

UK1 Series Ultrasonic Sensors

M18 (18mm) 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 [6.56 ft] Output Cable

UK1A Series Ultrasonic Discrete or Analog Output Sensor Selection Chart

Part Number	Price	Sensing Range	Output State	Connection	Wiring	Function
<u>UK1A-EN-0E</u>		50 to 400 mm [1.97 to 15.75 in]	NPN, N.O./N.C. selectable	M12 quick-disconnect	Diagram 1	1
<u>UK1A-EN-0A</u>		50 to 400 mm [1.97 to 15.75 in]	NPN, N.O./N.C. selectable	2m output cable	Diagram 1	1
<u>UK1A-E1-0A</u>		50 to 400 mm [1.97 to 15.75 in]	0 to 10 VDC analog output	2m output cable	Diagram 3	2
<u>UK1A-E2-0E</u>		50 to 400 mm [1.97 to 15.75 in]	4 to 20mA analog output	M12 quick-disconnect	Diagram 3	2
<u>UK1A-E3-0E</u>		50 to 400 mm [1.97 to 15.75 in]	NPN, 2 N.O./N.C. selectable	M12 quick-disconnect	Diagram 4	3
<u>UK1A-E3-0A</u>		50 to 400 mm [1.97 to 15.75 in]	NPN, 2 N.O./N.C. selectable	2m output cable	Diagram 4	3
<u>UK1A-E4-0E</u>		50 to 400 mm [1.97 to 15.75 in]	4 to 20mA analog output, NPN, N.O./N.C. selectable	M12 quick-disconnect	Diagram 5	4
<u>UK1A-E4-0A</u>		50 to 400 mm [1.97 to 15.75 in]	4 to 20mA analog output, NPN, N.O./N.C. selectable	2m output cable	Diagram 5	4
<u>UK1A-E5-0A</u>		50 to 400 mm [1.97 to 15.75 in]	PNP, 2 N.O./N.C. selectable	2m output cable	Diagram 6	3
<u>UK1A-E7-0E</u>		50 to 400 mm [1.97 to 15.75 in]	0 to 10 VDC analog output, PNP, N.O./N.C. selectable	M12 quick-disconnect	Diagram 7	4
<u>UK1A-E9-0A</u>		50 to 400 mm [1.97 to 15.75 in]	0 to 10 VDC analog output, NPN, N.O./N.C. selectable	2m output cable	Diagram 5	4

UK1 Series Ultrasonic Sensors

UK1C Series Ultrasonic Discrete or Analog Output Sensor Selection Chart

Part Number	Price	Sensing Range	Output State	Connection	Wiring	Function
UK1C-EN-0E		100 to 900 mm (3.94 to 35.43 in)	NPN, N.O./N.C. selectable	M12 quick-disconnect	Diagram 1	1
UK1C-EN-0A			NPN, N.O./N.C. selectable	2m output cable	Diagram 1	1
UK1C-EP-0E			PNP, N.O./N.C. selectable	M12 quick-disconnect	Diagram 2	1
UK1C-E2-0A			4 to 20mA analog output	2m output cable	Diagram 3	2
UK1C-E3-0E			NPN, 2 N.O./N.C. selectable	M12 quick-disconnect	Diagram 4	3
UK1C-E3-0A			NPN, 2 N.O./N.C. selectable	2m output cable	Diagram 4	3
UK1C-E4-0E			4 to 20mA analog output, NPN, N.O./N.C. selectable	M12 quick-disconnect	Diagram 5	4
UK1C-E4-0A			4 to 20mA analog output, NPN, N.O./N.C. selectable	2m output cable	Diagram 5	4
UK1C-E5-0A			PNP, 2 N.O./N.C. selectable	2m output cable	Diagram 6	3
UK1C-E6-0E			4 to 20mA analog output, PNP, N.O./N.C. selectable	M12 quick-disconnect	Diagram 7	4
UK1C-E6-0A			4 to 20mA analog output, PNP, N.O./N.C. selectable	2m output cable	Diagram 7	4
UK1C-E7-0A			0 to 10 VDC analog output, PNP, N.O./N.C. selectable	2m output cable	Diagram 7	4
UK1C-E9-0A			0 to 10 VDC analog output, NPN, N.O./N.C. selectable	2m output cable	Diagram 5	4

