

NAIS

CYLINDRICAL TYPE PHOTOELECTRIC SENSORS

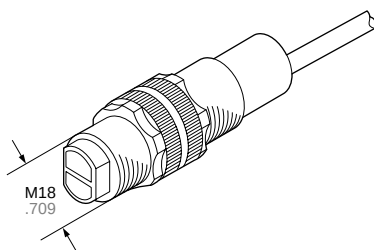
UZC Series

SIMPLE MOUNTING WITH A M18 THREAD



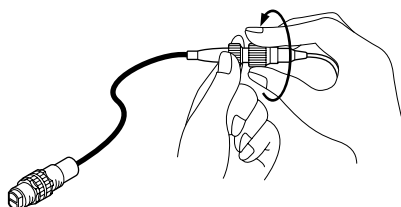
M18 Thread

This sensor has a M18 thread on an enclosure, which is convenient for mounting.



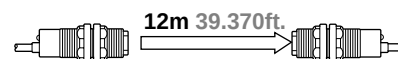
Easy to Replace

The sensor with a connector (UZC---A) makes its replacement easy.

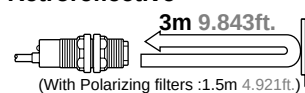


Long Sensing Range

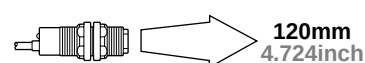
Thru-beam



Retroreflective



Diffuse reflective



Wide Product Range

Supply voltage

- q AC type (24 to 240V AC)
- w DC type (10 to 30V DC)

Output

- q NPN open-collector transistor
- w PNP open-collector transistor
- e AC non-contact (thyristor) output

Connection

- q Cable type
- w Connector type

A total of 32 models are available.

Environment Resistant

IP67 achieved by total encapsulation. Strong resistance against vibration by resin encapsulation. Connector protection is also IP67.

Convenient Options

Side-view attachment (For the thru-beam sensors only)
Light is bent to a right angle when this attachment is used.

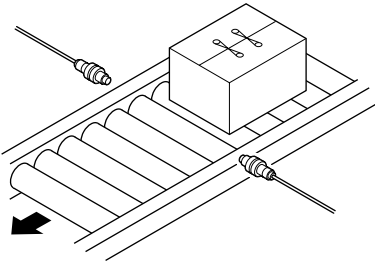


Slit mask (For the thru-beam sensors only)
It is convenient for detecting small objects or enhancing sensing accuracy.

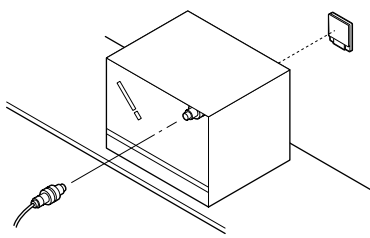


APPLICATIONS

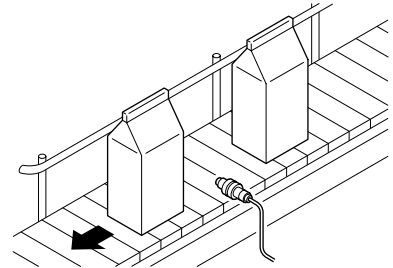
Cardboard boxes sensing



Specular objects sensing



Milk packs sensing



ORDER GUIDE

		Appearance (*1)	Sensing range	Model No.	Supply voltage	Output	Output operation
DC type	Thru-beam		12m 39.370ft.	UZC200	10 to 30V DC	NPN open-collector transistor	Light-ON/Dark-ON Selected by an operation mode control wire
				UZC2005		PNP open-collector transistor	
	Retroreflective (*1)		3m 9.843ft. (*1)	UZC250		NPN open-collector transistor	
				UZC2505		PNP open-collector transistor	
	With polarizing filters		1.5m 4.921ft. (*1)	UZC240		NPN open-collector transistor	
				UZC2405		PNP open-collector transistor	
	Diffuse reflective		120mm 4.724inch	UZC230		NPN open-collector transistor	
				UZC2305		PNP open-collector transistor	
AC type	Thru-beam		12m 39.370ft.	UZC101	24 to 240V AC ± 10%	AC non-contact (thyristor) output	Light-ON
				UZC102			Dark-ON
	Retroreflective (*1)		3m 9.843ft. (*1)	UZC151			Light-ON
				UZC152			Dark-ON
	With polarizing filters		1.5m 4.921ft. (*1)	UZC141			Light-ON
				UZC142			Dark-ON
	Diffuse reflective		120mm 4.724inch	UZC131			Light-ON
				UZC132			Dark-ON

Cautions : A reflector is not supplied with the retroreflective sensor. Purchase a reflector separately.

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

ORDER GUIDE

Connector 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 of **UZZ2005** is "**UZZ2005A**".

