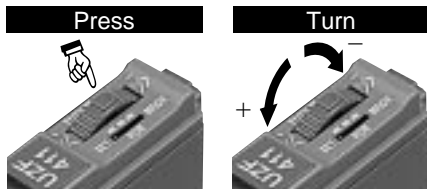


**SIMPLE OPERATION WITH INNOVATIVE JOG SWITCH SETTING AND
MANUAL SETTING TYPE**



Simple Operation UZF41/42 series

Uses an innovative highly operable jog switch.
Anyone can easily do the threshold value (sensitivity in case of **UZF42** series) setting or fine adjustment by using a single jog switch.



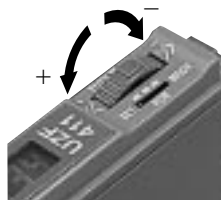
Threshold value (sensitivity in case of **UZF42** series) or each mode is set.

Threshold value (sensitivity in case of **UZF42** series) setting or fine adjustment, and selection of each mode is done.

Fine Adjustment is Possible UZF41/42 series

Fine adjustment is possible after setting the threshold value (sensitivity in case of **UZF42** series).

Simply turn the jog switch to the '+' or the '-' side for fine adjustment.



3 Types of Settings are Possible UZF41/42 series

You can select from the following three types of settings:

- 1) 2-level teaching
- 2) Limit teaching, which is highly suitable for threshold value (sensitivity in case of **UZF42** series) setting in the object absent condition, or in case a background body is present, or for minute difference detection.
- 3) Full auto-teaching, which is suitable for detecting a moving object,

Digital Display UZF41 series

Since the incident light intensity and the threshold value can be confirmed on a digital display (4 digit LCD), the threshold value can be set by seeing the numerical values. Moreover, since the display has a back light, the values can be read even in a dark place.



Level Indicators UZF42 series

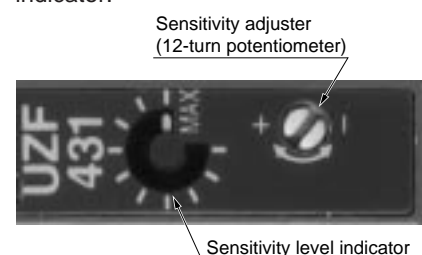
Level indicators, comprising of 10 LEDs, enable confirmation of the set sensitivity at one glance. Setting can be done while confirming the value on the level indicators.



Level indicators

12-turn Potentiometer with Indicator UZF43 series

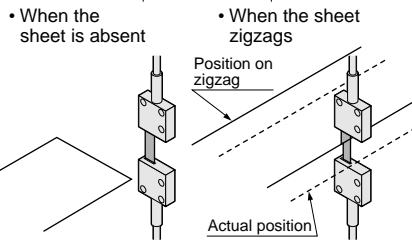
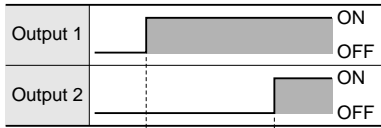
12-turn potentiometer has been incorporated for unprecedented fine adjustments. It enables detection of very fine differences. Moreover, the potentiometer position can be confirmed at a glance on the indicator.



Incorporates Two Independent Outputs UZF41 series

Since two independent outputs are incorporated, one sensor suffices even in places where, so far, two sensors had to be used.

Detection of a sheet's zigzag movement

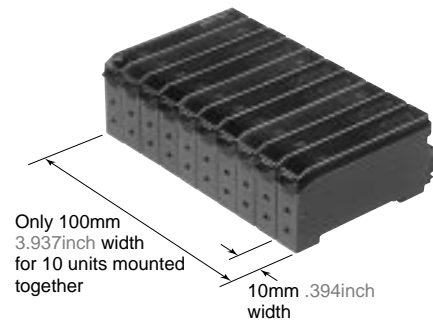


Incorporates a Convenient Timer Function

UZF41 series incorporates an ON-delay timer and an OFF-delay timer. The timer period can be selected from four values — 40ms, 100ms, 200ms and 500ms. Further, the UZF42 series and the UZF43 series incorporate a fixed 40ms (approx.) OFF-delay timer.

10mm .394inch Width Slim Size

Since the width is merely 10mm .394inch, it can be installed in a narrow space.



Close Mounting of Three Fibers is Possible

Three fibers can be mounted closely by selecting three different emission frequencies with the jog switch (frequency selection switch in case of UZF43 series).

Connector Type Available

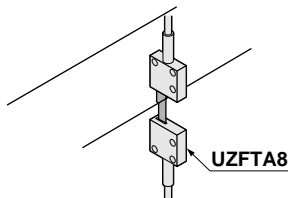
Besides the cable type, connector type sensors suitable for sensor and simple wire-saving using a sensor block and a connector attached cable, are available.



APPLICATIONS

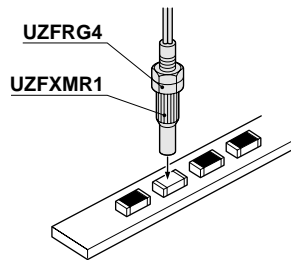
Detection of a sheet's zigzag movement

Since the UZF41 series incorporates two independent outputs, the sheet's presence/absence and its zigzag movement can be detected at the same time.



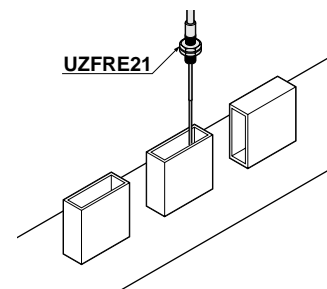
Distinguishing top/bottom surface of a chip component

Due to the small spot size, the top surface can be distinguished from the bottom surface for small components, such as the 1005 chip.



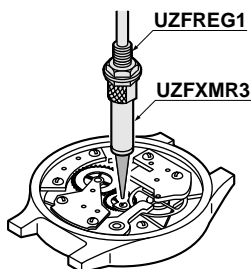
Detection of upright position of a condenser

Since the UZF41 series incorporates two independent outputs, it can detect not only the presence/absence of a condenser coming from a parts feeder, but also whether it stands upright.



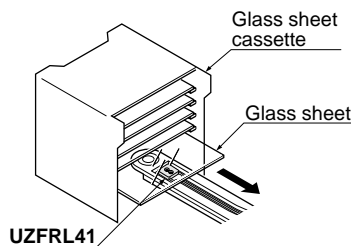
Detection of presence/absence of very small parts

It can reliably detect very small parts in a wrist watch.



Detection of presence/absence of glass sheets

It can reliably detect individual glass sheets which are normally difficult to detect.



ORDER GUIDE

For general use fiber optic cable [Thru-beam type (one set consists of two pcs.)]



| | Shape of sensing probe (mm inch) | Sensing range (*1) ■ : Red LED type □ : Green LED type | Min. sensing object [on optimum condition (*2)] ① : Red LED type ② : Green LED type | Features | Fiber optic cable length | Model No. |
|---------------------|---------------------------------------|--|--|--|-------------------------------|--|
| Long sensing range | Lens applicable | 650mm 25.591inch 115mm 4.528inch | ① $\phi 0.16\text{mm } \phi 0.06\text{inch}$ opaque object ② $\phi 0.08\text{mm } \phi 0.03\text{inch}$ opaque object | • Twice the sensing range as before of standard type | Freely cuttable 2m 6.562ft | UZFTB8 |
| | Lens applicable | | | | | UZFTF8 |
| Standard | With sleeve | 380mm 14.961inch 60mm 2.362inch | ① $\phi 0.12\text{mm } \phi 0.05\text{inch}$ opaque object ② $\phi 0.04\text{mm } \phi 0.02\text{inch}$ opaque object | • Freely cuttable type | Freely cuttable 2m 6.562ft | UZFTF89 Sleeve 90mm 3.543inch UZFTF84 Sleeve 40mm 1.575inch |
| | | | | | | UZFTS8 |
| | | | | | | |
| Economy | Lens applicable | 600mm 23.622inch 100mm 3.937inch | ① $\phi 0.16\text{mm } \phi 0.06\text{inch}$ opaque object ② $\phi 0.08\text{mm } \phi 0.03\text{inch}$ opaque object | • Low price & free-cut | Freely cuttable 2m 6.562ft | New UZFTNB8 |
| | | 350mm 13.780inch 50mm 1.969inch | ① $\phi 0.12\text{mm } \phi 0.05\text{inch}$ opaque object ② $\phi 0.04\text{mm } \phi 0.02\text{inch}$ opaque object | | (*3) | New UZFTN8 |
| Small sensing probe | Lens applicable | 380mm 14.961inch 60mm 2.362inch | ① $\phi 0.12\text{mm } \phi 0.05\text{inch}$ opaque object ② $\phi 0.04\text{mm } \phi 0.02\text{inch}$ opaque object | • Same sensing range as the standard with a smaller sensing probe | Freely cuttable 2m 6.562ft | UZFTT8 |
| Small diameter | | | | | | UZFTF4 |
| | With sleeve | 100mm 3.937inch 15mm .591inch | ① $\phi 0.08\text{mm } \phi 0.03\text{inch}$ opaque object ② $\phi 0.03\text{mm } \phi 0.01\text{inch}$ opaque object | • Suitable for sensing in the intricate apparatus • Freely cuttable type | Freely cuttable 2m 6.562ft | UZFTF49 Sleeve 90mm 3.543inch UZFTF44 Sleeve 40mm 1.575inch |
| | | | | | | UZFTS4 |
| Flexible | Lens applicable Small diameter | 70mm 2.756inch 13mm .512inch | ① $\phi 0.08\text{mm } \phi 0.03\text{inch}$ opaque object ② $\phi 0.04\text{mm } \phi 0.02\text{inch}$ opaque object | • Small diameter sensing probe coiled cable | 2m 6.562ft | UZFTC4 |
| | Lens applicable | 320mm 12.598inch 60mm 2.362inch | ① $\phi 0.12\text{mm } \phi 0.05\text{inch}$ opaque object ② $\phi 0.05\text{mm } \phi 0.02\text{inch}$ opaque object | | Freely cuttable 2m 6.562ft | UZFTP8 |
| | Small diameter | 100mm 3.937inch 10mm .394inch | ① $\phi 0.08\text{mm } \phi 0.03\text{inch}$ opaque object ② $\phi 0.03\text{mm } \phi 0.01\text{inch}$ opaque object | • Allowable bending radius : R4mm R.157inch • Bending durability : one million times min. | | UZFTP4 |
| | Small diameter | 120mm 4.724inch 18mm .709inch | ① $\phi 0.08\text{mm } \phi 0.03\text{inch}$ opaque object ② $\phi 0.08\text{mm } \phi 0.03\text{inch}$ opaque object | | 1m 3.281ft | UZFTP2 |

(*1): The free-cut fibers may reduce the sensing ranges 20% lower than the above specified according to how they are cut off.

(*2): The optimum condition is the condition when the sensitivity is set so that the sensing output just changes to light incident operation in the object absent condition.

(*3): Fiber cutter **UZFXCT1** is not supplied as accessory along with Standard (Economy) fibers. Please procure it separately.

ORDER GUIDE

For environmental-resistant use fiber optic cable [Thru-beam type (one set consists of two pcs.)]



| | Shape of sensing probe (mm inch) | Sensing range (*1) ■ : Red LED type □ : Green LED type | Min. sensing object [on optimum condition (*2)] ③ : Red LED type ④ : Green LED type | Features | Fiber optic cable length | Model No. | | | |
|--------------------|----------------------------------|--|--|--|--|----------------|---|--|----------------|
| Heat-resistant | Lens applicable | | | <ul style="list-style-type: none"> Heat-resistant : 350°C 662°F Cold-resistant : -60°C -76°F | 2m 6.562ft | UZFTH7 | | | |
| | With sleeve | 280mm 11.024inch 50mm 1.969inch | <ul style="list-style-type: none"> ③ $\phi 0.08\text{mm } \phi 0.003\text{inch}$ opaque object ④ $\phi 0.05\text{mm } \phi 0.002\text{inch}$ opaque object | | | | <ul style="list-style-type: none"> Silicon housing makes cable lead-around easy. Heat-resistant : 200°C 392°F Cold-resistant : -60°C -76°F | 1m 3.281ft | UZFTH6 |
| | Lens applicable | | | <ul style="list-style-type: none"> Heat-resistant : 130°C 266°F Cold-resistant : -60°C -76°F Freely cuttable type | Freely cuttable 2m 6.562ft | UZFTH8 | | | |
| | Lens applicable | 440mm 17.323inch 80mm 3.150inch | <ul style="list-style-type: none"> ③ $\phi 0.16\text{mm } \phi 0.006\text{inch}$ opaque object ④ $\phi 0.12\text{mm } \phi 0.005\text{inch}$ opaque object | | | | <ul style="list-style-type: none"> For the application in liquid chemical Heat-resistant specification (115°C 239°F) Long sensing range type with lens | 2m 6.562ft (Bending R : 30mm 1.181inch) | UZFTL8Y |
| Chemical-resistant | | 1,500mm 59.055inch 180mm 7.087inch | <ul style="list-style-type: none"> ③ $\phi 0.5\text{mm } \phi 0.020\text{inch}$ opaque object ④ $\phi 0.3\text{mm } \phi 0.012\text{inch}$ opaque object | <ul style="list-style-type: none"> For the application in liquid chemical Heat-resistant specification (115°C 239°F) Side-view type | 2m 6.562ft (Bending R : 30mm 1.181inch) | UZFTV8Y | | | |
| | | 400mm 15.748inch 70mm 2.756inch | <ul style="list-style-type: none"> ③ $\phi 0.5\text{mm } \phi 0.020\text{inch}$ opaque object ④ $\phi 0.3\text{mm } \phi 0.012\text{inch}$ opaque object | | | | | | |
| Vacuum-resistant | Lens applicable | 230mm 9.055inch | ③ $\phi 0.16\text{mm } \phi 0.006\text{inch}$ opaque object | 1m 3.281ft (Bending R : 30mm 1.181inch) | UZFT60V | | | | |
| | | 100mm 3.937inch | ③ $\phi 0.16\text{mm } \phi 0.006\text{inch}$ opaque object | | | | | | |

(*1): The free-cut fibers may reduce the sensing ranges 20% lower than the above specified according to how they are cut off.

