

High-Performance Fiber Optic Sensor SP Series



Ask SENPUM

+86-755-83330055

Fast Delivery Standard Models



Most products are in stock. Upon receiving your order, we will arrange prompt shipment to minimize your downtime-related costs and losses.



WeChat



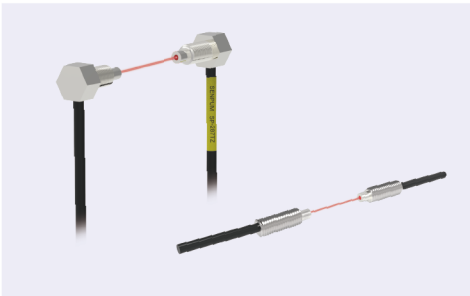
WhatsApp



LINE

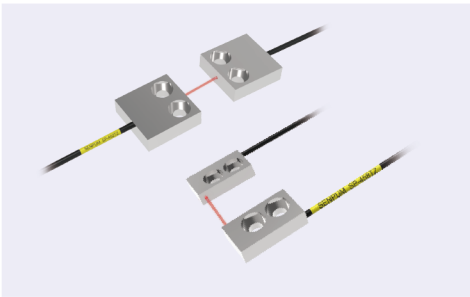
Screw-mount type

Threaded sensor design for direct screw mounting.



Flat bracket type

The flat bracket type comes with pre-drilled mounting holes for easy installation in space-limited applications.



Heat-resistant type

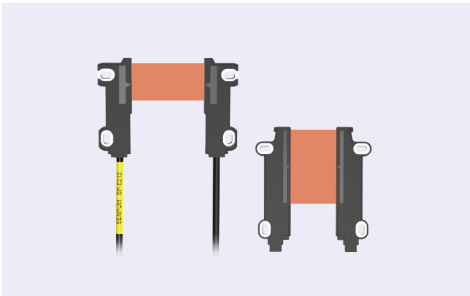
The sensor's heat resistance ranges from 100 °C to 500 °C, meeting diverse requirements.



High temperature resistance: 100 to 500 °C or higher

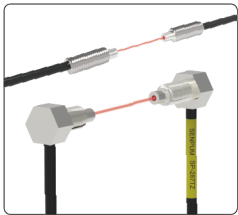
Area type

Capable of detecting objects within a specific area, with a maximum detection zone width of over 100 mm.



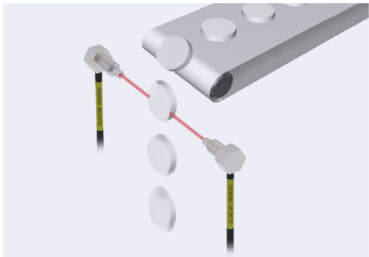
* For more product features, please contact a SENPUM sales engineer.

Thrubeam



Screw-fixed type

The sensor is fixed by screws, which is simple and convenient.



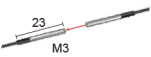
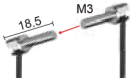
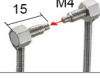
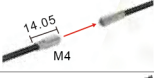
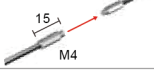
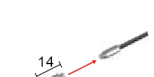
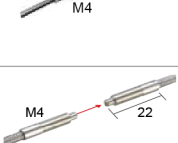
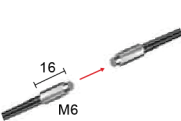
Screw-fixed type



Small target detection



ToughFlex

Type		Fiber unit length (diameter) Ambient temperature	Appearance	Bend radius (mm)	Detection distance (mm)	Optical axis diameter (mm)	Smallest detectable object	Model/Weight	Dimensions
Dimensions/Shape									
M3	Threaded	1 m Free-cut (ø1.3×2) -40 to +50°C		R25	0~550	-	ø0.005	SP-236FA Approx.12g	-
		1 m Free-cut (ø1.3×2) -40 to +70°C		R2 ToughFlex	0~450	-		SP-236TZ Approx.12g	-
M4	Hexagon	2 m Free-cut (ø2.3) -20 to +50°C		R1 ToughFlex	0~3600	ø2.3		SP-271TZ Approx.22g	 P.0147
		2 m Free-cut (ø2.2) -40 to +50°C		R2 ToughFlex	0~3100	ø1.13		SP-278TZ Approx.43g	 P.0133
		1 m Cut not allowed -40 to +50°C		R10 Stainless steel	0~1800			SP-278TG Approx.43g	 P.0147
	Threaded	2m Free-cut (ø2.2) -40 to +70°C		R25	0~3600	ø1		SP-28F Approx.21g	 P.0132
		2 m Free-cut (ø1.3) -40 to +70°C		R4	0~2200			SP-279 Approx.9g	 P.0132
		2 m Free-cut (ø2.2) -40 to +50°C		R4 ToughFlex	0~3600	ø1.13		SP-278 Approx.25g	 P.0133
				R0.5 ToughFlex			SP-278V Approx.25g	 P.0133	
		1 m Cut not allowed -40 to +50°C		R10 Stainless steel	0~1800		SP-278G Approx.39g	 P.0147	
M6		2 m Free-cut (ø2.2) SP-272Z: -40 to +50°C SP-272: -40 to +70°C		R2 ToughFlex	0~3600	ø1.5	SP-272Z Approx.25g	 P.0133	
				R25			SP-272 Approx.25g	 P.0133	

Fiber Optic Sensors

Photoelectric Sensors

Color Sensors

Laser Sensors

Proximity Sensors

Precision Contact
Sensors

Area Sensors/
Safety Light Curtains

Laser Scanners

Digital Contact Sensors

Laser Displacement
Sensors

Laser Micrometers

Confocal Displacement
Sensors

Barcode Readers

AI Vision Sensors

RFID

Infrared Temperature
Sensors

Pressure Sensors

Flow Sensors

Magnetic Sensors

Ultrasonic Sensors

Magnetic Scales

Static Eliminators



- Photoelectric Sensors
- Color Sensors
- Laser Sensors
- Proximity Sensors
- Precision Contact Sensors
- Area Sensors/
Safety Light Curtains
- Laser Scanners
- Digital Contact Sensors
- Laser Displacemen
Sensors
- Laser Micrometers
- Confocal Displacement
Sensors
- Barcode Readers
- AI Vision Sensors
- RFID
- Infrared Temperature
Sensors
- Pressure Sensors
- Flow Sensors
- Magnetic Sensors
- Ultrasonic Sensors
- Magnetic Scales
- Static Eliminators



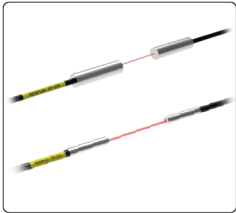
SP

Thrubeam Type High-Performance Fiber Optic Sensor

Thrubeam							
Type		Fiber unit length (diameter) Ambient temperature	Appearance	Minimum bend radius (mm)	Detection distance (mm)*1	Optical axis diameter (mm)	Model/Weight
Dimensions/Shape							Dimensions
M4	Hexagon	2m Free-cut (ø2.2) -40 to +60°C		R2 ToughFlex	0~3600	Transmission: ø1 Reception: ø3.2	SP-R278TZ Approx.25g ➤ P.0147
		1m Cut not allowed -40 to +60°C		R10 Stainless steel	0~1800		SP-R278TG Approx.43g ➤ P.0147
	Threaded	2m Free-cut (ø2.2) -40 to +60°C		R2 ToughFlex	0~3600		SP-R278 Approx.21g ➤ P.0147
		2m Free-cut (ø2.2) -40 to +60°C		R25	0~3600		SP-R28F Approx.21g ➤ P.0148
		1m Cut not allowed -40 to +60°C		R10 Stainless steel	0~1800		SP-R278G Approx.41g ➤ P.0148

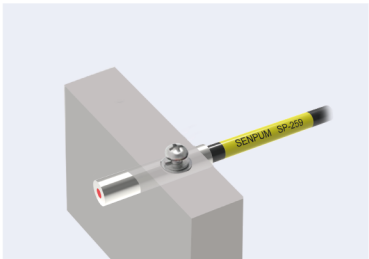
*1 when using FX-N10 series, "3600mm(1800mm)"is the maximum value because the length of the fiber optic cable is 2m(1m).

Thrubeam

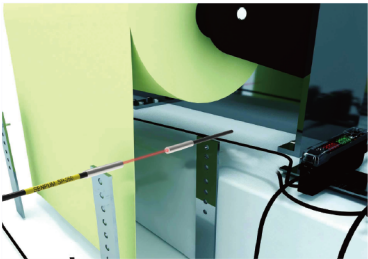


Cylindrical

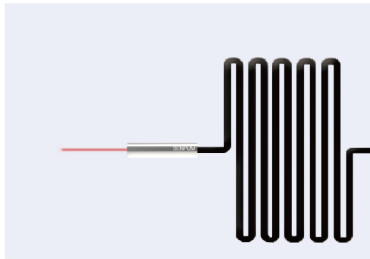
In tight spaces, it can be mounted by screws after drilling.



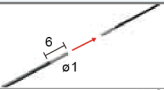
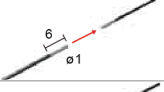
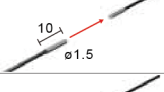
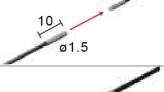
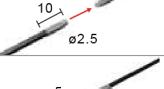
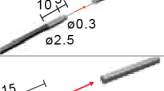
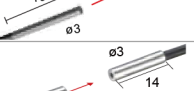
In limited space, it can be mounted by screws after drilling.



Detection of papers edges



ToughFlex

Size	Fiber unit length (diameter) Ambient temperature	Appearance (mm inch)	Bend radius (mm)	Detection distance(mm)	Optical axis diameter (mm inch)	Smallest detectable object	Model/Weight	Dimensions
ø1.0	50cm Cut not allowed -40 to +50°C		R10	0~380	ø0.265	ø0.005	SP-259 Approx.8g	 P0132
	1m Free-cut (ø1.0) -40 to +50°C		R2 ToughFlex High-flex	0~590	ø0.5		SP-259U Approx.4g	 P0132
ø1.5	1 m Free-cut (ø1.0) -40 to +70°C		R4 High-flex	0~1200	ø0.7		SP-260 Approx.3g	 P0133
	1 m Free-cut (ø1.0) -40 to +50°C		R2 ToughFlex High-flex	0~590	ø0.5		SP-260U Approx.4g	 P0133
ø2.5	50 cm Cut not allowed -40 to +70°C		R10	0~45	ø0.125		SP-256 Approx.3g	 P0132
	50 cm Cut not allowed -40 to +70°C						SP-257 Approx.3g	 P0132
ø3	2m Free-cut (ø2.2) -40 to +70°C		R25	0~3600	ø1		SP-26F Approx.19g	 P0132
	2 m Free-cut (ø2.2) -40 to +50°C		R2 ToughFlex	0~3600	ø1.13		SP-26FZ Approx.19g	 P0147

Fiber Optic Sensors

SP
P-20/40
SP2
FX-N10
FX-N425

Fiber Optic Sensors

Photoelectric Sensors

Color Sensors

Laser Sensors

Proximity Sensors

Precision Contact Sensors

Area Sensors/ Safety Light Curtains

Laser Scanners

Digital Contact Sensors

Laser Displacement Sensors

Laser Micrometers

Confocal Displacement Sensors

Barcode Readers

AI Vision Sensors

RFID

Infrared Temperature Sensors

Pressure Sensors

Flow Sensors

Magnetic Sensors

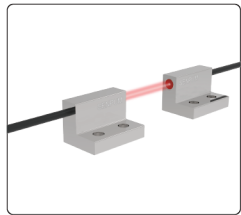
Ultrasonic Sensors

Magnetic Scales

Static Eliminators

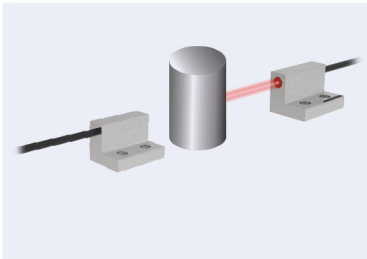


Thrubeam

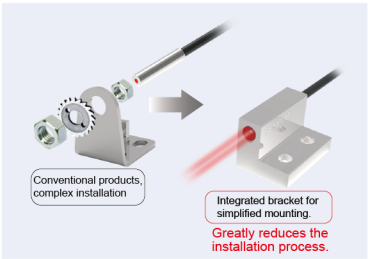


Integrated mounting bracket type

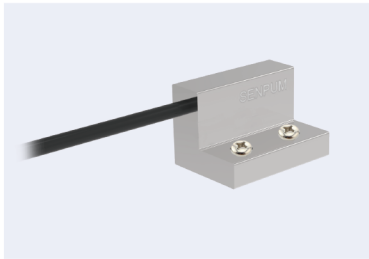
Sensor with mounting holes for quick fixing and simplified installation.



Vibration resistance



Simple and easy to install

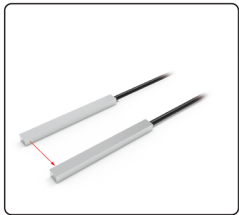


Self-contained screw holes for quick and easy installation

Beam emitting direction	Fiber unit length (diameter) Ambient temperature	Appearance (mm inch)	Minimum bend radius (mm inch)	Detection distance (mm inch)	Optical axis diameter (mm inch)	Smallest detectable object	Model/Weight	Dimensions
Top	2 m Free-cut (ø2.2) -40 to +50°C		R2 ToughFlex	0~2200	ø1.13	ø0.005	SP-L452Z Approx.30g	P.0135
	2 m Free-cut (ø2.2) -40 to +50°C						SP-L453Z Approx.30g	P.0135
	2 m Free-cut (ø2.2) -40 to +50°C						SP-L454Z Approx.30g	P.0135
Top (Built-in lens)	2 m Free-cut (ø2.2) -40 to +50°C			0~3600	ø3.5	ø0.2	SP-L451Z Approx.30g	P.0135
Side	2 m Free-cut (ø2.2) -40 to +50°C			0~1900	ø1.13	ø0.005	SP-L455Z Approx.30g	P.0134



Thrubeam



Focused beam/High power

Long range, narrow beam makes the beam more focused.

Detection direction	Aperture angle	Fiber unit length (diameter) Ambient temperature	Appearance	Bend radius (mm)	Detection distance (mm)	Optical axis diameter (mm)	Model/Weight	Dimensions
Side	Approx. 2°	2 m Free-cut (ø1.0) SP-217Z -40 to +50°C SP-217 / 219 -20 to +70°C		R10	0~3600	ø2.5	SP-219 Approx. 8g	P0145
	Approx. 6°			R2			SP-217 Approx. 8g	P0145
	Approx. 3°			R10			SP-219M Approx. 6g	P0145
Side	Approx. 6°	2 m Free-cut (ø1.0) -20 to +50°C		R2 ToughFlex	0~3600	ø2.8	SP-251 Approx. 8g	P0145

Fiber Optic Sensors

- Photoelectric Sensors
- Color Sensors
- Laser Sensors
- Proximity Sensors
- Precision Contact Sensors
- Area Sensors/ Safety Light Curtains
- Laser Scanners
- Digital Contact Sensors
- Laser Displacement Sensors
- Laser Micrometers
- Confocal Displacement Sensors
- Barcode Readers
- AI Vision Sensors
- RFID
- Infrared Temperature Sensors
- Pressure Sensors
- Flow Sensors
- Magnetic Sensors
- Ultrasonic Sensors
- Magnetic Scales
- Static Eliminators



Thrubeam

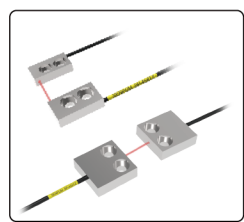
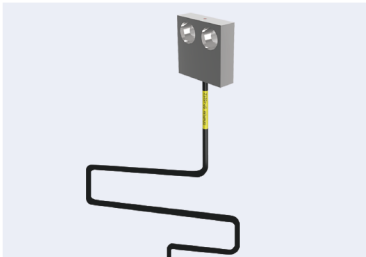


Plate bracket type

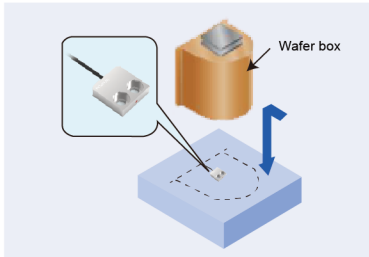
Thin sensor with mounting holes for easy installation where space is limited.



