EX SERIES DUAL-DIGITAL DISPLAY OPTICAL FIBER AMPLIFIER

Intelligent adjustment, simple and stable

Accuracy of detection and simplicity for the customer. Long-term stable brightness and reduced device maintenance.

Setting up with just one key

Just one key to set, press the SET button when there is no target detection object, and press the SET button again when there is a target detection object to automatically set the optimal position.

Dust cover

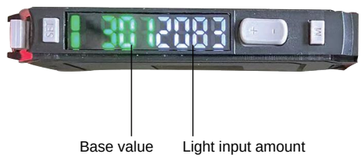
For easy observation, the dust cover is close to the display.

Adjustable light projection amount

In the case of close range detection or detection of transparent objects or small objects, when the lighted level is saturated, the light projection amount by the sensor can be adjusted without changing the response time to realize stable detection. This function makes it easy to set up detection that previously required changes in response time and optical fiber.

Two digital screens are convenient to use

Equipped with two digital screens, allowing you to check the base value, the light input amount, and various settings at the same time, making high operability.



Wire outgoing method

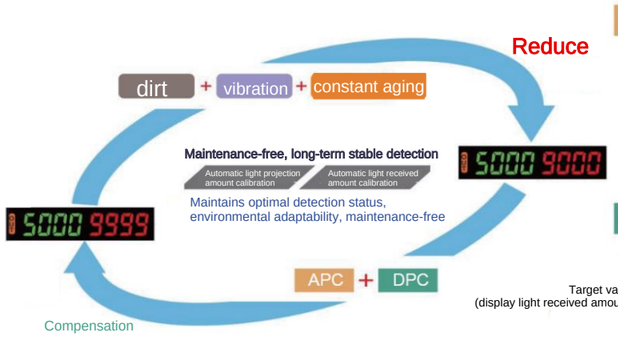
Wire lead type (standard with two meters of flexing-endurable cable) and connector type are available.

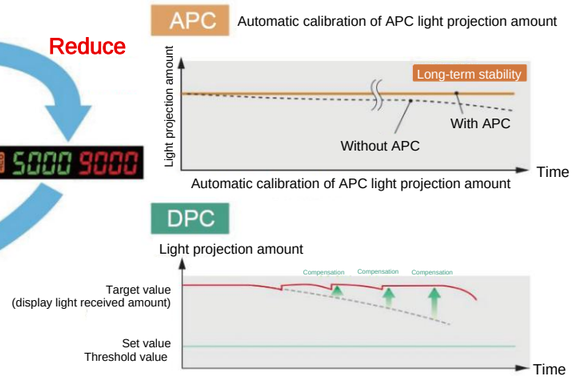
Dual-digital display optical fiber amplifier

Function introduction

Light amount value compensation

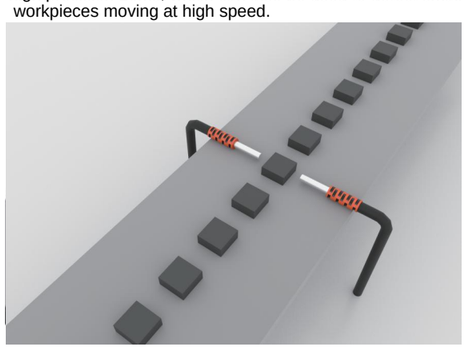
The automatic maintenance function restores the sensor to its original display state when it detects a decrease in brightness due to dirt or other reasons. This function eliminates the effects of the surrounding environment and enables the sensor to consistently perform high-precision detection.





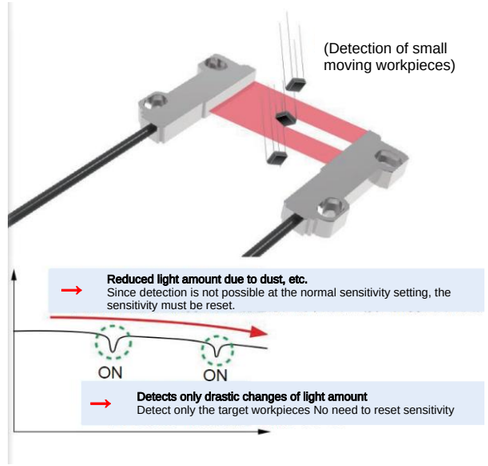
Four methods of detection

Four detection modes are available: standard detection mode 1ms, high speed 250us, ultra-high speed 25us and high precision 16ms, which can also be used to detect small workpieces moving at high speed.



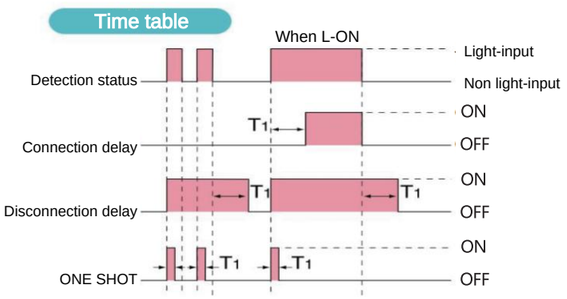
Differential detection mode

Measurements that used to be performed by multiple sensor and those for which it was difficult to set a base value can be realized.



There are 3 types of timers available

Equipped with switch-on delay, disconnect delay and ONE SHOT timer. (Time of timer is about 1ms~10s)

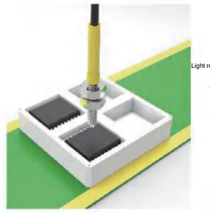


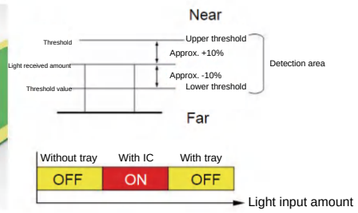
ON delay	Delayed output of ON status after detection.
OFF delay	When the detection time is short and it is not possible to execute the detection through PLC. Maintains output of ON status.
SHOT inching	Timed output is possible even if the size of the detected object is uneven.

