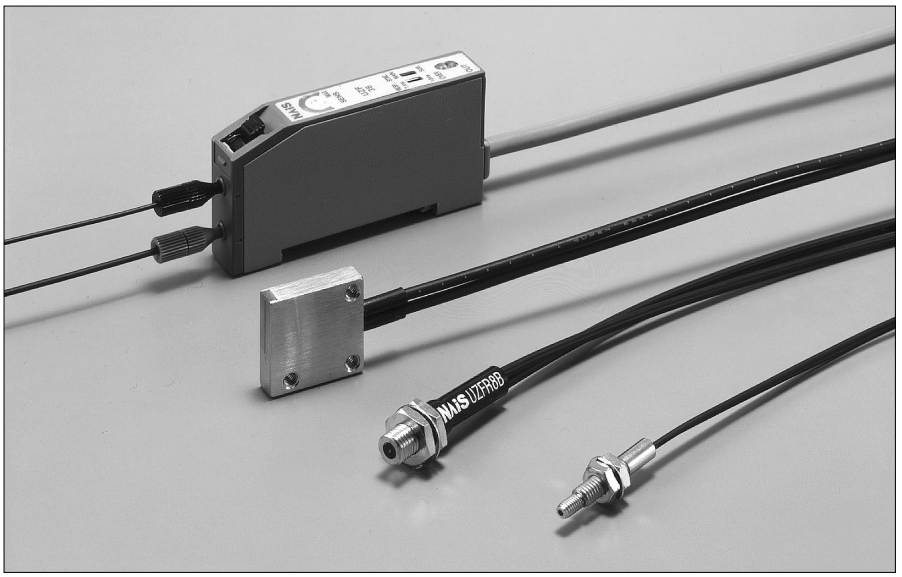
NAiS

ANALOG OUTPUT TYPE OPTICAL FIBER PHOTOELECTRIC SENSOR

UZF36

NEW ANALOG OUTPUT TYPE FOR DIVERSE APPLICATIONS



Analog Voltage Output

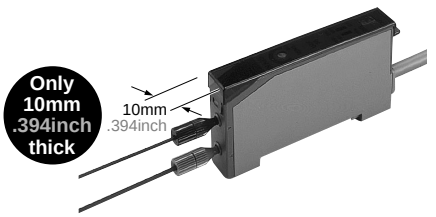
Incorporated with the analog voltage output (1 to 5V).

Various Uses

The analog process with various kinds of fiber heads offers unique application solutions such as a height evaluation, or a gap detection.

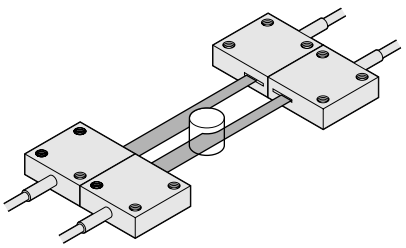
Slim

Space-effective as it is only 10mm .394inch thick.



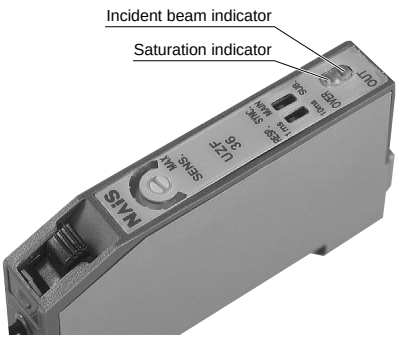
Automatic Crosstalk Prevention Function

Two sets of fibers can be mounted close together or face to face.



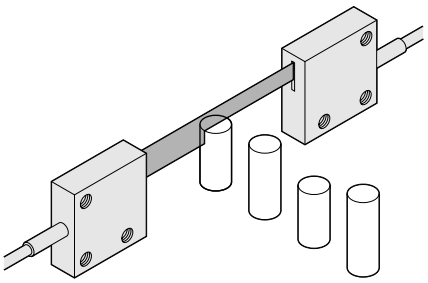
Saturation Indicator

Saturation indicator lights up when the output reaches 5V, thereby its sensitivity is easily adjusted without using a tester.
The incident beam indicator brightens up in proportion to the amount of incident beam (output voltage).

