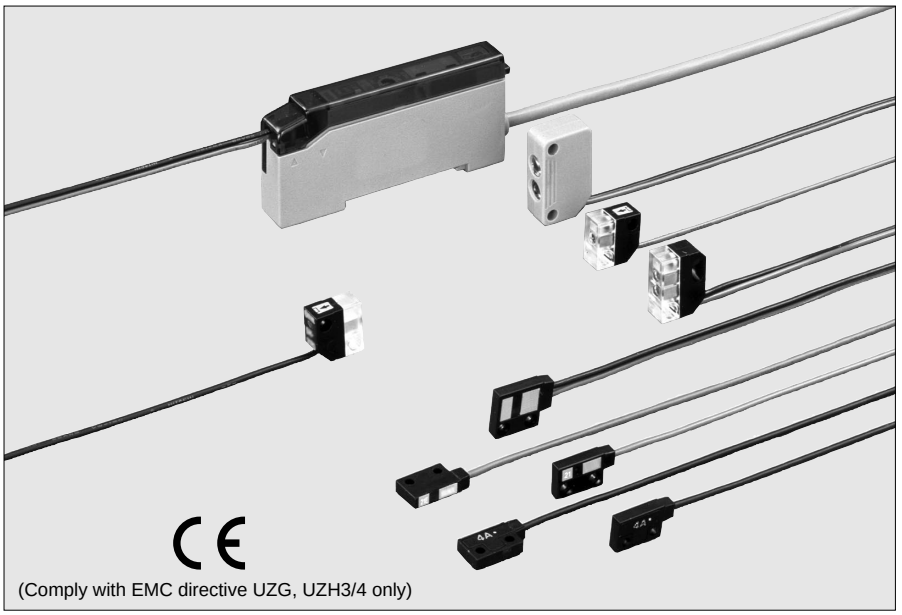
NAiS

AMPLIFIER-SEPARATED PHOTOELECTRIC SENSORS

UZG/H Series

SMALL PACKAGE POWER & FLEXIBILITY

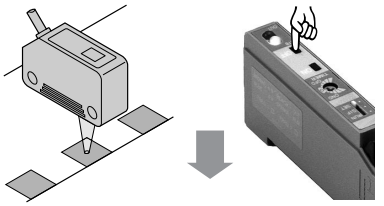


(Comply with EMC directive UZG, UZH3/4 only)

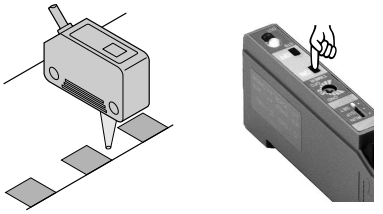
Just Press the Buttons

Anyone can achieve the optimum sensitivity setting with the press of a button.

① Press “ON” button on the mark.



② Press “OFF” button off the mark.



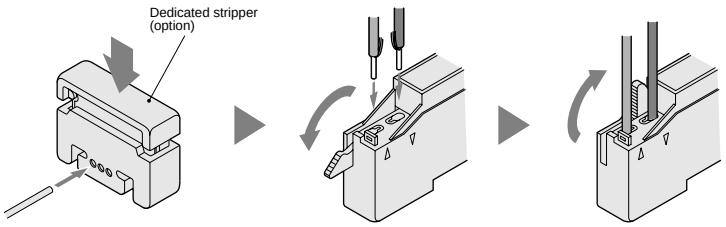
Quick Wire Connection

One push of a lever completes the cable connection to an amplifier. Using a dedicated stripper (option) makes cable insulation stripping easy.

① Strip the housing with the dedicated stripper.

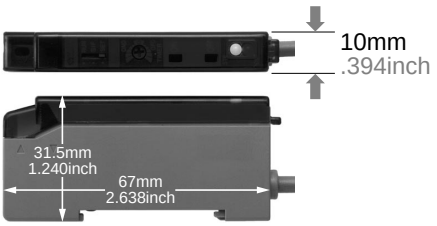
② Insert core-wire ends into the holes.

③ Lock the lever in place.



Thickness: 10mm .394inch

UZG series is only 10mm .394inch wide, first in the industry.



Nine Functions for Advanced Sensing Technique

① **Limit setting function** All models
Achieves minimum target setting with one push of the button without a target.

② **Sensitivity setting shift function** All models
Shifts the threshold level for reliable sensing.

③ **Remote sensitivity selection function** UZG140
Stores four levels of sensitivity, and a remote signal can retrieve any one of them.

④ **Remote sensitivity setting function** UZG130
A remote signal adjusts the sensitivity.

⑤ **Remote synchronous function** UZG121
A remote signal gates the sensor output.

⑥ **Emission disable function** UZG121
Convenient for start-up inspection.

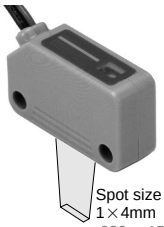
⑦ **Stability margin indicating function** All models
The number of blinks indicates the degree of sensing stability.

⑧ **ON-delay/OFF-delay timer function** UZG120 UZG130 UZG140 UZG1205
Selectable ON-delay or OFF-delay – variable 0 to 5sec.

⑨ **Crosstalk prevention function** All models
Two sensing probes can be mounted next to each other.

Refer to “PRECAUTIONS FOR PROPER USE” for detailed instructions.

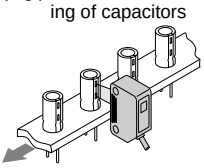
Line-Focus Type/UZH471



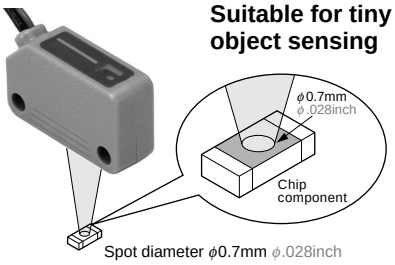
Suitable for character sensing
A line-spot (1×4mm .039×.157inch) is suitable for printed character presence sensing.

Positional deviation
The line-spot can identify the target objects which are incorrectly marked.

(e.g.) Polar mark sensing of capacitors



Pinpoint Detection Type with Red LED Light/UZH461



Suitable for tiny object sensing

Spot diameter: ϕ0.7mm ϕ.028inch
Front/back judgment of chips is easy.

Pinpoint Detection Type with Green LED Light/UZH462

Distinguishes red from white
UZH462 can distinguish red/white, red/yellow, or red/orange

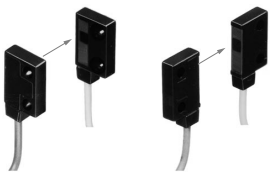
Super-Slim Type/UZH100·UZH200·UZH130

Smallest in the industry: 0.3cm³
Thickness: only 3mm .118inch

Versatile mounting

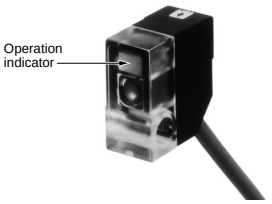
Diffuse reflective sensor/Front-sensing

Thru-beam sensor
Front-sensing Side-sensing



Super-Small Type/ UZH301·UZH302

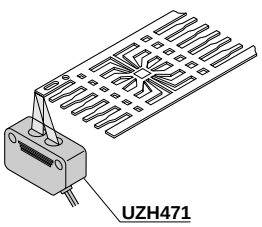
Sensing probe with an indicator
An operation indicator shows the operational condition at the sensing site.



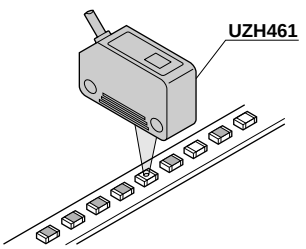
Long sensing range with red LED: 1m 3.28ft (UZH301)
Visible red LED light makes alignment easy.

