

## 阅读申明

- 1.本站收集的数据手册和产品资料都来自互联网，版权归原作者所有。如读者和版权方有任何异议请及时告之，我们将妥善解决。
- 2.本站提供的中文数据手册是英文数据手册的中文翻译，其目的是协助用户阅读，该译文无法自动跟随原稿更新，同时也可能存在翻译上的不当。建议读者以英文原稿为参考以便获得更精准的信息。
- 3.本站提供的产品资料，来自厂商的技术支持或者使用者的心得体会等，其内容可能存在描述上的差异，建议读者做出适当判断。
- 4.如需与我们联系，请发邮件到marketing@iczoom.com，主题请标有“数据手册”字样。

## Read Statement

1. The datasheets and other product information on the site are all from network reference or other public materials, and the copyright belongs to the original author and original published source. If readers and copyright owners have any objections, please contact us and we will deal with it in a timely manner.
2. The Chinese datasheets provided on the website is a Chinese translation of the English datasheets. Its purpose is for reader's learning exchange only and do not involve commercial purposes. The translation cannot be automatically updated with the original manuscript, and there may also be improper translations. Readers are advised to use the English manuscript as a reference for more accurate information.
3. All product information provided on the website refer to solutions from manufacturers' technical support or users the contents may have differences in description, and readers are advised to take the original article as the standard.
4. If you have any questions, please contact us at marketing@iczoom.com and mark the subject with "Datasheets" .

Compact Sensor Offers Long Sensing Distance and Superior Noise-Immunity

- Photo-IC provides long sensing distance: 15 m for through-beam, 4 m for retroreflective, and 1 m for diffuse
- Integrated Photo-IC improves noise immunity to interference from inverters and other inductive loads
- New injection molding technology assures IP67 rating to withstand water and dust
- Switch-selectable, Light-ON/Dark-ON operation
- M8 connector-ready and 2-m, pre-wired models
- NPN or PNP output models available



## Ordering Information

### ■ SENSORS

Sensing method	Light source	Appearance	Connection method	Sensing distance	Part number	
					NPN output	PNP output
Through-beam	IR		Pre-wired	15 m	<b>E3Z-T61</b>	<b>E3Z-T81</b>
			Connector		<b>E3Z-T66</b>	<b>E3Z-T86</b>
Polarized retroreflective	RED		Pre-wired	100 mm to 4 m 100 mm to 3 m (See Note 2.)	<b>E3Z-R61</b>	<b>E3Z-R81</b>
			Connector		<b>E3Z-R66</b>	<b>E3Z-R86</b>
Diffuse reflective	IR		Pre-wired	5 to 100 mm (wide view)	<b>E3Z-D61</b>	<b>E3Z-D81</b>
			Connector		<b>E3Z-D66</b>	<b>E3Z-D86</b>
			Pre-wired	1 m	<b>E3Z-D62</b>	<b>E3Z-D82</b>
			Connector		<b>E3Z-D67</b>	<b>E3Z-D87</b>

**Note: 1.** The Reflector is sold separately. Select the Reflector model most suited to the application.

**2.** Sensing distance can be extended to 4 meters when the E39-R1S reflector is used. The sensing distance is 3 meters when the E39-R1 reflector is used.

## ■ ACCESSORIES (ORDER SEPARATELY)

### Slit for Through-beam Models (E3Z-T□□)

Order a slit for each emitter and receiver.

Slit width	Sensing distance (typical)	Minimum sensing object (typical)	Part number
0.5 mm dia.	50 mm	0.5 mm dia.	<b>E39-S65A</b>
1 mm dia.	200 mm	1 mm dia.	<b>E39-S65B</b>
2 mm dia.	800 mm	2 mm dia.	<b>E39-S65C</b>
0.5 × 10 mm	1 m	0.7 mm dia.	<b>E39-S65D</b>
1 × 10 mm	2.2 m	1.2 mm dia.	<b>E39-S65E</b>
2 × 10 mm	5 m	2.4 mm dia.	<b>E39-S65F</b>

### Reflectors for Retroreflective Models

Name	Sensing distance (typical)	Part number
Reflector	100 mm to 3 m	<b>E39-R1</b>
	100 mm to 4 m	<b>E39-R1S</b>
	100 mm to 5 m	<b>E39-R2</b>
	100 mm to 2.5 m	<b>E39-R9</b>
	100 mm to 3.5 m	<b>E39-R10</b>
Miniature Reflector	50 mm to 1.5 m	<b>E39-R3</b>
Tape Reflector	150 mm to 700 mm	<b>E39-RS1</b>
	150 mm to 1.1 m	<b>E39-RS2</b>
	150 mm to 1.4 m	<b>E39-RS3</b>

**Note:** The actual sensing distance may be reduced to approximately 70% of the typical sensing distance when using a Reflector other than the E39-R1 or the E39-R1S.

