Built-in Amplifier Photoelectric Sensor (Medium Size)

E3S-A

CSM E3S-A DS E 4





Be sure to read *Safety Precautions* on page 10.

Ordering Information

Built-in Amplifier Photoelectric Sensors

Built-in Amplif	ier Photoele		Red lig	ht Infrared light			
Sensing method	Appearance	Connection	Sensing di	otonoo	Functions	Мо	del
Sensing method	Appearance	method	Sensing un	Statice	FullClions	NPN output	PNP output
		Pre-wired				E3S-AT11 Emitter E3S-AT11-L Receiver E3S-AT11-D	E3S-AT31 Emitter E3S-AT31-L Receiver E3S-AT31-D
	Horizontal	rie-wiied			Timer Turbo Self Diagnosis External Diagnosis	E3S-AT21 Emitter E3S-AT21-L Receiver E3S-AT21-D	E3S-AT41 Emitter E3S-AT41-L Receiver E3S-AT41-D
Through-beam	△,,,,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Connector (M12)		\ 7 m		E3S-AT16 Emitter E3S-AT16-L Receiver E3S-AT16-D	E3S-AT36 Emitter E3S-AT36-L Receiver E3S-AT36-D
Sensors *1	Vertical	Pre-wired				E3S-AT61 Emitter E3S-AT61-L Receiver E3S-AT61-D	E3S-AT81 Emitter E3S-AT81-L Receiver E3S-AT81-D
		rie-wiied			Timer Turbo Self Diagnosis External Diagnosis	E3S-AT71 Emitter E3S-AT71-L Receiver E3S-AT71-D	E3S-AT91 Emitter E3S-AT91-L Receiver E3S-AT91-D
		Connector (M12)				E3S-AT66 Emitter E3S-AT66-L Receiver E3S-AT66-D	E3S-AT86 Emitter E3S-AT86-L Receiver E3S-AT86-D
						E3S-AR11	E3S-AR31
	Horizontal	Pre-wired			Timer Turbo Self Diagnosis External Diagnosis	E3S-AR21	E3S-AR41
Retro-reflective Sensors		Connector (M12)		2 m		E3S-AR16	E3S-AR36
			(1	00 mm)		E3S-AR61	E3S-AR81
	Vertical	Pre-wired		*2	Timer Turbo Self Diagnosis External Diagnosis	E3S-AR71	E3S-AR91
		Connector (M12)				E3S-AR66	E3S-AR86

^{*1.} Through-beam Sensors are normally sold in sets that include both the Emitter and Receiver. Orders for individual Emitters and Receivers are accepted.

 $^{^{\}star}2.$ Values in brackets are the minimum required distance between the Sensor and Reflector.

Consing method	Appearance	Connection	Consing distance	Functions	Mod	Model	
Sensing method	Appearance	method	Sensing distance	Functions	NPN output	PNP output	
					E3S-AD13 *3	E3S-AD33	
			100 mm (wide view)	Timer Self Diagnosis	E3S-AD23	E3S-AD43	
					E3S-AD11	E3S-AD31	
	Horizontal	Pre-wired	200 mm	Timer Turbo Self Diagnosis	E3S-AD21	E3S-AD41	
	Horizoniai				E3S-AD12	E3S-AD32	
	ਰੇ		700 mm	Timer Turbo Self Diagnosis	E3S-AD22	E3S-AD42	
		Connector (M12)	100 mm (wide view)		E3S-AD18	E3S-AD38	
			200 mm		E3S-AD16	E3S-AD36	
Diffuse-reflective			700 mm		E3S-AD17	E3S-AD37	
Sensors					E3S-AD63 *3	E3S-AD83	
			100 mm (wide view)	Timer Self Diagnosis	E3S-AD73	E3S-AD93	
					E3S-AD61	E3S-AD81	
	Vertical	Pre-wired	200 mm	Timer Turbo Self Diagnosis	E3S-AD71	E3S-AD91	
	- 4				E3S-AD62	E3S-AD82	
			700 mm	Timer Self Diagnosis	E3S-AD72	E3S-AD92	
			100 mm (wide view)		E3S-AD68	E3S-AD88	
		Connector	200 mm		E3S-AD66	E3S-AD86	
		(M12)	700 mm	-	E3S-AD67	E3S-AD87	

^{*3.} The following models are available with 200-mm sensing distances: E3S-AD14 and E3S-AD64.

Accessories (Order Separately)

Insert-type Long Slit

Slit width	Sensing distance	Minimum sensing object (typical)	Model	Quantity	Remarks
0.5 mm × 11.1 mm	500 mm	0.2-mm dia.		1 of each for Emitter/	Slits can be used with the E3S-
1 mm × 11.1 mm	1.1 m	0.4-mm dia.	E39-S46	Receiver (4 Silts total)	AT Through-beam
2 mm × 13.6 mm	0.5	0.8-mm dia.	E09-340	1 of cook for Emitter/	Sensor.→Page 10
2 IIIII × 13.0 IIIII	2.5 m	0.0-IIIII ula.		Receiver (2 Slits total)	Conson. Vi age 10

Mutual Interference Prevention Filters

Sensing distance	Model	Quantity	Remarks
2.4 m	E39-E6	2 of each for Emitter/Receiver	Can be used with the E3S-AT□□ Through-beam Sensor.
		(4 Filters total)	→ Page 10

Reflectors/Other Accessories

Name	Sensing distance (typical)	Model	Quantity	Remarks
Reflectors	2 m (100 mm) * (rated value)	E39-R1	1	Provided with E3S-AR□□ Retro-reflective Sensor.
Small Reflectors	1.3 m (100 mm) *	E39-R3	1	
	600 mm (70 mm) *	E39-R4	1	
	450 mm (100 mm) *	E39-RS1	1	
Tape Reflectors	700 mm (100 mm) *	E39-RS2	1	Enables MSR function.
	900 mm (100 mm) *	E39-RS3	1	
Optical Axis Confirmation Reflector		E39-R5	1	Used to check optical axis for the E3S-AT□□ Through-beam Sensor.