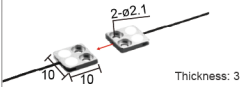
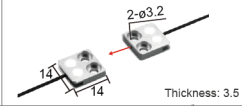
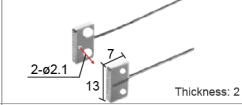
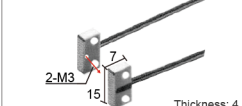
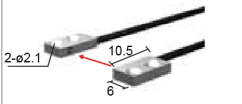
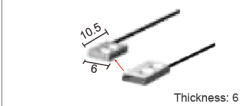
Ability to install in tight spaces



Unaffected by movement, ToughFlex



This sensor can be installed in limited space, wafer drop detection

Beam emitting direction	Fiber unit length (diameter) Ambient temperature	Appearance (mm inch)	Minimum bend radius (mm inch)	Detection distance (mm inch)	Optical axis diameter (mm inch)	Smallest detectable object	Model/Weight	Dimensions
Top	1 m Free-cut (ø1.0) -40 to +50°C		R2 ToughFlex	0~810	ø0.5	ø0.005	SP-452TZ Approx. 5g	 P.0134
	2 m Free-cut (ø1.3) -40 to +50°C			0~2900	ø1		SP-453TZ Approx. 15g	 P.0134
Flat	1 m Free-cut (ø1.0) -40 to +50°C			0~500	ø0.5		SP-454TZ Approx. 10g	 P.0134
	2 m Free-cut (ø2.2) -40 to +50°C			0~2900	ø1		SP-455TZ Approx. 25g	 P.0134
	2m Free-cut (ø2.2) -40 to +50°C			0~750	ø1.13		SP-457TZ Approx. 20g	 P.0134
Side	1 m Free-cut (ø1.0) -40 to +50°C			0~740	ø0.5		SP-458TZ Approx. 5g	 P.0134
	1 m Free-cut (ø1.0) -40 to +70°C			0~630	ø0.7		SP-458TE Approx. 5g	 P.0132

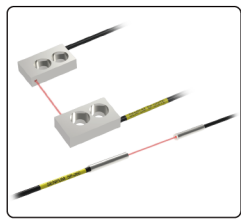




Beam emitting direction	Fiber unit length (diameter) Ambient temperature	Appearance (mm)	Minimum bend radius (mm)	Detection distance (mm)	Optical axis diameter (mm)	Smallest detectable object	Model/Weight	Dimensions
Side	1 m Free-cut (ø1.3) -40 to +70°C		R25	0~520	ø0.6	ø0.005	SP-233 Approx.5g	P.0132
	2 m Free-cut (ø2.2) -40 to +70°C			0~1600	ø1		SP-235 Approx.17g	P.0132
Top	2 m Free-cut (ø2.2) -40 to +70°C			0~3600			SP-274 Approx.24g	P.0133
	1 m Free-cut (ø1.0) -40 to +70°C		R10	0~690	ø0.5		SP-276F Approx.10g	P.0133
	50cm Cut not allowed -40 to +70°C			0~45	ø0.125		SP-257 Approx.3g	P.0132

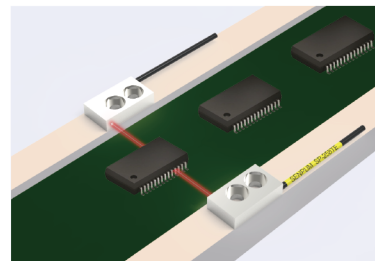


Thrubeam

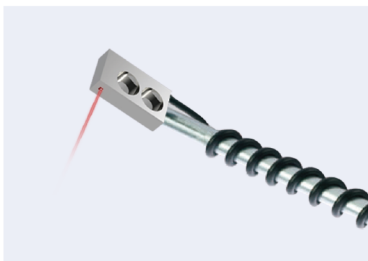


High flex

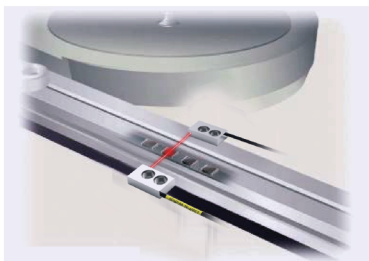
Made of flexible, bend-resistant fiber optic cable material; can withstand 10 million bends.



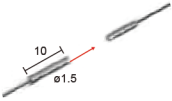
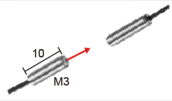
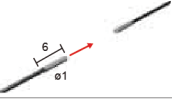
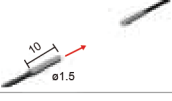
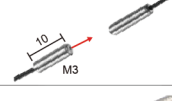
Unaffected by movement, flexural



ToughFlex



High flexible type, exceeding 50 million times

Size	Fiber unit length (diameter) Ambient temperature	Appearance (mm)	Bend radius (mm)	Detection distance (mm)	Optical axis diameter (mm)	Smallest detectable object	Model/Weight	Dimensions
ø1.5	1 m Free-cut (ø1.0) -40 to +70°C		R4 High-flex	0~1200	ø0.7	ø0.005	SP-260 Approx.3g	 P.0133
M3	1 m Free-cut (ø1.0) -40 to +70°C						SP-280 Approx.6g	 P.0133
ø1.0	1 m Free-cut (ø1.0) -40 to +50°C		R2 ToughFlex High-flex	0~590	ø0.5		SP-259U Approx.4g	 P.0132
ø1.5	1 m Free-cut (ø1.0) -40 to +50°C						SP-260U Approx.4g	 P.0133
M3	1 m Free-cut (ø1.0) -40 to +50°C						SP-280U Approx.5g	 P.0133
M4	1 m Free-cut (ø1.0) -40 to +50°C		R1 ToughFlex	0~1800	ø2.3	-	SP-271U Approx.5g	 P.0147
	2 m Free-cut (ø1.0) -40 to +50°C			0~3600			SP-271TU Approx.5g	-

Thrubeam



Oil/chemical resistance type

Oil- and chemical-resistance protective housing prevents fiber optic deterioration.

Type	Beam emission direction	Fiber unit length (diameter) Ambient temperature	Appearance (mm)	Minimum bend radius (mm)	Detection distance (mm)*1	Optical axis diameter (mm)	Model/Weight	Dimensions
Chemical resistance	Top	2 m Free-cut (ø2.2) -40 to +70°C		R40	0~3600	ø3.7	SP-893 Approx.71g	P.0143
		2 m Free-cut (ø2.2) -40 to +70°C				ø6	SP-899 Approx.70g	P.0143
		2 m Free-cut (ø2.2) -40 to +70°C		R40		ø2.8	SP-897 Approx.71g	P.0143
	Side	2 m Free-cut (ø2.2) 0 to +60°C		R25*2		ø3.7	SP-897T Approx.35g	P.0143
Oil-proof		2m Free-cut (ø2.2) -20 to +100°C		R2 ToughFlex	ø2.3	SP-881TZ Approx.30g	P.0143	
		2 m Free-cut (ø2.2) -20 to +100°C			ø4.3	SP-881MTZ Approx.55g	P.0143	

*1 When using the SP series, "360mm" is the maximum value because the length of the fiber optic cable is 2m.

*2 The optical fiber cannot be bent within 25mm of the end of the fixing screw cap.

*3 Please use within the range of -40 ~ +130°C for continuous use.

*4 The fiber is 2m long on one side, so the length is 4000mm.

Fiber Optic Sensors

Photoelectric Sensors

Color Sensors

Laser Sensors

Proximity Sensors

Precision Contact Sensors

Area Sensors/ Safety Light Curtains

Laser Scanners

Digital Contact Sensors

Laser Displacement Sensors

Laser Micrometers

Confocal Displacement Sensors

Barcode Readers

AI Vision Sensors

RFID

Infrared Temperature Sensors

Pressure Sensors

Flow Sensors

Magnetic Sensors

Ultrasonic Sensors

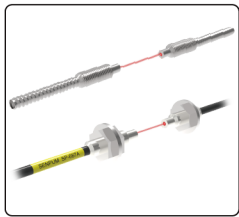
Magnetic Scales

Static Eliminators



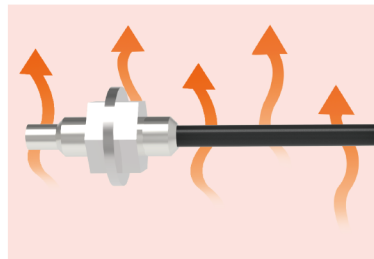


Thrubeam

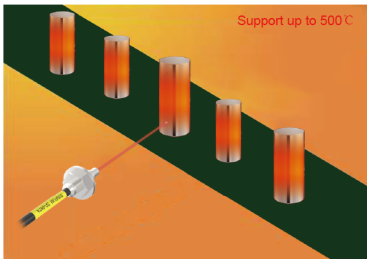


Heat resistant temperature

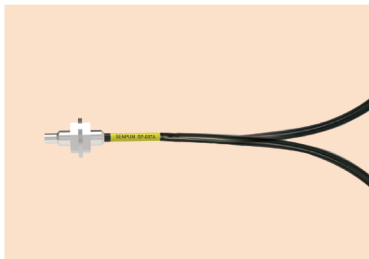
Sensor withstands temperatures from 100°C to 500°C.



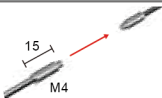
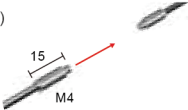
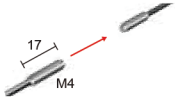
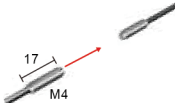
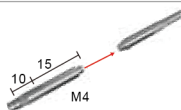
Heat resistant temperature



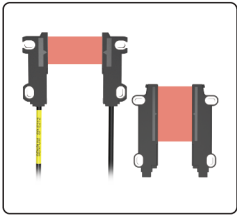
Support up to 500°C



ToughFlex

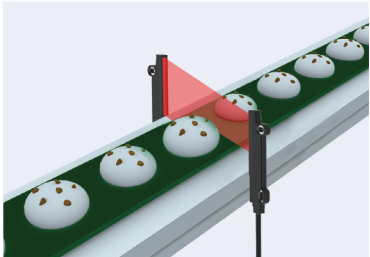
Heat resistant temperatures	Fiber unit length (diameter) Ambient temperature	Appearance	Bend radius (mm)	Detection distance (mm)	Optical axis diameter (mm inch)	Smallest detectable object	Model/Weight	Dimensions
100℃	2 m Free-cut (ø2.2) -40 to +100℃		R5 ToughFlex	0~3600	ø1	ø0.005	SP-687Z Approx.25g	 P.0135
105℃	2 m Free-cut (ø2.2) -40 to +105℃		R25				SP-687A Approx.22g	 P.0134
150℃	2 m Free-cut (ø2.2) -40 to +150℃		R20	0~2700	ø1.5		SP-687H Approx.35g	 P.0134
180℃	2 m Free-cut (ø2.2) -60 to +180℃		R35				SP-689 Approx.36g	 P.0135
300℃	2 m Cut not allowed -40 to +300℃		R25	0~1800	ø1		SP-685C Approx.66g	 P.0134

Thrubeam

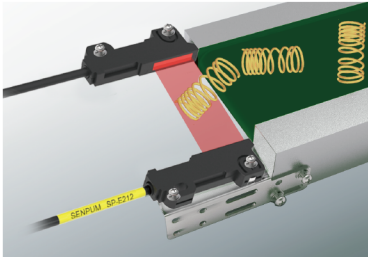


Area type

Area detection width up to 100mm.



Large detection range for material counts



Detecting spring drop counts



Easily adjust the optical axis using the long screw hole design.

Detection method	Optical axis width	Fiber unit length (diameter) Ambient temperature	Appearance	Bend radius (mm)	Detection distance (mm inch)	Optical axis diameter (mm inch)	Model/Weight	Dimensions
Area	10	2m Free-cut (ø2.2) -40 to +50°C	 Thickness: 4.2	R2 ToughFlex	0~3600	10×3 (comes with a 1.0mm wide seam allowance)	SP-A223 Approx.23g	-
	11	2 m Free-cut (ø2.2) -40 to +50°C	 Thickness: 4.0			11×2	SP-E212 Approx.20g	➤ P0135
	40	2 m Free-cut (ø2.2) -40 to +50°C	 Thickness: 5.1			40×3	SP-E241 Approx.30g	➤ P0135
Array	5	2 m Free-cut(ø2.2) -40 to +70°C	 Thickness: 4.0	R4*2	0~3600	Approx.6×0.3	SP-A206 Approx.20g	➤ P0144
	10	2 m Free-cut (ø2.2) -40 to +70°C	 Thickness: 4.0			Approx.11×0.3	SP-A201 Approx.20g	➤ P0144
	40	2 m Free-cut (Exception for the screw section 50mm) -20 to +50°C	 Thickness: 5.0	R10		Approx. 40×0.25	SP-A241 Approx.70g	➤ P0144
	100	2 m Free-cut(Exception for the screw section 50mm) -20 to +50°C	 Thickness: 5.0			Approx. 100×0.25	SP-A2100 Approx.110g	➤ P0144

Fiber Optic Sensors

Photoelectric Sensors

Color Sensors

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Laser Micrometers

Confocal Displacement Sensors

Barcode Readers

AI Vision Sensors

RFID

Infrared Temperature Sensors

Pressure Sensors

Flow Sensors

Magnetic Sensors

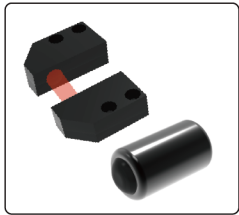
Ultrasonic Sensors

Magnetic Scales

Static Eliminators



Reflective



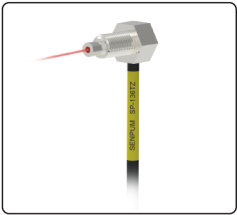
Focusing lens

Detection distances using thrubeam lenses

Type	Ambient temperature	Appearance (mm inch)	Model/Weight	Detection distance (mm inch)	Applicable fiber
Long-detecting distance Aperture Angle: Approx. 15°	-40 to +300°C	Tip: ø4.3 Tip: ø4.3 P-22 P-41	Cost effective P-22 Approx.2g High performance P-41 Approx.2g	0~3600	SP-278TZ/278V/278/285C/289K SP-28F/287A SP-287Z SP-279
				0~1800	SP-278G/278MG/278TG/278MTG
Ultra-long detecting distance Aperture Angle: Approx. 8°	-40 to +70°C	Tip: ø4.3 P-24	P-24 Approx.1g	0~3600	SP-278TZ/278V/278 SP-28F SP-279
				0~1800	SP-278G/278MG/278TG/278MTG
Side-view with mounting holes	-40 to +105°C	Fixing Nut P-25	P-25 Approx.10g	0~3600	SP-278V/278 SP-28F/288A SP-287Z SP-279
				0~1800	SP-278G

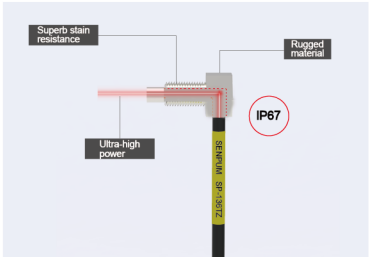


Reflective

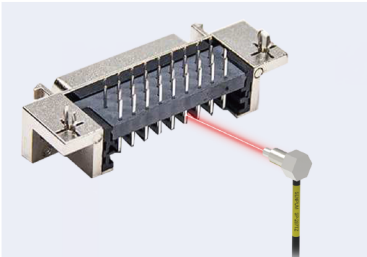


Screw-fixed type

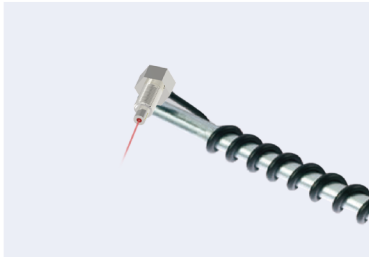
The sensor is fixed by screws, which is simple and convenient.



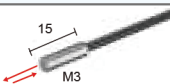
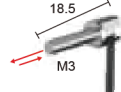
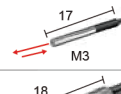
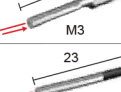
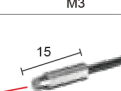
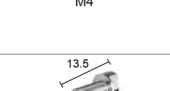
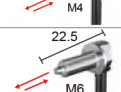
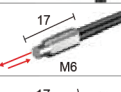
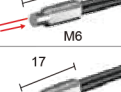
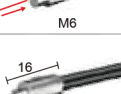
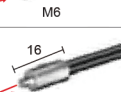
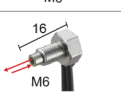
Resin material inside



Detect PIN



ToughFlex

Size	Shape	Detection layout	Fiber unit length (diameter) Ambient temperature	Appearance	Bend radius (mm)	Detection distance (mm)	Smallest detectable object	Model/Weight	Dimensions
M3	Threaded	Coaxial	50cm Cut not allowed SP-122X: -40 to +70°C SP-125X: -40 to +50°C		R25	0~130	ø0.005 Metal wire	SP-122X Approx.4g	 P.0136
				R10	0~100	SP-125X Approx.4g		 P.0136	
	Hexagon		1 m Free-cut(ø1.3×2) -40 to +50°C		R2 ToughFlex	0~400		SP-136TZ Approx.7g	 P.0137
			1 m Free-cut(ø1.3×2) -40 to +50°C			0~450		SP-136FZ Approx.6g	 P.0137
	Threaded		1 m Free-cut(ø1.3×2) 30cm screw -40 to +50°C		R10 Stainless Steel				SP-136FG Approx.6g
			1 m Free-cut(ø1.3×2) -40 to +70°C		R25	0~550		SP-136FA Approx.6g	 P.0137
M4	Threaded	Parallel	2 m Free-cut(ø1.3×2) SP-167: -40 to +70°C SP-167Z: -40 to +50°C		R25	0~1100	ø0.005 Metal wire	SP-167 Approx.10g	 P.0139
					R2 ToughFlex	0~770		SP-167Z Approx.10g	 P.0139
			2 m Free-cut(ø1.3×2) -40 to +50°C					0~640	SP-167TZ Approx.10g
M6	Hexagon	Coaxial	1 m Cut not allowed -40 to +50°C		R10 Stainless Steel	0~400		SP-136TG Approx.32g	 P.0137
			2 m Free-cut(ø2.2×2) -40 to +70°C					0~720	SP-126 Approx.18g
	Threaded	Parallel	2 m Free-cut(ø2.2×2) -40 to +70°C		R25	0~1100	SP-17F Approx.21g	 P.0136	
			2 m Free-cut(ø2.2×2) -40 to +70°C				0~1300	SP-162 Approx.21g	 P.0138
				2 m Free-cut(ø2.2×2) -40 to +50°C		R2 ToughFlex	0~900	SP-168 Approx.21g	 P.0139
				2 m Free-cut(ø2.2×2) -40 to +50°C		R0.5 ToughFlex		SP-168V Approx.25g	 P.0139
		2 m Free-cut(ø2.2×2) -40 to +50°C		R0.5 ToughFlex		SP-168TZ Approx.32g	 P.0139		

Fiber Optic Sensors

- Photoelectric Sensors
- Color Sensors
- Laser Sensors
- Proximity Sensors
- Precision Contact Sensors
- Area Sensors/ Safety Light Curtains
- Laser Scanners
- Digital Contact Sensors
- Laser Displacement Sensors
- Laser Micrometers
- Confocal Displacement Sensors
- Barcode Readers
- AI Vision Sensors
- RFID
- Infrared Temperature Sensors
- Pressure Sensors
- Flow Sensors
- Magnetic Sensors
- Ultrasonic Sensors
- Magnetic Scales
- Static Eliminators



- Photoelectric Sensors
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Safety Light Curtains
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Sensors
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Sensors
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SP

Reflective High-Performance Fiber Optic Sensor

Reflective

Type		Fiber unit length (diameter) Ambient temperature	Appearance	Minimum bend radius (mm)	Detection distance (mm)**	Model/Weight	Dimensions
Dimensions/Shape							
M4	Hexagon	2m Free-cut(ø2.2×2) -40 to +60℃		R2 ToughFlex	0~710	SP-R168TZ Approx.25g	P.0148
		1m Cut not allowed -40 to +60℃		R10 Stainless Steel	0~710	SP-R168TG Approx.32g	P.0148
	Threaded	2m Free-cut(ø2.2×2) -40 to +60℃		R2 ToughFlex	0~900	SP-R168 Approx.21g	P.0148
		2m Free-cut(ø2.2×2) -40 to +60℃		R25	0~1100	SP-R17F Approx.21g	P.0148
		1m Cut not allowed -40 to +60℃		R10 Stainless Steel	0~900	SP-R168G Approx.29g	P.0148

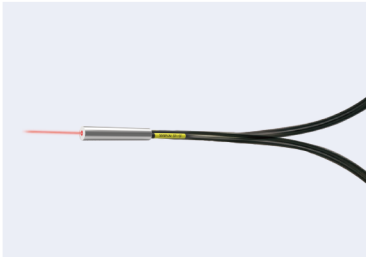
*1 When using the FS-N40 series.

