



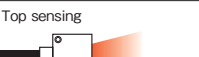

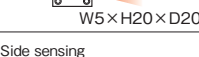
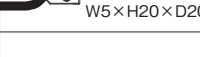

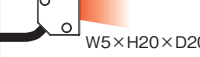


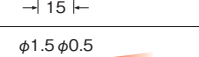
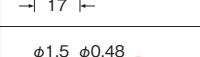
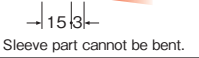
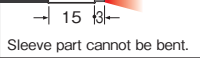
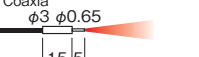
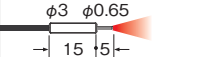
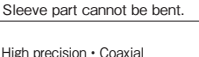
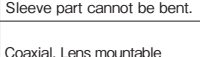
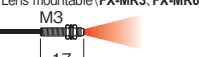
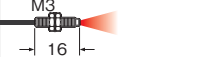



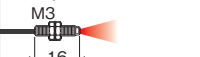
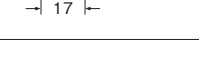

Fiber head 114 models

Stopping taking order date: 31 Mar., 2012

Advantages of switching to recommended replacements

- The quality of many models has been improved by shortening their bending radii and achieving better bending performance.
- The number of part numbers has been reduced, letting you reduce the part numbers to keep track of and service parts to keep on hand.
- We have reduced our environmental impact further by making fiber end bracket out of stainless steel and plastic, which contain no RoHS substances.

Subjected models

| Type | Discontinued models | | | | | Recommended replacements | Main points of difference from discontinued models | |
|-----------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|----------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Model No. | Shape of fiber head (mm) | Bending radius (mm) | Bending durability | Sensing range FX-500 STD (mm in) | | | |
| Reflective type | FD-A15 |  W7×H15×D30 | R25 | — | 200 7.874 | Tough FD-A16 |  W7×H15×D30 | |
| | FD-AFM2 |  Top sensing W5×H20×D20 | R25 | — | 280 11.024 | Tough FD-AL11 |  W5×H20×D20 | • Cable lead out orientation changed • Metal case material (brass) ⇒ Changed to plastic (PPS) |
| | FD-AFM2E |  Side sensing W5×H20×D20 | R25 | — | 280 11.024 | Tough FD-AL11 |  W5×H20×D20 | • Cable lead out orientation changed • Metal casing material (brass) ⇒ Changed to plastic (PPS) |
| | FD-B8 |  M6 15 | R25 | — | 490 19.291 | FD-62 |  M6 17 | • End bracket total length for the M6 part only: 15 mm ⇒ Changed to 17 mm (M6 part/15 mm + ø4.5 area/2 mm) |
| | FD-E12 |  φ1.5 φ0.5 Sleeve part cannot be bent. | R10 | — | 12 0.472 | FD-E13 |  φ1.5 φ0.48 Sleeve part cannot be bent. | • Split amplifier insertion section configuration ⇒ Changed to integrated light emitting/receiving configuration |
| | FD-E22 |  Coaxial φ3 φ0.65 Sleeve part cannot be bent. | R25 | — | 55 2.165 | FD-E23 |  φ3 φ0.65 Sleeve part cannot be bent. | • Split amplifier insertion section configuration ⇒ Changed to integrated light emitting/receiving configuration |
| | FD-EG1 |  High precision • Coaxial Lens mountable (FX-MR3, FX-MR6) M3 17 | R25 | — | 40 1.575 | FD-EG30 |  Coaxial, Lens mountable M3 16 | • Split amplifier insertion section configuration ⇒ Changed to integrated light emitting / receiving configuration • End bracket total length 17 mm ⇒ Changed to 16 mm |
| | FD-EG2 |  High precision • Coaxial Lens mountable (FX-MR3, FX-MR6) Light emitting fiber element φ0.125 M3 17 | R10 | — | 24 0.945 | FD-EG31 |  Coaxial, Lens mountable M3 16 | • Split amplifier insertion section configuration ⇒ Changed to integrated light emitting/receiving configuration • End bracket total length 17 mm ⇒ Changed to 16 mm • Protective tube outside diameter ø1.6 ⇒ Changed to ø1.2 |
| | FD-EG3 |  High precision • Coaxial Lens mountable (FX-MR3, FX-MR6) Light emitting fiber element φ0.125 M3 17 | R10 | — | 20 0.787 | FD-EG31 |  Coaxial, Lens mountable M3 16 | • Split amplifier insertion section configuration ⇒ Changed to integrated light emitting/receiving configuration • End bracket total length 17 mm ⇒ Changed to 16 mm • Protective tube outside diameter ø1.6 ⇒ Changed to ø1.2 |
| | FD-EN500S1 |  M3 φ0.5 Sleeve part cannot be bent. | R25 | — | — | FD-EG30S |  Sleeve 15 mm M3 φ0.8 Sleeve part cannot be bent. | • Split amplifier insertion section configuration ⇒ Changed to integrated light emitting/receiving configuration • Sleeve size ø0.5 ⇒ Changed to ø0.8 |
| | FD-ENM1S1 |  Coaxial M3 φ0.8 Sleeve part cannot be bent. | R25 | — | 50 1.969 | FD-EG30S |  Sleeve 15 mm M3 φ0.8 Sleeve part cannot be bent. | • Split amplifier insertion section configuration ⇒ Changed to integrated light emitting/receiving configuration |
| | FD-F705 |  SEMI S2 compliant W20×H30×D10 (Protective tube R20) | R4 | ○ | Liquid leak detection | Tough FD-F71 |  SEMI S2 compliant W20×H30×D10 (Protective tube R20) | Liquid leak detection |
| | FD-FA90 |  Mountable on pipe • Array fiber W6.5×H28.3×D17 | R10 | — | Liquid detection | Tough FD-FA93 |  Array fiber W6.5×H28.3×D17 | Liquid detection |

