

1-Line System Fiber Sensor Amplifiers FS-T/M Series



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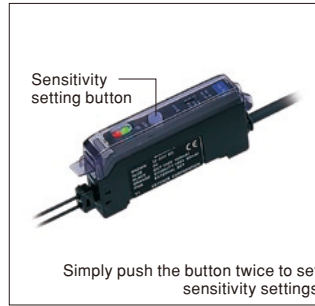
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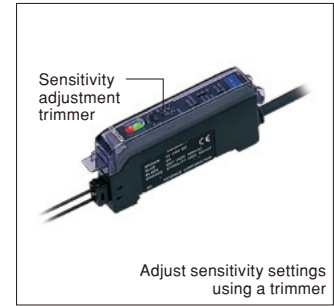
Two types of setting adjustment

Simple fiberoptic sensor available in button or trimmer models.

FS-T: Button adjustment



FS-M: Trimmer adjustment



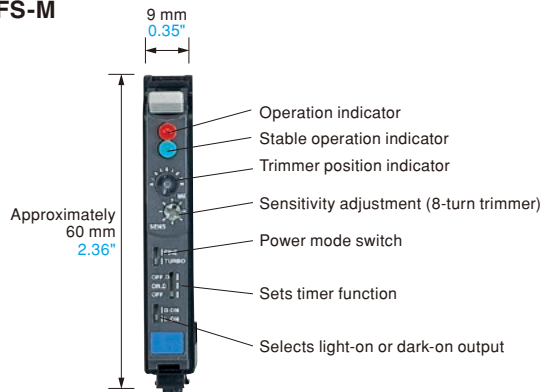
All settings except for sensitivity are set with switches

Check settings without having to refer to the instruction manual.

FS-T




FS-M




Lineup

The FS-T/M Series saves on wiring between main units and expansion units.
Up to 16 expansion units can be added to a single main unit.

1-touch calibration type FS-T Series

Appearance	Type		Light source	Model	
				NPN	PNP
 <p>Main units</p> <p>Expansion units</p>	Main units	Standard	Red LED	FS-T1	FS-T1P
		Mark identification type	Green LED	FS-T1G	—
	Expansion units	Standard	Red LED	FS-T2	FS-T2P

Trimmer type FS-M Series

Appearance	Type		Light source	Model	
				NPN	PNP
 <p>Main units</p> <p>Expansion units</p>	Main units	Standard	Red LED	FS-M1	FS-M1P
		Ultra-fast response type		FS-M1H	—
	Expansion units	Standard		FS-M2	FS-M2P

Main units include mounting brackets and expansion units include end units.



Mounting bracket
OP-25431



End Units
OP-26751





» **RECOMMEND**
FS-M1H is the fastest amplifier in the FS Series.

- New Products
- Fiberoptic Sensors
- Photoelectric Sensors
- Proximity Sensors
- Safety Equipment
- Flow/ Pressure/ Temperature
- Measurement Sensors
- Controls
- Static Eliminators
- Vision Systems
- Marking Equipment
- Code Readers
- Handheld Mobile Computers
- Microscopes
- Projector/ 3D Measurement Systems



Specifications

Amplifier (FS-T/M Series)

Type		Main unit	1-line Expansion unit	Main unit	1-line Expansion unit
Model	NPN	FS-T1	FS-T2	FS-M1	FS-M2
	PNP	FS-T1P	FS-T2P	FS-M1P	FS-M2P
Appearance					
Light source		Red LED			
Sensitivity adjustment/Mode selection		Button		8-turn trimmer (with indicator), FINE/TURBO (switch-selectable)	
Response time		250 μs		250 μs (FINE)/500 μs (TURBO)	
Operation mode		LIGHT-ON/DARK-ON (switch-selectable)			
Display indicator		Output indicator: Red LED Stable operation indicator: Green LED Calibration indicator: Orange LED		Output indicator: Red LED Stable operation indicator: Green LED	
Timer function		ON-delay: 40 ms/ OFF-delay: 40 ms/ Timer OFF (switch-selectable)			
External calibration input signal		Non-voltage input (contact, solid state)		—	
Control output	NPN	NPN open-collector 100 mA max. (40 VDC max.), Residual voltage: 1 V max. ¹			
	PNP	PNP open-collector 100 mA max. (40 VDC max.), Residual voltage: 1 V max. ¹			
Stability output	NPN	NPN open-collector 50mA max. (40 VDC max.), Residual voltage: 1 V max. ^{1,2}			
	PNP	PNP open-collector 50 mA max. (40 VDC max.), Residual voltage: 1 V max. ^{1,2}			
Protection circuit		Reversed polarity protection, over-current protection, surge absorber			
No. of expansion units ¹		Up to 16 expansion units can be connected (a total of 17 units)			
Mutual interference suppression		FINE : 4, TURBO/SUPER: 8			
Power supply		12 to 24 VDC (±10%), ripple (p-p): 10% max. ³			
Current consumption		35 mA max.			
Ambient illumination		Incandescent lamp: 10,000 lux max., Sunlight: 20,000 lux max.			
Ambient temperature		-10 to +55°C (14 to 131°F), No freezing			
Relative humidity		35 to 85%, No condensation			
Vibration resistance		10 to 55 Hz, double amplitude: 1.5 mm 0.06", 2 hours each in the X, Y and Z axis			
Shock resistance		500 m/s ² in X, Y, and Z directions, 3 times respectively			
Housing		Polycarbonate			
Weight (including 2-m 6.6' cable)		Approx. 75 g	Approx. 40 g	Approx. 75 g	Approx. 40 g

