

# Fiber Optics, Plastic Types FUR, FUT

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- Inner fiber diameter  $\varnothing$ 0.25, 0.5 or 1.0 mm
- Outer fiber diameter  $\varnothing$ 2.2, 1.25 mm
- Bending radius 10, 15 or 25 mm
- For use with fiber optic sensor amplifier FA series
- Overmoulding protection for better curvature and protection from breakage of fiber
- High tensile strength of 8 kg ensuring reliability and durability
- 2000 mm fiber length



Over moulding for better curvature protection

## Ordering Key

**FURC6-20/S10**

Fiber unit

Fiber type

- R Reflective
- T Through-beam

Fiber diameter

- O 1.0 mm/ $\varnothing$ 2.2
- C 0.25 mm x 10/0.5 mm x 1
- A 0.25 mm/ $\varnothing$ 1.25
- D 0.5 mm/ $\varnothing$ 1.25
- S 0.5 mm/ $\varnothing$ 2.2

Head diameter

- 6 M6
- 4 M4
- 3 M3

Fiber length 2000 mm

Options

- /E Extended range
- /A Angled
- /S10 Sleeve 10 mm
- /S20 Sleeve 20 mm
- /S40 Sleeve 40 mm
- /S90 Sleeve 90 mm

### Note:

1. Not every combination is available.
2. Please see Type Selection section to see availability
3. Sleeve option is not available if you choose extended range (/E) or angled (/A) version

## General Specifications

Temperature range

Operating temperature

-55 to +70°C (-67 to +158°F)

Materials

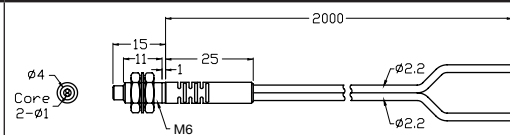
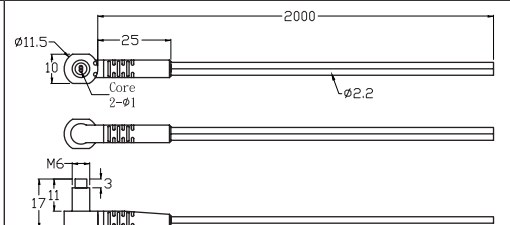
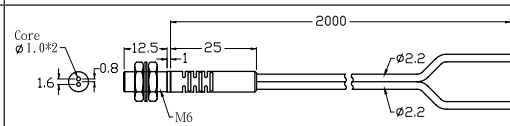
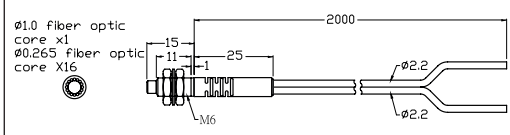
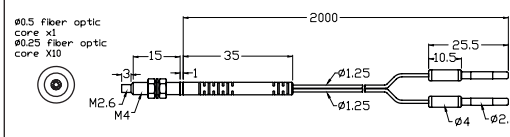
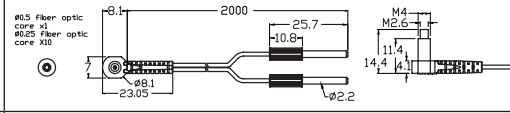
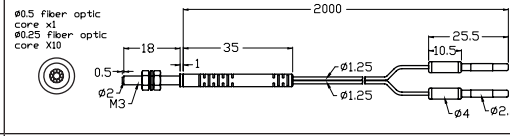
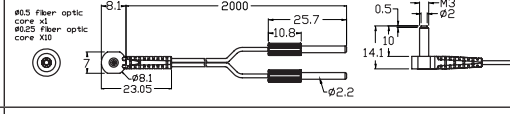
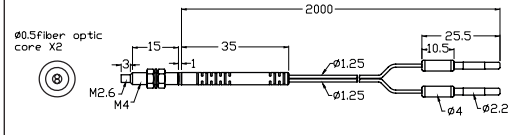
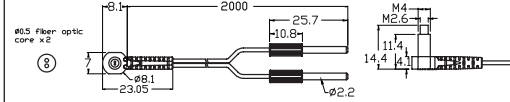
Fiber  
Sheath  
Detection head