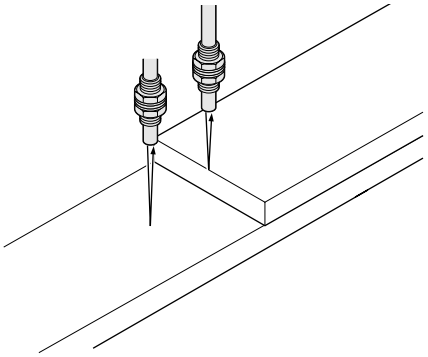


APPLICATIONS

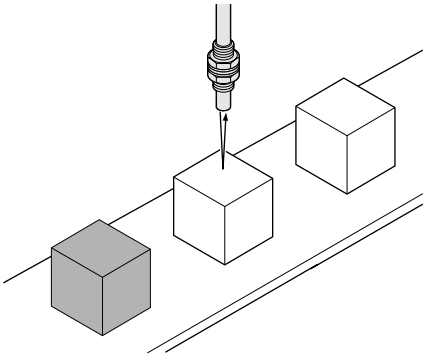
Comparing traveling objects in height
With the array fiber, columns are classified in height.



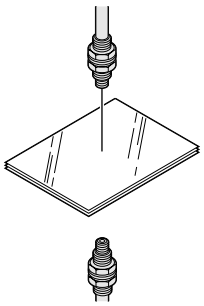
Detecting gap to boards
No sensitivity setting is required even as products are changed over because of the differential sensing.



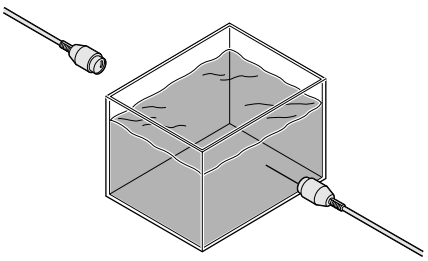
Detecting irrelevant products
Extraneous products are sorted out that differ from normal products in reflection ratio.



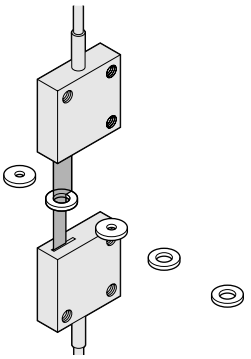
Ascertaining the number of translucent films
The number of translucent films overlaid is inspected by beam penetration.



Sensing turbidity of liquid
The turbidness of liquid inside a clear-wall tank is analogically observed.

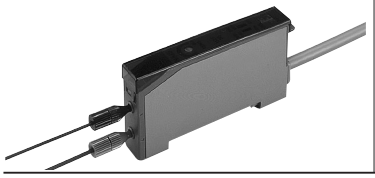


Measuring inner diameter of rings
Rings are classified according to inner diameter.



ORDER GUIDE

Amplifier

Appearance	Model No.	Supply voltage	Analog output
	**UZF36**	12 to 24V DC ± 10%	Analog voltage • Voltage output: 1 to 5V

