NAiS

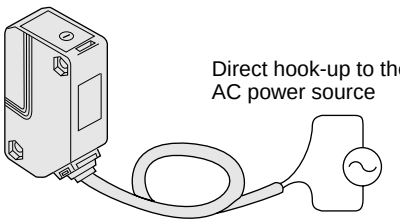
COMPACT-SIZE MULTI-VOLTAGE PHOTOELECTRIC SENSORS

UZE Series

NEW WORLD-WIDE USABLE SENSOR

Multi-voltage

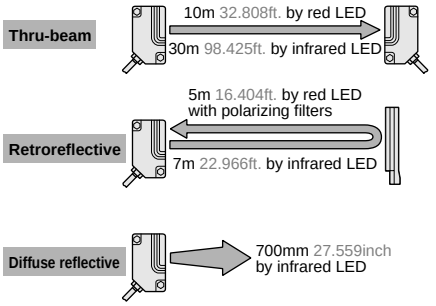
24 to 240V AC and 12 to 240V DC applicable for supply voltages all over the world.



DC voltage reduction is no need.

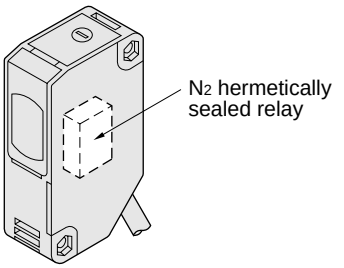
Long Sensing Range

Most suitable for conveyor lines and parking garage applications.



High Reliability

The protection is IP66. The new N_2 hermetically sealed relay significantly increases the reliable lifetime.

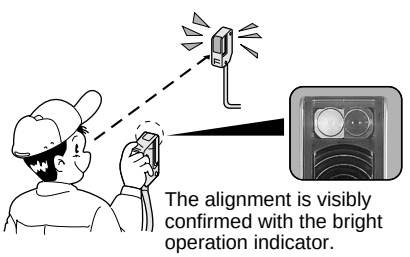


Micro Assembly

The smallest in self-contained sensors.
(W18 × H62 × D35mm
W.709 × H2.441 × D1.378inch)

Easy Alignment

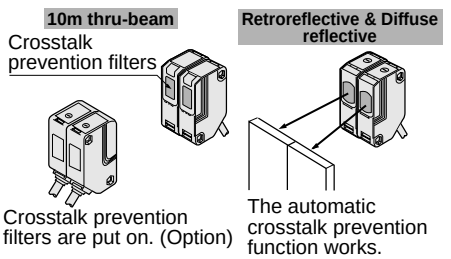
The 10m thru-beam sensor and the 5m retroreflective sensor are incorporated with the red LED beam sources.
The exact alignment is attained by the emitted beam in your sight.



The alignment is visibly confirmed with the bright operation indicator.

Crosstalk Prevention

Two sensors operate quite normally even mounted closely.
(Excluding the 30m 98.425ft. thru-beam sensor)

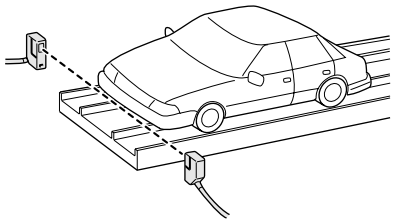


Crosstalk prevention filters are put on. (Option)

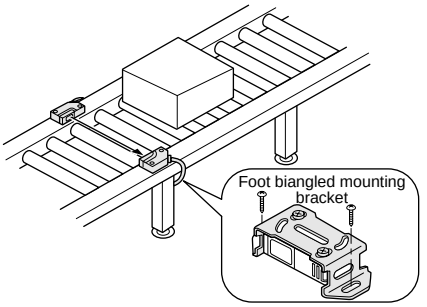
The automatic crosstalk prevention function works.

APPLICATIONS

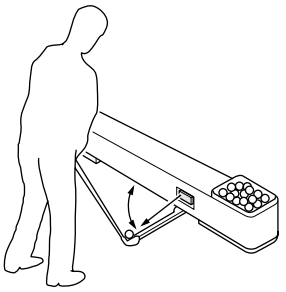
Detecting car position at parking garage



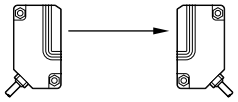
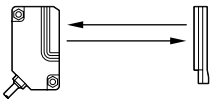
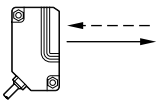
Detecting workpieces on conveyor line



Detecting golf balls

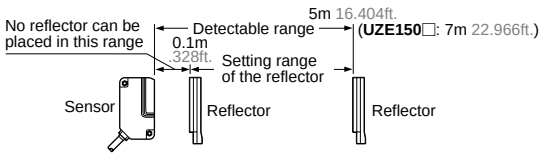


ORDER GUIDE

Type			Appearance	Sensing range	Model No. (*2)	Emitting element
Thru-beam		Light-ON		10m 32.808ft.	**UZE1011**	Red LED
		Dark-ON			**UZE1012**	
	Long sensing range	Light-ON		30m 98.425ft.	**UZE1001**	Infrared LED
		Dark-ON			**UZE1002**	
Retroreflective	With polarizing filters	Light-ON		0.1 to 5m (*1) .328 to 16.404ft.	**UZE1411**	Red LED
		Dark-ON			**UZE1412**	
	Long sensing range	Light-ON		0.1 to 7m (*1) .328 to 22.966ft.	**UZE1501**	Infrared LED
		Dark-ON			**UZE1502**	
Diffuse reflective		Light-ON		700mm 27.559inch	**UZE1301**	Infrared LED
		Dark-ON			**UZE1302**	

NOTE : No mounting bracket is supplied with sensor. Please select optional mounting brackets from our options. (three types)

(*1) : The sensing range of the retroreflective sensor is specified with using the **UZZ112** reflector.
The sensing ranges of the retroreflective sensor in the above table are identified as the possible setting ranges of the **UZZ112** reflector.
The sensor can detect an object under 0.1m .328ft. apart.