Reflective

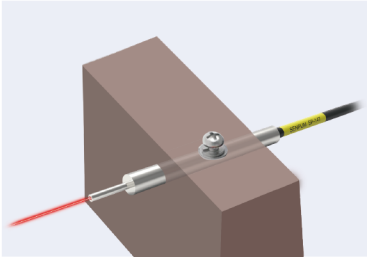


Cylindrical

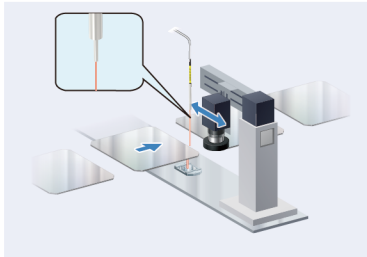
In tight spaces, it can be mounted by screws after drilling.



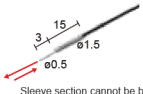
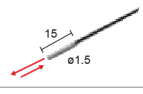
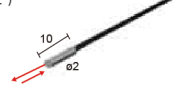
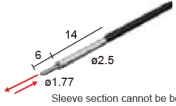
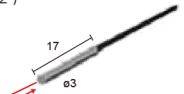
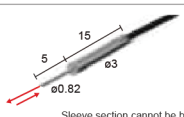
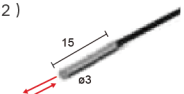
ToughFlex



Perforated mounting where space is limited



Solar cell wafer inspection

Size	Fiber unit length (diameter) Ambient temperature	Appearance (mm inch)	Minimum bend radius (mm inch)	Detection distance (mm inch)	Smallest detectable object	Model/Weight	Dimensions
ø1.5	1 m Cut not allowed -40 to +70°C		R10	0~27	ø0.005 Metal wire	SP-147 Approx.2g	P.0138
	1 m Cut not allowed -40 to +70°C		R4 ToughFlex	0~150		SP-150X Approx.3g	P.0138
ø2	1 m Cut not allowed (ø1.0×2) -40 to +50°C		R2 ToughFlex High-flex	0~140		SP-150U Approx.4g	P.0138
ø2.5	50 cm Cut not allowed -40 to +70°C		R25	0~72		SP-123X Approx.4g	P.0136
ø3	2 m Cut not allowed (ø1.3×2) SP-15F: -40 to +70°C SP-15FZ: -40 to +50°C		R2 ToughFlex	0~1100		SP-15F Approx.8g	P.0136
	50 cm Cut not allowed -40 to +70°C		R25	0~830		SP-124X Approx.4g	P.0136
	50 cm Cut not allowed -40 to +70°C		R4	0~68		SP-146X Approx.4g	P.0138
	2 m Cut not allowed (ø1.0×2) -40 to +70°C		R4 High-flex	0~290		SP-149 Approx.7g	P.0138

Fiber Optic Sensors

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Pressure Sensors

Flow Sensors

Magnetic Sensors

Ultrasonic Sensors

Magnetic Scales

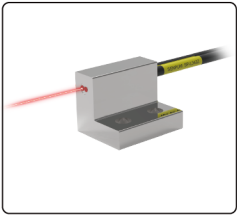
Static Eliminators



SP

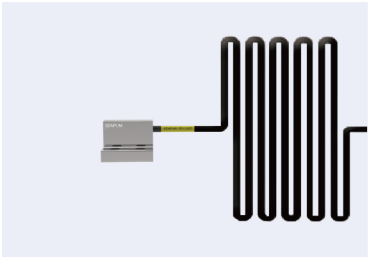
Reflective High-Performance Fiber Optic Sensor

Reflective

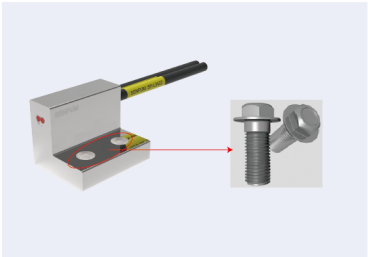


Integrated mounting bracket type

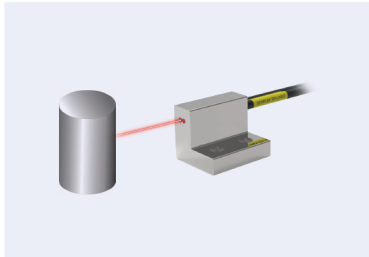
Sensor with mounting holes for quick fixing and simplified installation.



ToughFlex



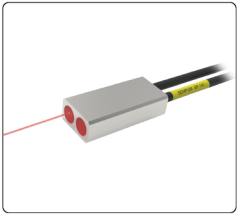
Self-contained screw holes for direct mounting



Anti-vibration

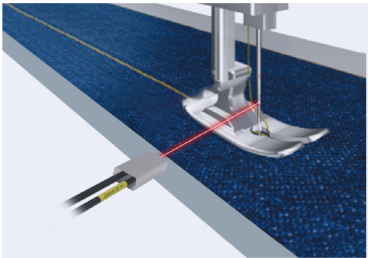
Beam emitting direction	Optical axis height	Fiber unit length (diameter) Ambient temperature	Appearance (mm inch)	Minimum bend radius (mm inch)	Detection distance (mm inch)	Smallest detectable object	Model/Weight	Dimensions
Top	10	2 m Free-cut (ø2.2) -40 to +50°C		R2 ToughFlex	0~760	ø0.005	SP-L342Z Approx.25g	P0135

Reflective

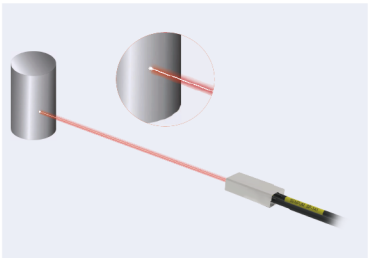


Focused beam/High power

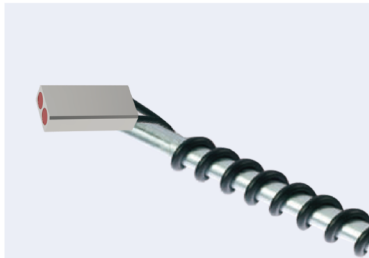
Long range, narrow beam makes the beam more focused.



High power



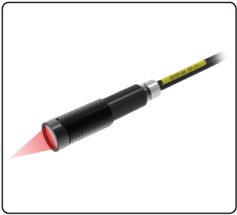
Remote inspection of workpiece



Superb bending resistance

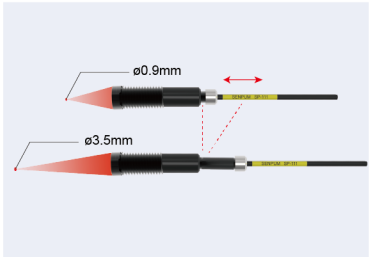
Detection direction	Aperture angle	Fiber unit length (diameter) Ambient temperature	Appearance (mm)	Bend radius (mm)	Detection distance (mm)	Smallest detectable object	Model/Weight	Dimensions
Top	Approx.8°	2 m Free-cut (ø2.2) -40 to +50°C		R2 ToughFlex	0~2300	ø0.3 Stainless steel(vertical)	SP-141 Approx.23g	P0138
		1 m Cut not allowed (ø1.0) -40 to +50°C		R10 Stainless steel	0~2700		SP-141G Approx.50g	P0145

Reflective

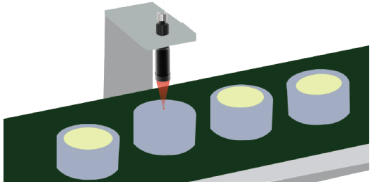


Small beam spot

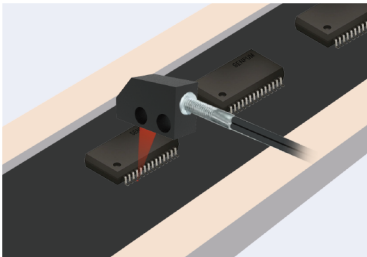
Suitable for detecting smaller objects. You can freely choose the size of the light spot and change the focal distance.



Spot adjustable

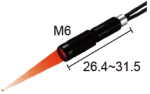


Can be installed even if space is limited

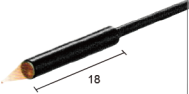


Small beam spot to detect tiny objects

Adjustable photoelectric sensors(built-in lens fiber optic unit)

Type	Beam spot diameter (mm inch)	Focal distance (mm inch)	Fiber unit length (diameter) Ambient temperature	Appearance (mm inch)	Minimum bend radius (mm inch)	Model/Weight	Dimensions
Built-In Lens Variable Beam Spot	ø0.9~3.5	10~30	2 m Free-cut (ø1.3×2) -40 to +70°C		R25	SP-111 Approx.5g	 P.0136

Small beam spot (built-in lens fiber optic unit)

Type	Beam spot diameter (mm inch)	Focal distance (mm inch)	Fiber unit length (diameter) Ambient temperature	Appearance (mm inch)	Minimum bend radius (mm inch)	Model/Weight	Dimensions
Small spot	Approx.ø0.1	5	50 cm Cut not allowed -40 to +70°C Tip: ø3		R25	SP-121 Approx.2g	 P.0136

Fiber Optic Sensors

Photoelectric Sensors

Color Sensors

Laser Sensors

Proximity Sensors

Precision Contact Sensors

Area Sensors/
Safety Light Curtains

Laser Scanners

Digital Contact Sensors

Laser Displacement
Sensors

Laser Micrometers

Confocal Displacement
Sensors

Barcode Readers

AI Vision Sensors

RFID

Infrared Temperature
Sensors

Pressure Sensors

Flow Sensors

Magnetic Sensors

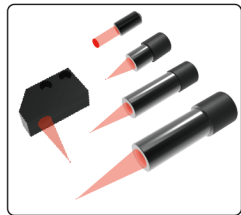
Ultrasonic Sensors

Magnetic Scales

Static Eliminators



Reflective

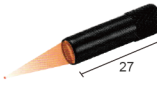


Focusing lens

Small spot(lens attachment + fiber unit)

Type	Beam spot diameter (mm inch)	Focal distance (mm inch)	Lens attachment			Fiber unit			
			Model/Weight	Ambient temperature	Appearance (mm inch)	Minimum bend radius (mm inch)	Appearance (mm inch)	Model	Dimensions
Small Spot	Approx.ø0.2	7±2	Cost effective P-12HA Approx.1g	-30 to +70°C	 P-12HA	R25		SP-122X	 P.0136
	Approx.ø0.1					R10		SP-125X	 P.0136
	Approx.ø0.4					R25		SP-136FA	 P.0137
						R10 Stainless Steel		SP-136FG	 P.0137
			R2 ToughFlex		SP-136FZ	 P.0137			
			R10 Stainless Steel		SP-136TG	 P.0137			
	R2 ToughFlex			SP-136TZ	 P.0137				

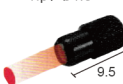
Small spot(lens attachment + fiber unit)

Type	Beam spot diameter (mm inch)	Focal distance (mm inch)	Lens attachment			Fiber unit							
			Model/Weight	Ambient temperature	Appearance (mm inch)	Minimum bend radius (mm inch)	Appearance (mm inch)	Model	Dimensions				
Small Spot	Approx.ø0.5	15±2	P-14HA Approx.2g	-30 to +70°C		R25		SP-136FA	 P.0137				
						R10 Stainless Steel		SP-136FG	 P.0137				
						R2 ToughFlex		SP-136FZ	 P.0137				
						R10 Stainless Steel		SP-136TG	 P.0137				
						R2 ToughFlex		SP-136TZ	 P.0137				
	Approx.ø1.0	35±3	P-16HA Approx.5g	-40 to +70°C		R25		SP-122X	 P.0136				
	Approx.ø2.0					R10 Stainless Steel		SP-136FA	 P.0137				
						R2 ToughFlex		SP-136FG	 P.0137				
	Approx.ø2.0					R2 ToughFlex		SP-136FZ	 P.0137				
						R2 ToughFlex		SP-136TZ	 P.0137				

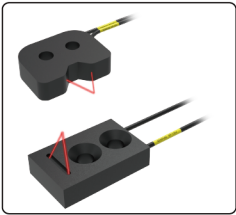
Lens attachment + fiber unit

Type	Beam spot diameter (mm inch)	Focal distance (mm inch)	Lens attachment			Fiber unit			
			Model/Weight	Ambient temperature	Appearance (mm inch)	Minimum bend radius (mm inch)	Appearance (mm inch)	Model	Dimensions
Side-view adjustable spot	ø0.5~3	8~30	P-15HA Approx.2g	-30 to +70°C		R25		SP-136FA	P.0137
Flow Sensors						R10 Stainless Steel		SP-136FG	P.0137
						R2 ToughFlex		SP-136FZ	P.0137

Parallel beam(lens attachment + fiber unit)

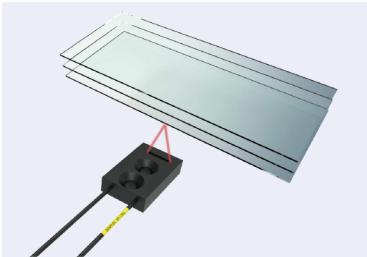
Type	Beam spot diameter (mm inch)	Lens attachment			Fiber unit				
		Model/Weight	Ambient temperature	Appearance (mm inch)	Minimum bend radius (mm inch)	Detection distance (mm inch)	Appearance (mm inch)	Model	Dimensions
Parallel Beam Spot	Approx. ø4 (within the detecting range of 0 to 20 mm)	P-13HA Approx.2g	-30 to +70°C	 P-13HA	R25	0~65		SP-136FA	P.0137
					R10 Stainless Steel	0~45		SP-136FG	P.0137
					R2 ToughFlex			SP-136FZ	P.0137
					R10 Stainless Steel	0~40		SP-136TG	P.0137
					R2 ToughFlex			SP-136TZ	P.0137

Reflective

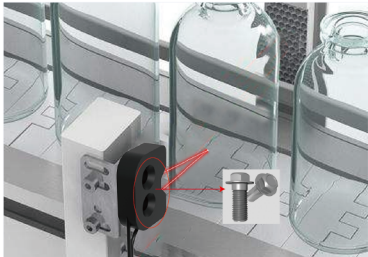


Definite-reflective model

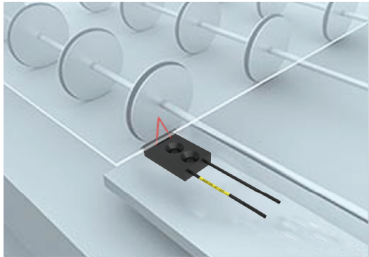
Definite detection range can detect transparent objects, comes with mounting holes for easy installation.