## ■ MOUNTING BRACKETS

Appearance	Description	Part number
	L-bracket, horizontal	<b>E39-L104</b>
	L-bracket, vertical	<b>E39-L44</b>
	Open top, 20° angle adjustability	<b>E39-L43</b>
	Protected top 5° angle adjustability	<b>E39-L144</b>

Appearance	Description	Part number
	Compact vertical protective cover bracket	<b>E39-L142</b>
	Vertical protective cover bracket	<b>E39-L98</b>

**Note:** If a through-beam model is used, order two Mounting Brackets — one for the emitter and one for the receiver.

## M8 Connectors

Appearance	Cable type	Part number	
Straight	2 m (6.56 ft)	Four-wire type XS3F-M421-402-A	
	5 m (16.40 ft)		XS3F-M421-405-A
Right angle	2 m (6.56 ft)		XS3F-M422-402-A
	5 m (16.40 ft)		XS3F-M422-405-A

## Specifications

Item	Sensing method	Through-beam	Polarized retroreflective	Diffuse reflective	
		E3Z-T61/T66	E3Z-R61/R66	E3Z-D61/D66	E3Z-D62/D67
		E3Z-T81/T86	E3Z-R81/R86	E3Z-D81/D86	E3Z-D82/D87
Sensing distance		15 m	100 mm (4 m Note 1) (when using E39-R1S) 100 mm (3 m Note 2) (when using E39-R1)	White paper (100 × 100 mm): 100 mm	White paper (300 × 300 mm): 1 m
Standard sensing object		Opaque: 12 mm (dia. min.)	Opaque: 75 mm (dia. min.)	---	
Hysteresis		---		20% max. of setting distance	
Directional angle		Both emitter and receiver: 3 to 15°	2 to 10°	---	
Light source (wave length)		Infrared LED (860 nm)	Red LED (680 nm)	Infrared LED (860 nm)	
Power supply voltage		12 to 24 VDC ±10% including 10% (p-p) max. ripple			
Current consumption		Emitter: 15 mA Receiver: 20 mA	30 mA max.		
Control output		100 mA max. at 26.4 VDC, open collector output (residual voltage: 1 V max.) L-ON/D-ON, switch selectable			
Circuit protection		Load short-circuit and reversed power supply protection	Reversed power supply connection, output short-circuit, and mutual interference protection		
Response time		1 ms max.			
Sensitivity adjustment		One-turn potentiometer			
Ambient illumination (receiver side)	Incandescent lamp	3,000 lux max.			
	Sunlight	10,000 lux max.			
Ambient temperature	Operating	-25°C to 55°C (-13°F to 131°F)			
	Storage	-40°C to 70°C (-40°F to 158°F) with no icing or condensation			
Ambient humidity	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		10 to 55 Hz, 1.5-mm double amplitude or 300 m/s <sup>2</sup> for 2 hours each in X, Y, and Z axes			
Shock resistance	Destruction	500 m/s <sup>2</sup> 3 times each in X, Y, and Z axes			
Enclosure rating		IP67 (IEC60529)			
Approvals		CE			
Connection method		2 m cable or M8 connector			
Indicator		Operation indicator (orange) Stability indicator (green) Emitter has power indicator (orange) only			
Weight (packed state)	Pre-wired cable (2 m)	Approx. 120 g (4.2 oz)	Approx. 65 g (2.3 oz)		
	Connector	Approx. 30 g (1.1 oz)	Approx. 20 g (0.7 oz)		
Material		Case: PBT (polybutylene terephthalate); Lens: Methacrylate resin			
Accessories		Instruction manual (Order Reflector and Mounting Bracket separately.)			

- Note:** 1. Sensing distance can be extended up to 4 meters when the E39-R1S reflector is used.  
2. Sensing distance can be extended up to 3 meters when the E39-R1 reflector is used.

# Nomenclature

**Through-beam Models**  
E3Z-T6□ Receiver

**Retroreflective Models**  
E3Z-R6□

**Diffuse-reflective Models**  
E3Z-D6□



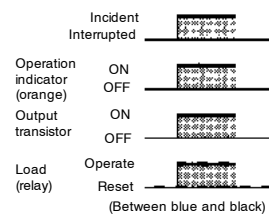
# Operation

## OUTPUT CIRCUITS

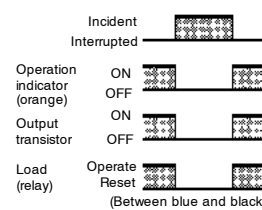
Model	E3Z-T61/-T66/-R61/-R66/-D61/-D66/-D62/-D67	
NPN output	Through-beam receiver Retroreflective model Diffuse reflective model	Through-beam emitter
Model	E3Z-T81/-T86/-R86/-D81/-D86/-D82/-D87	
PNP output	Through-beam receiver Retroreflective model Diffuse reflective model	Through-beam emitter
Connector pin arrangement		