(*2): The optimum condition is the condition when the sensitivity is set so that the sensing output just changes to light incident operation in the object absent condition.

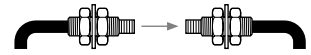
The vacuum fiber must be used with both the followings.

UZFTJ6 : Outer fibers in the atmosphere (One pair of two fibers a set)

UZFVBR1 : Terminal joints (One pair of two joints a set)

ORDER GUIDE

For special application use fiber optic cable [Thru-beam type (one set consists of two pcs.)]



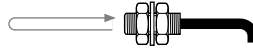
| | Shape of sensing probe (mm inch) | Sensing range (*1) ■ : Red LED type □ : Green LED type | Min. sensing object [on optimum condition (*2)] ③ : Red LED type ⑥ : Green LED type | Features | Fiber optic cable length | Model No. |
|------------------------------|----------------------------------|--|--|--|---|-----------|
| Long sensing range with lens | | 10,000mm 393.7inch 2,800mm 110.236inch | ③ $\phi 0.5\text{mm } \phi 0.020\text{inch}$ opaque object ⑥ $\phi 0.5\text{mm } \phi 0.020\text{inch}$ opaque object | <ul style="list-style-type: none"> By applying large diameter lens, a long sensing range is achieved. Fiber optic cable length is 10m 32.808ft | 10m 32.808ft Freely cuttable | UZFTL9 |
| | | 800mm 31.496inch 130mm 5.118inch | ③ $\phi 0.16\text{mm } \phi 0.006\text{inch}$ opaque object ⑥ $\phi 0.16\text{mm } \phi 0.006\text{inch}$ opaque object | <ul style="list-style-type: none"> A long sensing range is achieved with a very small sensing probe of $\phi 2.5\text{mm } \phi 0.098\text{inch}$. | 2m 6.562ft Freely cuttable | UZFTL8 |
| Array | Top sensing | 320mm 12.598inch 50mm 1.969inch | ③ ϕ Vertical $\phi 0.7\text{mm } \phi 0.028\text{inch}$ opaque object ϕ Horizontal $\phi 0.05\text{mm } \phi 0.002\text{inch}$ opaque object ⑥ ϕ Vertical $\phi 0.2\text{mm } \phi 0.008\text{inch}$ opaque object ϕ Horizontal $\phi 0.04\text{mm } \phi 0.002\text{inch}$ opaque object | <ul style="list-style-type: none"> Arrayed beam does not miss by detecting object regardless of its position. | 2m 6.562ft Freely cuttable | UZFTA8 |
| | Side sensing | 290mm 11.417inch 40mm 1.575inch | ③ ϕ Vertical $\phi 0.7\text{mm } \phi 0.028\text{inch}$ opaque object ϕ Horizontal $\phi 0.05\text{mm } \phi 0.002\text{inch}$ opaque object ⑥ ϕ Vertical $\phi 0.2\text{mm } \phi 0.008\text{inch}$ opaque object ϕ Horizontal $\phi 0.04\text{mm } \phi 0.002\text{inch}$ opaque object | | | UZFTA8E |
| Elbow | Lens applicable | 270mm 10.630inch 45mm 1.772inch | ③ $\phi 0.12\text{mm } \phi 0.005\text{inch}$ opaque object ⑥ $\phi 0.08\text{mm } \phi 0.003\text{inch}$ opaque object | <ul style="list-style-type: none"> Installation is simple as the sensing probe is bent 90 degrees and has 5mm .197inch radius. | 2m 6.562ft Freely cuttable | UZFTR8 |
| Side-view | Small diameter | 175mm 6.890inch 18mm .709inch | ③ $\phi 0.08\text{mm } \phi 0.003\text{inch}$ opaque object ⑥ $\phi 0.05\text{mm } \phi 0.002\text{inch}$ opaque object | <ul style="list-style-type: none"> Side sensing method saves installation space. | 1m 3.281ft 2m 6.562ft Freely cuttable | UZFTV22 |
| | Sleeve part cannot be bent. | 70mm 2.756inch 10mm .394inch | ③ $\phi 0.08\text{mm } \phi 0.003\text{inch}$ opaque object ⑥ $\phi 0.06\text{mm } \phi 0.002\text{inch}$ opaque object | | | UZFTV41 |
| | | 200mm 7.874inch 35mm 1.378inch | ③ $\phi 0.12\text{mm } \phi 0.005\text{inch}$ opaque object ⑥ $\phi 0.05\text{mm } \phi 0.002\text{inch}$ opaque object | | | UZFTV82 |
| Ultra-small diameter | | 7mm .276inch | ③ $\phi 0.02\text{mm } \phi 0.0008\text{inch}$ opaque object | <ul style="list-style-type: none"> Ultra-small diameter, and diameter of $\phi 0.125\text{mm } \phi 0.005\text{inch}$ | 500mm 19.685inch | UZFTE1 |
| | | 30mm 1.181inch | ③ $\phi 0.3\text{mm } \phi 0.012\text{inch}$ opaque object | <ul style="list-style-type: none"> Ultra-small diameter, and diameter of $\phi 0.25\text{mm } \phi 0.010\text{inch}$ | 1m 3.281ft | UZFTE2 |
| Narrow-view | | 160mm 6.299inch 18mm .709inch | ③ $\phi 0.08\text{mm } \phi 0.003\text{inch}$ opaque object ⑥ $\phi 0.02\text{mm } \phi 0.0008\text{inch}$ opaque object | <ul style="list-style-type: none"> The spread of beam is one-sixth of conventional model, so that it doesn't cause crosstalk. | 1m 3.281ft | UZFTK22 |

(*1): The free-cut fibers may reduce the sensing ranges 20% lower than the above specified according to how they are cut off.

(*2): The optimum condition is the condition when the sensitivity is set so that the sensing output just changes to light incident operation in the object absent condition.

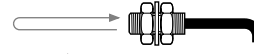
ORDER GUIDE

For general use fiber optic cable (reflective type)



| | Shape of sensing probe (mm inch) | Sensing range (*1) (*2) ■ : Red LED type □ : Green LED type | Min. sensing object [at the maximum sensitivity (*3)] ③ : Red LED type ⑥ : Green LED type | Features | Fiber optic cable length | Model No. | |
|---------------------|----------------------------------|---|---|--|---------------------------------------|---|--|
| Long sensing range | | 210mm 8.268inch | ③ $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire ⑥ $\phi 0.05\text{mm } \phi .002\text{inch}$ copper wire | <ul style="list-style-type: none"> Long sensing range Freely cuttable type | Freely cuttable 2m 6.562ft | UZFR8B | |
| | | 40mm 1.575inch | | | | | |
| Standard | Coaxial | 140mm 5.512inch | <ul style="list-style-type: none"> ③ $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire ⑥ $\phi 0.02\text{mm } \phi .0008\text{inch}$ copper wire | <ul style="list-style-type: none"> Suitable for green LED type | 500mm 19.685inch | UZFRF5 | |
| | | 20mm .787inch | | | | | |
| | With sleeve | | | <ul style="list-style-type: none"> Freely cuttable type | Freely cuttable 2m 6.562ft | UZFRF8 UZFRF89 Sleeve 90mm 3.543inch UZFRF84 Sleeve 40mm 1.575inch | |
| Economy | | 120mm 4.724inch | <ul style="list-style-type: none"> ③ $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire ⑥ $\phi 0.12\text{mm } \phi .005\text{inch}$ copper wire | <ul style="list-style-type: none"> Low price & free-cut | Freely cuttable 2m 6.562ft (*4) | New UZFRN8 | |
| | | 18mm .709inch | | | | | |
| Small sensing probe | Small diameter | 34mm 1.339inch | <ul style="list-style-type: none"> ③ $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire ⑥ $\phi 0.3\text{mm } \phi .012\text{inch}$ copper wire | <ul style="list-style-type: none"> Same sensing range as the standard with small sensing probe | Freely cuttable 2m 6.562ft | UZFRN4 | |
| | | 3mm .118inch | | | | | |
| | Small diameter | 40mm 1.575inch | <ul style="list-style-type: none"> ③ $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire ⑥ $\phi 0.02\text{mm } \phi .0008\text{inch}$ copper wire | | | | <ul style="list-style-type: none"> ③ $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire ⑥ $\phi 0.02\text{mm } \phi .0008\text{inch}$ copper wire |
| 5mm .197inch | | | | | | | |
| Small diameter | | 140mm 5.512inch | | | | | |
| Small diameter | Small diameter | 20mm .787inch | <ul style="list-style-type: none"> ③ $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire ⑥ $\phi 0.02\text{mm } \phi .0008\text{inch}$ copper wire | <ul style="list-style-type: none"> Suitable for sensing in the intricate apparatus Freely cuttable type | Freely cuttable 2m 6.562ft | UZFRS8 | |
| | | 5mm .197inch | | | | | |
| | With sleeve | 40mm 1.575inch | | | | | |
| Flexible | Small diameter | 5mm .197inch | <ul style="list-style-type: none"> ③ $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire ⑥ $\phi 0.05\text{mm } \phi .002\text{inch}$ copper wire | <ul style="list-style-type: none"> Allowable bending radius : R4mm R.157inch Bending durability : one million times min. | Freely cuttable 2m 6.562ft | UZFRF49 Sleeve 90mm 3.543inch UZFRF44 Sleeve 40mm 1.575inch | |
| | | 5mm .197inch | | | | | |
| | Small diameter | 40mm 1.575inch | | | | | |
| Flexible | Small diameter | 100mm 3.937inch | <ul style="list-style-type: none"> ③ $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire ⑥ $\phi 0.05\text{mm } \phi .002\text{inch}$ stainless steel bar | <ul style="list-style-type: none"> Allowable bending radius : R4mm R.157inch Bending durability : one million times min. | Freely cuttable 2m 6.562ft | UZFRP8 | |
| | | 16mm .630inch | | | | | |
| | Small diameter | 16mm .630inch | | | | | |
| Flexible | Small diameter | 23mm .906inch | <ul style="list-style-type: none"> ③ $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire ⑥ $\phi 0.02\text{mm } \phi .0008\text{inch}$ copper wire | <ul style="list-style-type: none"> Allowable bending radius : R4mm R.157inch Bending durability : one million times min. | 1m 3.281ft | UZFRP2 | |
| | | 2.5mm .098inch | | | | | |

For environmental-resistant use fiber optic cable (reflective type)

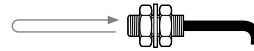


| | Shape of sensing probe (mm inch) | Sensing range (*1) (*2) ■ : Red LED type □ : Green LED type | Min. sensing object [at the maximum sensitivity (*3)] ③ : Red LED type ⑥ : Green LED type | Features | Fiber optic cable length | Model No. |
|------------------|----------------------------------|---|---|---|-------------------------------|---------------|
| Heat-resistant | Coaxial | 140mm 5.512inch | <ul style="list-style-type: none"> ③ $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire ⑥ $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire | <ul style="list-style-type: none"> Heat-resistant : 350°C 662°F Cold-resistant : -60°C -76°F | 2m 6.562ft | UZFRH7 |
| | | 18mm .709inch | | | | |
| | With sleeve | | | | | |
| Heat-resistant | Coaxial | 150mm 5.906inch | <ul style="list-style-type: none"> ③ $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire ⑥ $\phi 0.06\text{mm } \phi .002\text{inch}$ stainless steel bar | <ul style="list-style-type: none"> Silicon housing makes cable lead-around easy. Heat-resistant : 200°C 392°F Cold-resistant : -60°C -76°F | 1m 3.281ft | UZFRH6 |
| | | 26mm 1.024inch | | | | |
| Heat-resistant | Small diameter | 26mm 1.024inch | <ul style="list-style-type: none"> ③ $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire ⑥ $\phi 0.06\text{mm } \phi .002\text{inch}$ stainless steel bar | <ul style="list-style-type: none"> Heat-resistant : 130°C 266°F Cold-resistant : -60°C -76°F | Freely cuttable 2m 6.562ft | UZFRH8 |
| | | 26mm 1.024inch | | | | |
| Vacuum-resistant | Small diameter | 75mm 2.953inch | <ul style="list-style-type: none"> ③ $\phi 0.01\text{mm } \phi .0004\text{inch}$ copper wire | <ul style="list-style-type: none"> For the application in vacuum area Heat-resistant : 120°C 248°F | 1m 3.281ft | UZFR6V |