APPLICATIONS

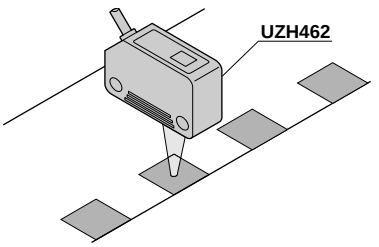
Positioning sensing of lead frames



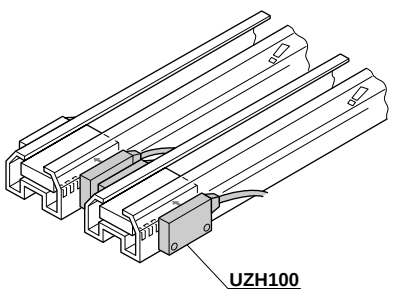
Front/back judgment of chips



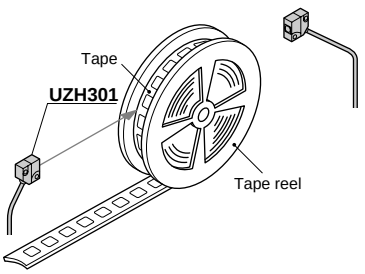
Red mark sensing on white paper



IC sensing in transparent sticks

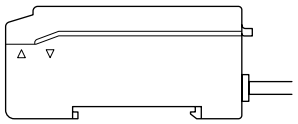


Remaining tape quantity sensing



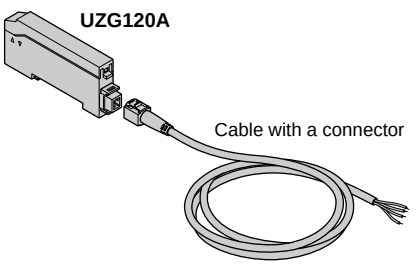
ORDER GUIDE

Amplifier

		Appearance	Model No.	Functions (●: equipped)									
				Automatic sensitivity setting	Sensitivity setting shift	Limit setting	Remote sensitivity setting	Remote sensitivity selection	Sensitivity margin indicating	Remote synchronous	Emission disable	Timer	Crosstalk prevention
NPN output	Standard type		**UZG120**	●	●	●	—	—	●	—	—	●	●
	Remote synchronous input type		**UZG121**	●	●	●	—	—	●	●	●	—	●
	Remote sensitivity setting type		**UZG130**	●	●	●	●	—	●	—	—	●	●
	Remote sensitivity selection type		**UZG140**	●	●	●	—	●	●	—	—	●	●
PNP output	Standard type		**UZG1205**	●	●	●	—	—	●	—	—	●	●

Connector type

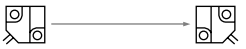
Connector type is also available for the standard type of NPN output.
Model No.: **UZG120A**



UZF851 (length: 2m 6.56ft)
UZF852 (length: 5m 16.40ft)

ORDER GUIDE

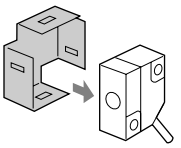
Sensing probe

			Appearance	Sensing range	Model No.	Emitting element	Operation indicator
Super-slim type	Thru-beam	Front sensing		300mm 11.811inch	**UZH100**	Infrared LED	——
		Side sensing			**UZH200**		
	Diffuse reflective	Front sensing		50mm 1.969inch	**UZH130**		
Super-small type	Thru-beam			1m 3.28ft	**UZH301**	Red LED	Equipped
				100mm 3.937inch	**UZH302**	Green LED	
	Diffuse reflective			100mm 3.937inch	**UZH331**	Red LED	
Mark sensor	Pinpoint type			10 to 14mm .394 to .551inch (center: 12mm .472inch) (Spot dia: ϕ0.7mm ϕ.028inch)	**UZH461**	Red LED	
				10 to 14mm .394 to .551inch (center: 12mm .472inch) (Spot dia: ϕ1mm ϕ.039inch)	**UZH462**	Green LED	
	Line-focus type			17 to 23mm .669 to .906inch (center: 20mm .787inch) (Spot size: 1×4mm .039×.157inch)	**UZH471**	Red LED	

OPTION

Component	Model No.	Description				
Slit mask [for **UZH301** and **UZH302** only]	**UZH801**	Convenient slit masks with four types of holes. (One set consists of 1pc.)				
		Slit size	Fitted	Sensing range **UZH301**	Sensing range **UZH302**	Min. sensing object
		0.5×3mm .020×.118inch	One side	500mm 19.685inch	50mm 1.969inch	ϕ3mm ϕ.118inch
			Both sides	250mm 9.843inch	25mm .984inch	0.5×3mm .020×.118inch
		1×3mm .039×.118inch	One side	700mm 27.559inch	70mm 2.756inch	ϕ3mm ϕ.118inch
			Both sides	500mm 19.685inch	50mm 1.969inch	1×3mm .039×.118inch
Mounting bracket for sensing probe (For the super-small type only)	**UZH811**	Mounting bracket set for the super-small sensing probe (Two sets are required for the thru-beam sensor.)				
Mounting bracket for sensing probe (For the mark sensor only)	**UZH812**	Mounting bracket set for the mark sensor				

Slit mask

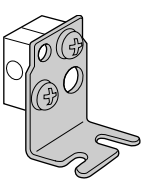


Attach the slit mask to the sensing probe with the mounting screws.

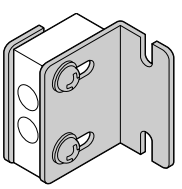
Attach the slit mask to the sensing probe by screws

Mounting bracket for the sensing probe

UZH811



UZH812



SPECIFICATIONS

Amplifier

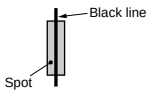
Type / Data		NPN output				PNP output
		Standard type	Remote synchronous input type	Remote sensitivity setting type	Remote sensitivity selection type	Standard type
Model No.		**UZG120**	**UZG121**	**UZG130**	**UZG140**	**UZG1205**
Applicable sensing probe		**UZH** series				
Supply voltage		12 to 24V DC ± 10% Ripple P-P: 10% or less				
Consumption		35mA or less				
Output		NPN open-collector transistor Sink current: Max. 100mA Applied voltage: 30V DC or less Residual voltage: 1.0V or less (at 100mA sink current) 0.4V or less (at 16mA sink current)				PNP open-collector transistor Source current: Max. 100mA Residual voltage: 2.0V or less (at 100mA source current) 1.0V or less (at 16mA source current)
	Output operation	Selection of ON/OFF mode by the buttons. (**UZG130** may also be set by the remote input signal.)				
	Short-circuit protection	Provided				
Self-diagnostic output		NPN open-collector transistor Sink current: Max. 50mA Applied voltage: Max. 30V DC Residual voltage: Max. 1.0V (at 50mA sink current) Max. 0.4V (at 16mA sink current)				PNP open-collector transistor Source current: Max. 50mA Residual voltage: Max. 2.0V (at 50mA source current) Max. 1.0V (at 16mA source current)
	Output operation	ON in the unstable sensing condition (this signal lasts approx. 40ms), or ON when the sensing output is short-circuit (after opening the short-circuit, this signal stops.) (The remote sensitivity setting type is in the ON state during approx. 40ms after accepting the remote sensitivity setting input.)				
	Short-circuit protection	——				
Response time		0.6ms or less (0.8ms or less when using the crosstalk prevention function)				
Operation indicator		Red LED (turns on when the sensing output is in the ON state)				
Stable operation indicator		Green LED { "RUN" mode: Turns on in the stable light-receiving or stable light-interrupted condition "SET" mode: Blinks when setting the sensitivity (blinks twice when the difference of the light-receiving intensity between ON/OFF is more than the hysteresis, or blinks fifteen times when the difference is less than the hysteresis); Blinks twice when the crosstalk prevention function has been set. "SET" mode → When switching to the "SIF" mode or "RUN" mode: Blinks 0 to 5 times in accordance with the sensitivity margin level }				
Emission disable function		——	Provided	——	——	——
Remote synchronous function		——	Provided (selection of trigger or gate sync.)	——	——	——
Remote sensitivity setting function		——	——	Provided	——	——
Remote sensitivity selection function		——	——	——	Provided (stores four levels of sensitivity)	——
Sensitivity setting shift & limit setting function		Shifts the sensitivity level				
Crosstalk prevention function		Provided				
Timer function		Equipped with ON-delay/OFF-delay timer (variable 0 to 5sec.)	——	Equipped with ON-delay/OFF-delay timer (variable 0 to 5sec.)		
Environmental resistance	Ambient tempetarure	–10 to +55°C +14 to +131°F (with no dew nor ice condensation), Storage: –20 to +70°C –4 to +158°F				
	Ambient humidity	35 to 85%RH, Storage: 35 to 85%RH				
	Noise	Power line: 240Vp with 0.5μs pulse duration, Radiation: 300Vp with 0.5μs pulse duration (by a noise simulator)				
	Dielectric	1,000V AC applied between the live parts and enclosure for 1 min.				
	Insulation	Min. 20MΩ applied between the live parts and enclosure at 250V DC				
	Vibration	0.75mm .030inch amplitude at the frequency of 10 to 150Hz in each of X, Y and Z directions for 2 hours each in the power OFF state				
	Shock	100m/s^2 {approx. 10G} impulse in each of X, Y, and Z directions, 5 times each in the power OFF state				
Material		Enclosure: Heat-resistant ABS, Case cover: Polycarbonate, Cable lock lever: PPS				
Cable		0.15mm^2×6 cores (0.2mm^2×4 cores for **UZG120** and **UZG1205**) with 2m 6.56ft of cabtyre cable				
Cable extension		Extensible up to 100m 328.08ft by using 0.3mm^2 or more cable				
Weight		Approx. 65g 2.29oz				
Accessories		**UZF811** (mounting bracket): 1 pc., **UZH821** (stripper): 1 pc.				