PMMA  
PE (polyethylene)  
SUS303

### Note 3:

FURO6-20/E, FURD4-20/E, FURD3-20/E, FUTO4-20/E, FUTO3-20/E head is made of nickel plated brass

## Type Selection

| Reflective types      |                               |                            |                  |  |            |  |
|-----------------------|-------------------------------|----------------------------|------------------|--|------------|--|
| Inner diameter        | Max. detection distance (mm)* | Smallest detectable object | Min. bend radius | Dimensions (mm)**  | Weight (g) | Ordering key   |
| Ø1.0 x 2              | 90                            | Ø0.50                      | R25              |    | 38         | FURO6-20<br>FURO6-20/S10<br>FURO6-20/S20<br>FURO6-20/S40<br>FURO6-20/S90 |
| Ø1.0 x 2              | 60                            | Ø0.50                      | R25              |    | 30         | FURO6-20/A   |
| Ø1.0 x 2              | 100                           | Ø0.50                      | R25              |   | 38         | FURO6-20/E***  |
| Ø1.0 x 1, Ø0.265 x 16 | 90                            | Ø0.50                      | R25              |  | 38         | FURC6-20<br>FURC6-20/S10<br>FURC6-20/S20<br>FURC6-20/S40<br>FURC6-20/S90 |
| Ø0.5 x 1, Ø0.25 x 10  | 40                            | Ø0.05                      | R15              |  | 25         | FURC4-20<br>FURC4-20/S10<br>FURC4-20/S20<br>FURC4-20/S40<br>FURC4-20/S90 |
| Ø0.5 x 1, Ø0.25 x 10  | 20                            | Ø0.05                      | R15              |  | 30         | FURC4-20/A   |
| Ø0.5 x 1, Ø0.25 x 10  | 40                            | Ø0.05                      | R15              |  | 25         | FURC3-20<br>FURC3-20/S10<br>FURC3-20/S20<br>FURC3-20/S40<br>FURC3-20/S90 |
| Ø0.5 x 1, Ø0.25 x 10  | 20                            | Ø0.05                      | R15              |  | 29         | FURC3-20/A   |
| Ø0.5 x 2              | 20                            | Ø0.10                      | R15              |  | 25         | FURD4-20<br>FURD4-20/S10<br>FURD4-20/S20<br>FURD4-20/S40<br>FURD4-20/S90 |
| Ø0.5 x 2              | 20                            | Ø0.10                      | R15              |  | 20         | FURD4-20/A   |

\*note 1 : Detection distance in the table is based on FA1 amplifier with setting; response time at 5000µs and threshold value at 27 (max setting)

\*\*note 2 : Dimensional drawing shown here is for the standard version (without sleeve).