Note: When using any Reflector other than the provided one, use a sensing distance of approximately 0.7 times the typical value as a guide. *Values in brackets are the minimum required distance between the Sensor and Reflector.

Mounting Brackets/Other

Appearance	Model	Quantity	Remarks
	E39-L69	1	Provided with E3S-A Horizontal Sensors.
	E39-L70	1	Provided with E3S-A Vertical Sensors.
	E39-L59	1	Provided with E3S-A Vertical Pre-wired Sensors.
	E39-L81	1	Provided with E3S-A Vertical Connector Sensors.
	E39-L97	1	Protective Cover for Horizontal Sensors Note: When mounting Sensors with Connectors, the Sensor I/O Connector will come into contact with the Bracket. Mount the Sensor with care.
	E39-L98	1	Protective Cover for Vertical Sensors Note: When mounting Sensors with Connectors, the Sensor I/O Connector will be longer. Mount the Sensor with care.
	E39-L60	1	Close Mounting Plate: Provided with E3S-A Connector Sensors.

Note: If a Through-beam Model is used, order two Mounting Brackets, one for the Emitter and one for the Receiver.

Sensors I/O Connectors

ĺ	Model	Quantity	Remarks
	E39-G2	1	Provided with product.

Sensors I/O Connectors

Cable	Appearance	Cable type		Model
	Straight	2 m	- 3-wire	XS2F-D421-DC0-A
Standard -		5 m		XS2F-D421-GC0-A
	L-shaped	2 m		XS2F-D422-DC0-A
	L-snaped	5 m		XS2F-D422-GC0-A

Note: When using Through-beam models, order one connector for the Receiver and one for the Emitter.

Ratings and Specifications

	Sensing method	Through-beam Sensors	Retro-reflective Sensors (with MSR function)		Diffuse-reflective Sensor	rs		
ltem	Model	E3S-AT11, 16, 21, 31, 36, 41, 61, 66, 71, 81, 86, 91	E3S-AR11, 16, 21, 31, 36, 41, 61, 66, 71, 81, 86, 91	E3S-AD13, 18, 23, 33, 38, 43, 63, 68, 73, 83, 88, 93	E3S-AD11, 16, 21, 31, 36, 41, 61, 66, 71, 81, 86, 91	E3S-AD12, 17, 22, 32, 37, 42, 62, 67, 72, 82, 87, 92		
Sensing distance		7 m	2 m (100 mm) *1 (When using E39-R1)	100 mm (wide view) (white paper 100 × 100 mm)	10 to 200 mm (white paper 100 × 100 mm)	700 mm (white paper 200 × 200 mm)		
Standard sen	sing object	Opaque: 10-mm dia. min.	Opaque: 75-mm dia. min.					
Differential tr	avel		-	20% max. of sensing distance	10% max. of sensing distance	20% max. of sensing distance		
Directional a	ngle	Both Emitter and Receiver: 3° to 15°	3 to 10°					
Light source	(wavelength)	Red LED (700 nm)		Infrared LED (880 nm)	Red LED (700 nm)	Infrared LED (880 nm)		
Power supply	y voltage	10 to 30 VDC, including r	ipple (p-p) 10%	1	•			
Current cons	umption	Both Emitter and Receiver: 20 mA max. (plus approx. 15 mA with turbo function)	30 mA max. (plus approx. 15 mA with turbo function)	35 mA max.	30 mA max. (plus approx. 15 mA with turbo function)	35 mA max.		
	ut tic output (Only vith self-diagnos-	Open-collector output (Ni (Only Sensors with self-d Load current: 50 mA max	PN or PNP depending on liagnostic function) Load p		I selectable			
External diagnostic input (Only on Sensors with external diagnostic		NPN with Emitter OFF: 0 V sho (source current: 1 mA ma with Emitter ON: Open (leakage current: 0.1 mA PNP with Emitter OFF: +DC sh max. (sink current: 3 mA with Emitter ON: Open (leakage current: 0.1 mA	ort-circuit or 1.5 V max. max.) mort-circuit or –1.5 VDC max.)					
outputs) Response time		0.5 ms max.	··· ··· ··					
Protection ci	rcuits	Power supply reverse polarity protection, Output short-circuit protection Power supply reverse polarity protection, Output short-circuit protection, Mutual interference prevention protection						
Response tin	ne	Operation or reset: 0.5 ms max.						
Sensitivity ac		Two-turn endless adjuster with an indicator						
Timer function	on (Only on Sen- timer function)	0 to 100 ms OFF-delay variable adjuster						
	on (Only on Sen- turbo function)	Yes (with turbo switch)						
Ambient illun er side)	nination (Receiv-	Incandescent lamp: 5,000 Sunlight: 10,000 lx max.) lx max.					
Ambient tem	perature	Storage: -40°C to 70°C ((with no icing or condens with no icing or condensat					
Ambient hum		Operating: 35% to 85% (vi Storage: 35% to 95% (with	th no condensation)					
Insulation res			etween current-carrying p					
Dielectric str		1,000 VAC, 50/60 Hz for	1 min. between current-ca	rrying parts and case				
Vibration res (destruction)	istance	10 to 55 Hz, 1.5-mm doul	ole amplitude for 2 hours	each in X, Y, and Z direction	ons			
Shock resista (destruction)	ance	Destruction: 500m/s², 3 ti	mes each in X, Y, and Z o	lirections				
Degree of protection IEC IP67; NEMA: 4X (indoors only) *2								
Connection method Weight (packed state)		Pre-wired (standard length: 2 m) or M12 connector Pre-wired cable: Approx. 150 g Connector: Approx. 70 g Connector: Approx. 70 g Connector: Approx. 50 g						
	Case	PBT		<u> </u>				
	Lens	Denatured polyallylate						
Material	Mounting Bracket	Stainless steel (SUS304)						
		Mounting bracket (with so	rews), Sensitivity adjustm	ent driver. Sensitivity adiu	sting knob. Instruction she	et Close mounting plate		