UK1D Series Ultrasonic Discrete or Analog Output Sensor Selection Chart

Part Number	Price	Sensing Range	Output State	Connection	Wiring	Function
UK1D-EN-0E		150 to 1600 mm (5.90 to 62.99 in)	NPN, N.O./N.C. selectable	M12 quick-disconnect	Diagram 1	1
UK1D-EN-0A			NPN, N.O./N.C. selectable	2m output cable	Diagram 1	1
UK1D-EP-0E			PNP, N.O./N.C. selectable	M12 quick-disconnect	Diagram 2	1
UK1D-EP-0A			PNP, N.O./N.C. selectable	2m output cable	Diagram 2	1
UK1D-E1-0A			0 to 10 VDC analog output	2m output cable	Diagram 3	2
UK1D-E2-0E			4 to 20mA analog output	M12 quick-disconnect	Diagram 3	2
UK1D-E2-0A			4 to 20mA analog output	2m output cable	Diagram 3	2
UK1D-E3-0E			NPN, 2 N.O./N.C. selectable	M12 quick-disconnect	Diagram 4	3
UK1D-E3-0A			NPN, 2 N.O./N.C. selectable	2m output cable	Diagram 4	3
UK1D-E4-0A			4 to 20 mA analog output, NPN, N.O./N.C. selectable	2m output cable	Diagram 5	4
UK1D-E5-0E			PNP, 2 N.O./N.C. selectable	M12 quick-disconnect	Diagram 6	3
UK1D-E5-0A			PNP, 2 N.O./N.C. selectable	2m output cable	Diagram 6	3
UK1D-E6-0E			4 to 20mA analog output, PNP, N.O./N.C. selectable	M12 quick-disconnect	Diagram 7	4
UK1D-E6-0A			4 to 20mA analog output, PNP, N.O./N.C. selectable	2m output cable	Diagram 7	4
UK1D-E7-0A			0 to 10 VDC analog output, PNP, N.O./N.C. selectable	2m output cable	Diagram 7	4
UK1D-E9-0A			0 to 10 VDC analog output, NPN, N.O./N.C. selectable	2m output cable	Diagram 5	4

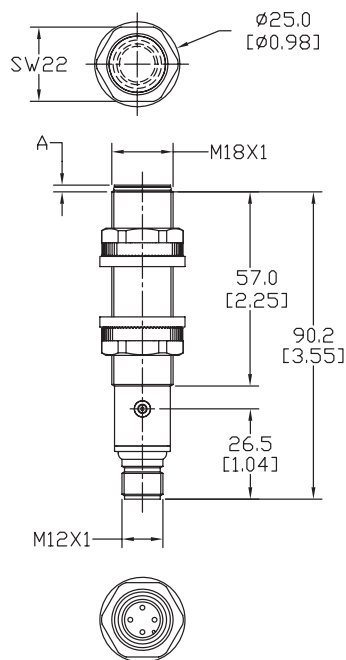
UK1 Series Ultrasonic Sensors

UK1F Series Ultrasonic Discrete or Analog Output Sensor Selection Chart

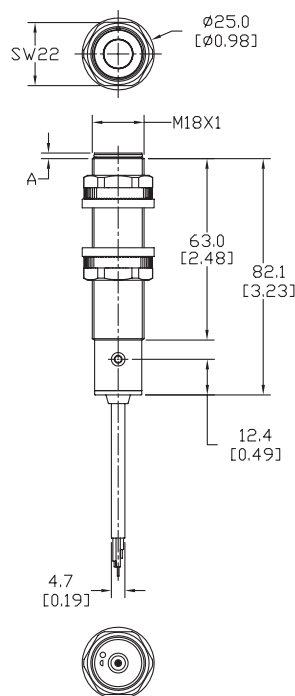
Part Number	Price	Sensing Range	Output State	Connection	Wiring	Function
UK1F-EN-0E		200 to 2200 mm (7.87 to 86.61 in)	NPN, N.O./N.C. selectable	M12 quick-disconnect	Diagram 1	1
UK1F-EN-0A			NPN, N.O./N.C. selectable	2m output cable	Diagram 1	1
UK1F-EP-0A			PNP, N.O./N.C. selectable	2m output cable	Diagram 2	1
UK1F-E2-0A			4 to 20mA analog output	2m output cable	Diagram 3	2
UK1F-E3-0A			NPN, 2 N.O./N.C. selectable	2m output cable	Diagram 4	3
UK1F-E4-0E			4 to 20mA output, NPN, N.O./N.C. selectable	M12 quick-disconnect	Diagram 5	4
UK1F-E4-0A			4 to 20mA output, NPN, N.O./N.C. selectable	2m output cable	Diagram 5	4
UK1F-E5-0E			PNP, 2 N.O./N.C. selectable	M12 quick-disconnect	Diagram 6	3
UK1F-E5-0A			PNP, 2 N.O./N.C. selectable	2m output cable	Diagram 6	3
UK1F-E6-0E			4 to 20mA analog output, PNP, N.O./N.C. selectable	M12 quick-disconnect	Diagram 7	4
UK1F-E6-0A			4 to 20mA analog output, PNP, N.O./N.C. selectable	2m output cable	Diagram 7	4
UK1F-E7-0A			0 to 10 VDC analog output, PNP, N.O./N.C. selectable	2m output cable	Diagram 7	4
UK1F-E9-0E			0 to 10 VDC analog output, NPN, N.O./N.C. selectable	M12 quick-disconnect	Diagram 5	4
UK1F-E9-0A			0 to 10 VDC analog output, NPN, N.O./N.C. 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	≤ 50mA			
Operating (Load) Current	100mA			
Off-state (Leakage) Current	10μA @ 30VDC			
Analog Output	Voltage: minimum load is 3kOhms / Current: maximum load is 500 Ohms at 24VDC supply			
Voltage Drop	2.2 volts max @ 100 mA			
Switching Frequency	10Hz	4Hz	2Hz	1Hz
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	400kHz	300kHz	230kHz	200kHz
Ultrasonic Beam Angle	±8°	±7°	±8°	±7°
Max. Response Time (digital output)	50ms	125ms	250ms	500ms
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 Proximity Sensor Terminology			
Tightening Torque	1 Nm (0.737 lb-ft)			
Weight	35g (1.23 oz) (plug exit) 88g (3.10 oz) (cable exit)			
Connection	M12 (12 mm) connector or 2m prewired output cable			
Agency Approvals	CE, cULus file E187310, RoHS			