Mating cable

Type	Model No.	Description	
For DC type sensors (*1)	UZZ8211	Length: 2m 6.562ft.	For the emitter of the thru-beam sensor (2 cores) (*2)
	UZZ8212	Length: 5m 16.404ft.	
	UZZ8231	Length: 2m 6.562ft.	For the emitter/receiver of the thru-beam, retroreflective and diffuse reflective sensors (4 cores) (*2)
	UZZ8232	Length: 5m 16.404ft.	
For AC type sensors (*1)	UZZ8111	Length: 2m 6.562ft.	For the emitter of the thru-beam sensor (2 cores)
	UZZ8112	Length: 5m 16.404ft.	
	UZZ8121	Length: 2m 6.562ft.	The receiver of the thru-beam, retroreflective and diffuse reflective sensors (3 cores)
	UZZ8122	Length: 5m 16.404ft.	

(*1) : Mating cables for the DC and AC type sensors are not compatible with each other as connector dimensions are different.

(*2) : When using an input emission disable, use **UZZ823** of 4 cores.

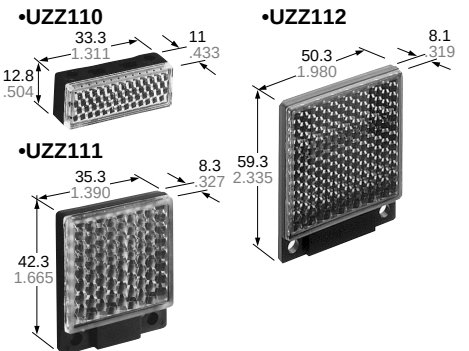
OPTION

Component	Model No.	Description		
Slit mask (For thru-beam sensor only)	UZZ802	11.6×0.5mm .457×.020inch	When fitted to the emitter	Sensing range: 3m 9.843ft. Min. sensing object: ø8mm ø.315inch
			When fitted to the receiver	Sensing range: 2.5m 8.202ft. Min. sensing object: ø8mm ø.315inch
			When fitted to both sides	Sensing range: 0.8m 2.625ft. Min. sensing object: 10×0.7mm .394×.028inch
		11.6×1.5mm .457×.059inch	When fitted to the emitter	Sensing range: 5m 16.404ft. Min. sensing object: ø8mm ø.315inch
			When fitted to the receiver	Sensing range: 4.5m 14.764ft. Min. sensing object: ø8mm ø.315inch
			When fitted to both sides	Sensing range: 2m 6.562ft. Min. sensing object: 10×2mm .394×.079inch
		11.6×3mm .457×.118inch	When fitted to the emitter	Sensing range: 7.5m 24.606ft. Min. sensing object: ø8mm ø.315inch
			When fitted to the receiver	Sensing range: 7m 22.966ft. Min. sensing object: ø8mm ø.315inch
			When fitted to both sides	Sensing range: 4.5m 14.764ft. Min. sensing object: 10×3mm .394×.118inch
Side-view attachment (For thru-beam sensor only)	UZZ801	Light is bent to a right angle with this attachment. Sensing range (when fitted to both side) : 8m 26.247ft.		
Reflector (For retroreflective sensor only)	UZZ112	Sensing range: 3m 9.843ft. [UZZ250□ & UZZ15□], 1.5m 4.921ft. [UZD240□ & UZD14□]		
	UZZ111	Sensing range: 2m 6.562ft. [UZZ250□ & UZZ15□], 1.2m 3.937ft. [UZD240□ & UZD14□]		
	UZZ110	Sensing range: 1m 3.281ft. [UZZ250□ & UZZ15□], 0.7m 2.297ft. [UZD240□ & UZD14□]		
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)	UZZ102	Sensing range: 0.7m 2.297ft. [UZZ250□ & UZZ15□], 0.4m 1.312ft. [UZD240□ & UZD14□]		
	UZZ101	Sensing range: 0.5m 1.640ft. [UZZ250□ & UZZ15□]		