The vacuum fiber must be used with both the followings.
UZFTJ6 : Outer fibers in the atmosphere (One pair of two fibers a set)
UZFVBR1 : Terminal joints (One pair of two joints a set)

ORDER GUIDE

For special applications use fiber optic cable (reflective type)



| | Shape of sensing probe (mm inch) | Sensing range (*1) (*2) ■ : Red LED type □ : Green LED type | Min. sensing object [at the maximum sensitivity (*3)] ① : Red LED type ② : Green LED type | Features | Fiber optic cable length | Model No. |
|--------------------------|---|--|---|---|--------------------------------|--------------------------------|
| Fixed-focus board | | 4.5 to 12mm .177 to .472inch (Center: 8mm .315inch) | ① $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire | • Sensing performance is not affected by color or surface condition of the object. | Freely cuttable 2m 6.562ft | UZFRL4 |
| | | 3 to 14mm .118 to .551inch (Center: 8mm .315inch) | ② $\phi 0.2\text{mm } \phi .008\text{inch}$ gold wire | • Just 4mm .157inch thick • Glass board is securely detected. | | UZFRL41 |
| | | Center: 2mm .079inch | ② $\phi 0.2\text{mm } \phi .008\text{inch}$ gold wire | • Just 3mm .118inch thick • Wafer is securely detected. | | UZFRL42 |
| High precision (Coaxial) | Lens applicable Coaxial | 50mm 1.969inch 7.5mm .295inch | ① $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire ② $\phi 0.02\text{mm } \phi .001\text{inch}$ stainless steel bar | • A highly precise positioning is possible with coaxial reflective mode. | Freely cuttable 2m 6.562ft | UZFRG4 |
| | Lens applicable Coaxial • Small diameter | 17mm .669inch | ① $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire | • Approx. $\phi 0.3\text{mm } \phi .012\text{inch}$ is achieved by means of combining with ultra-small spot lens UZFXMR3 . | 500mm 19.685inch | UZFREG1 |
| Array | Top sensing | 110mm 4.331inch | ① Vertical $\phi 0.1\text{mm } \phi .004\text{inch}$ copper wire Horizontal $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire | • Arrayed beams meet various sensing demand. | Freely cuttable 2m 6.562ft | UZFRA8 |
| | Side sensing | 17mm .669inch | ② Vertical $\phi 0.06\text{mm } \phi .002\text{inch}$ stainless steel bar Horizontal $\phi 0.01\text{mm } \phi .0004\text{inch}$ copper wire | | | UZFRA8E |
| Elbow | | 85mm 3.346inch 13mm .512inch | ① $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire ② $\phi 0.2\text{mm } \phi .008\text{inch}$ stainless steel bar | • Installation is simple as sensing probe is bent 90 degrees and has 5mm .197inch radius. | Freely cuttable 2m 6.562ft | UZFRR8 |
| Side-view | Small diameter | 25mm .984inch | ① $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire | • Side sensing method saves installation space. | Freely cuttable 2m 6.562ft | UZFRV41 |
| | Coaxial | 45mm 1.772inch 5mm .200inch | ① $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire ② $\phi 0.5\text{mm } \phi .020\text{inch}$ stainless steel bar | | | UZFRV82 |
| Ultra-small diameter | | 2mm .079inch | ① $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire | • Suitable for sensing in the intricate apparatus | 500mm 19.685inch | UZFRE11 |
| | Coaxial | 17mm .669inch | ① $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire | • A highly precise positioning is possible with coaxial reflective type. | 1m 3.281ft | UZFRE21 |
| Narrow-view | Coaxial | 15mm .591inch | ① $\phi 0.01\text{mm } \phi .0004\text{inch}$ gold wire | • The spread of beam is one-sixth of a conventional model. It is effective for the detection in the narrow space. | 1m 3.281ft | UZFRK22 |
| Liquid level detection | | — | ③ (Liquid) | • Reduces malfunction due to liquid drop at the tip. | Freely cuttable 2m 6.562ft | UZFRM8Y |
| | Mountable on pipe | Applicable pipe diameter: $\phi 6$ to $\phi 26\text{mm}$ $\phi .236$ to $\phi 1.024\text{inch}$ Pipe made of PFA (fluorine resin) or material having equivalent transparency, | ③ (Liquid) | • Liquid drop on top never affects the sensing securely. | Freely cuttable 5m 16.404ft | UZFRM4 UZFRM9 |








(*1): The sensing range is specified with using white non-glossy paper (**UZFR8B**: 200×200mm 7.874×7.874inch, **UZFRL42** and **UZFRV41**: 50×50mm 1.969×1.969inch, **UZFRK22**: 10×10mm .394×.394inch, **UZFRL41**: glass sheet 25×25×1.3mm .984×.984×t.051inch, Others: 100×100mm 3.937×3.937inch)
 (*2): The free-cut fibers may reduce the sensing ranges 20% lower than the above specified according to how they are cut off.

(*3): The minimum sensing object is obtainable with the maximum sensitivity, but at the ideal sensing distance within the rated sensing range.

(*4): Fiber cutter **UZFXCT1** is not supplied as accessory along with Standard (Economy) fibers. Please procure it separately.

ORDER GUIDE

Amplifiers

| Type | | Appearance | | Model No. | Emitting element | Output | |
|-----------------|----------------|---|---|---|---|---|---|
| | |  | Display | | | | |
| Digital setting | Red LED type | |  |  | UZF411 | Red LED | NPN open-collector transistor (Output 1, Output2) |
| | |  | | UZF4115 | PNP open-collector transistor (Output 1, Output2) | | |
| Auto-setting | Red LED type |  | | UZF421 | Red LED | NPN open-collector transistor (Sensing output, self-diagnosis output) | |
| | |  | | UZF4215 | | PNP open-collector transistor (Sensing output, self-diagnosis output) | |
| | Green LED type | | | UZF422 | Green LED | NPN open-collector transistor (Sensing output, self-diagnosis output) | |
| Manual setting | Red LED type |  | | | UZF431 | Red LED | NPN open-collector transistor (Sensing output, self-diagnosis output) |
| | | | | UZF4315 | PNP open-collector transistor (Sensing output, self-diagnosis output) | | |
| | Green LED type | | | | UZF432 | Green LED | NPN open-collector transistor (Sensing output, self-diagnosis output) |

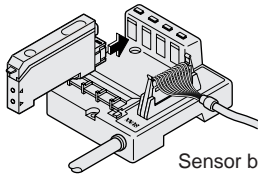
Plug-in connector type

Plug-in connector type is available. (Standard: cable type)

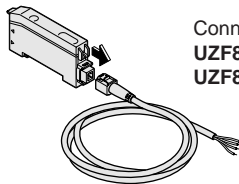
To order the plug-in connector type, add suffix 'A' at the end of the model No.

Example: Plug-in connector type of **UZF4215** is '**UZF4215A**'.

Usable with the sensor block for simple wiring **UZZ70** or **UZZ72**, or with connector attached cable **UZF851** or **UZF852**.



Sensor block for simple wiring **UZZ70/UZZ72**

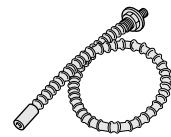


Connector attached cable
UZF851 (2m 6.562ft. long)
UZF852 (5m 16.404ft. long)

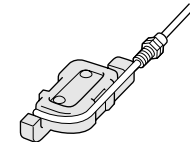
OPTION

| Component | Model No. | Description | | |
|--|-----------------------------|--|--|--|
| Protective tube for Thru-beam fiber optic cable | UZF831 (0.5m 1.64ft) | For M4 thread | UZFTB8 UZFTP8 UZFTF8 UZFTH8 UZFTF89 UZFTF84 | |
| | UZF832 (1m 3.28ft) | | For M3 thread | UZFTT8 UZFTP4 UZFTF4 UZFRT4 UZFTF49 UZFRP4 UZFTF44 |
| | UZF833 (1.5m 4.92ft) | | | For M6 thread |
| | UZF834 (0.5m 1.64ft) | For M4 thread | | |
| | UZF835 (1m 3.28ft) | | For M4 thread | UZFRF8 UZFRF4 UZFRF49 UZFRF44 |
| | UZF836 (1.5m 4.92ft) | | | |
| Protective tube for Reflective fiber optic cable | UZF841 (0.5m 1.64ft) | For M6 thread | UZFR8B UZFRP8 UZFRF8 UZFRH8 UZFRF89 UZFRF84 | |
| | UZF842 (1m 3.28ft) | | For M4 thread | UZFRF8 UZFRF4 UZFRF49 UZFRF44 |
| | UZF843 (1.5m 4.92ft) | For M4 thread | | UZFRF8 UZFRF4 UZFRF49 UZFRF44 |
| | UZF844 (0.5m 1.64ft) | | | |
| | UZF845 (1m 3.28ft) | | | |
| UZF846 (1.5m 4.92ft) | | | | |
| Fiber bender | UZFXB1 | Sleeve head can be bent easily with adequate bending radius. (*1) | | |
| Fiber cutter | UZFXCT1 | The straight portion of the free-cut type fiber and the flexible coiled fiber can be freely cut. | | |

Protective tube



Fiber bender

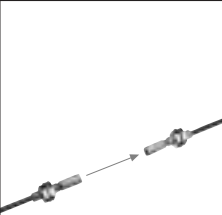
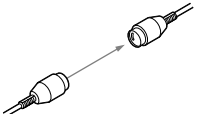



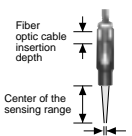
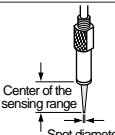
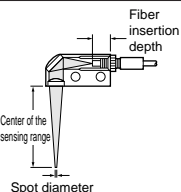


Fiber cutter



Note: Do not bend the sleeve part of any side-view fiber, ultra-small diameter probe fiber, narrow beam fiber, or narrow-view fiber.