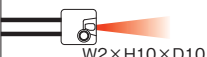

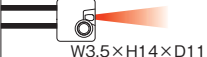

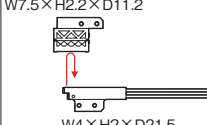
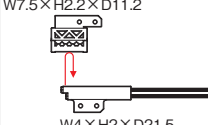
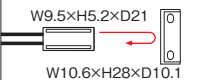
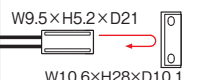
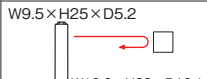
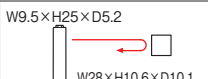
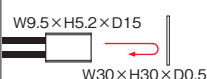
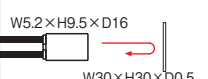
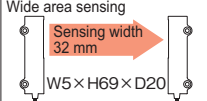
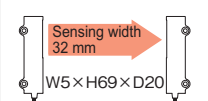
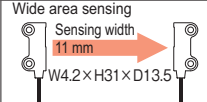
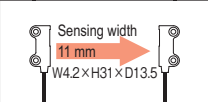
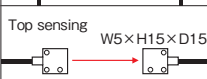
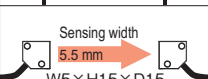
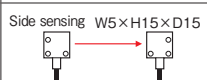
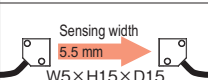

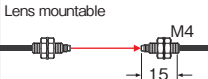
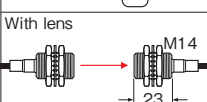
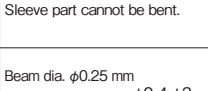
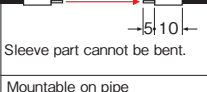
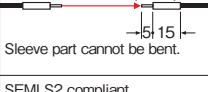
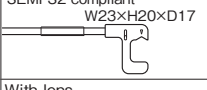
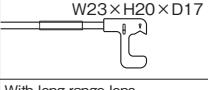
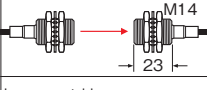
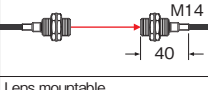
| Type | Discontinued models | | | | |
|-----------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|----------------------------------|
| | Model No. | Shape of fiber head (mm) | Bending radius (mm) | Bending durability | Sensing range FX-500 STD (mm in) |
| Reflective type | FD-FM2 | Coaxial M6 20 | R25 | — | 420 16.535 |
| | FD-FM2S | Sleeve 90 mm M6 20 φ2.5 | R25 (Sleeve R10) | — | 380 14.961 |
| | FD-FM2S4 | Sleeve 40 mm M6 20 φ2.5 | R25 (Sleeve R10) | — | 380 14.961 |
| | FD-G4 | Minute objects can be detected due to the small spot beam. Coaxial · Lens mountable (FX-MR1/MR2/MR3/MR5/MR6) M4 25 | R25 | — | 140 5.512 |
| | FD-G6 | Lens mountable (FX-MR3, FX-MR6) Coaxial M3 17 | R25 | — | 140 5.512 |
| | FD-G6X | Metal-jacketed Lens mountable (FX-MR3, FX-MR6) Coaxial M3 18 | R25 | — | 170 6.693 |
| | FD-L4 | W6×H18×D14 | R25 | — | 15.5 0.610 |
| | FD-L41 | Glass substrate detection W24×H21×D4 | R10 | — | 1.5 to 16 0.059 to 0.630 |
| | FD-L43 | Glass substrate detection · Alignment W17×H29×D3.8 | R4 | — | 0 to 24 0 to 0.945 |
| | FD-L44 | Glass substrate detection · Seating confirmation W12×H19×D3 | R10 | — | 0 to 9.5 0 to 0.374 |
| | FD-L44S | Glass substrate detection · Seating confirmation W12×H19×D3 | R10 | — | 0 to 5 0 to 0.197 |
| | FD-L45 | Glass substrate detection · Alignment W20×H29×D3.8 | R4 | — | 0 to 40 0 to 1.575 |
| | FD-L45A | Glass substrate detection · Alignment W23.5×H29×D4.5 | R25 | — | 4 to 44 0.157 to 1.732 |
| | FD-L46 | Glass substrate detection · Mapping W25×H7.3×D30 | R25 | — | 1 to 56 0.039 to 2.205 |
| | FD-L47 | Glass substrate detection · Seating confirmation W18×H29×D3.8 | R4 | — | 0 to 29 0 to 1.142 |
| | FD-NFM2 | M4 17 | R25 | — | 120 4.724 |
| | FD-NFM2S | Sleeve 90 mm M4 12 φ1.48 | R25 (Sleeve R10) | — | 120 4.724 |