## TIMING CHARTS

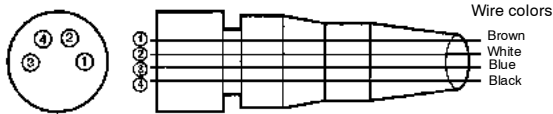
### Light-ON (L-ON) Operation



### Dark-ON (D-ON) Operation



CONNECTOR PIN-OUT



XS3F-M421-402-A XS3F-M421-405-A  
 XS3F-M422-402-A XS3F-M422-405-A

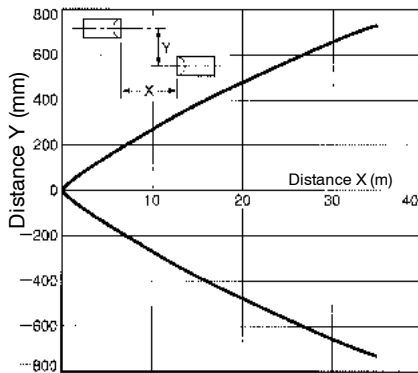
Classification	Wire color	Connector pin No.	Use
DC	Brown	A	Power supply (+V)
	White	B	Pin 2 is not used.
	Blue	C	Power supply (0 V)
	Black	D	Output

Note: The through-beam emitter does not use pins 2 and 4.

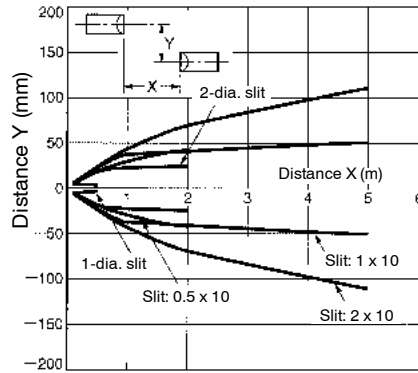
Engineering Data

PARALLEL OPERATING RANGE (TYPICAL)

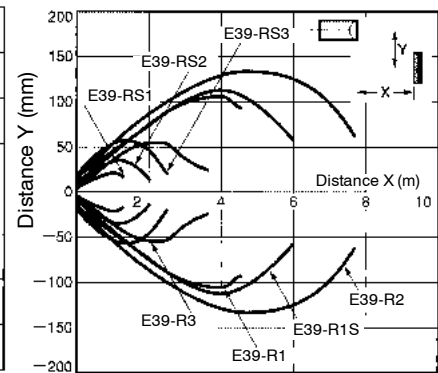
Through-beam Models  
 E3Z-T□1 (T□6)



Through-beam Models  
 E3Z-T□1 (T□6) and Slit

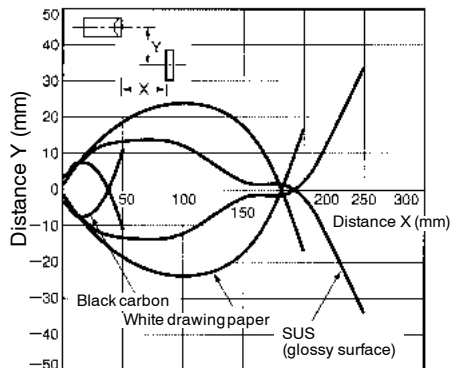


Retroreflective Models  
 E3Z-R□1 (R□6) and Reflector

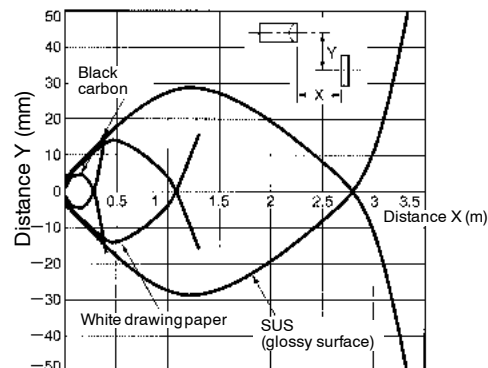


OPERATING RANGE (TYPICAL)

Diffuse Reflective Models  
 E3Z-D□1 (D□6)

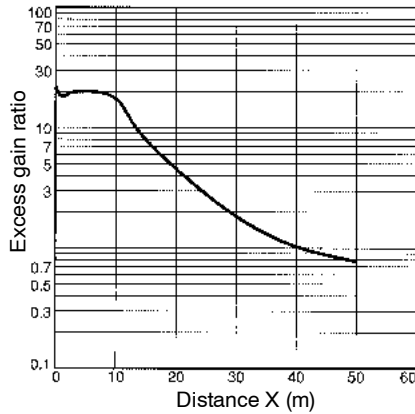


Diffuse Reflective Models  
 E3Z-D□2 (D□7)