SPECIFICATIONS

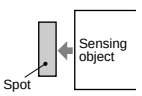
Sensing probe

Type	Super-slim type			Super-small type			Mark sensor		
	Thru-beam		Diffuse reflective	Thru-beam		Diffuse reflective	Pinpoint type		Line-focus type
Data / Model No.	Front sensing	Side sensing		Red LED	Green LED		Red LED	Green LED	
	UZH100	**UZH200**	**UZH130**	**UZH301**	**UZH302**	**UZH331**	**UZH461**	**UZH462**	**UZH471**
Applicable amplifier	**UZG** series								
Sensing range	300mm 11.811inch		50mm (*1) 1.969inch	1m 3.28ft	100mm 3.937inch	100mm (*1) 3.937inch	10 to 14mm .394 to .551inch center: 12mm .472inch (*1) [spot dia.: ϕ0.7mm ϕ.028inch]	10 to 14mm .394 to .551inch center: 12mm .472inch (*1) [spot dia.: ϕ1mm ϕ.039inch]	17 to 23mm .669 to .906inch center: 20mm .787inch (*1) [spot size: 1×4mm .039×.157inch]
Sensing object	Opaque object of min. ϕ0.3mm ϕ.012inch (in the optimum conditions) (*2)		Copper wire of min. ϕ0.3mm ϕ.012inch [3mm .118inch setting distance at the max. sensitivity setting]	Opaque object of min. ϕ1mm ϕ.039inch [1m 3.28ft setting distance at the optimum sensitivity setting (*3)]	Opaque object of min. ϕ1mm ϕ.039inch [100mm 3.937inch setting distance at the optimum sensitivity setting (*3)]	Opaque, translucent & transparent objects	Black line of min. 0.07mm .003inch width on the white paper [12mm .472inch setting distance at the optimum sensitivity setting (*3)]	Black line of min. 0.2mm .008inch width on the white paper [12mm .472inch setting distance at the optimum sensitivity setting (*3)]	Black line of min. 0.07mm .003inch width on the white paper (*4) [20mm .787inch setting distance at the optimum sensitivity setting (*3)]
Hyseteresis	—		15% or less of an operation range	—		15% or less of an operation range	10% or less of an operation range		
Repeatability (vertical direction for a light axis)	0.03mm .001inch or less		0.15mm .006inch or less	0.1mm .004inch or less			0.02mm .001inch or less	0.03mm .001inch or less	0.03mm .001inch or less (*5)
Operation indicator	—			Red LED (turns on when the sensing output of the amplifier is in the ON state, provided on the emitter of the thru-beam sensor)					
Environmental resistance: Protection	IP62 (IEC)			IP66 (IEC)			—		
Environmental resistance: Ambient temperature	–10 to +60°C +14 to +140°F (*6) Storage: –20 to +70°C –4 to +158°F			–25 to +60°C –13 to +140°F (*6) Storage: –30 to +70°C –22 to +158°F			–10 to +55°C +14 to +131°F (*6) Storage: –20 to +70°C +4 to +158°F		
Environmental resistance: Ambient humidity	35 to 85%RH, Storage: 35 to 85%RH								
Environmental resistance: Ambient light	Sun light: 11,000ℓx at the light-receiving face, Incandescent: 3,500ℓx at the light-receiving face								
Environmental resistance: Vibration	1.5mm .059inch amplitude at the frequency of 10 to 55Hz (3mm .118inch amplitude at the frequency of 10 to 500Hz for mark sensor) in each of X, Y and Z directions for 2 hours each in the power OFF state								
Environmental resistance: Shock	500m/s^2 {approx. 50G} impulse in each of X, Y and Z directions, 3 times each in the power OFF state								
Emitting element	Infrared LED (modulated)			Red LED (modulated)	Green LED (modulated)	Red LED (modulated)	Red LED (modulated)	Green LED (modulated)	Red LED (modulated)
Material	Polycarbonate (containing glass fiber)			Enclosure: ABS, Lens: Polycarbonate			Enclosure: Polycarbonate, Lens: Acrylic		
Cable	0.089mm^2 (Super-slim type: 0.057mm^2)×1 core (diffuse reflective sensor & mark sensor: 1 core with parallel two wires) with 3m 9.84ft (mark sensor: 2m 6.56ft) of shielded cable								
Cable extension	Extendable up to 5m 16.40ft (super-small type: 10m 32.81ft) by using the same cable (thru-beam sensor: each emitter and receiver)								
Weight	Emitter: approx. 12g .42oz Receiver: approx. 12g .42oz		Approx. 24g .85oz	Emitter: approx. 10g .35oz Receiver: approx. 10g .35oz		Approx. 20g .71oz	Approx. 40g 1.41oz		
Accessories	Mounting screw: 2 sets (**UZH130**: 1 set)			—					

(*1): The sensing range of the diffuse reflective sensor and mark sensor is the figure using a target of non-glossy white paper (50×50mm 1.969×1.969inch).
(*2): The optimum condition is when the sensitivity is adjusted to get the point where the operation indicator just starts to turn on when receiving the emitting light at the operational setting distance.
(*3): The optimum sensitivity is the level at which the operation indicator just turns on when receiving the emitting light.
(*4): The min. sensing object of **UZH471** is obtained by sensing a black line as shown below.



(*5): Repeatability of **UZH471** is the measured value when the sensing object moves into the light spot as shown below.
(Repeatability is 0.12mm .005inch when approaching the light spot from above.)

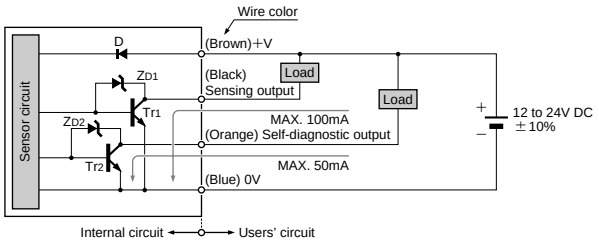


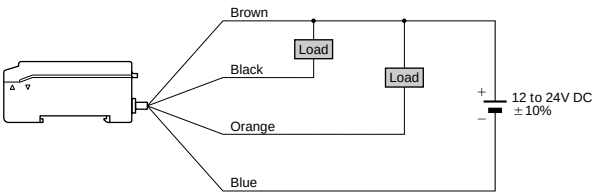
(*6): With no dew or ice condensation

TYPICAL WIRING DIAGRAMS

UZG120

Standard type · NPN output



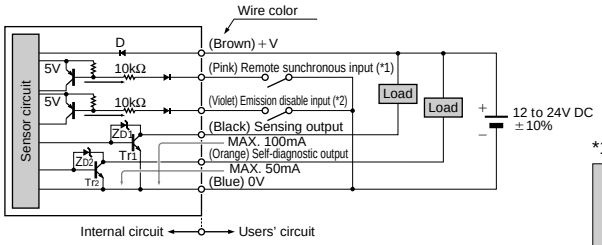


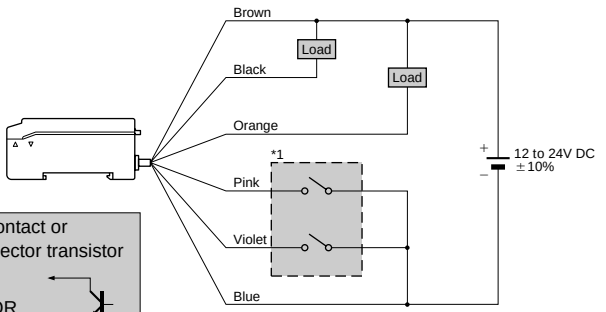
Symbol ... D: Reverse polarity protection diode
Z_{D1}, Z_{D2}: Surge absorption zener diode
Tr_1, Tr_2: NPN output transistor

UZG121
UZG140

Remote synchronous input type/Remote sensitivity selection type

(*1): It is the remote sensitivity selection input 1 for **UZH140**.
(*2): It is the remote sensitivity selection input 2 for **UZH140**.

