

Ultra-small Separate Amplifier Photoelectric Sensors

PS-N Series



The PS-N Series is part of the NEO family of sensors

The NEO family contains many common features, including those listed below.

PS-NEO FUNCTION

- NEO Preset
- NEO MEGA
- Built-in application modes
- DATUM function
- Open field network compatibility
- Reduced wiring
- Interference prevention function
- Pause function
- Sleep function

Wide range of sensor head options

The PS Series lineup includes a broad range of sensor heads that have a wide variety of special characteristics, such as the environmentally resistant models that are encased in PFA, or the limited range reflective models that are able to avoid the effects of background light.

Small size heads with high power

While the conventional PS Series had only "FINE" and "TURBO" modes, it is now equipped with additional power modes including "MEGA" mode. This allows the PS Series to be used in applications where strong light intensity is required.



Communication unit support

Current values can be monitored and settings can be read and written over a network.



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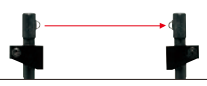





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Sensor head lineup



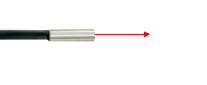
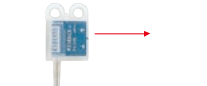
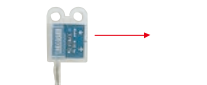
Thrubeam type

Type	Appearance	Detecting distance (mm inch)*1	Features	Model (C means with connector)
Thrubeam type	General purpose	 MEGA : 3600 (6000) 141.73" (236.22") ULTRA : 2800 (5000) 110.24" (196.85") SUPER : 2200 (4200) 86.61" (165.35") TURBO : 2000 (4000) 78.74" (157.48")	Compact body and long-detecting distance	PS-55 (PS-55C)
		 MEGA : 3600 (6000) 141.73" (236.22") ULTRA : 2800 (5000) 110.24" (196.85") SUPER : 2200 (4200) 86.61" (165.35") TURBO : 2000 (4000) 78.74" (157.48")	Compact body and long-detecting distance easy optical-axis alignment	PS-05
		 MEGA : 1000 39.37" ULTRA : 900 35.43" SUPER : 750 29.53" TURBO : 700 27.56"	Cylindrical, embedded type	PS-58
	Environment-proof	 MEGA : 1200 (1500) 47.24" (59.06") ULTRA : 800 (1000) 31.50" (39.37") SUPER : 400 (650) 15.75" (25.59") TURBO : 300 (600) 11.81" (23.62")	Side-to-side type, 3 mm 0.12" thickness	PS-52 (PS-52C)
		 MEGA : 750 (900) 29.53" (35.43") ULTRA : 500 (600) 19.69" (23.62") SUPER : 400 (450) 15.75" (17.72") TURBO : 300 (400) 11.81" (15.75")	Flat type 2.8 mm 0.11" thickness	PS-56
		 MEGA : 3600 (6000) 141.73" (236.22") ULTRA : 2800 (5000) 110.24" (196.85") SUPER : 2200 (4200) 86.61" (165.35") TURBO : 2000 (4000) 78.74" (157.48")	PFA-sheath type, oil-proof, chemical proof	PS-201 (PS-201C)
	 MEGA : 900 (1000) 35.43" (39.37") ULTRA : 700 (900) 27.56" (35.43") SUPER : 600 (800) 23.62" (31.50") TURBO : 500 (750) 19.69" (29.53")	PFA-sheath type, Slit ² built-in	PS-202	

*1 Depending on the mode, the response time may be different even at the same detecting distance. The detecting distance in parentheses is the value when enabling the long distance detection mode and using a 5 m sensor head cable.

*2 5x1 mm 0.2"x0.04" slits for both transmitter/receiver.

Reflective model

Type	Appearance	Detecting distance (mm inch)*1	Features	Model (C means with connector)
Diffuse-reflective	General purpose	 MEGA : 600 (900) 23.62" (35.43") ULTRA : 400 (600) 15.75" (23.62") SUPER : 250 (450) 9.84" (17.72") TURBO : 200 (400) 7.87" (15.75")	Compact body and long-detecting distance	PS-45
		 MEGA : 200 (250) 7.87" (9.84") ULTRA : 150 (200) 5.91" (7.87") SUPER : 120 (160) 4.72" (6.30") TURBO : 100 (140) 3.94" (5.51")	Flat type 2.8 mm 0.11" thickness	PS-46
		 MEGA : 75 2.95" ULTRA : 45 1.77" SUPER : 30 1.18" TURBO : 25 0.98"	Cylindrical, embedded type	PS-48
	Environment-proof	 MEGA : 600 (900) 23.62" (35.43") ULTRA : 400 (600) 15.75" (23.62") SUPER : 250 (450) 9.84" (17.72") TURBO : 200 (400) 7.87" (15.75")	PFA-sheath type, oil-proof, chemical proof	PS-205
		 MEGA : 250 9.84" ULTRA : 180 7.09" SUPER : 100 3.94" TURBO : 70 2.76"	PFA-sheath type, Focused beam small spot	PS-206
	Definite-reflective	Small spot	10±4 0.39"±0.16" * Common for all power modes	Small Spot ø0.8 mm ø0.03" nearly unaffected by target background
Long distance/ small spot		32 to 53 1.26" to 2.09" * Common for all power modes	Long distance small spot nearly unaffected by target background	PS-49 (PS-49C)

