



Sensor I/O Connectors (M12) (Refer to Dimensions on XS2.)

Cable	Appearance	Cable type		Model
Standard	Straight 	2 m	3-wire	XS2F-D421-DC0-F
		5 m		XS2F-D421-GC0-F
	L-shape 	2 m		XS2F-D422-DC0-F
		5 m		XS2F-D422-GC0-F

Note: For details on Sensor I/O Connectors and cables such as vibration-proof robot cables, refer to *Introduction to Sensor I/O Connectors/Sensor Controllers*.

Ratings and Specifications

Item	Model	Sensing method		Retro-reflective		
		Retro-reflective		Retro-reflective (with MSR function) *1		
		NPN	E3S-R12, R62, R17, R67	E3S-R11, R16, R61, R66	E3S-RS30E4, RS30E42	E3S-R1E4, R1E42
		PNP	---	E3S-R31, R36, R81, R86	---	---
Sensing distance			300 mm [100 mm] *2 (When using E39-R1)	1 m [100 mm] *2 (When using E39-R1)	300 mm (When using E39-R1)	1 m (When using E39-R1)
Standard sensing object			Opaque: 75-mm dia. min. 0.7-mm-thick LCD glass boards; 10-mm-dia., 1.0-mm-thick, 30-mm-long cylindrical glass objects	Opaque: 75-mm dia. min. 0.7-mm-thick LCD glass boards	Opaque: 75-mm dia. min. 10-mm-dia., 1.0-mm-thick, 30-mm-long cylindrical glass objects	
Directional angle			3° to 10°		---	
Light source (wavelength)			Infrared LED (880 nm)	Red LED (700 nm)	Infrared LED (950 nm)	
Power supply voltage			10 to 30 VDC; ripple: 10% max.		12 to 24 VDC±10%; ripple: 10% max.	
Current consumption			30 mA max.		40 mA max.	
Control output			Load power supply voltage: 30 VDC max. Load current: 100 mA max. with a maximum residual voltage of 1 V Open collector output configuration Light-ON/Dark-ON selector switch		Load power supply voltage: 24 VDC max Load current: 80 mA max. with a maximum residual voltage of 2 V NPN voltage output configuration Light-ON/Dark-ON cable connection selection	
Protection circuits			Power supply reverse polarity protection, Output short-circuit protection, Mutual interference prevention			
Response time			Operate or reset: 1 ms max.			
Sensitivity adjustment			Two-turn endless adjuster		One-turn adjuster	
Ambient illumination (Receiver side)			Incandescent lamp: 5,000 lx max. Sunlight: 10,000 lx max.		Incandescent lamp: 3,000 lx max. Sunlight: 10,000 lx max.	
Ambient temperature range			Operating: 0 to 40°C, Storage: -40 to 70°C (with no icing or condensation)			Operating: -25 to 55°C Storage: -40 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, 50/60 Hz for 1 min			
Vibration resistance			Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 h each in X, Y, and Z directions			
Shock resistance			Destruction: 500 m/s ² for 3 times each in X, Y, and Z directions			
Degree of protection			IEC 60529 IP67			
Connection method			Pre-wired (standard length: 2 m)/Standard connector			
Weight (packed state)			Pre-wired models: Approx. 110 g Standard connector: Approx. 60 g		Pre-wired models: Approx. 190 g	
Materials	Case		Polybutylene terephthalate		Zinc die-cast	
	Lens		Modified polyallylate		Polycarbonate	
	Mounting Bracket		Stainless steel (SUS304)		Iron	
Accessories			Mounting Bracket (with screw), Adjustment screwdriver, Instruction manual, Reflector		Mounting Bracket (with screw), Adjustment screwdriver, Sensitivity adjuster, Instruction manual, Reflector	

*1. Refer to MSR function of *Technical Guide (Technical version)*.

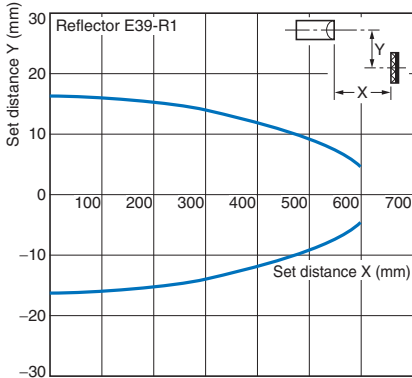
*2. Values in parentheses indicate the minimum required distance between the Sensor and Reflector.