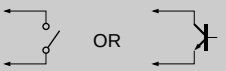




Symbol ... D: Reverse polarity protection diode
Z_{D1}, Z_{D2}: Surge absorption zener diode
Tr_1, Tr_2: NPN output transistor

*1

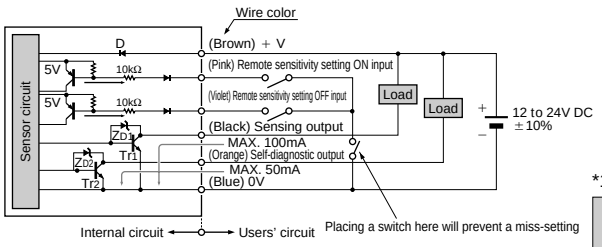
Non-voltage contact or
NPN open-collector transistor

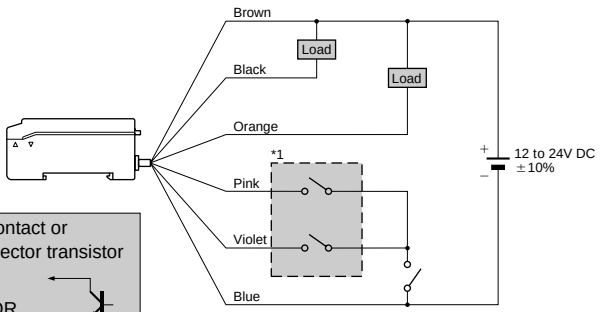


Low: 0 to 1V
High: 4.5V to 30V or open

UZG130

Remote sensitivity setting type

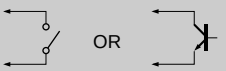




Symbol ... D: Reverse polarity protection diode
Z_{D1}, Z_{D2}: Surge absorption zener diode
Tr_1, Tr_2: NPN output transistor

*1

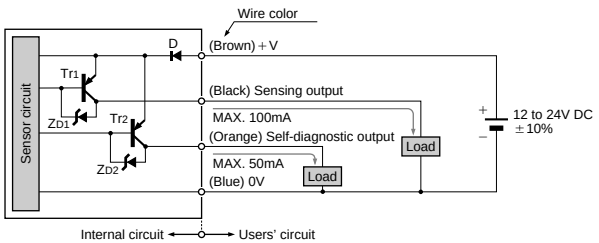
Non-voltage contact or
NPN open-collector transistor

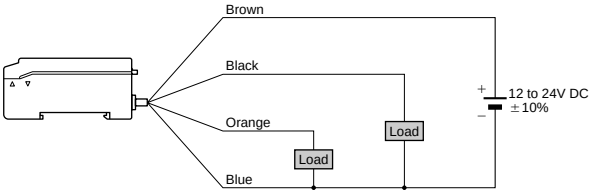


Low: 0 to 1V
High: 4.5V to 30V or open

UZG1205

Standard type · PNP output





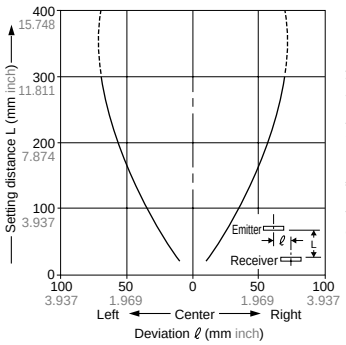
Symbol ... D: Reverse polarity protection diode
Z_{D1}, Z_{D2}: Surge absorption zener diode
Tr_1, Tr_2: PNP output transistor

SENSING FIELDS

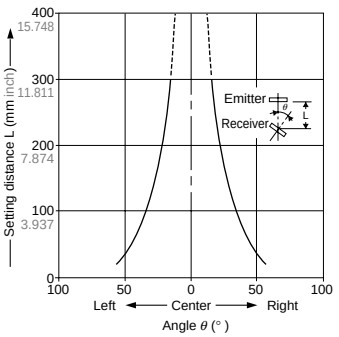
These are typical sensing fields, which may vary slightly from unit to unit.

UZH100 UZH200 — Thru-beam

Parallel deviation

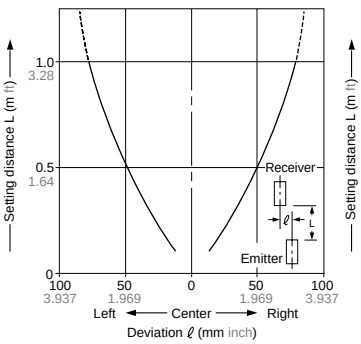


Angular deviation

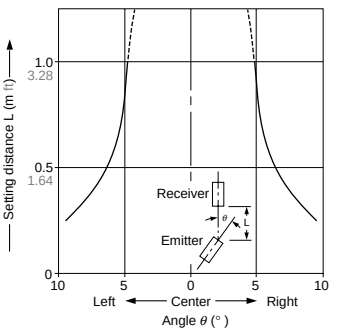


UZH301 — Thru-beam

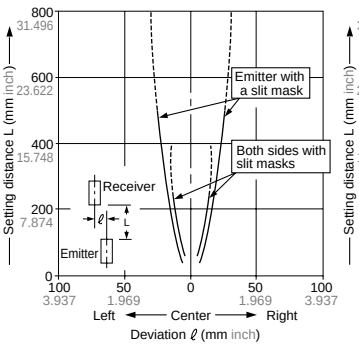
Parallel deviation



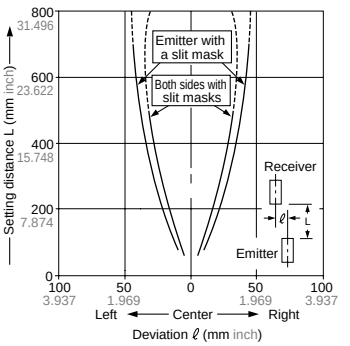
Angular deviation



Parallel deviation with slit masks (0.5×3mm .020×.118inch)

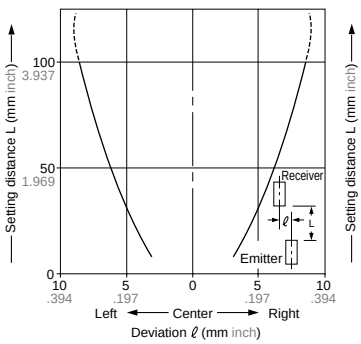


Parallel deviation with slit masks (1×3mm .039×.118inch)

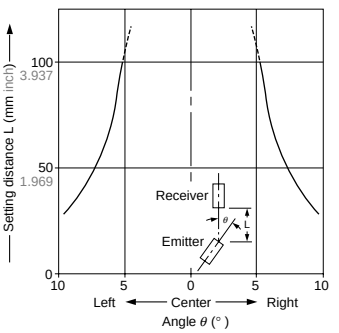


UZH302 — Thru-beam

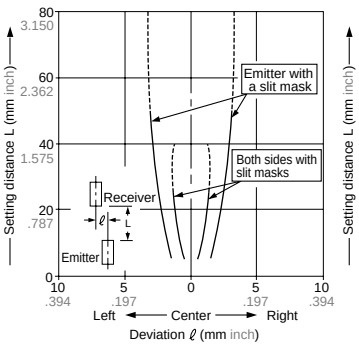
Parallel deviation



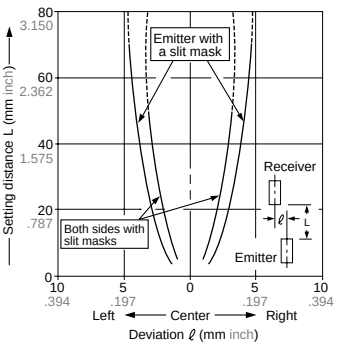
Angular deviation



Parallel deviation with slit masks (0.5×3mm .020×.118inch)

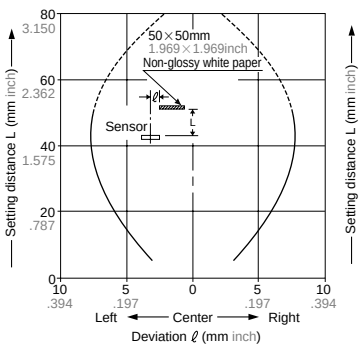


Parallel deviation with slit masks (1×3mm .039×.118inch)