Fibers

Type		Shape of sensing probe (mm inch)	Sensing range (*1)	Features	Fiber optic cable length	Model No.
Thru-beam	Long sensing range	Lens applicable M4	160mm 6.299 inch	• Sensing range is about double of that of conventional modle	Free Cut 2m 6.562ft	**UZFTB8**
	Standard	Lens applicable M4	85mm 3.346inch	• Free cuttable type	Free Cut 2m 6.562ft	**UZFTF8**
		With sleeve M4 ϕ1.48 ϕ.058				**UZFTF89** With sleeve 90mm 3.543inch **UZFTF84** With sleeve 40mm 1.575inch
		ϕ2.5 ϕ.098				**UZFTS8**
	Small sensing probe	Lens applicable M3	85mm 3.346inch	• Same sensing range as the standard with a smaller sensing probe	Free Cut 2m 6.562ft	**UZFTT8**
	Small diameter	M3	23mm .906inch	• Suitable for sensing in the intricate apparatus • Free cuttable type	Free Cut 2m 6.562ft	**UZFTF4**
		With sleeve M3 ϕ0.88 ϕ.035				**UZFTF49** With sleeve 90mm 3.543inch **UZFTF44** With sleeve 40mm 1.575inch
		Small diameter ϕ1.5 ϕ.059				**UZFTS4**
	Long sensing range with lenses	ϕ2.5 ϕ.098	125mm 4.921inch	• A long sensing range is achieved with a very small sensing probe ϕ2.5mm ϕ.098inch	Free Cut 2m 6.562ft	**UZFTL8**
	Array	Top sensing □15 □.591	65mm 2.559inch	• Arrayed beam does mot miss by detecting object regardless of its position	Free Cut 2m 6.562ft	**UZFTA8**
		Side sensing □15 □.591				**UZFTA8E**
Reflective	Long sensing range	M6	31mm 1.220inch	• Long sensing range	Free Cut 2m 6.562ft	**UZFR8B**
	Standard	Coaxial M6	22mm .866inch	• Free cuttable type	Free Cut 2m 6.562ft	**UZFRF8**
		With sleeve M6 ϕ2.5 ϕ.098				**UZFRF89** With sleeve 90mm 3.543inch **UZFRF84** With sleeve 40mm 1.575inch
	Small sensing probe	M4	22mm .866inch	• Same sensing range as the standard with small sensing probe	Free Cut 2m 6.562ft	**UZFRT8**
		Small diameter M3	7mm .276inch			**UZFRT4**
		ϕ3 ϕ.118	22mm .866inch			**UZFRS8**
	Small diameter	M4	7mm .276inch	• Suitable for sensing in the intricate apparatus • Free cuttable type	Free Cut 2m 6.562ft	**UZFRF4**
		With sleeve M4 ϕ1.48 ϕ.058				**UZFRF49** With sleeve 90mm 3.543inch **UZFRF44** With sleeve 40mm 1.575inch
		ϕ2.5 ϕ.098				**UZFRS4**
	High precision	Lens applicable Coaxial M4	10mm .394inch	• A highly precise positioning is possible with coaxial reflective mode	Free Cut 2m 6.562ft	**UZFRG4**
		Lens applicable Coaxial · Small diameter M3	3mm .118inch	• Approx. ϕ0.3mm ϕ.012inch is achieved by means of combining with ultra-small spot lens **UZFXMR3**	500mm 19.685inch	**UZFREG1**
	Array	Top sensing □20 .787	13mm .512inch	• Arrayed beams meet various sensing demand	Free Cut 2m 6.562ft	**UZFRA8**
		Side sensing □20 □.787				**UZFRA8E**

(*1) : The sensing range is defined as the range until the saturation indicator lights up. With the reflective fibers, it is specified with using white non-glossy paper (50×50mm 1.969×1.969inch). (**UZFR8B** : 100×100mm 3.937×3.937inch)

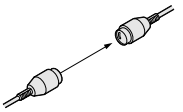
OPTION

Designation		Model No.	Description
For thru-beam fiber	Long sensing range lens	**UZFXLE1**	Six times longer or more • Sensing range (Two lenses on both sides)(*1) : 900mm 35.433inch (**UZFTB8**), 750mm 29.528inch (**UZFTF8**, **UZFTT8**)
	Ultra-long sensing range lens	**UZFXLE2**	The farthest expansion with large aperture lenses • Sensing range (Two lenses on both sides)(*1) : 3,000mm 118.11inch (**UZFTB8**), 2,500mm 98.425inch (**UZFTF8**)
	Side-view lens	**UZFXSV1**	Beam axis is bent by 90°. • Sensing range (Two lenses on both sides)(*1) : 220mm 8.661inch (**UZFTB8**), 200mm 7.874inch (**UZFTF8**, **UZFTT8**)
For reflective fiber	Pinpoint spot lens	**UZFXMR1**	Pinpoint spot of ϕ0.5mm ϕ.020inch • Applicable fiber : **UZFRG4** • Distance to focal point : 6±1mm .236±.039mm
	Zoom lens	**UZFXMR2**	The spot diameter is adjustable from ϕ0.7 to ϕ2mm ϕ.028 to ϕ.079inch according to how much it is screwed in. • Applicable fiber : **UZFRG4** • Distance to focal point : Approx. 18.5 to 43mm .728 to 1.693inch (Screw-in depth : 7 to 14mm .276 to .551inch) • Spot diameter : ϕ0.7 to ϕ2mm ϕ.028 to ϕ.079inch (Screw-in depth : 7 to 14mm .276 to .551inch)
	Ultra-small pinpoint lens	**UZFXMR3**	Finest spot of ϕ0.3mm ϕ.012inch • Applicable fiber : **UZFREG1**, **UZFRG4** • Distance to focal point : 7.5±0.5mm .295±.020inch • Spot diameter : ϕ0.3mm ϕ.012inch (**UZFREG1**), ϕ0.5mm ϕ.020inch (**UZFRG4**)

(*1) : The sensing range is defined as the range until the saturation indicator lights up.

