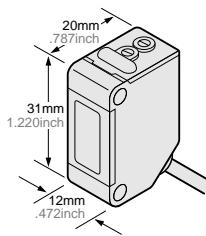


EXHAUSTIVE PERSUIT OF THE BASIC PERFORMANCE



Compact Size

Depth is only 20mm .787inch.

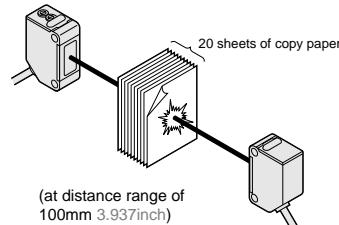


Waterproof

IP67 housing (temporarily submersible)
stainless steel brackets.

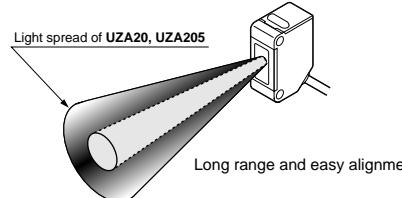
Strong Light Beam Potential

UZA20, UZA205 use an infrared light beam strong enough to penetrate 20 sheets of copy paper (highly resistant to contamination).



Easy Alignment

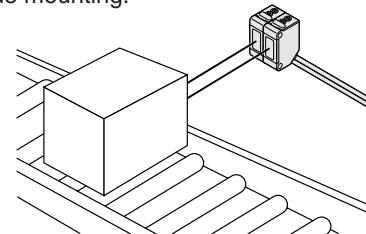
The width of the emitted beam makes alignment easy for the thru-beam, while the use of a visible red LED does the same for the retroreflective version.

Reliable Detection of
Transparent Targets

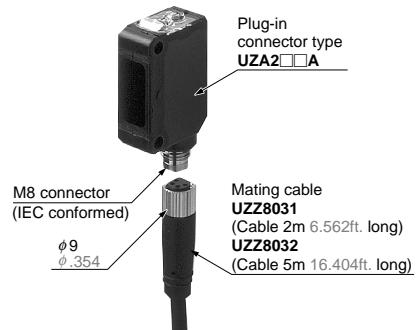
UZA25, 255 have unique optics and electronics design to "see" transparent objects.

Close Mounting of Two Sensors

UZA23□, UZA24□, and UZA26□ are equipped with an automatic crosstalk prevention function to allow side by side mounting.

Plug-in Connector Type is
Available

By one-touch disconnection, any one can replace the sensor in a minute. If a trouble happens, the **UZA** with the connector assists your maintenance with ease.

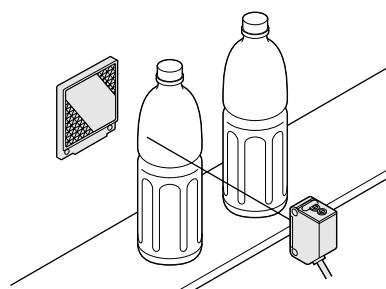


Transparent Objects can be Detected Reliably

UZA25□ detect transparent objects reliably because of its unique optical system and electronic circuit.

ℓ : Length, t : Thickness

Pass sensing of pet bottles



Detectable transparent objects

[by using a UZZ112 reflector at optimum condition (*1)]

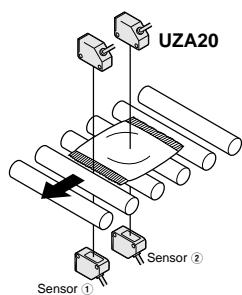
When the passing position of the sensing object places at the center of the sensor and reflector.

(*1) : The optimum state is the condition that the sensitivity is set at the limit level where a stability indicator just starts to light up.

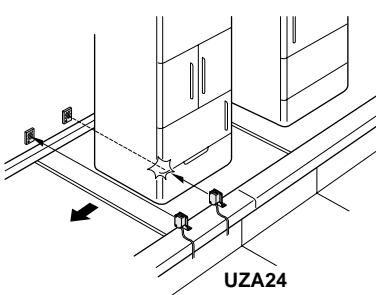
Sensing object	The size of a sensing object
Glass boards	□50mm 1.969inch $t=1.0mm$.039inch
Cylindrical glasses	ø50mm ø1.969inch $\ell=50mm$ 1.969inch $t=2.0mm$.078inch
Acrylic boards	□50mm 1.969inch $t=1.5mm$.059inch
Styrols (floppy cases)	□50mm 1.969inch $t=1.2mm$.047inch
Food wrapping films	□50mm 1.969inch $t=10\mu m$
Cigarette case films	□50mm 1.969inch $t=20\mu m$
Venyl sacks	□50mm 1.969inch $t=30\mu m$
Pet bottles	ø55mm ø2.165inch ø70mm ø2.756inch
Glass bins	ø65mm ø2.559inch

APPLICATIONS

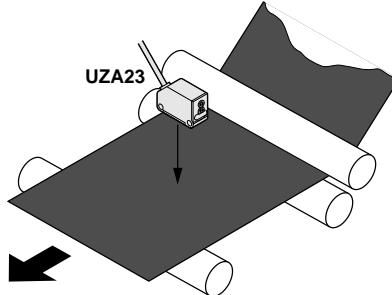
Content check inside paper pouches



Detection of white specular goods



Detection of rubber sheets



ORDER GUIDE

		Appearance	Sensing range	Model No.	Sensing output	Emitting element
NPN output type	Thru-beam		10m 32.80ft.	UZA20	NPN open-collector transistor	Infrared LED
	Retroreflective		0.1 to 3m (*1) .328 to 9.843ft.	UZA24		Red LED
			50 to 1,000mm (*1) 1.969 to 39.370inch	UZA25		Infrared LED
	Diffuse reflective		800mm 31.496inch	UZA23		Infrared LED
PNP output type	Thru-beam		300mm 11.811inch	UZA26	PNP open-collector transistor	Infrared LED
	Retroreflective		10m 32.80ft.	UZA205		Infrared LED
			0.1 to 3m (*1) .328 to 9.843ft.	UZA245		Red LED
	Diffuse reflective		50 to 1,000mm (*1) 1.969 to 39.370inch	UZA255		Infrared LED
	Thru-beam		800mm 31.496inch	UZA235		Infrared LED
	Diffuse reflective		300mm 11.811inch	UZA265		Infrared LED

Cautions: Mounting bracket is not supplied with UZA series so that users' can select it in accordance with mounting methods.

Purchase optional sensor mounting brackets (five types) are available for users' need. See next page.

(*1) : The sensing range of the retroreflective sensor is the figure using a UZZ112 reflector.