*1 Depends on the mode, response time may be different even with the same detecting distance. The detecting distance in parentheses is the value when enabling the long distance detection mode.



Amplifier

Cable type

Type	Appearance	Model		Control outputs	External input	
		NPN output	PNP output			
Standard	Main unit		PS-N11N	PS-N11P	1	1
	Expansion unit		PS-N12N	PS-N12P		

M8 connector type

Type	Appearance	Model		Control outputs	External input	
		NPN output	PNP output			
Standard	Main unit		PS-N11CN	PS-N11CP	1	1
	Expansion unit		PS-N12CN	PS-N12CP		

Zero line type

Type	Appearance	Model	Control outputs	External input
Standard		PS-N10	None*1	0

*1 Counted as one output when added to an NU Series communication unit.

Sensor head specifications

Thrubeam sensor head

Type	Thrubeam type							
	General purpose					Environment-proof		
	Long-detecting distance	Free-positioning	Cylindrical	Thin		Long-detecting distance	Slit built-in	
Model	PS-55 (C)	PS-05	PS-58	PS-52 (C)	PS-56	PS-201 (C)	PS-202	
Detecting distance*1 (mm inch)	MEGA	3600 (6000) 141.73" (236.22")	3600 (6000) 141.73" (236.22")	1000 39.37"	1200 (1500) 47.24" (59.06")	750 (900) 29.53" (35.43")	3600 (6000) 141.73" (236.22")	900 (1000) 35.43" (39.37")
	ULTRA	2800 (5000) 110.24" (196.85")	2800 (5000) 110.24" (196.85")	900 35.45"	800 (1000) 31.50" (39.37")	500 (600) 19.69" (23.62")	2800 (5000) 110.24" (196.85")	700 (900) 27.56" (35.43")
	SUPER	2200 (4200) 86.61" (165.35")	2200 (4200) 86.61" (165.35")	750 29.53"	400 (650) 15.75" (25.59")	400 (450) 15.75" (17.72")	2200 (4200) 86.61" (165.35")	600 (800) 23.62" (31.50")
	TURBO	2000 (4000) 78.74" (157.48")	2000 (4000) 78.74" (157.48")	700 27.56"	300 (600) 11.81" (23.62")	300 (400) 11.81" (15.75")	2000 (4000) 78.74" (157.48")	500 (750) 19.69" (29.53")
Light source	Infrared LED							
Smallest detectable object**2	ø1.0 mm ø0.04* Opaque	ø1.0 mm ø0.04* Opaque	ø0.5 mm ø0.02* Opaque	ø0.3 mm ø0.01* Opaque	ø0.3 mm ø0.01* Opaque	ø0.8 mm ø0.03* Opaque	ø0.5 mm ø0.02* Opaque	
Environmental resistance	Protective structure	IP64	IP64	IP67	—	—	IP67	
	Ambient light	Incandescent lamp: 4000 lux max., Sunlight: 12000 lux max.						
	Ambient temperature/ Relative humidity	-10 to +60°C (14 to +140°F) (No freezing)/35 to 85% RH (No condensation)						

*1 Depending on the mode, the response time may be different even with the same detecting distance. The detecting distance in parentheses is the value when enabling the long distance detection mode and using a 5 m sensor head cable.

*2 With thrubeam sensors, the smallest detectable object indicates the size of a detectable object from the maximum detecting distance.

