Panasonic

Square Head Fiber

FT-R□ / FD-R□

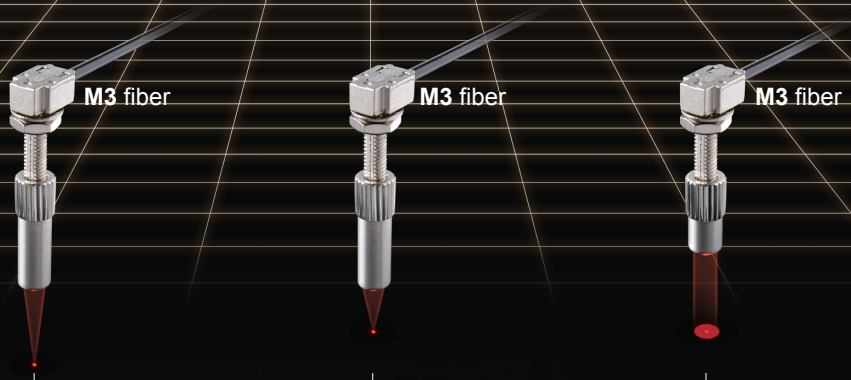
NEW

Reflective Spot Lens

FX-MR7 / FX-MR8 / FX-MR9

Delivering super-high-precision detection with 3 times more light received and 1.3 times the S/N ratio! (compared to previous models)

Finest spot lens **FX-MR7**



FX-MR8
ø0.4 to ø3.5 mm
ø0.016 to ø0.138 in
Variable spot light

FX-MR7
ø0.1 mm
ø0.004 in
Finest spot light

FX-MR9
ø4 mm
ø0.157 in
Parallel light

The product line includes three lenses for chip component detection applications: a finest spot lens, a zoom lens, and a parallel light lens.

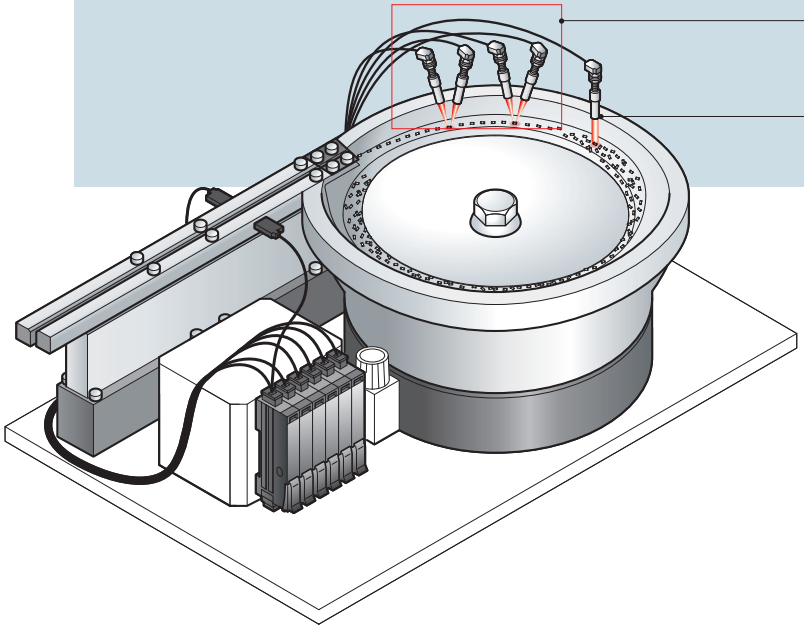
Featuring an extensive selection of spot diameters and the ability to save space when used with square head fiber

Products accommodate a variety of target objects with different shapes, colors, and surface characteristics.

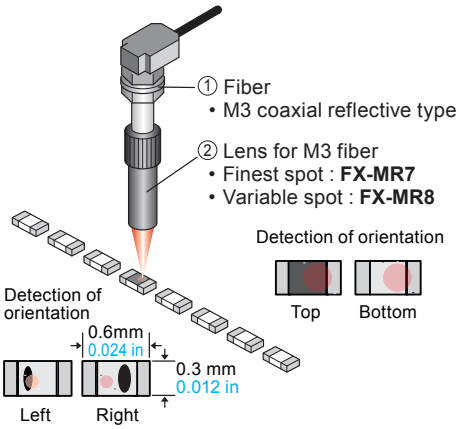
<Spot diameter>

Combination with **FX-MR7**

ø0.1 mm ø0.004 in : **FD-R33EG**
ø0.15 mm ø0.006 in : **FD-R34EG**
ø0.2 mm ø0.008 in : **FD-R32EG**
ø0.4 mm ø0.016 in : **FD-R31G**

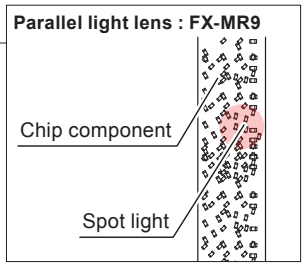


Application: Detection of chip component orientation and direction



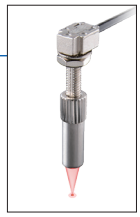
Application: Verification of chip component supply quantity

As seen from above



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.