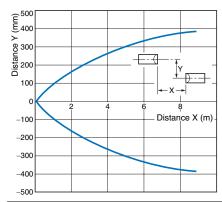
^{*1.} Values in brackets are the minimum required distance between the Sensor and Reflector.
*2. National Electrical Manufacturers Association

Engineering Data (Typical)

Parallel Sensing Range

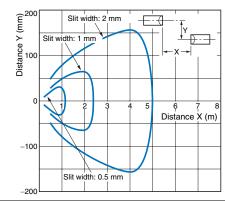
Through-beam Sensors

E3S-AT□□



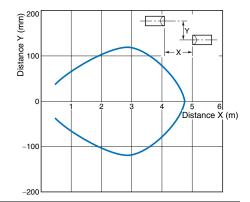
Through-beam Sensors E3S-AT□□ + E39-S46

(Slit Sold Separately)



Through-beam Sensors

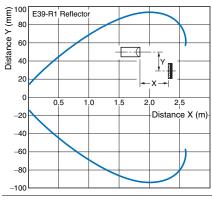
E3S-AT□□ + E39-E6 (Filter Sold Separately)



Parallel Sensing Range

Retro-reflective Sensors

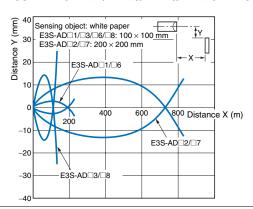
E3S-AR□□ + E39-R1 (with Reflector)



Sensing Range

Diffuse-reflective Sensors

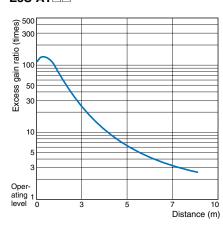
E3S-AD 1/AD 2/AD 3/AD 6/AD 7/AD 8



Excess Gain vs. Set Distance

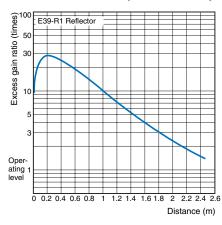
Through-beam Sensors

E3S-AT□□



Retro-reflective Sensors

E3S-AR□□ + E39-R1 (with Reflector)



Diffuse-reflective Sensor

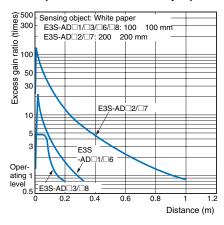
Diffuse-reflective Sensor

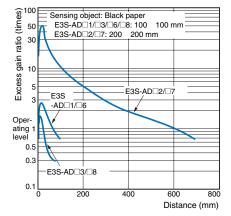
Sensing Object Size vs. Sensing Distance

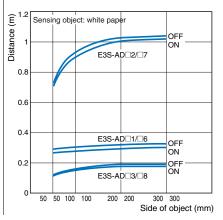
E3S-AD□1/AD□2/AD□3/AD□6/AD□7/ AD□8 (Detection of White Paper)

E3S-AD□1/AD□2/AD□3/AD□6/AD□7/ AD□8 (Detection of Black Paper)

E3S-AD□1/AD□2/AD□3/AD□6/AD□7/ AD□8







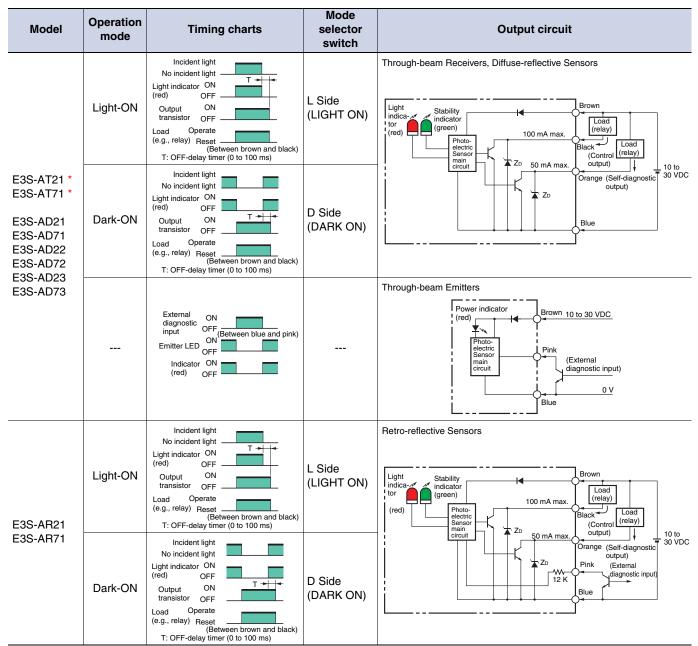
I/O Circuit Diagrams

NPN Output

Model	Operation mode	Timing charts	Mode selector switch	Output circuit
E3S-AT11 * E3S-AT16 * E3S-AT61 * E3S-AT66 * E3S-AR11 E3S-AR16	Light-ON	Incident light No incident light Light indicator ON (red) OFF Output ON transistor OFF Load Operate (e.g., relay) Reset (Between brown and black)	L Side (LIGHT ON)	Through-beam Receivers, Retro-reflective Sensors, Diffuse-reflective Sensors Light indi- cator (green) (Control output) (Control output) (Relay) (Relay) 10 to make the control output ou
E3S-AR10 E3S-AR61 E3S-AD11 E3S-AD16 E3S-AD61 E3S-AD66 E3S-AD12	Dark-ON	Incident light No incident light Light indicator ON (red) OFF Output ON transistor OFF Load Operate (e.g., relay) Reset (Between brown and black)	D Side (DARK ON)	Connector Pin Arrangement One of the content of th
E3S-AD17 E3S-AD62 E3S-AD67 E3S-AD13 E3S-AD18 E3S-AD63 E3S-AD68	Through-be	Power indica-ind	Brown Blue	To to To Note: Pins 2 and 4 are not used.