Reflective sensor head

Type	Diffuse-reflective					Definite-reflective		
	General purpose			Environment-proof		General purpose		
	Long-detecting distance	Thin	Cylindrical	Long-detecting distance	Narrow-beam	Small spot	Long-detecting distance/small spot	
Model	PS-45	PS-46	PS-48	PS-205	PS-206	PS-47 (C)	PS-49 (C)	
Detecting distance*1 (mm inch)	MEGA	600 (900) 23.62" (35.43")	200 (250) 7.87" (9.84")	75 2.95"	600 (900) 23.62" (35.43")	250 9.84"	10±4 0.39"±0.16"	32 to 53 1.26" to 2.09"
	ULTRA	400 (600) 15.75" (23.62")	150 (200) 5.91" (7.87")	45 1.77"	400 (600) 15.75" (23.62")	180 7.09"		
	SUPER	250 (450) 9.84" (17.72")	120 (160) 4.72" (6.30")	30 1.18"	250 (450) 9.84" (17.72")	100 3.94"		
	TURBO	200 (400) 7.87" (15.75")	100 (140) 3.94" (5.51")	25 0.98"	200 (400) 7.87" (15.75")	70 2.76"		
Light source	Infrared LED					Red LED		
Detectable object	Transparent and opaque							
Smallest detectable object**2	—	—	—	—	—	ø0.03 mm ø0.001* Copper wire	ø0.1 mm ø0.004* Copper wire	
Spot diameter	—	—	—	—	ø6 mm ø0.24* At detecting distance of 70 mm 2.76"	ø0.8 mm ø0.03* At detecting distance of 10 mm 0.39"	ø1.5 mm ø0.06* At detecting distance of 50 mm 1.97"	
Hysteresis (% of detecting distance)	15% max.	10% max.	20% max.	15% max.		3% max.	6% max.	
Environmental resistance	Protective structure	IP64	—	IP67				
	Ambient light	Incandescent lamp: 4000 lux max., Sunlight: 12000 lux max.					Incandescent lamp: 4000 lux max., Sunlight: 5000 lux max.	
	Ambient temperature	-10 to +60°C (14 to +140°F) (No freezing)						
	Relative humidity	35 to 85% RH (No condensation)						

*1 Depending on the mode, the response time may be different even with the same detecting distance. The detecting distance in parentheses is the value when enabling the long distance detection mode.

*2 With reflective sensors, the smallest detectable object was determined at the optimal detecting distance and sensitivity setting.



Amplifier specifications

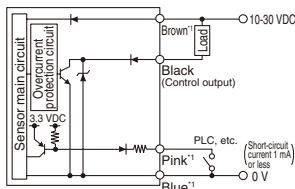
Type	Cable		M8 connector		Zero line
Main/Expansion unit	Main unit	Expansion unit	Main unit	Expansion unit	Expansion unit
Model	NPN PS-N11N PS-N11P	PS-N12N PS-N12P	PS-N11CN PS-N11CP	PS-N12CN PS-N12CP	PS-N10
I/O	Control outputs External input	1 output 1 input	1 output None	1 output 1 input	None*1 None
Response time	500 μs (TURBO)/1 ms (SUPER)/4 ms (ULTRA)/16 ms (MEGA)				
Output selection	LIGHT-ON/DARK-ON				
Timer function	Timer OFF/OFF-delay timer/ON-delay timer/One-shot timer, Timer duration selectable: 1 ms to 9999 ms, Maximum error against the setting value: ±10% max.				
Control outputs	NPN output PNP output	NPN open collector 30 V, (without expansion) 100 mA max., (with expansion) 20 mA max, residual voltage 1 V max. (when the out current is 10 mA or less)/2 V max. (when the output current is 10 to 100 mA) PNP open collector 30 V, (without expansion) 100 mA max., (with expansion) 20 mA max, residual voltage 1.2 V max. (when the output current is 10 mA or less)/2.2 V max. (when the output current is 10 to 100 mA)			
External input	Input time 2 ms (ON)/20 ms (OFF) or more*2				
Expansion units	Up to 16 units (Up to 17 units including 1 main unit can be connected in total.)				
Protection circuit	Reverse polarity protection, Over-current protection, Surge absorber				
Number of interference prevention units	4 for TURBO/SUPER/ULTRA/MEGA (When set to DOUBLE, the number of interference-prevention units will be doubled)				
Power voltage	24 VDC (operating voltage 10-30 VDC (with ripple), ripple (P-P) 10% or less, Class 2 or LPS)				
Power consumption	NPN PNP	Normal: 810 mW or less (28 mA max. at 24 V, 34 mA max. at 12 V) Eco on mode: 700 mW or less (24 mA max. at 24 V, 27 mA max. at 12 V) Eco Full mode: 490 mW or less (17 mA max. at 24 V, 20 mA max. at 12 V) Normal: 860 mW or less (30 mA max. at 24 V, 35 mA max. at 12 V) Eco on mode (ALL): 750 mW or less (26 mA max. at 24 V, 28 mA max. at 12 V) Eco Full mode: 540 mW or less (19 mA max. at 24 V, 21 mA max. at 12 V)			
Environmental resistance	Ambient temperature Relative humidity Vibration resistance Shock resistance	-20°C to +55°C (-4°F to +131°F) (No freezing)*3 35 to 85% RH, (No condensation) 10 to 55 Hz, double amplitude: 1.5 mm 0.06", 2 hours each in the X, Y and Z axis 500 m/s ² 3 times for each of X, Y and Z axis			
Material	Case Cable	Main unit and cover material: Polycarbonate PVC			
Case size	H 32.6 mm 1.28" × W 9.8 mm 0.39" × L 78.7 mm 3.1"				
Weight	Approx. 75 g	Approx. 65 g	Approx. 20 g	Approx. 20 g	Approx. 20 g