Typical FX-501 performance (STD mode)

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

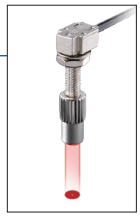
Zoom lens FX-MR8

Variable spot diameter

Spot diameters ranging from ø0.4 to ø3.5 mm ø0.016 to ø0.138 in can be achieved by combining the lens with a variety of fibers.

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 ø4 mm ø0.157 in at a sensing range of 0 to 30 mm 0 to 1.181 in.

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.

All models

Standard lens outer diameter of ø4.3 mm (ø0.169 in)

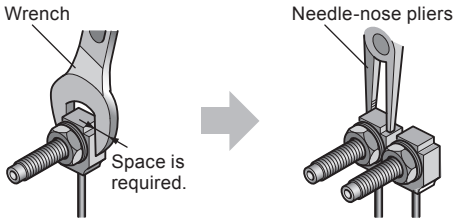
Use of the same mounting hardware across the product line means less inventory and lower costs.

New square head fiber models for the Tough Series (break-free and bendable*)

* These fibers provide a combination of break-free (10 million times bending durability [typical value, when bent back and forth at 180° with a bending radius of R10 mm R0.394 in]) and bendable (bending radius of R2 to R4 mm R0.079 to R0.157 in) characteristics.

Compact, space-saving

Fiber can be installed at a minimum pitch of M3: 6.5 mm 0.256 in or M4: 8.5 mm 0.335 in using needle-nose pliers.



Compact installation

Square head fiber heads can be installed cleanly on the side of a conveyor belt. The design makes it less likely for tools and other objects to catch on the fiber cable during installation.

FT-R□ / FD-R□

Standard fiber

Extensive selection of product variants

We offer an extensive selection of variants representing a total of seven models. The **FD-□EG** features higher coaxial precision for increased precision when used with lenses.

Thru-beam type: 2 models

M4 : FT-R43
M3 : FT-R31

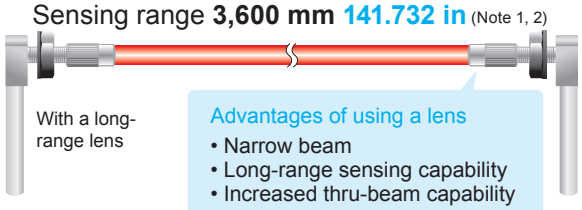
Reflective type: 5 models

M4 : FD-R41
M3 : FD-R31G (Fiber core : Ø0.5 mm Ø0.020 in)
FD-R32EG (Fiber core : Ø0.25 mm Ø0.010 in)
FD-R34EG (Fiber core : Ø0.175 mm Ø0.007 in)
FD-R33EG (Fiber core : Ø0.125 mm Ø0.005 in)

Use for long-range sensing or spot detection by attaching a lens

Thru-beam type fibers

Sensing range **3,600 mm 141.732 in** (Note 1, 2)



Advantages of using a lens
- Narrow beam
- Long-range sensing capability
- Increased thru-beam capability

Lens (For thru-beam type fiber)

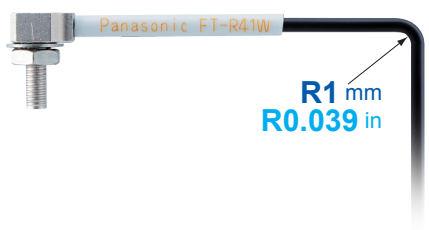
Sensing range (mm in) (Note 1) [Lens on both sides]	Beam axis dia. (mm in)	Lens		Applicable fiber
		Designation	Model No.	Model No.
3,600 141.732 (Note 2)	ø3.6 ø0.142	Expansion lens	**FX-LE1**	**FT-R43**
	ø9.8 ø0.386	Super-expansion lens	**FX-LE2**	
950 37.402	ø2.8 ø0.110	Side-view lens	**FX-SV1**	

Notes: 1) The sensing ranges are the values when used in combination with an **FX-500** series amplifier (in STD mode).
2) The fiber cable length practically limits the sensing range.

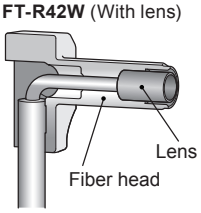
Introducing square R1 mm (R0.039 in) (sharp bending) fiber

We now offer a sharp bending fiber featuring a low level of light fluctuations, even when bent at R1 mm R0.039 in. It is also available with a lens capable of long-range sensing.

FT-R41W FT-R42W



FT-R42W (With lens)



- Resistant to dust and particulate matter.
- Tip dimensions can be shortened.

Semi-custom fibers that flexibly meet diverse needs

Custom-ordered products are available with different fiber lengths and sleeve lengths in order to respond quickly to different requirements. Contact your nearest our office for details on model numbers, standard prices and delivery periods.