1. If more than one unit is used together, the ambient temperature varies with the conditions below. Mount the units on the DIN rail with mounting brackets and check that the output current is 20 mA or less.
 3 to 10 Units: -10 to +50°C (14 to 122°F), 11 to 16 Units: -10 to +45°C (14 to 113°F)
 2. Only the **FS-T1** and **FS-M1** can provide stability outputs.
 3. Power to the **FS-T2/M2** is supplied through the **FS-T1/M1/V11, PS-T1, LV-21A/11A**.

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Special Amplifier Specifications

Mark identification type

Model	FS-T1G
Appearance	
Light source	Green LED
Response time	250 μs
Operation mode	LIGHT-ON/DARK-ON (switch-selectable)
Display indicator	Output indicator: Red LED, Stable operation indicator: Green LED, Calibration indicator: Orange LED
Timer function	ON-delay: 40 ms/ OFF-delay: 40 ms/ Timer OFF (switch-selectable)
External calibration input signal	Non-voltage input (contact, solid state)
Control output	NPN open-collector: 100 mA max. (40 VDC max.), Residual voltage: 1 V max.
Stability output	NPN open-collector: 50 mA max. (40 VDC max.), Residual voltage: 1 V max.
Protection circuit	Reversed polarity protection, over-current protection, surge absorber
Power supply	12 to 24 VDC ±10%, ripple (P-P): 10% max.
Current consumption	35 mA max.
Ambient illumination	Incandescent lamp: 10,000 lux max., Sunlight: 20,000 lux max.
Ambient temperature	-10 to +55°C (14 to 131°F), No freezing*
Relative humidity	35 to 85%, No condensation
Vibration resistance	10 to 55 Hz, double amplitude: 1.5 mm 0.06*, 2 hours each in the X, Y and Z axis
Shock resistance	500 m/s ² in X, Y, and Z directions, 3 times respectively
Housing	Polycarbonate
Weight (including 2-m 6.6' cable)	Approx. 75 g

Ultra-fast response type

Model	FS-M1H
Appearance	
Light source	RED LED
Sensitivity adjustment/ Mode selection	8-turn trimmer (with indicator), FINE/TURBO (switch-selectable)
Response time	20 μs (FINE)/ 50 μs (TURBO)
Operation mode	LIGHT-ON/DARK-ON (switch-selectable)
Display indicator	Output indicator: Red LED, Stable operation indicator: Green LED
Timer function	ON-delay: 40 ms/ OFF-delay: 40 ms/ Timer OFF (switch-selectable)
Control output	NPN open-collector: 100 mA max. (40 VDC max.), Residual voltage: 1 V max.
Stability output	NPN open-collector: 50 mA max. (40 VDC max.), Residual voltage: 1 V max.
Protection circuit	Reversed polarity protection, over-current protection, surge absorber
Power supply	12 to 24 VDC ±10%, ripple (P-P): 10% max.
Current consumption	35 mA max.
Ambient illumination	Incandescent lamp: 10,000 lux max., Sunlight: 20,000 lux max.
Ambient temperature	-10 to +55°C (14 to 131°F), No freezing*
Relative humidity	35 to 85%, No condensation
Vibration resistance	10 to 55 Hz, double amplitude: 1.5 mm 0.06*, 2 hours each in the X, Y and Z axis
Shock resistance	500 m/s ² in X, Y, and Z directions, 3 times respectively
Housing	Polycarbonate
Weight (including 2-m 6.6' cable)	Approx. 75 g

* If more than one unit is used together, the ambient temperature varies with the conditions below. Mount the units on the DIN rail with mounting brackets and check that the output current is 20 mA or less.
3 to 10 Units: -10 to +50°C (14 to 122°F), 11 to 16 Units: -10 to +45°C (14 to 113°F)

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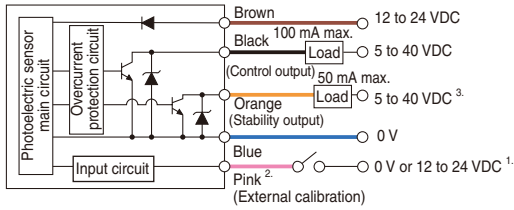
Microscopes

