

Photoelectric Sensors

E3F2

Threaded Cylindrical Photoelectric Sensors with Built-in Amplifier for Use as an Optical Proximity Switch

- M18 DIN-sized cylindrical housing
- Housing materials: plastic, nickel plated brass and stainless steel
- Axial and radial types (with integrated 90°-optics)
- Enclosure rating IP67
- DC switching types with connectors for easy maintenance
- Full metal plug-in type
- Sensing distance separate types: 7 m, 10 m
- Retroreflective polarizing types: 2 m, 4 m
- Background suppression type: 10 cm
- Long detection distance (0.3 m, 1 m) with sensitivity adjuster for diffuse type
- Wide-beam characteristics (10 cm) for diffuse type
- Wide operating voltage range (10 to 30 VDC or 24 to 240 VAC)
- Short-circuit and reverse connection protection (DC switching type)
- UL and CSA approved (AC switching types)
- UL listed (DC switching types)

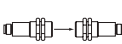
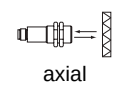
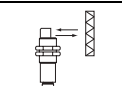
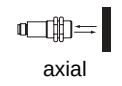
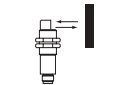
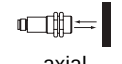


Ordering Information

■ DC-Switching Models

Housing Material: Plastic

Note: Shaded models are normally stocked.

Sensing method			Appearance	Connection method	Sensing distance	Model			
						PNP output	NPN output		
Through-beam	Multi purpose		 axial	pre-wired	7 m	E3F2-7B4	E3F2-7C4		
				M12 connector		E3F2-7B4-P1	E3F2-7C4-P1		
	- precision detection ^{(*)1} - test input			pre-wired	10 m	E3F2-10B4	E3F2-10C4		
				M12 connector		E3F2-10B4-P1	E3F2-10C4-P1		
Retro-reflective (incl. reflector E39-R1 or E39-R1S)	Non-polarizing (without MSR function)		 axial	pre-wired	0.1 - 2 m ^{(*)2}	E3F2-R2B4	E3F2-R2C4		
				M12 connector		E3F2-R2B4-P1	E3F2-R2C4-P1		
	Polarizing (with MSR function)	Fixed sensitivity		pre-wired	0.1 - 4 m ^{(*)3}	E3F2-R4B4F	E3F2-R4C4F		
				M12 connector		E3F2-R4B4F-P1	E3F2-R4C4F-P1		
		Adjustable sensitivity	pre-wired	E3F2-R4B4		E3F2-R4C4			
			M12 connector	E3F2-R4B4-P1		E3F2-R4C4-P1			
	Polarizing (with MSR function)		 radial	pre-wired	0.1 - 2 m ^{(*)2}	E3F2-R2RB41	E3F2-R2RC41		
				M12 connector		E3F2-R2RB41-P1	E3F2-R2RC41-P1		
Diffuse reflective	Fixed sensitivity		 axial	pre-wired	0.1 m	E3F2-DS10B4-N	E3F2-DS10C4-N		
	Wide-beam characteristics			M12 connector		E3F2-DS10B4-P1	E3F2-DS10C4-P1		
	Adjustable sensitivity			pre-wired	0.3 m	E3F2-DS30B4	E3F2-DS30C4		
				M12 connector		E3F2-DS30B4-P1	E3F2-DS30C4-P1		
			pre-wired	1 m	E3F2-D1B4	E3F2-D1C4			
			M12 connector		E3F2-D1B4-P1	E3F2-D1C4-P1			
	Adjustable sensitivity		 radial	pre-wired	0.3 m	E3F2-DS30B41	E3F2-DS30C41		
				M12 connector		E3F2-DS30B41-P1	E3F2-DS30C41-P1		
Background suppression	Fixed sensing distance		 axial	pre-wired	10 cm	E3F2-LS10B4	E3F2-LS10C4		
				M12 connector		E3F2-LS10B4-P1	E3F2-LS10C4-P1		

^{(*)1} with slit E39-ES18

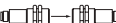
^{(*)2} with reflector E39-R1

^{(*)3} with reflector E39-R1S

Note: Standard cable length is 2 m. Models provided with a 5 m long cable are available. When ordering, specify the cable length by adding the length of the cable (e.g. E3F2-R2RB4 2M or E3F2-R2RB4 5M). For other cable length please contact your OMRON sales representative.

■ Housing material: Metal (Nickel plated brass)

Note: Shaded models are normally stocked.

Sensing method			Appearance	Connection method	Sensing distance	Model				
						PNP output	NPN output			
Through-beam	Multi purpose		 axial	pre-wired	7 m	E3F2-7B4-M	E3F2-7C4-M			
				M12 connector		E3F2-7B4-M1-M	E3F2-7C4-M1-M			
	- precision detection - test input			pre-wired	10 m	E3F2-10B4-M	E3F2-10C4-M			
				M12 connector		E3F2-10B4-M1-M	E3F2-10C4-M1-M			
Retro-reflective (incl. reflector E39-R1)	Polarizing (with MSR function)	Fixed sensitivity	 axial	pre-wired	0.1 - 2 m ^(*)	E3F2-R2RB4-M	E3F2-R2RC4-M			
				M12 connector		E3F2-R2RB4-M1-M	E3F2-R2RC4-M1-M			
				Adjustable sensitivity	pre-wired	0.1 - 4 m ^(*)	E3F2-R4B4F-M	E3F2-R4C4F-M		
					M12 connector		E3F2-R4B4F-M1-M	E3F2-R4C4F-M1-M		
		pre-wired			E3F2-R4B4-M	E3F2-R4C4-M				
		M12 connector			E3F2-R4B4-M1-M	E3F2-R4C4-M1-M				
	Polarizing (with MSR function)		 radial	pre-wired	0.1 - 2 m ^(*)	E3F2-R2RB41-M	E3F2-R2RC41-M			
	Diffuse reflective	Fixed sensing distance		 axial	pre-wired	0.1 m	E3F2-DS10B4-M	E3F2-DS10C4-M		
		Wide-beam characteristics			M12 connector		E3F2-DS10B4-M1-M	E3F2-DS10C4-M1-M		
Adjustable sensing distance		pre-wired	0.3 m		E3F2-DS30B4-M	E3F2-DS30C4-M				
		M12 connector			E3F2-DS30B4-M1-M	E3F2-DS30C4-M1-M				
		 radial	pre-wired	1 m	E3F2-D1B4-M	E3F2-D1C4-M				
			M12 connector		E3F2-D1B4-M1-M	E3F2-D1C4-M1-M				
Adjustable sensing distance			pre-wired	0.3 m	E3F2-DS30B41-M	E3F2-DS30C41-M				
			M12 connector		E3F2-DS30B41-M1-M	E3F2-DS30C41-M1-M				
		Background suppression	Fixed sensing distance		 axial	pre-wired	10 cm	E3F2-LS10B4-M	E3F2-LS10C4-M	
						M12 connector		E3F2-LS10B4-M1-M	E3F2-LS10C4-M1-M	