■ EXCESS GAIN RATIO VS. DISTANCE (TYPICAL)

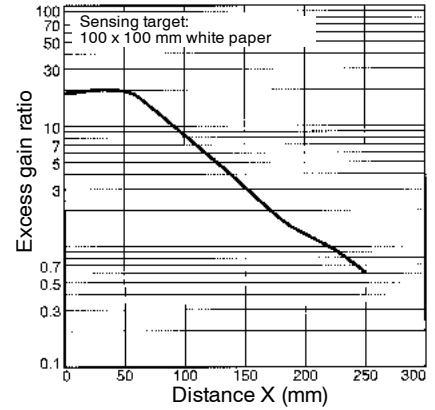
**Through-beam Models**  
E3Z-T□1 (T□6)



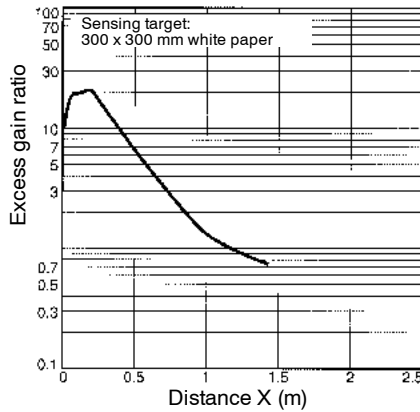
**Retroreflective Models**  
E3Z-R□1 (R□6) and Reflector



**Diffuse Reflective Models**  
E3Z-D□1 (D□6)

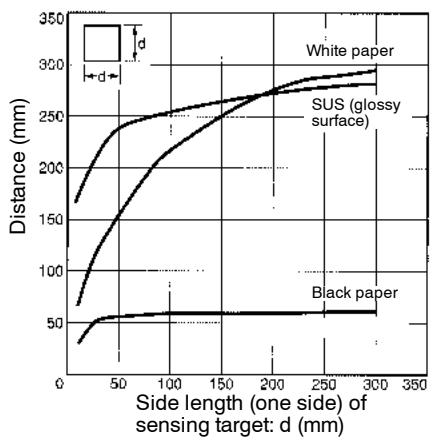


**Diffuse Reflective Model**  
E3Z-D□2 (D□7)



**Sensing Target Size vs. Sensing Distance (Typical)**

**Diffuse Reflective Models**  
E3Z-D□1 (D□6)



**Diffuse Reflective Models**  
E3Z-D□2 (D□7)



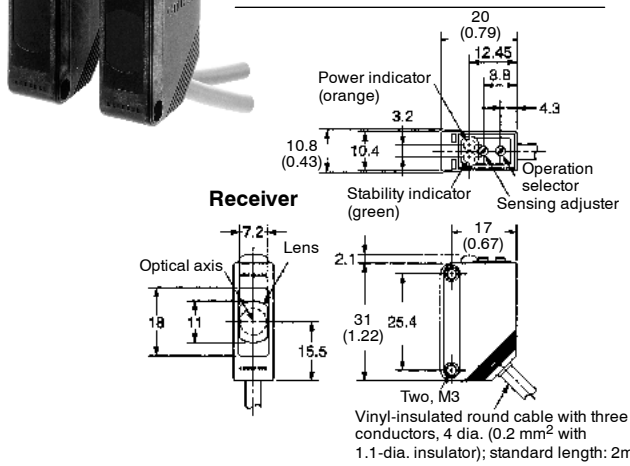
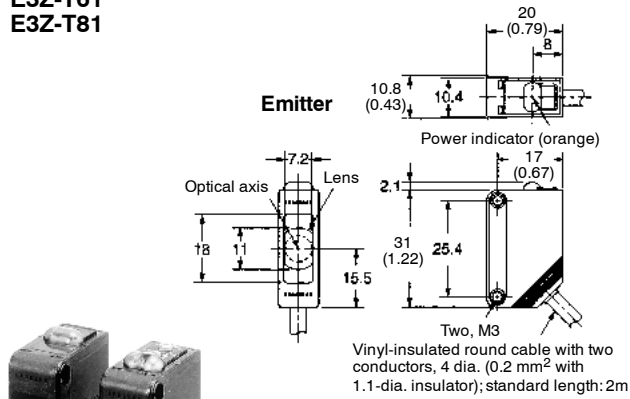
# Dimensions

Unit: mm (inch)