(*2) : The Light-ON mode sensor (model No. with suffix "**1**") and the Dark-ON mode sensor (model No. with suffix "**2**") are available in this **UZE1** series.
Each of the following models gives the fail-safe operation that the output stays at the same state when detecting an object as when power is disconnected.
Refer to P.35 for the output operation.

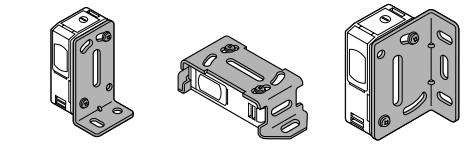
Thru-beam	Retroreflective	Diffuse reflective
UZE1011 and **UZE1001** (Light-ON)	**UZE1411** and **UZE1501** (Light-ON)	**UZE1302** (Dark-ON)

OPTION

Designation	Model No.	Description	
Sensor mounting bracket	**UZE811**	Foot angled mounting bracket (The thru-beam sensor needs two brackets.)	
	UZE812	Foot biangled mounting bracket (sensor protective bracket) (The thru-beam sensor needs two brackets.)	
	UZE813	Back angled mounting bracket (The thru-beam sensor needs two brackets.)	
Slit mask (For thru-beam sensor only)	**UZE801** (3×6mm .118×.236inch)	One side slit-on	• Sensing range : 3m 9.843ft. [**UZE101**□] 16m 52.493ft. [**UZE100**□] • Min. sensing object : ϕ10mm ϕ.394inch
		Both side slit-on	• Sensing range : 1m 3.281ft. [**UZE101**□] 6m 19.685ft. [**UZE100**□] • Min. sensing object : 3×6mm .118×.236inch
Crosstalk prevention filter (For **UZE1011** or **UZE1012** only)	**UZE821** (Vertical)	Either filters on both sides • Sensing range : 5m 16.404ft. • Min. sensing object : ϕ20mm ϕ.787mm (One set consists of 2 pieces of crosstalk prevention filters.)	
	UZE822 (Horizontal)		
Reflector (For retroreflective sensor only)	**UZZ110**	• Sensing range : 0.1 to 1.5m .328 to 4.921ft. [**UZE141**□] 0.1 to 2.5m .328 to 8.202ft. [**UZE150**□] • Min. sensing object : ϕ30mm ϕ1.181mm	
	UZZ111	• Sensing range : 0.1 to 3.5m .328 to 11.483ft. [**UZE141**□] 0.1 to 5m .328 to 16.404ft. [**UZE150**□] • Min. sensing object : ϕ35mm ϕ1.378mm	
Reflector mounting bracket	**UZZ1100**	Protective mounting bracket for **UZZ110** Protects the reflector from damage and keeps an alignment securely.	
	UZZ1110	For **UZZ111**	
	UZZ1120	For **UZZ112**	
Reflective tape (For retroreflective sensor only)	**UZZ101**	• Ambient temperature : −25 to +50°C • Ambient humidity : 35 to 85%RH (*1) : Keep it free from stress. If it is much pressed, the capability may deteriorate. (*2) : Do not cut the tape. Doing so may worsen the sensing performance.	• Sensing range : 0.1 to 0.8m .328 to 2.625ft. [**UZE141**□] 0.1 to 1m .328 to 3.281ft. [**UZE150**□]
	UZZ102		• Sensing range : 0.1 to 1m .328 to 3.281ft. [**UZE141**□] 0.1 to 1.5m .328 to 4.921ft. [**UZE150**□]

Sensor mounting bracket

• **UZE811** • **UZE812** • **UZE813**



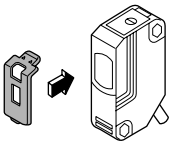
Two M4×25mm .984 inch screws with washers and two M4 nuts are attached.

Two M4×25mm .984 inch screws with washers and two M4 nuts are attached.

Two M4×25mm .984 inch screws with washers and two M4 nuts are attached.

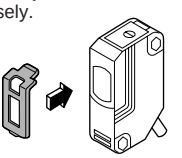
Slit mask

Fitted to the front surface of the sensor with one-touch.



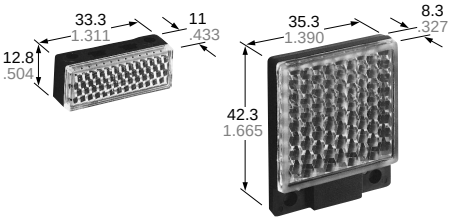
Crosstalk prevention filter

(For **UZE101**□ only)
Two sets of thru-beam sensors operate quite normally even mounted closely.



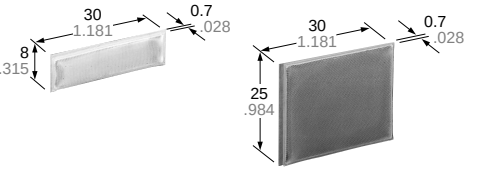
Reflector

•**UZZ110** •**UZZ111**



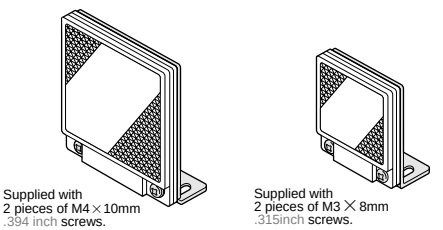
Reflective tape

•**UZZ101** •**UZZ102**



Reflector mounting bracket

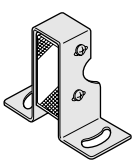
•**UZZ1120** •**UZZ1110**



Supplied with 2 pieces of M4×10mm .394 inch screws.