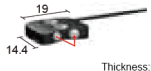
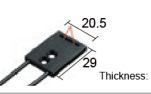
Limited reflection detection of transparent objects



Comes with screw holes for direct mounting



Detects the presence of glass

Detection direction	Fiber unit length (diameter) Ambient temperature	Appearance	Bend radius (mm)	Detection distance(mm)	Optical axis diameter (mm inch)	Smallest detectable object	Model/Weight	Dimensions
Side	2 m Free-cut (ø1.0×2) -40 to +70°C		R10	3 center of detection distance	Approx.ø4.5 Approx.ø3.5 (at distance of 3)	ø0.005 Metal wire	SP-138 Approx.6g	➤ P0137
Flat	2 m Free-cut (ø1.0×2) -40 to +70°C			0~4	—	ø0.08 Copper wire	SP-139V Approx.5g	➤ P0137
	2 m Free-cut (ø1.0×2) -40 to +70°C			6 center	Approx.ø1.5 (at distance of 6)	-	SP-139 Approx.5g	➤ P0145
	2 m Free-cut (ø2.2×2) -40 to +60°C		R25	0~89	-	-	SP-139L Approx.20g	➤ P0145
	2 m Free-cut (ø2.2×2) -40 to +70°C		R5	0~25	-	-	SP-139S Approx.20g	➤ P0146
	2 m Free-cut (ø2.2×2) -40 to +70°C		R25	0~14	-	-	SP-139R Approx.20g	➤ P0146
Top	2 m Free-cut (ø2.2×2) -40 to +70°C		R25	0~150	-	-	SP-141S Approx.25g	➤ P0145

Fiber Optic Sensors

Photoelectric Sensors

Color Sensors

Laser Sensors

Proximity Sensors

Precision Contact Sensors

Area Sensors/ Safety Light Curtains

Laser Scanners

Digital Contact Sensors

Laser Displacement Sensors

Laser Micrometers

Confocal Displacement Sensors

Barcode Readers

AI Vision Sensors

RFID

Infrared Temperature Sensors

Pressure Sensors

Flow Sensors

Magnetic Sensors

Ultrasonic Sensors

Magnetic Scales

Static Eliminators





Reflective

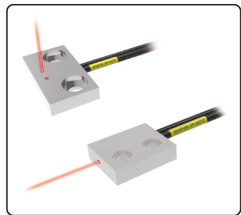
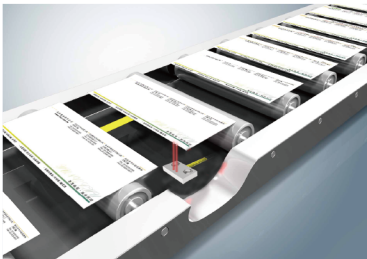
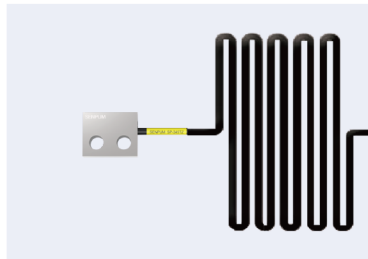


Plate bracket type

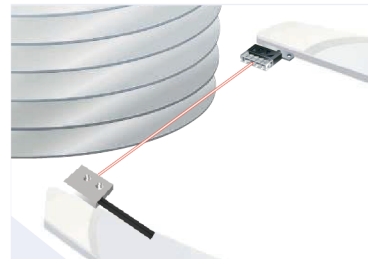
Thin sensor with mounting holes for easy installation where space is limited.



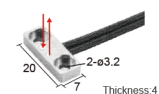
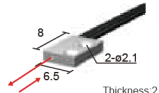
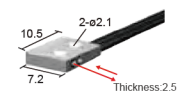
Envelope detection



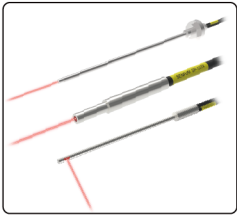
ToughFlex



Wafer inspection

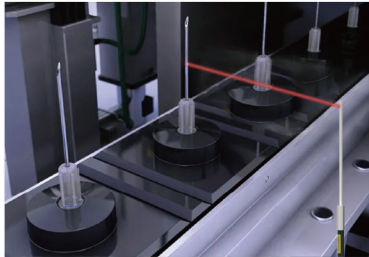
Beam emitting direction	Fiber unit length (diameter) Ambient temperature	Appearance (mm inch)	Minimum bend radius (mm inch)	Detection distance (mm inch)	Smallest detectable object	Model/Weight	Dimensions	
Flat	1 m Free-cut (ø1.0×2) -40 to +50°C		R2 ToughFlex	0~120	ø0.005 Metal wire	SP-342TZ Approx. 5g	 P.0140	
	2 m Free-cut (ø2.2×2) -40 to +50°C			0~500		SP-343TZ Approx. 24g	 P.0140	
	2 m Free-cut (ø2×2.2) -40 to +50°C			0~120		SP-344TZ Approx. 22g	 P.0140	
Top	1 m Free-cut (ø1.0×2) -40 to +50°C			0~160		SP-345TZ Approx. 3g	 P.0140	
Side	1 m Free-cut (ø1.0×2) -40 to +50°C					SP-348TZ Approx. 4g	 P.0140	

Reflective



Casing type

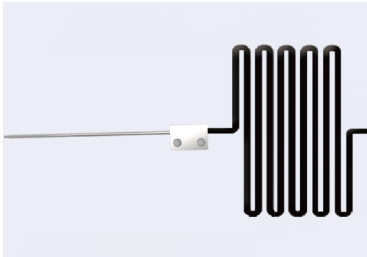
The front part is thin and side-view type is available, which makes it easier to install in places with limited space.



Needles to detect defects



Number of bottles detected



ToughFlex

Detection direction	Fiber unit length (diameter) Ambient temperature	Appearance	Bend radius (mm)	Detection distance (mm)	Smallest detectable object	Model/Weight	Dimensions
Coaxial narrow beam 10°	50cm Cut not allowed -40 to +70°C		R25	0~72	ø0.005 Metal wire	SP-123X Approx. 4g	P0136
Side	2 m Free-cut (ø1.0×2) -40 to +70°C		R10	0~180		SP-132 Approx. 5g	P0137
	1 m Free-cut (ø2.2×2) -40 to +70°C		R25	0~320		SP-134 Approx. 10g	P0137
Top	2 m Free-cut (ø1.3×2) -40 to +70°C		R25	0~330		SP-144 Approx. 8g	P0138
	50cm Cut not allowed -40 to +70°C		R4	0~68		SP-146X Approx. 4g	P0138
	1 m Cut not allowed -40 to +70°C		R10	0~27		SP-147 Approx. 2g	P0138
	1 m Free-cut(ø1.0) -40 to +70°C		R10	0~390		SP-277F Approx. 10g	P0145
	2 m Free-cut (ø1.3×2) -40 to +70°C		R25	0~330		SP-164 Approx. 10g	P0138
	2 m Free-cut (ø1.3×2) -40 to +70°C		R25	0~330		SP-164T Approx. 10g	P0139
	2 m Free-cut (ø1.3×2) -40 to +50°C		R2 ToughFlex	0~290		SP-164Z Approx. 10g	P0139
	50cm Cut not allowed -40 to +70°C		R4	0~68		SP-166X Approx. 5g	P0139

Fiber Optic Sensors

Photoelectric Sensors

Color Sensors

Laser Sensors

Proximity Sensors

Precision Contact Sensors

Area Sensors/ Safety Light Curtains

Laser Scanners

Digital Contact Sensors

Laser Displacement Sensors

Laser Micrometers

Confocal Displacement Sensors

Barcode Readers

AI Vision Sensors

RFID

Infrared Temperature Sensors

Pressure Sensors

Flow Sensors

Magnetic Sensors

Ultrasonic Sensors

Magnetic Scales

Static Eliminators



SP

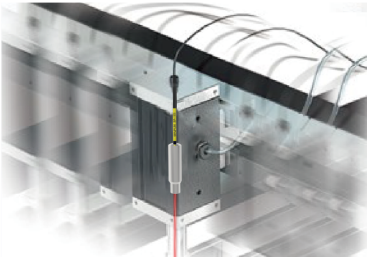
Reflective High-Performance Fiber Optic Sensor

Reflective

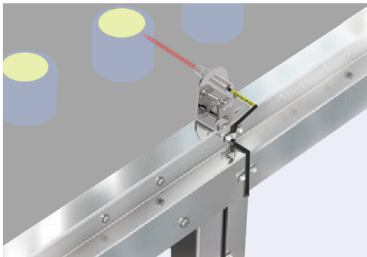


High flex

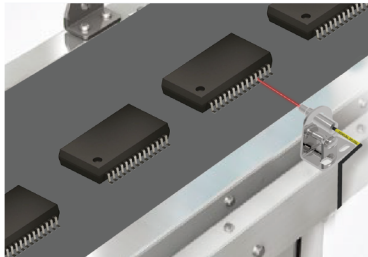
Made of fiber optic cable material that is elastic and flexible and can be bent repeatedly up to tens of million of times.



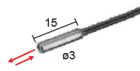
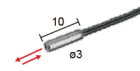
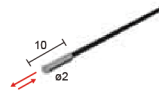
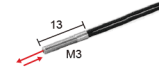
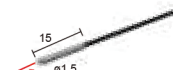
Highly resistant to movement and mounted on moving robotic arms.



Superb resistant to bending



High flexible type, exceeding 50 million times

Size	Fiber unit length (diameter) Ambient temperature	Appearance	Minimum bend radius (mm)	Detection distance (mm)	Smallest detectable object	Model/Weight	Dimensions	
ø3	2 m Free-cut (ø1.0×2) -40 to +70°C		R4 High-flex	0~290	ø0.005 Metal wire	SP-149 Approx.7g	 P.0138	
M4	2 m Free-cut (ø1.0×2) -40 to +70°C					SP-169 Approx.8g	 P.0139	
ø3	1 m Free-cut (ø1.0×2) -40 to +50°C		R2 ToughFlex High-flex	0~140		SP-149U Approx.4g	 P.0138	
ø2	1 m Free-cut (ø1.0×2) -40 to +50°C					SP-150U Approx.4g	 P.0138	
M3	1 m Free-cut (ø1.0×2) -40 to +50°C					SP-170U Approx.4g	 P.0140	
ø1.5	1 m Cut not allowed -40 to +70°C		R4 High-flex	0~150		SP-150X Approx.3g	 P.0138	
M3	1 m Cut not allowed -40 to +70°C					SP-170X Approx.3g	 P.0139	

Reflective



Oil/chemical resistance type

The sensor is locked up in a carbon-oxygen resin box.

Type	Beam emission direction	Fiber unit length (diameter) Ambient temperature	Appearance (mm)	Minimum bend radius (mm)	Detection distance (mm)*1	Standard target to be detected	Model/Weight	Dimensions
Oil/chemical resistance	Top	2 m Free-cut (ø1.3×2) -40 to +70°C		R40	0~310	—	SP-792 Approx. 32g	P.0143
		2 m Free-cut (ø1.3×2) -40 to +60°C	Thinkness: 9.6 (ø4.1 width of mounting hole support surface)		0~20	200×200mm t=0.7mm Glass substrate	SP-798P Approx. 75g	P.0143
		2 m Free-cut (ø1.3×2) -40 to +85°C	Thinkness: 9				SP-798S Approx. 90g	P.0144

*1 when using the SP series, standard target object: white matter paper (reflective type only).

Fiber Optic Sensors

- Photoelectric Sensors
- Color Sensors
- Laser Sensors
- Proximity Sensors
- Precision Contact Sensors
- Area Sensors/ Safety Light Curtains
- Laser Scanners
- Digital Contact Sensors
- Laser Displacement Sensors
- Laser Micrometers
- Confocal Displacement Sensors
- Barcode Readers
- AI Vision Sensors
- RFID
- Infrared Temperature Sensors
- Pressure Sensors
- Flow Sensors
- Magnetic Sensors
- Ultrasonic Sensors
- Magnetic Scales
- Static Eliminators



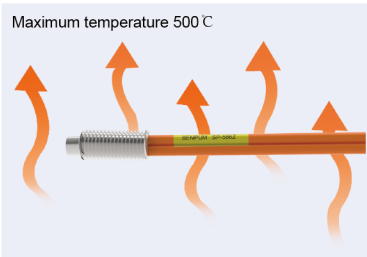


Reflective

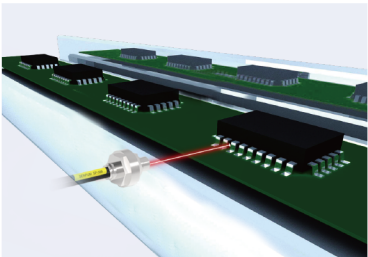


Heat resistant temperature

Sensor heat resistant from 100 °C to 500 °C .



Suitable for high temperature use up to 500 °C



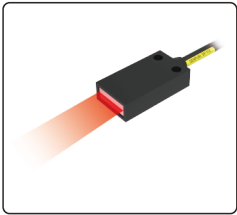
Detect PIN



ToughFlex

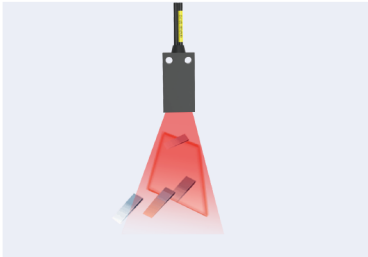
Heat resistant temperatures ^{*3}	Fiber unit length (diameter) Ambient temperature	Appearance	Bend radius (mm)	Detection distance(mm)	Smallest detectable object	Model/Weight	Dimensions
350℃	1 m Cut not allowed -30 to +350℃		R25	0~650	ø0.005 Metal wire	SP-582C Approx.24g	P.0140
300℃	1 m Cut not allowed -40 to +300℃			0~770		SP-583C Approx.29g	P.0141
	1 m Cut not allowed -40 to +300℃					SP-584C Approx.23g	P.0141
250℃	2 m Cut not allowed -40 to +250℃			0~86		SP-139LK Approx.70g	P.0146
	1 m Cut not allowed -40 to +250℃			0~150		SP-139K Approx.45g	P.0146
105℃	2 m Free-cut(ø2.2×2) -40 to +105℃			0~1100		SP-586A Approx.21g	P.0141
200℃	1 m Cut not allowed -40 to +200℃		R8	0~790	ø0.005 Metal wire	SP-688K Approx.15g	P.0144
150℃	2 m Free-cut(ø2.2×2) -40 to +150℃		R20	0~720		SP-586H Approx.35g	P.0141
100℃	2 m Free-cut(ø2.2×2) -40 to +100℃		R5 ToughFlex	0~740		SP-586Z Approx.25g	P.0135
180℃	2 m Free-cut(ø2.2×2) -60 to +180℃		R35	0~860		SP-588 Approx.33g	P.0135
	2 m Free-cut(ø2.2×2) -40 to +180℃			0~150		SP-139H Approx.45g	P.0146

Reflective

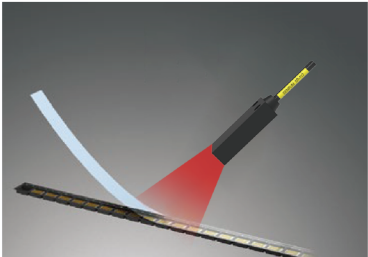


Area type

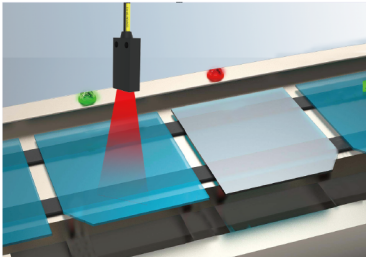
Area detection width up to 15mm.



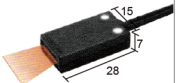
Detecting tin slips



Aluminum surface temperature inspection



Detecting workpieces of different colors

Detection method	Optical axis width	Fiber unit length (diameter) Ambient temperature	Appearance	Bend radius (mm)	Detection distance(mm)	Smallest detectable object	Model/Weight	Dimensions
Area	15 (at distance of 15)	2 m Free-cut (ø2.2) -40 to +70°C		R25	0~200	ø0.1 Metal wire	SP-112 Approx.19g	 P0136
Array	10 (at distance of 4)	2 m Free-cut (ø2.2×2) -40 to +70°C		R4	0~1200		SP-A106D Approx.20g	 P0146
	15 (at distance of 4)	2 m Free-cut -40 to +70°C					SP-A111D Approx.20g	 P0146

Fiber Optic Sensors

Photoelectric Sensors

Color Sensors

Laser Sensors

Proximity Sensors

Precision Contact
Sensors

Area Sensors/
Safety Light Curtains

Laser Scanners

Digital Contact Sensors

Laser Displacement
Sensors

Laser Micrometers

Confocal Displacement
Sensors

Barcode Readers

AI Vision Sensors

RFID

Infrared Temperature
Sensors

Pressure Sensors

Flow Sensors

Magnetic Sensors

Ultrasonic Sensors

Magnetic Scales

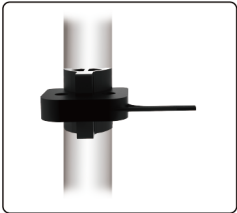
Static Eliminators





Reflective

Space Saving



Liquid level

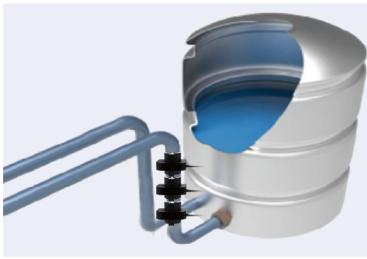
Detecting the liquid level in a transparent pipe requires only a fixed installation outside the pipe, without contact.