Window detection

The upper and lower base values can be set and light input amount in this range can be made ON/OFF.

(Detection of IC in the tray)





Light amount value adjustment

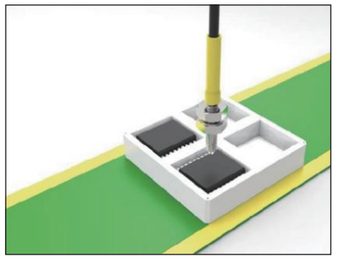
When you want to change the light input amount target (light amount value adjustment level), you can set the light amount value adjustment level (100-9999, scale of 1, initial value is 9999.).

Saves current consumption

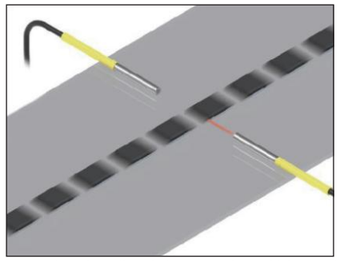
When no key operation is performed for about 20 seconds after setting , the digital display will turn off and the power consumption will be controlled to about 600mW or below. (720mW or below when light on)

Slotted sensor
Optical fiber sensor
Displacement sensor
Safety sensor
Photoelectric sensor
Proximity sensor
Specialized sensor

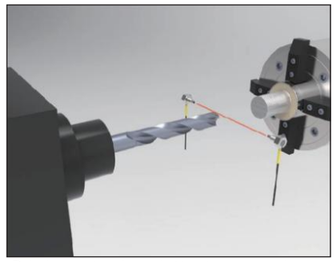
Application examples



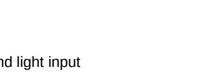
Detects presence of IC on the tray



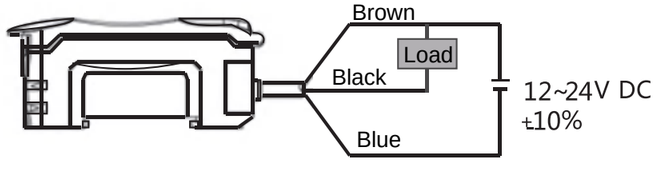
Detection of small workpieces passing at high speed



Detection in oil-contaminated harsh environments

Category	Shape (mm)	NPN type	PNP type
Economy type		EX-NA11	EX-NA11P
Simple dual-digital display		EX-HD08	EX-HD08P
Optical sensing amplifier		EX-HD09	EX-HD09P
Universal dual-digital display		EX-HD10	EX-HD10P
Chinese dual-digital display		EX-HD20	EX-HD20P

Input/output circuit

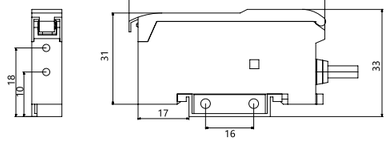


Category

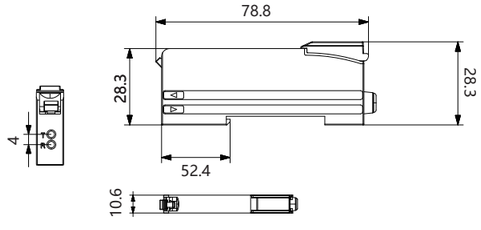
Item	Model	Economy type	Simple dual-digital display	Optical sensing amplifier	Universal dual-digital display	Chinese dual-digital display
		EX-NA11	EX-HD08	EX-HD09	EX-HD10	EX-HD20
Light source		640nm red modulated light				
Power supply voltage		DC 12-24V±10% pulsation (p-p) 10% or below				
Power consumption		≤30mA				
Output mode		NPN open collector/PNP open collector				
Switching mode		L.on(light-input action)/D.on(light-darkening action) can be set				
Response time		P-025μsP-1:100μs,P-2:400μs,P-3:800μs,P-4:3.2ms				
Timer function		Switch-on delay, disconnect delay, ONE SHOT timer				
Timing range		1~9999ms				
Practical functions		Parameter initialization/key lock/threshold two points, fully automatic and manual setting				
Advanced functions		Automatic compensation of light projection amount and light received amount, differential detection, area detection				
Ambient temperature		-20℃~+50℃				
Environmental humidity		35~85%RH				
Ambient light		Daylight: 30000LX or below Incandescent light: 20000LX or below				
Protection circuit		Surge protection circuit, short circuit protection, reverse polarity protection				
Vibration (durable)		10~55Hz,1.5mm double amplitude, reaches 2h in each direction of X, Y, Z				
Impact (durable)		500m/s² double amplitude, 10 times in each direction of X, Y, Z				
Link method		Wire lead type (standard 2m)				
Material		Housing: PBT Cover: PC				

Dimension diagram (unit: mm)

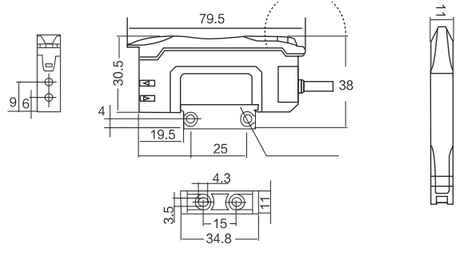
EX-NA11



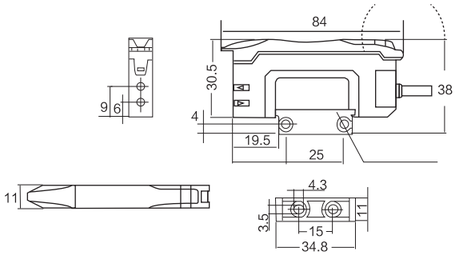
EX-HD08



EX-HD10



EX-HD20

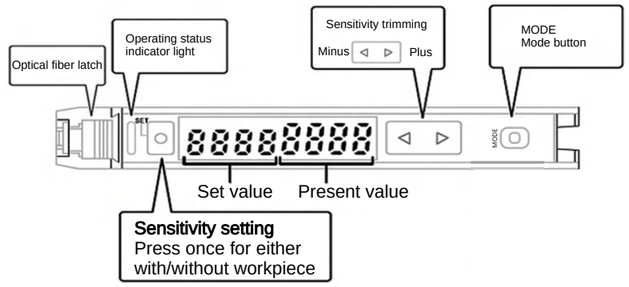


Slotted sensor
Optical fiber sensor
Displacement sensor
Safety sensor
Photoelectric sensor
Proximity sensor
Specialized sensor

