



**New Standard!**  
**General-Purpose**  
**Metal Photoeye**

Self-contained  
Photoelectric Sensor

**PR-G**  
**SERIES**

New Standard for  
Photoelectric Sensors

**03**



Self-contained  
Photoelectric Sensor

# PR-G SERIES



## Revolutionizing general-purpose photoelectric sensors

In industrial automation, the large majority of general-purpose photoelectric sensors are made of plastic. While this design is adequate for certain environments, harsher industrial environments require that these sensors be frequently replaced due to damage. By combining a metal housing with reliable detection capabilities, KEYENCE has developed a durable photoelectric sensor that will provide lasting detection in the harshest of environments.

### **DURABLE & LONG LIFE**

High enclosure rating and Stainless steel body (SUS316L\*)

### **HIGH POWER**

Integrated 4-element LED

### **EASE OF USE**

Highly visible indicator and 7-segment display

\* See page 11 for details.



# DURABLE & LONG LIFE

High enclosure rating and  
Stainless steel body (SUS316L\*)





KEYENCE requires that all of its photoelectric sensors provide long-term, reliable operation. With a durable stainless steel housing (SUS316L\*), the PR-G Series is able to withstand over tightening and impact without the need for additional guarding. The PR-G Series maintains IP68 & IP69K enclosure ratings; while also remaining highly resistant to oils, acids, and alkaline detergents.



Resists damage, even when over-tightened



Meets NEMA Type 4X\*, 6P\*, 13 and IP68/69K requirements

#### Downtime as a result of sensor damage, compared to normal operation

Downtime	Cause identification	Sensor replacement	Guarding against recurrence
Normal operation	Periodic inspection	Significant reduction	

By eliminating downtime due to sensor damage, the amount of normal operation time is greatly increased

\* See page 11 for details.

# HIGH POWER

## Integrated 4-element LED

The integration of a high luminance 4-element LED with an increase in the gain of the received light intensity, has enabled the PR-G Series thru-beam model to achieve a maximum detecting distance of 30 meters **98.4'**. These two factors allow the PR-G Series to reliably detect through oil, dust, and other forms of build-up. This high power ensures the stable operation of the PR-G Series in harsh environments.

**30 m 98.4'**  
**max.**



# EASE OF USE

## Highly visible indicator and 7-segment display

The large output indicator is clearly visible from any position and is approximately six times larger than that of a conventional KEYENCE sensor. The PR-G Series also offers an easy to adjust trimmer for simplistic sensitivity setting (no special tools required). Along with this, the reflective and retro-reflective models contain a 7-segment digital display, which enables accurate calibration based on numerical values.











Highly visible indicator (Approx. 6 times larger than conventional KEYENCE models)



Easily adjust sensitivity while monitoring numeric values



# ■ Lineup











Configuration	Type	Detecting distance	Connection Method	Output	Model	Weight
Thrubeam 	 M18 threaded mount w/ M12 connector	 30 m 98.4'	M12 4-pin <sup>*1</sup>	Bipolar (NPN + PNP)	<b>PR-G51CBD</b>	Approx. 85 g
	 Rectangular w/ 2 m 6.6' cable		NPN	<b>PR-G51N</b>	Approx. 160 g	
			PNP	<b>PR-G51P</b>		
	 Rectangular w/ M8 connector		NPN	<b>PR-G51CN</b>	Approx. 55 g	
			PNP	<b>PR-G51CP</b>		
				<b>PR-G51C3PD</b>		
Retro-reflective <sup>*2</sup> 	 M18 threaded mount w/ M12 connector	 0.1 to 4.2 m 0.3' to 13.8' * When OP-84219 (R-2L) is used	M12 4-pin <sup>*1</sup>	Bipolar (NPN + PNP)	<b>PR-G61CBD</b>	Approx. 45 g
	 Rectangular w/ 2 m 6.6' cable		NPN	<b>PR-G61N</b>	Approx. 75 g	
			PNP	<b>PR-G61P</b>		
	 Rectangular w/ M8 connector		NPN	<b>PR-G61CP</b>	Approx. 25 g	
			<b>PR-G61C3PD</b>			
	Reflective 		 M18 threaded mount w/ M12 connector	 500 mm 19.69'	M12 4-pin <sup>*1</sup>	Bipolar (NPN + PNP)
 Rectangular w/ 2 m 6.6' cable		NPN	<b>PR-G41N</b>		Approx. 75 g	
 Rectangular w/ M8 connector		M8 4-pin <sup>*1</sup>	PNP		<b>PR-G41CP</b>	Approx. 25 g

\*1 Cable sold separately.