Long sensing range lens

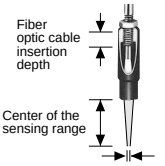
Ultra-long sensing range lens



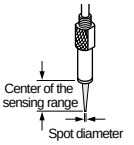
Side-view lens

Pinpoint spot lens

Zoom lens



Ultra-small pin-point lens



SPECIFICATIONS

Fibers

Item \ Type	Standard, Small fiber head, Small diameter, Long sensing range with lenses, Array, and High precision
Allowable bending radius	R25mm .984inch or more
Ambient temperature	−40 to +70°C −40 to +158°F (**UZFREG1**: −20 to +60°C −4 to +140°F) (No dew condensation nor icing allowed)
Ambient humidity	35 to 85%RH
Material	Fiber core : Acrylic, Sheath : Polyethylene Fiber head : Brass with nickel-plated (Threaded part of standard, Threaded part of small diameter, High precision, Array) SUS (**UZFTS8**, Small fiber head, **UZFTS4**, **UZFTL8**, **UZFRS4**, Sleeve part of sleeve-attached fiber)
Accessories	Threaded head fiber : 2 pcs. of nuts (thru-beam type : 4pcs.) and 1 pc. of toothed lock washer (thru-beam type : 2pcs.) Free-cut fiber : 1 pc. of **UZFXCT1** (Fiber cutter) Small diameter and high precision of free-cut fiber : 2 sets of plug attachments

SPECIFICATIONS

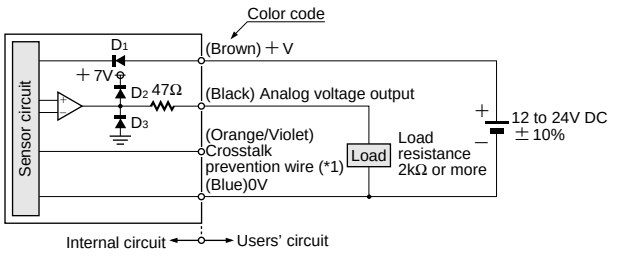
Amplifier

Item \ Model No.		UZF36
Supply voltage		12 to 24V DC ± 10% Ripple P-P 10% or less
Current consumption		35mA or less
Analog output		Analog voltage • Output voltage : 1 to 5V (proportional to incident beam) • Output current : 5mA or less • Output impedance : 47Ω • Load resistance : 2kΩ or more • Temperature characteristic : 0.3% F.S. /°C or less
Response time (*1)		Switchable either 1ms or less or 10ms or less
Incident beam indicator		Red LED (brightens up in proportion to analog output voltage)
Saturation indicator		Green LED (lights up when the analog output voltage reaches 5V)
Sensitivity adjuster		8-turn adjuster with the pointer
Automatic crosstalk prevention function		Incorporated
Euvironmental resistance	Ambient temperature	−10 to +55°C +14 to +131°F (No dew condensation nor icing allowed)
	Ambient humidity	35 to 85%RH, Storage : 35 to 85%RH
	Ambient illuminance (Extraneous light immunity)	Sun light : 1,000ℓx at the light-receiving face, Incandescent light : 1,000ℓx at the light-receiving face
	Noise immunity	Power line : 240Vp, 10ms cycle, and 0.5μs pulse duration, Radiation : 300Vp, 10ms cycle, and 0.5μs pulse duration (with noise simulator)
	Voltage withstandability	1,000V AC for one min. between all terminals connected and enclosure (*1)
	Insulation resistivity	20MΩ or more at 250V DC Megger between all terminals connected and enclosure (*1)
	Vibration-proof	10 to 150Hz frequency, 0.75mm amplitude, and X, Y, and Z directions each for two hours (unenergized)
	Shock-proof	100m/s^2 acceleration {approx. 10G}, and X, Y, and Z directions each for five times (unenergized)
Emitting element		Red LED (modulated)
Material		Enclosure : Heat-resistant ABS, Case cover : Polycarbonate, Fiber lock lever : PPS
Cable		Cabtyre cable 2m 6.562ft long with four 0.2mm^2 conductors
Cable extension		Maximum extension is 100m 328.084ft overall with an equivalent cable with conductors 0.3mm^2 or more (*2)
Weight		Approx. 60g 2.12oz
Accessories		**UZF811** (Mounting bracket) : 1pc., Adjusting screw-driver : 1pc.