*1) with reflector E39-R1

*2) with reflector E39-R1S

Note: Standard cable length is 2 m. Models provided with a 5 m long cable are available. When ordering, specify the cable length by adding the length of the cable (e.g. E3F2-R2RB4 2M or E3F2-R2RB4 5M). For other cable length please contact your OMRON sales representative.

■ Housing material: Metal (Stainless steel)

Note: Shaded models are normally stocked.

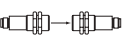
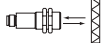
Sensing method		Appearance	Connection method	Sensing distance	Model	
					PNP output	NPN output
Through-beam		 axial	pre-wired	7 m	E3F2-7B4-S	E3F2-7C4-S
			M12 connector		E3F2-7B4-M1-S	E3F2-7C4-M1-S
Retro-reflective (incl. reflector E39-R1)	Polarizing (with MSR function)	 axial	pre-wired	0.1 - 2 m (with reflector E39-R1)	E3F2-R2RB4-S	E3F2-R2RC4-S
			M12 connector		E3F2-R2RB4-M1-S	E3F2-R2RC4-M1-S
Diffuse reflective	Fixed sensitivity	 axial	pre-wired	0.1 m	E3F2-DS10B4-S	E3F2-DS10C4-S
	Wide-beam characteristics		M12 connector		E3F2-DS10B4-M1-S	E3F2-DS10C4-M1-S
	Adjustable sensitivity		pre-wired	0.3 m	E3F2-DS30B4-S	E3F2-DS30C4-S
			M12 connector		E3F2-DS30B4-M1-S	E3F2-DS30C4-M1-S

Note: Standard cable length is 2 m. Models provided with a 5 m long cable are available. When ordering, specify the cable length by adding the length of the cable (e.g. E3F2-R2RB4-S 2M or E3F2-R2RB4-S 5M). For other cable length please contact your OMRON sales representative.

■ AC-Switching Models

Housing material: Plastic

Note: Shaded models are normally stocked.

Sensing method		Appearance	Connection method	Sensing distance	Model	
					Light-ON	Dark-ON
Through-beam		 axial	pre-wired	3 m	E3F2-3Z1	E3F2-3Z2
Retro-reflective (incl. reflector E39-R1)	Non-polarizing (without MSR function)	 axial	pre-wired	0.1 - 2 m (with reflector E39-R1)	E3F2-R2Z1	E3F2-R2Z2
Diffuse reflective	Fixed sensing distance Wide-beam characteristics	 axial	pre-wired	0.1 m	E3F2-DS10Z1-N	E3F2-DS10Z2-N

Note: Standard cable length is 2 m. Models provided with a 5 m long cable are available. When ordering, specify the cable length by adding the length of the cable (e.g. E3F2-R2Z1 2M or E3F2-R2Z1 5M). For other cable length please contact your OMRON sales representative.