| Recommended replacements | | | | | | Main points of difference from discontinued models |
|--------------------------|------------------------------------------------------------|---------------------|--------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Model No. | Shape of fiber head (mm) | Bending radius (mm) | Bending durability | Sensing range FX-500 STD (mm in) | | |
| Tough FD-61 | M6 17 | R4 | ○ | 450 17.717 | <ul style="list-style-type: none"> End bracket total length of 20 mm for the (M6 part/15 mm + ø3.5 area/5 mm) ⇒ Changed to 17 mm (M6 part/15 mm + ø4.5 area/2 mm) Coaxial cable used for wiring ⇒ Changed to parallel type | |
| Tough FD-61G | Coaxial M6 17 | R4 | ○ | 420 16.535 | | |
| Tough FD-61S | Sleeve 40 mm M6 20 φ2.5 | R4 (Sleeve R10) | ○ | 420 16.535 | <ul style="list-style-type: none"> The sleeve length 90 mm type supports semi-custom products. | |
| Tough FD-61S | Sleeve 40 mm M6 20 φ2.5 | R4 (Sleeve R10) | ○ | 420 16.535 | | |
| Tough FD-42G | Coaxial · Lens mountable M4 25 | R2 | ○ | 200 7.874 | | |
| Tough FD-32G | Coaxial · Lens mountable M3 17 | R2 | ○ | 200 7.874 | | |
| Tough FD-32GX | Coaxial · Lens mountable Stainless-jacketed M3 18 | R2 | — | 200 7.874 | <ul style="list-style-type: none"> Stainless steel mesh jacket covering the stainless steel spiral tube used as a protective cover for the fiber ⇒ Changed to plastic (polyolefin) | |
| Tough FD-L20H | W6×H18×D14 | R2 | ○ | 23 0.906 | | |
| Tough FD-L21 | W24×H21×D4 | R2 | ○ | 1.5 to 16 0.059 to 0.630 | | |
| Tough FD-L22A | Alignment W17×H29×D3.8 | R2 | ○ | 0 to 24 0 to 0.945 | | |
| Tough FD-L11 | Seating confirmation W12×H19×D3 | R4 | ○ | 0 to 9.5 0 to 0.374 | | |
| Tough FD-L10 | Seating confirmation W12×H19×D3 | R4 | ○ | 0 to 5 0 to 0.197 | | |
| Tough FD-L30A | Alignment W20×H29×D3.8 | R4 | ○ | 0 to 43 0 to 1.693 | | |
| Tough FD-L31A | Alignment W23.5×H29×D4.5 | R4 | ○ | 4 to 33 0.157 to 1.299 | <ul style="list-style-type: none"> Previous no flexing distance specifications ⇒ Specification wording changed to state flexing ±2 degrees (Reference: Discontinued model ±2 degrees specification is 10 mm to 32 mm) | |
| Tough FD-L32H | Mapping W25×H7.3×D30 | R4 | ○ | 0 to 56 0 to 2.205 | | |
| Tough FD-L23 | Seating confirmation W18×H29×D3.8 | R2 | ○ | 0 to 29 0 to 1.142 | | |
| Tough FD-41 | M4 14 | R2 | ○ | 125 4.921 | <ul style="list-style-type: none"> End bracket total length of 17 mm for the (M4 part/12 mm + ø2.5 area/5 mm) ⇒ Changed to 14 mm (M4 part/12 mm + ø2.5 area/2 mm) | |
| Tough FD-41S | Sleeve 40 mm M4 12 φ1.48 | R2 (Sleeve R10) | ○ | 125 4.921 | | |