OPTION

| Component | Model No. | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|-----------------------------|----------------|--|--|---|--|--|--|-----------------------|--|--|--------------------|---------------|---------------|-------------------|--------------------|---------------|--------------------|---------------|---------------|--------------------|-------------------|------------|---------------|--------------|------------|
| For Thru-beam fiber optic cable | Long sensing range lens | UZFXLE1 | <p>Sensing range extended more than 5 times.</p> <p>Ambient temperature : - 60 to + 350°C - 76 to + 662°F</p>  | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <p>Sensing range (mm inch) [when mounting two pieces of lens]</p> <table border="1"> <thead> <tr> <th>Fiber optic cable \ Combined amplifier</th> <th>Red LED type</th> <th>Green LED type</th> </tr> </thead> <tbody> <tr> <td>UZFTB8</td> <td>3,000 118.11</td> <td>650 25.591</td> </tr> <tr> <td>UZFTF8</td> <td>3,500 137.795 (*1)</td> <td>600 23.622</td> </tr> <tr> <td>UZFTT8</td> <td>3,500 137.795 (*1)</td> <td>600 23.622</td> </tr> <tr> <td>UZFTC4</td> <td>800 31.496</td> <td>220 8.661</td> </tr> <tr> <td>UZFTP8</td> <td>3,500 137.795 (*1)</td> <td>500 19.685</td> </tr> <tr> <td>UZFTH7</td> <td>2,800 110.236</td> <td>300 11.811</td> </tr> <tr> <td>UZFTH6</td> <td>1,600 62.992 (*1)</td> <td>300 11.811</td> </tr> <tr> <td>UZFTR8</td> <td>2,400 94.488</td> <td>400 15.748</td> </tr> </tbody> </table> | Fiber optic cable \ Combined amplifier | Red LED type | Green LED type | UZFTB8 | 3,000 118.11 | 650 25.591 | UZFTF8 | 3,500 137.795 (*1) | 600 23.622 | UZFTT8 | 3,500 137.795 (*1) | 600 23.622 | UZFTC4 | 800 31.496 | 220 8.661 | UZFTP8 | 3,500 137.795 (*1) | 500 19.685 | UZFTH7 | 2,800 110.236 | 300 11.811 | UZFTH6 | 1,600 62.992 (*1) | 300 11.811 | UZFTR8 | 2,400 94.488 | 400 15.748 |
| | Fiber optic cable \ Combined amplifier | Red LED type | Green LED type | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | UZFTB8 | 3,000 118.11 | 650 25.591 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| UZFTC4 | 800 31.496 | 220 8.661 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| UZFTH7 | 2,800 110.236 | 300 11.811 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFTH6 | 1,600 62.992 (*1) | 300 11.811 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFTR8 | 2,400 94.488 | 400 15.748 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ultra-long sensing range lens | UZFXLE2 | <p>Sensing range strikingly increased with the large diameter lens.</p> <p>Ambient temperature : - 60 to + 350°C - 76 to + 662°F</p>  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Fiber optic cable \ Combined amplifier | Red LED type | Green LED type | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFTB8 | 3,500 137.795 (*1) | 3,500 137.795 (*1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| UZFTP8 | 3,500 137.795 (*1) | 3,000 118.11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFTH7 | 3,500 137.795 (*1) | 2,700 106.299 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFTH6 | 1,600 62.992 (*1) | 1,600 62.992 (*1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFTH8 | 3,500 137.795 (*1) | 2,400 94.488 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFTR8 | 3,500 137.795 (*1) | 2,400 94.488 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Side view lens | UZFXSV1 | <p>Beam axis is bent 90 degrees.</p> <p>Ambient temperature : - 60 to + 300°C - 76 to + 572°F</p>  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <p>Sensing range (mm inch) [when mounting two pieces of lens]</p> <table border="1"> <thead> <tr> <th>Fiber optic cable \ Combined amplifier</th> <th>Red LED type</th> <th>Green LED type</th> </tr> </thead> <tbody> <tr> <td>UZFTB8</td> <td>650 25.591</td> <td>120 4.724</td> </tr> <tr> <td>UZFTF8</td> <td>600 23.622</td> <td>100 3.937</td> </tr> <tr> <td>UZFTT8</td> <td>600 23.622</td> <td>100 3.937</td> </tr> <tr> <td>UZFTC4</td> <td>180 7.087</td> <td>20 .787</td> </tr> <tr> <td>UZFTP8</td> <td>600 23.622</td> <td>100 3.937</td> </tr> <tr> <td>UZFTH7</td> <td>450 17.717</td> <td>75 2.953</td> </tr> <tr> <td>UZFTH6</td> <td>280 11.024</td> <td>75 2.953</td> </tr> </tbody> </table> | Fiber optic cable \ Combined amplifier | Red LED type | Green LED type | UZFTB8 | 650 25.591 | 120 4.724 | UZFTF8 | 600 23.622 | 100 3.937 | UZFTT8 | 600 23.622 | 100 3.937 | UZFTC4 | 180 7.087 | 20 .787 | UZFTP8 | 600 23.622 | 100 3.937 | UZFTH7 | 450 17.717 | 75 2.953 | UZFTH6 | 280 11.024 | 75 2.953 | | | | |
| Fiber optic cable \ Combined amplifier | Red LED type | Green LED type | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFTB8 | 650 25.591 | 120 4.724 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFTF8 | 600 23.622 | 100 3.937 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFTT8 | 600 23.622 | 100 3.937 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFTC4 | 180 7.087 | 20 .787 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFTP8 | 600 23.622 | 100 3.937 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFTH7 | 450 17.717 | 75 2.953 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFTH6 | 280 11.024 | 75 2.953 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Long sensing range lens for vacuum-resistant fiber optic cable | UZFVLE1 | <p>Sensing range extended more than 5 times</p> <p>Ambient temperature : - 40 to + 120°C - 40 to + 248°F</p>  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <p>Sensing range (mm inch) [when mounting two pieces of lens]</p> <table border="1"> <thead> <tr> <th>Fiber optic cable \ Combined amplifier</th> <th>Red LED type</th> <th>Green LED type</th> </tr> </thead> <tbody> <tr> <td>UZFT6V</td> <td>2,700 106.299</td> <td>—</td> </tr> <tr> <td>UZFT60V</td> <td>1,400 55.118</td> <td>—</td> </tr> </tbody> </table> | Fiber optic cable \ Combined amplifier | Red LED type | Green LED type | UZFT6V | 2,700 106.299 | — | UZFT60V | 1,400 55.118 | — | | | | | | | | | | | | | | | | | | | |
| Fiber optic cable \ Combined amplifier | Red LED type | Green LED type | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFT6V | 2,700 106.299 | — | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFT60V | 1,400 55.118 | — | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| For Reflective fiber optic cable | Pinpoint spot lens | UZFXMR1 | <p>Pinpoint spot of $\phi 0.5\text{mm } \phi.020\text{inch}$, detects fine small object or small mark.</p> <ul style="list-style-type: none"> • Combined amplifiers : Red LED type • Applicable fiber : UZFRG4 • Center of the sensing range : $6 \pm 1\text{mm } .236 \pm .039\text{inch}$ • Ambient temperature : - 40 to + 70°C - 40 to + 158°F  | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Zoom lens | UZFXMR2 | <p>Spot optic cable diameter is adjustable from $\phi 0.7$ to $2\text{mm } \phi.028$ to $.079\text{inch}$ changing fiber optic cable insertion depth.</p> <ul style="list-style-type: none"> • Combined amplifiers : Red LED type • Applicable fiber : UZFRG4 • Ambient temperature : - 40 to + 70°C - 40 to + 158°F  <table border="1"> <thead> <tr> <th>Fiber optic cable insertion depth</th> <th>Center of the sensing range</th> <th>Spot diameter</th> </tr> </thead> <tbody> <tr> <td>7mm .276inch</td> <td>Approx.18.5mm .728inch</td> <td>$\phi 0.75\text{mm } \phi.030\text{inch}$</td> </tr> <tr> <td>12mm .472inch</td> <td>Approx.27mm 1.063inch</td> <td>$\phi 1.2\text{mm } \phi.047\text{inch}$</td> </tr> <tr> <td>14mm .551inch</td> <td>Approx.43mm 1.693inch</td> <td>$\phi 2.0\text{mm } \phi.079\text{inch}$</td> </tr> </tbody> </table> | Fiber optic cable insertion depth | Center of the sensing range | Spot diameter | 7mm .276inch | Approx.18.5mm .728inch | $\phi 0.75\text{mm } \phi.030\text{inch}$ | 12mm .472inch | Approx.27mm 1.063inch | $\phi 1.2\text{mm } \phi.047\text{inch}$ | 14mm .551inch | Approx.43mm 1.693inch | $\phi 2.0\text{mm } \phi.079\text{inch}$ | | | | | | | | | | | | | | | |
| | Fiber optic cable insertion depth | Center of the sensing range | Spot diameter | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 7mm .276inch | Approx.18.5mm .728inch | $\phi 0.75\text{mm } \phi.030\text{inch}$ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12mm .472inch | Approx.27mm 1.063inch | $\phi 1.2\text{mm } \phi.047\text{inch}$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14mm .551inch | Approx.43mm 1.693inch | $\phi 2.0\text{mm } \phi.079\text{inch}$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ultra-small pinpoint lens | UZFXMR3 | <p>The smallest spot diameter in the industry : $\phi 0.3\text{mm } \phi.012\text{inch}$</p> <ul style="list-style-type: none"> • Combined amplifiers : Red LED type • Applicable fiber : UZFRG4 • Ambient temperature : - 40 to + 70°C - 40 to + 158°F  <table border="1"> <thead> <tr> <th>Fiber optic cable model No.</th> <th>Center of the sensing range</th> <th>Spot diameter</th> </tr> </thead> <tbody> <tr> <td>UZFREG1</td> <td>$7.5 \pm 0.5\text{mm } .295 \pm .020\text{inch}$</td> <td>Approx. $\phi 0.3\text{mm } \phi.012\text{inch}$</td> </tr> <tr> <td>UZFRG4</td> <td>$7.5 \pm 0.5\text{mm } .295 \pm .020\text{inch}$</td> <td>Approx. $\phi 0.5\text{mm } \phi.020\text{inch}$</td> </tr> </tbody> </table> | Fiber optic cable model No. | Center of the sensing range | Spot diameter | UZFREG1 | $7.5 \pm 0.5\text{mm } .295 \pm .020\text{inch}$ | Approx. $\phi 0.3\text{mm } \phi.012\text{inch}$ | UZFRG4 | $7.5 \pm 0.5\text{mm } .295 \pm .020\text{inch}$ | Approx. $\phi 0.5\text{mm } \phi.020\text{inch}$ | | | | | | | | | | | | | | | | | | | |
| Fiber optic cable model No. | Center of the sensing range | Spot diameter | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFREG1 | $7.5 \pm 0.5\text{mm } .295 \pm .020\text{inch}$ | Approx. $\phi 0.3\text{mm } \phi.012\text{inch}$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UZFRG4 | $7.5 \pm 0.5\text{mm } .295 \pm .020\text{inch}$ | Approx. $\phi 0.5\text{mm } \phi.020\text{inch}$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Zoom lens (side-view type) | UZFXMR5 | <p>UZFXMR2 is modified to side-view type to facilitate mounting in the limited space.</p> <ul style="list-style-type: none"> • Combined amplifiers : Red LED type • Applicable fiber : UZFRG4 • Ambient temperature : - 40 to + 70°C - 40 to + 158°F  <table border="1"> <thead> <tr> <th>Fiber optic cable insertion depth</th> <th>Center of the sensing range</th> <th>Spot diameter</th> </tr> </thead> <tbody> <tr> <td>8mm .315inch</td> <td>Approx.13mm .512inch</td> <td>$\phi 0.5\text{mm } \phi.020\text{inch}$</td> </tr> <tr> <td>10mm .394inch</td> <td>Approx.15mm .591inch</td> <td>$\phi 0.8\text{mm } \phi.031\text{inch}$</td> </tr> <tr> <td>14mm .551inch</td> <td>Approx.30mm 1.181inch</td> <td>$\phi 3.0\text{mm } \phi.118\text{inch}$</td> </tr> </tbody> </table> | Fiber optic cable insertion depth | Center of the sensing range | Spot diameter | 8mm .315inch | Approx.13mm .512inch | $\phi 0.5\text{mm } \phi.020\text{inch}$ | 10mm .394inch | Approx.15mm .591inch | $\phi 0.8\text{mm } \phi.031\text{inch}$ | 14mm .551inch | Approx.30mm 1.181inch | $\phi 3.0\text{mm } \phi.118\text{inch}$ | | | | | | | | | | | | | | | | |
| Fiber optic cable insertion depth | Center of the sensing range | Spot diameter | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8mm .315inch | Approx.13mm .512inch | $\phi 0.5\text{mm } \phi.020\text{inch}$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10mm .394inch | Approx.15mm .591inch | $\phi 0.8\text{mm } \phi.031\text{inch}$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14mm .551inch | Approx.30mm 1.181inch | $\phi 3.0\text{mm } \phi.118\text{inch}$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

(*1) : Actual sensing range is set at 3,500mm 137.795inch (1,600mm 62.992inch for **UZFTH6**) depending on fiber optic cable length.

SPECIFICATIONS

Fiber optic cable

| Item | Type | Temperature-resistant | | | Chemical-resistant | |
|--------------------------|---|---|-------------------------------------|--------------------------------------|--------------------------------|--|
| | | 350°C 662°F type | 200°C 392°F type | 130°C 266°F type | | |
| Allowable bending radius | R25mm .984inch or more (Flexible: R4mm .157inch or more, Thru-beam type of ultra-small diameter: R5mm .984inch or more) | | | | R30mm 1.181inch or more | |
| Ambient temperature | -40 to +70°C -40 to +158°F (UZFREG1 : -20 to +60°C -4 to +140°F) | | -60 to +350°C -76 to +662°F (*1) | -60 to +200°C -76 to +392°F | -60 to +130°C -76 to +266°F | -40 to +115°C -76 to +239°F |
| Ambient humidity | 35 to 85%RH (No dew condensation or icing allowed) | | | | | |
| Material | Fiber core | Acrylic | | Multi-component glass (*2) | Acrylic | |
| | Sheath | Polyethylene (Thru-beam type of ultra-small diameter and flexible, except for UZFTC4 and UZFRP2 : Vinyl chloride) | | Silicone (Inside SUS spiral tube) | Fluorine resin | Protective tube: Fluorine resin Fiber sheath: Polypropylene |
| | Sensing probe | Brass (Nickel plated): Threaded part of standard, threaded part of small diameter, high precision, UZFTC4 , threaded part of thru-beam type ultra-small diameter, UZFTP8 , UZFRP8 , array, threaded part of UZFTR8 SUS (Stainless steel) : UZFTS8 , small sensing probe, UZFTS4 , UZFRS4 , UZFTL8 , UZFTP4 , UZFTP2 , UZFRP4 , UZFRP2 ABS : UZFTL9 (Lens: Acrylic) Zinc alloy die-cast : Threaded part of UZFRR8 | | SUS (Stainless steel) | Brass (Nickel plated) | |
| Accessories | Threaded head fiber: 2 pcs. of nuts (thru-beam type: 4 pcs.) and 1 No. of toothed lock washer (thru-beam type: 2 pcs.) Free-cut fiber (except economy type), flexible coiled fiber, chemical-resistant fiber: 1 No. of UZFXCT1 (Fiber cutter) Small diameter free-cut fiber, high precision free-cut fiber: 2 sets of plug attachments | | | | | |

(*1) If the fiber is used under -30°C -22°F, its resistable maximum temperature drops to +200°C +392°F. If the side-view lens **UZFXSV1** is put on the fiber head, the allowable maximum temperature comes down to +300°C +572°F. (The ambient temperature range of the **UZFXSV1** is from -60 to +300°C -76 to +572°F.)

(*2) If the fiber material is multi-component glass, keep it away from vibration or impact.