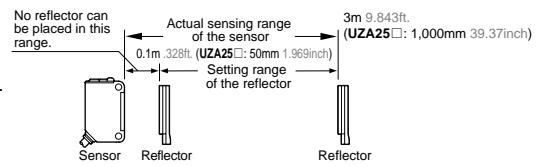
Possible setting range of the reflector is indicated as a sensing range. Therefore, the sensor can detect an object within a sensing range of 0.1m .328ft. (UZA25□ : 50mm 1.969inch).

Self-diagnosis output type (Equipped for NPN output type only and not equipped for UZA25□).

Self-diagnosis output type is also available.

A package without a reflector

A package without a reflector is also available for the model Nos. of UZA24□ and UZA25□.



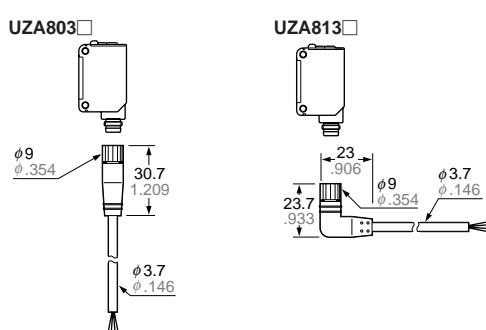
Plug-in connector type (Not available with the self-diagnosis output type)

The sensor with a connector is also available. When ordering this type, add suffix "A" at the end of the model number. Purchase a mating cable separately.

e. g.) The connector type for UZA20 is "UZA20A".

Mating cable

Type	Model No.	Description
Straight	UZZ8031	Length: 2m 6.562ft.
	UZZ8032	Length: 5m 16.404ft.
Elbow	UZZ8131	Length: 2m 6.562ft. With the connector on one end. Two cables a set.
	UZZ8132	Length: 5m 16.404ft.



OPTION

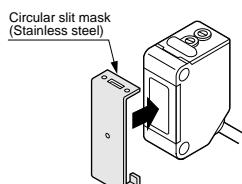
Component	Model No.	Description	
Circular slit mask (For thru-beam sensor only)	UZA801 (ϕ 0.5mm 0.020inch)	When fitted to one side	Sensing range: 400mm 15.748inch [UZA20□] Min. sensing object: ϕ 12mm ϕ .472inch
		When fitted to both sides	Sensing range: 20mm .787inch [UZA20□] Min. sensing object: ϕ 0.5mm ϕ .020inch
	UZA802 (ϕ 1mm 0.039inch)	When fitted to one side	Sensing range: 900mm 35.433inch [UZA20□] Min. sensing object: ϕ 12mm ϕ .472inch
	UZA803 (ϕ 2mm 0.079inch)	When fitted to both sides	Sensing range: 100mm 3.937inch [UZA20□] Min. sensing object: ϕ 1mm ϕ .039inch
		When fitted to one side	Sensing range: 2m 6.562ft. [UZA20□] Min. sensing object: ϕ 12mm ϕ .472inch
		When fitted to both sides	Sensing range: 400mm 15.748inch [UZA20□] Min. sensing object: ϕ 2mm ϕ .079inch
Rectangular slit mask (For thru-beam sensor only)	UZA804 (0.5×6mm .020×.236inch)	One side slit-on	Sensing range: 2m 6.562ft. [UZA20□] Min. sensing object: ϕ 12mm ϕ .472inch
		Both side slit-on	Sensing range: 400mm 15.748inch [UZA20□] Min. sensing object: 0.5mm×6mm .020×.236inch
	UZA805 (1×6mm .039×.236inch)	One side slit-on	Sensing range: 3m 9.843ft. [UZA20□] Min. sensing object: ϕ 12mm ϕ .472inch
	UZA806 (2×6mm .079×.236inch)	Both side slit-on	Sensing range: 1m 3.281ft. [UZA20□] Min. sensing object: 1mm×6mm .039×.236inch
		One side slit-on	Sensing range: 5m 16.404ft. [UZA20□] Min. sensing object: ϕ 12mm ϕ .472inch
		Both side slit-on	Sensing range: 400mm 15.748inch [UZA20□] Min. sensing object: 2mm×6mm .079×.236inch
Reflector (For retroreflective sensor only)	UZZ110	Sensing range: 0.1 to 1m .328 to 3.281ft. [UZA24□] 50 to 250mm 1.969 to 9.843inch [UZA25□] Min. sensing object: ϕ 30mm ϕ .181inch [UZA24□, UZA25□]	
	UZZ111	Sensing object: 0.1 to 1.5m .328 to 4.921ft. [UZA24□] 50 to 500mm 1.969 to 19.685inch [UZA25□] Min. sensing object: ϕ 35mm ϕ .1378inch	
Reflector mounting bracket	UZZ1100	Protective mounting bracket for UZZ110 Protects the reflector from damage and keeps an exact alignment	
	UZZ1110	For UZZ111	
	UZZ1120	For UZZ112	
Reflective tape (For retroreflective sensor only) (*)1	UZZ101	Ambient temperature: -25 to +50°C -13 to +122°F Ambient humidity: 35 to 85%RH	Sensing range: 0.1 to 0.5mm .004 to .020inch [UZA24□]
	UZZ102	The performance of the reflective tape may deteriorate if it is used under a pressed condition. Do not cut the tape to use. Doing so may lose the performance.	Sensing range: 0.1 to 0.7mm .004 to .028inch [UZA24□] 0.15 to 0.4mm .006 to .016inch [UZA25□]
Sensor mounting bracket (*)2	UZA821	Foot angled mounting bracket Usable as the mounting bracket for UZZ110	
	UZA822	Foot di-angled mounting bracket Saving height and mountable on the flat Usable as the mounting bracket for UZZ110	
	UZA823	Protective mounting bracket Protects the sensor from damage and keeps an exact alignment	
	UZA824	Back di-angled mounting bracket	
	UZA825	Back angled mounting bracket	

(*)1 : UZZ101 and UZZ102 can not be used for UZA25□.

(*)2 : Two sets are required for the thru-beam sensor.