## SENSORS

### Through-beam (Pre-wired Models)

E3Z-T61  
E3Z-T81

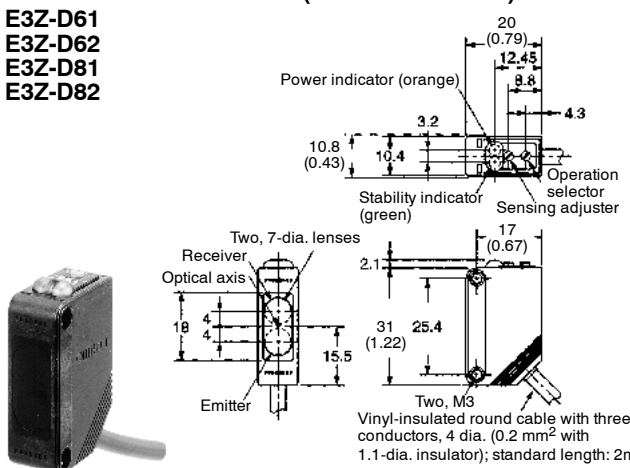


### Retroreflective Models (Pre-wired Models)

E3Z-R61  
E3Z-R81

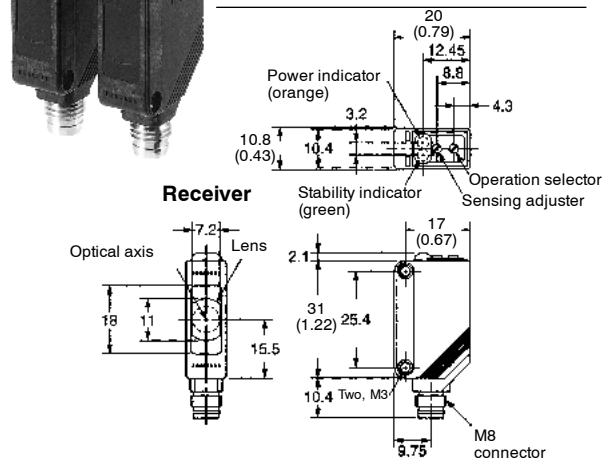
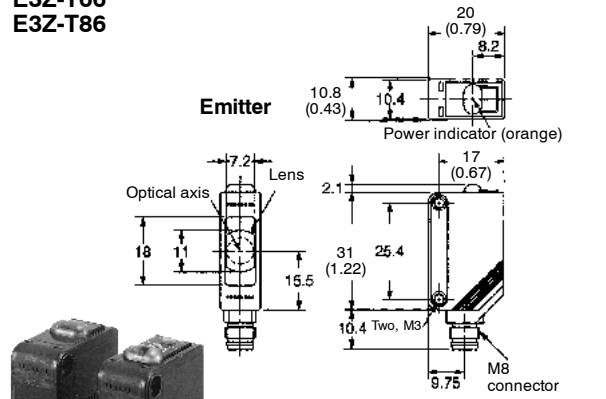
### Diffuse Reflective Models (Pre-wired Models)

E3Z-D61  
E3Z-D62  
E3Z-D81  
E3Z-D82



### Through-beam (Connector Models)

E3Z-T66  
E3Z-T86

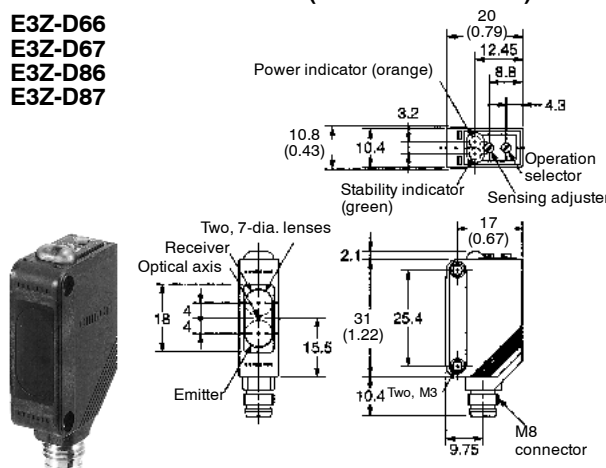


### Retroreflective Models (Connector Models)

E3Z-R66  
E3Z-R86

### Diffuse Reflective Models (Connector Models)

E3Z-D66  
E3Z-D67  
E3Z-D86  
E3Z-D87

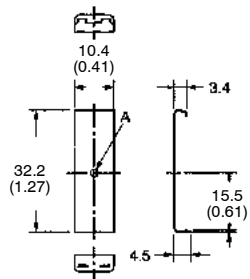




Unit: mm (inch)

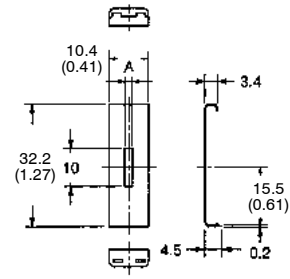
■ SLITS

**E39-S65A**  
**E39-S65B**  
**E39-S65C**



Model	Side A	Material
E39-S65A	0.5 dia.	SUS301 stainless steel
E39-S65B	1.0 dia.	
E39-S65C	2.0 dia.	