Fiber optic cable

| Item | Type | Vacuum-resistant | Fixed-focus reflective | Side-view, narrow-view, reflective type of ultra-small diameter | Liquid level detection | |
|--------------------------|---|--|---|--|---|--|
| | | | | | | Mountable on pipe |
| Allowable bending radius | R200mm 7.874inch or more (UZFT60V : R30mm 1.181inch or more) | R10mm .394inch or more | | R25mm .984inch or more | Protective tube: R40mm 1.575inch or more Fiber cable: R15mm .591inch or more | R10mm .394inch or more |
| Ambient temperature | -40 to +120°C -40 to +248°F | -40 to +70°C -40 to +158°F (UZFRL42 : -40 to +60°C -40 to +140°C) | -20 to +60°C -4 to +140°C (UZFTV41 and UZFRV41 : -40 ~ +60°C -40 ~ +60°C) | -40 to +125°C -40 to +257°F (*1) | -40 to +100°C -40 to +212°F (*1) | |
| Ambient humidity | 35 to 85%RH (No dew condensation or icing allowed) | | | | | |
| Material | Fiber core | Quartz glass (*2) | Acrylic | | | |
| | Sheath | Fluorine resin | Polyethylene (Reflective type of narrow-view: Polyurethane) | | | Polypropylene |
| | Sensing probe | Aluminium | ABS: UZFRL41 , UZFRL41 (Lens: Acrylic) Aluminium: UZFRL42 (Lens: Acrylic) | SUS (Stainless steel) Threaded part of UZFRE11 , UZFRE21 , UZFRK22 and UZFRK22 : Brass | | Protective tube: Fluorine resin Sheath: Polypropylene |
| Accessories | Threaded head fiber: 2 pcs. of nuts (thru-beam type: 4 pcs.) and 1 No. of toothed lock washer (thru-beam type: 2 pcs.) Free-cut type fiber: 1 No. of UZFXCT1 (Fiber cutter) Convergent reflective fiber, UZFRM4 and UZFRM9 : 1 set of attachments (UZFRL4 : 2 sets) UZFRM4 and UZFRM9 : 4 pcs. of tying bands and 2 pcs. of anti-slip tubes UZFRL4 : 2 pcs. of M2.6 × 12mm screws with washers and 2 pcs. of nuts | | | | | |

(*1) With the liquid level detection fiber, make sure that the temperature of the liquid is also within the ambient temperature range.

(*2) If the fiber material is quartz glass, keep it away from vibration or impact.

SPECIFICATIONS

Amplifiers

| Item | Model No. | Type | NPN output | | | | PNP output | | | | |
|----------------------------------|--|--|---|---------------|---|--|---|---|---|----------------|--|
| | | | Digital setting | Auto-setting | | Manual setting | | Digital setting | Auto-setting | Manual setting | |
| | | | Red LED type | Red LED type | Green LED type | Red LED type | Green LED type | Red LED type | | | |
| | | | UZF411 | UZF421 | UZF422 | UZF431 | UZF432 | UZF4115 | UZF4215 | UZF4315 | |
| Supply voltage | 12 to 24V DC \pm 10% Ripple P-P 10% or less | | | | | | | | | | |
| Current consumption | 45mA or less | 50mA or less | | 45mA or less | | 45mA or less | 50mA or less | 45mA or less | | | |
| Sensing output (Note 1) | NPN open-collector transistor | | | | | PNP open-collector transistor | | | | | |
| | <ul style="list-style-type: none"> • Maximum sink current: 100mA • Applied voltage: 30V DC or less • Residual voltage: 1V or less (at 100mA sink current) 0.4V or less (at 16mA sink current) | | | | | <ul style="list-style-type: none"> • Maximum source current: 100mA • Applied voltage: 30V DC or less • Residual voltage: 1V or less (at 100mA source current) 0.4V or less (at 16mA source current) | | | | | |
| | Output operation | Switchable, either Light-ON or Dark-ON, with jog switch | | | Switchable, either Light-ON or Dark-ON, with selection switch | | Switchable, either Light-ON or Dark-ON, with jog switch | | Switchable, either Light-ON or Dark-ON, with selection switch | | |
| Short-circuit protection | Incorporated | | | | | | | | | | |
| Self-diagnosis output | NPN open-collector transistor | | | | | PNP open-collector transistor | | | | | |
| | <ul style="list-style-type: none"> • Maximum sink current: 50mA • Applied voltage: 30V DC or less • Residual voltage: 1V or less (at 50mA sink current) 0.4V or less (at 16mA sink current) | | | | | <ul style="list-style-type: none"> • Maximum source current: 50mA • Applied voltage: 30V DC or less • Residual voltage: 1V or less (at 50mA source current) 0.4V or less (at 16mA source current) | | | | | |
| | Output operation | ON in unstable sensing condition | | | | | ON in unstable sensing condition | | | | |
| Short-circuit protection | Incorporated | | | | | | | | | | |
| Response time | Emission Frequency 1 | 0.5ms or less | | | | | | | | | |
| | Emission Frequency 2 | 0.65ms or less | | | | | | | | | |
| | Emission Frequency 3 | 0.75ms or less | | | | | | | | | |
| Sensitivity setting | 2-level teaching/Limit teaching/ Full auto-teaching | | | | Potentiometer setting | | 2-level teaching/Limit teaching/ Full auto-teaching | | Potentiometer setting | | |
| Sensitivity adjuster | _____ | | | | 12-turn potentiometer with indicator | | _____ | | 12-turn potentiometer with indicator | | |
| Timer function | Incorporated with ON-delay timer/OFF-delay timer, switchable, either effective or ineffective (Note 2) | Approx. 40ms fixed OFF-delay timer, switchable, either effective or ineffective | | | | Incorporated with ON-delay timer/OFF-delay timer, switchable, either effective or ineffective (Note 2) | Approx. 40ms fixed OFF-delay timer, switchable, either effective or ineffective | | | | |
| Interference prevention function | Incorporated (Three units of sensors can be mounted closely.) | | | | | | | | | | |
| Environmental resistance | Ambient temperature | 0 to +50°C +32 to +122°F Storage: -20 to +70°C -4 to +158°F | -10 to +50°C +14 to +122°F (No dew condensation or icing allowed), Storage: -20 to +70°C -4 to +158°F | | | | 0 to +50°C +32 to +122°F Storage: -20 to +70°C -4 to +158°F | -10 to +50°C +14 to +122°F (No dew condensation or icing allowed), Storage: -20 to +70°C -4 to +158°F | | | |
| | Ambient humidity | 35 to 85%RH, Storage: 35 to 85%RH | | | | | | | | | |
| | Ambient illuminance (Extraneous light immunity) | Sunlight: 10,000 lx at the light-receiving face, Incandescent light: 3,000 lx at the light-receiving face | | | | | | | | | |
| | EMC | Emission: EN50081-2, Immunity: EN50082-2 | | | | | | | | | |
| | Voltage withstandability | 1,000V AC for one min. between all live terminals connected together and enclosure (Note 3) | | | | | | | | | |
| | Insulation resistance | 20M Ω , or more, with 250V DC megger between all live terminals connected together and enclosure (Note 3) | | | | | | | | | |
| | Vibration withstandability | 10 to 150Hz frequency, 0.75mm amplitude in X, Y, and Z directions for two hours each (unenergized) | | | | | | | | | |
| | Shock withstandability | 98m/s ² acceleration (10G approx.) in X, Y, and Z directions for five times each (unenergized) | | | | | | | | | |
| Emitting element | Red LED (modulated) | | Green LED (modulated) | | Red LED (modulated) | | Green LED (modulated) | | Red LED (modulated) | | |
| Material | Enclosure: Heat-resistant ABS, Case cover: Polycarbonate | | | | | | | | | | |
| Cable | 0.2mm ² 4 core cabtyre cable 2m 6.652ft. long | | | | | | | | | | |
| Cable extension | Extension up to total 100m possible with 0.3mm ² (or above) cable | | | | | | | | | | |
| Weight | 70g 2.47oz approx. | | | | | | | | | | |
| Accessories | UZF811 (Amplifier mounting bracket): 1 No. Adjusting screw-driver (Manual setting type only): 1 No. | | | | | | | | | | |

(*1) The digital setting fiber sensor **UZF41** series is equipped with two independent outputs (Output 1, Output 2).

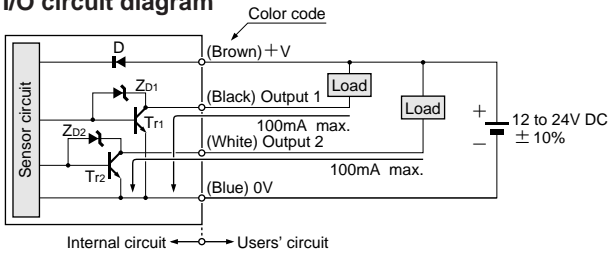
(*2) The timer period of ON-delay timer and OFF-delay timer can be selected from 40ms, 100ms, 200ms and 500ms. Also, independent settings can be made for Output 1 and Output 2.

(*3) The voltage withstandability and the insulation resistance values given in the above table are for the amplifier only.

I/O CIRCUIT AND WIRING DIAGRAM

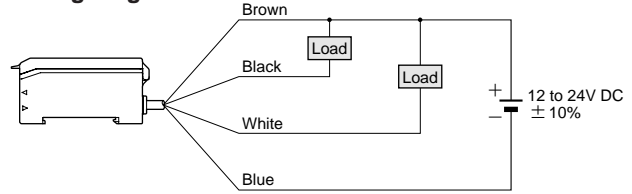
UZF411 □ NPN output

I/O circuit diagram

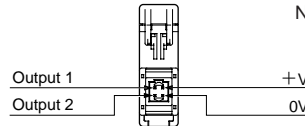


Symbol ... D: Reverse polarity protection diode
 Z_{D1}, Z_{D2}: Surge absorption zener diode
 Tr₁, Tr₂: NPN output transistor

Wiring diagram



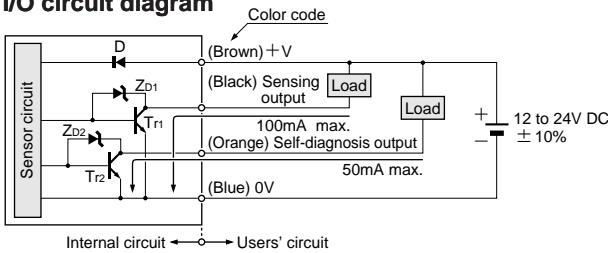
Pin position for connector type (Note)



Note: In case the optional connector attached cable **UZF85** □ is connected to the connector type sensor, the color of Output 2 wire is orange.

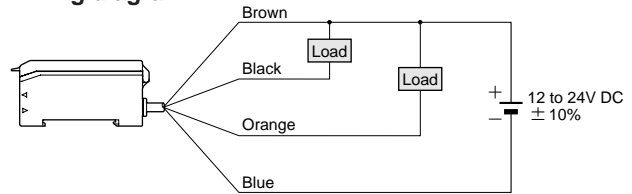
UZF421 □ UZF431 □ NPN output

I/O circuit diagram

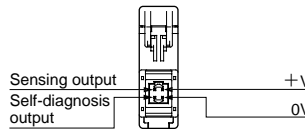


Symbol ... D: Reverse polarity protection diode
 Z_{D1}, Z_{D2}: Surge absorption zener diode
 Tr₁, Tr₂: NPN output transistor

Wiring diagram

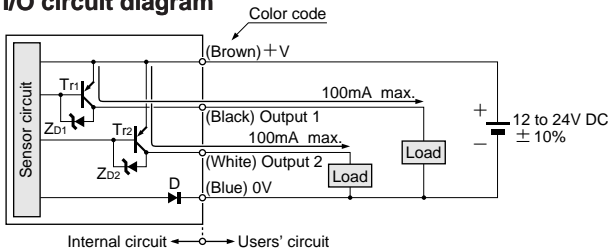


Pin position for connector type



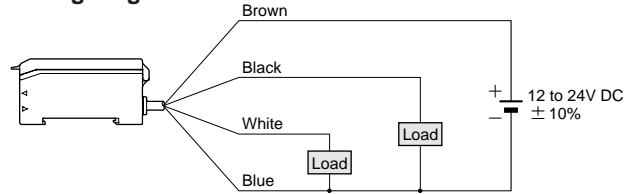
UZF415 □ PNP output

I/O circuit diagram

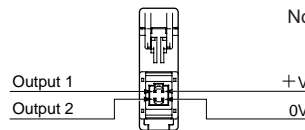


Symbol ... D: Reverse polarity protection diode
 Z_{D1}, Z_{D2}: Surge absorption zener diode
 Tr₁, Tr₂: PNP output transistor

Wiring diagram



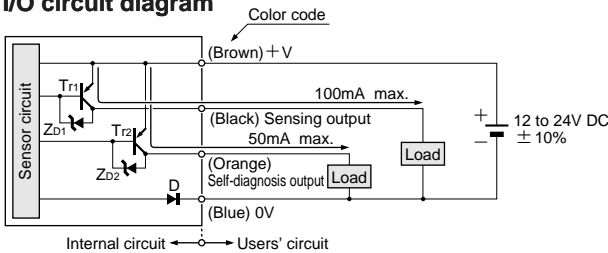
Pin position for connector type (Note)



Note: In case the optional connector attached cable **UZF85** □ is connected to the connector type sensor, the color of Output 2 wire is orange.