Wiring Diagrams

Diagram 1

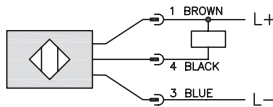


Diagram 2

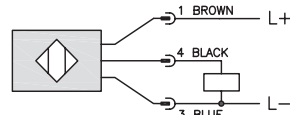


Diagram 3

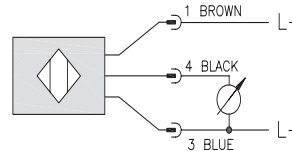


Diagram 4

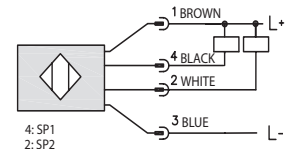


Diagram 5

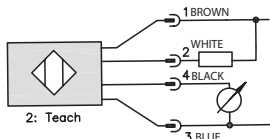


Diagram 6

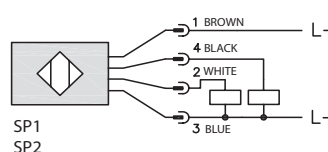
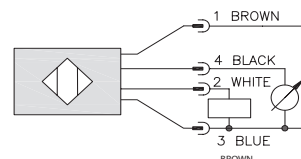


Diagram 7



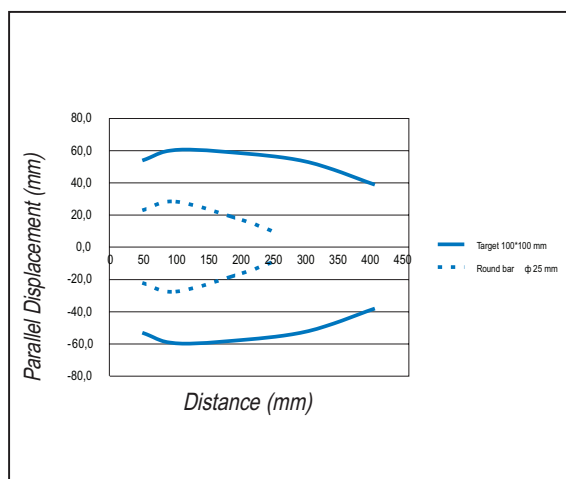
Connector
M12 connector



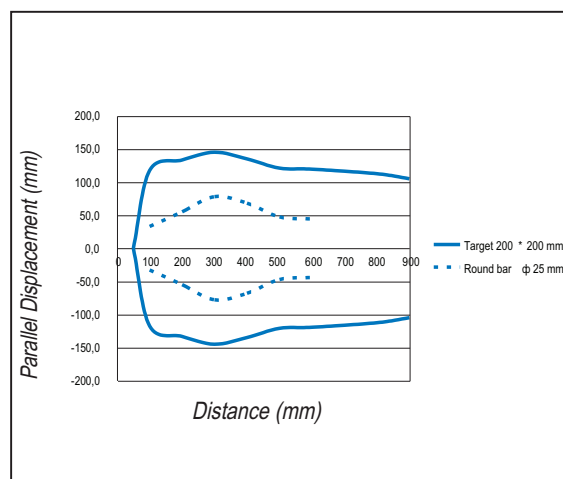
UK1 Series Ultrasonic Sensors

Characteristic Curves

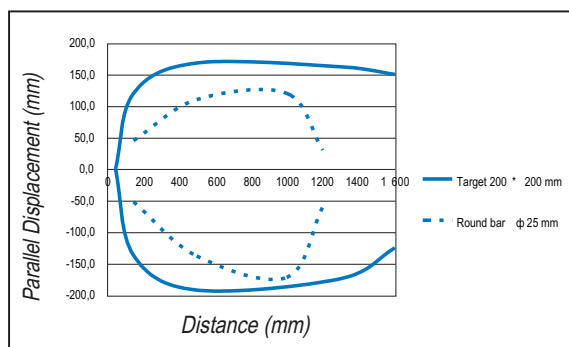