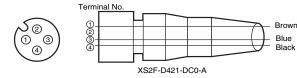
^{*}Models numbers for Through-beam Sensors (E3S-ATII) are for sets that include both the Emitter and Receiver.

The model number of the Emitter is expressed by adding "-L" to the set model number (example: E3S-AT11-L 2M), the model number of the Receiver, by adding "-D" (example: E3S-AT11-D 2M). Refer to *Ordering Information* to confirm model numbers for Emitter and Receivers.



^{*}Models numbers for Through-beam Sensors (E3S-AT□1) are for sets that include both the Emitter and Receiver.

Structure of Sensor I/O Connector

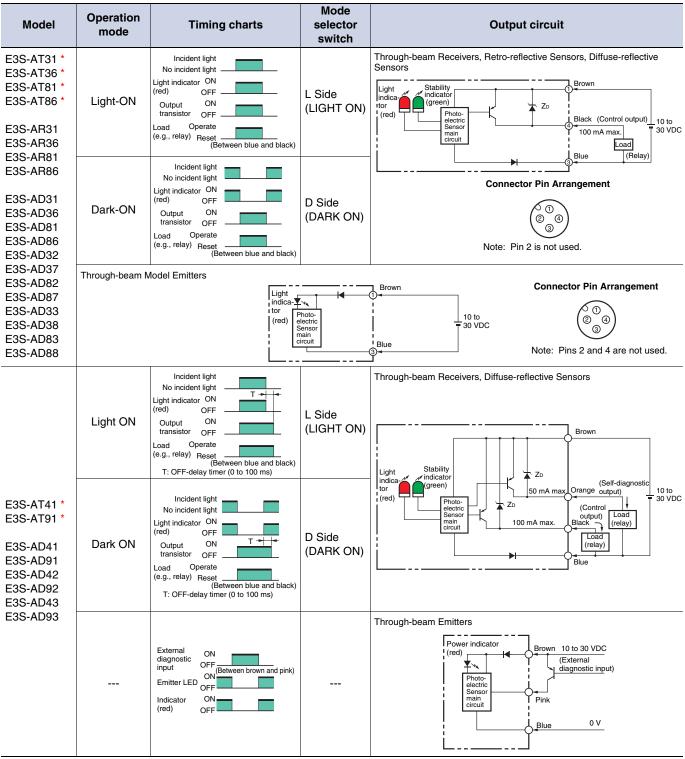


Classification	Wire color	Connection Pin No.	Application
For DC	Brown	1	+V
		2	
	Blue	3	0 V
	Black	4	Output

Note: Pin No. 2 is not used.

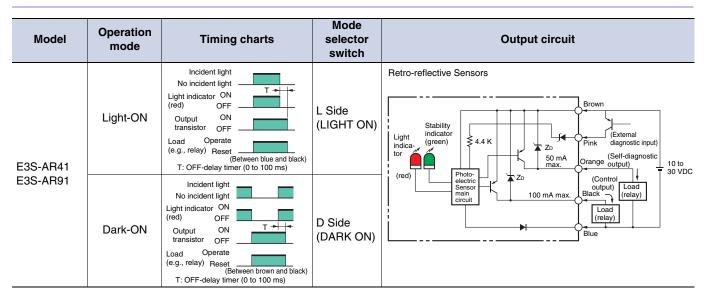
The model number of the Emitter is expressed by adding "-L" to the set model number (example: E3S-AT21-L 2M), the model number of the Receiver, by adding "-D" (example: E3S-AT21-D 2M). Refer to *Ordering Information* to confirm model numbers for Emitter and Receivers.

PNP Output

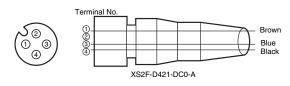


^{*}Models numbers for Through-beam Sensors (E3S-AT \(\) are for sets that include both the Emitter and Receiver.

The model number of the Emitter is expressed by adding "-L" to the set model number (example: E3S-AT31-L 2M), the model number of the Receiver, by adding "-D" (example: E3S-AT31-D 2M). Refer to Ordering Information to confirm model numbers for Emitter and Receivers.



Structure of Sensor I/O Connector



Classification	Wire color	Connection Pin No.	Application
For DC	Brown	1	+V
		2	
	Blue	3	0 V
	Black	4	Output

Note: Pin 2 is not used.

Adjustment Methods

Sensitivity Adjustment for Diffuse-reflective Sensors Set to Light ON

Item	Sensing condition	Sensitivity adjuster	Indicators		Procedure
1) Position A	Photoelectric Sensor _ Backg-	(A)	ON → OFF	OFF → ON	Locate a sensing object at the sensing distance, set the sensitivity adjuster to the minimum scale position, and gradually increase sensitivity by turning
171 031101174	Sensing object	Min. Max.	Stability indicator (green)	Light indicator (red)	the sensitivity adjuster clockwise until the incident light indicator (red LED) is ON. Position A is where the indicator has turned ON.
2) Position B	Photoelectric Sensor Backg- round object Sensing object	Min. (C) (B) Max.	ON → OFF Stability indicator (green)	ON → OFF Light indicator (red)	Position B is when the sensing object is removed and the sensitivity adjuster is turned clockwise until the incident light indicator (red LED) is ON. Position C is where the adjuster is turned counterclockwise (reducing the sensitivity) from position B until the incident light indicator (red LED) is OFF. When there are no background objects, the maximum sensitivity is position C.
+			ON	$ON \to \mathbf{OFF}$	Set the sensitivity adjuster to halfway between (A) and (C) (at the optimum
3) Setting		(A) (C)			sensitivity). Check that the stability indicator (green LED) turns ON
o, cening		Min. Max.	Stability indicator (green)	Light indicator (red)	according to whether the sensing object is there or not. There is not sufficient margin if it does not turn ON. If this is the case, reconsider the detection method.

