

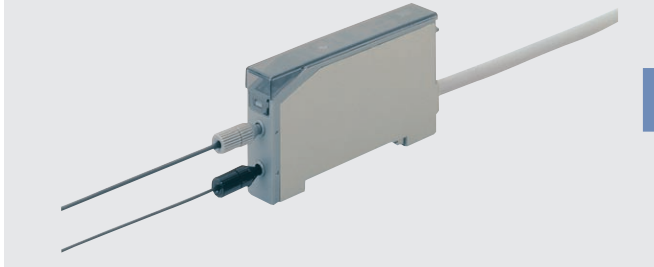
Information of Discontinued Models

Slim body manually sensitivity set fiber sensor FX-10 series

Stopping taking order date: **30, Sep, 2005**
Date of production discontinuance: **31, Dec, 2005**

Discontinued models

Slim body manually sensitivity set fiber sensor FX-10 series



※Confirm that table in

Main points of difference between recommended replacements and discontinued models for details on model numbers for each type.

Recommended replacements

Manually set fiber sensor FX-311 series



Digital fiber sensor FX-301-HS



Refer to 'Manually set fiber sensor FX-311 series catalog' or 'Digital fiber sensor FX-300 series catalog' for details.

Advantages of switching to recommended replacements

Increased sensing ranges

A double coupling lens has been adopted, so that light emitting efficiency has been increased to maximum limits. The sensing ranges for small-diameter and ultra-small diameter fibers has been increased by 50 % compared to previous models.

Stable sensing

The red LED type utilizes a four-chemical emitting element to maintain a stable light emitting amount over long periods. In addition, the digital fiber sensors are provided with an APC (auto power control) circuit to ensure light emitting amounts are stable over short periods, so that stable sensing can be obtained.

Digital display

The digital fiber sensors are equipped with a 4-digit display. This can be used for confirming incident light intensity, threshold value settings and a variety of other function displays.

MODE NAVI

The digital fiber sensors utilize a MODE NAVI function that is both multifunctional and yet easy to use. Basic sensor operations are indicated by means of six indicators, so that even inexperienced operators can use the sensors easily.

Wire-saving

A main cable and a sub cable enable the amount of wiring used to be reduced when the sensors are installed side by side.

Notes on using recommended replacements

Recommended replacements	Sensing performance	Specifications	Output circuit	Mounting dimensions	Dimensions	Enclosure color
FX-311 series FX-301-HS	◎	◎	○	○	※	※

◎: Highly interchangeable ○: Almost no difference
※: Large differences -: No corresponding item or model

- High degree of interchangeability in specifications, mounting dimensions and operability, so that replacement of the FX-10 series with the FX-311 series and the FX-301-HS can be carried out smoothly.
- The FX-10 series is equipped with self-diagnosis output, but the FX-311 series and the FX-301-HS are not.
- Cable types and connector types both must be changed to quick-connection cables.