UK1A models



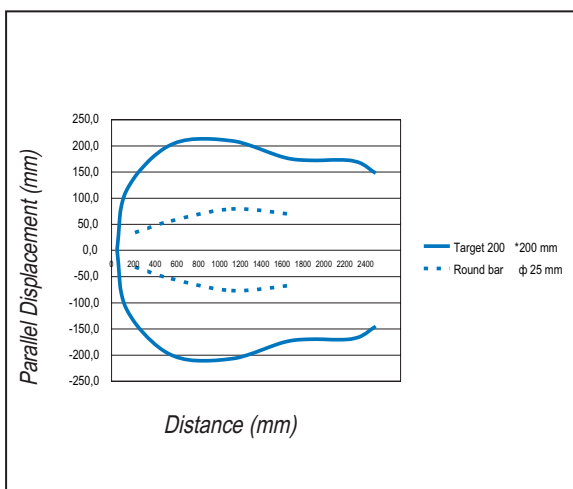
UK1C models



UK1D models



UK1F models



UK1 Series Ultrasonic Sensors

Functions

1 Models with single digital output

#1



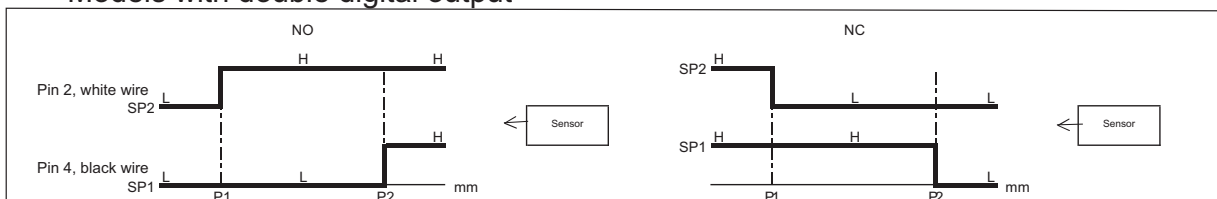
Models with single analog output

#2



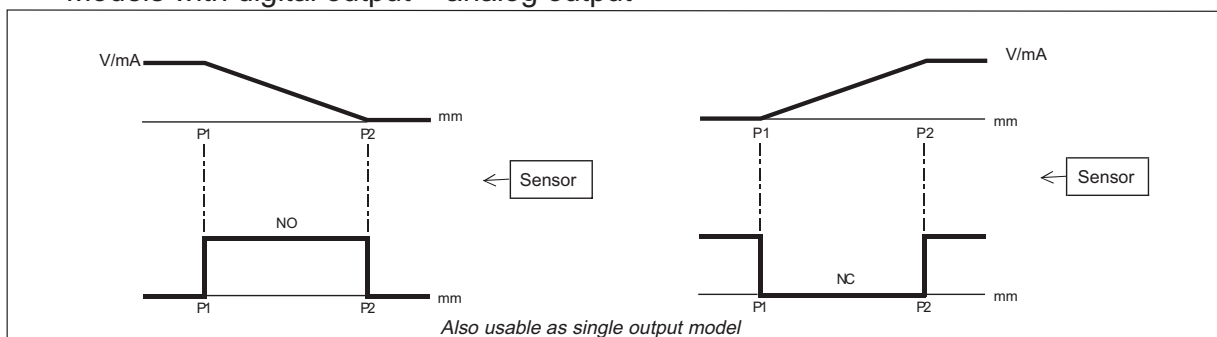
Models with double digital output

#3



Models with digital output + analog output

#4



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 available in zinc plated steel or 316L stainless steel. 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. For use with 18mm sensors.