\*2 Reflector sold separately. Reflectors and corresponding detecting distances can be found on page 9.



## ■ Mounting bracket

Type		Model	Material/Weight
	Standard mounting bracket for rectangular type (M3 screw x 2 supplied)	OP-87408 <sup>*1,2</sup>	SUS316L Approx. 30 g
	Rear mounting bracket for rectangular type (M3 screw x 2 supplied)	OP-87409 <sup>*2</sup>	SUS316L Approx. 30 g
	Robust mounting bracket for rectangular type (t = 3 0.12") (M3 screw x 2 supplied)	OP-87410 <sup>*2,3</sup>	SUS316L Approx. 170 g
	Adjustable bracket for rectangular type (M3 screw x 2 supplied)	OP-87404	Zinc nickel plating and others Approx. 95 g
	Adjustable bracket for threaded mount type	OP-87405	Zinc nickel plating and others Approx. 100 g
 Screw length Adjustable bracket fixing screw	Screw length: 45 mm 1.77"	OP-87406	Steel nickel plating Approx. 70 g
	Screw length: 65 mm 2.56"	OP-87407	Steel nickel plating Approx. 80 g
	Extendable bracket for rectangular type	OP-87664	Zinc nickel plating and others Approx. 190 g
	200 mm 7.87"	OP-87665 <sup>*2</sup>	SUS304 Approx. 77 g
	130 mm 5.12"	OP-87666 <sup>*2</sup>	SUS304 Approx. 50 g
	M18 nut	OP-3052 <sup>*4</sup>	Brass nickel plating Approx. 10 g
	M18 Lock washer	OP-2263 <sup>*4</sup>	Material: Steel Surface treatment: Trivalent chromium plating Approx. 5 g

\*1 This bracket is dedicated to the cable type sensors.

Use OP-87409 or OP-87410 when using the connector type sensors.

\*2 These brackets are only meant for use with the rectangular type sensors.

\*3 When installing a connector type sensor in this bracket, an L-shaped connector cable must be used.

\*4 Supplied with M18 threaded mount type.

## ■ Reflector

Type	Model	Detecting distance	Reflective Area	Temperature specification	Material/Weight
 Reflective mirror R-2L	OP-84219	0.1 to 4.2 m 0.3' to 13.8'	47 x 47 mm 1.85" x 1.85"	-20 to +50°C -4 to 122°F	Reflector: Acrylic Base: ABS Approx. 20 g
 Reflective mirror R-3	OP-96436	0.1 to 2.9 m 0.3' to 9.5'	31 x 31 mm 1.22" x 1.22"		Reflector: Acrylic Base: ABS Approx. 10 g
 Reflective mirror R-5	R-5	0.1 to 2.5 m 0.3' to 8.2'	34 x 11.6 mm 1.34" x 0.46"		Reflector: Acrylic Base: ABS Approx. 5 g
 Reflective tape	OP-84221	0.2 to 1.1 m 0.7' to 3.6'	30 x 40 mm 1.18" x 1.57"		Surface: Acrylic Cube: Polycarbonate Approx. 1 g
 Oil/Chemical-resistant reflector	OP-87623	0.1 to 2.4 m 0.3' to 7.9'	51 x 51 mm 2.01" x 2.01"	-20 to +70°C -4 to 158°F	Oil/Chemical-resistant resin Approx. 20 g
 Round reflector	OP-87624	0.1 to 3 m 0.3' to 9.8'	ø80 ø3.15" exclude ø10.5 ø0.41" in the middle	-20 to +50°C -4 to 122°F	Reflector: Acrylic Base: ABS 35 g