| Type | Discontinued models | | | | | Recommended replacements | | | | | Main points of difference from discontinued models |
|-----------------|---------------------|--------------------------|---------------------|--------------------|----------------------------------|--------------------------|--------------------------|---------------------|--------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Model No. | Shape of fiber head (mm) | Bending radius (mm) | Bending durability | Sensing range FX-500 STD (mm/in) | Model No. | Shape of fiber head (mm) | Bending radius (mm) | Bending durability | Sensing range FX-500 STD (mm/in) | |
| Reflective type | FD-NFM2S4 | Sleeve 40 mm | R25 (Sleeve R10) | — | 120 4.724 | Tough FD-41S | Sleeve 40 mm | R2 (Sleeve R10) | ○ | 125 4.921 | |
| | FD-P2 | | R4 | ○ | 80 3.150 | Tough FD-S21 | | R2 | ○ | 80 3.150 | <ul style="list-style-type: none"> Split amplifier insertion section configuration ⇒ Changed to integrated light emitting/receiving configuration End bracket total length 15 mm ⇒ Changed to 10 mm PVC outer covering material for fiber ⇒ Changed to PE |
| | FD-P40 | | R4 | ○ | 45 1.772 | Tough FD-31 | | R2 | ○ | 125 4.921 | <ul style="list-style-type: none"> End bracket shape is 12 mm for the M3 part only ⇒ Changed to a total length of 12 mm (M3 part/10 mm + ø2 area/2 mm) PVC outer covering material for fiber ⇒ Changed to PE |
| | FD-P50 | | R4 | ○ | 120 4.724 | Tough FD-S32 | | R4 | ○ | 420 16.535 | <ul style="list-style-type: none"> PVC outer covering material for fiber ⇒ Changed to PE |
| | FD-P60 | | R4 | ○ | 120 4.724 | Tough FD-41 | | R2 | ○ | 125 4.921 | <ul style="list-style-type: none"> End bracket total length of 15 mm for the (M4 part/12 mm + ø3 area/3 mm) ⇒ Changed to 14 mm (M4 part/12 mm + ø2.5 area/2 mm) PVC outer covering material for fiber ⇒ Changed to PE |
| | FD-P80 | | R4 | ○ | 280 11.024 | Tough FD-61 | | R4 | ○ | 450 17.717 | <ul style="list-style-type: none"> End bracket total length of 15 mm for the M6 part only ⇒ Changed to 17 mm (M6 part/15 mm + ø4.5 area/2 mm) PVC outer covering material for fiber ⇒ Changed to PE |
| | FD-P81X | Metal-jacketed | R10 | — | 270 10.630 | FD-64X | Stainless-jacketed | R4 | — | 280 11.024 | <ul style="list-style-type: none"> End bracket total length of 19 mm for the (M6 part/15 mm + crimped area/4 mm) ⇒ Changed to 22 mm (ø4.5 area/2 mm + M6 part/15 mm + crimped area/5 mm) Split amplifier insertion section configuration ⇒ Changed to integrated light emitting/receiving configuration Stainless steel mesh jacket covering the stainless steel spiral tube used as a protective cover for the fiber ⇒ Changed to plastic (polyolefin) |
| | FD-R80 | | R25 | — | 220 8.661 | Tough FD-R60 | | R4 | ○ | 290 11.417 | |
| | FD-S80 | | R25 | — | 380 14.961 | Tough FD-S32 | | R4 | ○ | 420 16.535 | |
| | FD-SFM2SV2 | | R25 | — | 120 4.724 | Tough FD-V50 | | R4 | ○ | 120 4.724 | <ul style="list-style-type: none"> From sleeve end to optical axis center position is 0.8 mm ⇒ Changed to 2.3 mm A D-shaped surface that makes it easy to align with the optical axis has been added |
| | FD-SNFM2 | | R25 | — | 120 4.724 | Tough FD-S31 | | R2 | ○ | 125 4.921 | <ul style="list-style-type: none"> End bracket shape is 8 mm for the ø2.5 part only ⇒ Changed to 10 mm (ø3 part/ 8 mm + ø2 area/2 mm) |
| | FD-T40 | | R25 | — | 120 4.724 | Tough FD-31 | | R2 | ○ | 125 4.921 | <ul style="list-style-type: none"> End bracket shape is 12 mm for the M3 part only ⇒ Changed to a total length of 12 mm (M3 part/ 10 mm + ø2 area/2 mm) |
| | FD-T80 | | R25 | — | 380 14.961 | Tough FD-61 | | R4 | ○ | 450 17.717 | <ul style="list-style-type: none"> End bracket shape is 12 mm for the M4 part only ⇒ Changed to a total length of 17 mm (M6 part/15 mm + ø4.5 area/2 mm) Fiber cable outside diameter ø1.3 ⇒ Changed to ø2.2 |
| | FD-V41 | | R25 | — | 65 2.559 | Tough FD-V30 | | R2 | ○ | 65 2.559 | <ul style="list-style-type: none"> From sleeve end to optical axis center position is 0.7 mm ⇒ Changed to 2 mm End sleeve length of 10 mm ⇒ Changed to 15 mm |

| Type | Discontinued models | | | |
|-----------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------|
| | Model No. | Shape of fiber head (mm) | Bending radius (mm) | Bending durability |
| Reflective type | FD-W44 | Sleeve 40 mm M4 φ1.48 12 | R1 (Sleeve R10) | — |
| | FD-W8 | M6 15 | R1 | — |
| | FD-WG4 | Minute objects can be detected due to the small spot beam. Coaxial • Lens mountable (FX-MR1/MR2/MR3/MR5/MR6) M4 25 | R2 | — |
| | FD-WKZ1 | Long sensing range • Rectangular head W5.2×H9.5×D15 | R1 | — |
| | FD-WL41 | Glass substrate detection W24×H21×D4 | R1 | — |
| | FD-WL48 | W7.2×H7.5×D2 | R1 | — |
| | FD-WS8 | φ3 15 | R1 | — |
| | FD-WSG4 | Coaxial φ3 15 | R2 | — |
| | FD-WT4 | M3 12 | R1 | — |
| | FD-WT8 | M4 14 | R1 | — |
| | FD-WV42 | 15 15 φ3 φ2 Sleeve part cannot be bent. | R1 | — |
| | | | | |
| | | | | 80 3.150 |
| | | | | 250 9.843 |
| | | | | 150 5.906 |
| | | | | 20 to 490 0.787 to 19.291 |
| | | | | 2.5 to 14 0.098 to 0.551 |
| | | | | 7.5 0.295 |
| | | | | 250 9.843 |
| | | | | 150 5.906 |
| | | | | 80 3.150 |
| | | | | 250 9.843 |
| | | | | 16 0.630 |