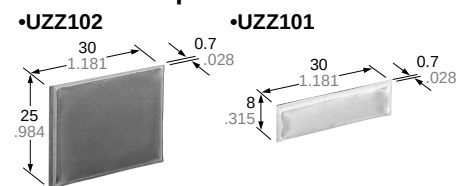
Side-view attachment



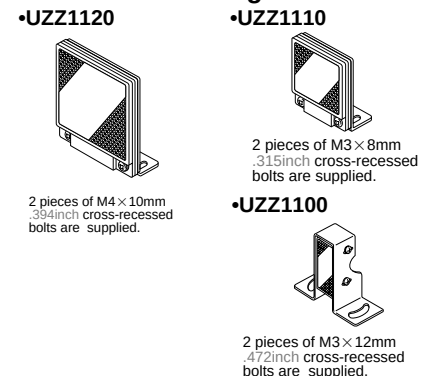
Reflector



Reflective tape



Reflector mounting bracket



SPECIFICATIONS

DC type sensors

Sensing mode		Thru-beam	Retroreflective (*1)		Diffuse reflective		
			With polarizing filters				
Data	Model No.	NPN Output	UZC200	UZC250	UZC240	UZC230	
		PNP Output	UZC2005	UZC2505	UZC2405	UZC2305	
Sensing range		12m 39.370ft.		3m 9.843ft. (*2)	1.5m 4.921ft. (*2)	120mm 4.724inch (*3)	
Sensing object		Opaque object of min. ϕ 8mm ϕ .315inch		Opaque & translucent objects of min. ϕ 50mm ϕ 1.969inch (*2)	Opaque, translucent & specular objects of min. ϕ 50mm ϕ 1.969inch (*2)	Opaque, translucent & transparent objects	
Hysteresis		—————				15% or less of an operation range	
Repeatability (vertical direction for a light axis)		0.1mm .004inch or less				0.3mm .012inch or less	
Supply voltage		10 to 30V DC Ripple P-P : $\pm$ 10% or less					
Consumption		Emitter: 20mA or less Receiver: 25mA or less		25mA or less			
Output		<NPN output type> NPN open-collector transistor Current sink: Max. 100mA Applied voltage: 30V DC or less Residual voltage: 1.5V DC or less (at 100mA current sink)			<PNP output type> PNP open-collector transistor Current source: Max. 100mA Applied voltage: 30V DC or less Residual voltage: 1.5V DC or less(at 100mA current source)		
		Output operation		Selection of Light-ON/Dark-ON by a control input wire			
		Short-circuit protection		Equipped			
Response time		2ms or less					
Emission disable function		Equipped		—————			
Operation indicator		Red LED (turns on when the output is in the ON state) Thru-beam sensor is provided to the receiver.					
Emission indicator		Red LED (turns on at the emitting) Equipped with the emitter		—————			
Environmental resistance	Protection		IP67 (IEC)				
	Ambient temperature		-25 to + 55°C -13 to + 131°F (with no dew nor ice condensation), Storage: -30 to + 70°C -22 to + 158°F				
	Ambient humidity		35 to 85%RH, Storage: 35 to 85%RH				
	Ambient light		Sun light: 11,000 $\ell\times$ at the light-receiving face, Incandescent light: 3,500 $\ell\times$ at the light-receiving face				
	Noise		Power line: 240Vp with 0.5 μ s pulse duration Radiation: 300Vp with 0.5 μ s pulse duration (by a noise simulator)				
	Dielectric		1,000V AC applied between the live parts and enclosure for 1 min.				
	Insulation		Min. 20M Ω applied between the live parts and enclosure at 250V DC				
	Vibration		1.5mm .059inch {Max. 10G} 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/s² {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: PBT (gray), Lens: Polycarbonate			Enclosure: PBT (gray), Font cover: Acrylic		
Cable		0.34mm² $\times$ 4 cores with 2m 6.562ft. of cabtyre cable (3 cores for the emitter only)					
Cable extension		Extensible up to 100m 328.084ft. by using. 0.34mm² or more cable (Thru-beam sensor: each of an emitter and a receiver)					
Weight		Emitter: Approx. 90g 3.175oz Receiver: Approx. 100g 3.527oz		Approx. 100g 3.527oz			
Accessories		Nut: 4 pcs.		Nut: 2 pcs.			

(*1): A reflector is not supplied with the retroreflective sensor. Purchase a reflector separately.

(*2): The sensing range and sensing object of the retroreflective sensor is the figure using a **UZZ112** reflector (optional).

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

SPECIFICATIONS

AC type sensors

Sensing mode			Thru-beam	Retroreflective (*1)		Diffuse reflective
				With polarizing filters		
Data	Model No.	Light-ON	UZC101	UZC151	UZC141	UZC131
		Dark-ON	UZC102	UZC152	UZC142	UZC132
Sensing range			12m 39.370ft.	3m 9.843ft. (*2)	1.5m 4.921ft. (*2)	120mm 4.724inch (*3)
Sensing object			Opaque object of min. $\phi 8\text{mm}$ $\phi 3.15\text{inch}$	Opaque & translucent objects of min. $\phi 50\text{mm}$ $\phi 1.969\text{inch}$ (*2)	Opaque, translucent & specular objects of min. $\phi 50\text{mm}$ $\phi 1.969\text{inch}$ (*2)	Opaque, translucent & transparent objects
Hysteresis			—————			15% or less of an operation range
Repeatability (vertical direction for a light axis)			0.1mm .004inch or less			0.3mm .012inch or less
Supply voltage			24 to 240V AC $\pm 10\%$			
Consumption			Emitter: 1.5VA or less Receiver: 2.5VA or less	2.7VA or less		
Output			AC non-contact (thyristor output) Load current: 5 to 200mA Applied voltage: 24 to 240V AC $\pm 10\%$ Residual voltage: Max. 4V AC (at 200mA load current)			
Response time			20ms or less			
Operation indicator			Red LED (turns on when the output is in the ON state) Thru-beam sensor is provided to the receiver			
Power indicator			Red LED (turns on when the power is supplied) Equipped with the emitter	—————		
Environmental resistance	Protection		IP67 (IEC)			
	Ambient temperature		−25 to + 55°C −13 to + 131°F (with no dew nor ice condensation), Storage: −30 to + 70°C −22 to + 158°F			
	Ambient humidity		35 to 85%RH, Storage: 35 to 85%RH			
	Ambient light		Sun light: 11,000 lx at the light-receiving face, Incandescent light: 3,500 lx at the light-receiving face			
	Noise		Power line: 1,500Vp with 0.5μs pulse duration Radiation: 300Vp with 0.5μs pulse duration (by a noise simulator)			
	Dielectric		1,500V AC applied between the live parts and enclosure for 1 min.			
	Insulation		Min. 20MΩ applied between the live parts and enclosure at 500V DC			
	Vibration		1.5mm .059inch {Max. 10G} 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: PBT (gray), Lens: Polycarbonate		Enclosure: PBT (gray), Font cover: Acrylic	
Cable			0.34mm ² ×3 cores with 2m 6.562ft. of cabtyre cable (2 cores for the emitter only)			
Cable extension			Extensible up to 100m 328.084ft. by using. 0.34mm ² or more cable (Thru-beam sensor: each of an emitter and a receiver)			
Weight			Emitter: Approx. 90g 3.175oz Receiver: Approx. 100g 3.527oz	Approx. 100g 3.527oz		
Accessories			Nut: 4 pcs.	Nut: 2 pcs.		