OP-87407 + 87664 + 87666



Extendable bracket for rectangular type

OP-87406 + 87404





Adjustable bracket for rectangular type

OP-87406 + 87405



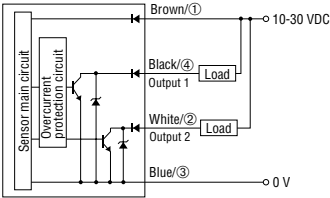
Adjustable bracket for threaded mount type

■ Cable

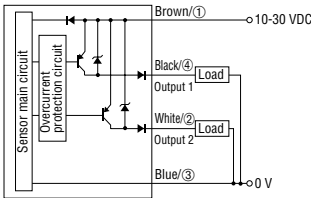
Specifications	Material	Appearance	Connection Method	Length	Model	Weight
Standard	Cable: PVC Connector: Zinc nickel plating	 Straight type	M12 4-pin	2 m <b>6.6'</b>	<b>OP-87634</b>	Approx. 100 g
				10 m <b>32.8'</b>	<b>OP-87635</b>	Approx. 430 g
			M8 4-pin	2 m <b>6.6'</b>	<b>OP-87625</b>	Approx. 75 g
				10 m <b>32.8'</b>	<b>OP-87626</b>	Approx. 340 g
Oil-resistant	Cable: PUR Connector: Zinc nickel plating		M8 3-pin	2 m <b>6.6'</b>	<b>OP-87627</b>	Approx. 80 g
				M12 4-pin	2 m <b>6.6'</b>	<b>OP-87636</b>
			10 m <b>32.8'</b>		<b>OP-87637</b>	Approx. 330 g
			M8 4-pin	2 m <b>6.6'</b>	<b>OP-87628</b>	Approx. 55 g
10 m <b>32.8'</b>	<b>OP-87629</b>	Approx. 260 g				
Chemical-resistant	Cable: PVC Connector: SUS316L	M8 4-pin	2 m <b>6.6'</b>	<b>OP-87621</b>	Approx. 75 g	
		M8 3-pin	2 m <b>6.6'</b>	<b>OP-87622</b>	Approx. 65 g	
Standard	Cable: PVC Connector: Zinc nickel plating	 L-shaped type	M12 4-pin	2 m <b>6.6'</b>	<b>OP-87638</b>	Approx. 100 g
				10 m <b>32.8'</b>	<b>OP-87639</b>	Approx. 430 g
			M8 4-pin	2 m <b>6.6'</b>	<b>OP-87630</b>	Approx. 75 g
				M8 3-pin	2 m <b>6.6'</b>	<b>OP-87631</b>
Oil-resistant	Cable: PUR Connector: Zinc nickel plating		M12 4-pin		2 m <b>6.6'</b>	<b>OP-87640</b>
				10 m <b>32.8'</b>	<b>OP-87641</b>	Approx. 330 g
			M8 4-pin	2 m <b>6.6'</b>	<b>OP-87632</b>	Approx. 55 g
				10 m <b>32.8'</b>	<b>OP-87633</b>	Approx. 260 g
Chemical-resistant	Cable: PVC Connector: SUS316L	M8 4-pin	2 m <b>6.6'</b>	<b>OP-87619</b>	Approx. 70 g	
		M8 3-pin	2 m <b>6.6'</b>	<b>OP-87620</b>	Approx. 60 g	

■ I/O circuit diagram

NPN



PNP



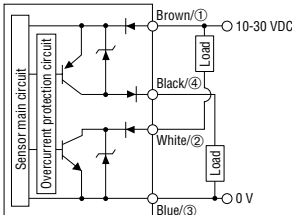
M8 connector (4-pin) type



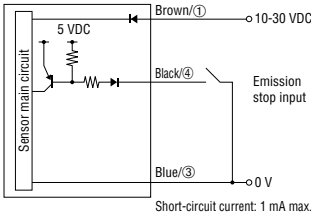
M8 connector (3-pin) type



Bipolar



Thrubeam transmitter



M12 connector (4-pin) type



■ Enclosure ratings

Enclosure rating	Connector type			Cable type
	Standard	Oil-resistant	Chemical-resistant	
IP67 IEC60529	✓	✓	✓	✓
IP68 IEC60529	—	✓	✓	✓
IP69K DIN40050-9	—	✓ <sup>*1</sup>	✓	✓
ECOLAB, Diversey	—	—	✓ <sup>*2</sup>	✓ <sup>*2</sup>

\*1 Only the M12 connector type satisfies this specification.  
\*2 Tested for endurance against cleaners of several companies.

