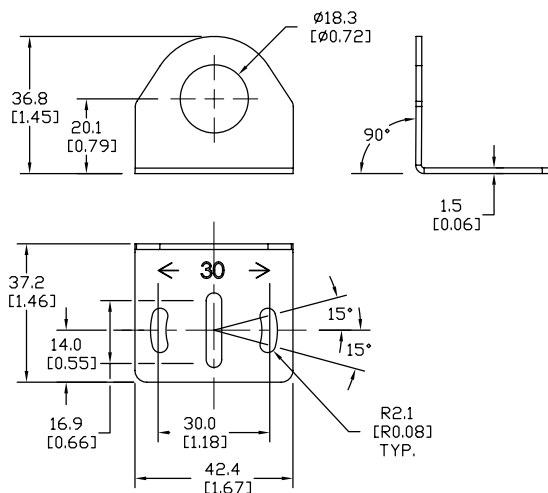
## Right-angle Mounting Bracket

Right-angle mounting bracket for use with 18mm sensors. Has two mounting holes (use 4mm screws) and allows the rotation of an optical axis for axial sensors. Hexagonal nuts not included.

Accessories for 18mm Sensors			
Part Number	Price	Description	Weight [lb]
ST18C	\$1.25	Mounting bracket, right angle, zinc-plated steel. For use with 18mm sensors. 1/pk.	0.06
ST18C7W	\$6.00	Mounting bracket, right angle, 316L stainless steel. For use with 18mm sensors. 1/pk.	0.06

### Dimensions

mm [inches]



ST18C

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

# Accessories for 18mm Sensors

## Right-angle Mounting Brackets

Mounting bracket, right-angle, fixed insertion stop adjustment, plastic. For use with 18mm sensors. Available with or without fixed insertion stop.

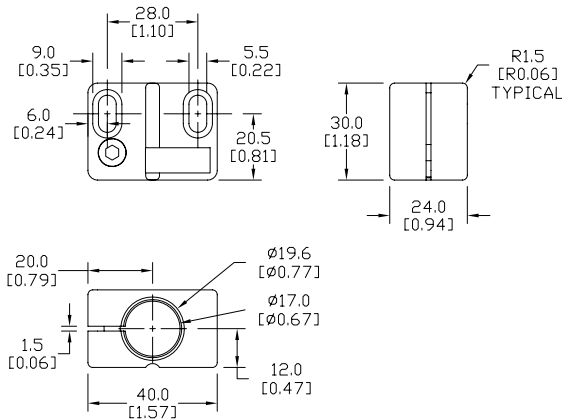
Accessories for 18mm Sensors				
Part Number	Price	Description	Weight [lb]	
<b>OPT2104</b>	\$8.00	Mounting bracket, right-angle, fixed insertion stop adjustment, plastic. For use with 18mm sensors.	0.06	
<b>OPT2105</b>	\$8.00	Mounting bracket, right-angle, plastic. For use with 18mm sensors.	0.06	



**OPT2104, OPT2105**

## Dimensions

mm [inches]



## Right-angle Swivel Mounting Systems

Mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 12mm rod mount. For use with 18mm sensors. Available in all 304 stainless steel or with an aluminum head and a stainless steel mounting plate.

Accessories for 18mm Sensors					
Part Number	Price	Description	Mounting Head	Mounting Plate	Weight [lb]
<b>OPT2116</b>	\$9.00	Mounting bracket, right-angle swivel, 360 vertical and horizontal adjustment, aluminum, 12mm rod mount. For use with 18mm sensors.	Aluminum	304 Stainless Steel	0.15
<b>OPT2117</b>	\$16.00	Mounting bracket, right-angle swivel, 360 vertical and horizontal adjustment, 304 stainless steel, 12mm rod mount. For use with 18mm sensors.	304 Stainless Steel	304 Stainless Steel	0.28

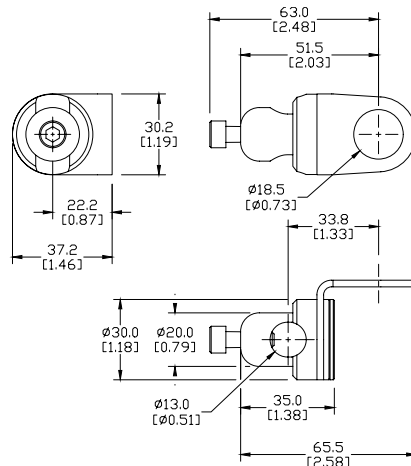
**Note: 304 Stainless steel mounting rods sold separately: OPT2109 (200mm length), OPT2110 (300mm length), and OPT2111 (500mm length).**



**OPT2116, OPT2117**

## Dimensions

mm [inches]



See our website: [www.AutomationDirect.com](http://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.

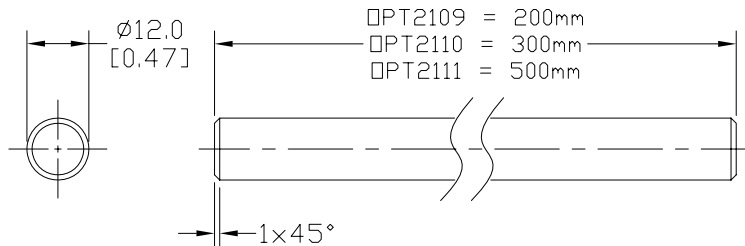
Mounting Rods for OPT2112-2127 Swivel Mounting Brackets			
Part Number	Price	Description	Weight [lb]
<b>OPT2109</b>	\$10.00	Mounting rod, 12mm diameter, 200mm length, 304 stainless steel.	0.41
<b>OPT2110</b>	\$12.00	Mounting rod, 12mm diameter, 300mm length, 304 stainless steel.	0.60
<b>OPT2111</b>	\$16.00	Mounting rod, 12mm diameter, 500mm length, 304 stainless steel.	0.98



**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.

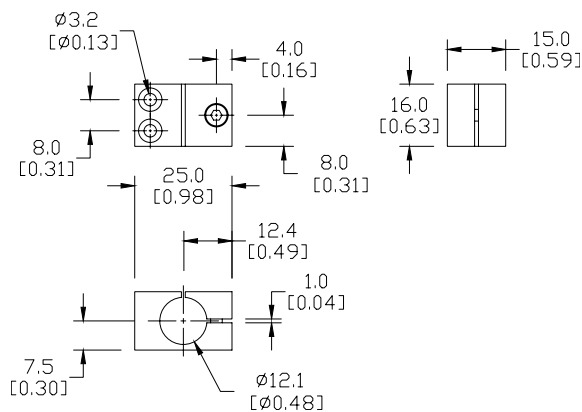
Accessories for 12mm Sensors			
Part Number	Price	Description	Weight [lb]
<b>OPT2108</b>	\$12.00	Mounting bracket, right-angle, nickel-plated brass. For use with 12mm mounting rods OPT2109, OPT2110 & OPT2111.	0.07



**OPT2108**

## Dimensions

mm [inches]



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