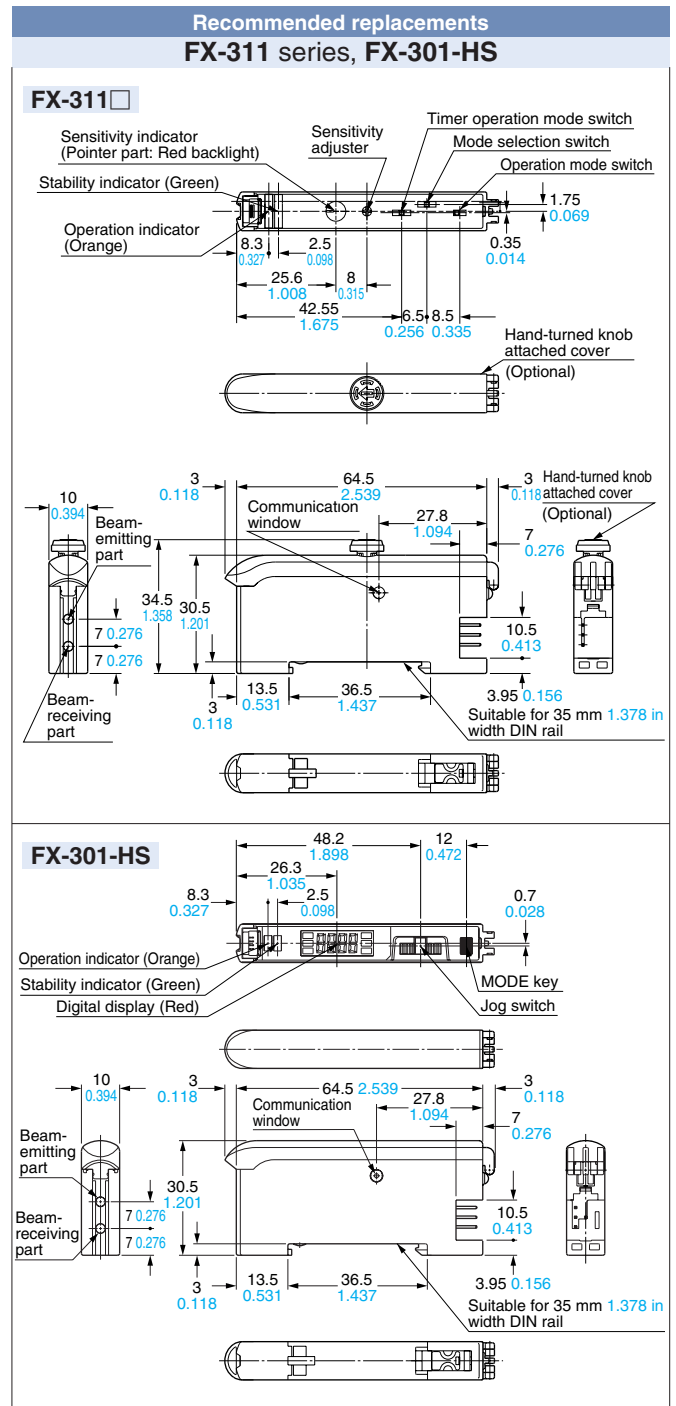
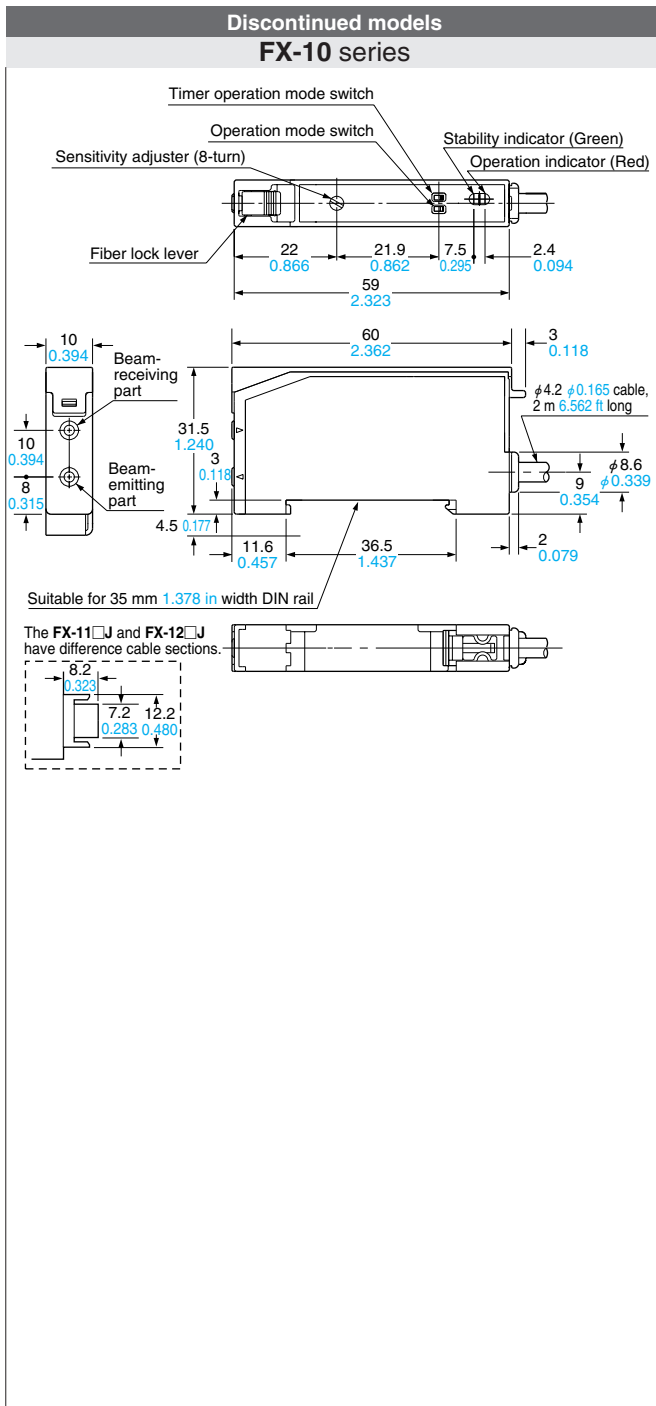
Main points of difference between recommended replacements and discontinued models