\*\*\*note 3 : Head is made of nickel plated brass

## Type Selection (cont.)

| Reflective types   |                               |                            |                  |                   |            |  |  |
|--------------------|-------------------------------|----------------------------|------------------|-------------------|------------|--|--|
| Inner diameter     | Max. detection distance (mm)* | Smallest detectable object | Min. bend radius | Dimensions (mm)** | Weight (g) | Ordering key   |  |
| Ø0.5 x 2           | 30                            | Ø0.10                      | R15              |                   | 25         | FURD4-20/E***  |  |
| Ø0.5 x 2           | 20                            | Ø0.10                      | R15              |                   | 24         | FURD3-20<br>FURD3-20/S10<br>FURD3-20/S20<br>FURD3-20/S40<br>FURD3-20/S90 |  |
| Ø0.5 x 2           | 20                            | Ø0.10                      | R15              |                   | 20         | FURD3-20/A   |  |
| Ø0.5 x 2           | 30                            | Ø0.10                      | R15              |                   | 24         | FURD3-20/E***  |  |
| Ø0.25 x 2          | 7                             | Ø0.05                      | R10              |                   | 16         | FURA4-20<br>FURA4-20/S10<br>FURA4-20/S20<br>FURA4-20/S40<br>FURA4-20/S90 |  |
| Ø0.25 x 2          | 5                             | Ø0.05                      | R10              |                   | 21         | FURA4-20/A   |  |
| Ø0.25 x 2          | 7                             | Ø0.05                      | R10              |                   | 16         | FURA3-20<br>FURA3-20/S10<br>FURA3-20/S20<br>FURA3-20/S40<br>FURA3-20/S90 |  |
| Ø0.25 x 2          | 5                             | Ø0.05                      | R10              |                   | 20         | FURA3-20/A   |  |
| Through-Beam types |                               |                            |                  |                   |            |  |  |
| Ø1.0               | 440                           | Ø0.50                      | R25              |                   | 38         | FUTO4-20<br>FUTO4-20/S10<br>FUTO4-20/S20<br>FUTO4-20/S40<br>FUTO4-20/S90 |  |
| Ø1.0               | 300                           | Ø0.50                      | R25              |                   | 28         | FUTO4-20/A   |  |
| Ø1.0               | 490                           | Ø0.50                      | R25              |                   | 38         | FUTO4-20/E***  |  |

\*note 1 : Detection distance in the table is based on FA1 amplifier with setting; response time at 5000µS and threshold value at 27 (max setting)

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## Type Selection (cont.)

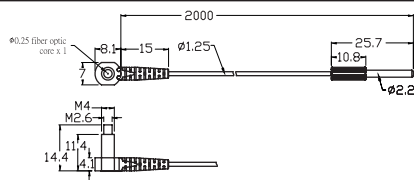
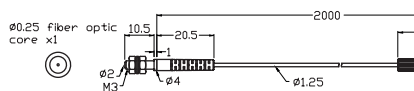
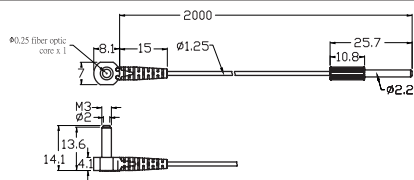
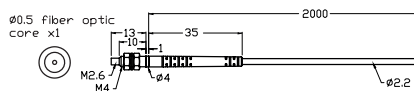
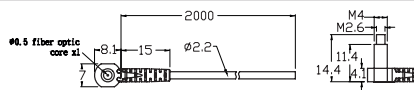
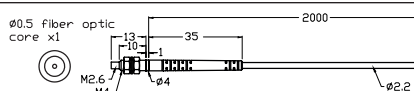
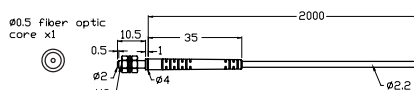
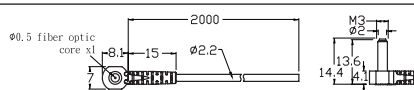
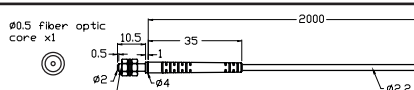
| Through-Beam types |                               |                            |                  |                   |            |  |  |
|--------------------|-------------------------------|----------------------------|------------------|-------------------|------------|--|--|
| Inner diameter     | Max. detection distance (mm)* | Smallest detectable object | Min. bend radius | Dimensions (mm)** | Weight (g) | Ordering key   |  |
| Ø1.0               | 440                           | Ø0.50                      | R25              |                   | 36         | FUTO3-20<br>FUTO3-20/S10<br>FUTO3-20/S20<br>FUTO3-20/S40<br>FUTO3-20/S90 |  |
| Ø1.0               | 300                           | Ø0.50                      | R15              |                   | 28         | FUTO3-20/A   |  |
| Ø1.0               | 490                           | Ø0.50                      | R25              |                   | 36         | FUTO3-20/E***  |  |
| Ø0.5               | 160                           | Ø0.05                      | R15              |                   | 28         | FUTD4-20<br>FUTD4-20/S10<br>FUTD4-20/S20<br>FUTD4-20/S40<br>FUTD4-20/S90 |  |
| Ø0.5               | 130                           | Ø0.05                      | R15              |                   | 20         | FUTD4-20/A   |  |
| Ø0.5               | 180                           | Ø0.05                      | R15              |                   | 28         | FUTD4-20/E   |  |
| Ø0.5               | 160                           | Ø0.05                      | R15              |                   | 28         | FUTD3-20<br>FUTD3-20/S10<br>FUTD3-20/S20<br>FUTD3-20/S40<br>FUTD3-20/S90 |  |
| Ø0.5               | 130                           | Ø0.05                      | R15              |                   | 20         | FUTD3-20/A   |  |
| Ø0.5               | 180                           | Ø0.05                      | R25              |                   | 28         | FUTD3-20/E   |  |
| Ø0.25              | 30                            | Ø0.03                      | R10              |                   | 20         | FUTA4-20<br>FUTA4-20/S10<br>FUTA4-20/S20<br>FUTA4-20/S40<br>FUTA4-20/S90 |  |