*1 Counted as one output when added to a NU Series communication unit.
*2 Input time is 25 ms (ON)/25 ms (OFF) when the external calibration time is selected.
*3 If more than one unit is used together, the ambient temperature in which the sensor should be used varies with the following conditions.
One or two additional units connected: -20°C to +55°C (-4°F to +131°F); 3 to 10 additional units connected: -20°C to +50°C (-4°F to +122°F); 11 to 16 additional units connected: -20°C to +45°C (-4°F to +113°F). These values are valid when the amplifiers are mounted to a DIN rail and the output current is 20mA or less per amplifier.

I/O Circuit Diagram

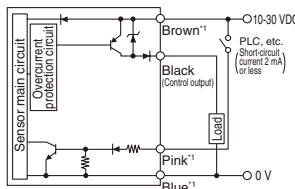
Cable type

PS-N11N/N12N



*1 PS-N11N only

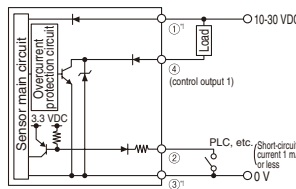
PS-N11P/N12P



*1 PS-N11P only

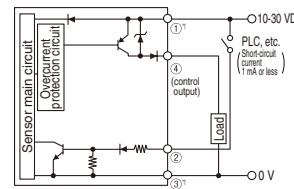
M8 connector type

PS-N11CN/N12CN



*1 PS-N11CN only

PS-N11CP/N12CP



*1 PS-N11CP only

Options

Model number	Applicable model	Type
OP-2555	PS-55	Slit (detecting distance: 700 mm 27.56") (transmitter/receiver set)
OP-93672	PS-05	
OP-0162	PS-45 (accessory)	PS-45 mounting bracket set
OP-0230	PS-56, 52 (accessory)	Mounting nut set for PS-56
OP-2812	PS-55	Mounting bracket set for PS-55
OP-6349	PS-48 (accessory)	PS-48 mounting bracket
OP-6350	PS-58 (accessory)	PS-58 mounting bracket
OP-6800	PS2-61 (accessory)	PS2 mounting bracket
OP-7080	PS-201, 202 (accessory)	PS-201 mounting bracket (one side only)
OP-27934	Amplifier (accessory)	Connector for sensor head (2)
OP-42113	PS-55, 05, 52, 56, 58	Thrubeam transmitter side cable (20 m 65.6')
OP-42114	PS-55, 05, 52, 56, 58	Thrubeam receiver side cable (20 m 65.6')
OP-42115	PS-45, 46, 47, 49	Reflective (except PS-48) cable (20 m 65.6')
OP-42116	PS-201, 202	PFA thrubeam transmitter side cable (20 m 65.6')
OP-42117	PS-201, 202	PFA thrubeam receiver side cable (20 m 65.6')
OP-42118	PS-205, 206	PFA Reflective cable (20 m 65.6')



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Photoelectric Sensors

Proximity Sensors

Safety Equipment

Flow/Pressure/Temperature

Measurement Sensors

Controls

Static Eliminators

Vision Systems

Marking Equipment

Code Readers

Handheld Mobile Computers

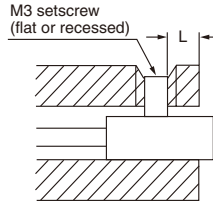
Microscopes

Projector/3D Measurement Systems

Hints on Correct Use

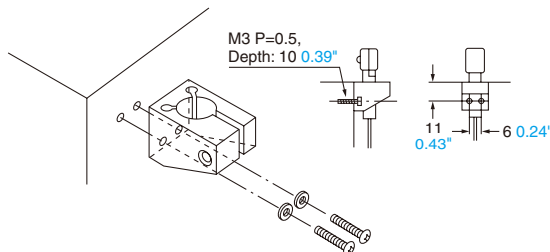
Mounting

- When mounting **PS-48**, ensure that the front face of the sensor head is forward of the mounting surface as shown in the drawing on the right.
- Tightening torque for mounting the **PS-58/48** with a set screw is shown below.