| Recommended replacements | | | | | | Main points of difference from discontinued models |
|--------------------------|-------------------------------------------------------------------|---------------------|--------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Model No. | Shape of fiber head (mm) | Bending radius (mm) | Bending durability | Sensing range FX-500 STD (mm in) | | |
| Tough FD-41S | Sleeve 40 mm M4 φ1.48 12 | R2 (Sleeve R10) | ○ | 125 4.921 | | |
| FD-41SW | Sleeve 40 mm M4 φ1.48 12 | R1 (Sleeve R10) | — | 80 3.150 | | |
| Tough FD-61 | M6 17 | R4 | ○ | 450 17.717 | • End bracket total length is 15 mm for the M6 part only ⇒ Changed to 17 mm (M6 part/ 15 mm + ø4.5 area/2 mm) | |
| FD-61W | M6 17 | R1 | — | 270 10.630 | • End bracket total length is 15 mm for the M6 part only ⇒ Changed to 17 mm (M6 part/ 15 mm + ø4.5 area/2 mm) | |
| Tough FD-42G | Coaxial • Lens mountable M4 25 | R2 | ○ | 200 7.874 | | |
| FD-42GW | Coaxial • Lens mountable M4 25 | R1 | — | 150 5.906 | | |
| FD-Z50HW | W5.2×H9.5×D15 | R1 | — | 10 to 650 0.394 to 25.591 | • Stainless steel unit casing material ⇒ Changed to plastic (PC) | |
| Tough FD-L21 | W24×H21×D4 | R2 | ○ | 1.5 to 16 0.059 to 0.630 | | |
| FD-L21W | W24×H21×D4 | R1 | — | 3 to 14 0.118 to 0.551 | | |
| FD-L12W | W7.2×H7.5×D2 | R1 | — | 8 0.315 | | |
| Tough FD-S32 | φ3 15 | R4 | ○ | 420 16.535 | | |
| FD-S32W | φ3 15 | R1 | — | 270 10.630 | | |
| FD-S33GW | Coaxial φ3 15 | R1 | — | 150 5.906 | | |
| Tough FD-31 | M3 12 | R2 | ○ | 125 4.921 | • End bracket total length is 12 mm for the M3 part only ⇒ Changed to 12 mm (M3 part/ 10 mm + ø2 area/2 mm) | |
| FD-31W | M3 12 | R1 | — | 80 3.150 | • End bracket total length is 12 mm for the M3 part only ⇒ Changed to 12 mm (M3 part/ 10 mm + ø2 area/2 mm) | |
| Tough FD-41 | M4 14 | R2 | ○ | 125 4.921 | • End bracket total length is 12 mm for the M4 part only ⇒ Changed to 14 mm (M4 part/12 mm + ø3 area/2 mm) | |
| FD-41W | M4 14 | R1 | — | 270 10.630 | • End bracket total length is 12 mm for the M4 part only ⇒ Changed to 14 mm (M4 part/12 mm + ø3 area/2 mm) | |
| Tough FD-V30 | Small diameter 15 15 φ3 φ1.5 Sleeve part cannot be bent. | R2 | ○ | 65 2.559 | • From sleeve end to optical axis center position is 1 mm ⇒ Changed to 2 mm • End sleeve thickness of ø2 ⇒ Changed to ø1.5 • A D-shaped surface that makes it easy to align with the optical axis has been added | |
| FD-V30W | 15 15 φ3 φ1.5 Sleeve part cannot be bent. | R1 | — | 20 0.787 | • From sleeve end to optical axis center position is 1 mm ⇒ Changed to 2 mm • End sleeve thickness of ø2 ⇒ Changed to ø1.5 • A D-shaped surface that makes it easy to align with the optical axis has been added | |