Supplied with 2 pieces of M3×8mm .315inch screws.

•**UZZ1100**

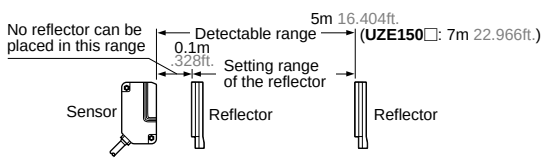


Supplied with 2 pieces of M3×12mm .472inch screws

SPECIFICATIONS

Item \ Type	Thru-beam		Long sensing range		Retroreflective: With polarizing filters		Retroreflective: Long sensing range		Diffuse reflective	
Model No.	**UZE1011**	**UZE1012**	**UZE1001**	**UZE1002**	**UZE1411**	**UZE1412**	**UZE1501**	**UZE1502**	**UZE1301**	**UZE1302**
Sensing range	10m 32.808ft.		30m 98.425ft.		0.1 to 5m .328 to 16.404ft. (*1)		0.1 to 7m .328 to 22.966ft. (*1)		700mm 27.559inch (*2)	
Sensing object	Opaque objects of ϕ20mm ϕ.787inch or more (*3)				Opaque, translucent & specular objects of ϕ50mm ϕ1.969inch or more (*1)		Opaque & translucent objects of ϕ50mm ϕ1.969inch or more (*1)		Opaque, translucent & transparent objects	
Hysteresis	———								15% or less of operation distance	
Repeatability (Perpendicular to axial direction)	0.1mm .004inch or less		0.2mm .008inch or less						0.3mm .012inch or less	
Supply voltage	24 to 240V AC ± 10% or 12 to 240V DC ± 10% Ripple P-P 10% or less									
Power consumption	Emitter : 1VA or less Receiver : 2VA or less		Emitter : 1.5VA or less Receiver : 2VA or less		2VA or less					
Output	Relay contact 1c • Switching capacity : 250V AC 1A (resistive load) 30V DC 2A (resistive load) • Electrical life : 100,000 or more operations (AC rated load) 500,000 or more operations (DC rated load) • Mechanical life : 100,000,000 or more operations									
Utilization category	DC-12 or DC-13									
Output operation	Light-ON	Dark-ON	Light-ON	Dark-ON	Light-ON	Dark-ON	Light-ON	Dark-ON	Light-ON	Dark-ON
Response time	10ms or less									
Operation indicator	Red LED (lights up when the output is activated)									
Stability indicator	Green LED (lights up under the stable Light condition or the stable Dark condition)									
Power indicator	———		Red LED (lights up while power is supplied)		———					
Sensitivity adjuster	Variable adjuster		———		Variable adjuster		———		Variable adjuster	
Automatic crosstalk prevention function	(Use optional crosstalk prevention filters)		———		Two units of sensors can be mounted closely					
Environmental resistance: Pollution degree	3 (Industrial environment)									
Environmental resistance: Protection	IP66 (IEC)									
Environmental resistance: Ambient temperature	− 20 to + 55°C − 4 to + 131°F (No dew condensation nor icing allowed), Storage : − 30 to + 70°C − 22 to + 158°F									
Environmental resistance: Ambient humidity	35 to 85%RH, Storage : 35 to 85%RH									
Environmental resistance: Ambient illuminance (Extraneous light immunity)	Sun light : 11,000 ℓx at the light-receiving face, Incandescent light : 3,500 ℓx at the light-receiving face									
Environmental resistance: EMC	Emission : EN50081-2, Immunity : EN50082-2									
Environmental resistance: Voltage withstandability	1,500V AC for one min. between the power source and output, 1,000V AC for one min. between the relay contact terminals									
Environmental resistance: Insulation resistivity	20MΩ or more at 500V DC Megger between the power source and output, and between the relay contact terminals									
Environmental resistance: Vibration-proof	10 to 55Hz frequency, 1.5mm .059inch amplitude, and X, Y, and Z directions each for two hours (unenergized)									
Environmental resistance: Shock-proof	500m/s^2 (approx. 50G), and X, Y, and Z directions each for three times (unenergized)									
Emitting element	Red LED (modulated)		Infrared LED (modulated)		Red LED (modulated)		Infrared LED (modulated)			
Material	Enclosure, Lens and Cover : Polycarbonate, Front cover : Acrylic (the retroreflective sensor only)									
Cable	Cabtyre cable 2m 6.562ft. long with five 0.3mm^2 conductors (emitter : two conductors)									
Cable extension	Maximum extension is 100m 328.084ft. overall with an equivalent cable with conductors 0.3mm^2 or more (thru-beam sensor : the emitter and the receiver each)									
Weight	Emitter : Approx. 100g 3.53oz Receiver : Approx. 140g 4.94oz		Emitter : Approx. 125g 4.41oz Receiver : Approx. 140g 4.94oz		Approx. 140g 4.94oz					
Accessories	Adjusting screw-driver : 1pc.		———		**UZZ112** (Reflector) : 1pc. Adjusting screw-driver : 1pc.		**UZZ112** (Reflector) : 1pc.		Adjusting screw-driver : 1pc.	