Installed directly outside the pipe



Simple and easy to install

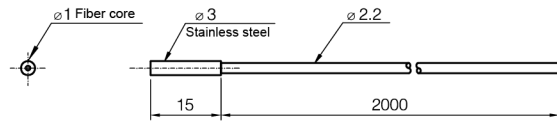
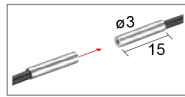


Installation outside the pipe can be detected

Detection method	Transparent tube diameter	Beam axes	Fiber unit length (diameter) Ambient temperature	Appearance	Bend radius (mm)	Accessories	Model/Weight	Dimensions
Pipe mounting type	ø4~ø26	1	2 m Free-cut (ø1.0×2) SP-196: -40 to +70°C SP-196Z: -40 to +50°C SP-196HA: -40 to +105°C		R10	End zone×2 Nonslip rubber×2 Packing×2 Screw×2 Nut×2	SP-196 Approx.7g	P.0140
					R2 ToughFlex		SP-196Z Approx.7g	P.0140
					R10		SP-196HA Approx.7g	P.0140
Penetration type	-	-	2 m Free-cut(ø1.3×2) SP-194: -40 to +70°C SP-194Z: -40 to +50°C	 ø6 (PFA)	R25	-	SP-194 Approx.78g	P.0146
					R0.5 ToughFlex		SP-194Z Approx.78g	P.0146

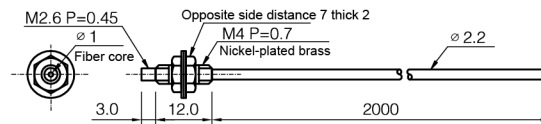
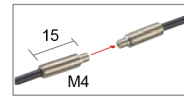
SP-26F

Thrubeam Free-cut



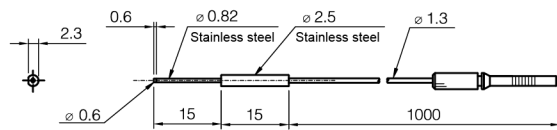
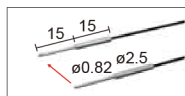
SP-28F

Thrubeam Free-cut



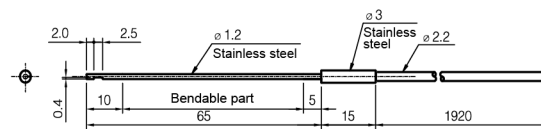
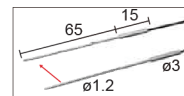
SP-233

Thrubeam Free-cut



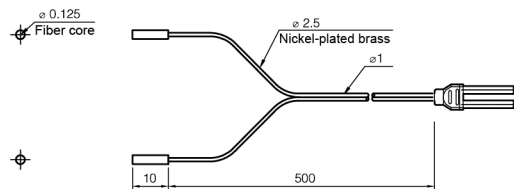
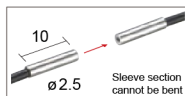
SP-235

Thrubeam Free-cut



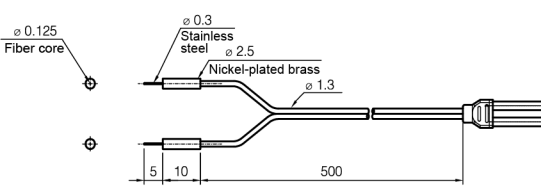
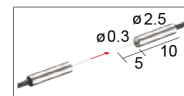
SP-256

Thrubeam Free-cut



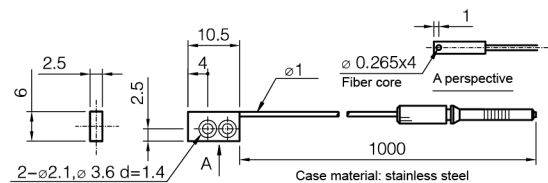
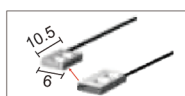
SP-257

Thrubeam Free-cut



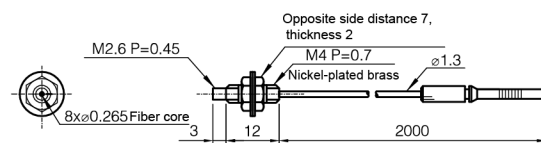
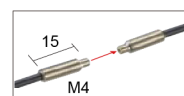
SP-458TE

Thrubeam Free-cut



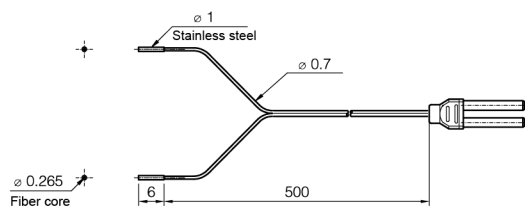
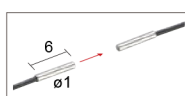
SP-279

Thrubeam Free-cut



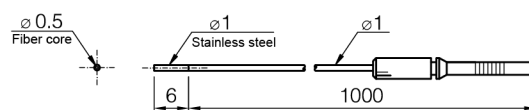
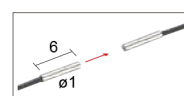
SP-259

Thrubeam
Can not be cut



SP-259U

Thrubeam Free-cut



Fiber Optic Sensors

Photoelectric Sensors

Color Sensors

Laser Sensors

Proximity Sensors

Precision Contact
Sensors

Area Sensors/
Safety Light Curtains

Laser Scanners

Digital Contact Sensors

Laser Displacement
Sensors

Laser Micrometers

Confocal Displacement
Sensors

Barcode Readers

AI Vision Sensors

RFID

Infrared Temperature
Sensors

Pressure Sensors

Flow Sensors

Magnetic Sensors

Ultrasonic Sensors

Magnetic Scales

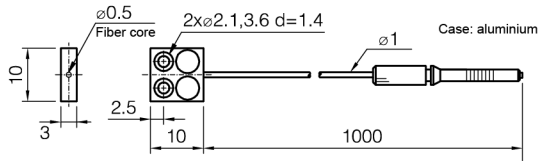
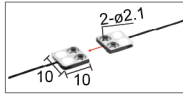
Static Eliminators



Technical drawing of a fiber optic cable assembly. The drawing shows a cross-section of the fiber core with a diameter of 0.5 mm. The assembly consists of a nickel-plated brass ferrule with an outer diameter of 1 mm and a length of 10 mm. The ferrule is inserted into a cable jacket with an outer diameter of 1000 mm. The distance from the ferrule to the cable jacket is 5.4 mm, and the thickness of the ferrule is 2 mm. The ferrule is secured with a nut and washer.

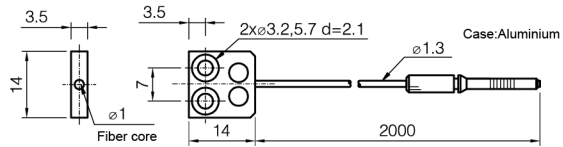
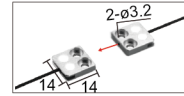
SP-452TZ

Thrubeam Free-cut



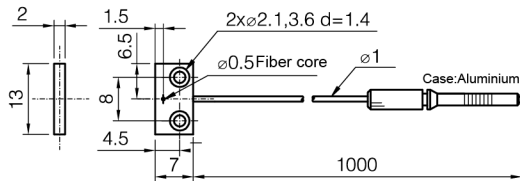
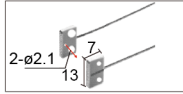
SP-453TZ

Thrubeam Free-cut



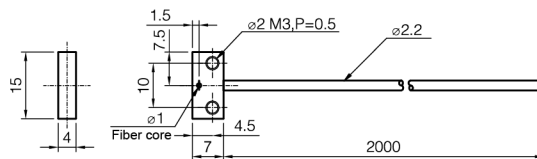
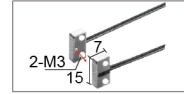
SP-454TZ

Thrubeam Free-cut



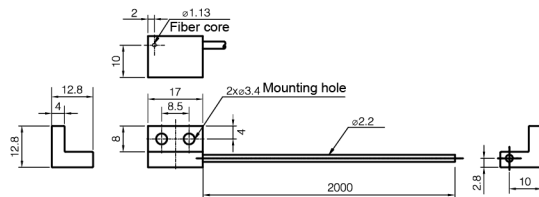
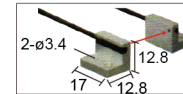
SP-455TZ

Thrubeam Free-cut



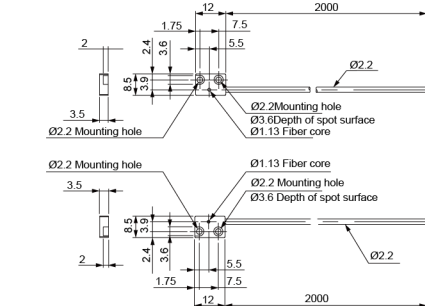
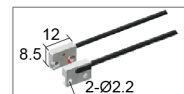
SP-L455Z

Thrubeam Free-cut



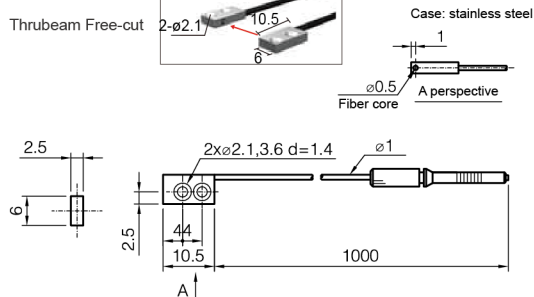
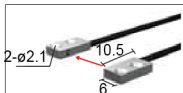
SP-457TZ

Thrubeam Free-cut



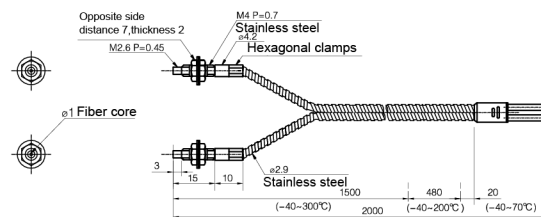
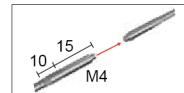
SP-458TZ

Thrubeam Free-cut



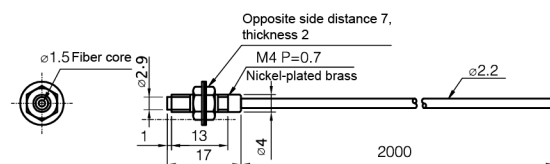
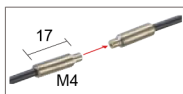
SP-685C

Thrubeam
Can not be cut



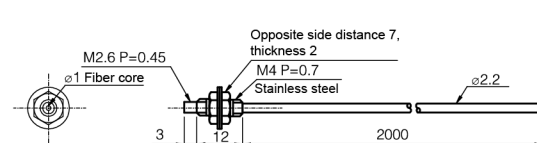
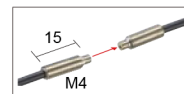
SP-687H

Thrubeam Free-cut



SP-687A

Thrubeam Free-cut



Fiber Optic Sensors

- Photoelectric Sensors
- Color Sensors
- Laser Sensors
- Proximity Sensors
- Precision Contact Sensors
- Area Sensors/
Safety Light Curtains
- Laser Scanners
- Digital Contact Sensors
- Laser Displacement
Sensors
- Laser Micrometers
- Confocal Displacement
Sensors
- Barcode Readers
- AI Vision Sensors
- RFID
- Infrared Temperature
Sensors
- Pressure Sensors
- Flow Sensors
- Magnetic Sensors
- Ultrasonic Sensors
- Magnetic Scales
- Static Eliminators

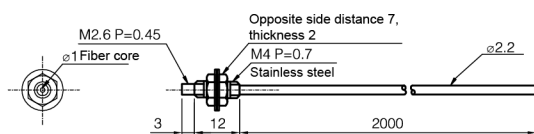
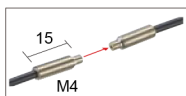




Dimensions

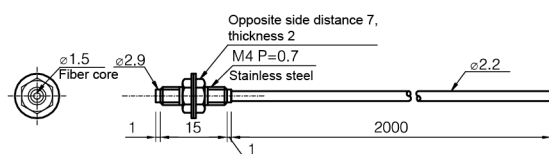
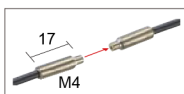
SP-687Z

Thru-beam Free-cut



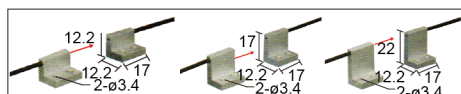
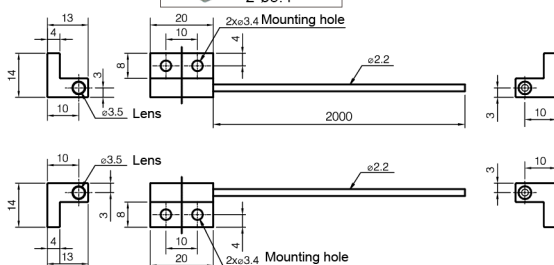
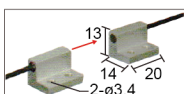
SP-689

Thru-beam Free-cut

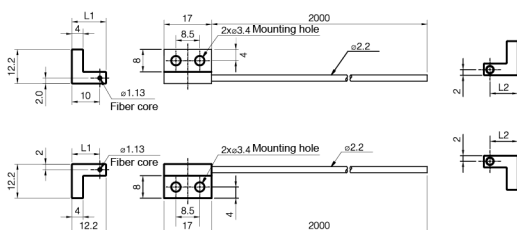


SP-L451Z

Thru-beam Free-cut



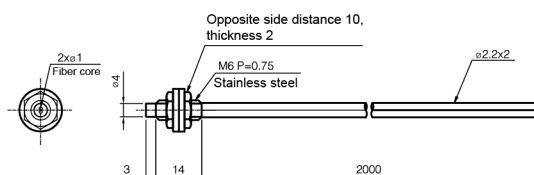
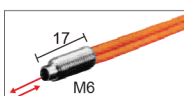
SP-L452Z / SP-L453Z / SP-L454Z



SP-L452Z L1=12.2 L2=10
SP-L453Z L1=17 L2=15
SP-L454Z L1=22 L2=20

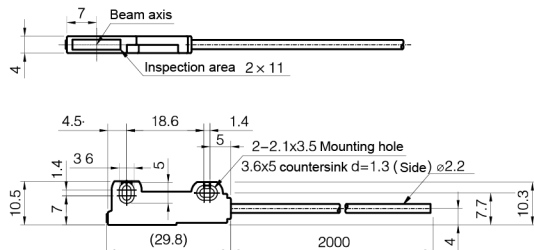
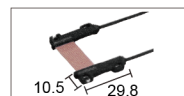
SP-586Z

Reflective Free-cut



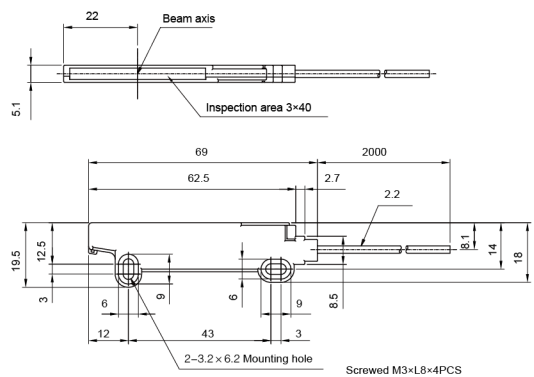
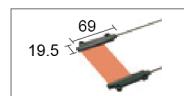
SP-E212

Thru-beam Free-cut



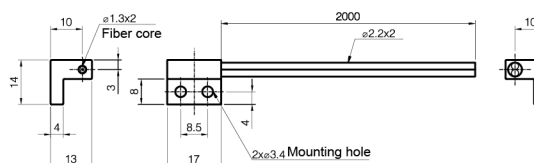
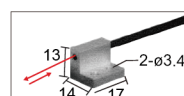
SP-E241

Thru-beam Free-cut



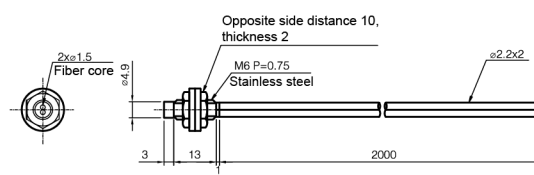
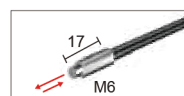
SP-L342Z