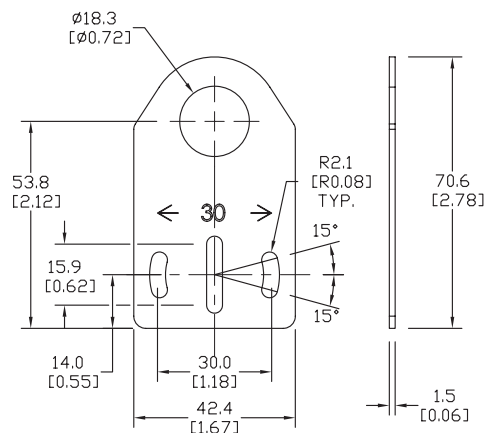
Accessories for 18mm Sensors			
Part Number	Price	Description	Weight lb (g)
ST18A		Micro Detectors mounting bracket, axial, zinc plated steel. For use with 18mm sensors.	0.06 (27.2)
ST18A7W		Micro Detectors mounting bracket, axial, 316L stainless steel. For use with 18mm sensors.	0.06 (27.2)



ST18A

Dimensions

mm [inches]



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.

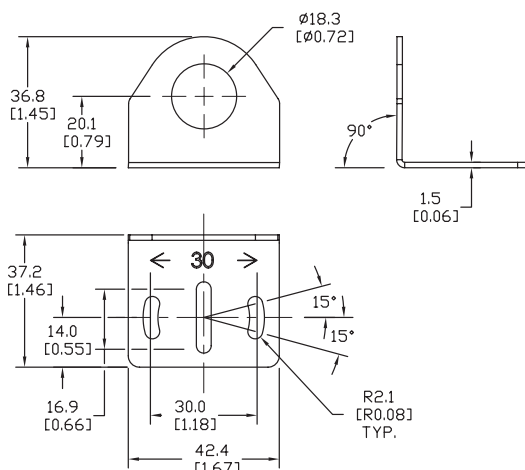
Accessories for 18mm Sensors			
Part Number	Price	Description	Weight lb (g)
ST18C		Micro Detectors mounting bracket, right-angle, zinc plated steel. For use with 18mm sensors.	0.06 (27.2)
ST18C7W		Micro Detectors mounting bracket, right-angle, 316L stainless steel. For use with 18mm sensors.	0.06 (27.2)



ST18C

Dimensions

mm [inches]



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	Drawing Link	Weight lb (g)
<u>OPT2104</u>		Wenglor mounting bracket, right-angle, fixed insertion stop adjustment, plastic. For use with 18mm sensors.	<u>PDF</u>	0.06 (27.2)
<u>OPT2105</u>		Wenglor mounting bracket, right-angle, plastic. For use with 18mm sensors.	<u>PDF</u>	0.06 (27.2)



OPT2104, OPT2105

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	Drawing Link	Weight lb (g)
<u>OPT2116</u>		Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, aluminum, 12mm rod mount. For use with 18mm sensors.	Aluminum	304 Stainless steel	<u>PDF</u>	0.15 (68.0)
<u>OPT2117</u>		Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 304 stainless steel, 12mm rod mount. For use with 18mm sensors.	304 Stainless steel	304 Stainless steel	<u>PDF</u>	0.28 (127.0)



OPT2116, OPT2117

Note: 304 Stainless steel mounting rods sold separately: OPT2109 (200mm [7.87 in] length), OPT2110 (300mm [11.81 in] length), and OPT2111 (500mm [19.69 in] length).

Mounting Rods and Brackets

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	Drawing Link	Weight lb (g)
OPT2109		Wenglor mounting rod, 12mm diameter, 200mm length, 304 stainless steel.	PDF	0.41 (185.97)
OPT2110		Wenglor mounting rod, 12mm diameter, 300mm length, 304 stainless steel.	PDF	0.60 (272.16)
OPT2111		Wenglor mounting rod, 12mm diameter, 500mm length, 304 stainless steel.	PDF	0.98 (444.52)



Right-angle Mounting Bracket

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

Right-angle Mounting Brackets for 12mm Sensors				
Part Number	Price	Description	Drawing Link	Weight lb (g)
OPT2108		Wenglor mounting bracket, right-angle, nickel plated brass. For use with 12mm mounting rods OPT2109, OPT2110 & OPT2111.	PDF	0.07 (31.8)