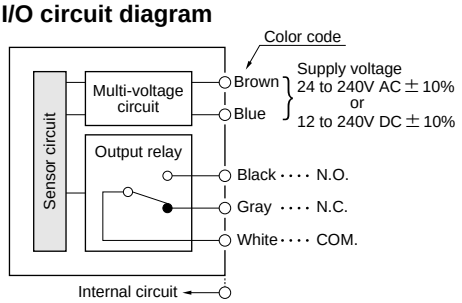
(*1) : The sensing range and the sensing object of the retroreflective sensor are specified with using the **UZZ112** reflector.
The sensing ranges of the retroreflective sensor in the above table are identified as the possible setting ranges of the **UZZ112** reflector.
The sensor can detect an object under 0.1m .328ft. apart.



(*2) : The sensing range of the diffuse reflective sensor is specified with using white non-glossy paper (200 × 200mm 7.874 × 7.874inch).
(*3) : If slit masks (option) are fitted, an object of 3 × 6mm .118 × .236inch can be detected.

I/O CIRCUIT AND WIRING DIAGRAMS

I/O circuit diagram



(*1) : The emitter engages only two wires for power (+V and 0V).

Output operation

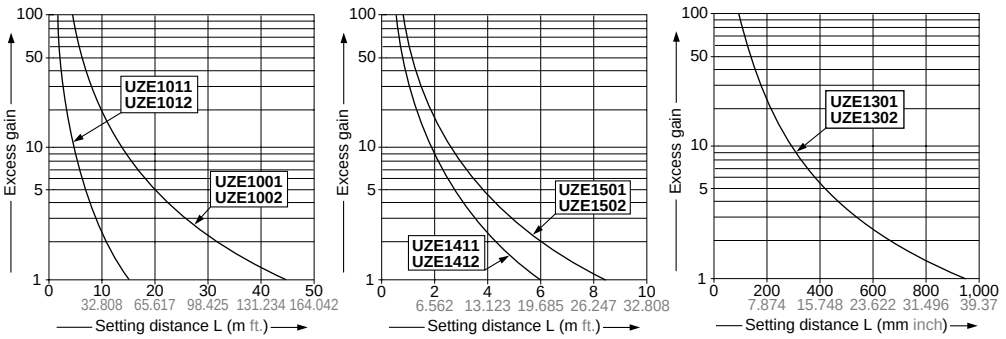
: State when an object is detected.

Sensing mode		Thru-beam & Retroreflective				Diffuse reflective			
		Light-ON (A) type		Dark-ON (B) type		Light-ON (A) type		Dark-ON (B) type	
Output		N.O. (Black cable)	N.C. (Gray cable)	N.O. (Black cable)	N.C. (Gray cable)	N.O. (Black cable)	N.C. (Gray cable)	N.O. (Black cable)	N.C. (Gray cable)
Output condition	Power OFF	Open	Close	Open	Close	Open	Close	Open	Close
	Beam-received	Close	Open	Open	Close	Close	Open	Open	Close
	Beam-interrupted	Open	Close	Close	Open	Open	Close	Close	Open

SENSING FIELDS (TYPICAL)

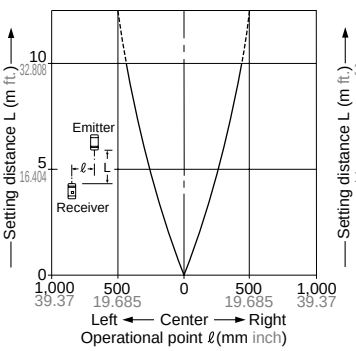
All models

Correlation between setting distance and excess gain

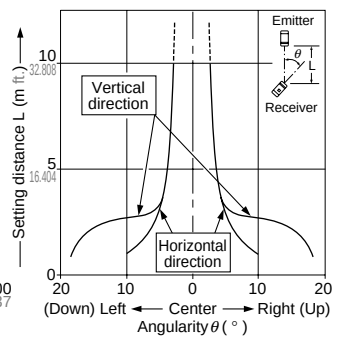


UZE1011 UZE1012 Thru-beam

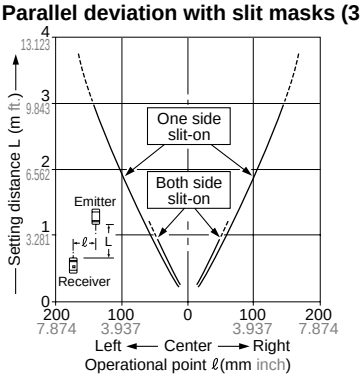
Parallel deviation



Angular deviation

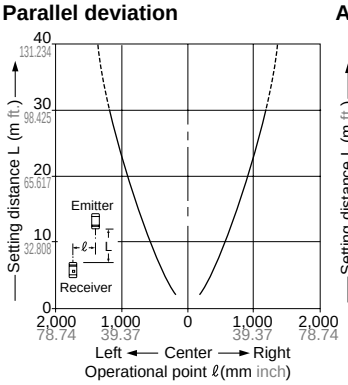


Parallel deviation with slit masks (3 × 6mm .118 × .236inch)