| Type | Discontinued models | | | | | Recommended replacements | | | | | Main points of difference from discontinued models |
|----------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------|----------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Model No. | Shape of fiber head (mm) | Bending radius (mm) | Bending durability | Sensing range FX-500 STD (mm in) | Model No. | Shape of fiber head (mm) | Bending radius (mm) | Bending durability | Sensing range FX-500 STD (mm in) | |
| Reflective type | FD-WZ4HB | Fiber bending type  W2×H10×D10 | R1 | — | 2.5 to 65 0.098 to 2.559 | FD-Z20HBW | Fiber bending type  W2×H10×D10 | R1 | — | 2 to 85 0.079 to 3.346 | |
| | FD-WZ7HB | Fiber bending type  W3.5×H14×D11 | R1 | — | 1 to 150 0.039 to 5.906 | FD-Z40HBW | Fiber bending type  W3.5×H14×D11 | R1 | — | 260 10.236 | |
| Retroreflective type | FR-KV1 |  W7.5×H2.2×D11.2 W4×H2×D21.5 | R10 | — | 20 to 310 0.787 to 12.205 | Tough FR-KZ22E |  W7.5×H2.2×D11.2 W4×H2×D21.5 | R2 | ○ | 15 to 310 0.591 to 12.205 | • Unit side installation screw positions have been moved back 1 mm from the front edge |
| | FR-KZ21 |  W9.5×H5.2×D21 W10.6×H28×D10.1 | R10 | — | 20 to 200 0.787 to 7.874 | Tough FR-KZ50H |  W9.5×H5.2×D21 W10.6×H28×D10.1 | R2 | ○ | 20 to 300 0.787 to 11.811 | |
| | FR-KZ21E |  W9.5×H25×D5.2 W10.6×H28×D10.1 | R10 | — | 20 to 200 0.787 to 7.874 | Tough FR-KZ50E |  W9.5×H25×D5.2 W28×H10.6×D10.1 | R2 | ○ | 20 to 300 0.787 to 11.811 | |
| | FR-WKZ11 |  W9.5×H5.2×D15 W30×H30×D0.5 | R1 | — | 100 to 990 3.937 to 38.976 | FR-Z50HW |  W5.2×H9.5×D16 W30×H30×D0.5 | R1 | ○ | 100 to 990 3.937 to 38.976 | |
| Thru-beam type | FT-A30 | Wide area sensing Sensing width 32 mm  W5×H69×D20 | R10 | — | 3600 141.732 | Tough FT-A32 | Wide area sensing Sensing width 32 mm  W5×H69×D20 | R2 | ○ | 3600 141.732 | • Fiber cable outside diameter $\phi 2.2$ \Rightarrow Changed to $\phi 1.3$ • Optical cable diameter of 3 × 32 \Rightarrow Changed to 3.2 × 32 |
| | FT-A8 | Wide area sensing Sensing width 11 mm  W4.2×H31×D13.5 | R10 | — | 3600 141.732 | Tough FT-A11 | Wide area sensing Sensing width 11 mm  W4.2×H31×D13.5 | R2 | ○ | 3600 141.732 | • Fiber cable outside diameter $\phi 2.2$ \Rightarrow Changed to $\phi 1.3$ |
| | FT-AFM2 | Top sensing  W5×H15×D15 | R25 | — | 860 33.858 | Tough FT-AL05 | Top sensing Sensing width 5.5 mm  W5×H15×D15 | R2 | ○ | 860 33.858 | • Cable lead out orientation changed • Metal casing material (brass) \Rightarrow Changed to plastic (PPS) |
| | FT-AFM2E | Side sensing  W5×H15×D15 | R25 | — | 860 33.858 | Tough FT-AL05 | Side sensing Sensing width 5.5 mm  W5×H15×D15 | R2 | ○ | 860 33.858 | • Cable lead out direction changed • Metal casing material (brass) \Rightarrow Changed to plastic (PPS) |
| | FT-B8 | Lens mountable (FX-LE1/LE2/SV1)  M4 15 | R25 | — | 1250 49.213 | FT-43 | Lens mountable  M4 15 | R4 | ○ | 1400 55.118 | |
| | FT-E12 | Beam dia. $\phi 0.125$ mm $\phi 0.25$ $\phi 3$ Sleeve part cannot be bent. | R5 | — | — | Tough FT-E13 | Beam dia. $\phi 0.125$ mm $\phi 0.25$ $\phi 3$ Sleeve part cannot be bent. | R2 | ○ | 15 0.591 | • Fiber length 500 mm /set length type \Rightarrow Changed to fiber length 1 m/free cut type • Fiber cable outside diameter $\phi 1.2$ \Rightarrow Changed to $\phi 1$ • End bracket length of 10 mm \Rightarrow Changed to 15 mm |
| | FT-E22 | Beam dia. $\phi 0.25$ mm $\phi 0.4$ $\phi 3$ Sleeve part cannot be bent. | R5 | — | — | Tough FT-E23 | Beam dia. $\phi 0.25$ mm $\phi 0.4$ $\phi 3$ Sleeve part cannot be bent. | R2 | ○ | 75 2.953 | • Set length type \Rightarrow Changed to free cut type • Fiber cable outside diameter $\phi 1.2$ \Rightarrow Changed to $\phi 1$ • End bracket length of 10 mm \Rightarrow Changed to 15 mm |
| | FT-F902 | Mountable on pipe SEMI S2 compliant W23×H20×D17 (Protective tube R20) | R4 (Protective tube R20) | ○ | Liquid detection | Tough FT-F93 | SEMI S2 compliant W23×H20×D17 (Protective tube R20) | R2 (Protective tube R20) | ○ | Liquid detection | |
| | FT-FM10L | With lens  M14 23 | R25 | — | 19600 771.654 | Tough FT-140 | With long range lens  M14 40 | R4 | ○ | 19600 771.654 | |
| | FT-FM2 | Lens mountable (FX-LE1/LE2/SV1)  M4 15 | R25 | — | 1100 43.307 | Tough FT-42 | Lens mountable  M4 15 | R4 | ○ | 1130 44.488 | |
| | FT-FM2S | Sleeve 90 mm  M4 $\phi 1.48$ 12 | R25 (Sleeve R10) | — | 1100 43.307 | Tough FT-42S | Sleeve 40 mm  M4 $\phi 1.48$ 12 | R4 (Sleeve R10) | ○ | 1130 44.488 | • The sleeve length 90 mm type supports semi-custom products. |
| | FT-FM2S4 | Sleeve 40 mm  M4 $\phi 1.48$ 12 | R25 (Sleeve R10) | — | 1100 43.307 | Tough FT-42S | Sleeve 40 mm  M4 $\phi 1.48$ 12 | R4 (Sleeve R10) | ○ | 1130 44.488 | |