Engineering Data (Reference Value)

Parallel Operating Range

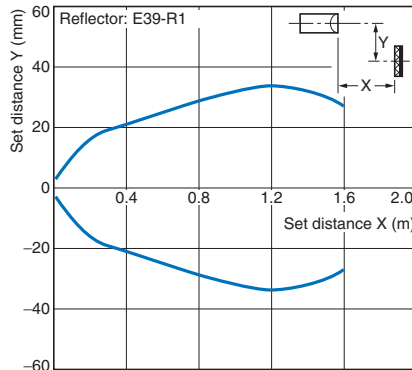
Retro-reflective

E3S-R12, E3S-R62 + E39-R1
(Supplied Reflector)



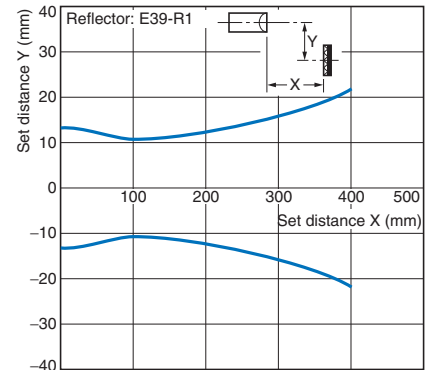
Retro-reflective

E3S-R□1, E3S-R□6 + E39-R1
(Supplied Reflector)



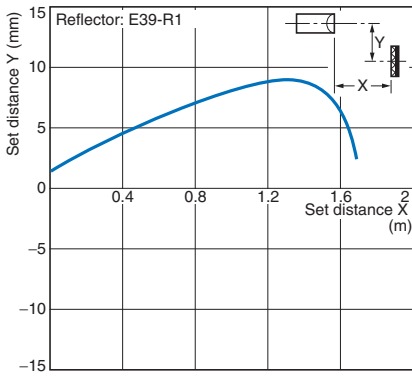
Retro-reflective

E3S-RS30E4□ + E39-R1
(Supplied Reflector)



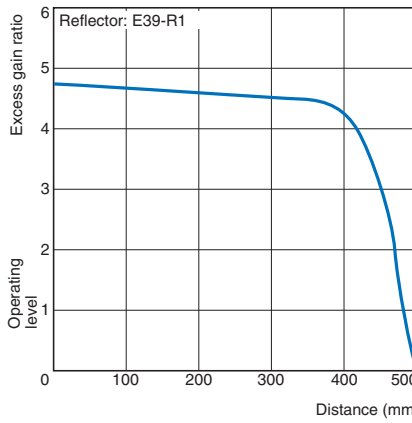
Retro-reflective

E3S-R1E4□ + E39-R1
(Supplied Reflector)

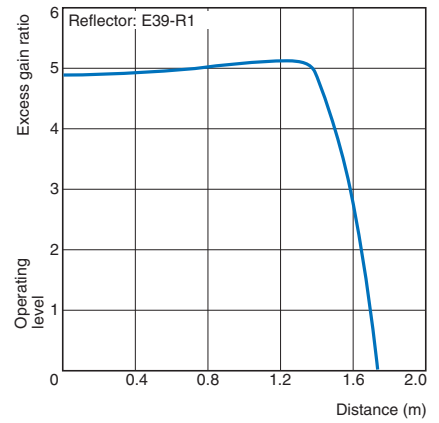


Excess Gain vs. Set Distance

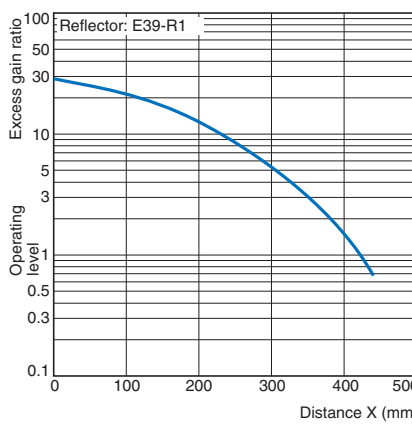
E3S-R12, E3S-R62 + E39-R1
(Supplied Reflector)



E3S-R□1, E3S-R□6 + E39-R1
(Supplied Reflector)



E3S-RS30E4□ + E39-R1
(Supplied Reflector)



E3S-R1E4□ + E39-R1
(Supplied Reflector)