Reflective Free-cut



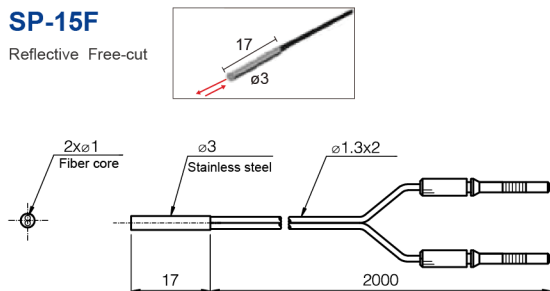
SP-588

Reflective Free-cut



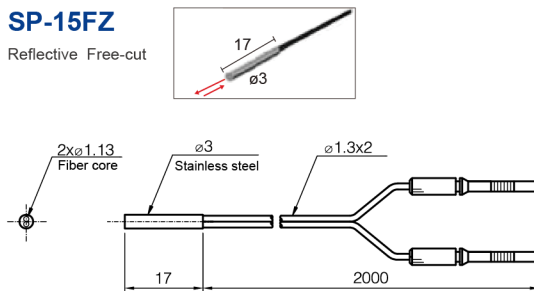
SP-15F

Reflective Free-cut



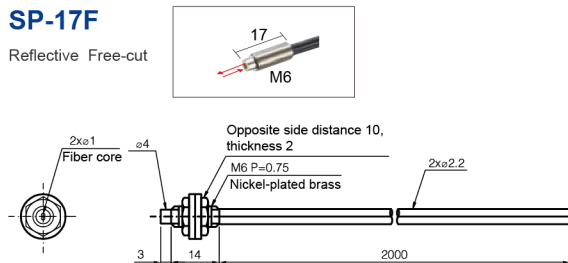
SP-15FZ

Reflective Free-cut



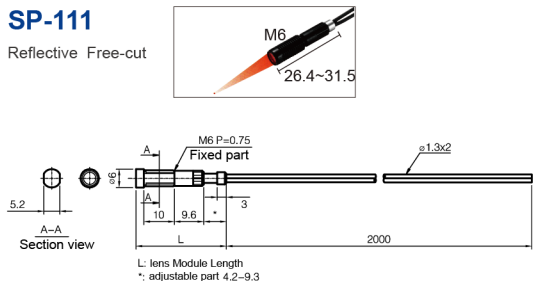
SP-17F

Reflective Free-cut



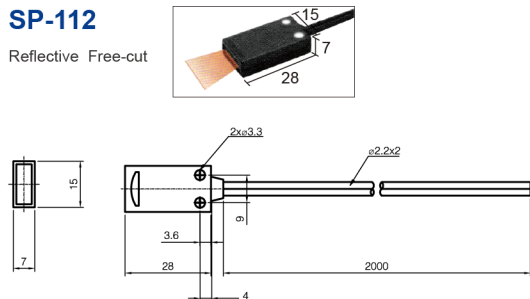
SP-111

Reflective Free-cut



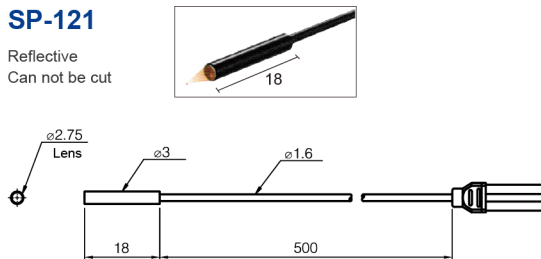
SP-112

Reflective Free-cut



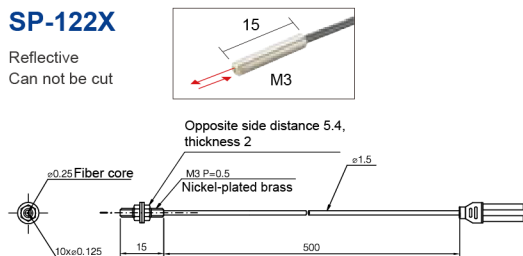
SP-121

Reflective
Can not be cut



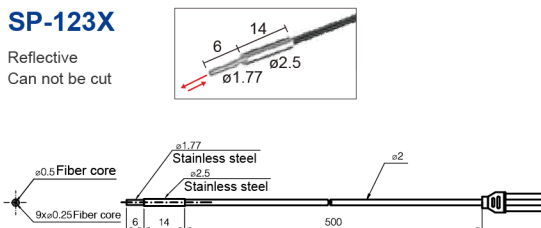
SP-122X

Reflective
Can not be cut



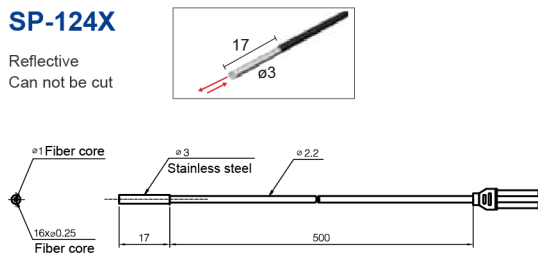
SP-123X

Reflective
Can not be cut



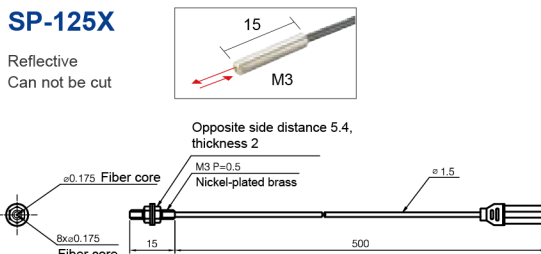
SP-124X

Reflective
Can not be cut



SP-125X

Reflective
Can not be cut

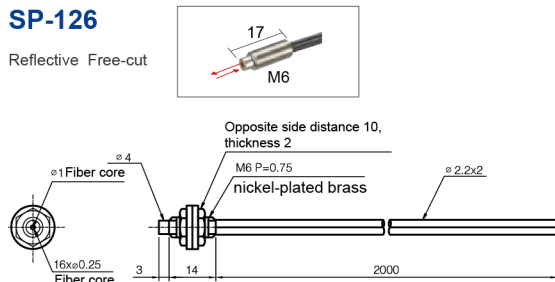




Dimensions

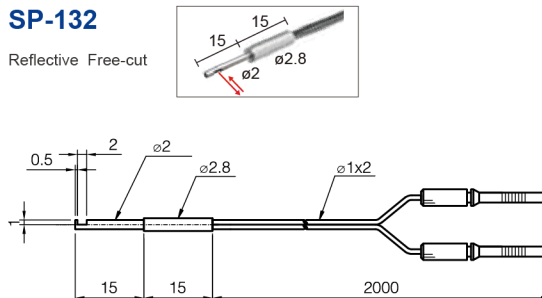
SP-126

Reflective Free-cut



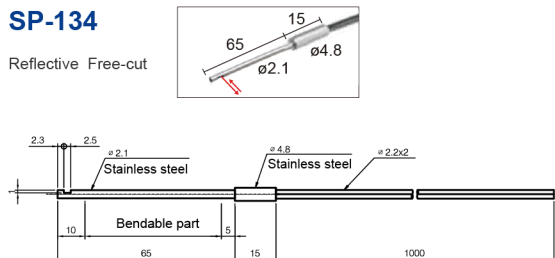
SP-132

Reflective Free-cut



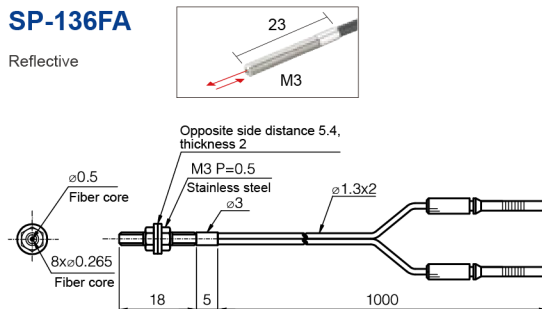
SP-134

Reflective Free-cut



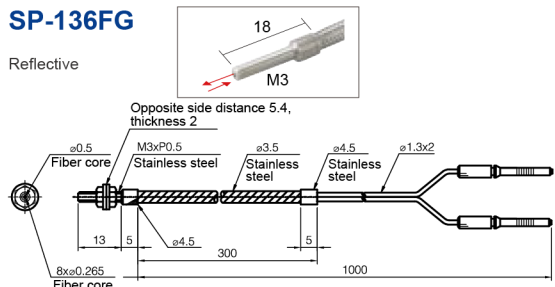
SP-136FA

Reflective



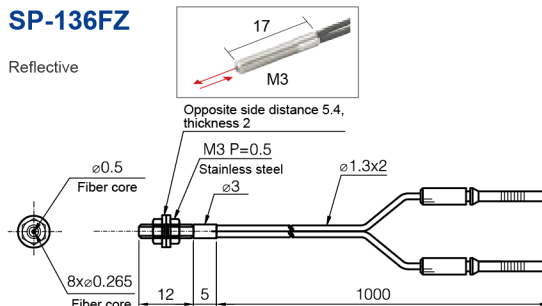
SP-136FG

Reflective



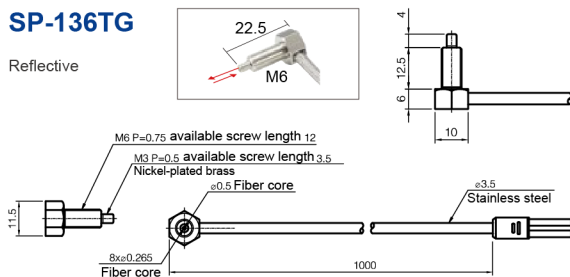
SP-136FZ

Reflective



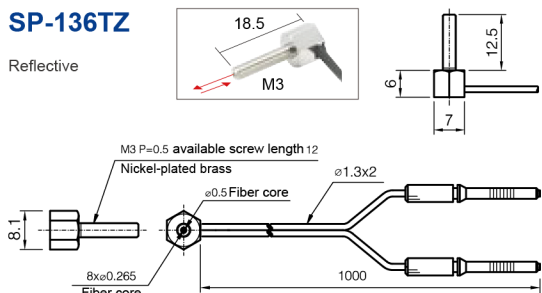
SP-136TG

Reflective



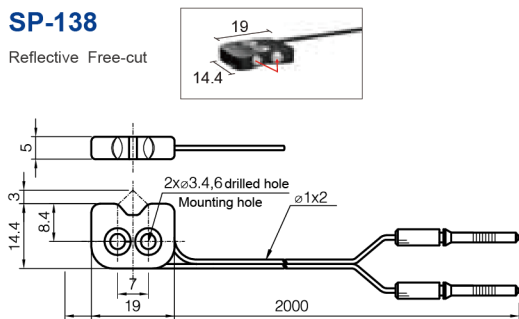
SP-136TZ

Reflective



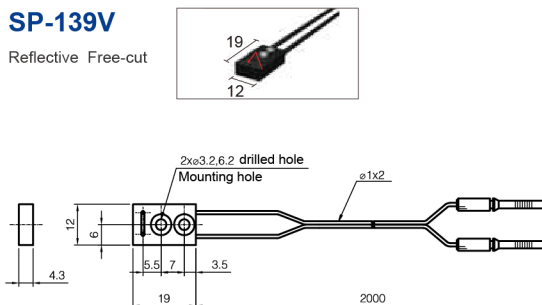
SP-138

Reflective Free-cut



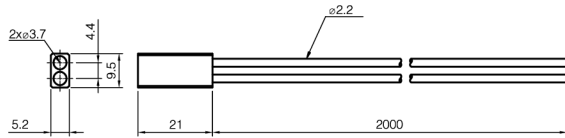
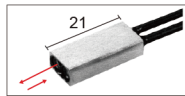
SP-139V

Reflective Free-cut



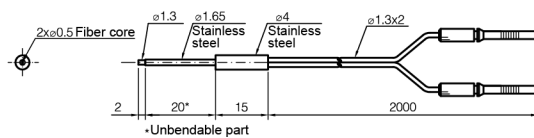
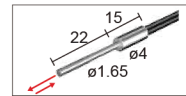
SP-141

Reflective Free-cut



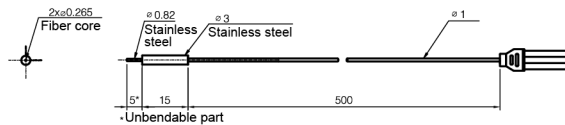
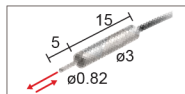
SP-144

Reflective Free-cut



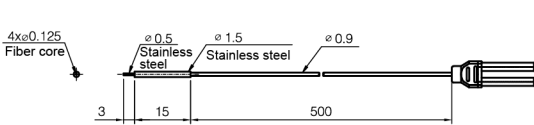
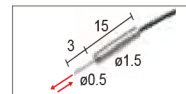
SP-146X

Reflective
Can not be cut



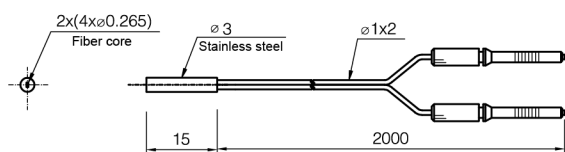
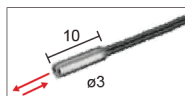
SP-147

Reflective
Can not be cut



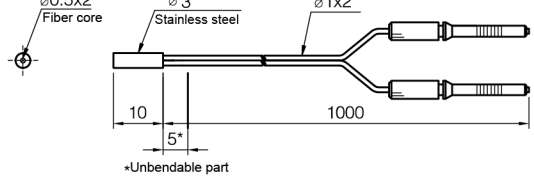
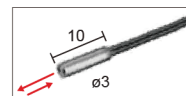
SP-149

Reflective Free-cut



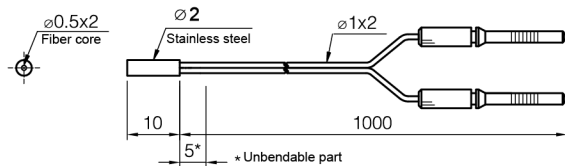
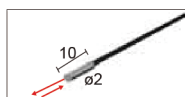
SP-149U

Reflective Free-cut



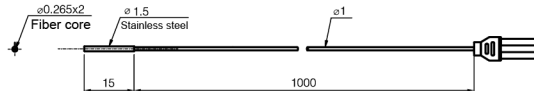
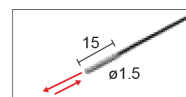
SP-150U

Reflective Free-cut



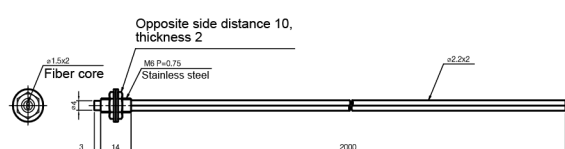
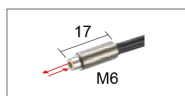
SP-150X

Reflective Free-cut



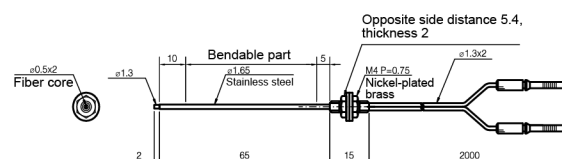
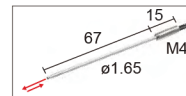
SP-162

Reflective Free-cut



SP-164

Reflective Free-cut



Fiber Optic Sensors

- Photoelectric Sensors
- Color Sensors
- Laser Sensors
- Proximity Sensors
- Precision Contact Sensors
- Area Sensors/ Safety Light Curtains
- Laser Scanners
- Digital Contact Sensors
- Laser Displacement Sensors
- Laser Micrometers
- Confocal Displacement Sensors
- Barcode Readers
- AI Vision Sensors
- RFID
- Infrared Temperature Sensors
- Pressure Sensors
- Flow Sensors
- Magnetic Sensors
- Ultrasonic Sensors
- Magnetic Scales
- Static Eliminators



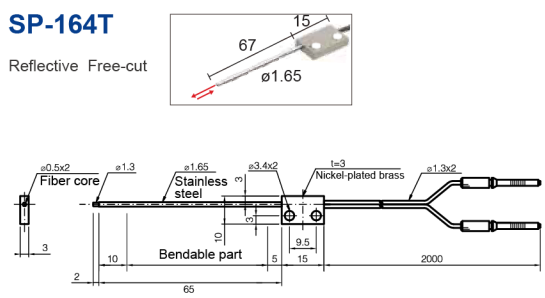
- Photoelectric Sensors
- Color Sensors
- Laser Sensors
- Proximity Sensors
- Precision Contact Sensors
- Area Sensors/
Safety Light Curtains
- Laser Scanners
- Digital Contact Sensors
- Laser Displacemen
Sensors
- Laser Micrometers
- Confocal Displacement
Sensors
- Barcode Readers
- AI Vision Sensors
- RFID
- Infrared Temperature
Sensors
- Pressure Sensors
- Flow Sensors
- Magnetic Sensors
- Ultrasonic Sensors
- Magnetic Scales
- Static Eliminators