(*1) : The voltage withstandability and the insulation resistivity described in the above table are inherent in the **UZF36** amplifier only.
(*2) : Pay attention that the voltage drops when the cable is extended.

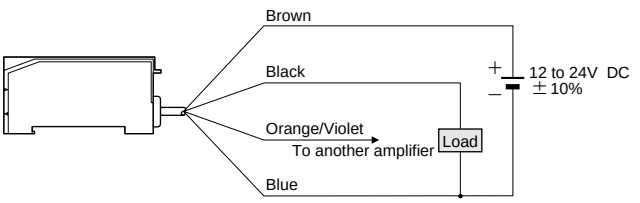
I/O CIRCUIT AND WIRING DIAGRAMS

I/O circuit diagram



Symbol . . . D_1 : Reverse polarity protection diode
D_2, D_3 : Surge absorption diode

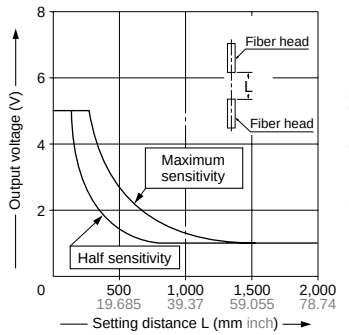
Wiring diagram



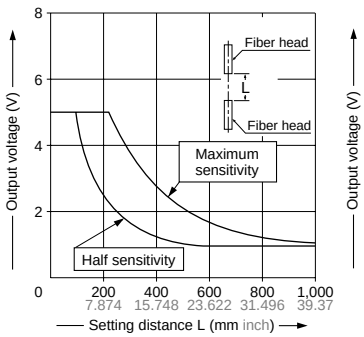
SENSING FIELDS (TYPICAL)

Correlation between setting distance and output voltage

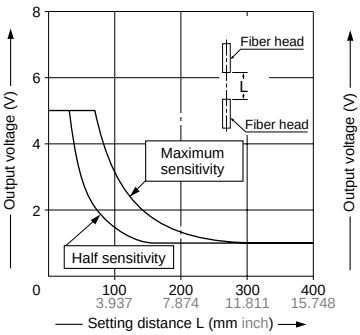
UZFTB8 Thru-beam



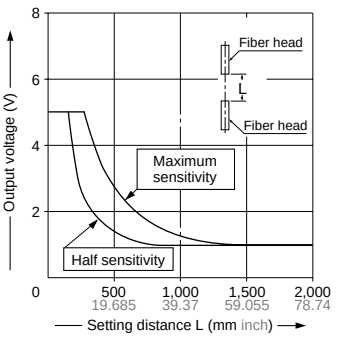
UZFTF8, UZFTF89, UZFTF84 UZFTS8, UZFTT8 Thru-beam



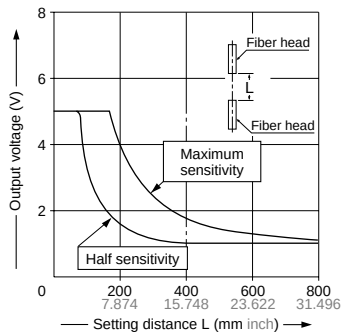
UZFTF4, UZFTF49 UZFTF44, UZFTS4 Thru-beam