## ■ Specifications



Type				Thrubeam	Retro-reflective	Diffuse reflective
Model	Threaded mount type	NPN + PNP (Bipolar)	M12 connector, 4-pin	PR-G51CBD	PR-G61CBD	PR-G41CBL
	Rectangular type	NPN	2 m 6.6' cable	PR-G51N	PR-G61N	PR-G41N
			M8 connector, 4-pin	PR-G51CN	—	—
		PNP	2 m 6.6' cable	PR-G51P	PR-G61P	—
			M8 connector, 4-pin	PR-G51CP	PR-G61CP	PR-G41CP
			M8 connector, 3-pin	PR-G51C3PD	PR-G61C3PD	—
Detecting distance				30 m 98.4'	0.1 to 4.2 m 0.3' to 13.8'	500 mm 19.69"
No. of control outputs				2 (Dark-ON + Light-ON)* <sup>1</sup>		
Output operation		Output 1		Dark-ON		Light-ON
		Output 2* <sup>2</sup>		Light-ON		Dark-ON
Response time				1 ms	0.5 ms	
Sensitivity adjustment				One-turn trimmer (230°)		Five-turn trimmer
Spot diameter				—		ø20 mm ø0.79" max. (at 300 mm 11.81")
Light source				4 elements, Red LED (631 nm)	4 elements, Red LED (630 nm)	4 elements, Point light source red LED (650 nm)
Mutual interference prevention				—		2 units
Indicators				Transmitter: Power indicator (green) Receiver: Output indicator (yellow), Stable operation indicator (green)		7-segment display (0 to 999), Output indicator (yellow)
Power voltage				10 to 30 VDC, including 10% ripple (P-P)		
Power consumption				Transmitter: 450 mW max. (15 mA max. at 24 V, 15 mA max. at 12 V) Receiver: 360 mW max. (12 mA max. at 24 V, 15 mA max. at 12 V)		450 mW max. (15 mA max. at 24 V, 21 mA max. at 12 V)
Control output				NPN output type: NPN open collector, PNP output type: PNP open collector, Bipolar output type: NPN + PNP open collector 30 VDC or less, 100 mA or less Residual voltage: 1.2 V or less at less than 10 mA, 2 V or less at 10 to 100 mA		
Emission stop input				Non-voltage input Input time ON: 1 ms or more, OFF: 20 ms or more		—
Protection circuit				Protection against reverse power connection, power supply surge, output overcurrent, output surge, and reverse output connection		
Environmental resistance	Enclosure rating* <sup>3</sup>		IP68 (IEC60529), IP69K (DIN40050-9), Rectangular type: 4X, 6P, 13 (NEMA250), Threaded mount type: 4, 6, 13 (NEMA250)			
	Ambient light		Incandescent lamp: 5000 lux or less, Sunlight: 20000 lux or less			
	Ambient temperature		-20 to +70°C -4 to 158°F (No freezing)* <sup>4</sup>			
	Storage temperature		-20 to +70°C -4 to 158°F			
	Ambient humidity		35 to 85% RH (No condensation)			
	Shock resistance		1000 m 3280.8/s <sup>2</sup> in X, Y, and Z directions, 6 times respectively			
	Vibration resistance		10 to 55 Hz, 1.5 mm 0.06" double amplitude in X, Y, and Z directions, 2 hours respectively			
	Insulating resistance		20 MΩ or more (500 VDC)			
Withstand voltage		1000 VAC, 50/60 Hz, 1 min				
Material				Case: Rectangular type: SUS316L, Threaded mount type: Zinc die cast (Nickel chrome plating), Indicator cover: PES, 7-segment display cover/Lens cover: PMMA (scratch-resistant coating) M18 nut: Brass (Nickel plating), Lock washer: Steel (Chrome plating)		
Weight	M12 connector		Approx. 85 g		Approx. 45 g	
	2 m 6.6' cable		Approx. 160 g		Approx. 75 g	
	M8 connector		Approx. 55 g		Approx. 25 g	
Accompanying items				Instruction Manual, (Threaded mount type only) M18 nut, Lock washer		

\*1 For the threaded mount type sensors, the outputs are 1 NPN output and 1 PNP output.