Discontinued models		Recommended replacements		Main points of difference from discontinued models
Model No.	Light source	Model No.	Light source	
FX-11	Red LED	FX-311	Red LED	<ul style="list-style-type: none"> • Recommended replacements are connector types. • Recommended replacements require the use of a quick-connection cable (CN-73-C□).
FX-11J	Red LED	FX-311	Red LED	
FX-11P	Red LED	FX-311P	Red LED	
FX-11PJ	Red LED	FX-311P	Red LED	
FX-11G	Green LED	FX-311G	Green LED	
• Long sensing range type				
Model No.	Light source	Model No.	Light source	
FX-12	Red LED	FX-311	Red LED	<ul style="list-style-type: none"> • Recommended replacements are connector types. • Recommended replacements require the use of a quick-connection cable (CN-73-C□).
FX-12J	Red LED	FX-311	Red LED	
FX-12P	Red LED	FX-311P	Red LED	
FX-12PJ	Red LED	FX-311P	Red LED	
• High speed type (30 μs)				
Model No.	Light source	Model No.	Light source	
FX-13	Red LED	FX-301-HS	Red LED	<ul style="list-style-type: none"> • Recommended replacements are connector types. • Recommended replacements require the use of a quick-connection cable (CN-73-C□). • The response time for the recommended replacements is 35 μs.
FX-13P	Red LED	FX-301P-HS	Red LED	
FX-13PJ	Red LED	FX-301P-HS	Red LED	

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Dimensions (Unit: mm in)



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Sensing performance

Discontinued models FX-10 series			
Fiber	Sensing range (mm in) (Note)		Min. sensing object
Thru-beam type FT-FM2	160	6.299	FX-11 φ0.08 mm φ0.003 in opaque object
	400	15.748	FX-12 φ0.08 mm φ0.003 in opaque object
	80	3.150	FX-13 φ0.08 mm φ0.003 in opaque object
Reflective type FD-FM2	60	2.362	FX-11 φ0.01 mm φ0.0004 in opaque object
	150	5.906	FX-12 φ0.01 mm φ0.0004 in opaque object
	30	1.181	FX-13 φ0.02 mm φ0.0008 in opaque object

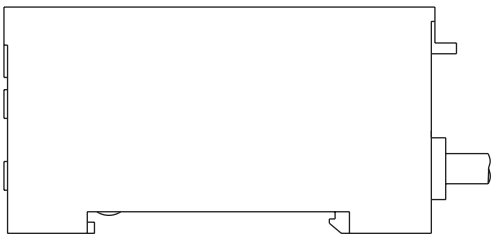
Note: The sensing range is the value for red LED type.