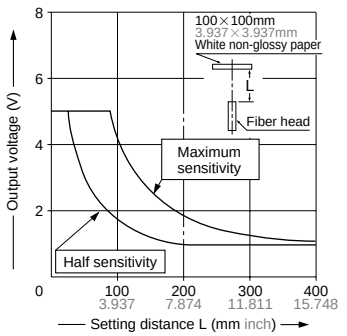
UZFTL8 Thru-beam



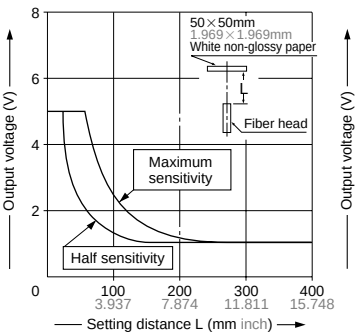
UZFTA8 UZFTA8E Thru-beam



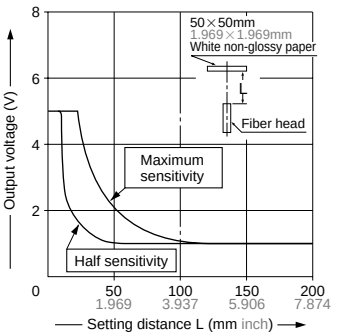
UZFR8B Reflective



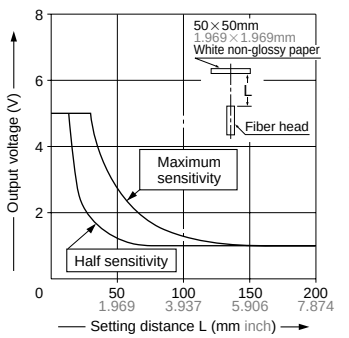
UZFRF8, UZFRF89 UZFRF84, UZFRT8, UZFRS8 Reflective



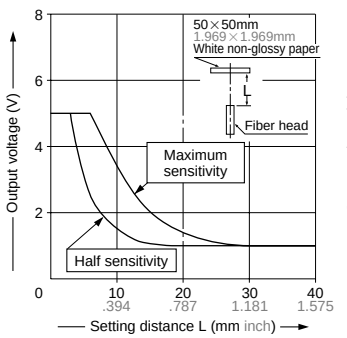
UZFRF4, UZFRF49, UZFRF44 UZFRT4, UZFRS4 Reflective



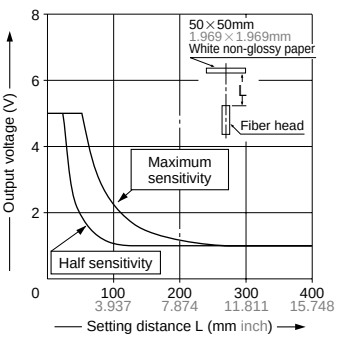
UZFRG4 Reflective



UZFREG1 Reflective

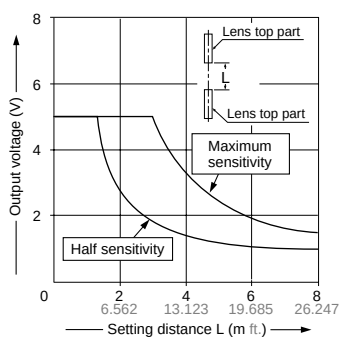


UZFRA8 UZFRA8E Reflective

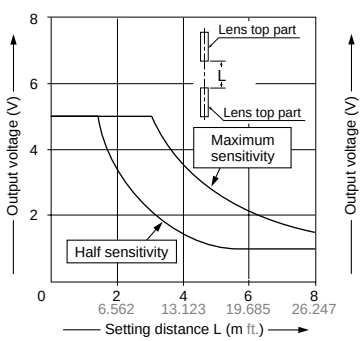


Correlation between setting distance and output voltage with UZFXLE1 applied on both sides

UZFTB8 Thru-beam

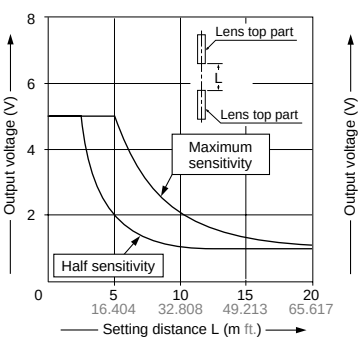


UZFTF8 UZFTT8 Thru-beam

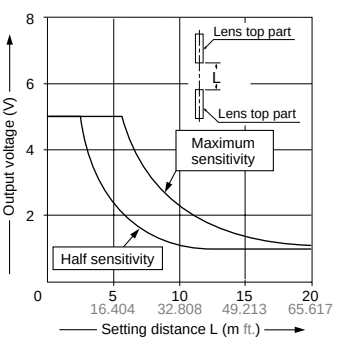


Correlation between setting distance and output voltage with UZFXLE2 applied on both sides

UZFTB8 Thru-beam



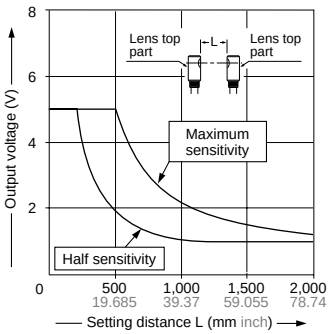
UZFTF8 UZFTT8 Thru-beam



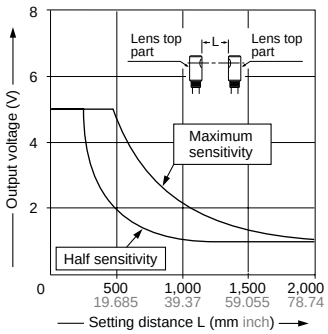
SENSING FIELDS (TYPICAL)