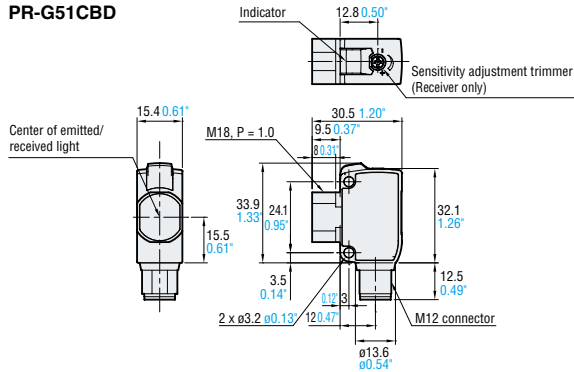
\*2 Output 2 is not available on the threaded mount type or M8 3-pin type.

\*3 For the connector type, the enclosure rating varies depending on the cable that is used.

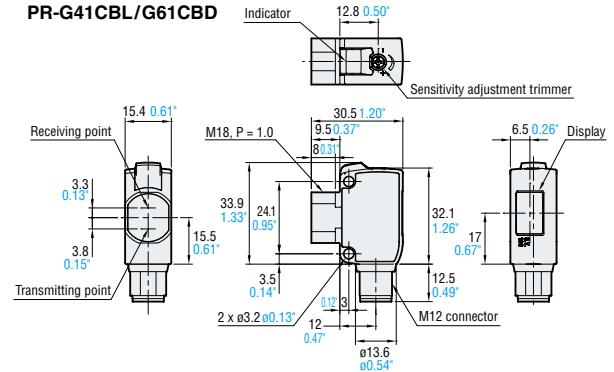
\*4 When the ambient temperature is 60°C 140°F or higher, the device should be powered with no more than 24 VDC and 50 mA.

## ■ Dimensions

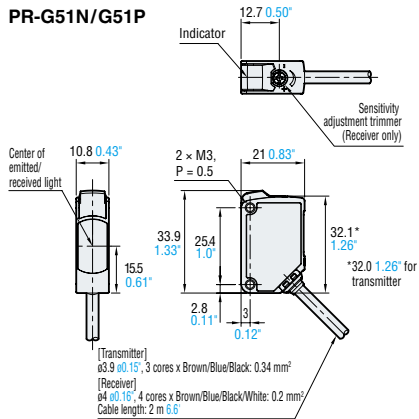
### PR-G51CBD



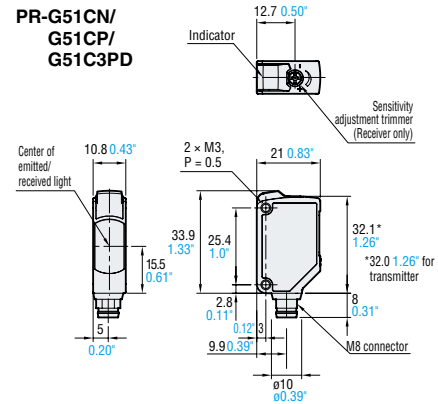
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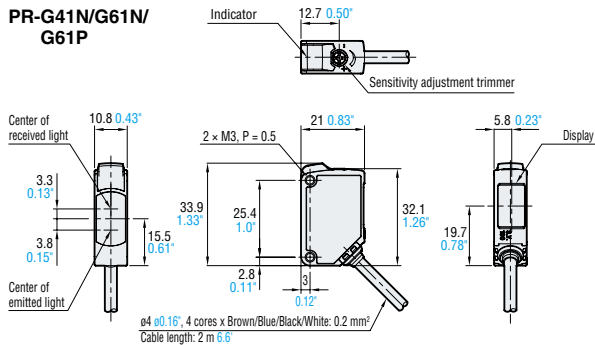
### PR-G51N/G51P