Specifications

■ Ratings / Characteristics of DC Switching Models

Item	E3F2-7□	E3F2-10□	E3F2-R2□4-□	E3F2-R2R□	E3F2-R4□-□	E3F2-DS10□	E3F2-DS30□	E3F2-D1□4-□	E3F2-LS10□4-□
Sensing method	Through-beam		Retroreflective			Diffuse reflective			
	- multi purpose	- Precision detection [6.] - test input	Non-polarizing	Polarizing		Wide beam characteristic	Adjustable sensing distance		Background suppression
Power supply voltage	10 to 30 V DC	12 to 24 V DC	10 to 30 V DC						
Current consumption	50 mA max.		25 mA max.	30 mA max.		25 mA max.	30 mA max.		
Rated sensing distance [1.]	7 m	10 m	0.1 - 2 m (with reflector E39-R1)		0.1 - 4 m (with reflector E39-R1S)	0.1 m (5 x 5 cm white mat paper)	0.3 m (10 x 10 cm white mat paper)	1 m (30 x 30 cm white mat paper)	0.1 m (10 x 10 cm white mat paper)
Typical sensing distance for different reflector types (ref. to accessories) [2.]	—		E39-R1: 4.0 m E39-R7: 4.5 m E39-R8: 5.3 m	E39-R1: axial 3.7 m radial 2.4 m E39-R7: axial 4.2 m radial 2.7 m E39-R8: axial 5.3 m radial 3.1 m	E39-R1S: 4.3 m E39-R7: 4.8 m E39-R8: 5.6 m E39-R40: 4.3 m E39-RS3: 2 m	—			
Standard object	Opaque: 11 mm dia. min.		Opaque: 56 mm dia. min.			—			
Directional angle	3° to 20°					—			
Differential travel (hysteresis)	—					20% max.			5% max
Black/white error	—								3%
Response time	Operation and Reset: 2.5 ms max.				1 ms max	2.5 ms max.		1 ms max.	
Control output	Transistor (open collector), load current: 100 mA max. (residual voltage: 2 V max.)								
Power reset time	50 ms				100 ms max.	50 ms		100 ms	
Ambient illumination	Incandescent lamp: 3000 lx max. / Sunlight: 10000 lx max.								
Ambient temperature	Operating: -25 to 55 °C / Storage: -30 to 70 °C (with no icing or condensation)								
Ambient humidity	Operating: 35% to 85% / Storage: 35% to 95% (without condensation)								
Insulation resistance	20 MΩ min. at 500 V DC between energized parts and case								
Dielectric strength	1000 VAC max., 50 / 60 Hz for 1 min between energized parts and case								
Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude for 2 hrs each direction (X, Y, Z)								
Shock resistance	Destruction: 500 m/s² each direction (X, Y, Z)								
Enclosure ratings	IP67 [3.]; NEMA 1, 2, 4								
Light source	Infrared LED (880 nm/850 nm)			Red LED (660 nm)		Infrared LED (880 nm)			Red LED (660 nm)
Indicators	Light incident / power indicator for light source (red)	Output (orange) / light emission (red)	Light incident / power indicator for light source (red)		Light incident (red) / stability (green)	Light incident / power indicator for light source (red)		Light incident (red) / stability (green)	Output indicator (orange) / stability (green)
Sensitivity adjustment	Fixed				Fixed / Adjustable	Fixed	Adjustable		Fixed
Connection method	2 m, 5 m pre-wired cable (PVC, dia. 4 mm (18 / 0.12) [4.]) or M12-connector								
Test Input	—	[7.]	—						
Operation mode	Light-ON or Dark-ON selectable by wiring								
Weight (approx.)									
Plastic case	pre-wired (2 m)	120 g		60 g					
	connector	40 g		20 g					
Metal case	pre-wired (2 m)	180 g		90 g					
	connector	120 g		50 g					
Circuit protection	Output short-circuit and power supply reverse polarity								
Housing materials	Plastic (case: ABS; lens: PMMA)								
	Nickel brass	Nickel brass	—	Nickel brass	Nickel brass	Nickel brass	Nickel brass	Nickel brass	Nickel brass
	Stainless steel [5.]	—	—	Stainless steel [5.]	—	Stainless steel [5.]	Stainless steel [5.]	—	—

Note: 1. For stable sensing distance in detail, please refer to "Engineering Data"

- Typical sensing distance corresponds to 80% of the max. sensing distance.
- The enclosure rating IP67 of OMRON internal standards correspond to stricter test requirements than the standard IEC 60529 (refer to chapter "Precautions")
- For other cable materials (e.g. PUR) please contact your OMRON sales representative.
- Material-specification for stainless steel housing case: 1.4305 (W.-No.), 303 (AISI), 2346 (SS). For other stainless steel materials please contact your OMRON sales representative.
- with slit E39-ES18
- PNP models -B4: V_{CC} to V_{CC} -2.5 V: Emitting OFF (Source current: 3 mA max.) / Open or 0 to 2.5 V: Emitting ON (Leakage current: 0.1 mA max.)
NPN models -C4: 0 to 2.5 V: Emitting OFF (Source current: 3 mA max.) / Open or V_{CC} to V_{CC} -2.5 V: Emitting ON (Leakage current: 0.1 mA max.)

■ Ratings / Characteristics of AC Switching Models

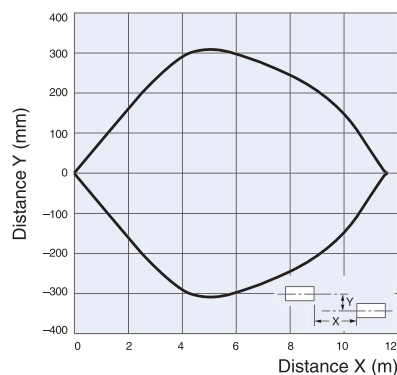
Item	E3F2-3Z1 E3F2-3Z2	E3F2-R2Z1 E3F2-R2Z2	E3F2-DS10Z1 E3F2-DS10Z2
Sensing method	Through-beam	Non-polarizing Retroreflective	Diffuse reflective (wide-beam characteristic)
Power supply voltage	24 to 240 VAC $\pm 10\%$, 50 / 60 Hz		
Current consumption	10 mA max.	5 mA max.	
Rated sensing distance[1.]	3 m	0.1 - 2 m (with reflector E39-R1)	0.1 m (5 x 5 cm white mat paper)
Typical sensing distance for different reflector types [2.]	—	E39-R1: 3,4 m E39-R7: 3,9 m E39-R8: 5,2 m	—
Detectable object	Opaque object: 11 mm min.	Opaque object: 56 mm min.	Opaque objects
Directional angle	3° to 20°		—
Differential travel	—		20% max.
Response time	30 ms max.		
Control output	AC solid state (SCR) 200 mA max.; residual voltage: 5 V max. at 200 mA		
Power reset time	100 ms		
Ambient illumination	Incandescent lamp: 3000 lx max. Sunlight: 10000 lx max.		
Ambient temperature	Operating: -25 to 55 °C / Storage: -30 to 70 °C (with no icing or condensation)		
Ambient humidity	Operating: 35% to 85% / Storage: 35% to 95% (without condensation)		
Insulation resistance	20 M Ω min. at 500 V DC between energized parts and case		
Dielectric strength	1500 VAC, 50 / 60 Hz for 1 min between energized parts and case		
Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude for 2 hrs each direction (X, Y, Z)		
Shock resistance	500 m/sqr (approx. 50 g) for each direction (X, Y, Z)		
Enclosure rating	IP67 [3.]; NEMA 1, 2, 4		
Light source	Infrared LED (880 nm)		
Indicators	Light incident/power indicator for light source (red)		
Sensitivity adjustment	Fixed		
Connection method	2 m, 5 m pre-wired cable (PVC dia. 4 mm (14 / 0.15))		
Operation mode	Light-ON or Dark-ON (fixed)		
Circuit protection	None		
Weight (approx.)	110 g (pre-wired 2 m cable)		
Housing materials	Plastic (case: ABS; lens: PMMA)		