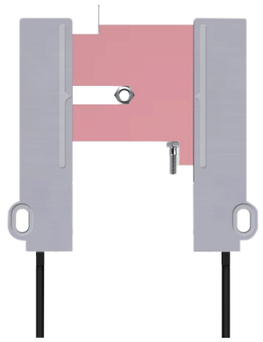
EX-V ANALOG CORRECTION AMPLIFIER

Analog correction amplifier

Product description

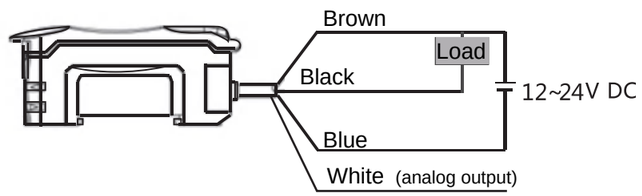


Product description



- Area correction
- Dimension measurement
- Detection for presence

Wiring diagram

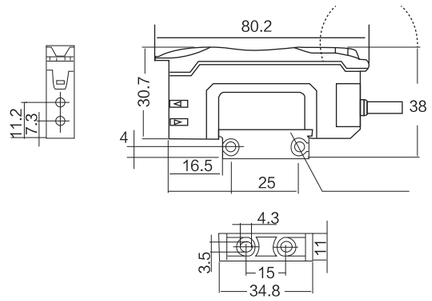


Rated specification and performance

Model	EX-V61M	EX-V61MV
	NPN output + analog current	NPN output + analog voltage
Type	1 Output, wire lead type	
Control output	1 Output port (with analog output)	
Light source	Red, 4-element light emitting diode body	
Response time	P-025μsP-1:100μs,P-2:400μs,P-3:800μs,P-4:3.2ms	
Output selection	LIGHT-ON/DARK-ON (switch selection)	
Display indicator	Operating indication light: White light emitting diode, double digit monitor: double 7-digit display, light on from threshold value (4-digit green light emitting diode body indicator) and the present value (4-digit white light emitting diode body indicator). Current value range：0-9999	
Detection method	Light intensity (area detection available, automatic sensitive tracking function available)	
Time-delay function	Disconnect delay timer/start delay timer/single timer/start delay single timer, selectable. The meter display is selectable in duration: 1ms to 9999ms	
Control output	NPN/PNP open collector 24V, max. 100mA (only the main component) max. 20mA (when the extension component is connected, residual voltage: 1V. Model with the character “ M ” sensor for the analog output, analog voltage from 0-5V, the detection accuracy of thousandth	
Power supply	12 to 24V DC within ±10%, floating ratio (P-P): max. 10% level 2	
Working environment brightness	Incandescent light: Max.: 20,000lux, daylight: Max.: 30,000lux	
Net power	Standard mode: 300mW max.	Standard mode: 300mW max.
Consumption	Max. voltage 24V	Max. voltage 24V
Vibration resistance	10 to 55Hz, Dual amplitude: 1.5mm, 2 hours for X, Y, Z axes respectively	
Ambient temperature	-10 to +55°C, non-freezing	

Dimension diagram (unit: mm)

EX-V61

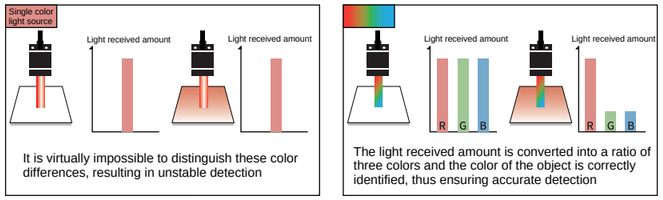


EX-C DUAL-DIGITAL COLOR DISPLAY OPTICAL FIBER AMPLIFIER

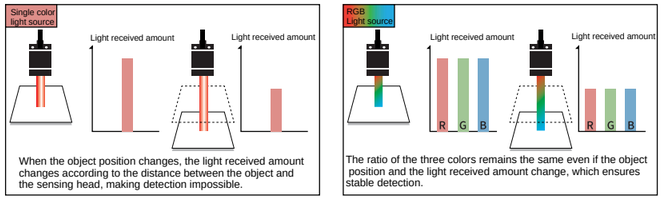
Color optical fiber amplifier

RGB light source that recognizes multiple kinds of targets

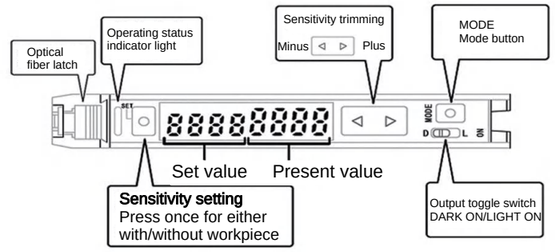
Light source advantage 1 Precise target identification

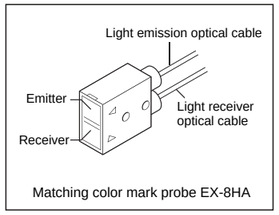


RGB light source advantage 2 Minimally affected by changes in object position



EX-C71





Matching color mark probe EX-8HA

EX-8HA

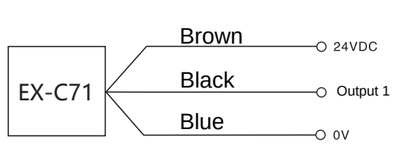
■ When detecting metal surfaces or smooth subject

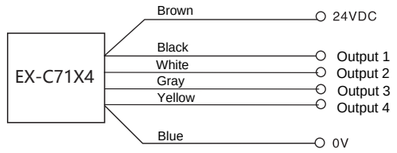
If the subject has a metal or smooth surface, tuning/recognition will fail. To detect such a subject , the sensing head should be tilted about 10-15 degrees.