**E39-S65D**  
**E39-S65E**  
**E39-S65F**



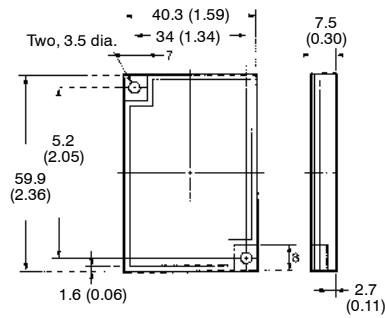
Model	Side A	Material
E39-S65D	0.5	SUS301 stainless steel
E39-S65E	1.0	
E39-S65F	2.0	

■ REFLECTORS

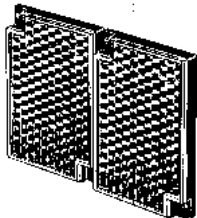
**E39-R1**  
**E39-R1S**



Material  
Surface: Acrylic resin  
Backside: ABS resin



**E39-R2**



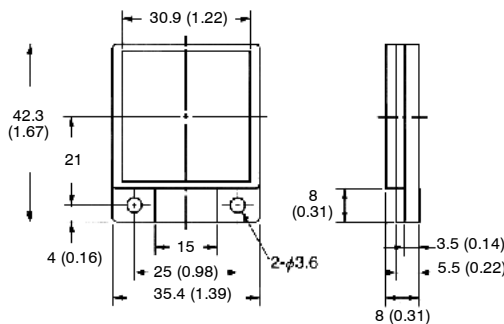
Material  
Surface: Acrylic resin  
Backside: ABS resin



**E39-R9**



Material  
Reflecting surface: Acrylic resin  
Back: ABS resin





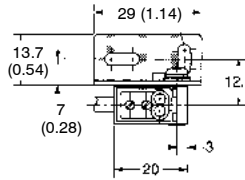
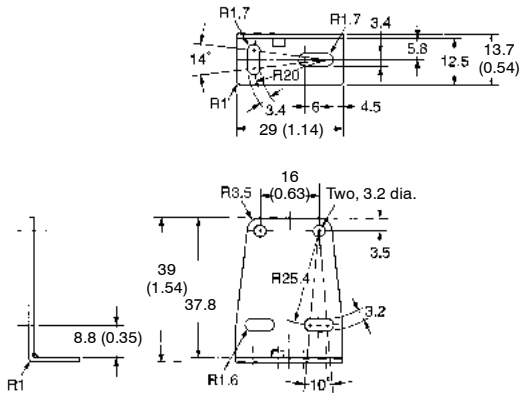
Unit: mm (inch)

■ MOUNTING BRACKETS

E39-L104



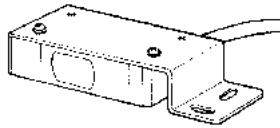
Material:  
SUS304  
stainless steel



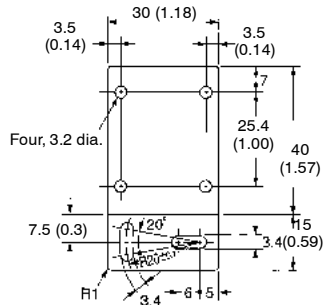
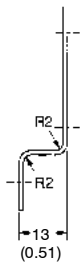
With Mounting Bracket  
(E3Z-D62)



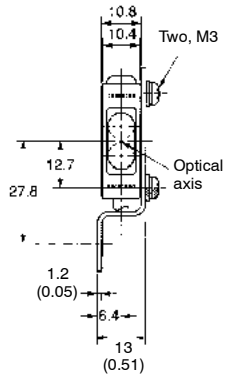
E39-L43



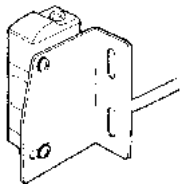
Material:  
SUS304  
stainless steel



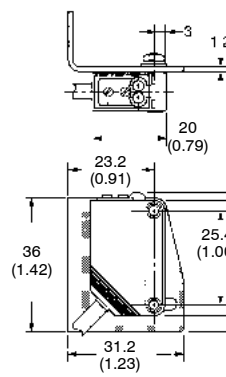
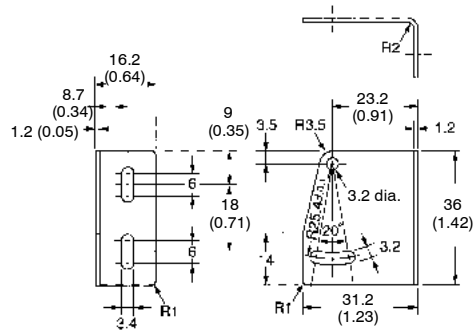
With Mounting Bracket  
(E3Z-D62)