Unlike conventional Photoelectric Sensors, the variation in the sensitivity of E3S-A Photoelectric Sensors is minimal. This means the sensitivity can be adjusted on only a single Photoelectric Sensor, and then the adjusters on the other Photoelectric Sensors can be set to the same scale position. There is no need to adjust the sensitivity of each Photoelectric Sensor individually.

Safety Precautions

MARNING

This product is not designed or rated for ensuring safety of persons.

Do not use it for such purposes.



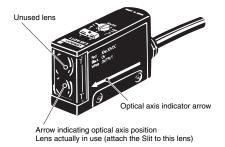
Precautions for Correct Use

Do not use the product in atmospheres or environments that exceed product ratings.

Mounting

Position of Optical Axis of Through-beam Model

Unlike conventional through-beam sensors, the E3S-A Through-beam Photoelectric Sensor incorporates 2 lenses. The lens actually in use is the one marked with an arrow indicating the position of the optical axis. When using a Slit, attach it to the lens marked with the arrow.

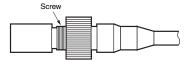


Position of Arrow Indicating Optical Axis

E3S-A (Vertical Sensors) E3S-A (Horizontal Sensors) Bottom Sensors)	Model	Position of lens in use
(Vertical Sensors) E3S-A (Horizontal Bottom	E3S-A	Тор
(Horizontal Bottom	(Vertical Sensors)	
,	E3S-A	Bottom
Sensors)	(Horizontal	
	Sensors)	

Tightening the Connector

Manually tighten the connector until the threads have completely disappeared. If tightening is insufficient, the degree of protection may not be maintained, or the connector may become loose when it is subjected to vibration. <u>Using pliers to tighten the connector may damage it.</u>

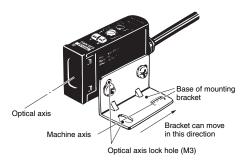


Use the E39-L60 Close Mounting Plate (provided) if the Sensor is mounted using mounting brackets or if it is mounted directly. (Refer to *Dimensions*.)

Mounting Bracket (Provided)

The direction of the optical axis coincides with the machine axis of the E3S-A when the mounting screw is inserted into the lock hole of the Mounting Bracket. If the mounting surface and the screw hole are correctly aligned toward the sensing object (or toward the Retroreflector for a Through-beam Sensor), the mechanical axis and optical axis will be aligned when the screw is inserted into the hole. Incident light will be detected, and time-consuming adjustment will not be necessary. (If, however, the mounting surface is not flat, adjustment of the optical axis may still be required.) Adjust the position of the Sensor so that incident light points at the center. Make sure that the incident light is at a fixed position.

The maximum tightening torque of the screw is 0.53 N.m max.



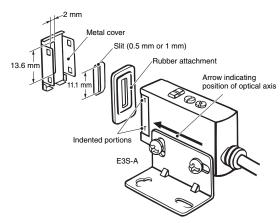
Adjustments

E39-S46 Through-beam Slits

(Accessory, order separately)

Use the rubber attachment with the metal cover if a slit width of 2 mm is required. (A Slit is not required in this case.) Insert the 0.5- or 1-mm Slit between the metal cover and rubber attachment if a slit width of 0.5 or 1 mm is desired.

These Slits fit into the rubber attachment.



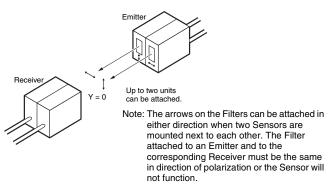
Apply the Slit to the lens of the Photoelectric Sensor marked with an arrow indicating the position of the optical axis (apply it to the bottom lens of Horizontal Sensors and the top lens of Vertical Sensors).

E39-E6 Polarized Mutual Interference Prevention Filters for Through-beam Sensors

(Accessory, order separately)

A set of 4 Filters are sold together for two Through-beam Sensors (for 2 each for Emitters and Receivers). Order one for every two sets of Photoelectric Sensors.

For mounting, refer to the figure of the Through-beam Slits.

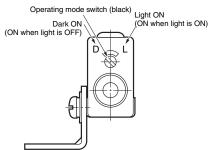


The arrow printed on the cover indicates the direction of polarization. By attaching the Filters opposite to each other in polarization to the Emitters and the Receivers in rows, mutual interference can be prevented (in any case, the Filter attached to an Emitter and to the corresponding Receiver must be the same in direction of polarization or the Photoelectric Sensor will not function).

Operating Mode Selection

As shown in the following illustration, the E3S-A has an operating mode selector on the panel where the Receiver connector is located.

With this operating mode selector, the E3S-A is in either Dark-ON or Light-ON mode.



The default operating mode is shown in the following table.

3		
Sensing method	Default switch setting	
Through-beam Sensors Retro-reflective Sensors	Dark-ON	
Diffuse-reflective Sensors	Light-ON	



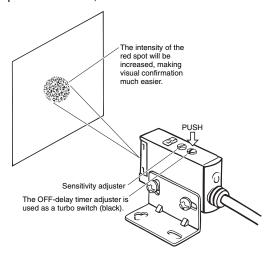
The Emitter of the Through-beam Sensor with the self-diagnostic feature incorporates a turbo switch. When this switch is ON, the intensity of the red LED light source can be increased to make a brighter spot.

Turbo Function (Turbo Switch)

The turbo function is effective with the turbo switch pressed, and the function is reset automatically when released. With the turbo function switched ON, the light spot is visible even at a distance of 200 mm, making it easy to check the sensing position and the angle of the optical axis.

Precautions

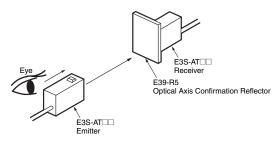
- (1)Do not keep the turbo switch pressed for longer than 3 minutes. (It will not break even if it is pressed for an extended period.)
- (2)Pressing the switch may change the timer delay settings. Set the timer after using the turbo function to check the optical axis.
- (3)To press the switch, use a force of 9.8 N max.



Using the E39-R5 Optical Axis Reflector for Throughbeam Sensors

(Accessory, order Separately)

Use this attachment when the set distance is long and adjustment is mechanically difficult with a sensing object.