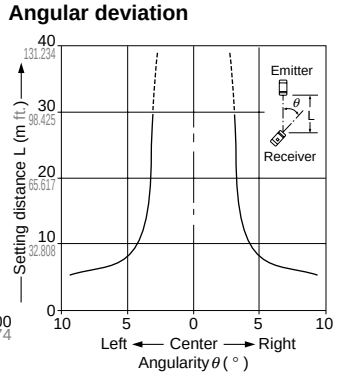


UZE1001 UZE1002 Thru-beam

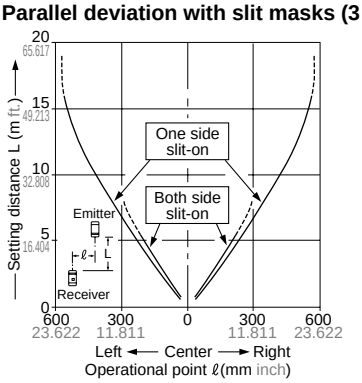
Parallel deviation



Angular deviation



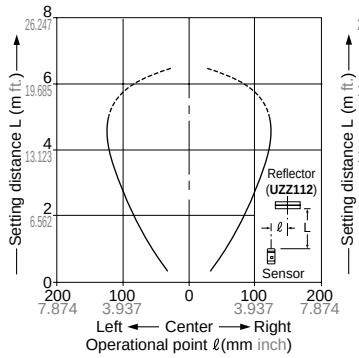
Parallel deviation with slit masks (3 × 6mm .118 × .236inch)



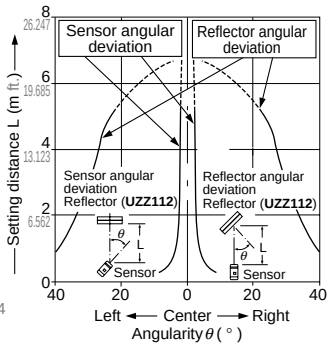
SENSING FIELDS (TYPICAL)

UZE1411 UZE1412 Retroreflective

Parallel deviation

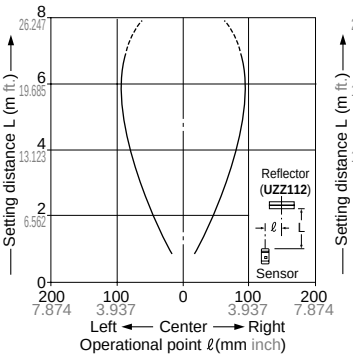


Angular deviation

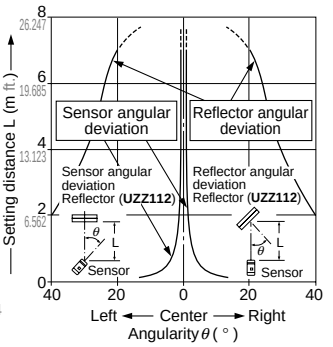


UZE1501 UZE1502 Retroreflective

Parallel deviation

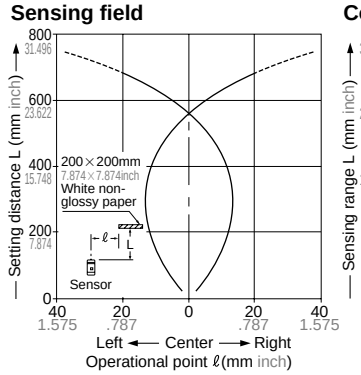


Angular deviation

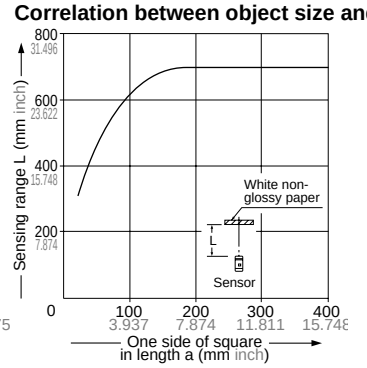


UZE1301 UZE1302 Diffuse reflective

Sensing field



Correlation between object size and sensing range



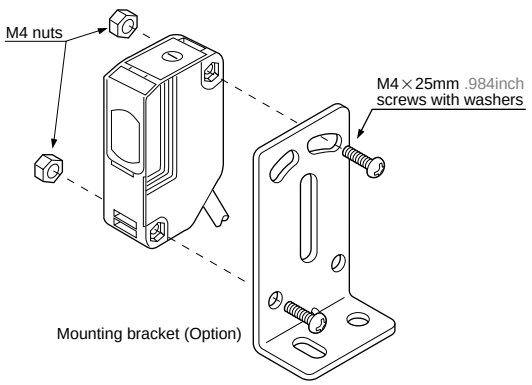
As an object size becomes smaller than the standard (White non-glossy paper 200 × 200mm 7.874 × 7.874inch), the sensing range shortens.
(The left graph is plotted on condition with the sensitivity having been adjusted at 700mm 27.559inch of the sensing distance exactly detectable with the white non-glossy paper of 200 × 200mm 7.874 × 7.874inch.)

PRECAUTIONS FOR PROPER USE

These products are **not** safety sensors and are **not** designed or intended to be used to protect life and prevent bodily injury or property damage.

Mounting

• The tightening torque should be 0.8N·m {8.2kgf·cm} or less.

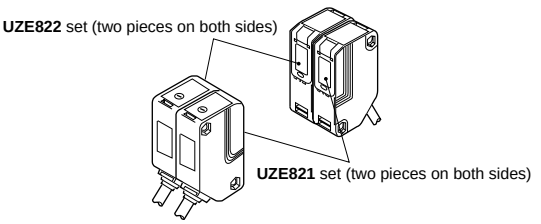


Others

• The transient time duration is 50ms after power-up.

Crosstalk prevention filter (For UZE1011 & UZE1012 only)

• Use the crosstalk prevention filters (option) when two units of the thru-beam sensors are close mounted.



• There are two kinds of the crosstalk prevention filters. When one set of sensor is fitted with the **UZE822**, the other should be fitted with the **UZE821**, and vice versa.

(*1) : They are useless **UZE1001** or **UZE1002**.