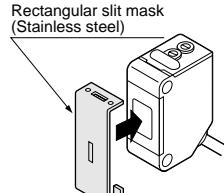
Circular slit mask

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



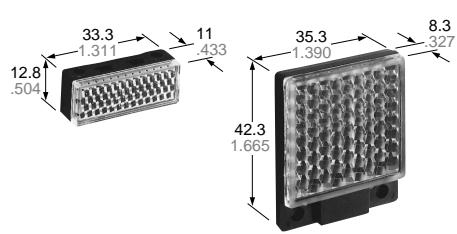
Rectangular slit mask

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



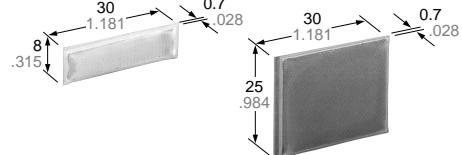
Reflector

•UZZ111



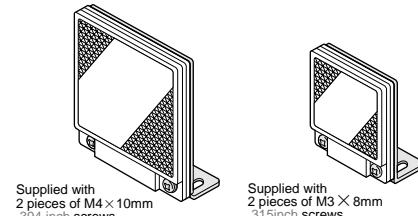
Reflective tape

•UZZ102

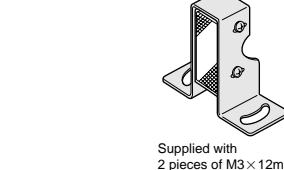


Reflector mounting bracket

•UZZ1110



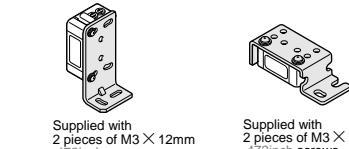
•UZZ1100



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

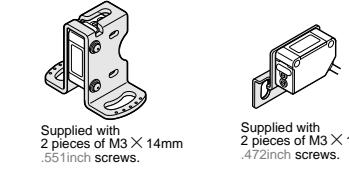
Sensor mounting bracket

•UZA821



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

•UZA823



Supplied with
2 pieces of M3×14mm
.551inch screws

•UZA825



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

SPECIFICATIONS

Type		Thru-beam	Retroreflective		Diffuse reflective						
			With polarizing filters	For transparent object sensing	Long sensing range	Short sensing range					
Item	Model No.	NPN output type	UZA20	UZA24	UZA25	UZA23					
		PNP output type	UZA205	UZA245	UZA255	UZA235					
Sensing range		10m 32.808ft.	0.1 to 3m .328 to 9.843ft. (*1)	50 to 1,000mm 1.969 to 39.37inch (*1)	800mm 31.496inch (*2)	300mm 11.811inch (*2)					
Sensing object		Opaque object of $\phi 12\text{mm}$ $\phi .472\text{inch}$ or more	Opaque, translucent & specular object of $\phi 50\text{mm}$ $\phi 1.969\text{inch}$ or more (*1) (*3)	Opaque, translucent & transparent object of $\phi 50\text{mm}$ $\phi 1.969\text{inch}$ or more (*1)	Opaque, translucent & transparent object.						
Hysteresis		—			15% or less of an operation distance						
Repeatability (vertical direction for a light axis)		0.5mm .020inch or less			1mm .039inch or less						
Supply voltage		12 to 24V DC $\pm 10\%$ Ripple P-P: 10% or less									
Consumption	NPN output type	Emitter: 35mA or less Receiver: 25mA or less	30mA or less		35mA or less						
	PNP output type	Emitter: 35mA or less Receiver: 30mA or less	35mA or less		40mA or less						
Sensing output		<NPN output type> NPN open-collector transistor Sink current: 100mA max. Applied voltage: 30V DC or less Residual voltage: 1.5V or less (at 100mA sink current) 0.4V or less (at 16mA sink current)			<PNP output type> PNP open-collector transistor Source current: 100mA max. Applied voltage: 30V DC or less Residual voltage: 1.5V or less (at 100mA source current) 0.4V or less (at 16mA source current)						
Output operation		Selection of Light-ON/Dark-ON by a switch									
Short-circuit protection		Equipped									
Response time		1ms or less									
Operation indicator		Red LED (lights up when the sensing output is in the ON state)									
Stability indicator		Green LED (lights up at the stable light-receiving or the stable light-interrupted conditions)									
Power indicator		Red LED (lights up while the power is supplied)	—								
Sensitivity adjuster		Equipped with a continuously variable adjuster									
Automatic crosstalk prevention function		—	Two units of sensors can be mounted closely.	—	Two units of sensors can be mounted closely						
Environmental resistance	Protection	IP67 (IEC)									
	Ambient temperature	-25 to + 55°C -13 to 131°F (No dew condensation nor icing allowed), Storage: -30 to + 70°C -22 to 158°F									
	Ambient humidity	35 to 85%RH, Storage: 35 to 85%RH									
	Ambient light	Sun light: 10,000 ℓ \times at the light-receiving face, Incandescent light: 3,000 ℓ \times at the light-receiving face									
	Noise	Power line: 240Vp with 0.5 μ s pulse duration (28 to 100Hz), Radiation: 300Vp with 10ms cycle and 0.5 μ s pulse duration (by a noise simulator)									
	Withstand voltage	1,000V AC applied between the live parts and enclosure for 1 min.									
	Insulation	20M Ω min. applied between the live parts and enclosure at 250V DC									
	Vibration	1.5mm amplitude at the frequency of 10 to 500Hz in each of X, Y and Z directions for 2 hours each in the power OFF state									
	Shock	500m/s ² (approx. 50G) impulse in each of X, Y and Z directions for 3 times each in the power OFF state									
Emitting element		Infrared LED (modulated)	Red LED (modulated)	Infrared LED (modulated)							
Material		Enclosure-Lens-Indicator cover: Polycarbonate, Front cover: Polycarbonate (Acrylic for UZA24□)									
Cable		0.2mm ² \times 3 cores with 2m of oil resistant cable (2 cores for the emitter only)									
Cable extension		Extendable up to 100m 328.084ft. by using 0.3mm ² or more cable (Thru-beam sensor: each emitter and receiver)									
Weight		Emitter: Approx. 45g 1.59oz Receiver: Approx. 50g 1.76oz	Approx. 50g 1.76oz								
Accessories		Screwdriver for the sensitivity adjustment : 1pc. Screwdriver for the sensitivity adjustment: 1pc.	Screwdriver for the sensitivity adjustment: 1pc.								

(*1): The sensing range and sensing object of the retroreflective sensor is the figure using a **UZZ112** reflector. Possible setting range of the reflector is indicated as a sensing range. Therefore, the sensor can detect the object within a sensing range of 0.1mm .004inch (**UZA25**□: 50mm 1.969inch)

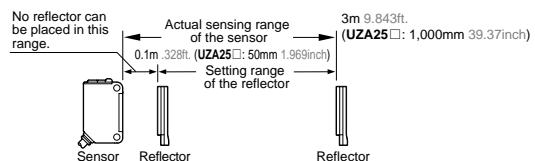
(*2): The sensing range of the diffuse reflective sensor is the figure using an object of non-glossy white paper (200 \times 200mm 7.874 \times 7.874inch).

(*3): The beam sensor of retroreflective mode with polarizing filters may not stably detect specular or glossy objects over transparent film. Refer to "PRECAUTIONS FOR PROPER USE"

(e.g.): Can wrapped by clear film

Aluminum sheet covered by plastic film

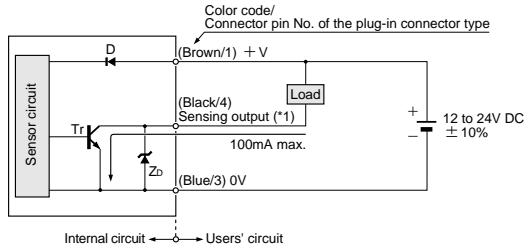
Silver sticker or paper with transparent membrane.