ORDER GUIDE

Square head fiber

Type			Shape of fiber head (mm in)	Model No.	Bending radius	Fiber cable length ✂: Free-cut	Sensing range (mm in) (Note 1, 2) FX-500 series	U-LG LONG FAST H-SP	FX-101 (Upper value) FX-102 (Lower value)	Beam axis (Fiber core) dia. (mm in)	Protection	Ambient temp.
Square head	Thru-beam	M3	W5.5 × H8 × D16 W0.217 × H0.315 × D0.630	Tough NEW FT-R31	R2 mm R0.079 in Bending durability	2 m 6.562 ft	STD 270 10.630 HYPR 1,000 39.370	580 22.835 440 17.323 160 6.299 55 2.165	100 3.937 340 13.386	ø0.5 ø0.020	IP67	−55 to +80 °C −67 to +176 °F
		M4	Lens mountable W7 × H9 × D13.5 W0.276 × H0.354 × D0.531	Tough NEW FT-R43	R4 mm R0.157 in Bending durability		STD 720 28.346 HYPR 3,000 118.110	1,600 62.992 1,100 43.307 430 16.929 130 5.118	210 8.268 640 25.197	ø1 ø0.039		
		M4	W7 × H9 × D13.9 W0.276 × H0.354 × D0.547	FT-R41W	R1 mm R0.039 in		STD 800 31.496 HYPR 3,200 125.984	1,800 70.866 1,400 55.118 460 18.110 150 5.906	250 9.843 710 27.953		IP40	−40 to +60 °C −40 to +140 °F
		M4	With expansion lens W7 × H9 × D14.4 W0.276 × H0.354 × D0.566	FT-R42W			STD 2,200 86.614 HYPR (Note 3) 3,600 141.732	3,600 141.732 (Note 3) 3,500 137.795 1,300 51.181 460 18.110	510 20.079 2,000 78.740	ø2.2 ø0.087		
	Reflective	M3	Coaxial, lens mountable M3 W5.5 × H8 × D16 W0.217 × H0.315 × D0.630	Tough NEW FD-R31G	R2 mm R0.079 in Bending durability	500 mm 1.640 ft	STD 170 6.693 HYPR 530 20.866	310 12.205 260 10.236 85 3.346 27 1.063	45 1.772 150 5.906	Emitter ø0.5 ø0.020	IP40	−55 to +80 °C −67 to +176 °F
			Coaxial, lens mountable M3 W5.5 × H8 × D16 W0.217 × H0.315 × D0.630	NEW FD-R32EG	R4 mm R0.157 in		STD 45 1.772 HYPR 170 6.693	110 4.331 92 3.622 30 1.181 9 0.354	20 0.787 68 2.677	Emitter ø0.25 ø0.010		−40 to +70 °C −40 to +158 °F
			Coaxial, lens mountable M3 W5.5 × H8 × D16 W0.217 × H0.315 × D0.630	NEW FD-R34EG			STD 38 1.496 HYPR 130 5.118	90 3.543 70 2.756 23 0.906 7 0.276	17 0.669 60 2.362	Emitter ø0.175 ø0.007		−20 to +60 °C −4 to +140 °F
			Coaxial, lens mountable M3 W5.5 × H8 × D16 W0.217 × H0.315 × D0.630	NEW FD-R33EG			STD 19 0.748 HYPR 84 3.307	44 1.732 33 1.299 11 0.433 3 0.118	7 0.276 22 0.866	Emitter ø0.125 ø0.005		
		M4	M4 W7 × H9 × D13.5 W0.276 × H0.354 × D0.531	Tough NEW FD-R41	R2 mm R0.079 in Bending durability	2 m 6.562 ft	STD 210 8.268 HYPR 710 27.953	430 16.929 320 12.598 100 3.937 34 1.339	60 2.362 170 6.693	ø0.75 ø0.030	IP67	−55 to +80 °C −67 to +176 °F

Notes: 1) Note that the sensing range of the free-cut type fiber may be reduced by 20 % max. depending upon how the fiber is cut.
2) The sensing range of reflective type is specified for white non-glossy paper.

Tough : These fibers provide a combination of break-free (when bent back and forth at 180° with a bending radius of R10 mm R0.394 in) and bendable (bending radius of R4 mm R0.157 in or less) characteristics.

Lens (For M3 Fiber)

Type	Spot diameter (mm in)	Distance to focal point (mm in)	Lens Shape (mm in)	Lens Model No.	Fiber Shape	Fiber Emitting fiber core (mm in)	Fiber Model No.
Finest spot lens	ø0.1 ø0.004 approx.	7 ± 0.5 0.276 ± 0.020	15.3 0.209 ø5 ø0.197	FX-MR7		ø0.125 ø0.005	FD-R33EG
						ø0.125 ø0.005	FD-EG31
	ø0.15 ø0.006 approx.					ø0.175 ø0.007	FD-R34EG
	ø0.2 ø0.008 approx.					ø0.25 ø0.010	FD-R32EG
						ø0.25 ø0.010	FD-EG30
	ø0.4 ø0.016 approx.					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

Type	Spot diameter (mm in)	Sensing range (mm in)	Lens Shape (mm in)	Lens Model No.	Applicable fibers Emitting fiber core (mm in)	Applicable fibers Model No.
Zoom lens	ø0.4 to ø2.0 ø0.016 to ø0.079 approx.	10 to 30 0.394 to1.181	15 0.591 ø5 ø0.197	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	10 0.394 ø5 ø0.197	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

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