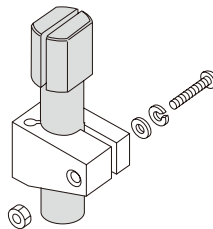


Model	L (mm inch)	Tightening torque
PS-58	7 mm 0.28" or more	0.15 N-m (approx. 21 PSI) or less
PS-48	5 mm 0.20" or more	0.15 N-m (approx. 21 PSI) or less

- The cable for the **PS-201**, **PS-202**, **PS-205**, and **PS-206** cannot be bent within 20 mm 0.79" of the base of the sensor head. The minimum allowable bend radius is 25 mm 0.98".
- To mount the bracket for the **PS-05**, use M3 x 10 screws and spring washers from the supplied screw set as shown in the drawing below, and apply a maximum tightening torque of 0.5 N-m (approx. 71 PSI). When using screws other than those supplied, use M3 oval head machine screws (JIS B1111).



- To mount the **PS-05** sensor head, use an M3 x 14 screw (with washers) and a nut from the supplied screw set as shown in the drawing on the right, and employ a maximum tightening torque of 0.5 N-m (approx. 71 PSI). Always adjust the optical axis after loosening this screw.



- Use the tightening torques indicated below when mounting a sensor head with built-in mounting holes.

Model	Tightening torque	Mounting screw dimensions
PS-45	0.6 N-m (approx. 85 PSI) or less	M3
PS-46	0.3 N-m (approx. 43 PSI) or less	M2
PS-47	0.6 N-m (approx. 85 PSI) or less	M3
PS-49	0.6 N-m (approx. 85 PSI) or less	M3
PS-52	0.15 N-m (approx. 21 PSI) or less	M2
PS-55	0.6 N-m (approx. 85 PSI) or less	M3
PS-56	0.3 N-m (approx. 43 PSI) or less	M2
PS-205	0.5 N-m (approx. 71 PSI) or less	M4
PS-206	0.5 N-m (approx. 71 PSI) or less	M4

Connection

- When extending the amplifier cable, use a cable that has a nominal cross-sectional area of 0.3 mm² or greater and is 100 m 328.1' or shorter.
- The stripped length must be 20 mm 0.79" or shorter at the end of the sensor cable, and core wires must be kept as short as possible. Do not use a relay terminal.
- When extending the sensor head cable, use a single-core shielded cable of 10 m 32.8' or shorter.

New Products

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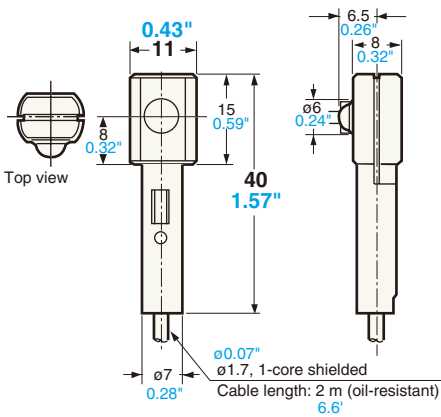
Dimensions

Unit: mm inch

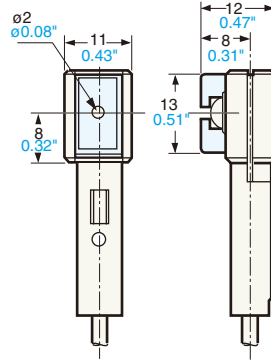
PR
PZ
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Sensor heads

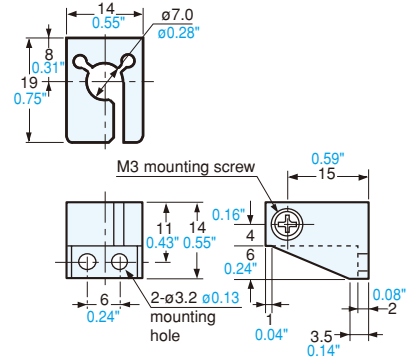
PS-05



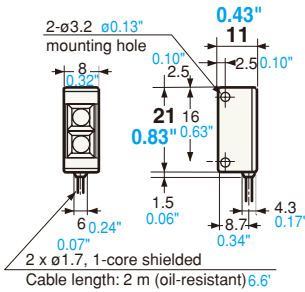
PS-05 with slit plate attached
OP-93672



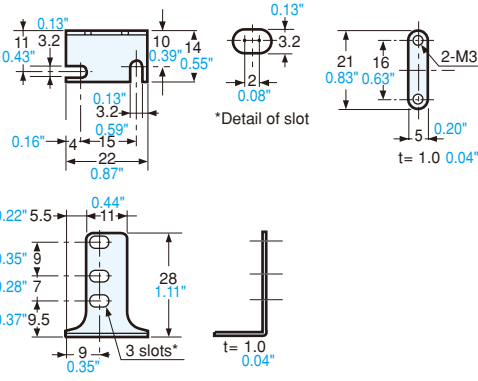
Bracket
(accessory for **PS-05**)