Attach the Reflector to the Receiver.

Look at the Reflector from right behind the Emitter. The Reflector should be bright with red light when the optical beam strikes the Reflector. If the Emitter has a turbo function, the Reflector looks brighter with the function switched ON.

When the Reflector is removed, the light beam strikes the Receiver.

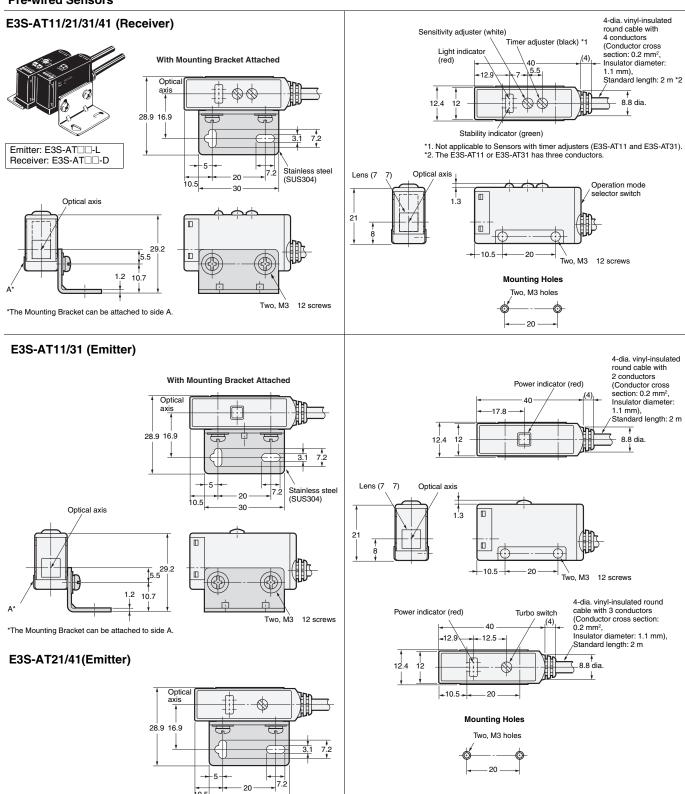
(Unit: mm)

Dimensions

E3S-A Built-in Amplifier Photoelectric Sensor

Through-beam Sensors (Horizontal)

Pre-wired Sensors

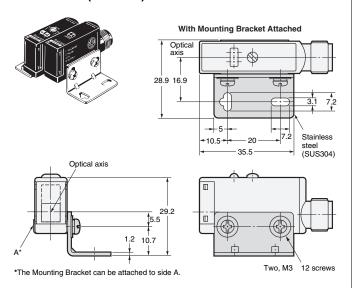


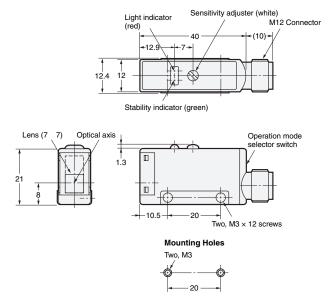
Note: Models numbers for Through-beam Sensors (E3S-AT□1) are for sets that include both the Emitter and Receiver.

The model number of the Emitter is expressed by adding "-L" to the set model number (example: E3S-AT11-L 2M), the model number of the Receiver, by adding "-D" (example: E3S-AT11-D 2M). Refer to *Ordering Information* to confirm model numbers for Emitter and Receivers.

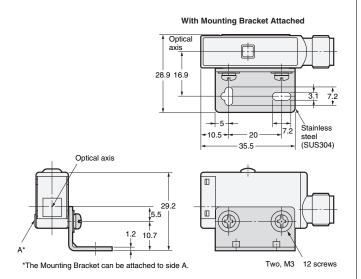
Sensors with Standard Connectors

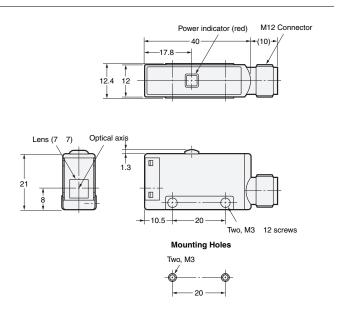
E3S-AT16/36 (Receiver)





E3S-AT16/36 (Emitter)





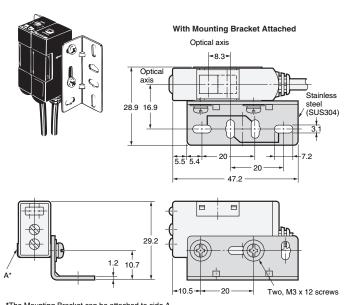
Note: Models numbers for Through-beam Sensors (E3S-AT \square 6) are for sets that include both the Emitter and Receiver.

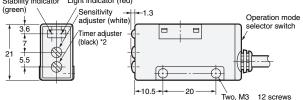
The model number of the Emitter is expressed by adding "-L" to the set model number (example: E3S-AT16-L 2M), the model number of the Receiver, by adding "-D" (example: E3S-AT16-D 2M). Refer to *Ordering Information* to confirm model numbers for Emitter and Receivers.

Through-beam Sensors (Vertical)

Pre-wired Sensors

E3S-AT61/71/81/91 (Receiver)





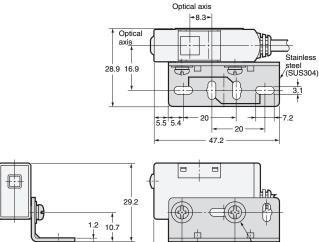
*1. The E3S-AT61 or E3S-AT81 has three conductors.
*2. Not applicable to timer adjuster models E3S-AT61 and E3S-AT81.

