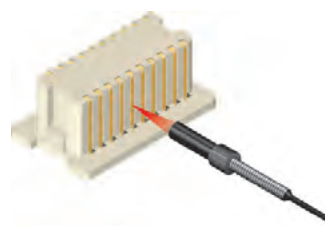


# Small Spot

■ Sensing of minute objects can be performed by combining the fiber and spot lens. The spot diameter can also be changed.



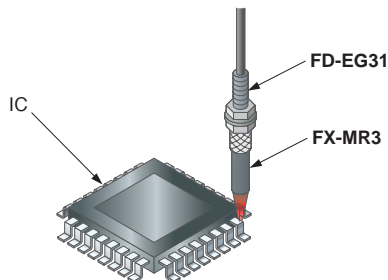
## Applications

### Packing detection

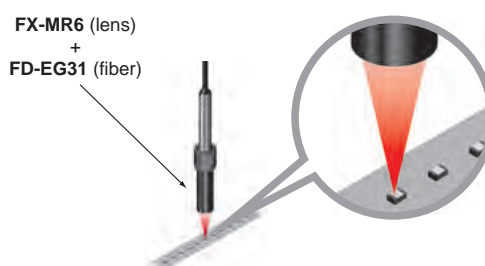


Because it's a side-view type, it can be mounted even in narrow spaces.

### Number of IC pins checking



### Discrimination of 0603 chip direction



Three optional lenses for reflective type fiber are available. Perfect for chip component detection applications.

## FX-MR7 / MR8 / MR9

### Finest spot lens FX-MR7

About 3 times more light received (compared to previous models)

Since there is a large difference in the amount of light received in applications such as direction detection, it is easy to set a threshold that will allow stable detection. Additionally, these products offer an S/N ratio that is 1.3 times better than previous models.



### Parallel light lens FX-MR9

### Long-range parallel light

Depending on the fiber with which it is used, this lens creates parallel light with a spot diameter of approximately  $\varnothing 4 \text{ mm } \varnothing 0.157 \text{ in}$  at a sensing range of 0 to 30 mm 0 to 1.181 in.



### Typical FX-501 erformance (STD mode)

	White	Black
<b>FX-MR7 + FD-R33EG</b>	3,200 digits	1,030 digits
<b>FX-MR6 (compared to previous models) + FD-R33EG</b>	1,000 digits	435 digits

### All models

### Tightening torque 5 times (compared to previous models)

The standard aluminum body has been changed to stainless steel (SUS 303) to reduce the likelihood of damage from over-tightening.

### Zoom lens FX-MR8

### Variable spot diameter

Spot diameters ranging from  $\varnothing 0.4$  to  $\varnothing 3.5 \text{ mm } \varnothing 0.016$  to  $\varnothing 0.138 \text{ in}$  can be achieved by combining the lens with a variety of fibers.



### Standard lens outer diameter of $\varnothing 4.3 \text{ mm } (\varnothing 0.169 \text{ in})$

Use of the same mounting hardware across the product line means less inventory and lower costs.