- Note:**
1. For stable sensing distance in detail, please refer to "Engineering Data"
 2. Typical sensing distance corresponds to 80% of the max. sensing distance.
 3. The enclosure rating IP67 of OMRON internal standards correspond to stricter test requirements than the standard IEC 60529 (refer to chapter "Precautions")

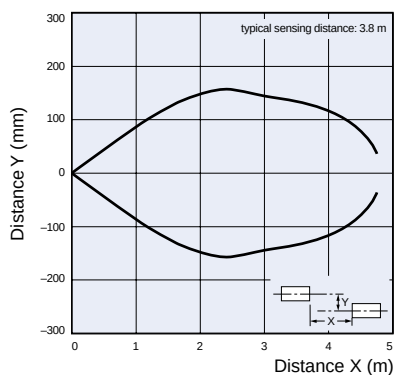
Engineering Data (Typical)

■ Operating Range (typical)

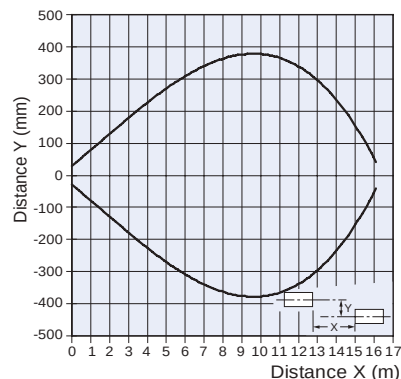
Through-beam Models (axial)
E3F2-7□4-□



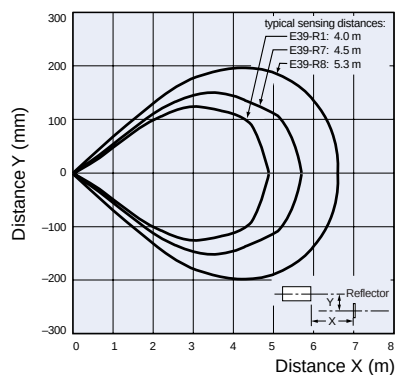
Through-beam Models (axial)
E3F2-3Z□



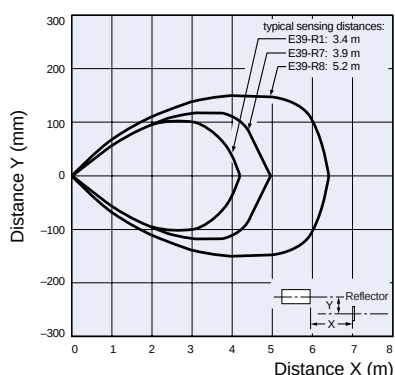
Through-beam Models (axial)
E3F2-10□



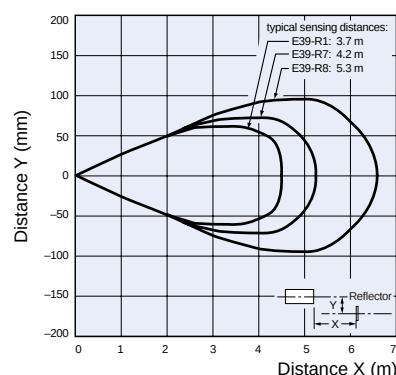
Retroreflective Models (axial)
E3F2-R2□4-□ (non polarizing)
and reflectors



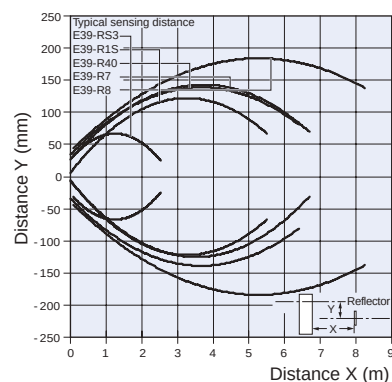
Retroreflective Models (axial)
E3F2-R2Z□ (non polarizing)
and reflectors



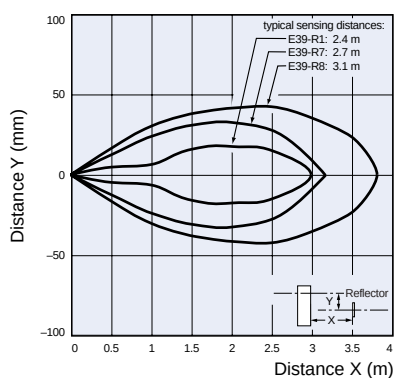
Retroreflective Models (axial)
E3F2-R2R□4-□ (polarizing)
and reflectors



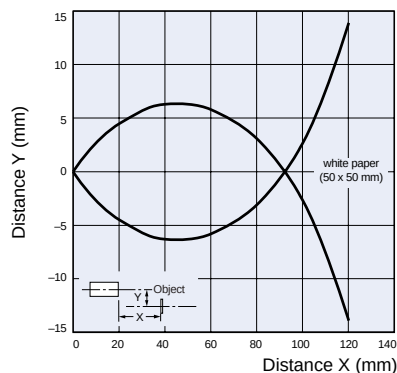
Retro-reflective Models (axial)
E3F2-R4□4-□ (polarizing)