TYPICAL WIRING DIAGRAMS

NPN output type

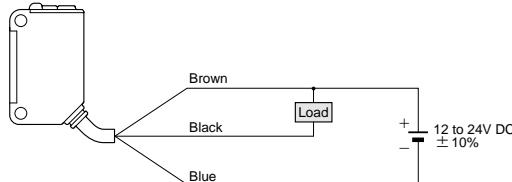
I/O circuit diagram



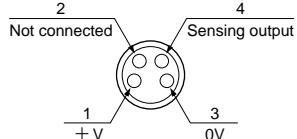
(*1): The emitter of the thru-beam sensor is not incorporated with the sensing output.

Symbol...D : Reverse polarity protection diode
Z_D : Surge absorption zener diode
Tr : NPN output transistor

Wiring diagram

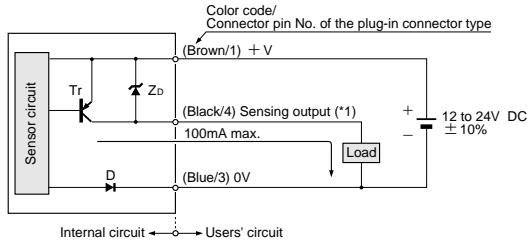


Connector pin position



PNP output type

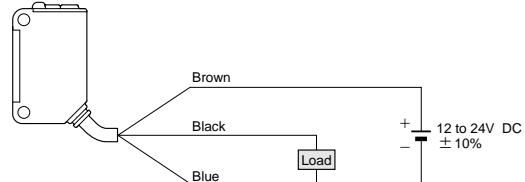
I/O circuit diagram



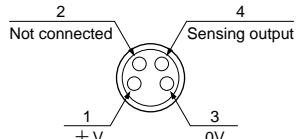
(*1): The emitter of the thru-beam sensor is not incorporated with the sensing output.

Symbol...D : Reverse polarity protection diode
Z_D : Surge absorption zener diode
Tr : PNP output transistor

Wiring diagram



Connector pin position

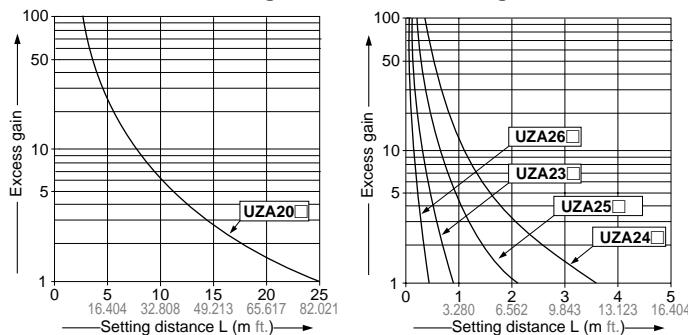


SENSING FIELDS

These are typical sensing fields, which may vary slightly from unit to unit.

All models

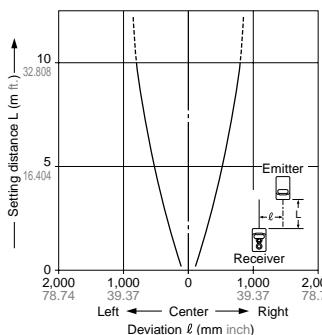
Correlation between setting distance and excess gain



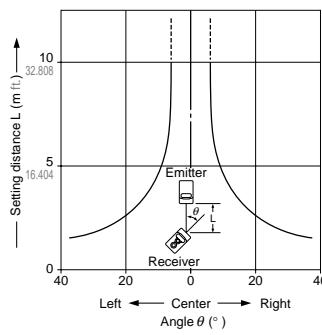
UZA20

Thru-beam

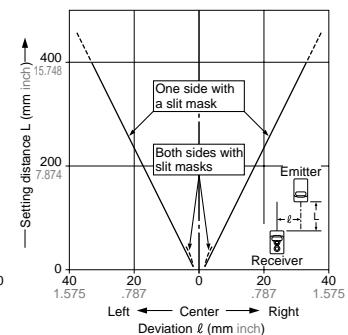
Parallel deviation



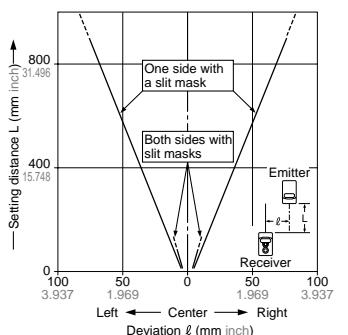
Angular deviation



Parallel deviation with circular slit masks (φ0.5mm .020inch)

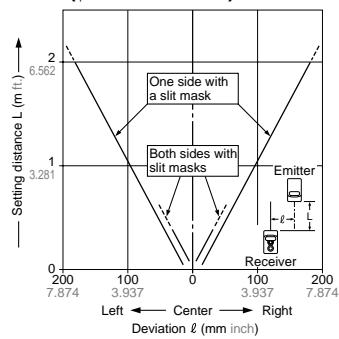


Parallel deviation with circular slit masks (φ1mm .039inch)

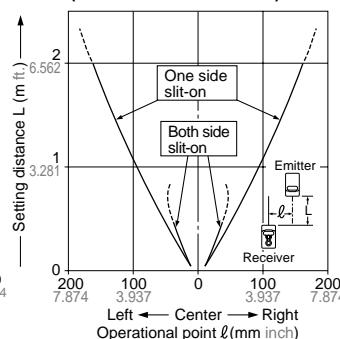


SENSING FIELDS

Parallel deviation with circular slit masks (φ2mm .079inch)

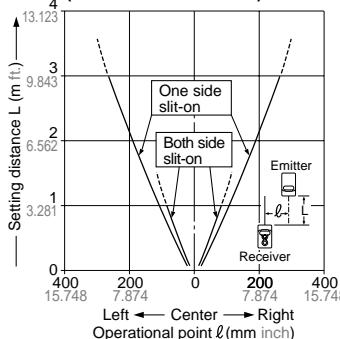


Parallel deviation with rectangular slit masks (0.5×6mm .020×.236inch)

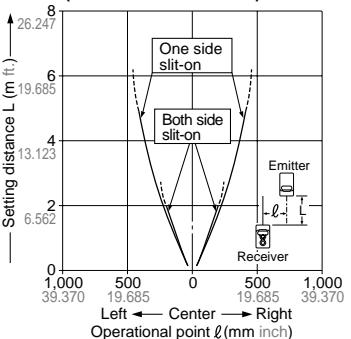


These are typical sensing fields, which may vary slightly from unit to unit.