**LIST OF FIBERS**

**High precision fiber & spot lens**

Designation	Shape of head (mm) Dimensions	Spot diameter (mm in) (Note)	Distance to focal point (mm in) (Note)	Lens		Applicable fibers																						
				Model No.	Ambient temp.	Model No.	Fiber cable length : Free-cut	Bending radius (mm)	Protection	Ambient temp.	Dimensions																	
Finest spot lens		ø0.1 ø0.004	7±0.5 0.276±0.020	FX-MR6	-20 to +60 °C	FD-EG31	500 mm	R4	IP40	-20 to +60 °C	P.59																	
		ø0.2 ø0.008				FD-EG30						-40 to +70 °C	P.58															
		ø0.4 ø0.016				Tough FD-42G	2 m	R2 Bending durability			-55 to +80 °C			P.57														
						FD-42GW		R1																				
						Tough FD-32G		R2 Bending durability																				
						FD-32GX		R2																				
	Pinpoint spot lens					ø0.5 ø0.020	6±1 0.236±0.039	FX-MR1			-40 to +70 °C		Tough FD-42G	2 m	R2 Bending durability	-55 to +80 °C	P.57											
													FD-42GW		R1													
													Zoom lens					ø0.7 to ø2.0 ø0.028 to ø0.079	Approx. 18.5 to 43 Approx. 0.728 to 1.693	FX-MR2	-40 to +70 °C	Tough FD-42G	2 m	R2 Bending durability	-55 to +80 °C	P.57		
																						FD-42GW		R1				
Zoom lens (Side-view type)				ø0.5 to ø3.0 ø0.020 to ø0.118	Approx. 13 to 30 Approx. 0.512 to 1.181				FX-MR5	-40 to +70 °C												Tough FD-42G		2 m			R2 Bending durability	-55 to +80 °C
												FD-42GW										R1						

**Square head type M3, Reflective type fiber & spot lens**

Type	Spot diameter (mm in) (Note)	Distance to focal point (mm in) (Note)	Lens		Fiber		
			Shape (mm in) Dimensions	Model No.	Shape	Emitting fiber core (mm in)	Model No.
Finest spot lens	ø0.1 ø0.004 approx.	7 ± 0.5 0.276 ± 0.020		FX-MR7		ø0.125 ø0.005	FD-R33EG
	ø0.15 ø0.006 approx.					ø0.125 ø0.005	FD-EG31
	ø0.2 ø0.008 approx.					ø0.175 ø0.007	FD-R34EG
						ø0.25 ø0.010	FD-R32EG
	ø0.4 ø0.016 approx.					ø0.25 ø0.010	FD-EG30
						ø0.5 ø0.020	FD-R31G
						ø0.5 ø0.020	FD-32G
						ø0.5 ø0.020	FD-32GX
						ø0.5 ø0.020	FD-42G
						ø0.5 ø0.020	FD-42GW
Zoom lens	ø0.4 to ø2.0 ø0.016 to ø0.079 approx.	10 to 30 0.394 to 1.181		FX-MR8		ø0.125 ø0.005	FD-R33EG, FD-EG31
	ø0.4 to ø2.2 ø0.016 to ø0.087 approx.					ø0.175 ø0.007	FD-R34EG
	ø0.5 to ø2.5 ø0.020 to ø0.098 approx.					ø0.25 ø0.010	FD-R32EG, FD-EG30
	ø0.8 to ø3.5 ø0.031 to ø0.138 approx.					ø0.5 ø0.020	FD-R31G, FD-32G, FD-32GX, FD-42G, FD-42GW
Parallel light lens	ø4.0 ø0.157 approx.	0 to 30 0 to 1.181		FX-MR9		ø0.125 ø0.005	FD-R33EG, FD-EG31
						ø0.175 ø0.007	FD-R34EG
						ø0.25 ø0.010	FD-R32EG, FD-EG30
						ø0.5 ø0.020	FD-R31G, FD-32G, FD-32GX, FD-42G, FD-42GW

Note: Spot diameter, distance to focal point and sensing range are specified for FX-500/FX-100 series.

**Tough** : Refers to a fiber which possesses both unbreakable (bending radius: R10 mm R0.394 in, reciprocating bending: 180°) and more flexible (bending radius: R4 mm R0.157 in or less) features.

New product introduction

Tough Fiber

Fiber Selection Guide

Model

Choose by shape/application

How to read Model No.

Earlier models comparison table

Fibers

Super Quality

Threaded Type

Square Head Type

Cylindrical Type

Sleeve

Flat Type

Small Spot

Narrow Beam

Wide Beam

Convergent Reflective Type

Retroreflective Type

Chemical / Oil-resistant

Heat-resistant

Vacuum-resistant

Liquid Leak / Liquid Detection

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Semi-custom fibers

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FX-100 series

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