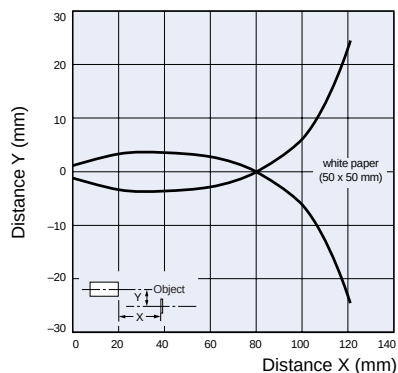
Retroreflective Models (radial)
E3F2-R2R□41-□ (polarizing)
and reflectors



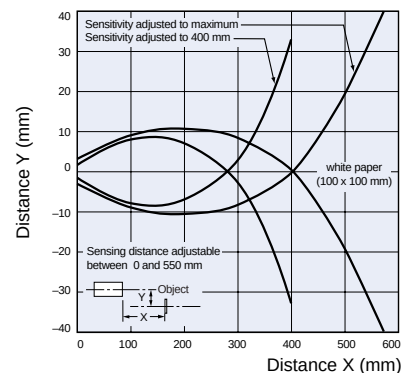
Diffuse reflective Models (axial)
E3F2-DS10□4-□ (wide-beam type)



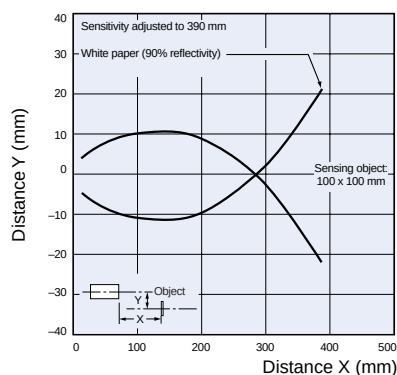
Diffuse reflective Models (axial)
E3F2-DS10Z-□ (wide-beam type)



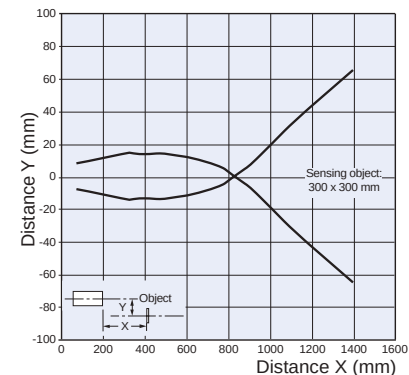
Diffuse reflective Models (axial)
E3F2-DS30□4-□



Diffuse reflective Models (radial)
E3F2-DS30□41-□

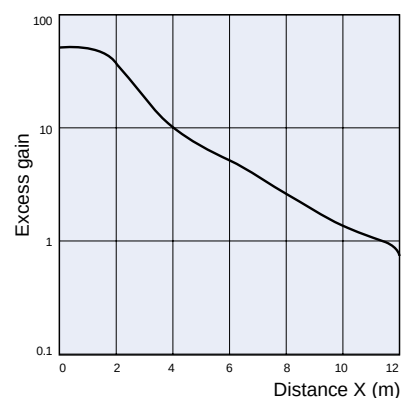


Diffuse reflective Models (axial)
E3F2-D1□4-□

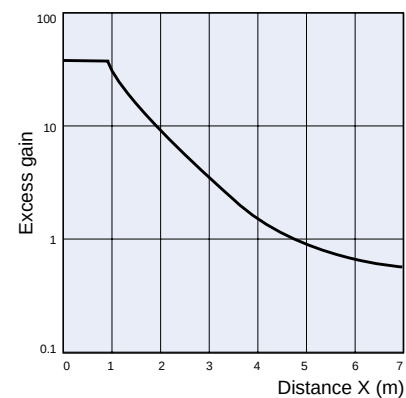


■ Excess Gain Ratio vs. Distance (typical)

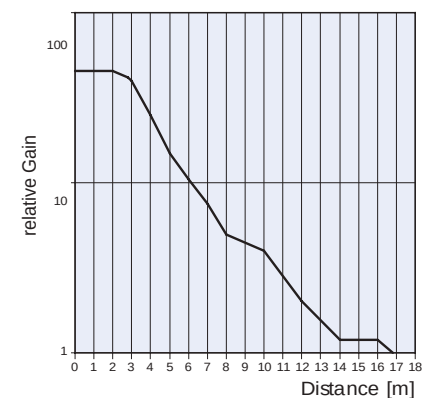
Through-beam Models (axial)
E3F2-7□4-□



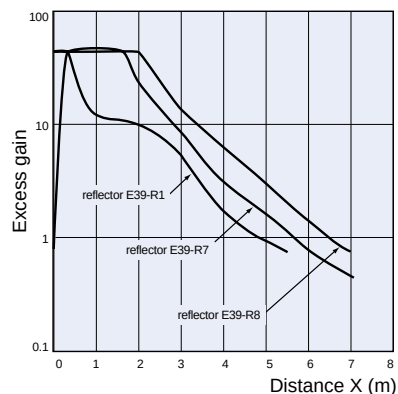
Through-beam Models (axial)
E3F2-3Z□



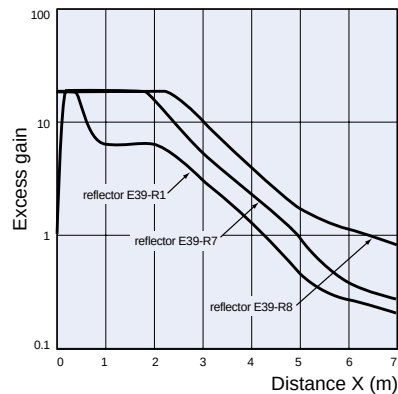
Through-beam Models (axial)
E3F2-10□



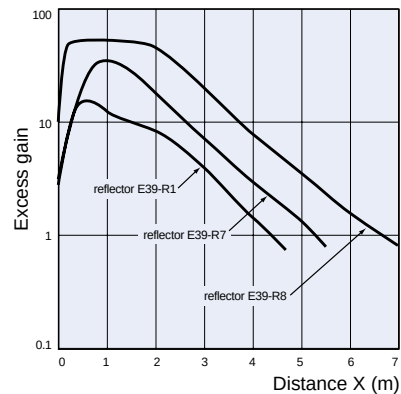
Retroreflective Models (axial)
E3F2-R2□4-□ (non polarizing)
and reflectors