Dimensions

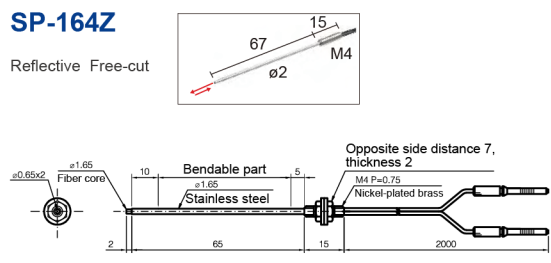
SP-164T

Reflective Free-cut



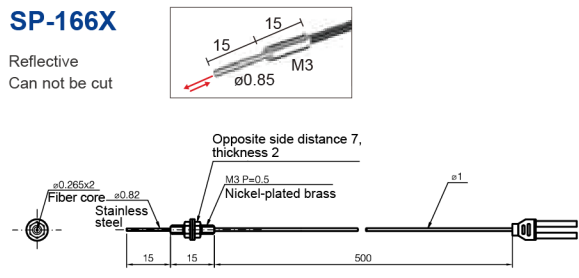
SP-164Z

Reflective Free-cut



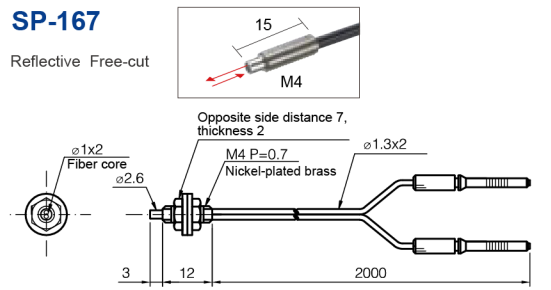
SP-166X

Reflective
Can not be cut



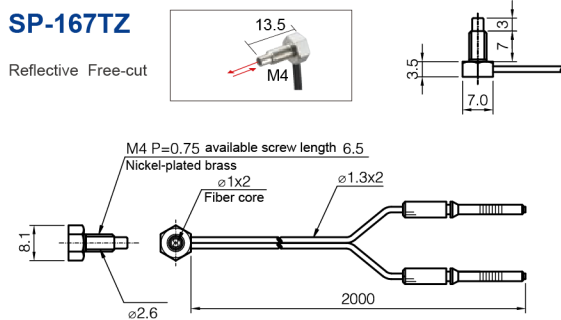
SP-167

Reflective Free-cut



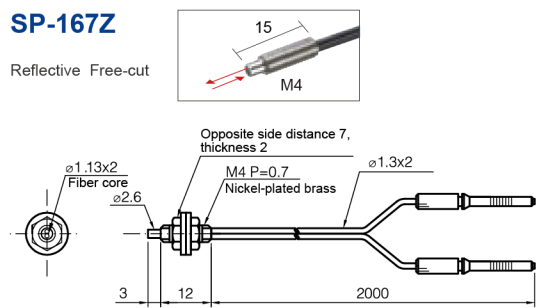
SP-167TZ

Reflective Free-cut



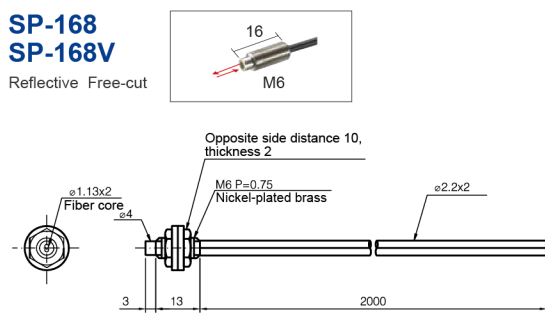
SP-167Z

Reflective Free-cut



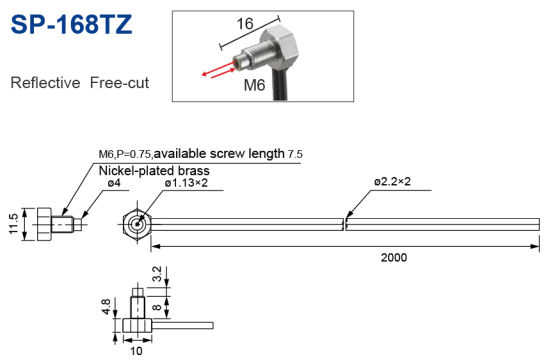
SP-168
SP-168V

Reflective Free-cut



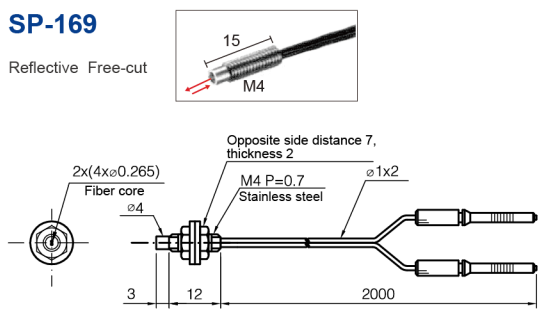
SP-168TZ

Reflective Free-cut



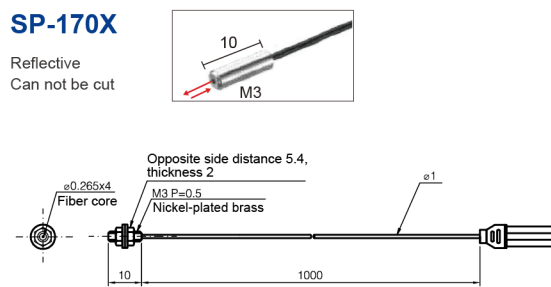
SP-169

Reflective Free-cut



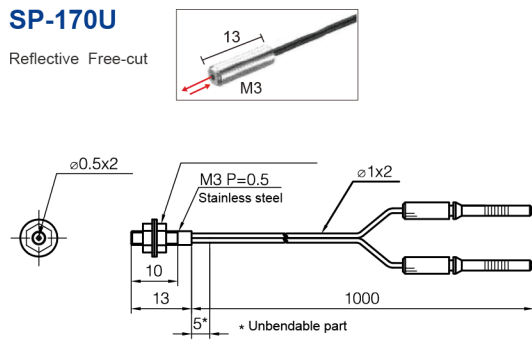
SP-170X

Reflective
Can not be cut



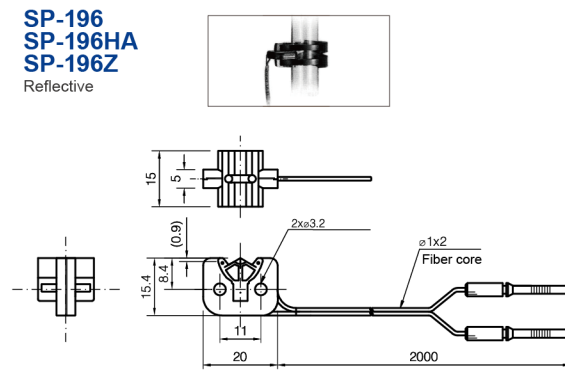
SP-170U

Reflective Free-cut



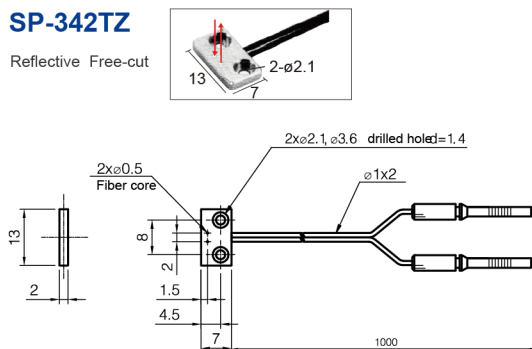
SP-196 SP-196HA SP-196Z

Reflective



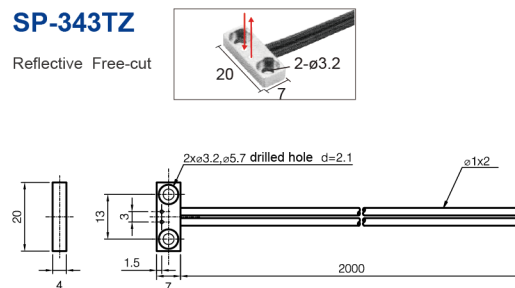
SP-342TZ

Reflective Free-cut



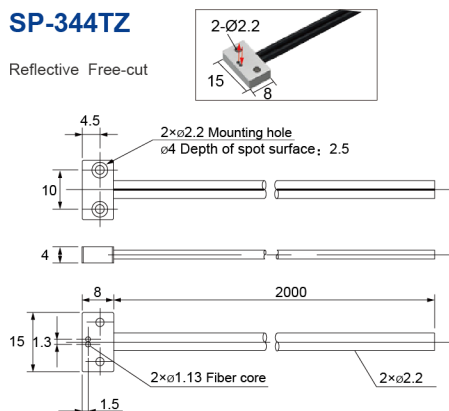
SP-343TZ

Reflective Free-cut



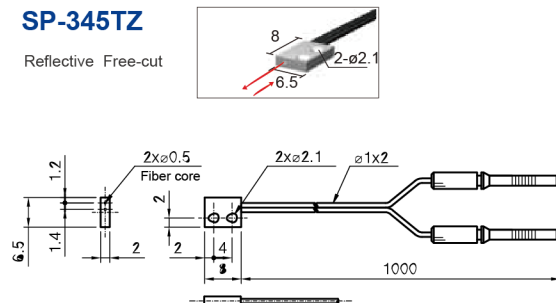
SP-344TZ

Reflective Free-cut



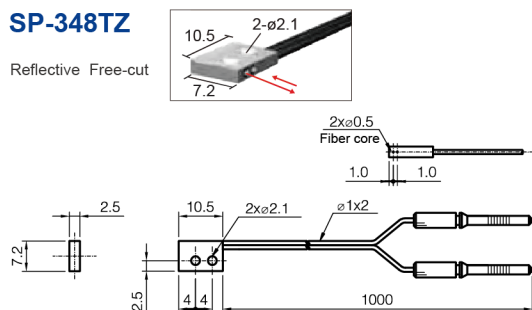
SP-345TZ

Reflective Free-cut



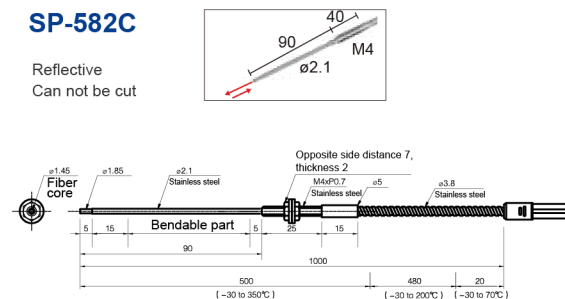
SP-348TZ

Reflective Free-cut



SP-582C

Reflective
Can not be cut



Fiber Optic Sensors

- Photoelectric Sensors
- Color Sensors
- Laser Sensors
- Proximity Sensors
- Precision Contact Sensors
- Area Sensors/
Safety Light Curtains
- Laser Scanners
- Digital Contact Sensors
- Laser Displacement
Sensors
- Laser Micrometers
- Confocal Displacement
Sensors
- Barcode Readers
- AI Vision Sensors
- RFID
- Infrared Temperature
Sensors
- Pressure Sensors
- Flow Sensors
- Magnetic Sensors
- Ultrasonic Sensors
- Magnetic Scales
- Static Eliminators



Photoelectric Sensors
Color Sensors
Laser Sensors
Proximity Sensors
Precision Contact Sensors
Area Sensors/ Safety Light Curtains
Laser Scanners
Digital Contact Sensors
Laser Displacemen Sensors
Laser Micrometers
Confocal Displacement Sensors
Barcode Readers
AI Vision Sensors
RFID
Infrared Temperature Sensors
Pressure Sensors
Flow Sensors
Magnetic Sensors
Ultrasonic Sensors
Magnetic Scales
Static Eliminators

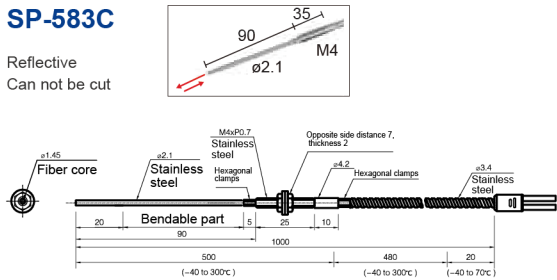


Dimensions

SP-583C

Reflective

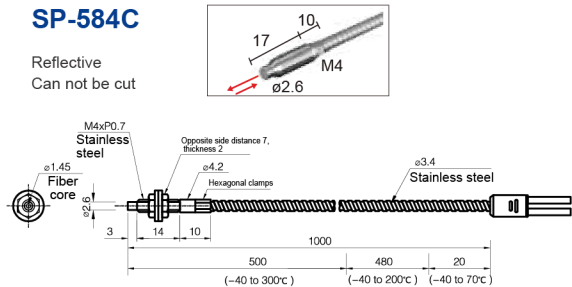
Can not be cut



SP-584C

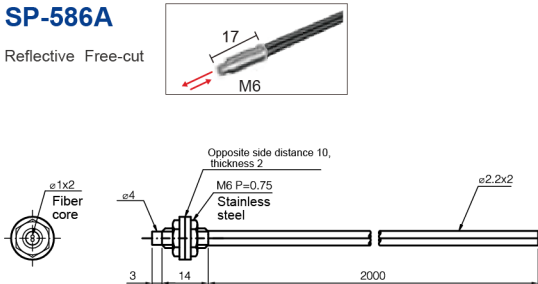
Reflective

Can not be cut



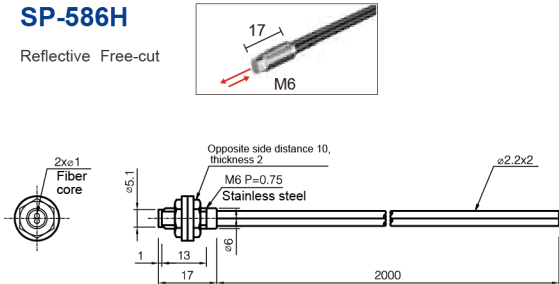
SP-586A

Reflective Free-cut

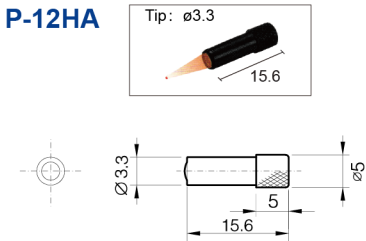


SP-586H

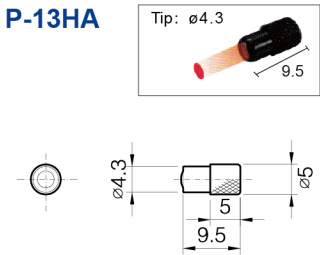
Reflective Free-cut



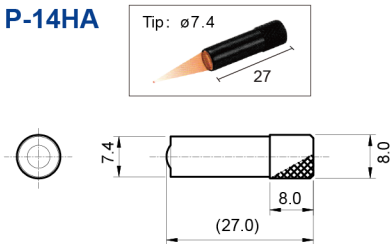
P-12HA



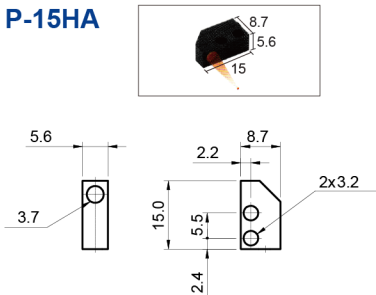
P-13HA



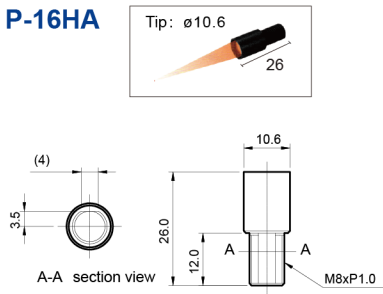
P-14HA



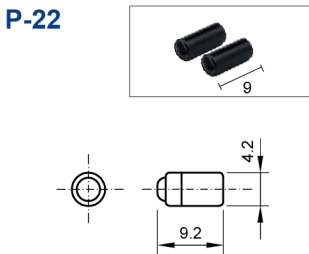
P-15HA



P-16HA



P-22



Photoelectric Sensors

Photoelectric Sensors

Color Sensors

Laser Sensors

Proximity Sensors

Precision Contact Sensors

Area Sensors/
Safety Light Curtains

Laser Scanners

Digital Contact Sensors

Laser Displacement Sensors

Laser Micrometers

Confocal Displacement Sensors

Barcode Readers

AI Vision Sensors

RFID

Infrared Temperature Sensors

Pressure Sensors

Flow Sensors

Magnetic Sensors

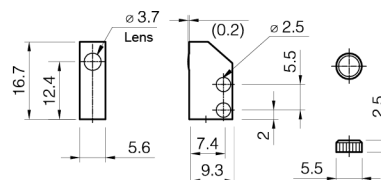
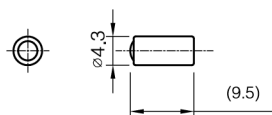
Ultrasonic Sensors

Magnetic Scales

Static Eliminators

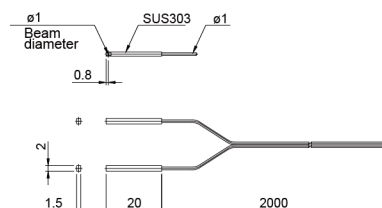
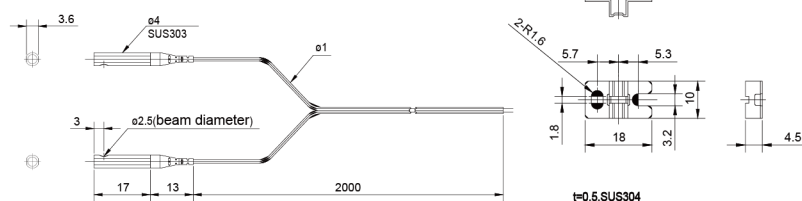
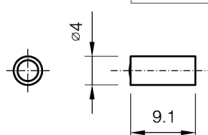
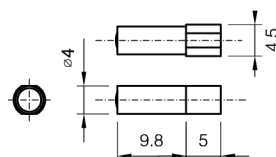


Tip: $\varnothing 4.3$

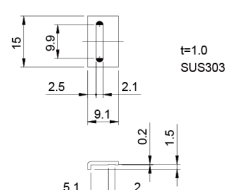


Tip: $\varnothing 4$

15



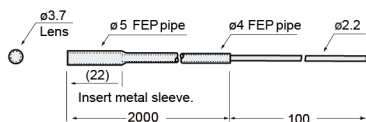
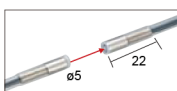
Mounting bracket



Dimensions

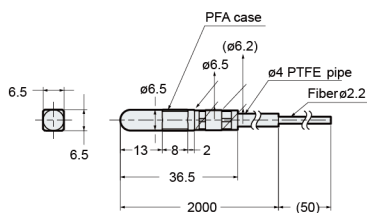
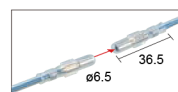
SP-893

Thrubeam Free-cut
A set of two



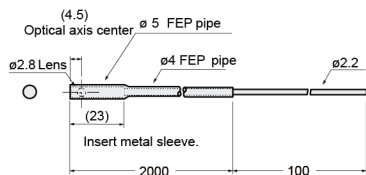
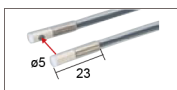
SP-899

Thrubeam Free-cut
A set of two



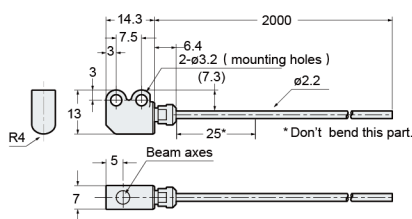
SP-897

Thrubeam Free-cut
A set of two



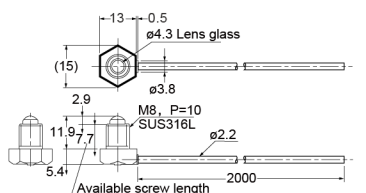
SP-897T

Thrubeam Free-cut
A set of two



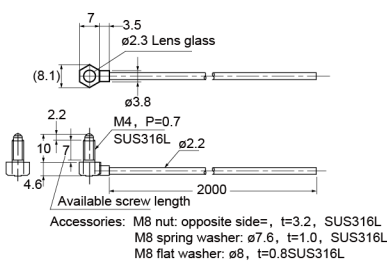
SP-881TZ

Thrubeam Free-cut
A set of two



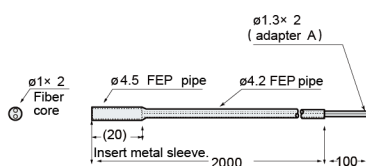
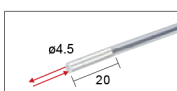
SP-881MTZ

Thrubeam Free-cut
A set of two



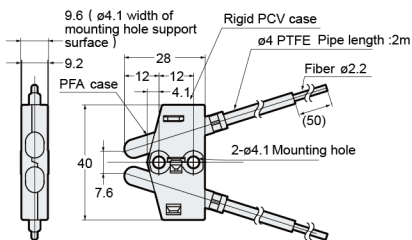
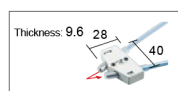
SP-792