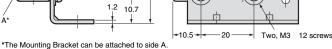


*The Mounting Bracket can be attached to side A

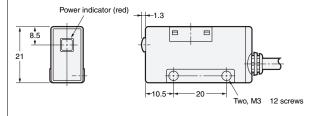
E3S-AT61/81 (Emitter)

With Mounting Bracket Attached

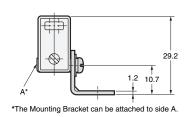


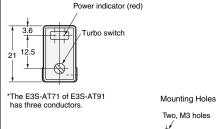


4-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.2 mm², Insulator diameter: 1.1 mm), Standard length: 2 m *



E3S-AT71/91 (Emitter)





Two, M3 holes

Two, M3 holes

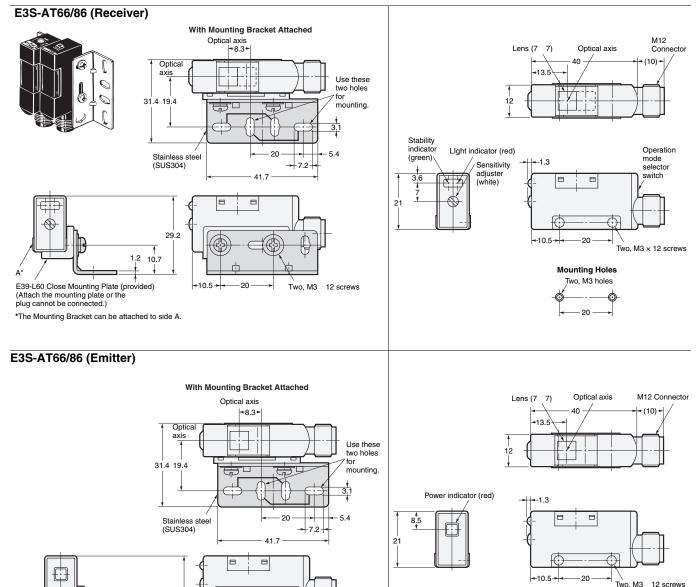
Two, M3 holes

Two, M3 holes

Note: Models numbers for Through-beam Sensors (E3S-AT□1) are for sets that include both the Emitter and Receiver.

The model number of the Emitter is expressed by adding "-L" to the set model number (example: E3S-AT61-L 2M), the model number of the Receiver, by adding "-D" (example: E3S-AT61-D 2M). Refer to *Ordering Information* to confirm model numbers for Emitter and Receivers.

Connector Sensors



Note: Models numbers for Through-beam Sensors (E3S-AT \square 6) are for sets that include both the Emitter and Receiver.

The model number of the Emitter is expressed by adding "-L" to the set model number (example: E3S-AT66-L 2M), the model number of the Receiver, by adding "-D" (example: E3S-AT66-D 2M). Refer to *Ordering Information* to confirm model numbers for Emitter and Receivers.

Two, M3 12 screws

29.2

1.2 10.7

E39-L60 Close Mounting Plate (provided)

*The Mounting Bracket can be attached to side A.

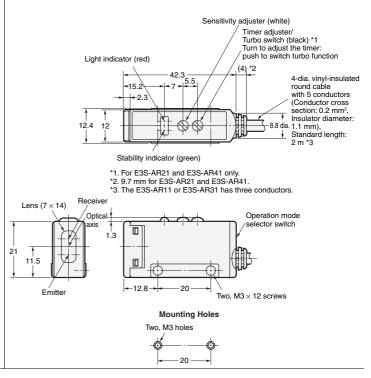
(Attach the mounting plate or the plug cannot be connected.)

Mounting Holes
Two, M3 holes

Retro-reflective Sensors (Horizontal)

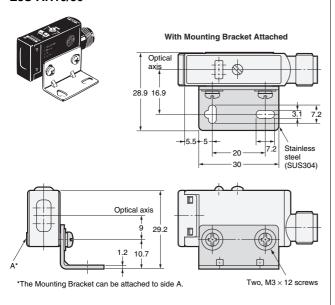
Pre-wired Sensors

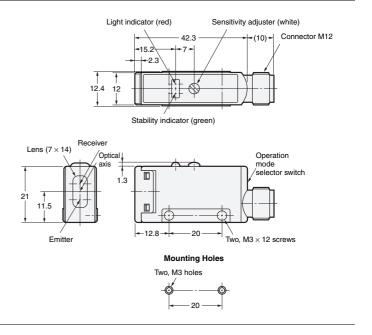
With Mounting Bracket Attached Optical axis 10.5 Optical axis Optical axis 12.10.7 Two, M3 × 12 screws



Sensors with Connectors

E3S-AR16/36

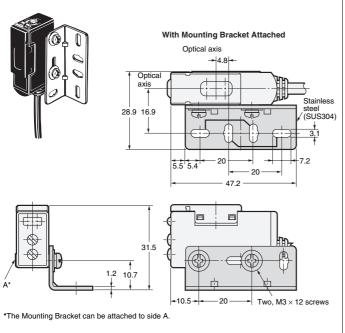


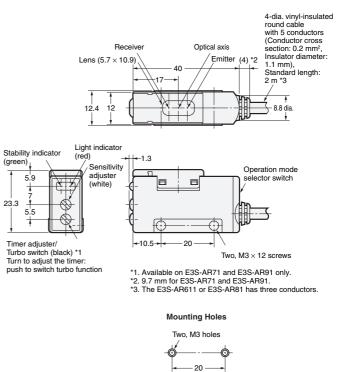


Retro-reflective Sensors (Vertical)