Correlation between setting distance and output voltage with UZFXSV1 applied on both sides

UZFTB8 Thru-beam



UZFTF8 UZFTT8 Thru-beam



PRECAUTIONS FOR PROPER USE

Amplifier

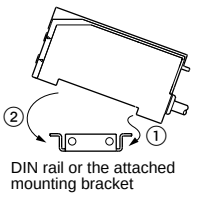
These products are **not** safety sensors and are **not** designed or intended to be used to protect life and prevent bodily injury or property damage.

Mounting

How to mount the amplifier

① Hook the rear part to the attached mounting bracket (**UZF811**) or DIN rail.

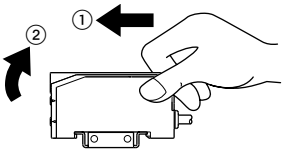
② Press the amplifier down on the bracket or DIN rail.



How to remove the amplifier

① Push the amplifier frontward.

② With keeping on it, lift up the front part of the amplifier.

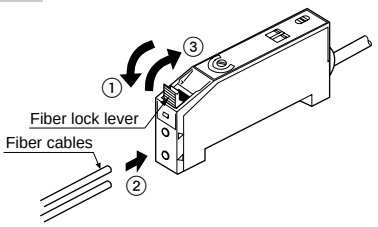


How to connect fiber cables

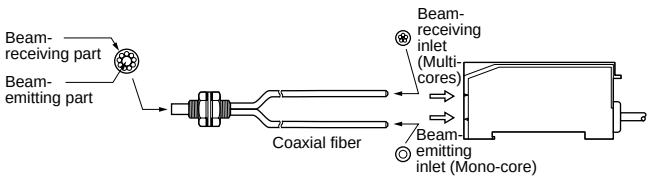
① Unlock the fiber lock lever upright.

② Insert fiber cables into the inlets slowly until fully deepened.

③ Lock the fiber lock lever on the original position.

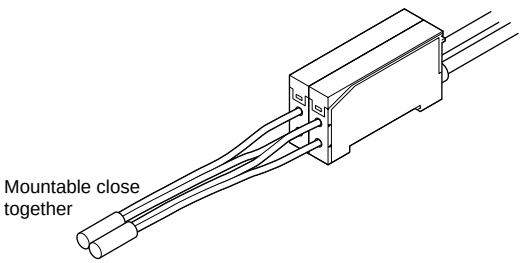


(*1) : With the coaxial diffuse fiber such as the **UZFRG4** or the **UZFRF8**, insert the mono-core fiber cable into the beam-emitting inlet and the multi-core fiber cable into the beam-receiving inlet. If they are inserted in opposition, the repeatability will deteriorate.



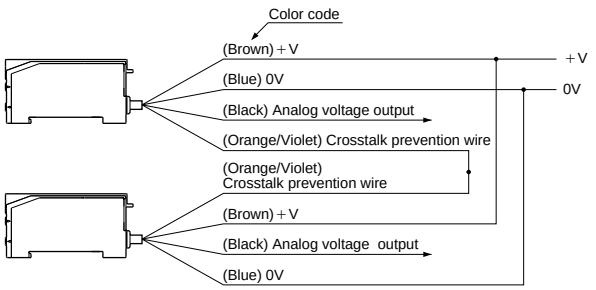
Crosstalk prevention function

• Two sets of fibers can be mounted close together that connected to the **UZF36** amplifiers because of the crosstalk prevention function.
Two sets of the **UZF36** amplifiers should be set the wiring and switches on them as follows.



1) Wiring

• Connect both crosstalk prevention wires together under both 0V wires in common.



2) Crosstalk prevention selection switch

• Set the crosstalk prevention selection switch on “MAIN” for the first amplifier and on “SUB” for the second amplifier.

∗ To neglect crosstalk prevention function

• If the amplifier is used singly, set the crosstalk prevention selection switch on “MAIN”, otherwise it is not operable.

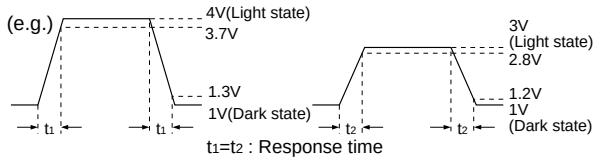
• Insulate the crosstalk prevention wire.