| Type | Discontinued models | | | | | Recommended replacements | | | | | |
|----------------|---------------------|-------------------------------------------------------|---------------------|--------------------|----------------------------------|--------------------------|-----------------------------------------|---------------------|--------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Model No. | Shape of fiber head (mm) | Bending radius (mm) | Bending durability | Sensing range FX-500 STD (mm in) | Model No. | Shape of fiber head (mm) | Bending radius (mm) | Bending durability | Sensing range FX-500 STD (mm in) | Main points of difference from discontinued models |
| Thru-beam type | FT-K8 | | R25 | — | 3600 141.732 | Tough FT-KS40 | | R2 | ○ | 3600 141.732 | • Fiber cable outside diameter $\phi 2.2$ \Rightarrow Changed to $\phi 1$ |
| | FT-KV1 | | R10 | — | 540 21.260 | Tough FT-KV26 | | R2 | ○ | 710 27.953 | |
| | FT-KV8 | Side-view type with small light dispersion | R25 | — | 3600 141.732 | Tough FT-KV40 | | R2 | ○ | 3600 141.732 | • Fiber cable outside diameter $\phi 2.2$ \Rightarrow Changed to $\phi 1$ • Metal end material (stainless steel) \Rightarrow Changed to plastic (LCP), set screw fastening specifications \Rightarrow Changed to MS-FD-3 fastener specifications |
| | FT-NFM2 | | R25 | — | 310 12.205 | Tough FT-31 | | R2 | ○ | 315 12.402 | • End bracket total length of 15 mm for the (M3 part/10 mm + $\phi 2$ area/5 mm) \Rightarrow Changed to 12 mm (M3 part/10 mm + $\phi 2$ area/2 mm) |
| | FT-NFM2S | Sleeve 90 mm | R25 (Sleeve R10) | — | 310 12.205 | Tough FT-31S | Sleeve 40 mm | R2 (Sleeve R10) | ○ | 315 12.402 | • The sleeve length 90 mm type supports semi-custom products. |
| | FT-NFM2S4 | Sleeve 40 mm | R25 (Sleeve R10) | — | 310 12.205 | Tough FT-31S | Sleeve 40 mm | R2 (Sleeve R10) | ○ | 315 12.402 | |
| | FT-P2 | | R4 | ○ | 330 12.992 | Tough FT-S21 | | R2 | ○ | 315 12.402 | • Fiber length 1 m/Set length type \Rightarrow Changed to fiber length 2 m/free cut type • Fiber exterior cover material of PVC \Rightarrow Changed to PE |
| | FT-P40 | | R4 | ○ | 160 6.299 | Tough FT-31 | | R2 | ○ | 315 12.402 | • End bracket total length of 10 mm for the M3 part \Rightarrow Changed to 12 mm (M3 part/10 mm + $\phi 2$ area/2 mm) • Fiber exterior cover material of PVC \Rightarrow Changed to PE |
| | FT-P60 | Lens mountable (FX-LE1/LE2/SV1) | R4 | ○ | 350 13.780 | Tough FT-42 | Lens mountable | R4 | ○ | 1130 44.488 | • Fiber exterior cover material of PVC \Rightarrow Changed to PE • Fiber cable outside diameter $\phi 1.25$ \Rightarrow Changed to $\phi 2.2$ |
| | FT-P80 | Lens mountable (FX-LE1/LE2/SV1) | R4 | ○ | 810 31.890 | Tough FT-42 | Lens mountable | R4 | ○ | 1130 44.488 | • Fiber exterior cover material of PVC \Rightarrow Changed to PE |
| | FT-P81X | Lens mountable (FX-LE1/LE2/SV1) Metal-jacketed | R10 | — | 880 34.646 | Tough FT-45X | Lens mountable • Stainless-jacketed | R4 | — | 1200 47.244 | • Stainless steel mesh jacket covering the stainless steel spiral tube used as a protective cover for the fiber \Rightarrow Changed to plastic (polyolefin) |
| | FT-PS1 | | R4 | ○ | 90 3.543 | Tough FT-S11 | | R2 | ○ | 90 3.543 | |
| | FT-R80 | Lens mountable (FX-LE1/LE2) | R25 | — | 780 30.709 | Tough FT-R40 | Lens mountable | R4 | ○ | 930 36.614 | • End bracket total length of 14 mm for the (M2.6 part/3 mm + M4 part/11 mm) \Rightarrow Changed to 15 mm (M2.6 part/3 mm + M4 part/12 mm) |
| | FT-SFM2 | | R25 | — | 1100 43.307 | Tough FT-S32 | Long sensing range • with lens | R10 | ○ | 3100 122.047 | • Optical cable diameter of $\phi 1$ \Rightarrow Changed to $\phi 2.2$ |
| | FT-SFM2L | Long sensing range • with lens | R25 | — | 2600 102.362 | Tough FT-S32 | Long sensing range • with lens | R10 | ○ | 3100 122.047 | |
| | FT-SFM2SV2 | Sleeve part cannot be bent. | R25 | — | 570 22.441 | Tough FT-V30 | Sleeve part cannot be bent. | R4 | ○ | 680 26.772 | • From sleeve end to optical axis center position is 0.8 \Rightarrow Changed to 1.3 mm • D-shaped surface that makes it easy to align with the optical axis has been added |
| | FT-SNFM2 | | R25 | — | 310 12.205 | Tough FT-S21 | | R2 | ○ | 315 12.402 | • End bracket total length of $\phi 1.5/8$ mm \Rightarrow Changed to 12 mm ($\phi 1$ area/2 mm + $\phi 1.5/8$ mm) |
| | FT-T80 | Lens mountable (FX-LE1/SV1) | R25 | — | 1100 43.307 | Tough FT-42 | Lens mountable | R4 | ○ | 1130 44.488 | • End bracket total length of 12.5 mm for the (M2.6 part/2.5 mm + M3 part/10 mm) \Rightarrow Changed to 15 mm (M2.6 part/3 mm + M4 part/12 mm) • Fiber cable outside diameter $\phi 1.3$ \Rightarrow Changed to $\phi 2.2$ |
| | FT-V10 | | R25 | — | 3500 137.795 | Tough FT-V40 | | R4 | ○ | 3500 137.795 | |

| Type | Discontinued models | | | |
|----------------|---------------------|--------------------------|---------------------|----------------------------------|
| | Model No. | Shape of fiber head (mm) | Bending radius (mm) | Bending durability |
| Thru-beam type | FT-V22 | | R25 | — |
| | FT-V41 | | R25 | — |
| | FT-W4 | | R1 | — |
| | FT-W8 | | R10 | — |
| | FT-WA30 | | R1 | — |
| | FT-WA8 | | R1 | — |
| | FT-WK8 | | R1 | — |
| | FT-WR80 | | R1 | — |
| | FT-WR80L | | R1 | — |
| | FT-WS3 | | R1 | — |
| | | | | Sensing range FX-500 STD (mm in) |
| | | | | 300 11.811 |
| | | | | 200 7.874 |
| | | | | 250 9.843 |
| | | | | 790 31.102 |
| | | | | 3600 141.732 |
| | | | | 3600 141.732 |
| | | | | 3600 141.732 |
| | | | | 3600 141.732 |
| | | | | 660 25.984 |
| | | | | 2200 86.614 |
| | | | | 790 31.102 |