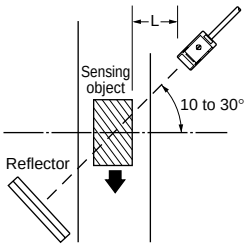
PRECAUTIONS FOR PROPER USE

Retroreflective sensor (UZE150□)

• To detect glossy objects, pay attention to the followings :

(1) Distance L should be spaced out as long as possible.
(2) Install the sensor at an angle of 10° to 30° against the surface of an object.

∗ **UZE141**□ does not need the above steps.



Retroreflective sensor with polarizing filters

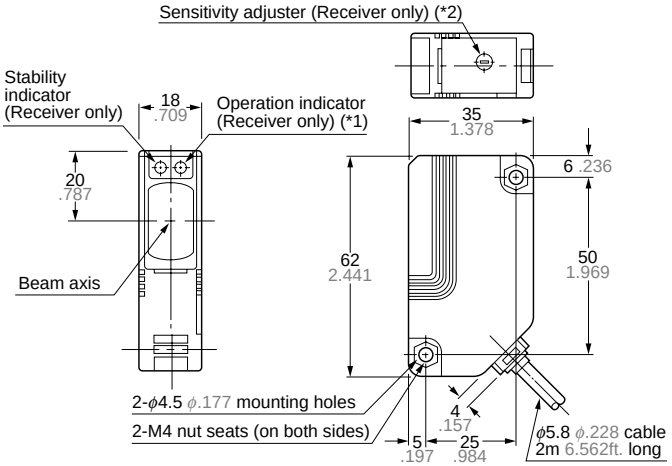
• If a shiny object is covered or wrapped with a transparent film such as discribed below, the retroreflective sensor with polarizing filters may not be able to detect it.
In that case, follow the below steps.

(e.g.)
- Can wrapped by clear film
- Aluminum sheet covered by plastic film
- Gold or silver label, wrapping paper, and the like (specular surface)

(Steps)
- Change an angle opposed to an object
- Reduce a sensitivity with the sensitivity ad-juster
- Set the sensor away from the sensing object

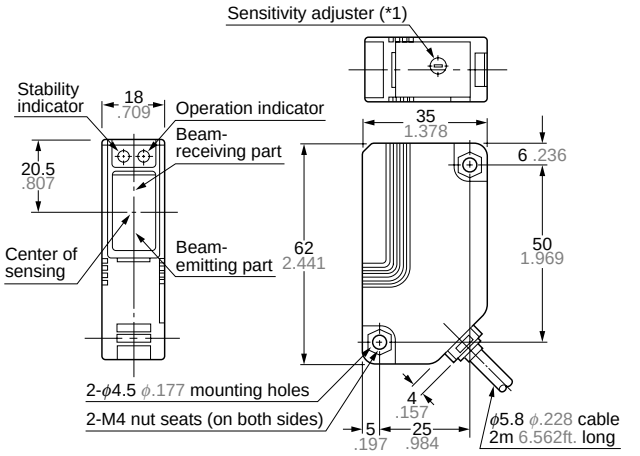
DIMENSIONS (Unit: mm inch)

UZE1011, UZE1012 UZE1001, UZE1002 Sensor



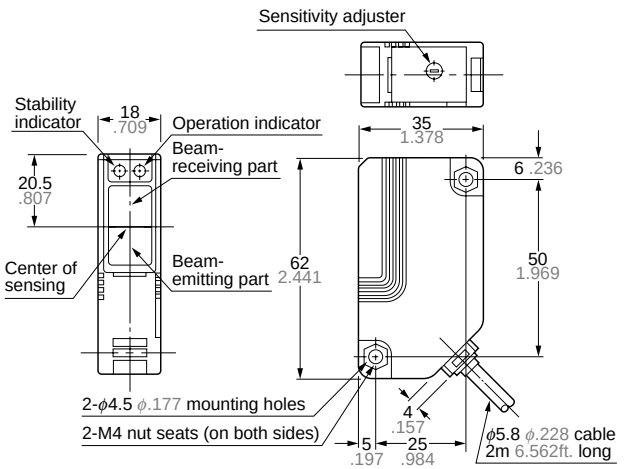
(*1) : It is substituted with the power indicator on the emitter of **UZE100**□.
(*2) : **UZE100**□ is not incorporated with it.

UZE1411, UZE1412 UZE1501, UZE1502 Sensor



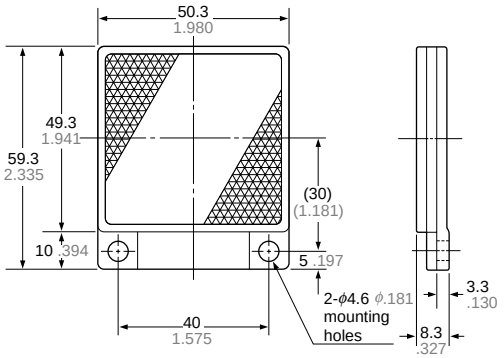
(*1) : **UZE150**□ is not incorporated with it.