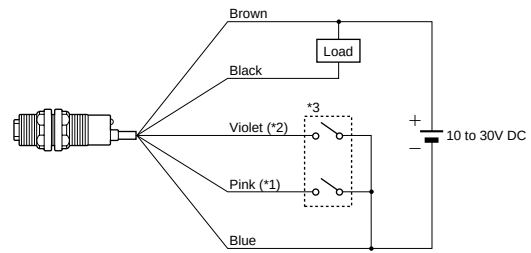
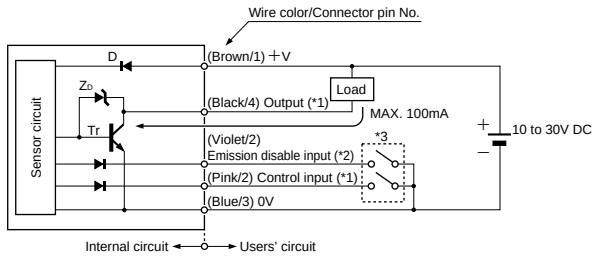
(*1): A reflector is not supplied for the retroreflective sensor. Purchase a reflector separately.

(*2): The sensing range and sensing object of the retroreflective sensor is the figure using a **UZZ112** reflector (optional).

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

TYPICAL WIRING DIAGRAMS

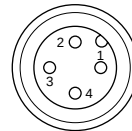
NPN output type



- (*1): Output and control input are not equipped for the emitter of the thru-beam sensor.
Wire color of the control input is white in case of the mating cable for the connector type sensor.
- (*2): Emission disable input is equipped for the emitter of the thru-beam sensor only.
Wire color of mating cable for the connector type sensor is white.

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

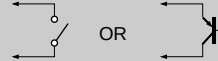
Connection Diagram of Connector Pin



- 1 : +V
2 : Emission disable input or control input
3 : 0V
4 : Output or not used

*3

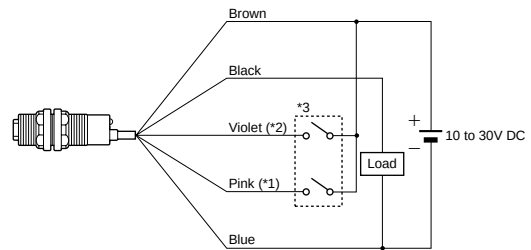
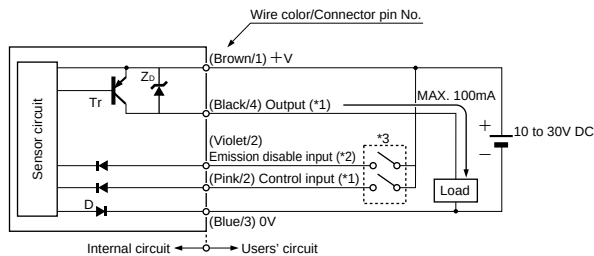
Non-voltage contact or NPN open-collector transistor



Emission disable input
Low (0 to 2.5V): Emission disable
High (6 to 30V or open): Emission

Control input
Low (0 to 1.5V): Dark-ON
High (6 to 30V or open): Light-ON

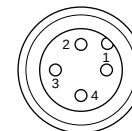
PNP output type



- (*1): Output and control input are not equipped for the emitter of the thru-beam sensor.
Wire color of the control input is white in case of the mating cable for the connector type sensor.
- (*2): Emission disable input is equipped for the emitter of the thru-beam sensor only.
Wire color of mating cable for the connector type sensor is white.