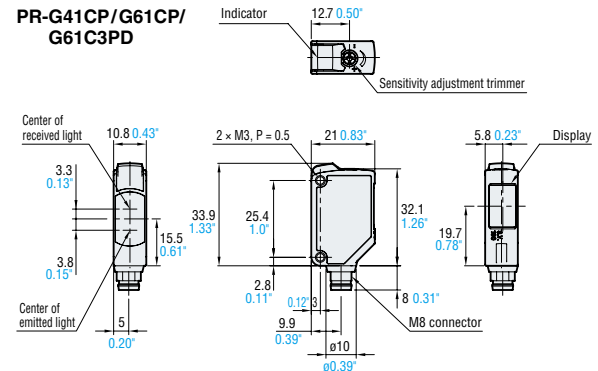
### PR-G51CN/ G51CP/ G51C3PD



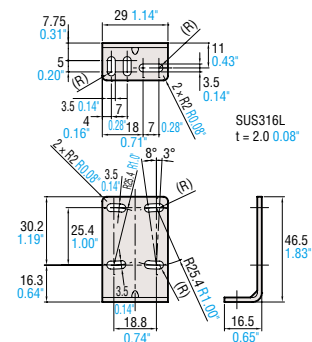
### PR-G41N/G61N/ G61P



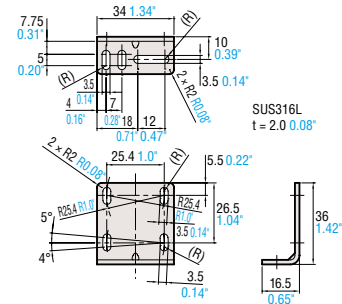
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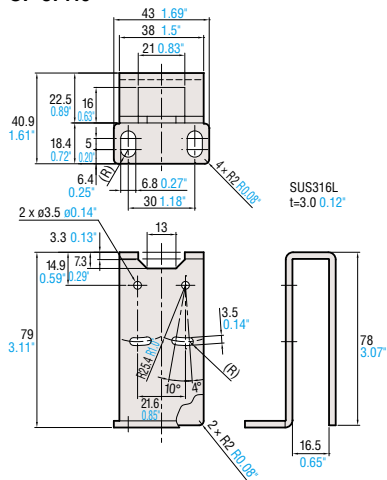
OP-87408



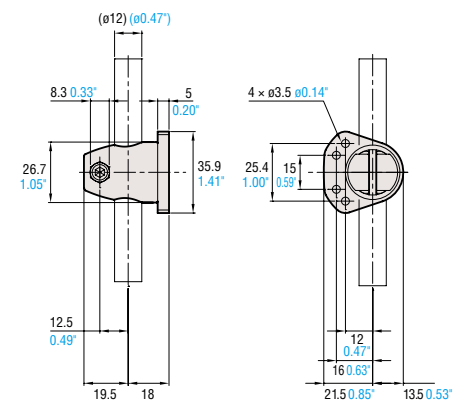
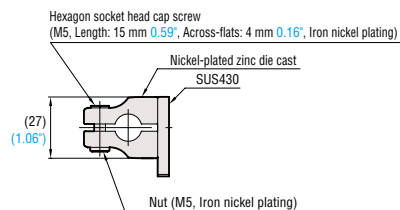
OP-87409



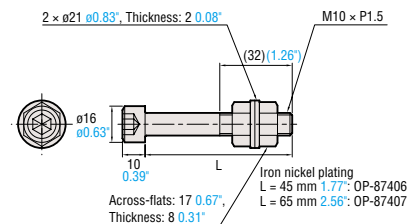
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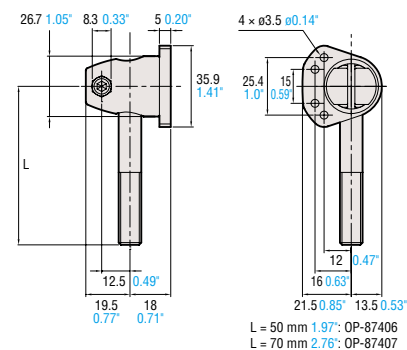
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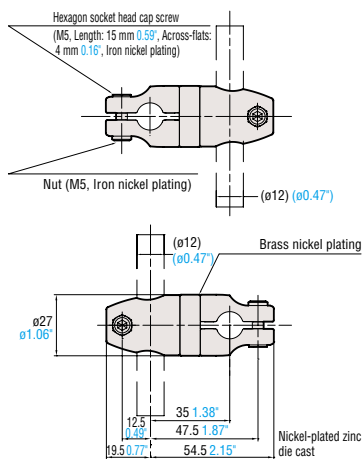
OP-87406/87407