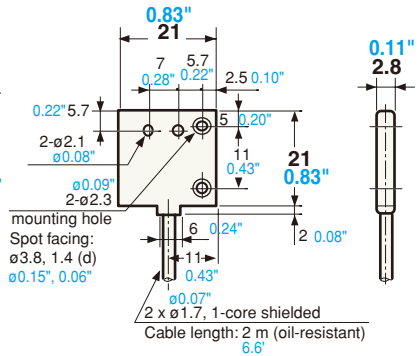
PS-45



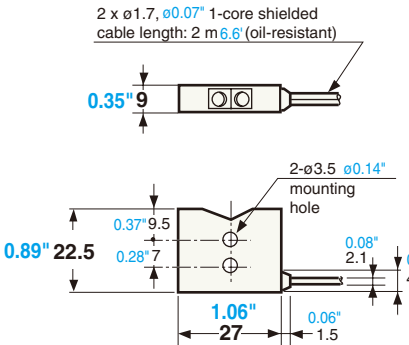
Mounting bracket
(accessory for **PS-45**) **(OP-0162)**



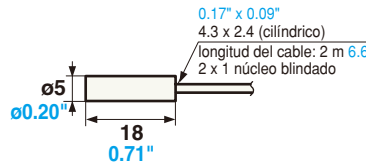
PS-46



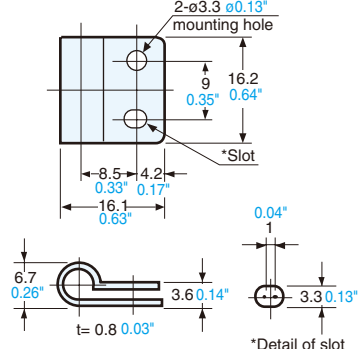
PS-47(C)



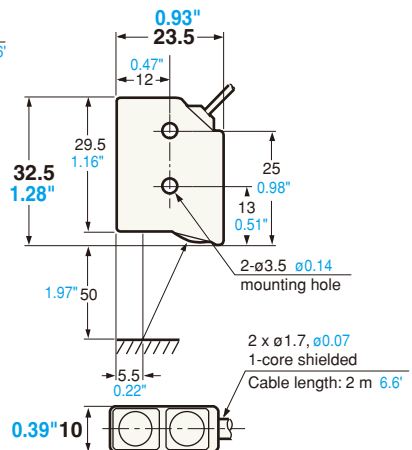
PS-48



Mounting bracket
(accessory for **PS-48**) **(OP-6349)**



PS-49(C)



New Products

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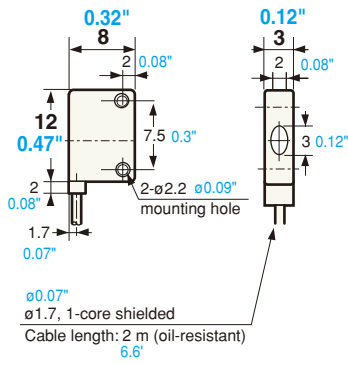
Microscopes

Projector/ 3D Measurement Systems

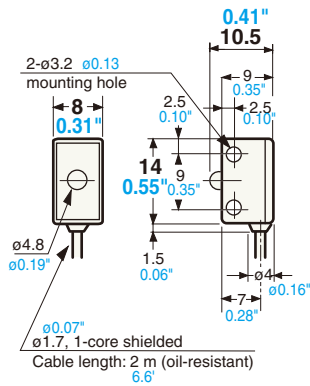


PS-N Ultra-small Separate Amplifier Photoelectric Sensors

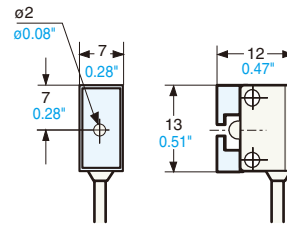
PS-52 (C)



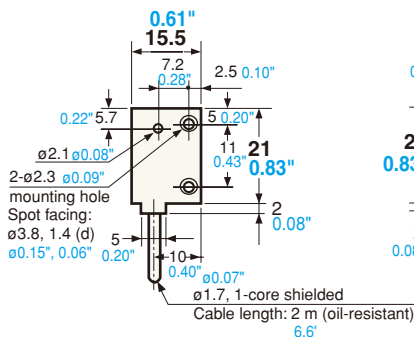
PS-55(C)



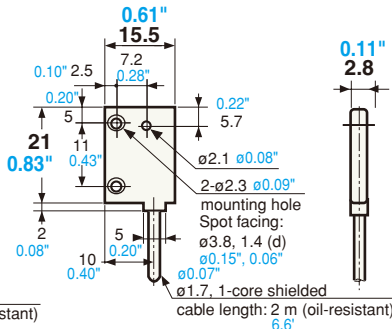
PS-55(C) with slit plate attached OP-2555