Product description

NPN output	EX-C71	EX-C71X4
PNP output	EX-C71P	EX-C71X4-P
Control output	Single channel output Detects single color	Four-channel output to detect four groups of colors
Light source	RGB three-color, 4-element light emitting diode	
Response time	300μs(HSP)/1ms(FINE)	
Output selection	LIGHT-ON/DARK-ON (switch selection)	
Display indicator	Output: red LED Match rate/received light intensity: LED (red) Set value: LED (green)	Operating indication light: Dual 7-digit displays, light on from threshold and present values. Present Value range：0-9999
Detection method	Light intensity (area detection available, automatic sensitive tracking function available)	
Time-delay function	Disconnect delay timer/start delay timer/single timer/start delay timer, selectable. The meter display is selectable in duration: 1ms to 9999ms	
Control output	PNP/NPN open collector: max. 40VDC (100mA max.) residual voltage: 1.0V max.	
Power supply	12 to 24V DC±10%, pulsation (P-P): Max. 10%	
Working environment brightness	Incandescent light: Max. 5000Lux daylight: Max. 10000Lux	
Power consumption	Standard mode: Max. 300mW Max. voltage: 24V	
Vibration resistance	10 to 55Hz, 1.5mm double amplitude in X, Y, Z directions, 2 hours each	
Ambient temperature	-10 to +55°C, non-icing	

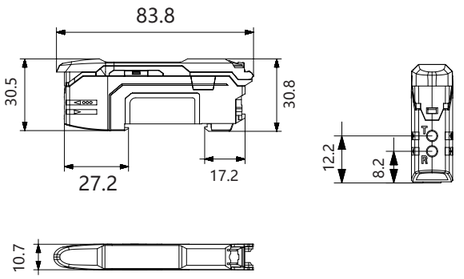
Wiring diagram



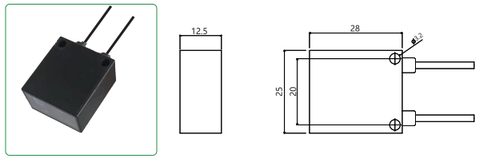


Product dimensions

EX-C71



EX-8HA



Optical fiber element

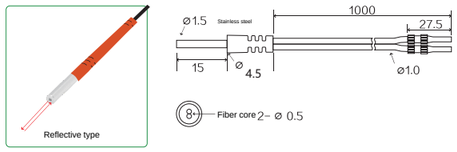
Selection rules

EX – L D 3 1 Q TZ S10

- Convex tube: none = no fine needle lead S10 = convex tube 10mm
- Optical fiber: none = plain TZ = coaxial N = right angle type
- Thread: none = threaded Q= unthreaded
- Wire length: 1=1M 2=2M
- Diameter: 1=φ1.5 2=φ2 3=M3 4=M4 A=area optical fiber
- Detection method: D=reflected T=through-beam
- Detection direction: none = forward L=side W=up F=front
- EX series optical fiber

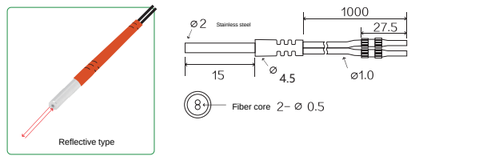
Reflective optical fiber

EX-D11Q



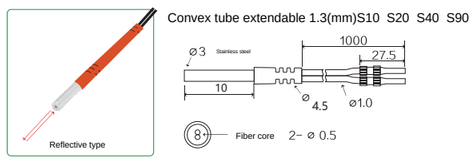
Detection distance	50
Detection accuracy	⌀ 0.05

EX-D21Q



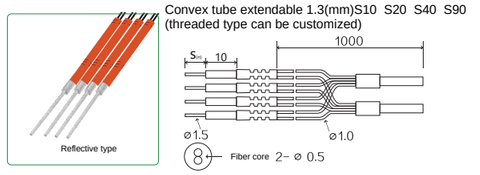
Detection distance	50
Detection accuracy	⌀ 0.05

EX-D31Q



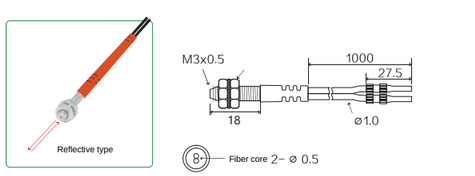
Detection distance	50
Detection accuracy	⌀ 0.05

EX-D31Q-n (all-in-one reflective optical fiber N = 2, 4, 6, 8, 10, 12)



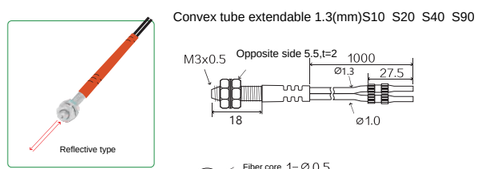
Detection distance	50
Detection accuracy	⌀ 0.05

EX-D31 (optional convex tube - 810, 820, S40 optional all-in-one optical fiber 2, 4, 6, 8, 10, 12)



Detection distance	50
Detection accuracy	⌀ 0.05

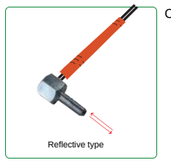
EX-D31TZ (optional convex tube - S10, S20, S40)