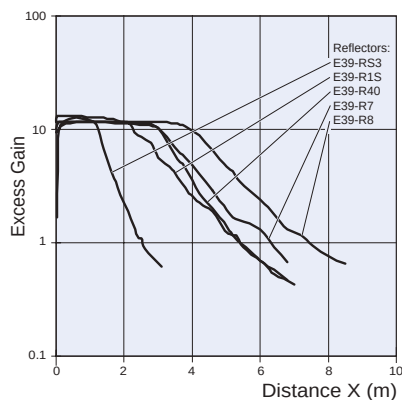
Retroreflective Models (axial)
E3F2-R2Z□ (non polarizing)
and reflectors



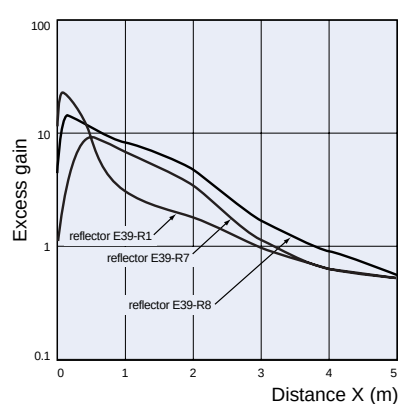
Retroreflective Models (axial)
E3F2-R2R□4-□ (polarizing)
and reflectors



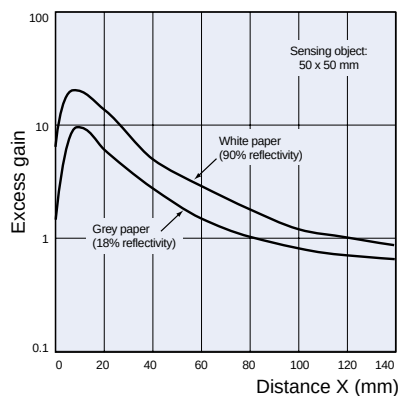
Retroreflective Models (axial)
E3F2-R4□4-□



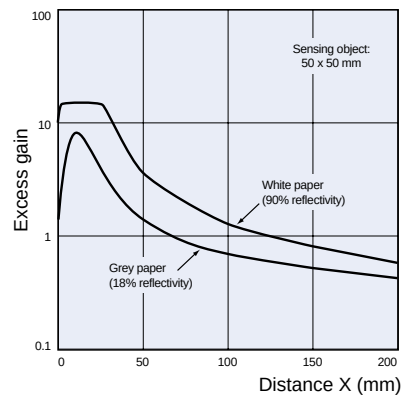
Retroreflective Models (radial)
E3F2-R2R□41-□ (polarizing)
and reflectors



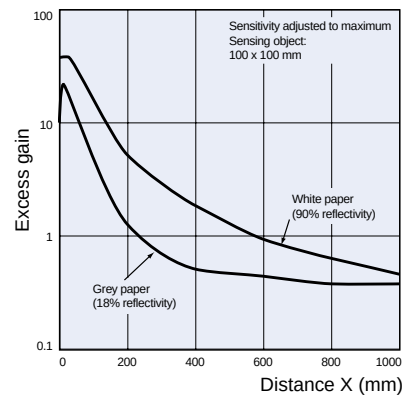
Diffuse reflective Models (axial)
E3F2-DS10□4-□ (wide-beam type)



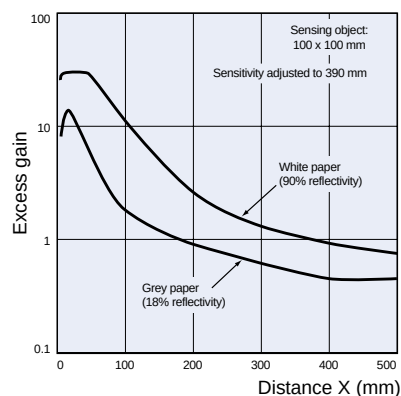
Diffuse reflective Models (axial)
E3F2-DS10Z-□ (wide-beam type)



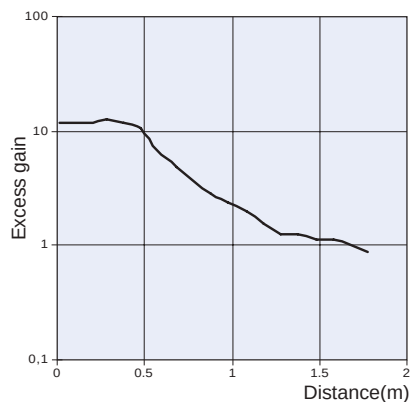
Diffuse reflective Models (axial)
E3F2-DS30□4-□