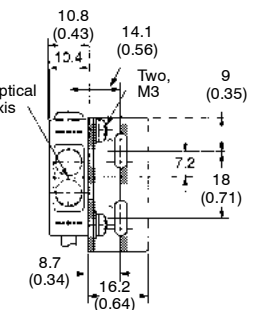
E39-L44



Material:  
SUS304  
stainless steel

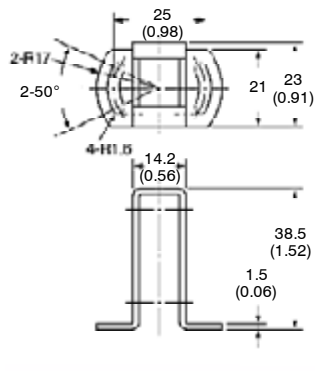


With Mounting Bracket  
(E3Z-D62)

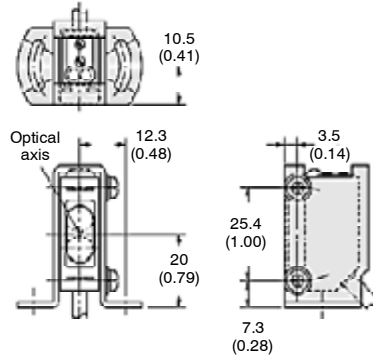


E39-L144

Material:  
SUS304 stainless steel

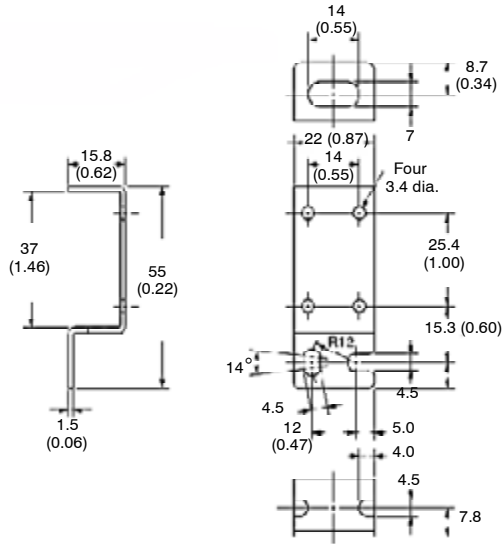


With Sensor  
(Example: E3Z-L61)

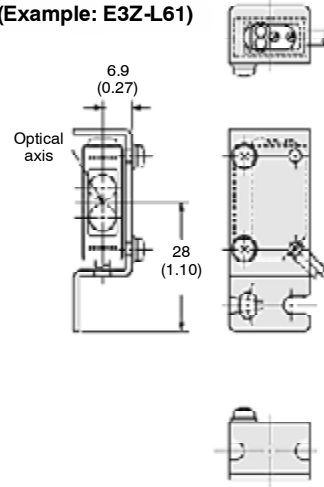


E39-L142

Material:  
SUS304 stainless steel



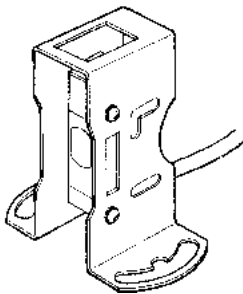
With Sensor  
(Example: E3Z-L61)



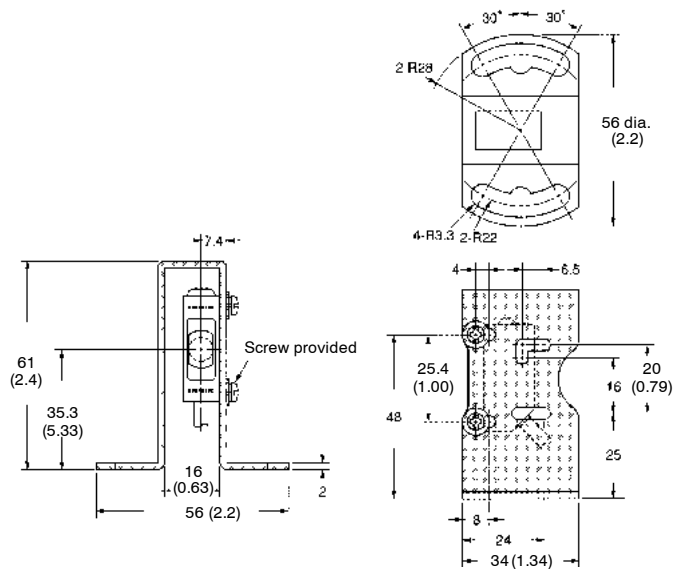
Unit: mm (inch)