Reflective Free-cut



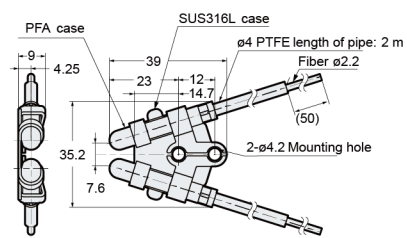
SP-798P

Reflective Free-cut



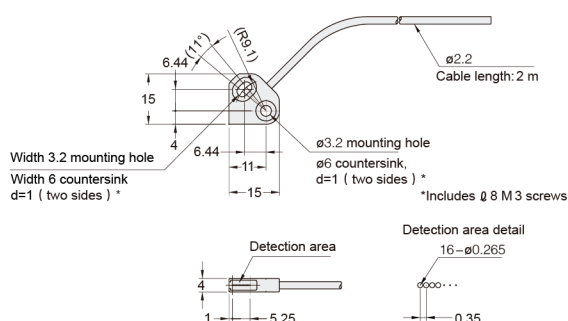
SP-798S

Reflective Free-cut
A set of two



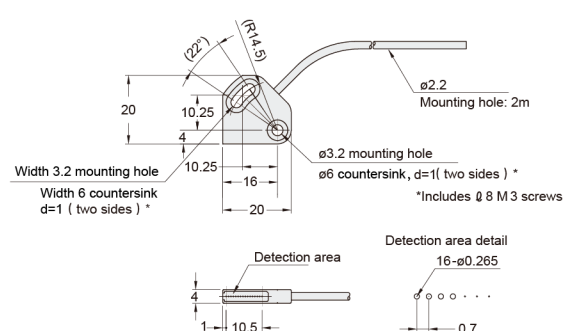
SP-A206

Thrubeam Free-cut



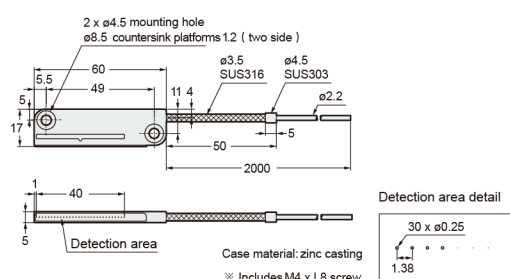
SP-A201

Thrubeam Free-cut



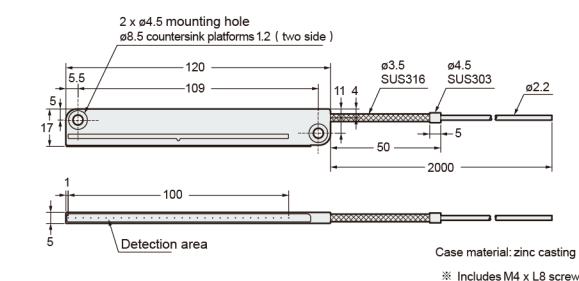
SP-A241

Thrubeam



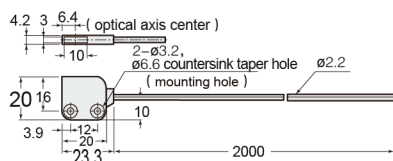
SP-A2100

Thrubeam



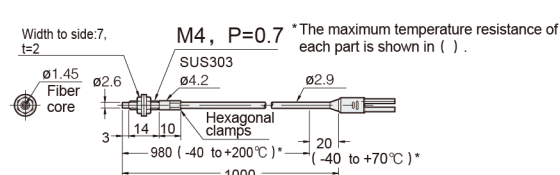
SP-223

Thrubeam Free-cut
A set of two



SP-688K

Heat-resistant
Thrubeam



Fiber Optic Sensors

Photoelectric Sensors

Color Sensors

Laser Sensors

Proximity Sensors

Precision Contact
Sensors

Area Sensors/
Safety Light Curtains

Laser Scanners

Digital Contact Sensors

Laser Displacement
Sensors

Laser Micrometers

Confocal Displacement
Sensors

Barcode Readers

AI Vision Sensors

RFID

Infrared Temperature
Sensors

Pressure Sensors

Flow Sensors

Magnetic Sensors

Ultrasonic Sensors

Magnetic Scales

Static Eliminators



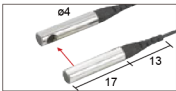


Dimensions

SP-217

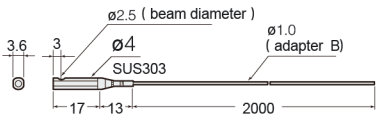
SP-217Z

SP-219



Thrubeam Free-cut

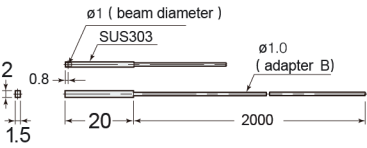
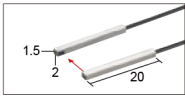
A set of two



SP-219M

Thrubeam Free-cut

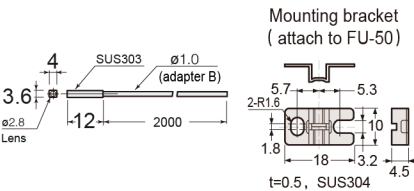
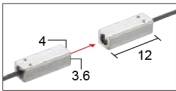
A set of two



SP-251

Thrubeam Free-cut

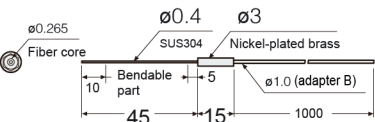
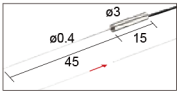
A set of two



SP-277F

Thrubeam Free-cut

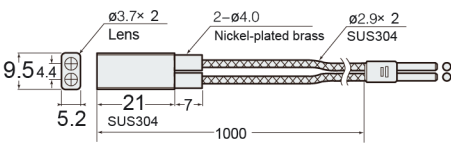
A set of two



SP-141G

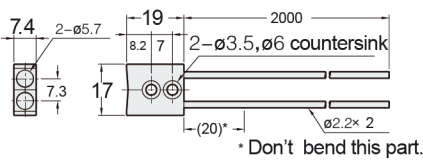
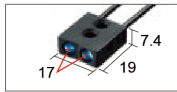
Thrubeam Free-cut

A set of two



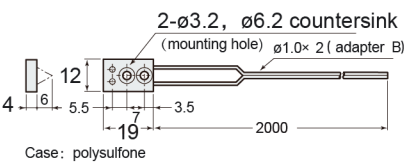
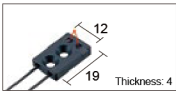
SP-141S

Thrubeam Free-cut



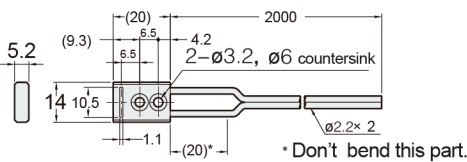
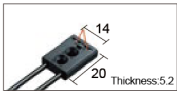
SP-139

Thrubeam Free-cut



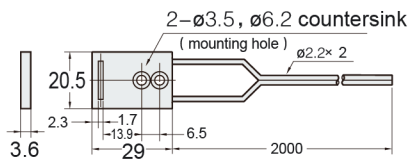
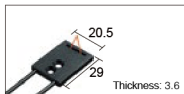
SP-139L

Thrubeam Free-cut



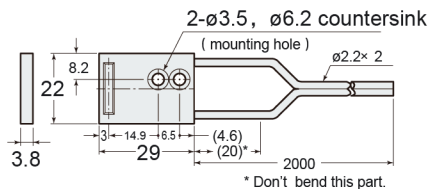
SP-139S

Reflective Free-cut



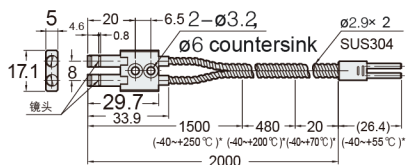
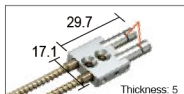
SP-139R

Reflective Free-cut



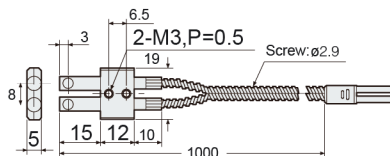
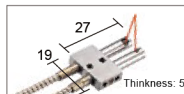
SP-139LK

Reflective



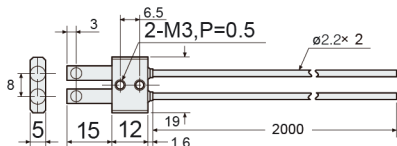
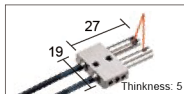
SP-139K

Reflective



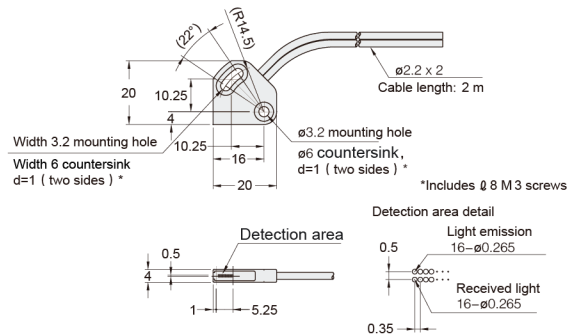
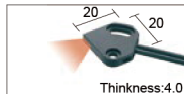
SP-139H

Reflective Free-cut



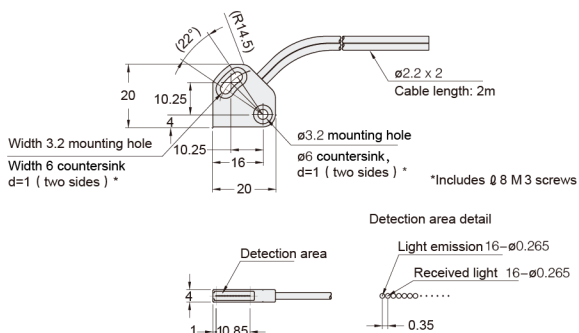
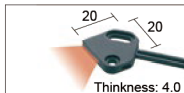
SP-A106D

Reflective Free-cut



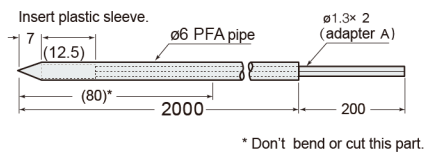
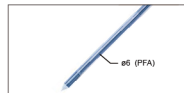
SP-A111D

Reflective



SP-194 SP-194Z

Reflective Free-cut



Fiber Optic Sensors

Photoelectric Sensors

Color Sensors

Laser Sensors

Proximity Sensors

Precision Contact Sensors

Area Sensors/
Safety Light Curtains

Laser Scanners

Digital Contact Sensors

Laser Displacement
Sensors

Laser Micrometers

Confocal Displacement
Sensors

Barcode Readers

AI Vision Sensors

RFID

Infrared Temperature
Sensors

Pressure Sensors

Flow Sensors

Magnetic Sensors

Ultrasonic Sensors

Magnetic Scales

Static Eliminators

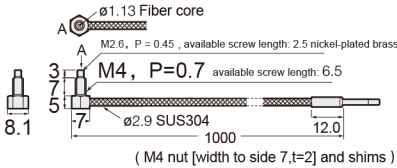
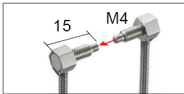


Dimensions

SP-278TG

Thrubeam

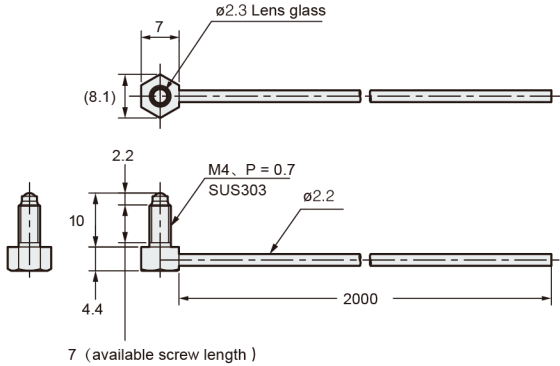
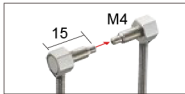
A set of two



SP-271TZ

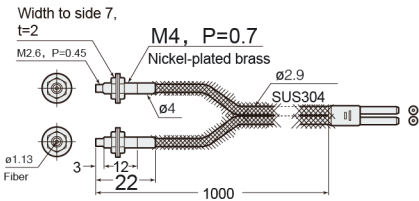
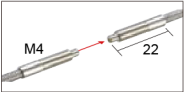
Thrubeam Free-cut

A set of two



SP-278G

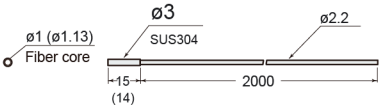
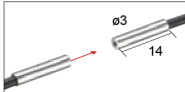
Thrubeam



SP-26FZ

Thrubeam Free-cut

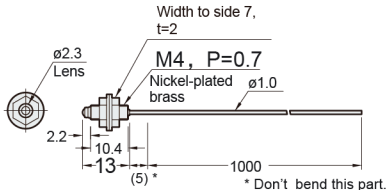
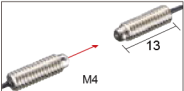
A set of two



SP-271U

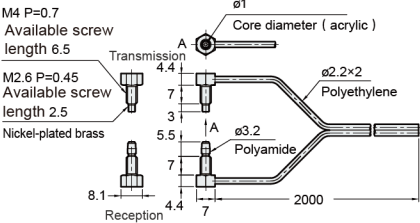
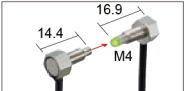
Thrubeam Free-cut

A set of two



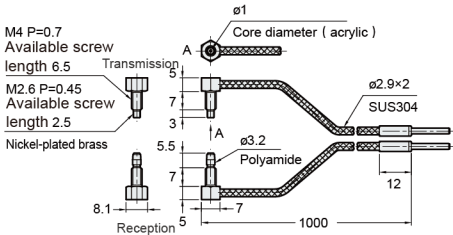
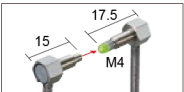
SP-R278TZ

Thrubeam Free-cut



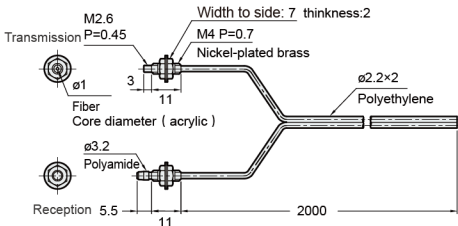
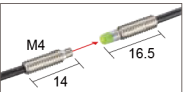
SP-R278TG

Thrubeam



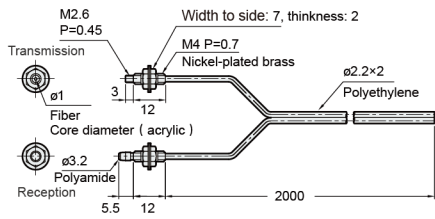
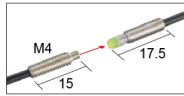
SP-R278

Thrubeam Free-cut



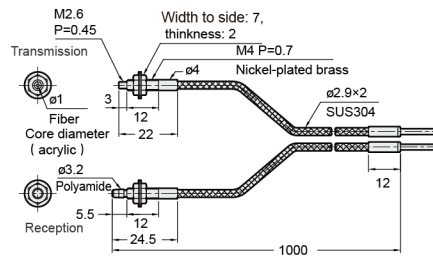
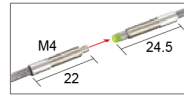
SP-R28F

Thrubeam Free-cut



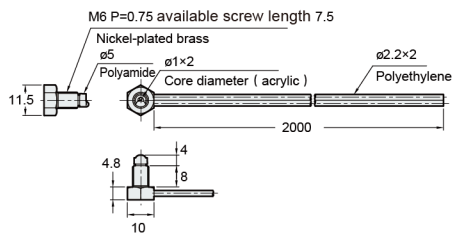
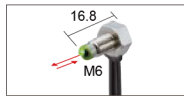
SP-R278G

Thrubeam Free-cut



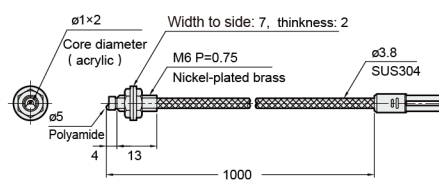
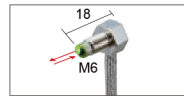
SP-R168TZ

Reflective Free-cut



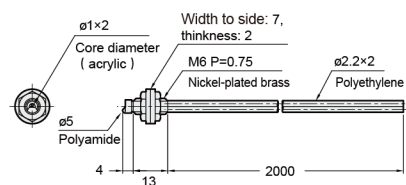
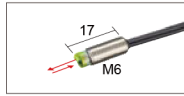
SP-R168TG

Reflective



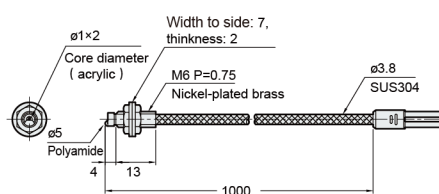
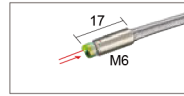
SP-R168 SP-R17F

Reflective Free-cut



SP-R168G

Reflective



Fiber Optic Sensors

- Photoelectric Sensors
- Color Sensors
- Laser Sensors
- Proximity Sensors
- Precision Contact Sensors
- Area Sensors/
Safety Light Curtains
- Laser Scanners
- Digital Contact Sensors
- Laser Displacement
Sensors
- Laser Micrometers
- Confocal Displacement
Sensors
- Barcode Readers
- AI Vision Sensors
- RFID
- Infrared Temperature
Sensors
- Pressure Sensors
- Flow Sensors
- Magnetic Sensors
- Ultrasonic Sensors
- Magnetic Scales
- Static Eliminators