Diffuse reflective Models (radial)
E3F2-DS30□41-□

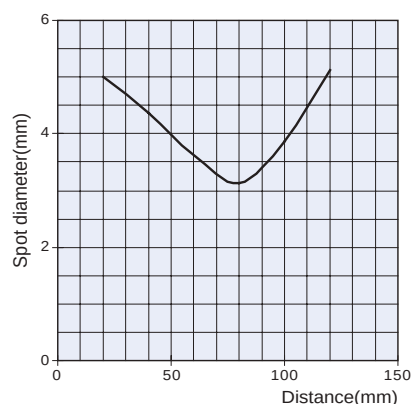


Diffuse reflective Models (axial)
E3F2-D1□4-□



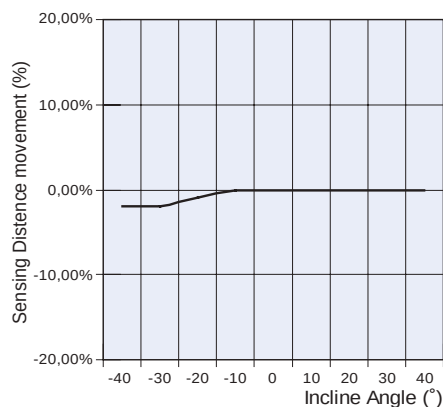
■ Light spot vs. sensing distance

Background suppression Models
E3F2-LS□

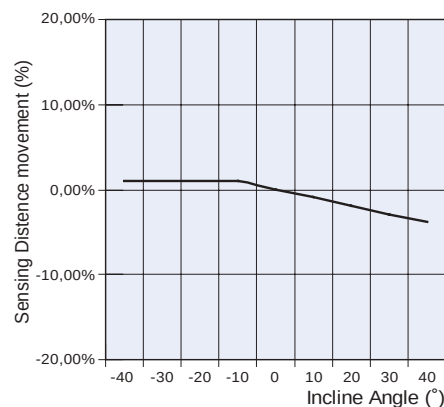


■ Incline (left and right) ■ Incline (up and down)

Background suppression Models
E3F2-LS□

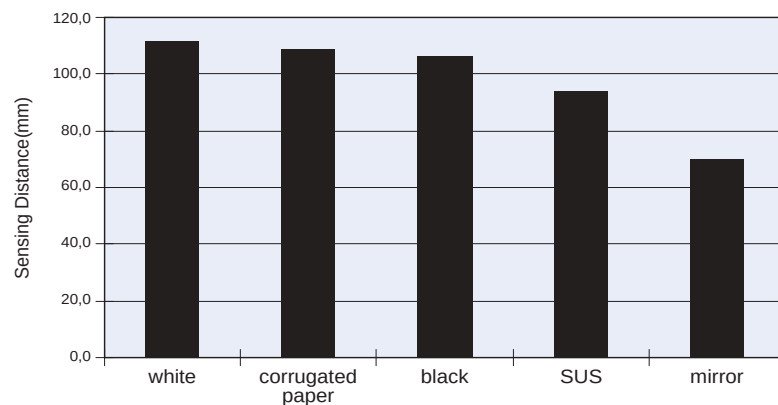


Background suppression Models
E3F2-LS□



■ Object material vs. sensing distance

Background suppression Models
E3F2-LS□

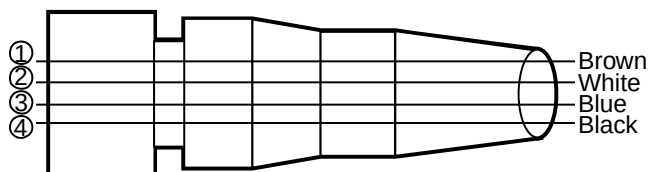


Operation

■ Output Circuits

Structure of Sensor I/O Connector

Classification	Wire color	Connector pin No.	Use
DC	Brown	①	Power supply (+V)
	White	②	Mode selection Lon/Don
	Blue	③	Power supply (0 V)
	Black	④	Output

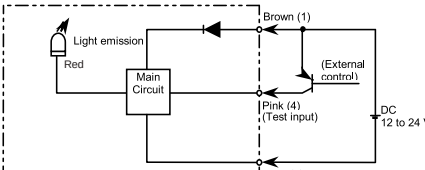
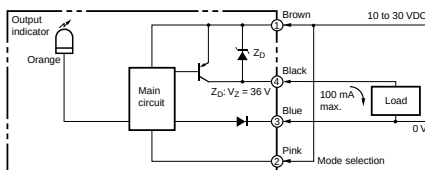
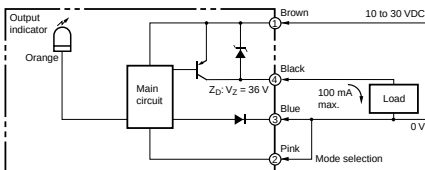
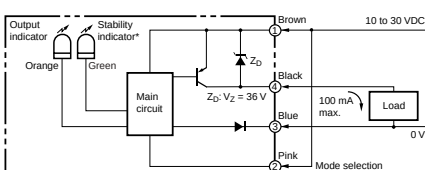
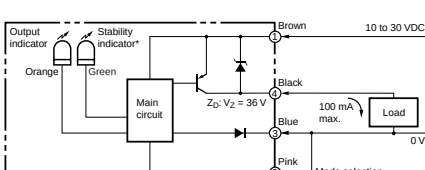


XS2F-D42□-D80-□

XS2F-G42□-G80-□

■ PNP Output

Model	Output transistor status	Timing chart	Connection method	Output circuit
E3F2-□B4-□ (except for E3F2-10B4-□ and E3F2-LS10B4-□)	—	—	—	Through-beam emitter Connector Pin Arrangement
	ON when light is incident. (Light-ON)		Connect the pink (Pin ④) and brown (Pin ①) cords or open the pink cord (Pin ④).	Connector Pin Arrangement * Only on models E3F2-R4B4-□ and E3F2-D1B4-□
	ON when light is interrupted. (Dark-ON)		Connect the pink (Pin ④) and blue (Pin ③) cords.	Connector Pin Arrangement * Only on models E3F2-R4B4-□ and E3F2-D1B4-□