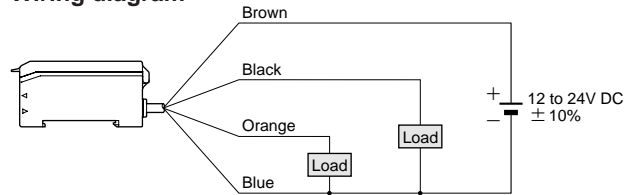
UZF4215 □ UZF4315 □ PNP output

I/O circuit diagram

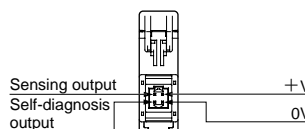


Symbol ... D: Reverse polarity protection diode
 Z_{D1}, Z_{D2}: Surge absorption zener diode
 Tr₁, Tr₂: PNP output transistor

Wiring diagram



Pin position for connector type

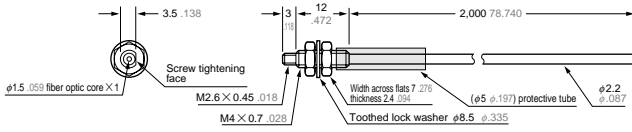


DIMENSIONS (Unit : mm inch)

Thru-beam fiber optic cable

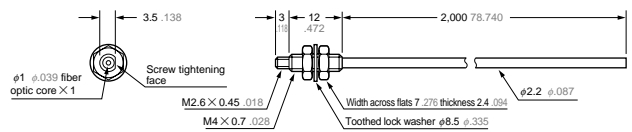
UZFTB8

Freely cuttable



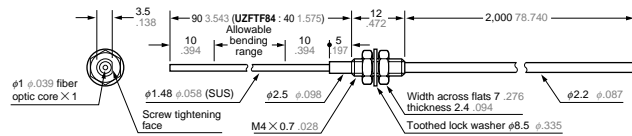
UZFTF8

Freely cuttable



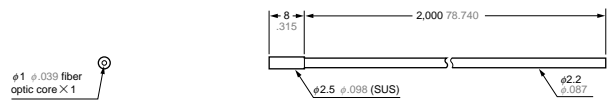
UZFTF89
UZFTF84

Freely cuttable



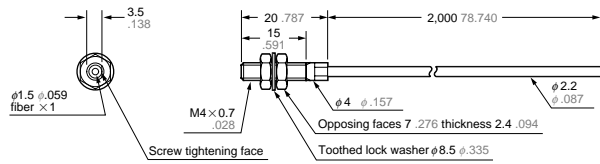
UZFTS8

Freely cuttable



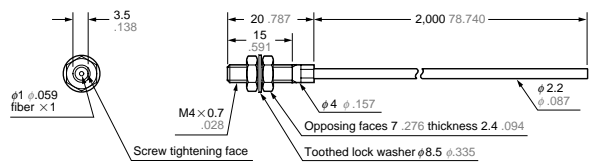
UZFTNB8

Freely cuttable



UZFTN8

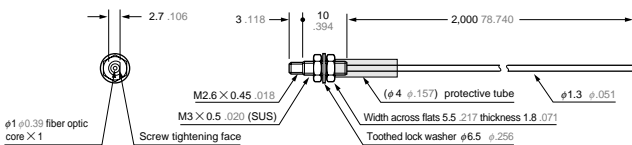
Freely cuttable



UZFTT8

Freely cuttable

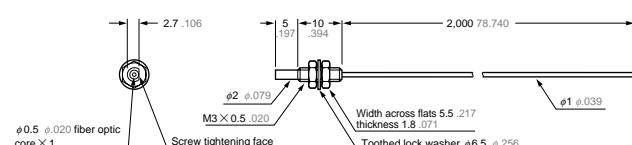
With attachment



UZFTF4

Freely cuttable

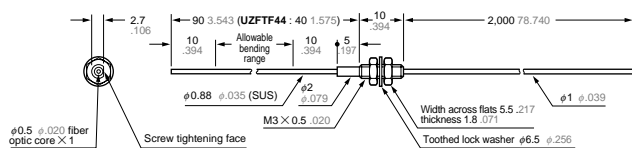
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UZFTF49
UZFTF44

Freely cuttable

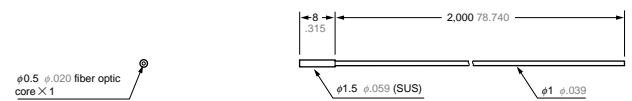
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UZFTS4

Freely cuttable

With attachment

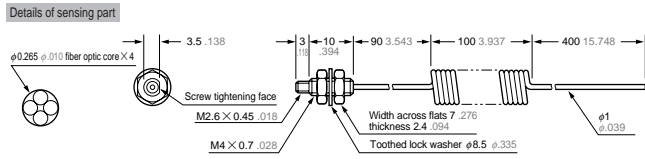


(SUS) : Stainless Steel

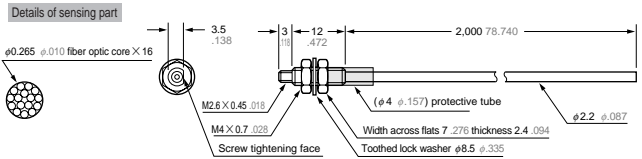
DIMENSIONS (Unit : mm inch)

Thru-beam fiber optic cable

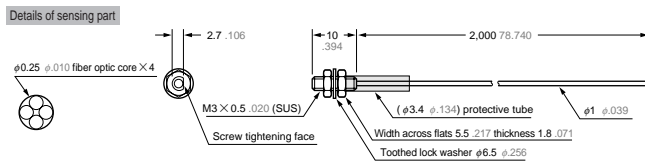
UZFTC4 With attachment



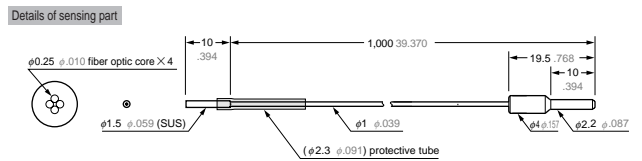
UZFTP8 Freely cuttable



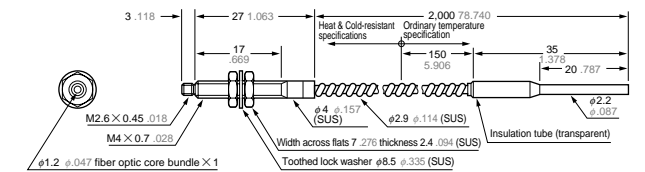
UZFTP4 Freely cuttable With attachment



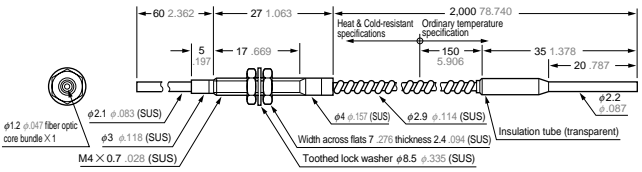
UZFTP2



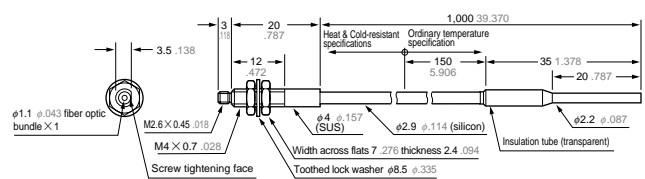
UZFTH7



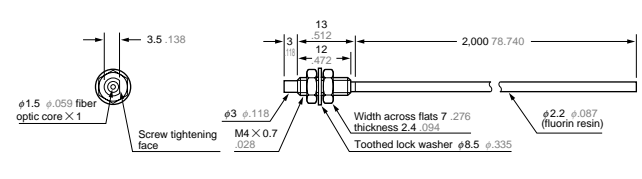
UZFTH76



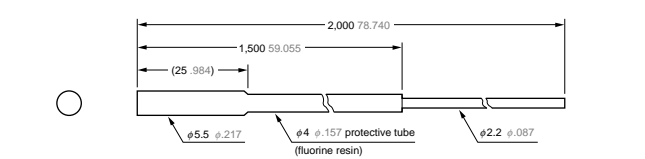
UZFTH6



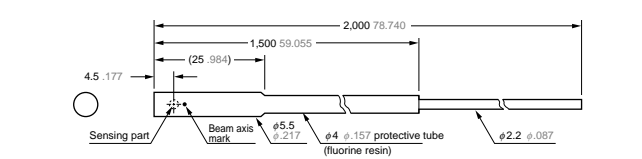
UZFTH8 Freely cuttable



UZFTL8Y



UZFTV8Y

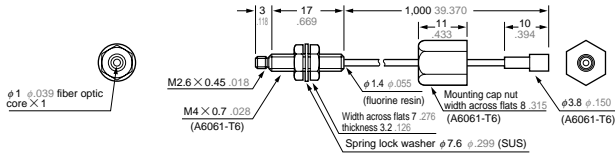


(SUS) : Stainless Steel

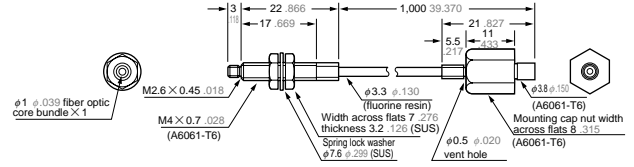
DIMENSIONS (Unit : mm inch)

Thru-beam fiber optic cable

UZFT6V

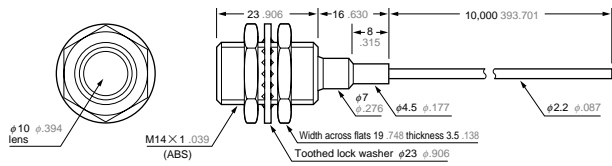


UZFT60V



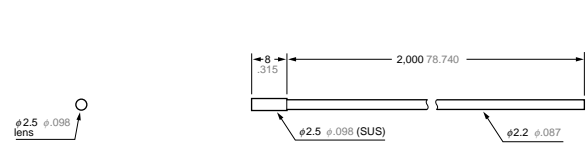
UZFTL9

Freely cuttable



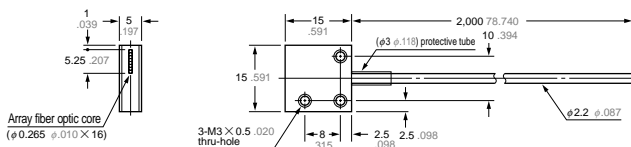
UZFTL8

Freely cuttable



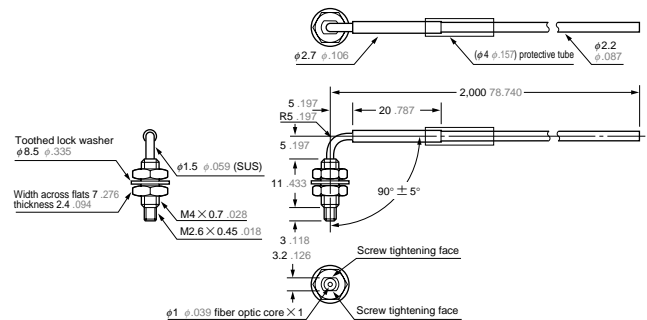
UZFTA8

Freely cuttable



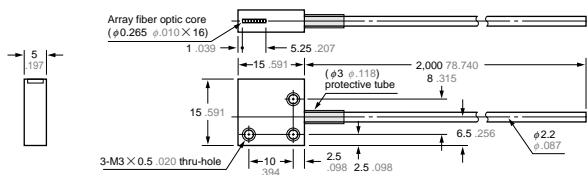
UZFTR8

Freely cuttable

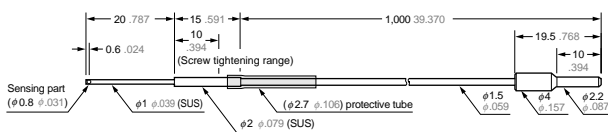


UZFTA8E

Freely cuttable

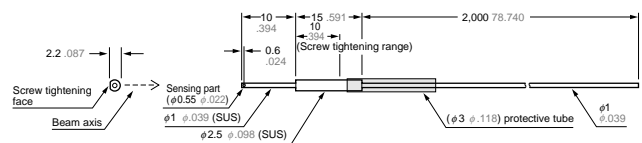


UZFTV22



UZFTV41

Freely cuttable With attachment



(SUS) : Stainless Steel

DIMENSIONS (Unit : mm inch)