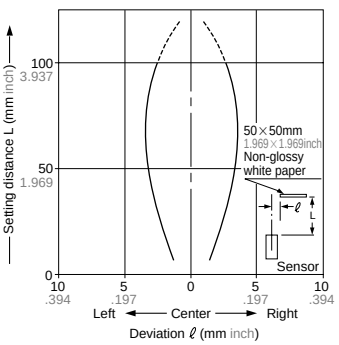
UZH130 — Diffuse reflective

Sensing field

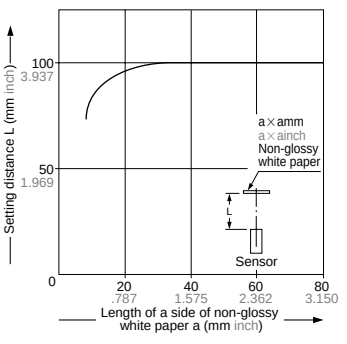


UZH331 — Diffuse reflective

Sensing field



Object size – Sensing range correlation



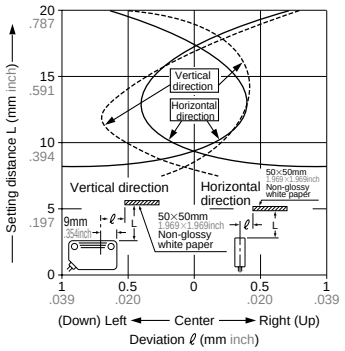
Note that the sensing range decreases if a sensing object is smaller than the standard size (a non-glossy white paper: 50×50mm 1.969×1.969inch) as shown in the graph on the left.
(The curve shows the figure obtained when the sensor is adjusted to detect a 50×50mm 1.969×1.969inch non-glossy white paper at the sensing range of 100mm 3.937inch.)

SENSING FIELDS

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

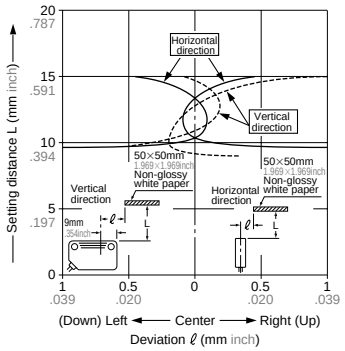
UZH461 Mark sensor

Sensing field



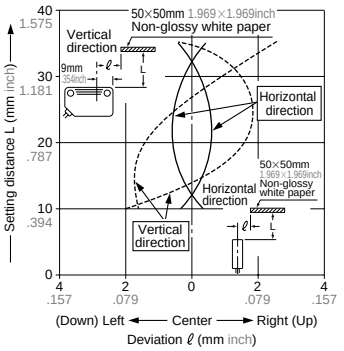
UZH462 Mark sensor

Sensing field



UZH471 Mark sensor

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 .

Sensing probe

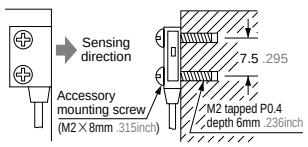
The sensing probe must be used with a dedicated amplifier.

Mounting

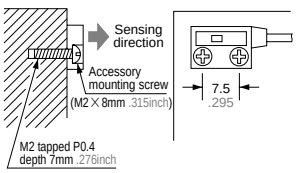
Super-slim type

When making a tap for mounting

Side sensing



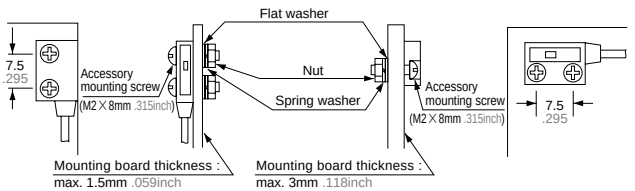
Front sensing



Tightening torque must not exceed 0.14N·m {1.5kg·cm}.

When using a mounting screw and nut

Side sensing



Front sensing

Tightening torque must not exceed 0.14N·m {1.5kg·cm}.

For super-small type, mark sensor detection type

Tightening torque must not exceed 0.29N·m {3kgf·cm} when mounting with the screw.

Others

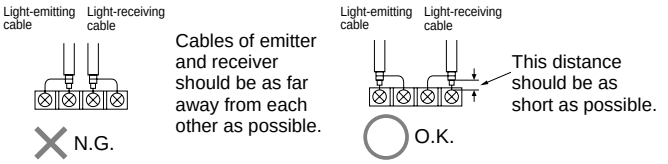
Do not use the sensor where it may be exposed to steam, dust or immersed in water.

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

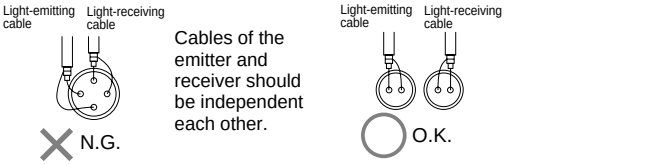
Wiring

When extending the cable, use two single-core shielded cables with same or higher quality than the existing. When the cable is connected by the terminal base or the connector, refer to the figure below.
(The diameter of the shielded cable must be ϕ1.45mm ϕ.057inch)

Terminal connection

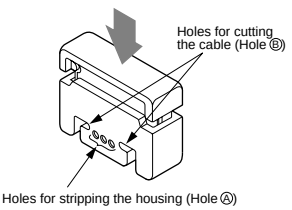


Metal connector connection



Process of the cable end

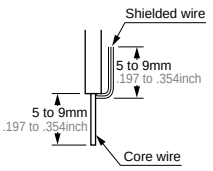
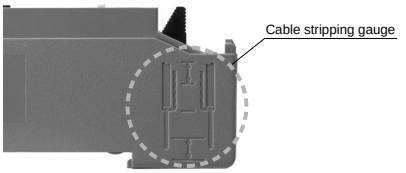
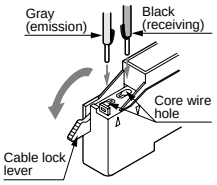
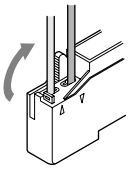
Use the stripper (**UZH821**) to cut the cable or strip the cable insulation easily.
Insert the cable into hole Ⓐ to strip the housing, and hole Ⓑ to cut the cable.



PRECAUTIONS FOR PROPER USE

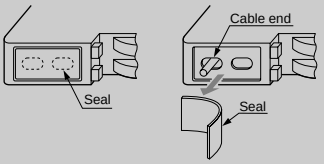
Amplifier

Connecting the sensing probe

Step	Operation
①	Open the case cover.
②	Process the cable end as shown on the right. Do not remove the core-wire insulation. When processing the cable, use the cable stripping gauge on the right of the amplifier to get the cable end as shown on the right.  
③	Pull the lock lever down and put the cable into the insertion hole of the amplifier. insert the shielded wires face to face. 
④	Pull the cable lock lever up to lock. 
⑤	Put on the case cover.

Cautions
If the cables are removed after releasing the lock lever, the same cables can be connected to the amplifier one more time. The third time, start from step ②. If the cable lock and release are repeated, the core wire may be cut off and conducting failure may occur.

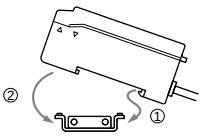
If the cable end is left in the insertion hole, remove it before inserting another cable. Turn the sensor over and tap around the cable insertion holes. If this does not work, strip the seal on the back of the sensor and take out the cable end.
(The seal can be used repeatedly.)



Mounting

How to mount the amplifier

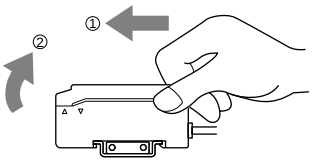
① Mount the rear part to the included mounting bracket (**UZF811**) or DIN rail.
② Push the amplifier foward and press the front part on the bracket or DIN rail.



DIN rail or attached mounting bracket

How to remove the amplifier

① Hold the amplifier and push forward
② Lift up the front and remove the amplifier.



Wiring
Short-circuit protection is not provided for the self-diagnosic output. Do not connect it directly to the power source or capacitive load.

Power supply should be turned off before wiring.

Verify that any voltage fluctuation does not exceed the rated value.

When using a switching regulator power supply (readily available in the market), always ground the frame ground (F.G.) terminal.

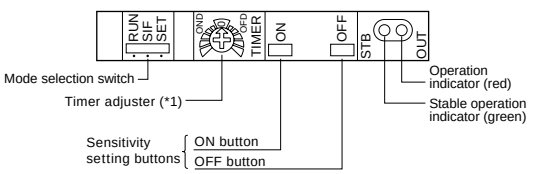
When using equipment which generates noise (switching regulator or inverter motor, etc.) near the sensor, ground the frame ground (F.G.) terminal of the equipment.