| Type | Recommended replacements | | | | Main points of difference from discontinued models |
|-------------------------|--------------------------|--------------------------|---------------------|----------------------------------|----------------------------------------------------|
| | Model No. | Shape of fiber head (mm) | Bending radius (mm) | Bending durability | |
| Thru-beam type | Tough FT-V23 | | R4 | ○ | |
| | Tough FT-V25 | | R2 | ○ | |
| | Tough FT-31 | | R2 | ○ | |
| | FT-31W | | R1 | — | |
| | Tough FT-42 | | R4 | ○ | |
| | FT-42W | | R1 | — | |
| | Tough FT-A32 | | R2 | ○ | |
| | FT-A32W | | R1 | — | |
| | Tough FT-A11 | | R2 | ○ | |
| | FT-A11W | | R1 | — | |
| Tough FT-KV40 | | R2 | ○ | | |
| FT-KV40W | | R1 | — | | |
| FT-R41W | | R1 | — | | |
| FT-R42W | | R1 | — | | |
| FT-S31W | | R1 | — | | |
| | | | | Sensing range FX-500 STD (mm in) | |
| | | | | 450 17.717 | |
| | | | | 240 9.449 | |
| | | | | 315 12.402 | |
| | | | | 260 10.236 | |
| | | | | 1130 44.488 | |
| | | | | 800 31.496 | |
| | | | | 3600 141.732 | |
| | | | | 3600 141.732 | |
| | | | | 3600 141.732 | |
| | | | | 3600 141.732 | |
| | | | | 660 25.984 | |
| | | | | 2200 86.614 | |
| | | | | 800 31.496 | |
| | | | | 2200 86.614 | |
| | | | | 800 31.496 | |

| Type | Discontinued models | | | |
|----------------|---------------------|------------------------------------|---------------------|--------------------|
| | Model No. | Shape of fiber head (mm) | Bending radius (mm) | Bending durability |
| Thru-beam type | FT-WS4 | | R1 | — |
| | FT-WS8 | | R1 | — |
| | FT-WS8L | Long sensing range · with lens | R1 | — |
| | FT-WV42 | Sleeve part cannot be bent. | R1 | — |
| | FT-WZ4HB | Fiber bending type W2×H10×D10 | R1 | — |
| | FT-WZ7HB | Fiber bending type W3.5×H14×D11 | R1 | — |
| | FT-WZ8 | Top sensing W8.5×H12×D3 | R1 | — |
| | FT-WZ8E | Side sensing W3×H12×D8 | R1 | — |
| | FT-WZ8H | Top sensing W3×H8×D12 | R1 | — |
| | FT-Z8 | Top sensing W8.5×H12×D3 | R4 | ○ |
| | FT-Z8E | Side sensing W3×H12×D8 | R4 | ○ |
| | FT-Z8H | Top sensing W3×H8×D12 | R4 | ○ |

| Type | Recommended replacements | | | | Main points of difference from discontinued models |
|-------------------------|----------------------------|------------------------------------|---------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| | Model No. | Shape of fiber head (mm) | Bending radius (mm) | Bending durability | |
| Thru-beam type | Tough FT-S21 | | R2 | ○ | • End bracket shape of $\phi 1.5/8$ mm ⇒ Changed to 10 mm ($\phi 1$ part/2 mm + $\phi 1.5$ part/8 mm) |
| | FT-S21W | | R1 | — | • End bracket shape of $\phi 1.5/8$ mm ⇒ Changed to 10 mm ($\phi 1$ part/2 mm + $\phi 1.5$ part/8 mm) |
| | FT-S31W | | R1 | — | • End bracket shape of $\phi 2.5/8$ mm ⇒ Changed to 10 mm ($\phi 2$ part/2 mm + $\phi 3$ part/8 mm) |
| | FT-S32 | Long sensing range · with lens | R10 | ○ | • End bracket shape of $\phi 3$ ⇒ Changed to $\phi 2.5$ • Bending radius of 1 mm ⇒ Changed to 10 mm |
| | Tough FT-V25 | Sleeve part cannot be bent. | R2 | ○ | • D-shaped surface that makes it easy to align with the optical axis has been added |
| | FT-V24W | Sleeve part cannot be bent. | R1 | — | • D-shaped surface that makes it easy to align with the optical axis has been added |
| | FT-Z20HBW | Fiber bending type W2×H10×D10 | R1 | — | |
| | FT-Z40HBW | Fiber bending type W3.5×H14×D11 | R1 | — | |
| | Tough FT-Z30 | Top sensing W8.5×H12×D3 | R2 | ○ | • Black casing color ⇒ Changed to translucent, protective seal eliminated |
| | FT-Z30W | Top sensing W8.5×H12×D3 | R1 | — | • Black casing color ⇒ Changed to translucent, protective seal eliminated |
| | Tough FT-Z30E | Side sensing W3×H12×D8 | R2 | ○ | |
| | FT-Z30EW | Side sensing W3×H12×D8 | R1 | — | |
| | Tough FT-Z30H | Top sensing W3×H8×D12 | R2 | ○ | |
| FT-Z30HW | Top sensing W3×H8×D12 | R1 | — | | |
| Tough FT-Z30 | Top sensing W8.5×H12×D3 | R2 | ○ | • Black casing color ⇒ Changed to translucent, protective seal eliminated | |
| Tough FT-Z30E | Side sensing W3×H12×D8 | R2 | ○ | | |
| Tough FT-Z30H | Top sensing W3×H8×D12 | R2 | ○ | | |