Detection distance	50
Detection accuracy	⌀ 0.05

Reflective optical fiber

EX-D31N

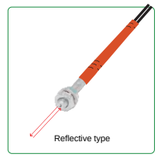


Detection distance	50
Detection accuracy	⌀ 0.05

EX-D31NTZ

Detection distance	50
Detection accuracy	⌀ 0.05

EX-D41 (optional convex tube - S10, S20, S40)



Detection distance	50
Detection accuracy	⌀ 0.05

EX-D41 (optional convex tube - S10, S20, S40 optional all-in-one optical fiber 2, 4, 6, 8, 10, 12)

Detection distance	50
Detection accuracy	⌀ 0.05

EX-D41N

Detection distance	50
Detection accuracy	⌀ 0.05

EX-D41NTZ

Detection distance	50
Detection accuracy	⌀ 0.05

EX-D61

Detection distance	50
Detection accuracy	⌀ 0.05

EX-D61TZ

Detection distance	50
Detection accuracy	⌀ 0.05

EX-D61N

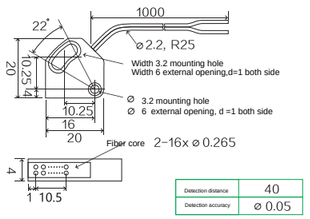
Detection distance	50
Detection accuracy	⌀ 0.05

EX-D61NTZ

Detection distance	50
Detection accuracy	⌀ 0.05

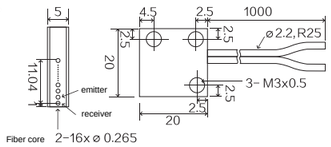
Reflective optical fiber

EX-WDA10



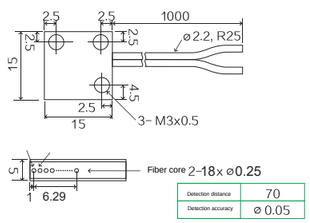
Detection distance	40
Detection accuracy	⌀ 0.05

EX-WDA20



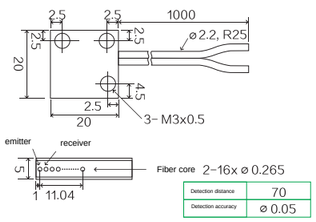
Detection distance	70
Detection accuracy	⌀ 0.05

EX-DA15



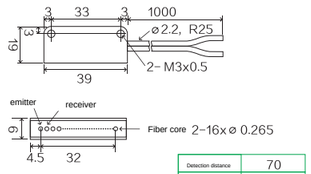
Detection distance	70
Detection accuracy	⌀ 0.05

EX-DA20



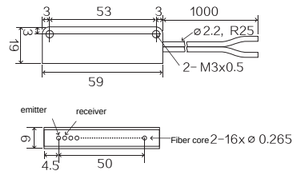
Detection distance	70
Detection accuracy	⌀ 0.05

EX-DA40



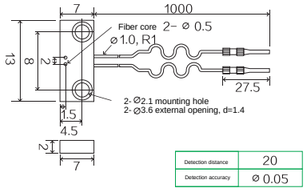
Detection distance	70
Detection accuracy	⌀ 4

EX-DA60



Detection distance	70
Detection accuracy	⌀ 10

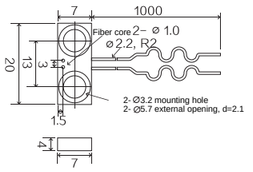
EX-FD41



Detection distance	20
Detection accuracy	⌀ 0.05

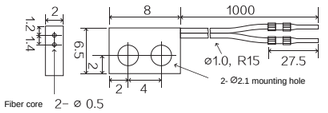
Reflective optical fiber

EX-FD42



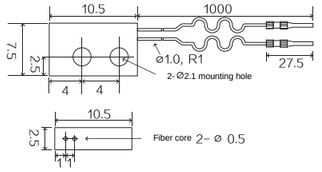
Detection distance	20
Detection accuracy	⌀ 0.05

EX-FD44



Detection distance	20
Detection accuracy	⌀ 0.05

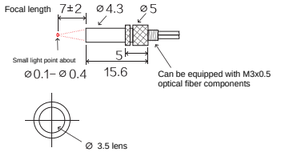
EX-FD47



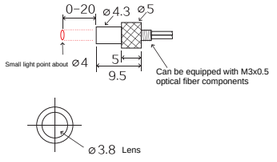
Detection distance	20
Detection accuracy	⌀ 0.05

EX-2HA (small light spot at 7mm)

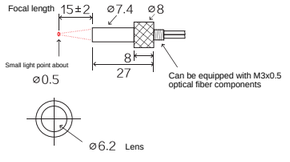
Small light spot at 3mm



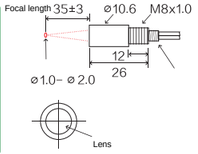
EX-3HA (parallel light spot)



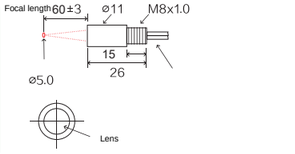
EX-4HA (small light spot at 15mm)



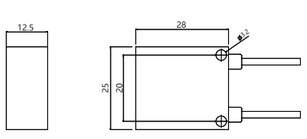
EX-6HA (small light spot at 35mm)



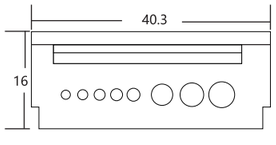
EX-7HA (small light spot at 60mm)



EX-8HA



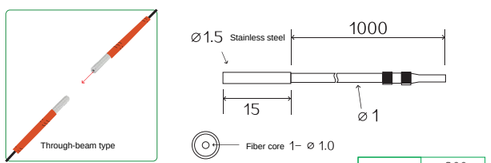
EX-KNF



Optical fiber element

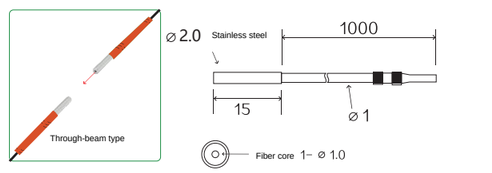
Through-beam optical fiber

EX-T11Q



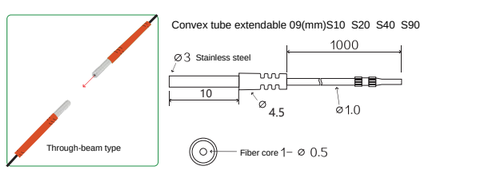
Detection distance	300
Detection accuracy	⌀ 0.05