Parallel deviation with rectangular slit masks (1×6mm .039×.236inch)



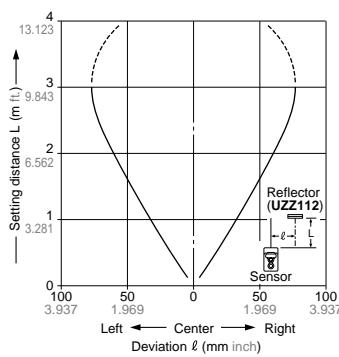
Parallel deviation with rectangular slit masks (2×6mm .079×.236inch)



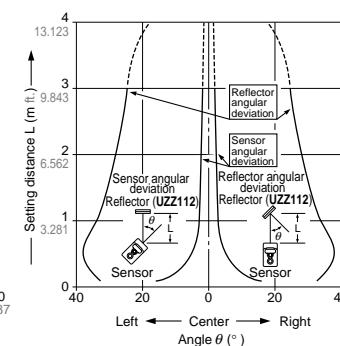
UZA24

Retroreflective

Parallel deviation



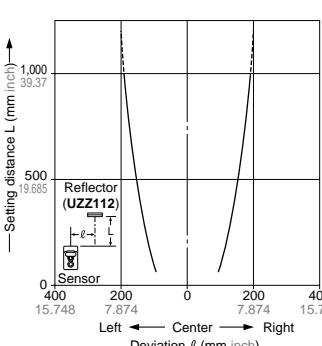
Angular deviation



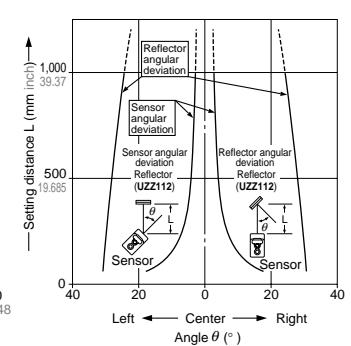
UZA25

Retroreflective

Parallel deviation



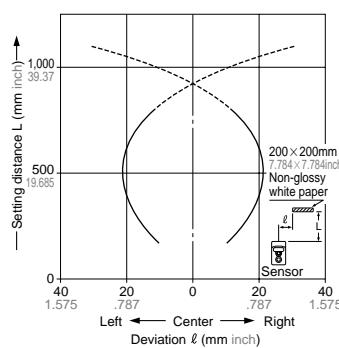
Angular deviation



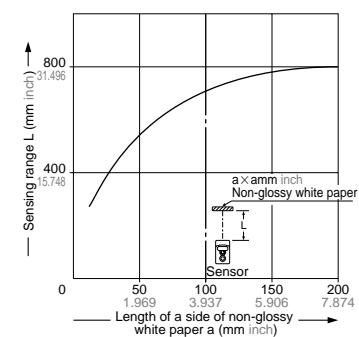
UZA23

Diffuse reflective

Sensing field



Object size – Sensing range correlation



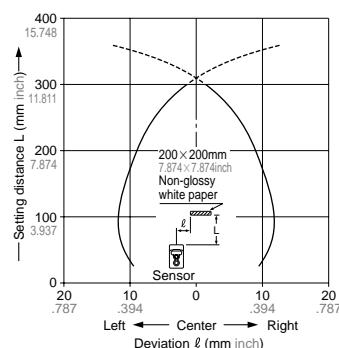
Note that the sensing range decreases if a sensing object is smaller than the standard size (a non-glossy white paper: 200×200mm 7.874×7.874inch) as shown in the graph on the left.

The curve shows the figure obtained when the sensor is adjusted to detect a 200×200mm 7.874×7.874inch non-glossy white paper at the sensing range of 800mm 31.496inch.

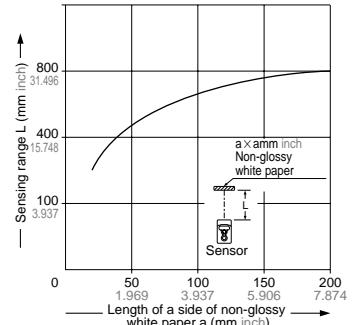
UZA26

Diffuse reflective

Sensing field



Object size – Sensing range correlation



Note that the sensing range decreases if a sensing object is smaller than the standard size (a non-glossy white paper: 200×200mm 7.874×7.874inch) as shown in the graph on the left.

The curve shows the figure obtained when the sensor is adjusted to detect a 200×200mm 7.874×7.874inch non-glossy white paper at the sensing range of 300mm 11.811inch.

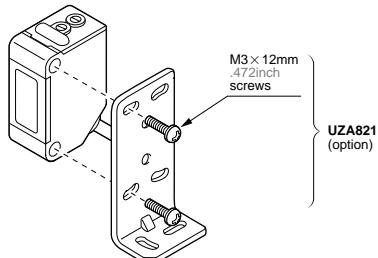
PRECAUTIONS FOR PROPER USE



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

Tightening torque should be $0.5\text{N}\cdot\text{m}$ {5.1kgf·cm} or less.



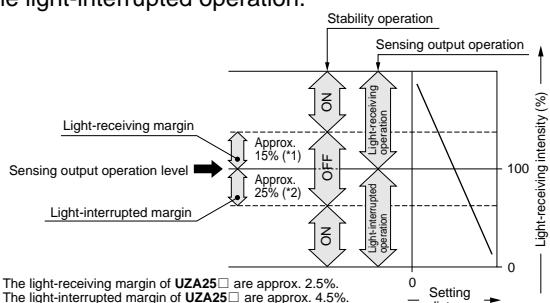
Operation mode selection switch

	Light-ON mode is obtained when the switch is turned fully counterclockwise.
	Dark-ON mode is obtained when the switch is turned fully clockwise.

Stability indicator

The stability indicator (green) lights up when the light-receiving intensity of the signal light is sufficient against the operation level.

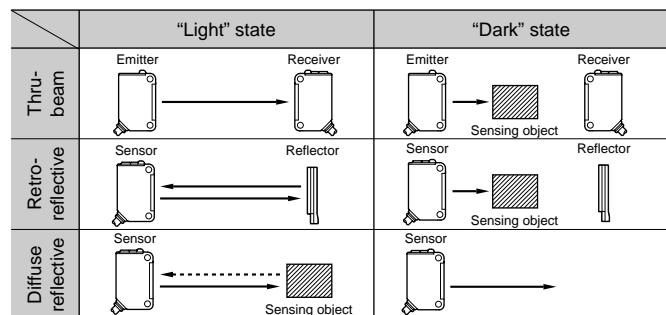
If the light-receiving level where the stability indicator lights up, the sensor can detect stably without affecting the temperature and the voltage change at the light-receiving operation and the light-interrupted operation.