Do not run sensor cables near high-voltage lines or power lines, or put them together in the same raceway. Doing so may cause malfunctions due to inductive interference.

Others
Do not use the amplifier output signal for 0.5s immediately after the power is supplied to the amplifier.

Do not use the sensor where it may be exposed to steam or immersed in water.

Adjustment panel



(*1): This is the remote synchronous selection switch on the **UZG121**.

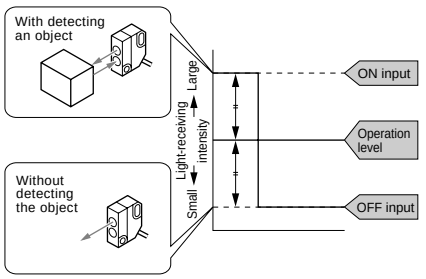
Amplifier

Sensitivity setting

● In normal cases, set the sensitivity as shown below.

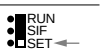
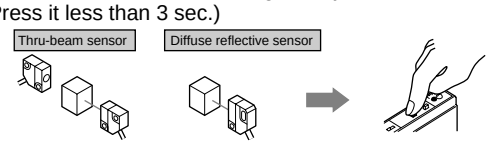
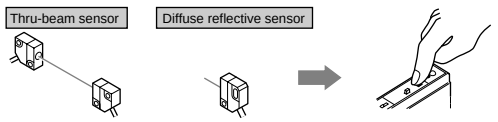
Standard setting

The sensor automatically adjusts the operation level to about half of the light intensity difference between ON button and OFF button levels.



Setting method

<When you want the sensing output in the ON state with the target present.>

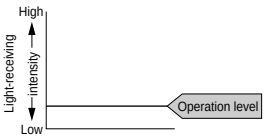
Step	Operation
①	Place the sensing probe within sensing range of the target.
②	Move the mode selection switch to “SET”. 
③	Press ON button with detecting an object. (Press it less than 3 sec.) 
④	When the ON state is recognized by the sensor, the stable operation indicator (green) will blink. 
⑤	Press ON button with target present. (Press it less than 3 sec.) 
⑥	The stable operation indicator blinks twice when the sensitivity gap between the ON state and OFF state is sufficient, indicating stable detection of the target. The stable operation indicator will blink continuously if the stable detection is not possible with the difference of the sensitivity between “ON” state and “OFF” state. (Although the sensitivity has been adjusted, the sensing condition is unstable because the margin is not sufficient.)
⑦	Set the mode selection switch to “RUN”. This registers the settings. So, even if the buttons are pressed by mistake in the “RUN” condition, the registered sensitivity will remain unchanged. 

<When you want the sensing output in the ON state when the target is absent.>
In the operation procedures above mentioned, – Press ON button with the target absent, and press OFF button with the target present.

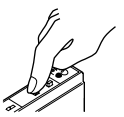
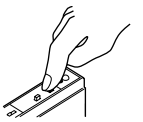
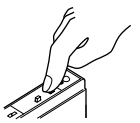
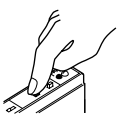
● Setting for maximum sensitivity.

Full power setting

Sets the sensitivity to maximum.
Note that the diffuse reflective sensor may be turned ON by the background alone in this mode.



Setting method

Step	Operation
①	Make sure that there is no target within sensing range.
②	Move the mode selection switch to “SET”. 
③	Press “ON” button for Light-ON mode.  Press “OFF” button for Dark-ON mode. 
④	When the input is recognized by the sensor, the stable operation indicator (green) will blink. 
⑤	Press “OFF” button for Light-ON mode.  Press “ON” button for Dark-ON mode. 
⑥	When the input is recognized by the sensor, the stable operation indicator (green) will blink.
⑦	Set the mode selection switch to “RUN”. 

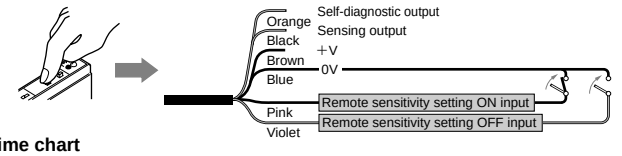
✻ Setting the sensitivity with the remote sensitivity setting input.

Remote sensitivity setting (For UZG130 only)

The setting is made with the remote sensitivity setting inputs instead of the buttons. (The shift setting can not be done with the remote sensitivity setting input.)

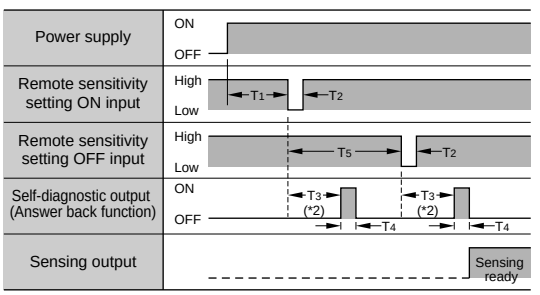
Setting method

Set the mode selection switch to “SET” or “RUN”. The procedure is the same as “the standard button setting”. Instead of pressing sensitivity the setting buttons, make the remote sensitivity setting input LOW.



Time chart

The self-diagnostic output turns ON for approx. 40ms when ON input or OFF input is recognized by the sensor.
(The output does not turn ON when the sensitivity difference between ON and OFF input is insufficient, and the detection is not stable.)



$T_1 \geqq 1{,}000$ms, $3{,}000\text{ms} > T_2 \geqq 5$ms, $T_3 \fallingdotseq 310$ms, $T_4 \fallingdotseq 40$ms, $T_5 \geqq 500$ms

(*1): Signal condition Low: 0 to 1V High: 4.5 to 30V or open Input impedance: 10kΩ
(*2): Do not change the target position during T_3.

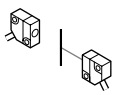
Amplifier

● Minimum target sensing

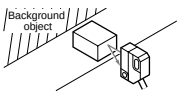
Limit setting

One press of the button allows minimum target setting without having a workpiece.

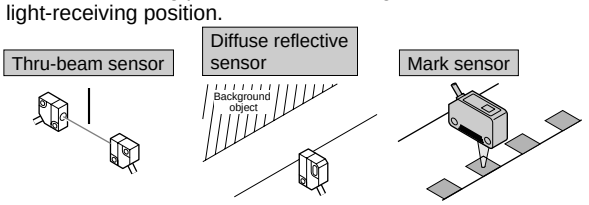
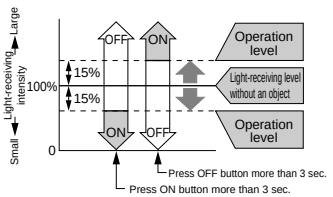
Detection of minimum target



Setting of the highest sensing level short of the background.



Setting method

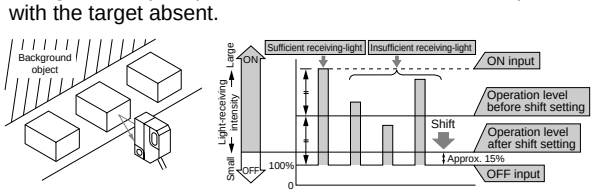
Step	Operation
①	Mount the sensing probe without the target or at the stable light-receiving position. Thru-beam sensor / Diffuse reflective sensor / Mark sensor 
②	Move the mode selection switch to “SET”. 
③	Press ON or OFF more than 3 sec. It will achieve the setting shown. (Note that the output operation mode cannot be reversed.) For example, press ON button for minimum target sensing. 
④	Move the mode selection switch to “RUN”. 

● When the light-receiving intensity is changeable

Shift setting

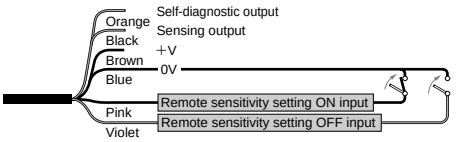
If the light-receiving intensity may change after the initial sensitivity setting, the threshold level of the ON/OFF output signal can be shifted to the optimum level for reliable sensing. The set level is the same as in limit setting. But because the threshold level shifts after normal sensitivity setting, the output operation mode can be selected (Light ON/Dark ON).

Setting method

Step	Operation
①	Set the sensitivity by the standard methods (insufficient sensitivity margin will not allow shifting the level.)
②	Move the mode selection switch to “SIF”. 
③	Press the sensitivity setting button that was pressed for the condition where light-receiving intensity will not change. For example, if a diffuse reflective sensor is used where there is a background object, press the same button which was pressed with the target absent. 
④	Set the mode selection switch to “RUN”. 