EX-T21Q



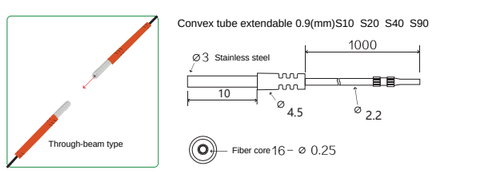
Detection distance	300
Detection accuracy	⌀ 0.05

EX-T31Q



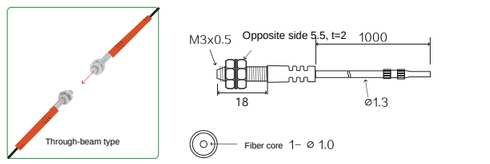
Detection distance	300
Detection accuracy	⌀ 0.05

EX-T31QTZ



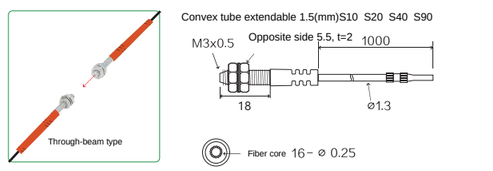
Detection distance	300
Detection accuracy	⌀ 0.05

EX-T31



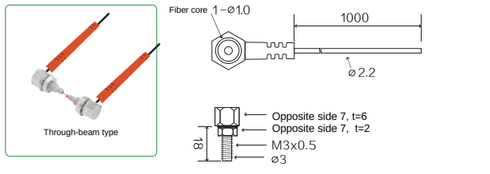
Detection distance	300
Detection accuracy	⌀ 0.05

EX-T31TZ



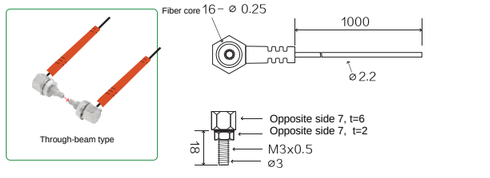
Detection distance	300
Detection accuracy	⌀ 0.05

EX-T31N



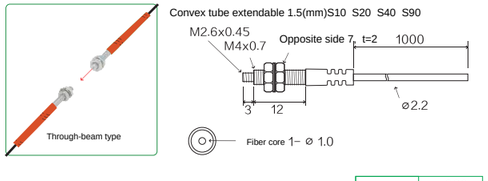
Detection distance	300
Detection accuracy	⌀ 0.05

EX-T31NTZ



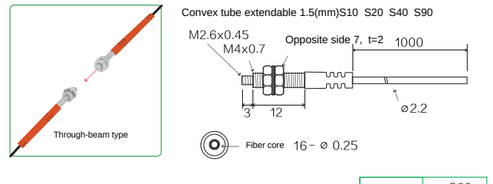
Detection distance	300
Detection accuracy	⌀ 0.05

EX-T41



Detection distance	300
Detection accuracy	⌀ 0.05

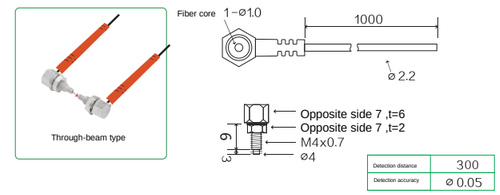
EX-T41TZ



Detection distance	300
Detection accuracy	⌀ 0.05

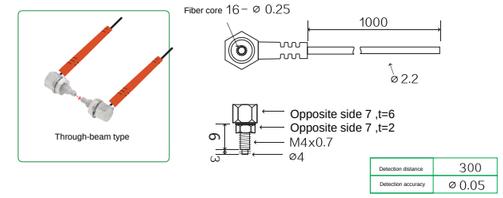
Through-beam optical fiber

EX-T41N



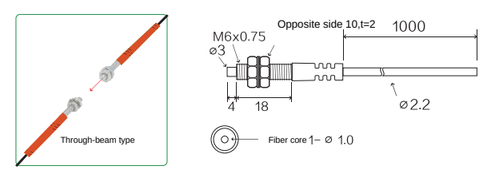
Detection distance	300
Detection accuracy	⌀ 0.05

EX-T41NTZ



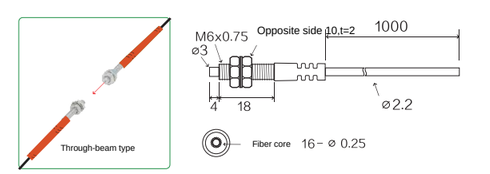
Detection distance	300
Detection accuracy	⌀ 0.05

EX-T61



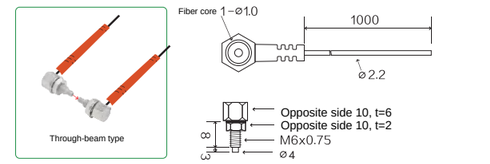
Detection distance	300
Detection accuracy	⌀ 0.05

EX-T61TZ



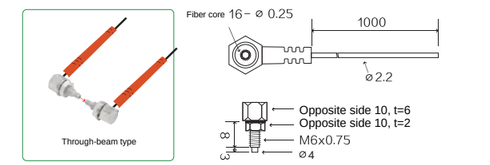
Detection distance	300
Detection accuracy	⌀ 0.05