Model	Output transistor status	Timing chart	Connection method	Output circuit
E3F2-10B4-□	—	Test input ON OFF  Light emission ON OFF  Indicator ON OFF 	—	Through-beam emitter 
	ON when light is incident. (Light-ON)	Incident Interrupted  Output indicator (orange) ON OFF  Output transistor ON OFF  Load (relay) Operate Release 	Connect the pink (Pin ②) and brown (Pin ①) cords or open the pink cord (Pin ②).	 Connector Pin Arrangement 
	ON when light is interrupted. (Dark-ON)	Incident Interrupted  Output indicator (orange) ON OFF  Output transistor ON OFF  Load (relay) Operate Release 	Connect the pink (Pin ②) and blue (Pin ③) cords.	 Connector Pin Arrangement 
E3F2-LS10B4-□	ON when light is incident. (Light-ON)	Incident Interrupted  Output indicator (orange) ON OFF  Output transistor ON OFF  Load (relay) Operate Release 	Connect the pink (Pin ②) and brown (Pin ①) cords or open the pink cord (Pin ②).	 Connector Pin Arrangement 
	ON when light is interrupted. (Dark-ON)	Incident Interrupted  Output indicator (orange) ON OFF  Output transistor ON OFF  Load (relay) Operate Release 	Connect the pink (Pin ②) and blue (Pin ③) cords.	 Connector Pin Arrangement 

Note: Terminal numbers for connector type.

NPN Output

Model	Output transistor status	Timing chart	Connection method	Output circuit
E3F2-□C4-□ (except for E3F2-10C4-□ and E3F2-LS10C4-□)	—	—	—	Through-beam emitter Connector Pin Arrangement
	ON when light is incident. (Light-ON)	Incident Interrupted	Connect the pink (Pin ②) and brown (Pin ①) cords or open the pink cord (Pin ②).	Connector Pin Arrangement * Only on models E3F2-R4C4-□ and E3F2-D1C4-□
	ON when light is interrupted. (Dark-ON)	Incident Interrupted	Connect the pink (Pin ②) and blue (Pin ③) cords.	Connector Pin Arrangement * Only on models E3F2-R4C4-□ and E3F2-D1C4-□
E3F2-10C4-□	—	Test input	—	Through-beam emitter Connector Pin Arrangement
	ON when light is incident. (Light-ON)	Incident Interrupted	Connect the pink (Pin ②) and brown (Pin ①) cords or open the pink cord (Pin ②).	Connector Pin Arrangement
	ON when light is interrupted. (Dark-ON)	Incident Interrupted	Connect the pink (Pin ②) and blue (Pin ③) cords.	Connector Pin Arrangement

Model	Output transistor status	Timing chart	Connection method	Output circuit
E3F2-LS10C4-□	ON when light is incident. (Light-ON)		Connect the pink (Pin ②) and brown (Pin ①) cords or open the pink cord (Pin ②).	Connector Pin Arrangement
	ON when light is interrupted. (Dark-ON)		Connect the pink (Pin ②) and blue (Pin ③) cords.	Connector Pin Arrangement

Note: Terminal numbers for connector type.

■ AC Output

Model	Output transistor status	Timing chart	Connection method	Output circuit
E3F2-3LZ	—	—	—	Through-beam emitter
E3F2-3Z1 E3F2-R2Z1 E3F2-DS10Z1-N	ON when light is incident. (Light-ON)		—	
E3F2-3Z2 E3F2-R2Z2 E3F2-DS10Z2-N	ON when light is interrupted. (Dark-ON)		—	

Dimensions

Note: All units are in millimeters unless otherwise indicated

DC-Switching Models, plastic, axial type

Cable type	Connector type
Without potentiometer E3F2-7□ E3F2-10□ E3F2-R2□4 E3F2-DS10□4-N E3F2-LS10□4 E3F2-R4□4F	E3F2-7□-P1 E3F2-10□-P1 E3F2-R2□4-P1 E3F2-DS10□4-P1 E3F2-LS10□4-P1 E3F2-R4□4F-P1
With potentiometer E3F2-DS30□4 E3F2-D1□4	E3F2-DS30□4-P1 E3F2-D1□4-P1

■ DC-Switching Models, plastic, radial type

Cable type	Connector type
Without potentiometer E3F2-R2R□41	E3F2-R2R□41-P1
With potentiometer E3F2-DS30□41	E3F2-DS30□41-P1

■ DC-Switching Models, metal (brass and stainless steel), axial type

Cable type	Connector type
Without potentiometer	
E3F2-7□-M E3F2-7□-S E3F2-10□-M E3F2-R2R□4-M E3F2-R2R□4-S E3F2-DS10□4-M E3F2-DS10□4-S E3F2-LS10□4-M E3F2-R4□4F-M	E3F2-7□-M1-M E3F2-7□-M1-S E3F2-10□-M1-M E3F2-R2R□4-M1-M E3F2-R2R□4-M1-S E3F2-DS10□4-M1-M E3F2-DS10□4-M1-S E3F2-LS10□4-M1-M E3F2-R4□4F-M1-M
With potentiometer	
E3F2-DS30□4-M E3F2-DS30□4-S E3F2-R4□4-M E3F2-D1□4-M	E3F2-DS30□4-M1-M E3F2-DS30□4-M1-S E3F2-R4□4-M1-M E3F2-D1□4-M1-M

■ DC-Switching Models, metal (brass and stainless steel), radial type

Cable type		Connector type	
Without potentiometer			
E3F2-R2R□41-M	E3F2-R2R□41-S	E3F2-R2R□41-M	E3F2-R2R□41-M1-S
With potentiometer			
E3F2-DS30□41-M	E3F2-DS30□41-S	E3F2-DS30□41-M1-M	E3F2-DS30□41-M1-S

■ AC-Switching Models, plastic, axial type

Cable type	
Without potentiometer	
E3F2-3Z□ E3F2-R2Z□ E3F2-DS10Z□-N	