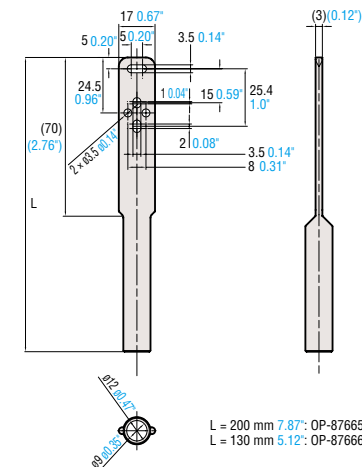
OP-87406 (87407) + OP-87404



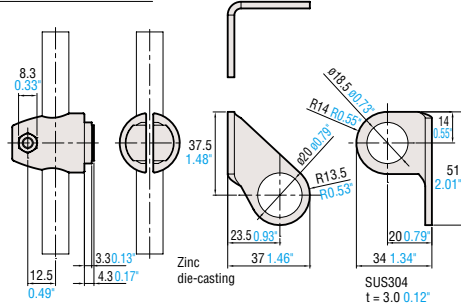
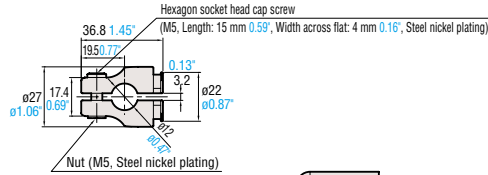
OP-87664



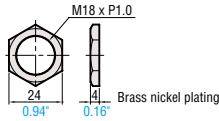
OP-87665/87666



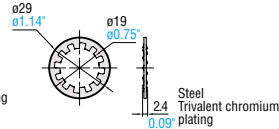
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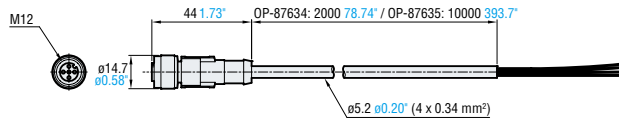
### OP-3052



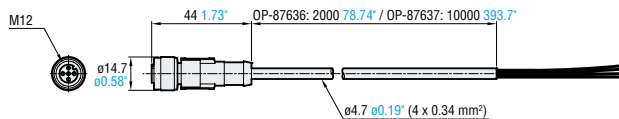
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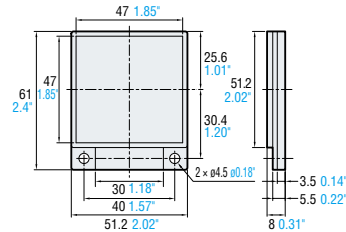
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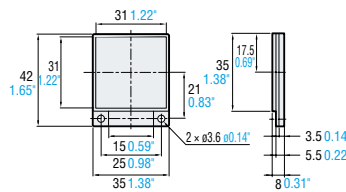
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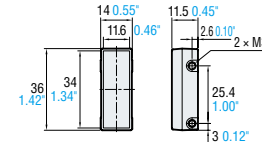
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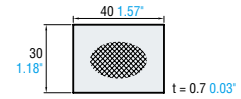
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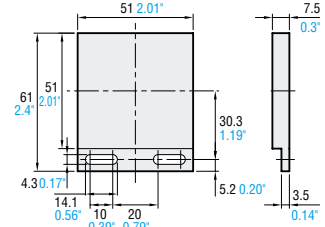
### R-5