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

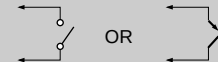
Connection Diagram of Connector Pin



- 1 : +V
2 : Emission disable input or control input
3 : 0V
4 : Output or not used

*3

Non-voltage contact or PNP open-collector transistor



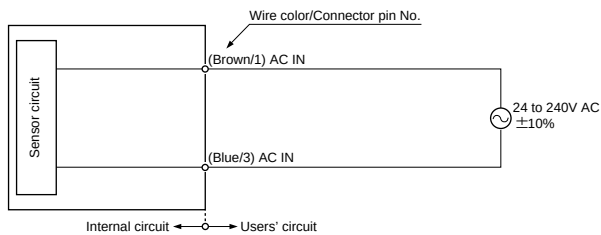
Input for emission disable
Low (0 to 1.5V or open): Emission
High (3 to 30V): Emission disable

Control input
Low [Max. (supply voltage -6V) or open]: Light-ON
High [Min. (supply voltage -1.5V)]: Dark-ON

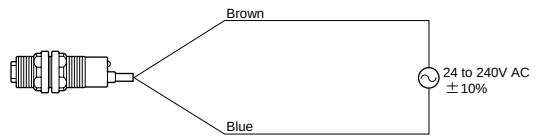
TYPICAL WIRING DIAGRAMS

AC non-contact output type

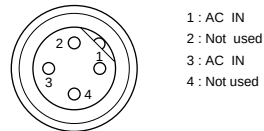
Emitter of thru-beam sensor



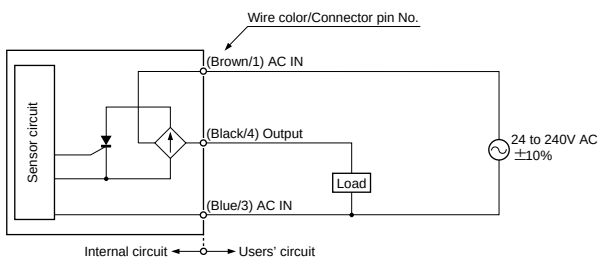
Emitter of thru-beam sensor



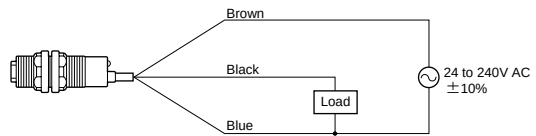
Connection Diagram of Connector Pin



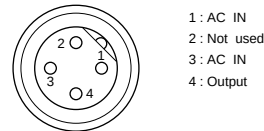
Receiver of thru-beam, retroreflective & diffuse reflective sensor