Pre-wired Sensors

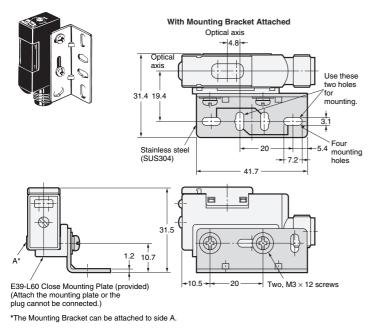
E3S-AR61/71/81/91

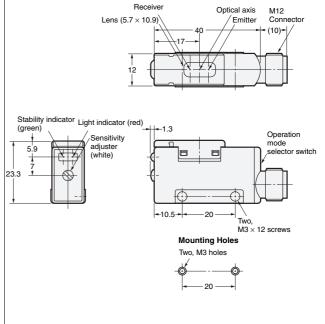




Sensors with Connectors

E3S-AR66/86

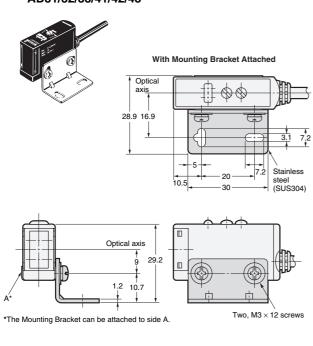


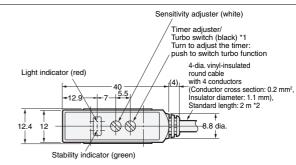


Diffuse-reflective Sensors (Horizontal)

Pre-wired Sensors

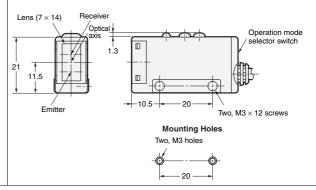
E3S-AD11/12/13/21/22/23 -AD31/32/33/41/42/43





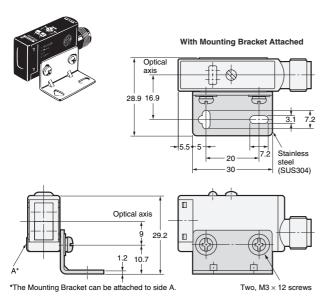
- *1. Timer adjuster: Not available on E3S-AD11, E3S-AD12, E3S-AD13, E3S-AD31, E3S-AD32 and E3S-AD33.
- Turbo switch: Available on E3S-AD21 and E3S-AD41 only.

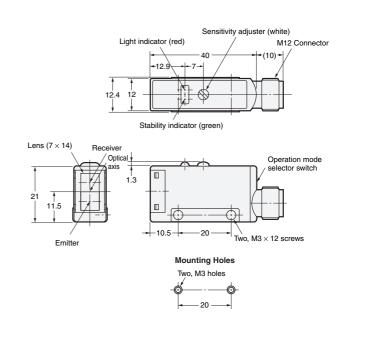
 *2. The E3S-AD11, E3S-AD12, E3S-AD13, E3S-AD31, E3S-AD32, or E3S-AD33 has three conductors.



Sensors with Connectors

E3S-AD16/17/18/36/37/38

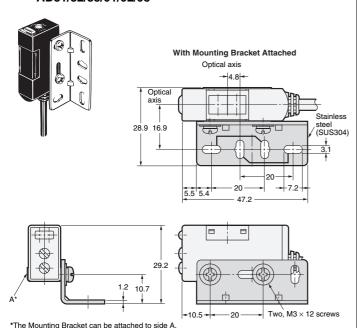


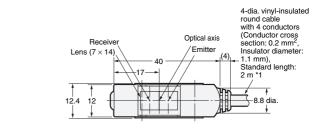


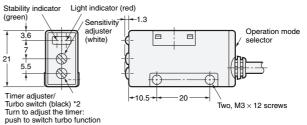
Diffuse-reflective Sensors (Vertical)

Pre-wired Sensors

E3S-AD61/62/63/71/72/73 -AD81/82/83/91/92/93







- *1, E3S-AD61, E3S-AD62, E3S-AD63, E3S-AD81, E3S-AD82, and E3S-AD83 have
- three conductors.

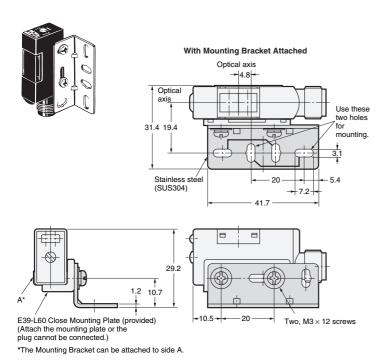
 *2. Timer adjuster: Not available on E3S-AD61, E3S-AD62, E3S-AD63, E3S-AD81, E3S-AD82 and E3S-AD83. Turbo switch: Available on E3S-AD71 and E3S-AD91 only.

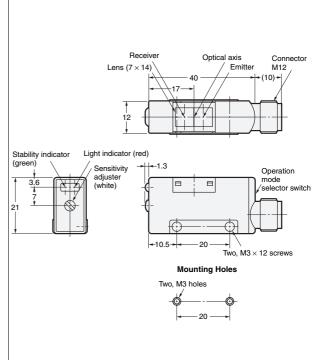
Mounting Holes



Sensors with Connectors

E3S-AD66/67/68/86/87/88



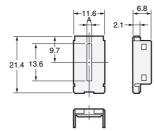


Accessories (Order Separately)

Insert-type Long Slit (For Through-beam Model)





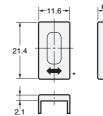


Name	Dimensions A	Material	Quantity
Supporter	2 mm	Stainless steel (SUS304)	One each for Emitter and Receiver (total of 2)
Slits	0.5 mm	PVC	One each for Emitter and
Onto	1 mm	1 40	Receiver (total of 4)

Filters for Mutual Interference Prevention (For Through-beam Model)

È39-E6

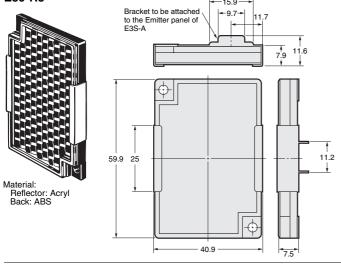




Material: Stainless steel (SUS304)

Optical Axis Confirmation Reflector (For Through-beam Model)

E39-R5



Reflectors Mounting Brackets

In the interest of product improvement, specifications are subject to change without notice.

^{*}Two of each for the Emitter and Receiver (total of four)

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2010.9

In the interest of product improvement, specifications are subject to change without notice.