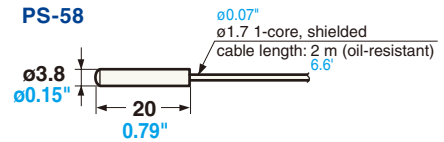
PS-56 (Receiver)



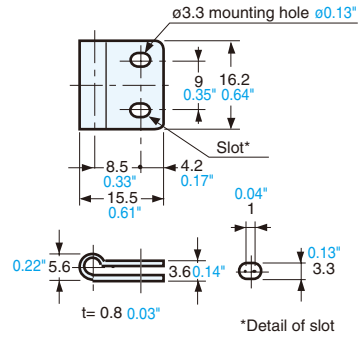
PS-56 (Transmitter)



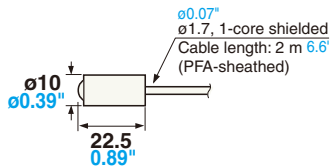
PS-58



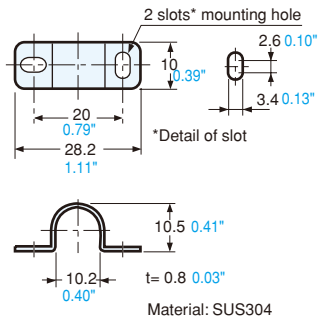
Mounting bracket (accessory for **PS-58**) (**OP-6350**)



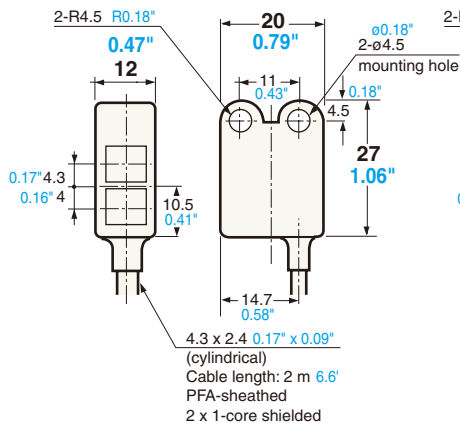
PS-201(C), PS-202



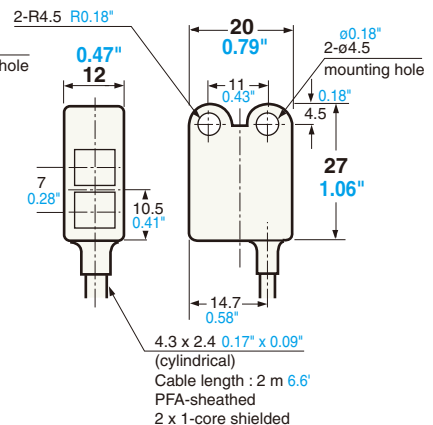
Mounting bracket (accessory for **PS-201(C), PS-202**) (**OP-7080**)



PS-205



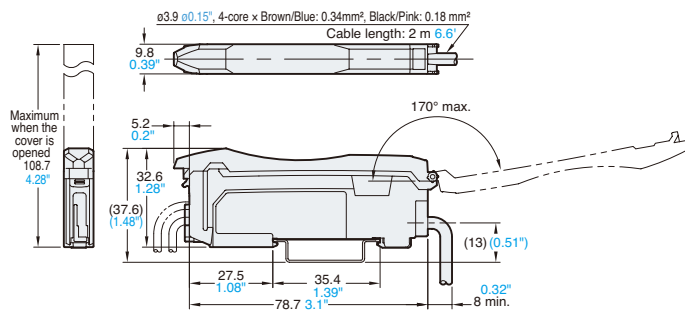
PS-206



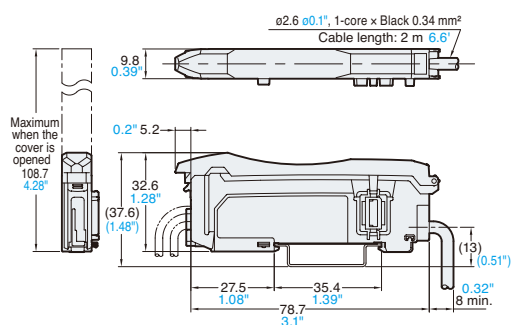
- New Products
- Fiberoptic Sensors
- Photoelectric Sensors
- Proximity Sensors
- Safety Equipment
- Flow/Pressure/Temperature
- Measurement Sensors
- Controls
- Static Eliminators
- Vision Systems
- Marking Equipment
- Code Readers
- Handheld Mobile Computers
- Microscopes
- Projector/3D Measurement Systems