Receiver of thru-beam, retroreflective & diffuse reflective sensor



Connection Diagram of Connector Pin



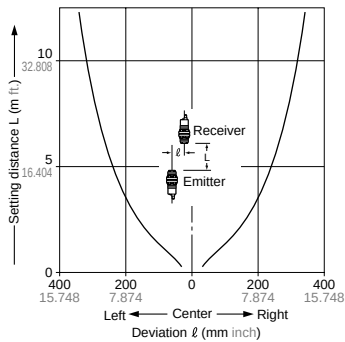
SENSING FIELDS

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

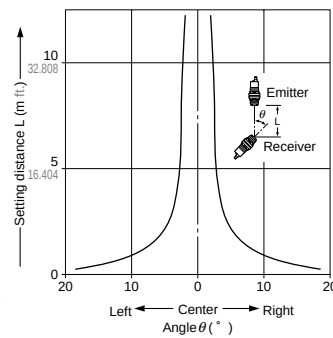
UZC200 UZC10

Thru-beam

Parallel deviation



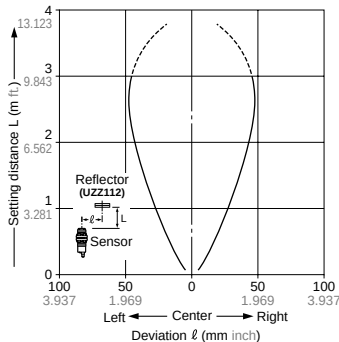
Angular deviation



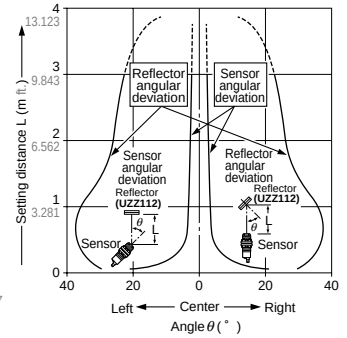
UZC250 UZC15

Retroreflective

Parallel deviation



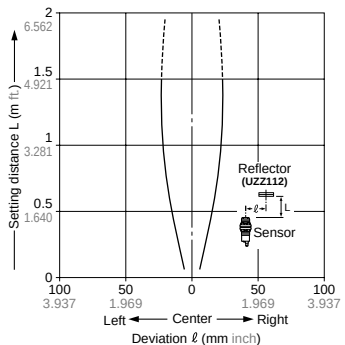
Angular deviation



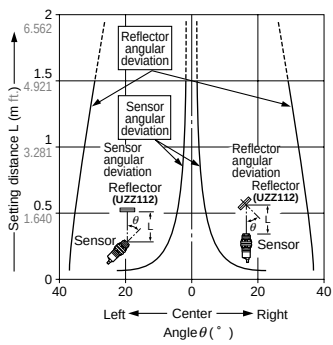
UZC240 UZC14

Retroreflective

Parallel deviation



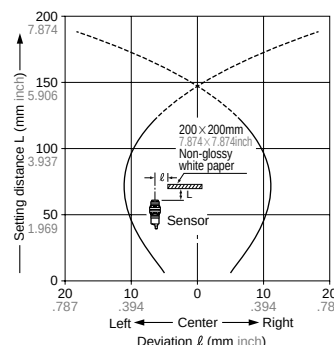
Angular deviation



UZC230 UZC13

Diffuse reflective

Sensing field



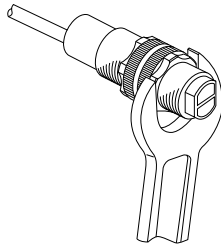
PRECAUTIONS FOR PROPER USE



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.

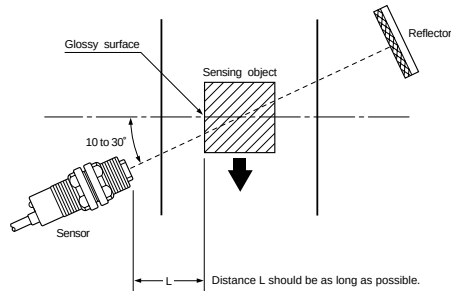
Mounting

Tightening torque must not exceed 2N·m{20.4kgf·cm}.



Setting of UZC250□ and UZC15□

When detecting a glossy object, mount the sensor at an angle of 10° to 30° against the surface on the object.



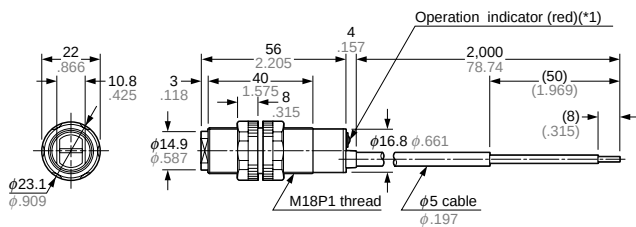
Others

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

DIMENSIONS (Unit: mm inch)

UZC200□, UZC250□ UZC230□

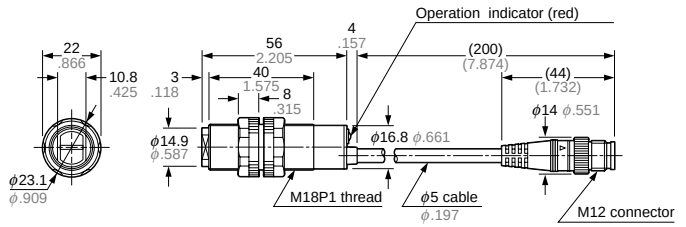
Sensor



(*1): It is the emitting indicator (red) for the emitter of the thru-beam sensor.

UZC200□A, UZC250□A UZC230□A

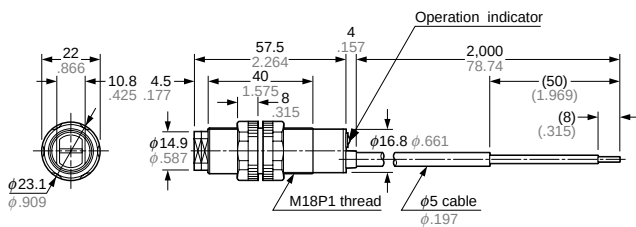
Sensor



(*1): It is the emitting indicator (red) for the emitter of the thru-beam sensor.