UZE1301 UZE1302 Sensor



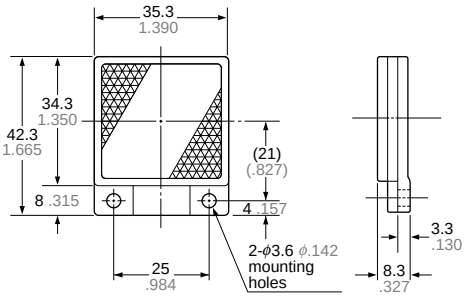
DIMENSIONS (Unit: mm inch)

UZZ112 Reflector (accessory for the retroreflective sensor)



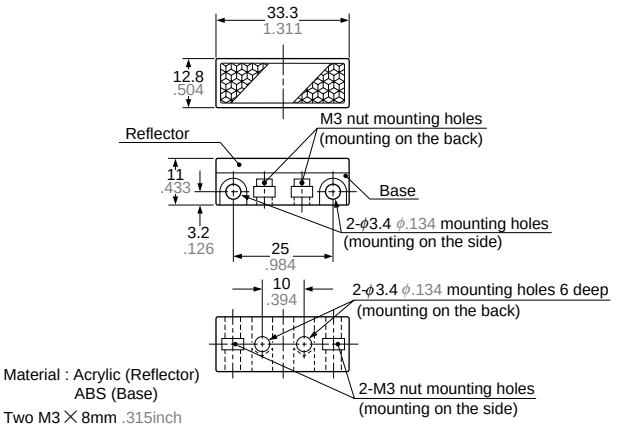
Material : Acrylic (Reflector)
ABS (Base)

UZZ111 Reflector (option)



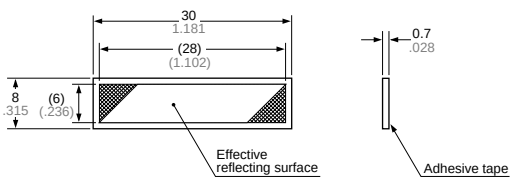
Material : Acrylic (Reflector)
ABS (Base)

UZZ110 Reflector (option)



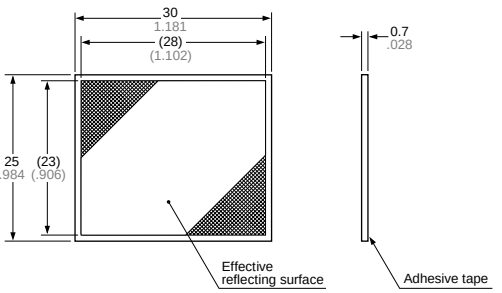
Material : Acrylic (Reflector)
ABS (Base)
Two M3 × 8mm .315inch screws with washers and two nuts are attached.

UZZ101 Reflective tape (option)



Material : Vinyl chloride

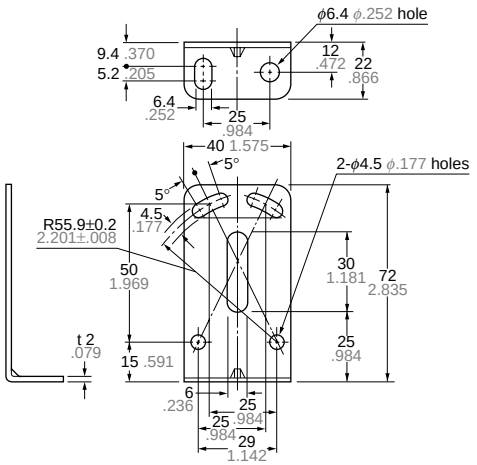
UZZ102 Reflective tape (option)



Material : Vinyl chloride

DIMENSIONS (Unit: mm inch)

UZE811 Sensor mounting bracket (Option)

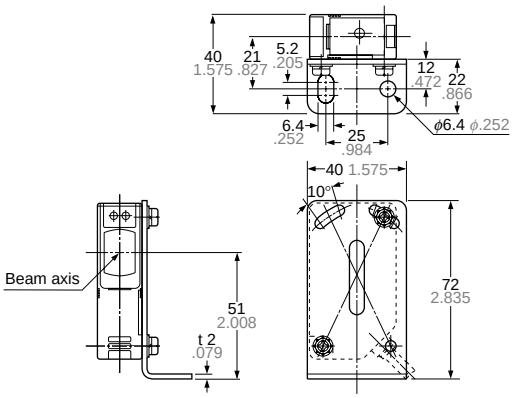


Material: SPCC (Iron steel)

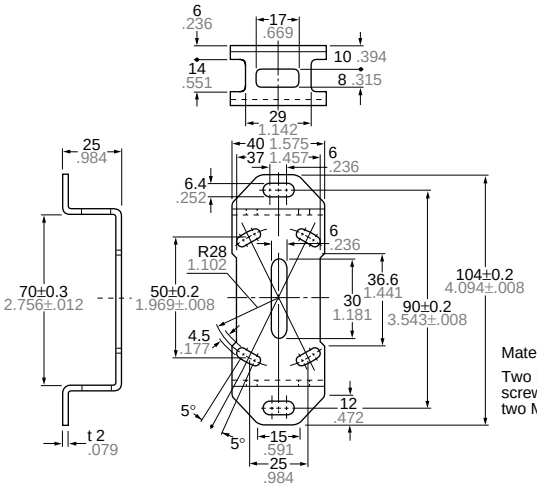
Two M4×25mm .984inch screws with washers and two M4 nuts are attached.

Assembled dimensions

Mounting drawing with the receiver of **UZE101□**



UZE812 Sensor mounting bracket (Option)

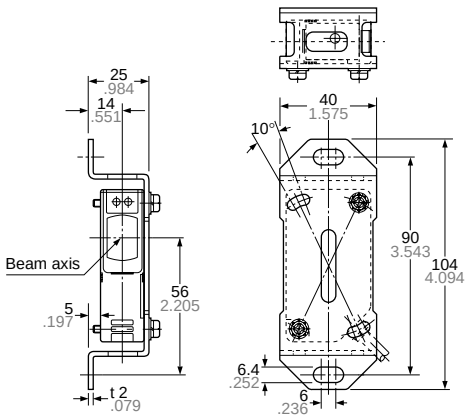


Material: SPCC (Iron steel)

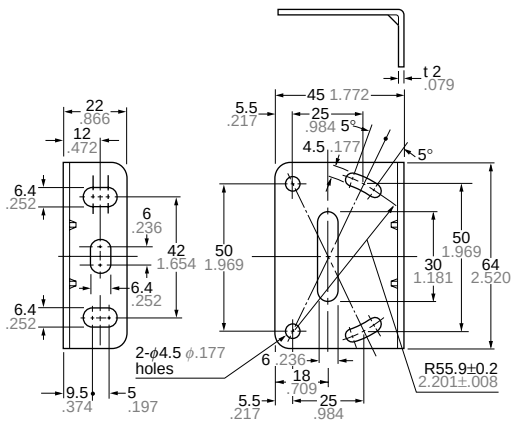
Two M4×25mm 984inch screws with washers and two M4 nuts are attached.