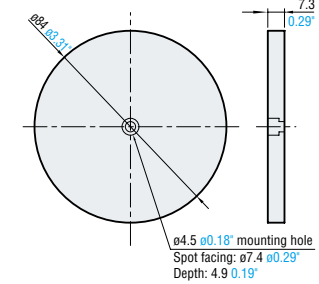
### OP-84221 (Reflective tape)



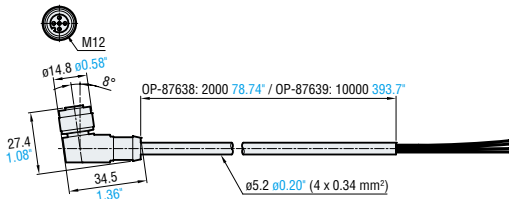
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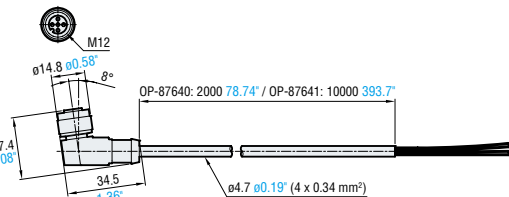
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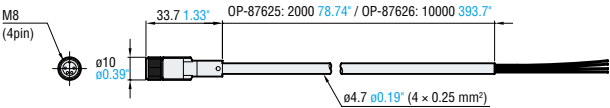
### OP-87638/87639



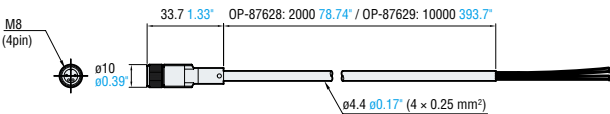
### OP-87640/87641



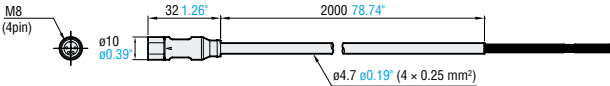
OP-87625/87626



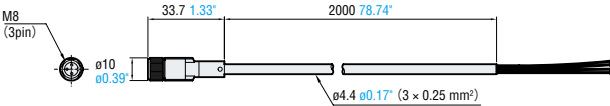
OP-87628/87629



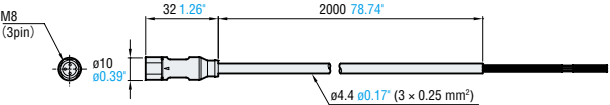
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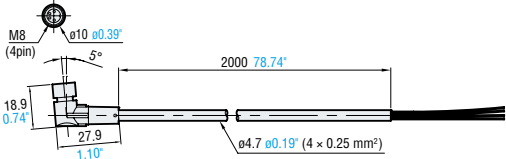
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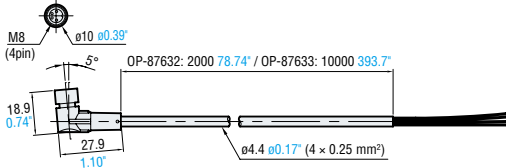
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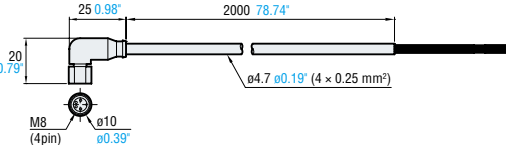
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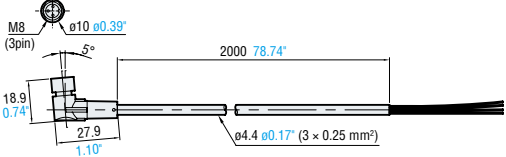
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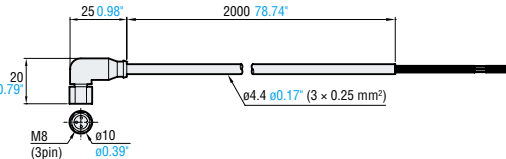
OP-87619



OP-87631



OP-87620



M12 connector  
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type



M8 connector  
(4-pin)  
type



M8 connector  
(3-pin)  
type



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②	White
③	Blue
④	Black

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