Sensitivity setup

	Turn the sensitivity adjuster over counterclockwise, set the min. sensitivity position (MIN.).
	Turn the sensitivity adjuster clockwise slowly at the "Light-receiving" condition, check the point A where the sensor turns on in the "light" state.
	Turn the sensitivity adjuster clockwise at the "Light-interrupted" condition, check the point B where the sensor turns off in the "light" state after operating at the light-receiving condition. (When the sensor does not operate, at the "light" state with turning it over clockwise, the position where turned it over is the point B.)
	The optimum position is halfway between point A and B.

(*)1: Turn the sensitivity adjuster slowly with the attached driver. If turn it over, be aware the sensor may be damaged.



Wiring

Do not supply power while wiring.

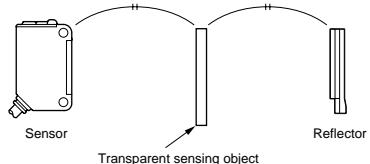
Verify that supply voltage ripple is within the rating. With a commercial switching regulator, ground the F.G. terminal.

Where equipment generating noise such as a switching regulator or an inverter motor is placed around the sensor, ground its F.G. terminal.

Do not run the sensor cable along any high-voltage or power cable in parallel or in a same raceway. It may cause a malfunction by induction.

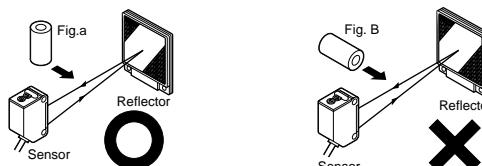
Transparent object sensing UZA25□ of the retroreflective sensor

The optimum sensing is possible when the sensing position of a transparent sensing object is set at the center of the sensor and the reflector. If setting the sensing position near the sensor or the reflector, the sensing may be unstable. In this case, set the sensing position at the center of the sensor and the reflector.



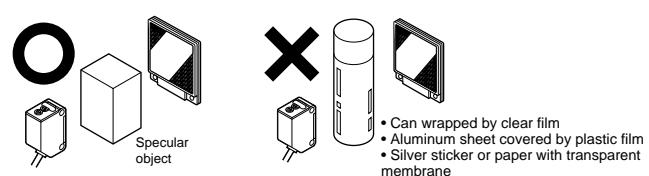
When the sensor detects a rough plastic receptacle or glass bin, the light-receiving intensity may differ in accordance with the sensing position or direction. Adjust the sensitivity by turning the sensing object and confirms the stable sensing condition.

If your object is a specular cylinder, feed it with standing, not lying, as the figure A. The sensor may fail to detect the lying object as the figure B.



UZA24□, Retroreflective mode with polarizing filters

As light is polarized by the transparent film or membrane, UZA24□ may not detect the object covered or wrapped by it.



Others

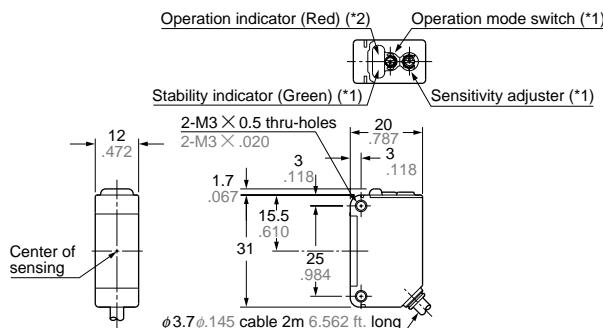
Do not use the sensor output signal for 50ms immediately after the power is supplied to the sensor.

Avoid places where the sensor may be directly exposed to fluorescent lamps with rapid-starters or high frequency lighting as it may affect the sensing performance.

DIMENSIONS (Unit: mm inch)

UZA2□□

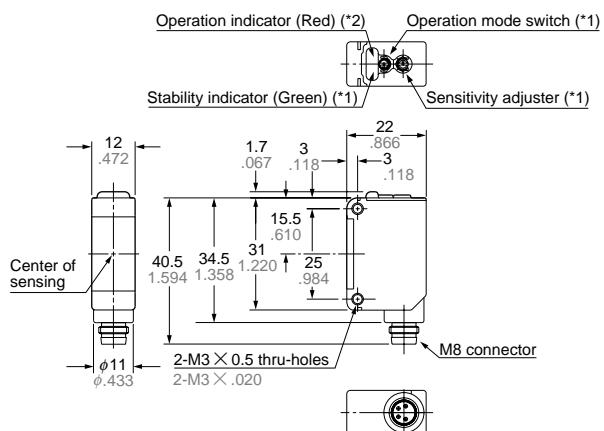
Sensor



(*1): The emitter of the thru-beam sensor is not incorporated with it.
 (*2): It is substituted with the power indicator (red) on the emitter of the thru-beam sensor.

UZA2□□A

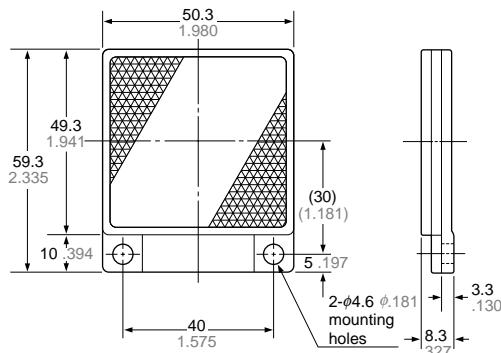
Sensor



(*1): The emitter of the thru-beam sensor is not incorporated with it.
 (*2): It is substituted with the power indicator (red) on the emitter of the thru-beam sensor.

UZZ112

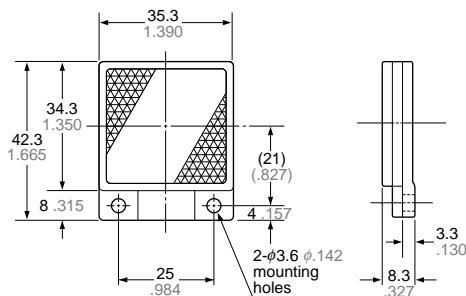
Reflector (accessory for the retroreflective sensor)



Material : Acrylic (Reflector)
 ABS (Base)

UZZ111

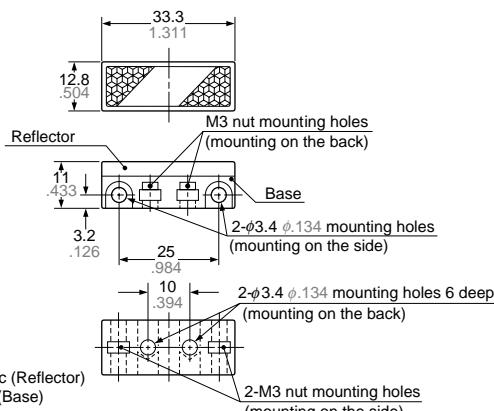
Reflector (option)



Material : Acrylic (Reflector)
 ABS (Base)

UZZ110

Reflector (option)

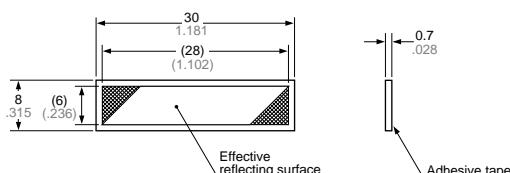


Material : Acrylic (Reflector)
 ABS (Base)

Two M3 × 8mm .315inch
 screws with washers and
 two nuts are attached.