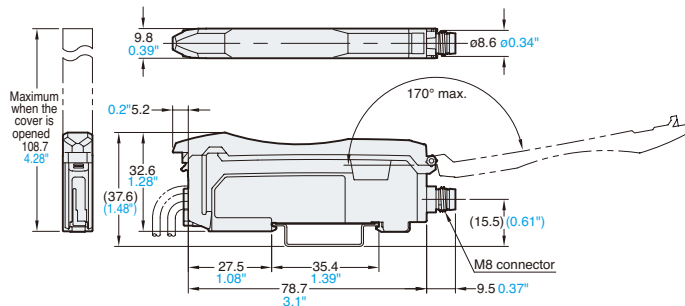
PS-N11N/N11P Cable type, Main unit



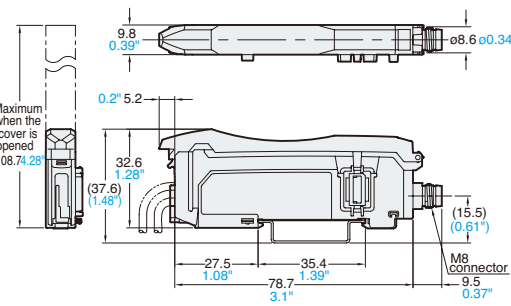
PS-N12N/N12P Cable type, Expansion unit



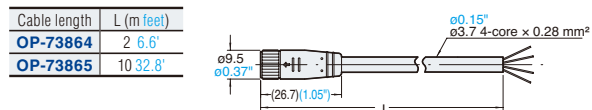
PS-N11CN/N11CP M8 connector type, Main unit



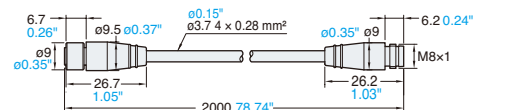
PS-N12CN/N12CP M8 connector type, Expansion unit



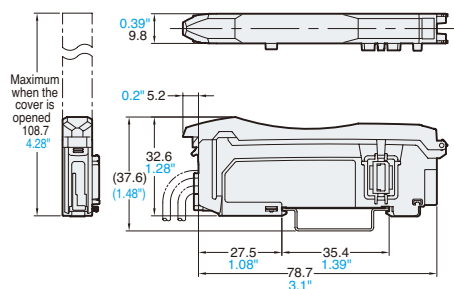
M8 connector cable (**OP-73864/73865** sold separately)



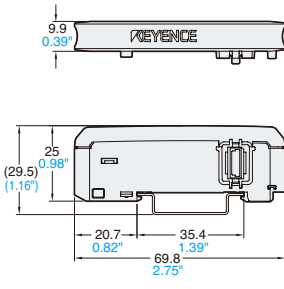
M8 connector junction cable (**OP-85498** sold separately)



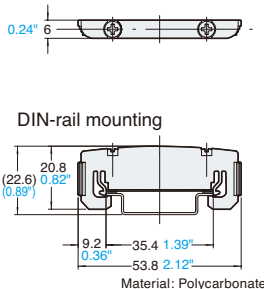
PS-N10 Zero line type, Expansion unit



OP-87199 Conversion adaptor

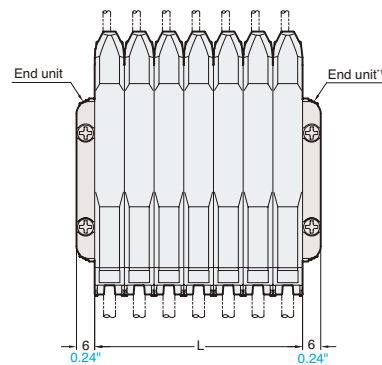


End unit (**OP-26751** sold separately)



Common for all types

When several units are connected:

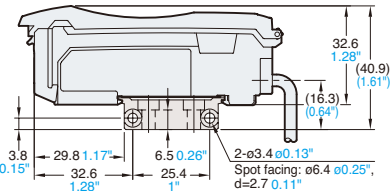


No. of units	L (mm inch)
1	9.8 0.39"
2	19.6 0.77"
3	29.4 1.16"
4	39.2 1.54"
5	49.0 1.93"
6	58.8 2.32"
7	68.6 2.7"
8	78.4 3.09"
9	88.2 3.47"
10	98.0 3.86"
11	107.8 4.24"
12	117.6 4.63"
13	127.4 5.02"
14	137.2 5.4"
15	147.0 5.79"
16	156.8 6.17"
17	166.6 6.56"

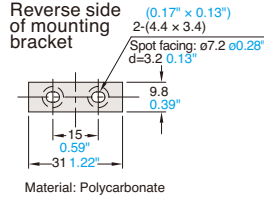
*1 End units must be used when several units are connected. (**OP-26751**)

When the mounting bracket is attached (**OP-73880** sold separately)

Cable type



Reverse side of mounting bracket



M8 connector type