Remote sensitivity selection function (For UZG140 only)
UZG140 can store four levels of sensitivity, and the remote signal can retrieve any one of them.

Sensitivity storing method

Step	Operation
①	Move the mode selection switch to “SET”. 
②	Designate the channel by setting the sensitivity selection input 1 or 2 to High or Low. Wiring  Signal condition Low: 0 to 1V High: 4.5 to 30V or open Input impedance: 10kΩ Channel selection
③	Set the sensitivity.
④	Get the other channel and register the sensitivity.
⑤	Set the mode selection switch to “RUN”. 

Channel \ Input	Remote sensitivity selection input 1	Remote sensitivity selection input 2
1	Low	Low
2	Low	High
3	High	Low
4	High	High

Sensitivity selection method

Step	Operation
①	Set the mode selection switch to “RUN”. 
②	Set the remote sensitivity selection inputs 1 or 2 to High or Low to designate the channel.

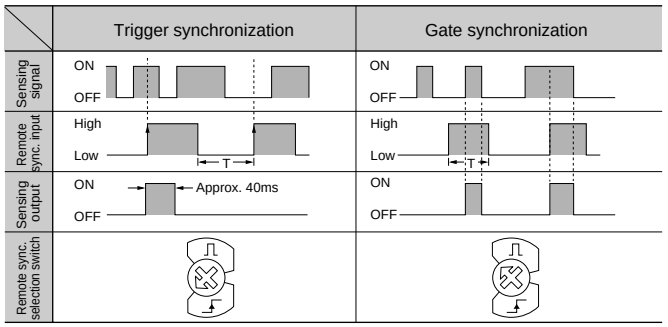
Stability margin indicating function
After setting the sensitivity, the margin of the set value can be visually confirmed. The stability margin is confirmed by the number of times which the stable operation indicator (green) blinks when the mode selection switch is moved to “SIF” or “RUN” from “SET”.

Number of blinks	0	1	2	3	4	5
(Margin (%) Margin for the operation level)	Under 15	15 to 30	30to 45	45 to 60	60 to 75	Over 75

Amplifier

Remote synchronous function (For UZG121 only)

The remote synchronous function allows timing of the output with an external signal. Trigger and gate synchronizations are available.

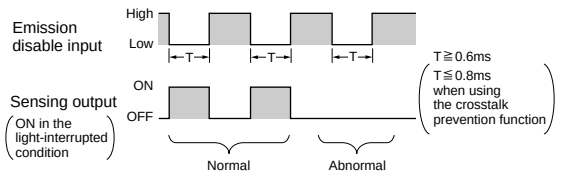


T≧0.6ms (T≧0.8ms when using the crosstalk prevention function)

(*1): Before using this function, the remote synchronous selection switch must be turned to fully clockwise or counterclockwise.

Emission disable function (For UZG121 only)

Making the emission disable input Low will cause the emission to stop. Because this function can turn the sensing output ON or OFF without a target, it's useful for start-up inspection. It is judged that the sensor operation is normal if the sensing output follows the ON and OFF of the emission disable input, and abnormal if it does not.



Timer function (Except for UZG121)

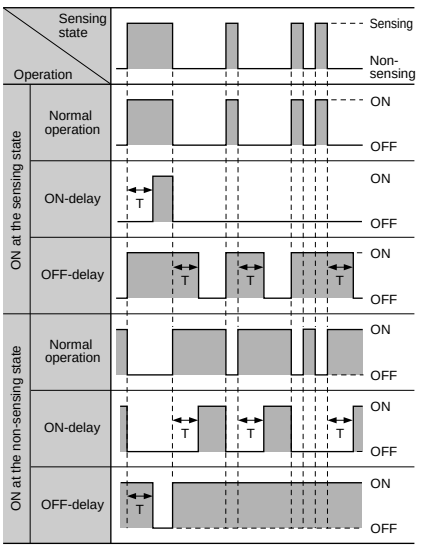
UZG series amplifiers have 0 to 0.5 sec. variable ON-delay/ OFF-delay timers.

ON-delay

This timer prevents the output of transient signals. Useful for the selective detection of long objects.

OFF-delay

This timer extends the output signal a pre-determined period of time. Useful if external controllers cannot catch a short output signal from the sensor.

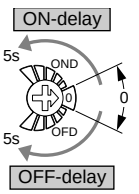


Timer: T = 0 to 5sec.

Timer setting

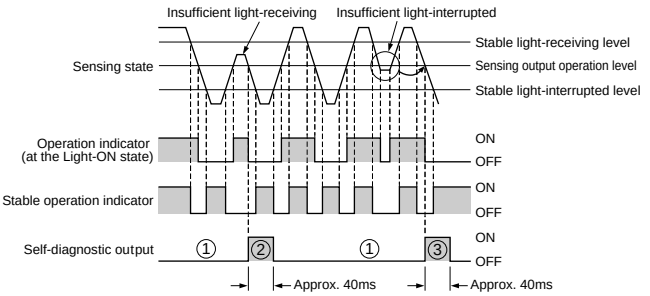
Use the potentiometer for ON-delay/OFF-delay adjustment.

(*1): Adjust the timer under “SET” mode. “RUN” and “SIF” modes does not allow timer setting.



Self-diagnostic function

The self-diagnostic output is in the ON state when the light-receiving intensity is reduced due to dirty lens and/or alignment deviation.

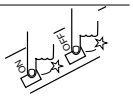
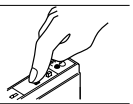
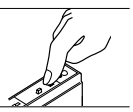
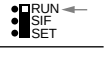


① The self-diagnostic output transistor is in the “OFF” state during the stable sensing.
② If the sensor does not arrive at either stable light-receiving level or stable light-interrupted level when the sensing output turns ON or OFF, the self-diagnostic output turns ON once and turns OFF in approx. 40ms.
(The sensing output has no influence on the self-diagnostic output.)
③ If the light is insufficiently interrupted, there will a time lag before the self-diagnostic output turns ON.

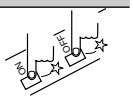
Crosstalk prevention function

Because **UZG** series amplifiers have a crosstalk prevention function, two sensing probes can be mounted side by side by setting different emitting frequencies in each amplifier.

Setting method

Step	Operation
①	Move the mode selection switch to “SET”. 
②	Press “ON” and “OFF” buttons simultaneously for a min. 2 sec.. The stable operation indicator (green) will blink. 
③	Press “ON” button. (The stable operation indicator will blink twice.) [Response time: Max. 0.6ms (*1)] 
④	Move the mode selection switch to “RUN”. (Completes the setting for the first sensor) 
⑤	Apply step ① and ② for another amplifier.
⑥	Press “OFF” button. (The stable operation indicator will blink twice.) [Response time: Max. 0.8ms (*1)] 
⑦	Move the mode selection switch to “RUN”. (The setting is complete.) 

Cancel method

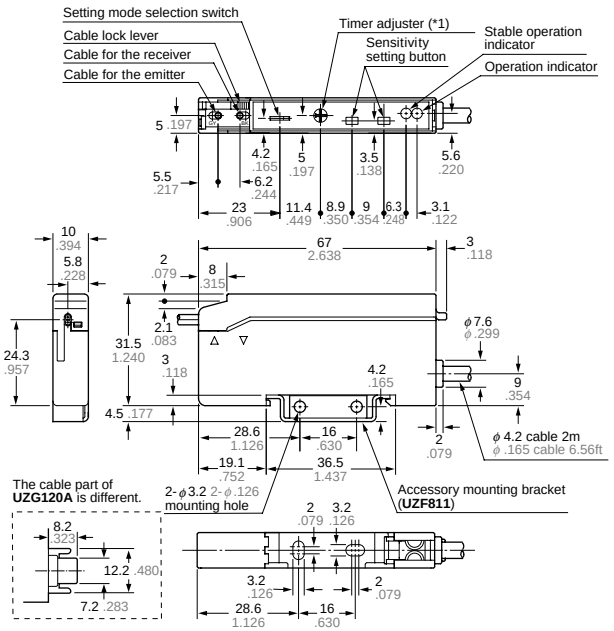
Step	Operation
①	Press “ON” and “OFF” buttons simultaneously for a min. 2 sec.. The stable operation indicator (green) will blink. 
②	Press “ON” and “OFF” buttons simultaneously. (The stable operation indicator will blink twice.)