UZZ101

Reflective tape (option)

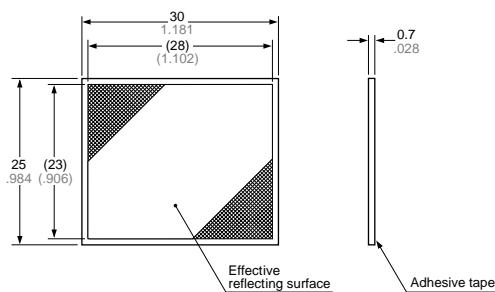


Material : Vinyl chloride

DIMENSIONS (Unit: mm inch)

UZZ102

Reflective tape (option)

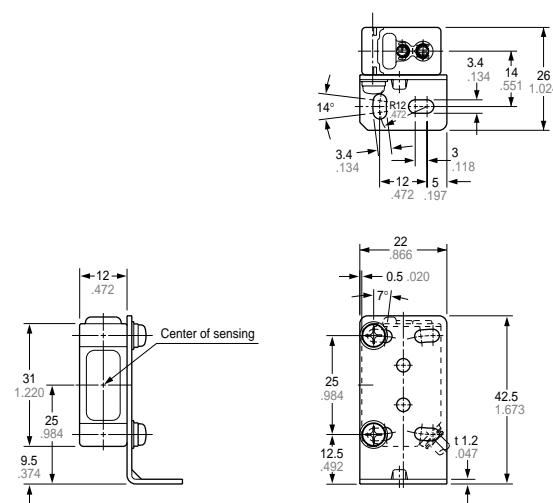
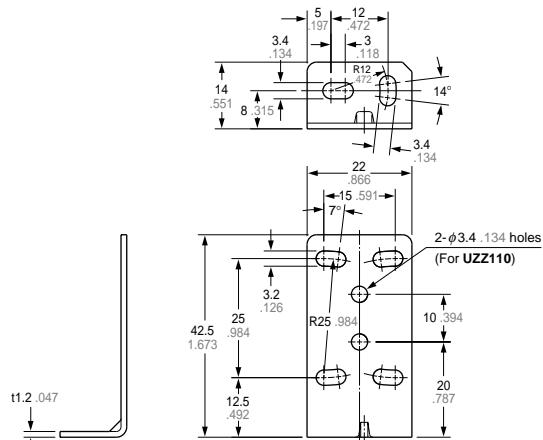


Material : Vinyl chloride

UZA821

Sensor mounting bracket (option)

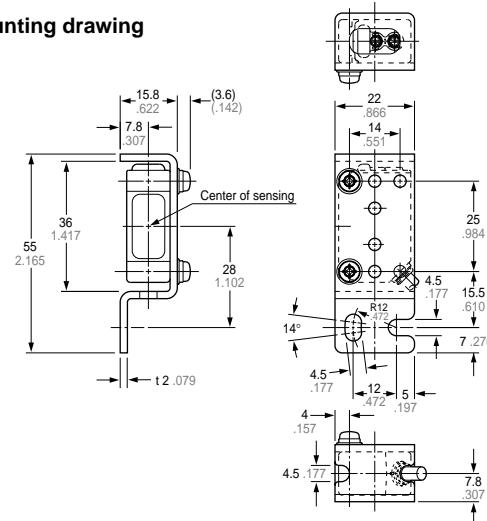
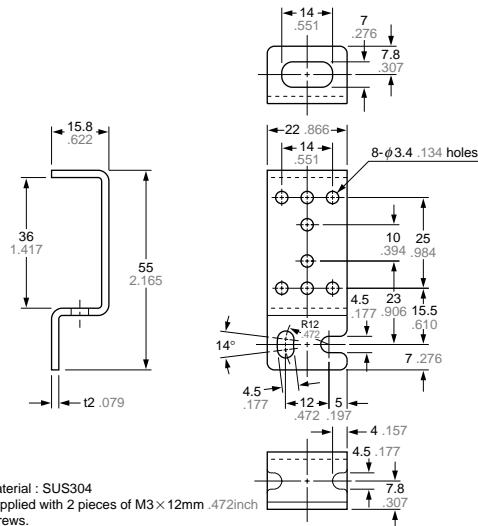
Mounting drawing



UZA822

Sensor mounting bracket (option)

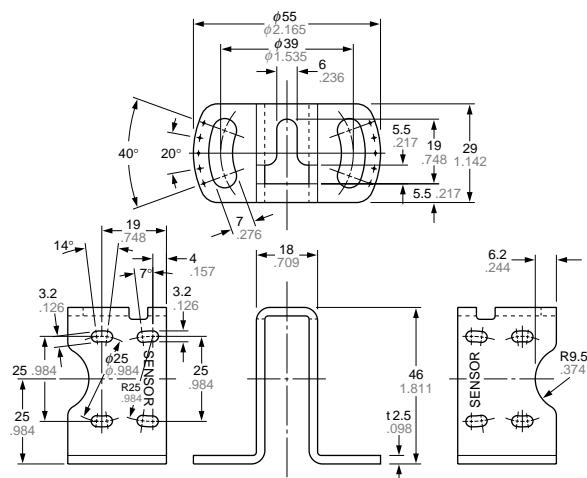
Mounting drawing



DIMENSIONS (Unit: mm inch)

UZA823

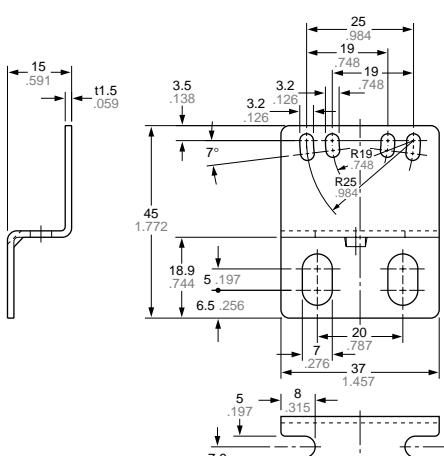
Sensor mounting bracket (option)



Material : SUS304
Supplied with 2 pieces
of M3 × 14mm .551inch screws.