E39-L93

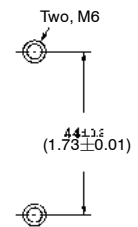
E39-L98



Material:  
SUS304 stainless steel



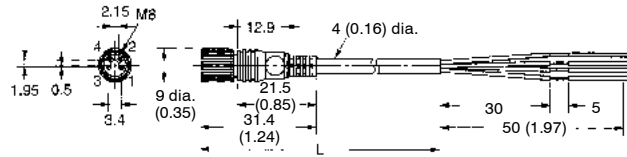
Mounting Holes



## ■ M8 CONNECTOR CORDSETS

### Straight

XS3F-M421-402-A (L=2 m)  
XS3F-M421-405-A (L=5 m)



### Right Angle

XS3F-M422-402-A (L=2 m)  
XS3F-M422-405-A (L=5 m)



## Precautions

To ensure safe sensor operation, please follow the following precautions:

### ■ WIRING

#### Power Supply Voltage

Make sure that the power supply to the Sensor is within the rated voltage range.

#### Load Short-circuiting

Do not short-circuit the load, or the Sensor may be damaged.

#### Polarity

Correct polarity wiring is required to prevent damage to the sensor.

#### Connection Without Load

Do not connect power supply to the Sensor with no load connected, or the internal elements may explode or burn.

### ■ OPERATING ENVIRONMENT

Do not use the Sensor in locations with explosive or flammable gas.

### ■ SETTINGS

#### Power Reset Time

The Sensor is ready to operate 100 ms after the Sensor is turned ON. If the load and Sensor are connected to independent power supplies respectively, be sure to turn ON the Sensor before turning the load ON.

### ■ CONNECTIONS

#### M8 Metal Connector

- Turn off power before disconnecting the sensor.
- Remove the connector cover before connecting or disconnecting the metal connector.
- Secure the connector cover by hand. Do not use any pliers, or the connector may be damaged.
- The proper tightening torque range is between 0.3 and 0.4 N • m. Be sure to tighten the connector securely in order to maintain the the specified degree of protection and to keep the connector from loosening due to vibration.

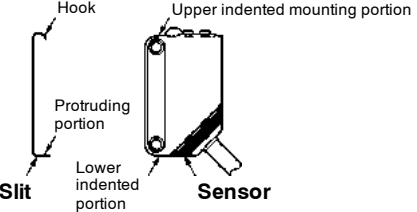
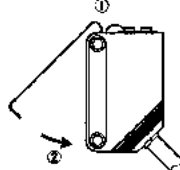
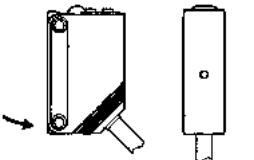
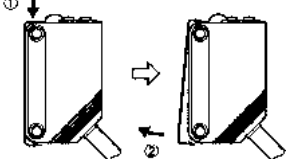
### ■ MOUNTING

Use M3 screws to mount the sensor and tighten each screw to a maximum torque of 0.53 N • m.



## ■ ADJUSTMENT

### Slits for Through-beam Models (E39-S65A/B/C/D/E/F) Sold Separately

 <p>Hook Upper indented mounting portion Protruding portion Lower indented portion <b>Slit</b>      <b>Sensor</b></p>	
<p><b>Mounting Method</b></p> <ol style="list-style-type: none"> <li>Hook the upper protruding portion of the Slit to the upper indented mounting portion of the Sensor and adjust the position of the Slit so that the Slit will be in parallel to the lens side of the Sensor.</li> <li>Press the lower protruding portion of the Slit onto the indented mounting portion of the Sensor until the Slit snaps in.</li> </ol>	
<p><b>Mounting Condition</b></p>	<p>Side View      Front View</p> 
<p><b>Removal Method</b></p> <ol style="list-style-type: none"> <li>Press the upper portion of the Slit.</li> <li>Disconnect the lower protruding portion of the Slit from the Sensor and remove the Slit.</li> </ol>	

**NOTE: DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters to inches divide by 25.4.**

**OMRON**<sup>®</sup>  
**OMRON ELECTRONICS LLC**  
 One East Commerce Drive  
 Schaumburg, IL 60173  
**1-800-55-OMRON**

**OMRON ON-LINE**  
 Global - <http://www.omron.com>  
 USA - <http://www.omron.com/oei>  
 Canada - <http://www.omron.com/oci>

**OMRON CANADA, INC.**  
 885 Milner Avenue  
 Scarborough, Ontario M1B 5V8  
**416-286-6465**

**NOTE: DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters to inches divide by 25.4.**

**OMRON**<sup>®</sup>

**OMRON ELECTRONICS LLC**

One East Commerce Drive  
Schaumburg, IL 60173

**1-800-55-OMRON**

**OMRON ON-LINE**

Global - <http://www.omron.com>  
USA - <http://www.omron.com/oei>  
Canada - <http://www.omron.com/oci>

**OMRON CANADA, INC.**

885 Milner Avenue  
Scarborough, Ontario M1B 5V8

**416-286-6465**