(*1): When using the crosstalk prevention function, the hysteresis will be greater, and the response time will be longer. Always check the operation after setting the crosstalk prevention function.

DIMENSIONS (Unit: mm inch)

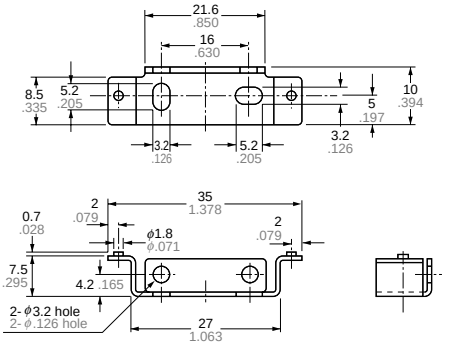
UZG1□□ Amplifier

Mounting drawing for UZF811

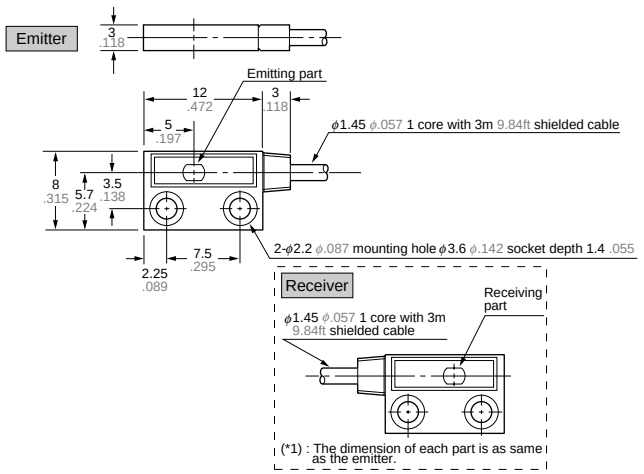


(*1): It is remote synchronous selection switch for **UZG121**.

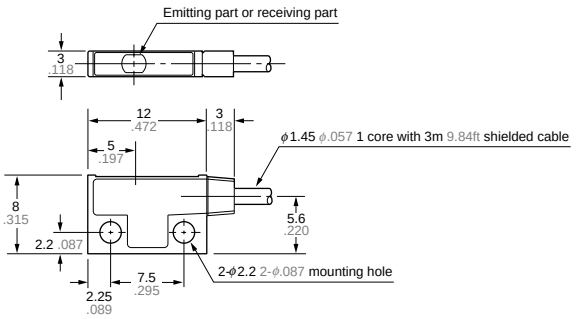
UZF811 Amplifier mounting bracket (accessory for amplifier)



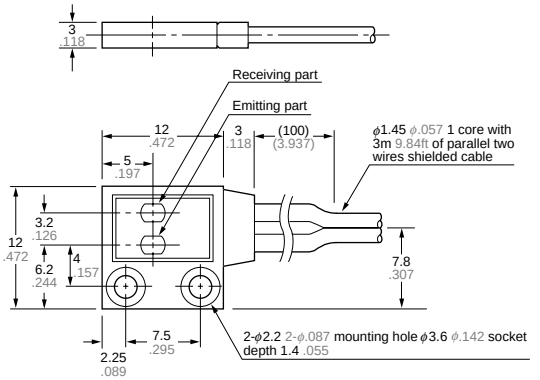
UZH100 Sensing probe



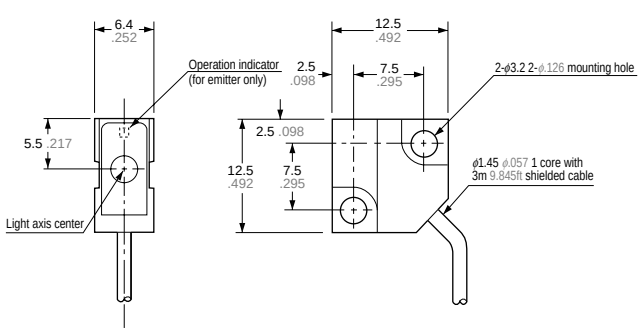
UZH200 Sensing probe



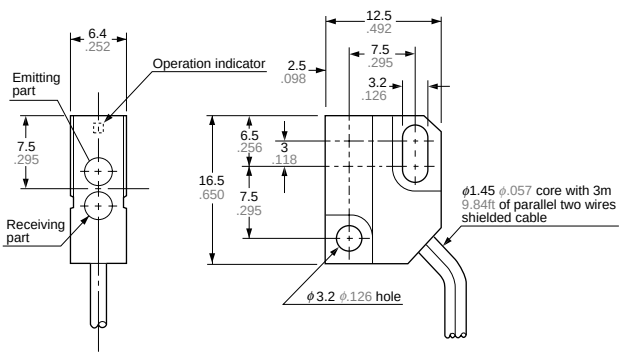
UZH130 Sensing probe



UZH301 UZH302 Sensing probe

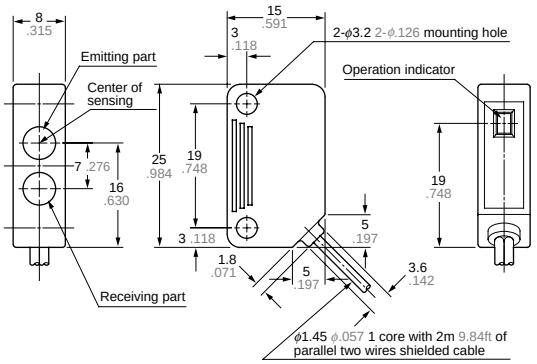


UZH331 Sensing probe

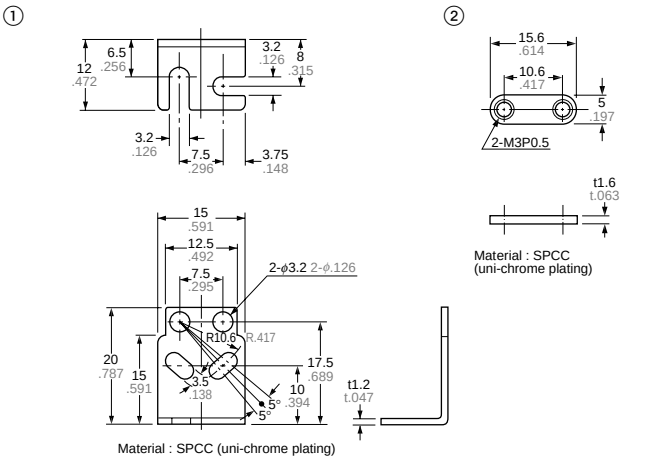


DIMENSIONS (Unit: mm inch)

UZH461 UZH462 UZH471 Sensing probe

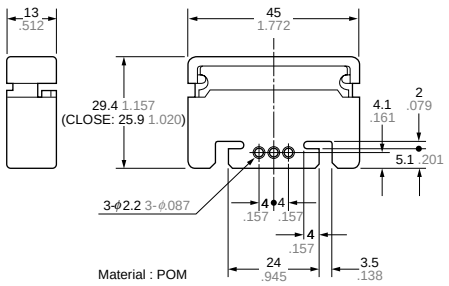


UZH811 Mounting bracket for sensing probe (option)

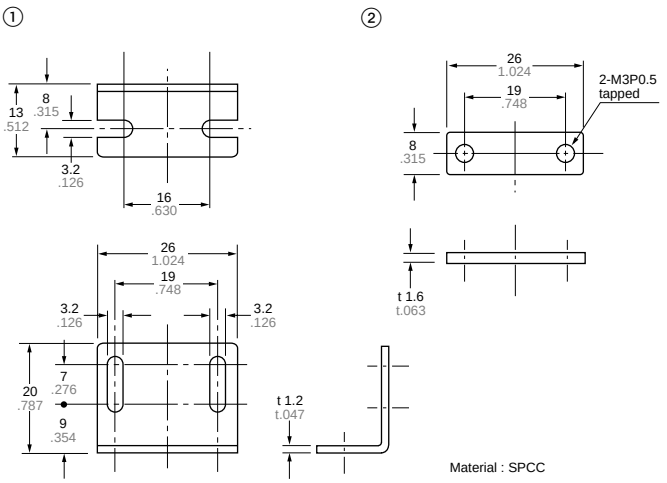


③ 2 pieces of M3×12mm .472inch screws (with flat washers and spring washers) are supplied.

UZH821 Stripper (accessory for amplifier)



UZH812 Mounting bracket for sensing probe (option)



③ 2 pieces of M3×14mm .551inch screws are supplied.