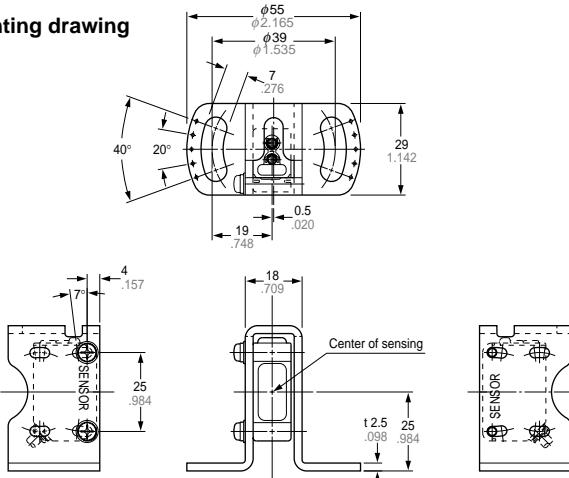
UZA824

Sensor mounting bracket (option)



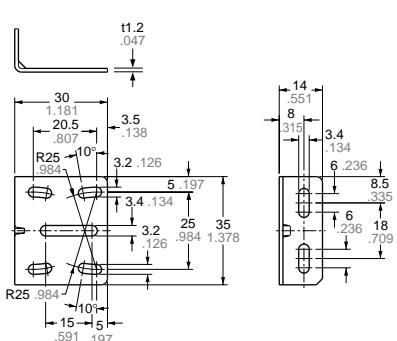
Material : SUS304
Supplied with 2 pieces
of M3×12mm .472inch screws.

Mounting drawing



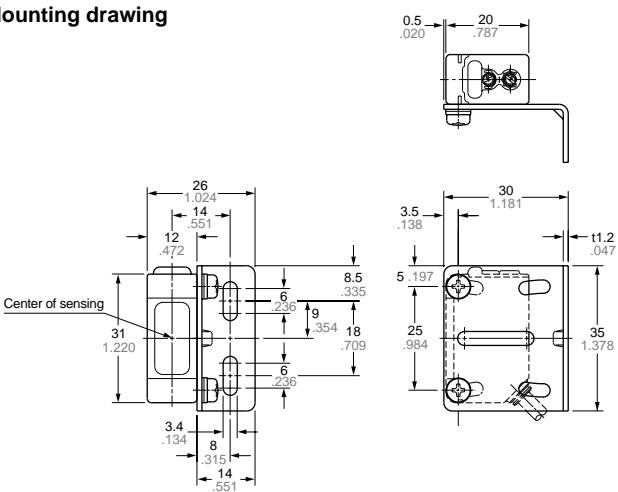
UZA825

Sensor mounting bracket (option)



Material : SUS304
Supplied with 2 pieces
of M3 × 12mm .472inch screws.

Mounting drawing

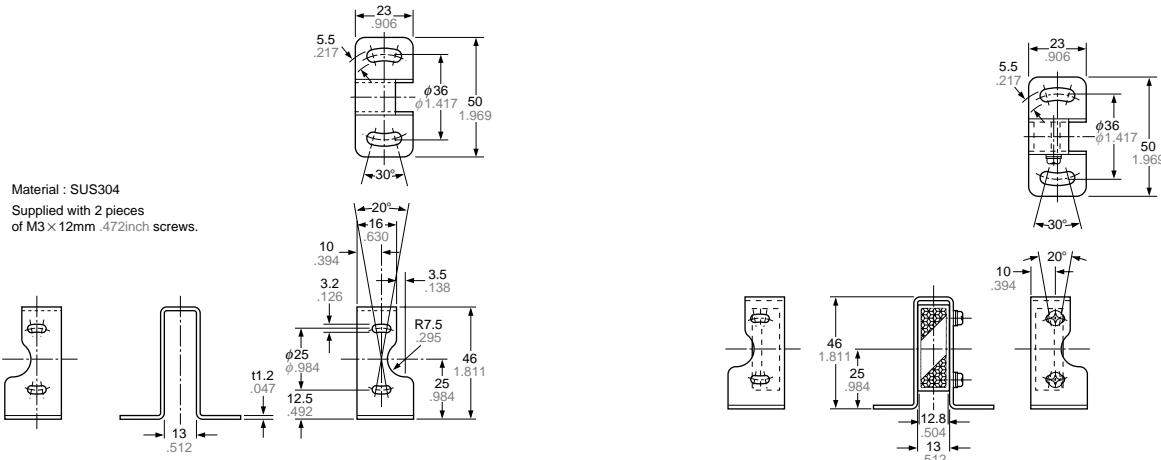


DIMENSIONS (Unit: mm inch)

UZZ1100

Mounting bracket for UZZ110 reflector (option)

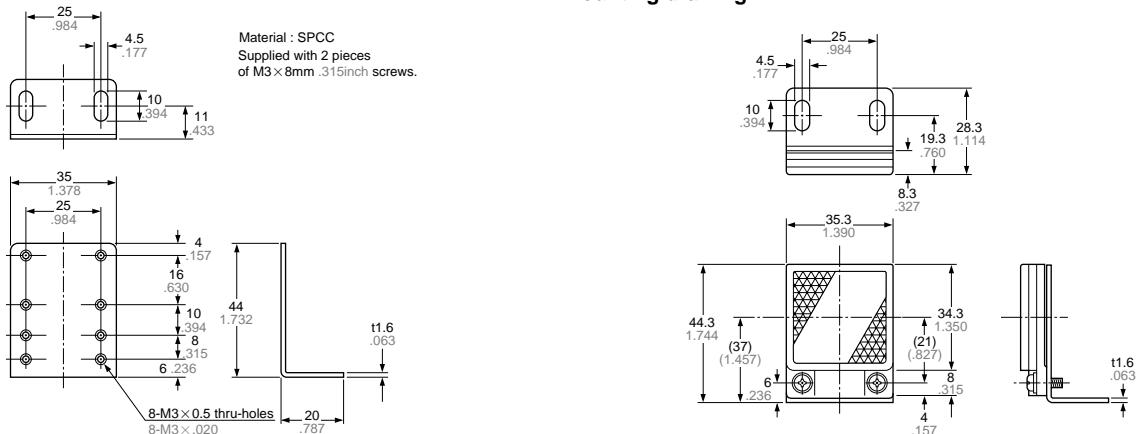
Mounting drawing



UZZ1110

Mounting bracket for UZZ111 reflector (option)

Mounting drawing



UZZ1120

Mounting bracket for UZZ112 reflector (option)

Mounting drawing