Projector/ 3D Measurement Systems



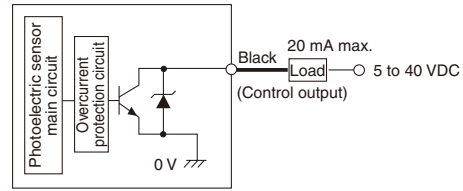
Input/Output circuit

FS-T1/M1/T1G/M1H



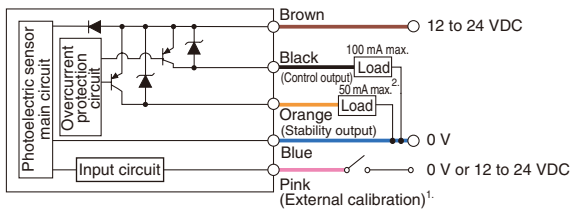
1. When the external calibration input is not used, cut the pink cable at the root, or connect this cable to the positive terminal of the power supply.
2. The **FS-M1/M1H** does not have a pink cable (for external calibration).
3. When the stability output is not used, cut the orange cable at the base, or connect this cable to the 0 V terminal of the power supply.

FS-T2/M2



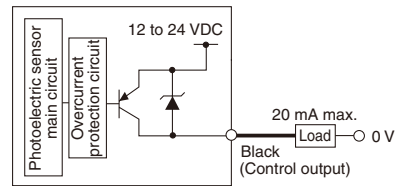
Power is supplied through the main unit.

FS-T1P/M1P



1. The **FS-M1P** does not have a pink cable (for external calibration).
2. When the stability output is not used, cut the orange cable at the base.

FS-T2P/M2P



Power is supplied through the main unit.

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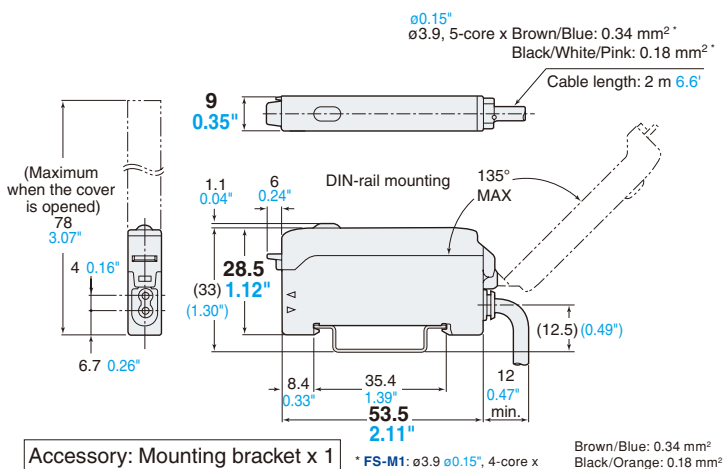
Projector/3D Measurement Systems



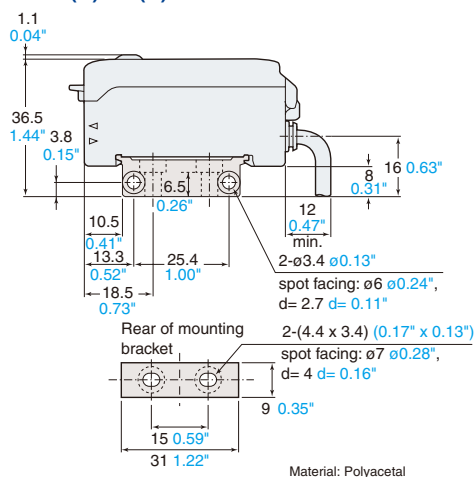
Dimensions

Unit: mm inch

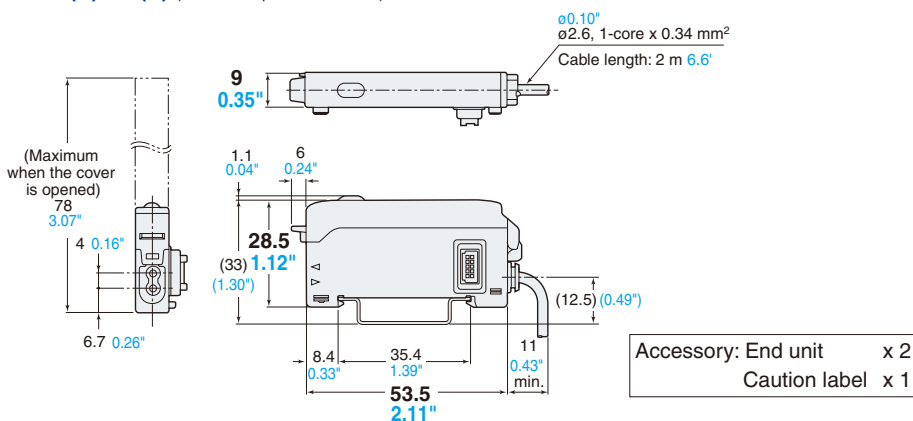
FS-T1(P)/M1(P) (1-line), **T1G/M1H**



When the mounting bracket (Optional)
FS-T1(P)/M1(P) is attached:



FS-T2(P)/M2(P) (1-line expansion unit)



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