Assembled dimensions

Mounting drawing with the receiver of **UZE101□**



UZE813 Sensor mounting bracket (Option)

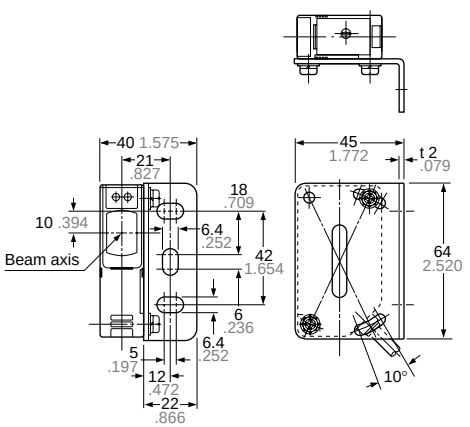


Material: SPCC (Iron steel)

Two M4×25mm .984inch screws with washers and two M4 nuts are attached.

Assembled dimensions

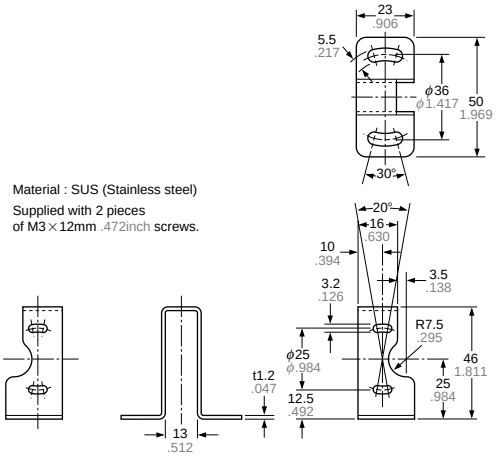
Mounting drawing with the receiver of **UZE101□**



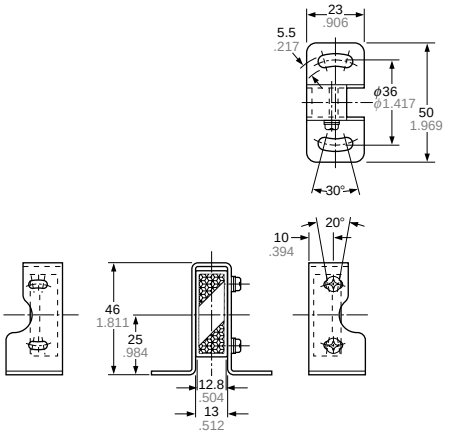
DIMENSIONS (Unit: mm inch)

UZZ1100

Mounting bracket for **UZZ110** reflector (option)

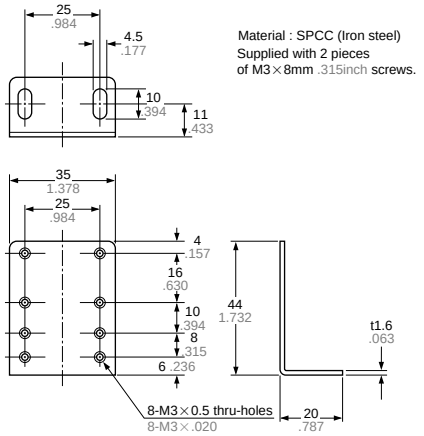


Mounting drawing

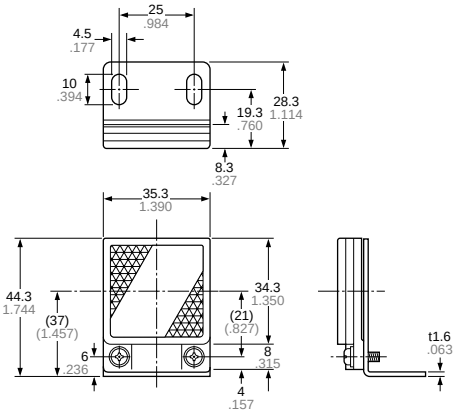


UZZ1110

Mounting bracket for **UZZ111** reflector (option)

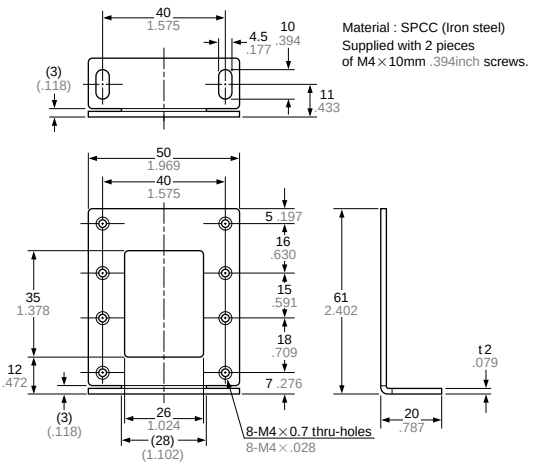


Mounting drawing



UZF1120

Mounting bracket for **UZZ112** reflector (option)



Mounting drawing