EX-T61N



Detection distance	300
Detection accuracy	⌀ 0.05

EX-T61NTZ



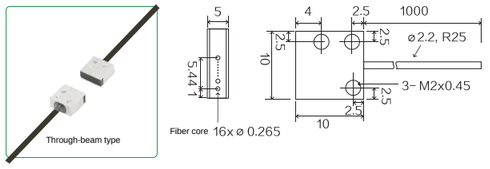
Detection distance	300
Detection accuracy	⌀ 0.05

Slotted sensor
Optical fiber sensor
Displacement sensor
Safety sensor
Photoelectric sensor
Proximity sensor
Specialized sensor

Optical fiber element

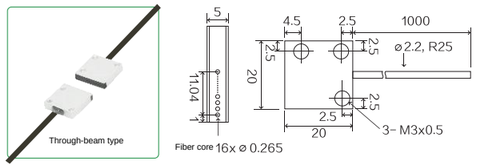
Through-beam optical fiber

EX-FTA10



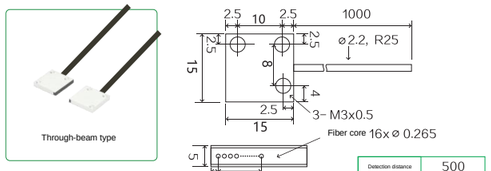
Detection distance	500
Detection accuracy	ø 0.1

EX-FTA20



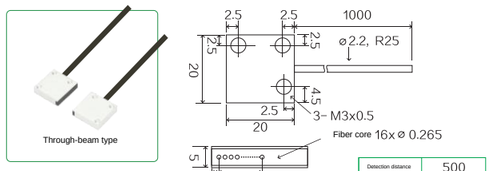
Detection distance	500
Detection accuracy	ø 0.5

EX-LTA15



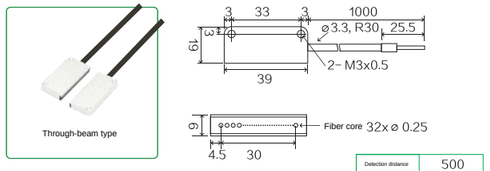
Detection distance	500
Detection accuracy	ø 0.5

EX-LTA20



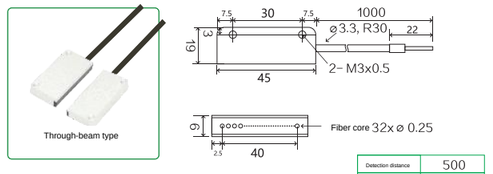
Detection distance	500
Detection accuracy	ø 0.5

EX-LTA40



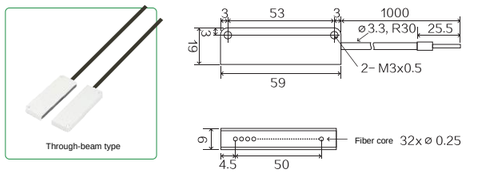
Detection distance	500
Detection accuracy	ø 3

EX-LTA45



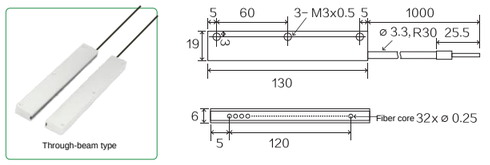
Detection distance	500
Detection accuracy	ø 3

EX-LTA60



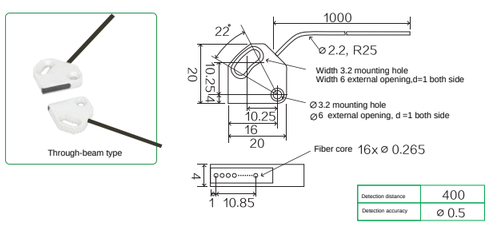
Detection distance	500
Detection accuracy	ø 5

EX-LTA130



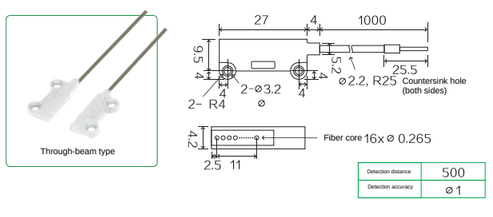
Detection distance	400
Detection accuracy	ø 5

EX-WTA10



Detection distance	400
Detection accuracy	ø 0.5

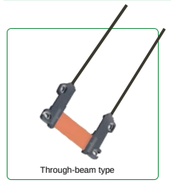
EX-LTE11

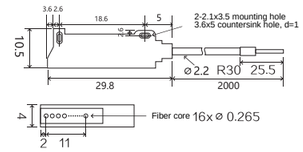


Detection distance	500
Detection accuracy	ø 1

Through-beam optical fiber

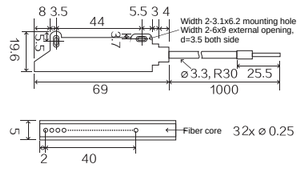
EX-LTE11-H





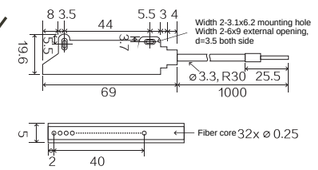
Detection distance	3000
Detection accuracy	ø 1

EX-LTE40



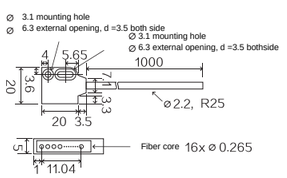
Detection distance	500
Detection accuracy	ø 1

EX-LTE40-H



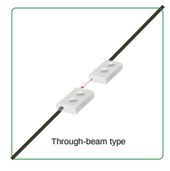
Detection distance	3000
Detection accuracy	ø 1

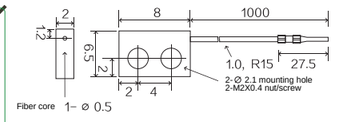
EX-LT12



Detection distance	300
Detection accuracy	ø 1

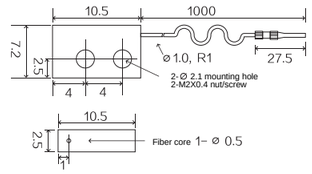
EX-FT44





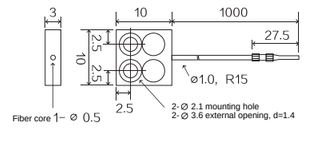
Detection distance	300
Detection accuracy	ø 0.05