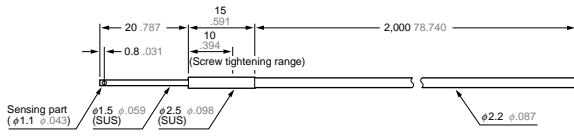
Thru-beam fiber optic cable



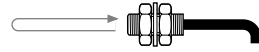
UZFTV82



Freely cuttable



Reflective fiber optic cable

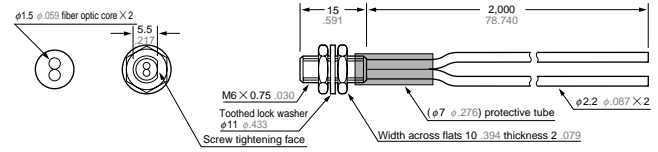


UZFR8B

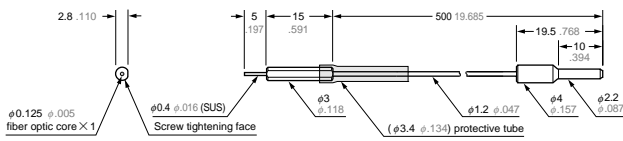


Freely cuttable

Details of sensing part

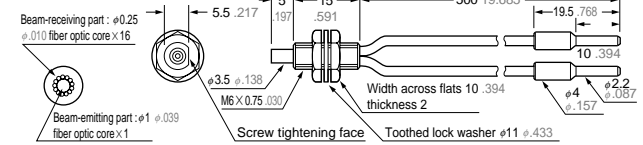


UZFTE1



UZFRF5

Details of sensing part

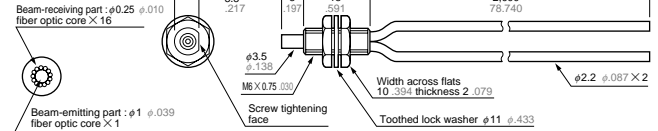


UZFRF8

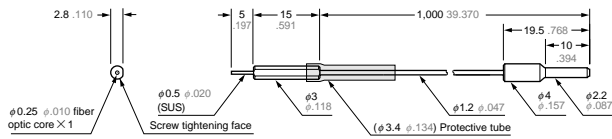


Freely cuttable

Details of sensing part



UZFTE2



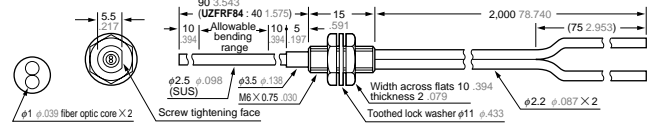
UZFRF89

UZFRF84

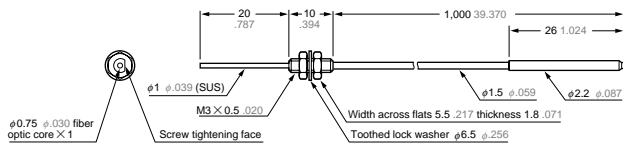


Freely cuttable

Details of sensing part



UZFTK22

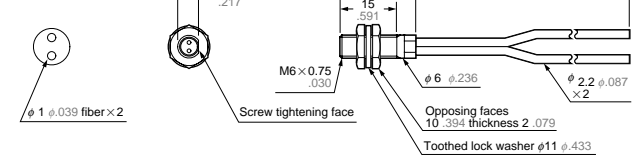


UZFRN8



Freely cuttable

Details of sensing part



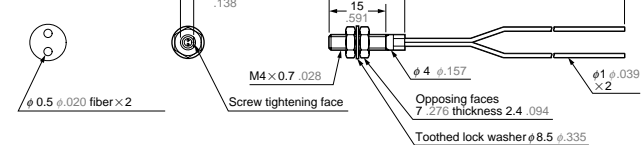
UZFRN4



Freely cuttable

With attachment

Details of sensing part



(SUS) : Stainless Steel

DIMENSIONS (Unit : mm inch)

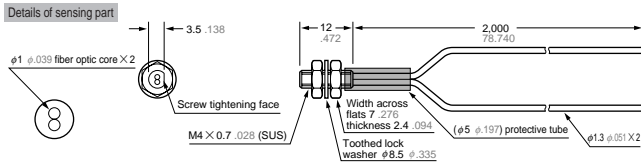
Reflective fiber optic cable

UZFR T8



Freely cuttable

With attachment

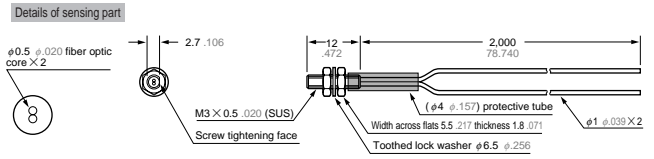


UZFR T4



Freely cuttable

With attachment

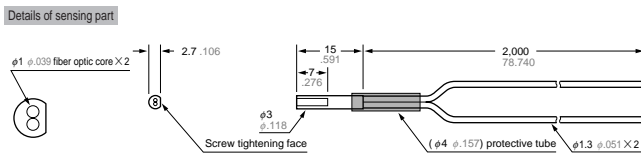


UZFR S8



Freely cuttable

With attachment

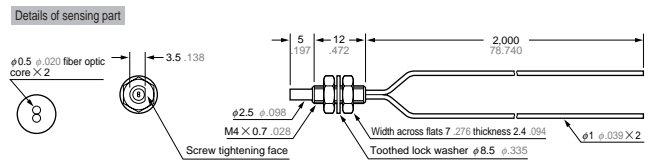


UZFR F4



Freely cuttable

With attachment

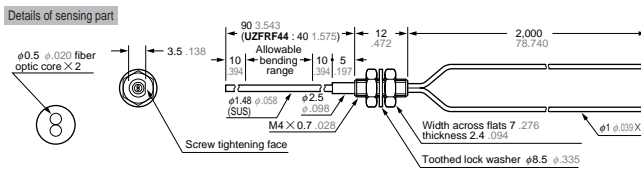


**UZFR F49
UZFR F44**



Freely cuttable

With attachment

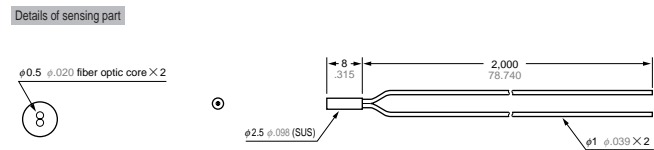


UZFR S4



Freely cuttable

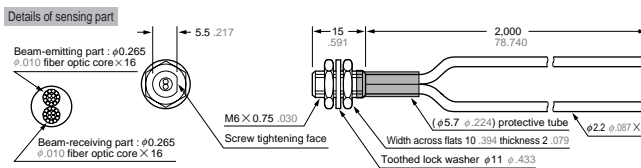
With attachment



UZFR P8



Freely cuttable

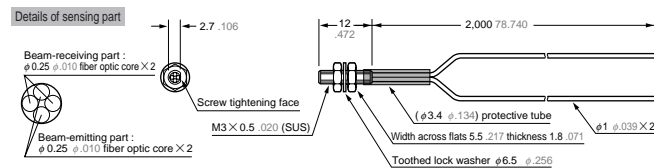


UZFR P4

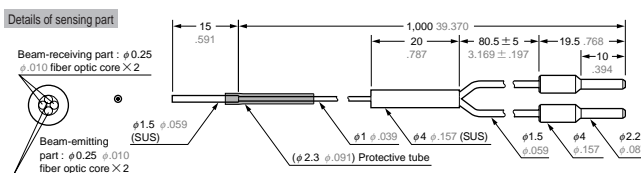


Freely cuttable

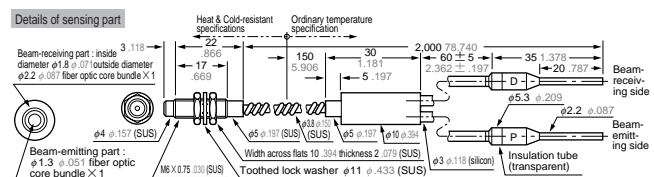
With attachment



UZFR P2



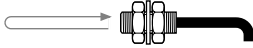
UZFR H7



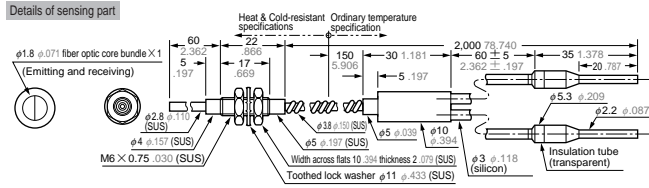
(SUS) : Stainless Steel

DIMENSIONS (Unit : mm inch)

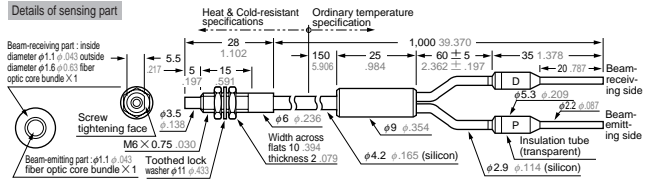
Reflective fiber optic cable



UZFRH76

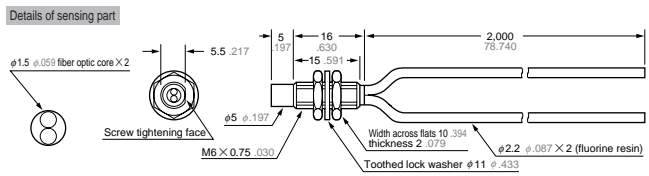


UZFRH6

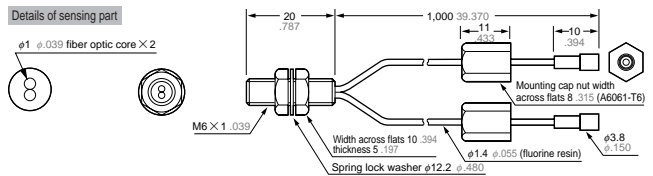


UZFRH8

Freely cuttable



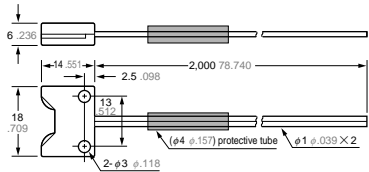
UZFR6V



UZFR4

Freely cuttable

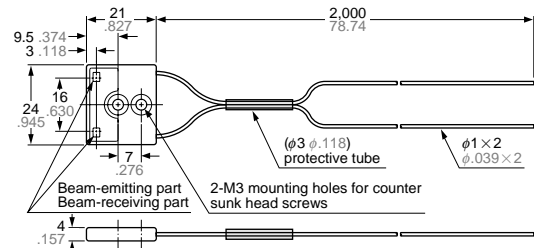
With attachment



UZFR41

Free-cut

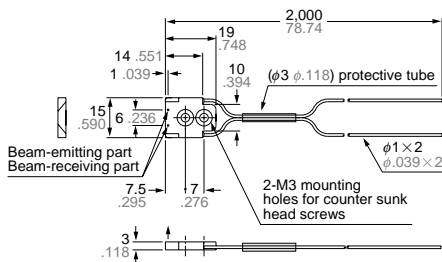
With attachment



UZFR42

Free-cut

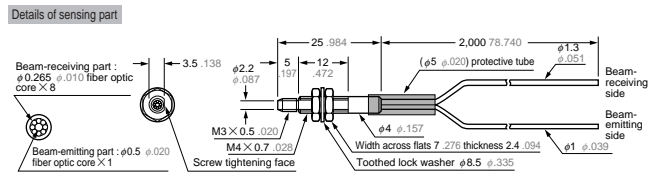
With attachment



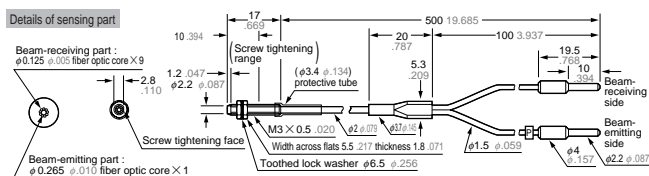
UZFRG4

Freely cuttable

With attachment

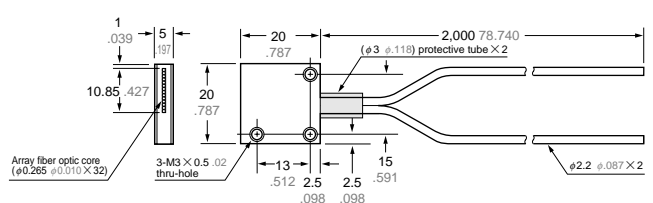


UZFREG1



UZFRA8

Freely cuttable

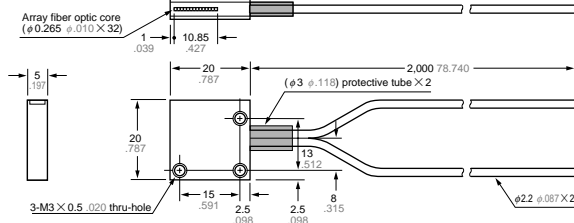


(SUS) : Stainless Steel

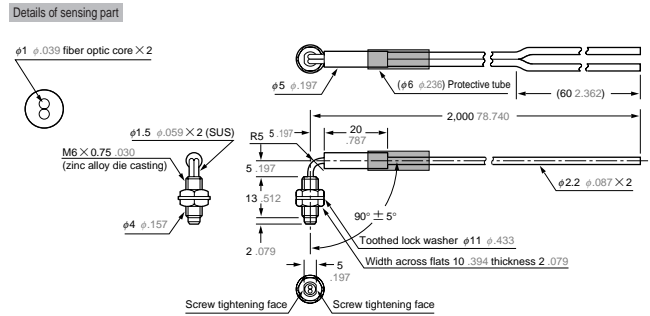
DIMENSIONS (Unit : mm inch)