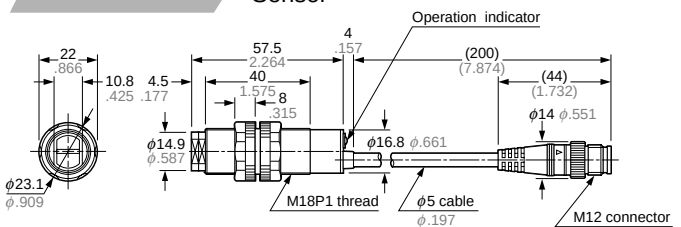
UZC240□

Sensor



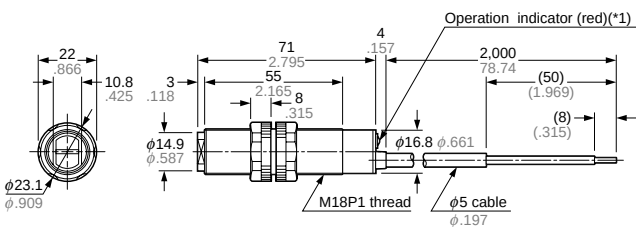
UZC240□A

Sensor



UZC10□, UZC15□ UZC13□

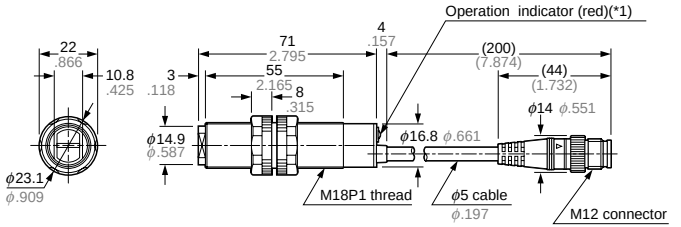
Sensor



(*1): It is the power indicator (red) for the emitter of the thru-beam sensor.

UZC10□A, UZC15□A UZC13□A

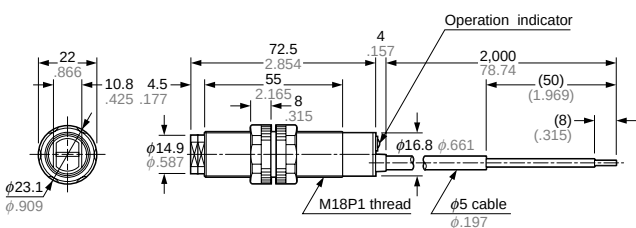
Sensor



(*1): It is the power indicator (red) for the emitter of the thru-beam sensor.

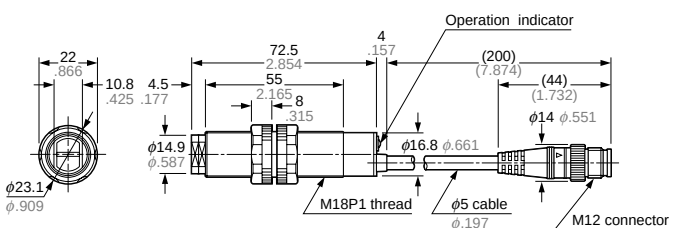
UZC14□

Sensor



UZC14□A

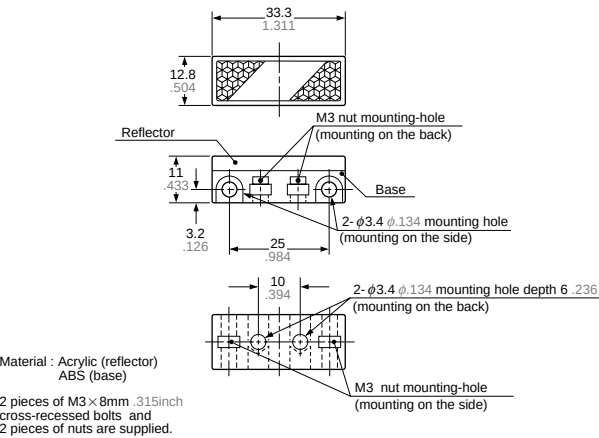
Sensor



DIMENSIONS (Unit: mm inch)

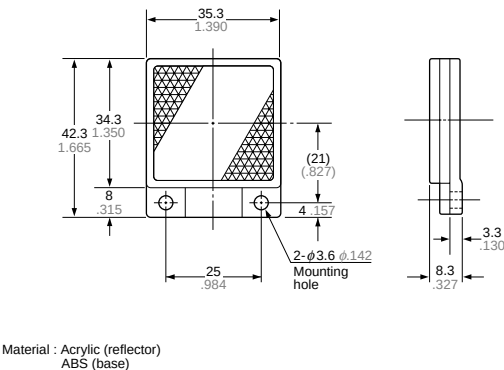
UZZ110

Reflector (option)



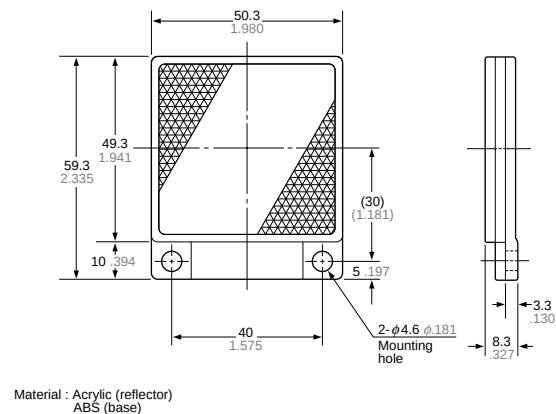
UZZ111

Reflector (option)



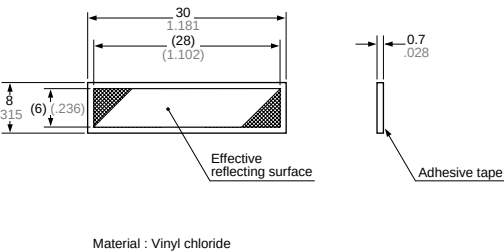
UZZ112

Reflector (option)



