

Ratings and Specifications

Straight type (E3FA/E3FB)

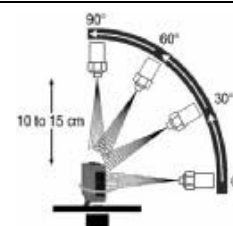
Model Item	Sensing method		Through-beam	Retro-reflective with MSR function
	PNP output	Pre-wired M12 Connector	E3F□-TP11-F2 2M E3F□-TP21-F2	E3F□-RP11-F2 2M E3F□-RP21-F2
Sensing distance		20 m		0.1 to 4 m (with E39-R1S)
Spot diameter (reference value)		—		—
Standard sensing object		Opaque: 7 mm dia.min.		Opaque: 75 mm dia.min.
Differential travel		—		—
Directional angle		2° min.		—
Light source (wavelength)		Red LED (624 nm)		Red LED (624 nm)
Power supply voltage		10 to 30 VDC (include voltage ripple of 10%(p-p) max.)		—
Current consumption		40 mA max. (Emitter 25 mA max. Receiver 15 mA max.)		25 mA max.
Control output		PNP (open collector) Load current: 100 mA max. (Residual voltage: 3 V max.), Load power supply voltage: 30 VDC max.		—
Operation mode		Light-ON/Dark-ON selectable by wiring		—
Indicator		Operation indicator (orange) Stability indicator (green) Power indicator (green): only Emitter of Through-beam		—
Protection circuits		Power supply reverse polarity protection, Output short-circuit protection, and Output reverse polarity protection		—
Response time		0.5 ms		—
Sensitivity adjustment		One-turn adjuster		—
Ambient illumination (Receiver side)		Incandescent lamp: 3,000 lx max./ Sunlight: 10,000 lx max.		—
Ambient temperature range		Operating: -25 to 55°C/ Storage: -30 to 70°C (with no icing or condensation)		—
Ambient humidity range		Operating: 35 to 85%/ Storage: 35 to 95% (with no condensation)		—
Insulation resistance		20 MΩ min. at 500 VDC		—
Dielectric strength		1,000 VAC at 50/60 Hz for 1 min. between current-carrying parts and case		—
Vibration resistance		Destruction: 10 to 55 Hz, 1.5 mm double amplitude for 2 hours each in X, Y and Z directions		—
Shock resistance		Destruction: 500 m/s ² 3 times each in X, Y and Z directions		—
Degree of protection		IEC: IP67, DIN 40050-9: IP69K ¹		—
Weight (packed state/only sensor)	Pre-wired cable (2M)	E3FA: Approx. 110 g/ Approx. 50 g, respectively, E3FB: Approx. 175 g/ Approx. 65 g, respectively		E3FA: Approx. 60 g/ Approx. 50 g, E3FB: Approx. 95 g/ Approx. 65 g
	Connector	E3FA: Approx. 30 g/ Approx. 10 g, respectively, E3FB: Approx. 85 g/ Approx. 20 g, respectively		E3FA: Approx. 20 g/ Approx. 10 g, E3FB: Approx. 50 g/ Approx. 20 g
Material	Case	E3FA: ABS, E3FB: Nickel-brass		—
	Lens and Display	PMMA		—
	Adjuster	POM		—
	Nut	E3FA: POM, E3FB: Nickel-brass		—
Accessories		Instruction sheet M18 nuts (4 pcs)		Instruction sheet M18 nuts (2 pcs)

¹ IP69K Degree of Protection Specifications

IP69K is a protection specification stipulated by DIN 40050 Part 9 of the German standards.

The test item is sprayed with 80°C water from a nozzle of a specified shape at a water pressure of 80 to 100 bar. The amount of water is 14 to 16 liters per minute.

The distance between the test item and the nozzle is 10 to 15 cm. The water is discharged at angles of 0°, 30°, 60°, and 90° from the horizontal plane for 30 seconds at each angle while the test item is rotated horizontally.



E3FA/B_-F2

Straight type (E3FA/E3FB)

Model Item	Sensing method		Diffuse-reflective					
	PNP output	Pre-wired M12 Connector	E3F□-DP11-F2 2M	E3F□-DP12-F2 2M	E3F□-DP13-F2 2M	E3F□-DP14-F2 2M	E3F□-DP15-F2 2M	E3F□-DP16-F2 2M
Sensing distance			100 mm (white paper: 300 × 300 mm)	300 mm (white paper: 300 × 300 mm)	1 m (white paper: 300 × 300 mm)	100 mm (white paper: 300 × 300 mm)	300 mm (white paper: 300 × 300 mm)	1 m (white paper: 300 × 300 mm)
Spot diameter (reference value)			40 × 45 mm Sensing distance of 100 mm	40 × 50 mm Sensing distance of 300 mm	120 × 150 mm Sensing distance of 1 m	40 × 45 mm Sensing distance of 100 mm	40 × 50 mm Sensing distance of 300 mm	120 × 150 mm Sensing distance of 1 m
Standard sensing object	—							
Differential travel	20% max.							
Directional angle	—							
Light source (wavelength)	Red LED (624 nm)					Infrared LED (850 nm)		
Power supply voltage	10 to 30 VDC (include voltage ripple of 10%(p-p) max.)							
Current consumption	25 mA max.							
Control output	PNP (open collector) Load current: 100 mA max. (Residual voltage: 3 V max.), Load power supply voltage: 30 VDC max.							
Operation mode	Light-ON/Dark-ON selectable by wiring							
Indicator	Operation indicator (orange) Stability indicator (green)							
Protection circuits	Power supply reverse polarity protection, Output short-circuit protection, and Output reverse polarity protection							
Response time	0.5 ms							
Sensitivity adjustment	One-turn adjuster							
Ambient illumination (Receiver side)	Incandescent lamp: 3,000 lx max./ Sunlight: 10,000 lx max.							
Ambient temperature range	Operating: -25 to 55°C/ Storage: -30 to 70°C (with no icing or condensation)							
Ambient humidity range	Operating: 35 to 85%/ Storage: 35 to 95% (with no condensation)							
Insulation resistance	20 MΩ min. at 500 VDC							
Dielectric strength	1,000 VAC at 50/60 Hz for 1 min. between current-carrying parts and case							
Vibration resistance	Destruction: 10 to 55 Hz, 1.5 mm double amplitude for 2 hours each in X, Y and Z directions							
Shock resistance	Destruction: 500 m/s ² 3 times each in X, Y and Z directions							
Degree of protection	IEC: IP67, DIN 40050-9: IP69K ^{†1}							
Weight (packed state/only sensor)	Pre-wired cable (2M)	E3FA: Approx. 60 g/ Approx. 50 g, E3FB: Approx. 95 g/ Approx. 65 g						
	Connector	E3FA: Approx. 20 g/ Approx. 10 g, E3FB: Approx. 50 g/ Approx. 20 g						
Material	Case	E3FA: ABS, E3FB: Nickel-brass						
	Lens and Display	PMMA						
	Adjuster	POM						
	Nut	E3FA: POM, E3FB: Nickel-brass						
Accessories	Instruction sheet M18 nuts (2 pcs)							

^{†1} IP69K Degree of Protection Specifications

IP69K is a protection specification stipulated by DIN 40050 Part 9 of the German standards.

The test item is sprayed with 80°C water from a nozzle of a specified shape at a water pressure of 80 to 100 bar. The amount of water is 14 to 16 liters per minute.

The distance between the test item and the nozzle is 10 to 15 cm. The water is discharged at angles of 0°, 30°, 60°, and 90° from the horizontal plane for 30 seconds at each angle while the test item is rotated horizontally.