Reflective fiber optic cable

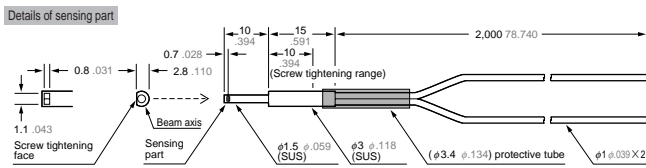
UZFRA8E Freely cuttable



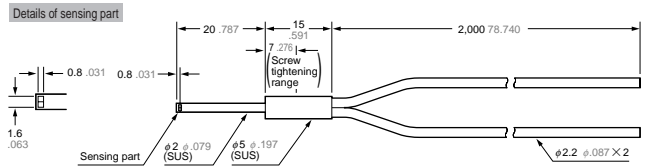
UZFRR8 Freely cuttable



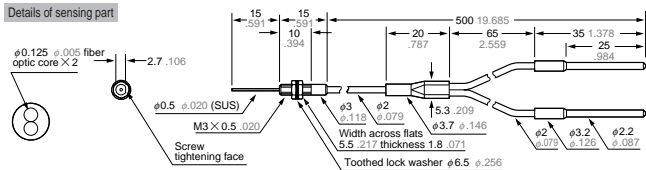
UZFRV41 Freely cuttable With attachment



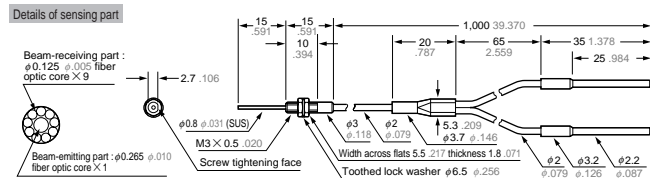
UZFRV82 Freely cuttable



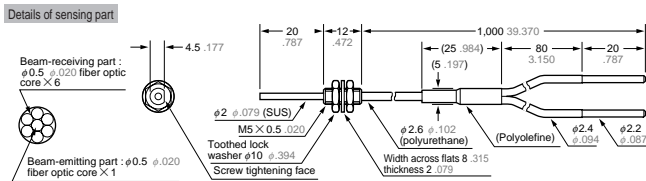
UZFRE11



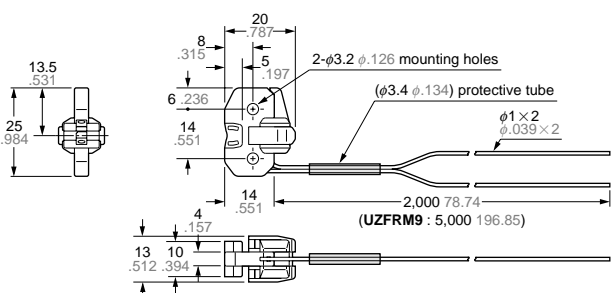
UZFRE21



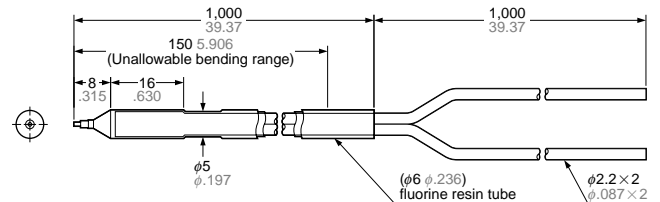
UZFRK22



UZFRM4 Free-cut With attachment



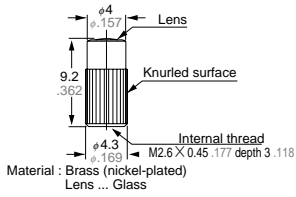
UZFRM8Y Free-cut



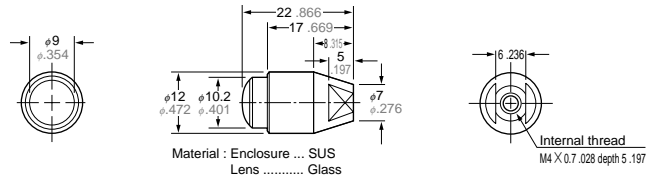
(SUS) : Stainless Steel

DIMENSIONS (Unit : mm inch)

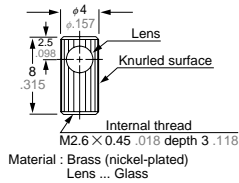
UZFXLE1 Long sensing range lens (option)



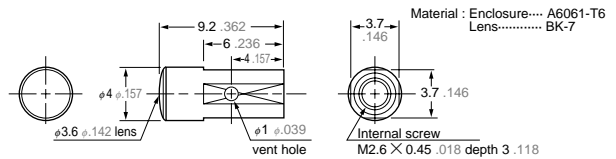
UZFXLE2 Ultra-long sensing range lens (option)



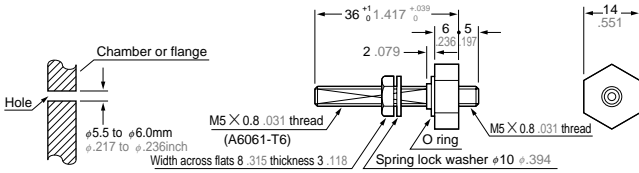
UZFXSV1 Side-view lens (option)



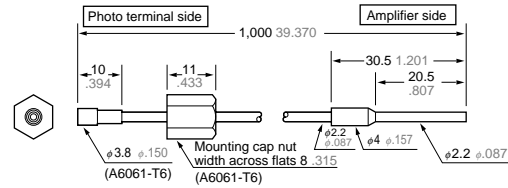
UZFVLE1 Long sensing range lens (for vacuum-resistant fiber optic cable)



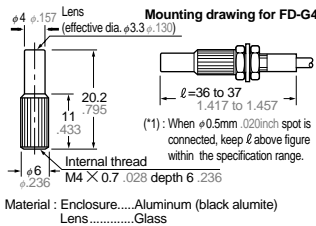
UZFVBR1 Photo terminal (for vacuum-resistant fiber optic cable)



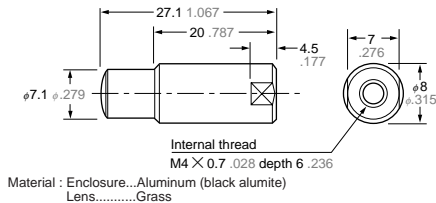
UZFTJ6 Fiber optic cable at atmospheric side (for vacuum-resistant fiber optic cable)



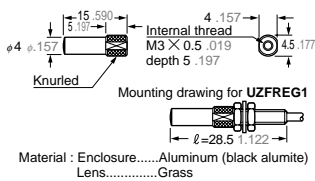
UZFXMR1 Pinpoint spot lens (option)



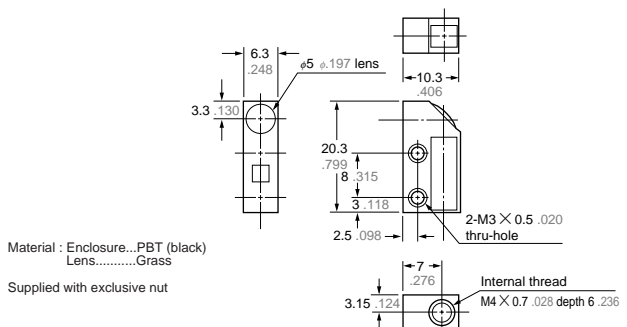
UZFXMR2 Zoom lens (option)



UZFXMR3 Ultra-small pinpoint spot lens (option)



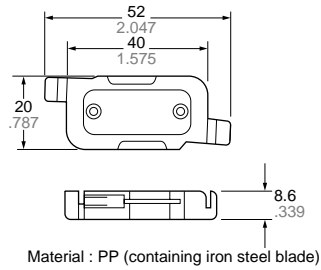
UZFXMR5 Zoom lens (option)



(SUS) : Stainless Steel

DIMENSIONS (Unit : mm inch)

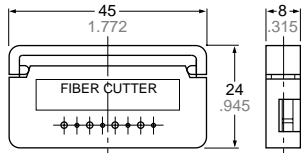
UZFXB1 Fiber bender (Option)



UZFXCT1 Fiber cutter

(Accessory for every free-cut fiber or coiled fiber)

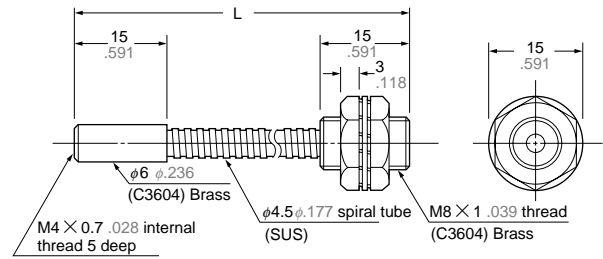
(Accessory with free-cut fiber (except economy type), flexible coiled fiber, chemical-resistant fiber, **UZFRL41**, **UZFRL42** or liquid level detection fiber)



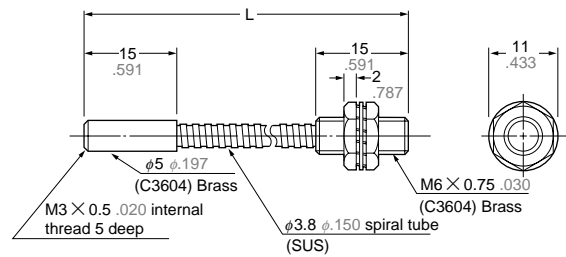
Material : ABS

UZF83□, UZF84□ Protective tube (Option)

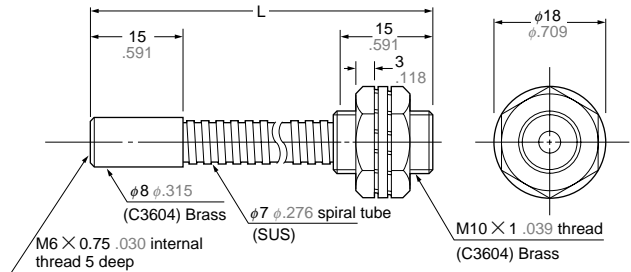
UZF831, UZF832, UZF833
UZF844, UZF845, UZF846



UZF834, UZF835, UZF836



UZF841, UZF842, UZF843



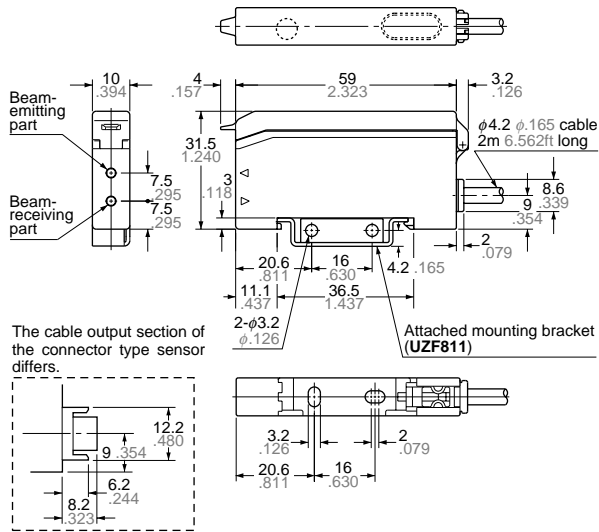
| Model No. | Length L (mm inch) |
|--------------------------------|---|
| UZF831, UZF834, UZF844, UZF841 | 500 ⁺¹⁰ ₀ 19.685 ⁺³⁹⁴ ₀ |
| UZF832, UZF835, UZF845, UZF842 | 1,000 ⁺¹⁰ ₀ 39.37 ⁺³⁹⁴ ₀ |
| UZF833, UZF836, UZF846, UZF843 | 1,500 ⁺¹⁰ ₀ 59.055 ⁺³⁹⁴ ₀ |

(SUS) : Stainless Steel

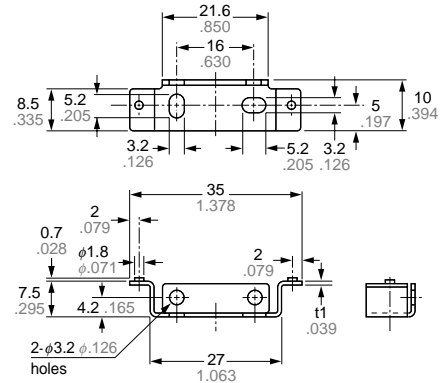
DIMENSIONS (Unit : mm inch)

UZF41 □ UZF42 □
UZF43 □ Amplifier

Assembled dimensions with attached mounting bracket

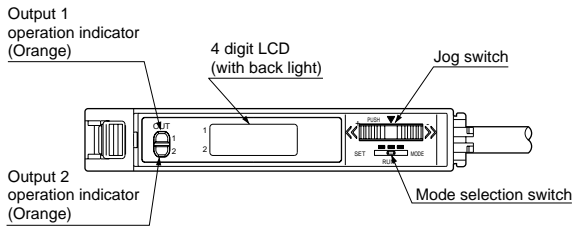


UZF811 Amplifier mounting bracket
(Accessory for amplifier)

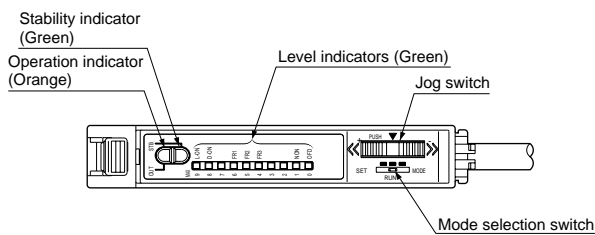


Display part

UZF41 □



UZF42 □



UZF43 □