EX-LT47



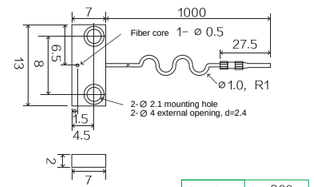
Detection distance	300
Detection accuracy	ø 0.05

EX-FT51



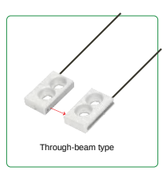
Detection distance	300
Detection accuracy	ø 0.05

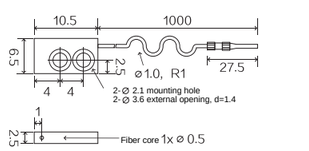
EX-LT53



Detection distance	300
Detection accuracy	ø 0.05

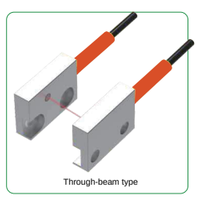
EX-LT57

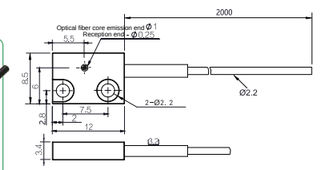




Detection distance	300
Detection accuracy	ø 0.05

EX-FT12





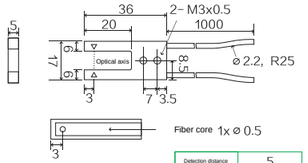
Min. bending radius: R15
Detection distance: 120mm
Min. detectable object size: φ 0.1mm

Detection distance	300
Detection accuracy	ø 0.05

Optical fiber element

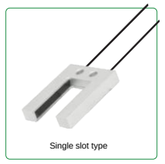
Slotted optical fiber

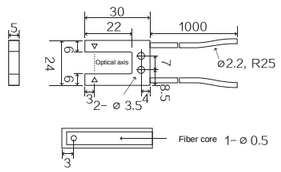
EX-UT0520



Detection distance	5
Detection accuracy	ø 0.2

EX-UT1220

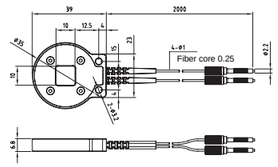




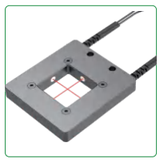
Detection distance	12
Detection accuracy	ø 0.2

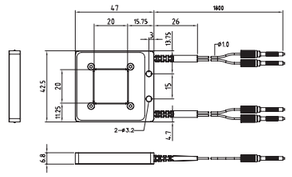
Cross-aligned optical fiber

EX-S4010



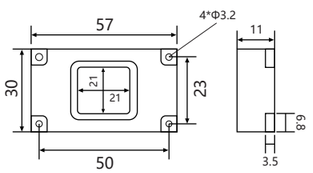
EX-Q4520



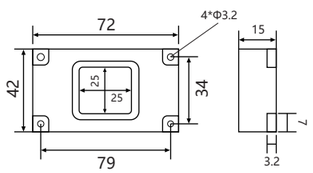


Window optical fiber

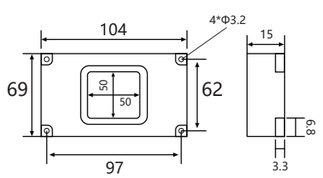
EX-C2121



EX-C2525

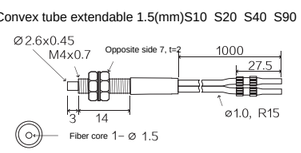


EX-C5050



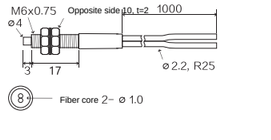
High temperature optical fiber Max. temperature 350°C

EX-D41HT



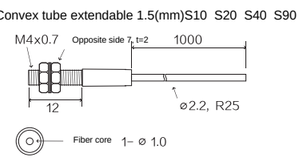
Detection distance	50
Detection accuracy	ø 0.05

EX-D61HT



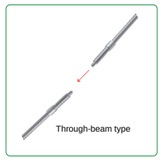
Detection distance	50
Detection accuracy	ø 0.05

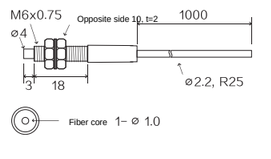
EX-T41HT



Detection distance	300
Detection accuracy	ø 0.05

EX-T61HT

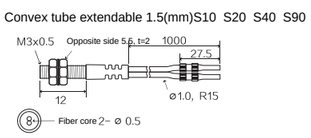




Detection distance	300
Detection accuracy	ø 0.05

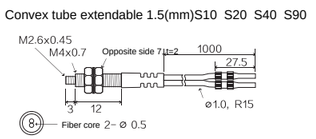
High-flexibility optical fiber

EX-D31GR



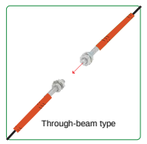
Detection distance	50
Detection accuracy	ø 0.05

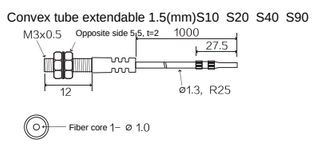
EX-D41GR



Detection distance	50
Detection accuracy	ø 0.05

EX-T31GR

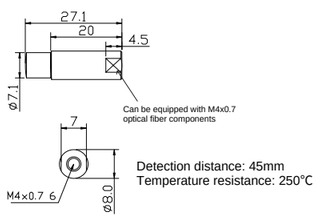




Detection distance	300
Detection accuracy	ø 0.05

High temperature lens

EX-D4RHT



EX-T4SHT