Recommended replacements FX-311 series			
Fiber	Sensing range (mm in) (Note)		Min. sensing object
	LONG	STD	
Thru-beam type FT-FM2	780	30.709	φ0.03 mm φ0.0011 in opaque object
	400	15.748	
Reflective type FD-FM2	310	12.205	φ0.02 mm φ0.0008 in gold wire
	140	5.512	

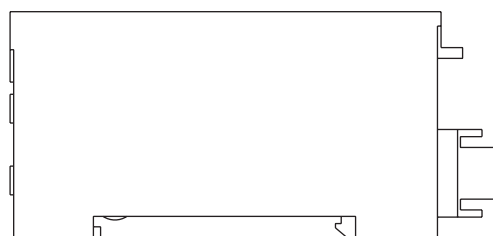
Examples of product configurations

**Discontinued models
FX-10 series**

Cable connection type



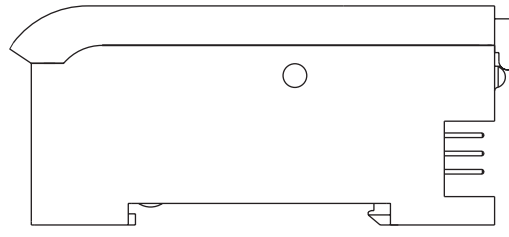
Connector connection type



※The **CN-54-C** cable with connector must be used.

**Recommended replacements
FX-311 series, FX-301-HS**

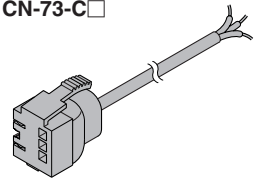
Connector connection type



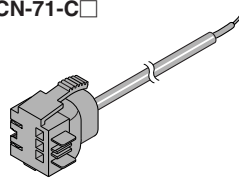
※The **CN-73-C** quick-connection cable must be used. Quick-connection cable is not supplied with the amplifier. Please order it separately.

※When installing side by side, you can reduce the amount of wiring used by using the **CN-71-C** quick-connection cable.

Main cable
CN-73-C



Sub cable
CN-71-C



Information of Discontinued Models

Slim body manually sensitivity set fiber sensor FX-10 series

Main rated specifications

Sensitive type / Long sensing range type

Item	Basic model No.	Discontinued models				Recommended replacements	
		NPN output		PNP output		NPN output	PNP output
		Sensitive type	Long sensing range type	Sensitive type	Long sensing range type		
Type		FX-11	FX-12	FX-11P	FX-12P	FX-311	FX-311P
Emitting element		Red LED					
Supply voltage		12 to 24 V DC \pm 10 % Ripple P-P 10 % or less					
Current / Power consumption		35 mA or less				840 mW or less (Current consumption 35 mA or less at 24 V supply voltage)	
Sensing output		NPN open-collector transistor • Maximum sink current: 100 mA • Applied voltage: 30 V DC or less (between output and 0 V) • Residual voltage: 1.5 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current)		PNP open-collector transistor • Maximum source current: 100 mA • Applied voltage: 30 V DC or less (between output and + V) • Residual voltage: 1.5 V or less (at 100 mA source current) 0.4 V or less (at 16 mA source current)		NPN open-collector transistor • Maximum sink current: 100 mA (50 mA, if five, or more, amplifiers are connected in cascade) • Applied voltage: 30 V DC or less (between output and 0 V) • Residual voltage: 1.5 V or less (at 100 mA sink current) (50 mA, if five, or more, amplifiers are connected in cascade) sink current	PNP open-collector transistor • Maximum source current: 100 mA (50 mA, if five, or more, amplifiers are connected in cascade) • Applied voltage: 30 V DC or less (between output and + V) • Residual voltage: 1.5 V or less (at 100 mA source current) (50 mA, if five, or more, amplifiers are connected in cascade) source current
Output operation		Selectable either Light-ON or Dark-ON, with selection switch					
Response time		0.3 ms or less	0.4 ms or less	0.3 ms or less	0.4 ms or less	250 μ s or less (STD / S-D), 2 ms or less (LONG) selectable with selection switch	
Sensitivity adjuster		8-turn potentiometer with indicator				12-turn potentiometer with indicator (Pointer part: red backlight)	
Ambient temperature		- 10 to + 55 °C + 14 to + 131 °F (No dew condensation or icing allowed), Storage: - 20 to + 70 °C - 4 to + 158 °F				- 10 to + 55 °C - 14 to + 131 °F (If 4 to 7 units are connected in cascade: - 10 to + 50 °C + 14 to + 122 °F, if 8 to 16 units are connected in cascade: - 10 to + 45 °C + 14 to + 113 °F) (No dew condensation or icing allowed), Storage: - 20 to + 70 °C - 4 to + 158 °F	
Material		Enclosure: Heat-resistant ABS Case cover: Polycarbonate, Fiber lock lever: PES				Enclosure: Heat-resistant ABS, Case cover: Polycarbonate	
Connecting method		0.2 mm ² 4-core cabtyre cable, 2 m 6.562 ft long				Connector (for quick-connection cable)	
Weight		60 g approx.				15 g approx.	
Accessories		MS-DIN-2 (Mounting bracket): 1 pc., Adjusting screwdriver: 1 pc.				—	