PRECAUTIONS FOR PROPER USE

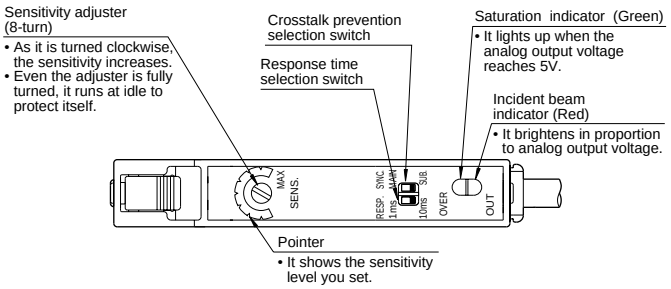
Amplifier

Response time selection

- The response time of the **UZF36** can be selected either “1ms” or “10ms”. If your detecting application does not need the quick response, “10ms” is recommended as it makes the detection secure against inductive noises and ambient lights.
  If you choose “1ms”, pay attention to inductive noises and ambient lights.
- The response time stands for the processing time that the output follows to an input change, either from the complete Dark level (1V) up to 90% extent of a certain Light level or from the Light level down to the complete Dark level 10% extent beforehand. The response time of the **UZF36** is constant regardless of the amplitude of the output voltage. The usage with “10ms” is recommended to gain the output reliability if you do not require quick response. When you select “1ms”, carefully consider the influence of extraneous lights or inductive noises.



Designation



Sensitivity adjustment

Procedure	Adjusting	Sensitivity adjuster
(1)	Turn the sensitivity adjuster counterclockwise fully up to the minimum sensitivity.	MAX. SENS.
(2)	Adjust the relative positions between fiber heads or between the fiber head and an object so as to receive as much the incident beam as possible. **Thru-beam fibers** Perfect beam-alignment **Diffuse-reflective fibers** The largest amount of reflected beam	
(3)	Turn the sensitivity adjuster clockwise until the saturation indicator lights up. Once it lights up, turn the sensitivity adjuster counterclockwise until the saturation indicator lights off. This is the point most sensitive before the saturation.	MAX. SENS.

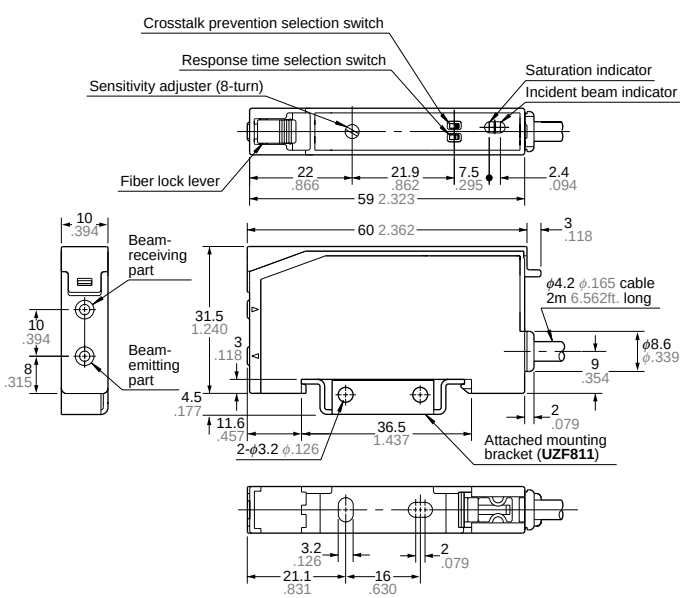
Others

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

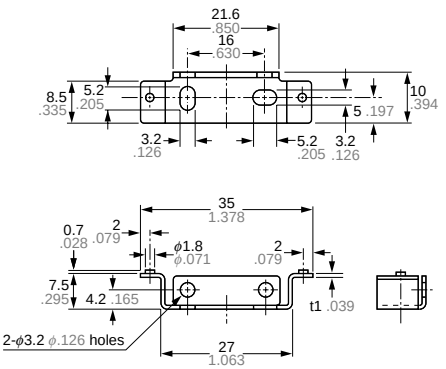
DIMENSIONS (Unit: mm inch)

UZF36 Amplifier

Assembled dimensions with attached mounting bracket



UZF811 Amplifier mounting bracket (Accessory for **UZF36**)



Material : SPCC (Uni-chrome plated)