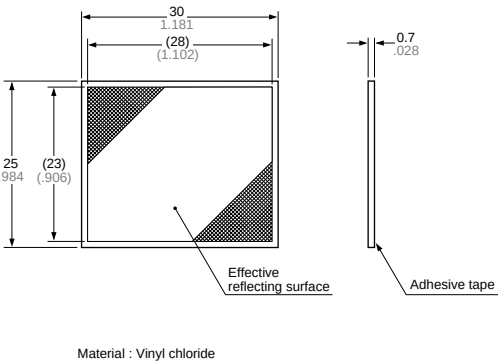
UZZ101

Reflective tape (option)



UZZ102

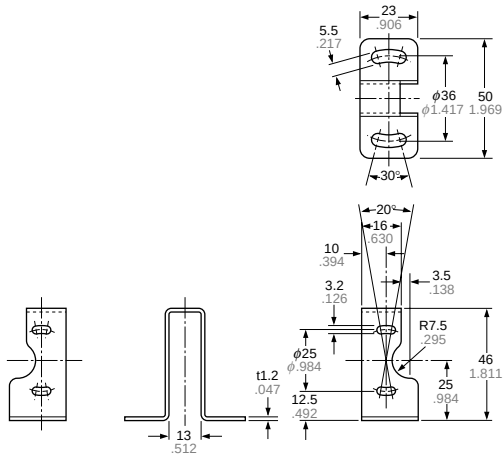
Reflective tape (option)



DIMENSIONS (Unit: mm inch)

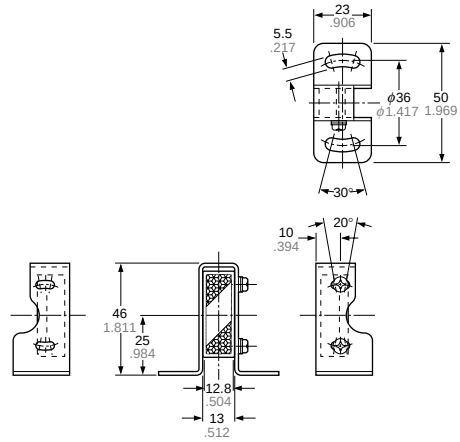
UZZ1100

Mounting bracket for UZZ110 reflector (option)



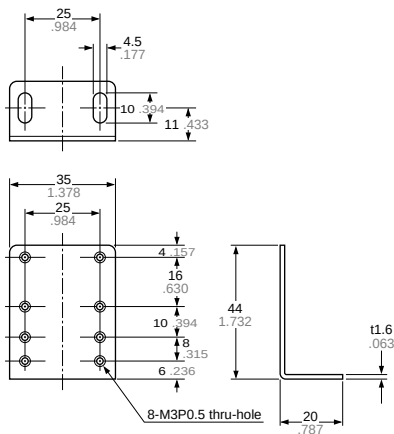
Material : SUS304
2 pieces of M3×12mm .472inch
cross-recessed bolts are supplied.

Mounting drawing



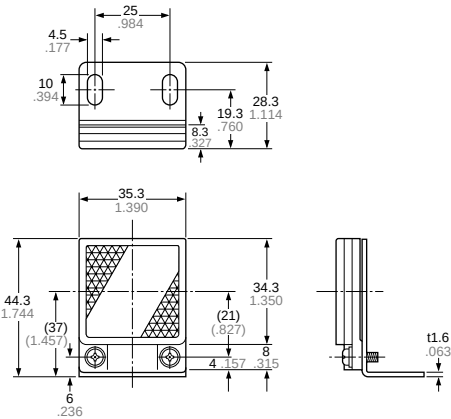
UZZ1110

Mounting bracket for UZZ111 reflector (option)



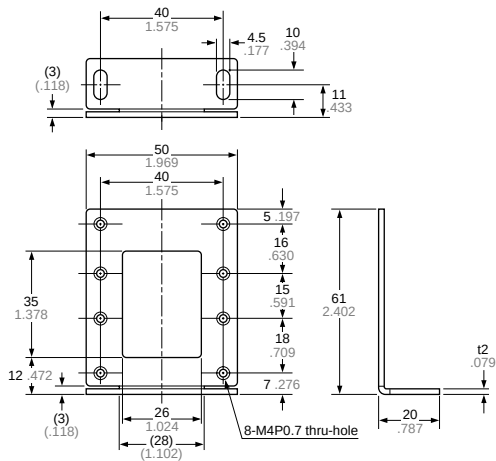
Material : SPCC
2 pieces of M3×8mm .315inch
cross-recessed bolts are supplied.

Mounting drawing



UZZ1120

Mounting bracket for UZZ112 reflector (option)



Material : SPCC
2 pieces of M4×10mm .394inch
cross-recessed bolts are supplied.

Mounting drawing