Refer to 'Manually set fiber sensor FX-311 series catalog' or 'Digital fiber sensor FX-300 series catalog' for details.

Information of Discontinued Models

Slim body manually sensitivity set fiber sensor FX-10 series

Main rated specifications

High speed type

Item	Type Basic model No.	Discontinued models		Recommended replacements	
		NPN output FX-13	PNP output FX-13P	NPN output FX-301-HS	PNP output FX-301P-HS
Emitting element		Red LED			
Supply voltage		12 to 24 V DC \pm 10 % Ripple P-P 10 % or less			
Current / Power consumption		35 mA or less		Normal operation: 960 mW or less (Current consumption 40 mA or less at 24 V supply voltage) ECO mode: 600 mW or less (Current consumption 25 mA or less at 24 V supply voltage)	
Sensing output		NPN open-collector transistor • Maximum sink current: 100 mA • Applied voltage: 30 V DC or less (between output and 0 V) • Residual voltage: 1.5 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current)	PNP open-collector transistor • Maximum source current: 100 mA • Applied voltage: 30 V DC or less (between output and + V) • Residual voltage: 1.5 V or less (at 100 mA source current) 0.4 V or less (at 16 mA source current)	NPN open-collector transistor • Maximum sink current: 100 mA (50 mA, if five, or more, amplifiers are connected in cascade) • Applied voltage: 30 V DC or less (between output and 0 V) • Residual voltage: 1.5 V or less (at 100 mA (50 mA, if five, or more, amplifiers are connected in cascade) sink current)	PNP open-collector transistor • Maximum source current: 100 mA (50 mA, if five, or more, amplifiers are connected in cascade) • Applied voltage: 30 V DC or less (between output and + V) • Residual voltage: 1.5 V or less (at 100 mA (50 mA, if five, or more, amplifiers are connected in cascade) source current)
Output operation		Selectable either Light-ON or Dark-ON, with selection switch		Selectable either Light-ON or Dark-ON, with jog switch	
Response time		30 μ s or less		35 μ s or less (H-SP), 150 μ s or less (FAST), 250 μ s or less (STD / S-D), 2 ms or less (LONG), selectable with jog switch	
Sensitivity setting		8-turn potentiometer with indicator		2-level teaching / Limit teaching / Manual adjustment / Full-auto teaching / Max. sensitivity teaching	
Ambient temperature		- 10 to + 55 °C + 14 to + 131 °F (No dew condensation or icing allowed), Storage: - 20 to + 70 °C - 4 to + 158 °F		- 10 to + 55 °C + 14 to + 131 °F (If 4 to 7 units are connected in cascade: - 10 to + 50 °C + 14 to + 122 °F, if 8 to 16 units are connected in cascade: - 10 to + 45 °C + 14 to + 113 °F) (No dew condensation or icing allowed), Storage: - 20 to + 70 °C - 4 to + 158 °F	
Material		Enclosure: Heat-resistant ABS Case cover: Polycarbonate, Fiber lock lever: PES		Enclosure: Heat-resistant ABS, Case cover: Polycarbonate MODE key: Acrylic, Jog switch: Heat-resistant ABS	
Connecting method		0.2 mm ² 4-core cabtyre cable, 2 m 6.562 ft long		Connector (for quick-connection cable)	
Weight		60 g approx.		20 g approx.	
Accessories		MS-DIN-2 (Mounting bracket): 1 pc., Adjusting screwdriver: 1 pc.		—	

Refer to 'Manually set fiber sensor **FX-311** series catalog' or 'Digital fiber sensor **FX-300** series catalog' for details.