\*note 1 : Detection distance in the table is based on FA1 amplifier with setting; response time at 5000µs and threshold value at 27 (max setting)

\*\*note 2 : Dimensional drawing shown here is for the standard version (without sleeve).

\*\*\*note 3 : Head is made of nickel plated brass

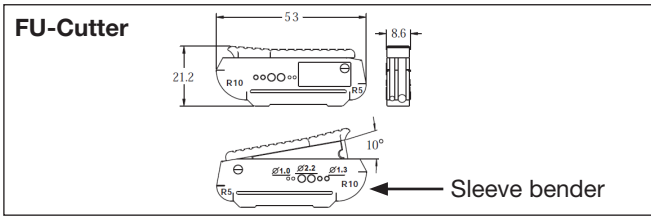
## Type Selection (cont.)

| Through-Beam types |                               |                            |                  |  |            |  |
|--------------------|-------------------------------|----------------------------|------------------|--|------------|--|
| Inner diameter     | Max. detection distance (mm)* | Smallest detectable object | Min. bend radius | Dimensions (mm)**  | Weight (g) | Ordering key   |
| Ø0.25              | 20                            | Ø0.03                      | R10              |    | 25         | FUTA4-20/A   |
| Ø0.25              | 30                            | Ø0.03                      | R10              |    | 20         | FUTA3-20<br>FUTA3-20/S10<br>FUTA3-20/S20<br>FUTA3-20/S40<br>FUTA3-20/S90 |
| Ø0.25              | 20                            | Ø0.03                      | R10              |   | 24         | FUTA3-20/A   |
| Ø0.5               | 160                           | Ø0.05                      | R15              |  | 25         | FUTS4-20<br>FUTS4-20/S10<br>FUTS4-20/S20<br>FUTS4-20/S40<br>FUTS4-20/S90 |
| Ø0.5               | 130                           | Ø0.05                      | R15              |  | 30         | FUTS4-20/A   |
| Ø0.5               | 180                           | Ø0.05                      | R15              |  | 25         | FUTS4-20/E   |
| Ø0.5               | 160                           | Ø0.05                      | R15              |  | 25         | FUTS3-20<br>FUTS3-20/S10<br>FUTS3-20/S20<br>FUTS3-20/S40<br>FUTS3-20/S90 |
| Ø0.5               | 130                           | Ø0.05                      | R15              |  | 29         | FUTS3-20/A   |
| Ø0.5               | 180                           | Ø0.05                      | R15              |  | 25         | FUTS3-20/E   |

\*note 1 : Detection distance in the table is based on FA1 amplifier with setting; response time at 5000µS and threshold value at 27 (max setting)

\*\*note 2 : Dimensional drawing shown here is for the standard version (without sleeve).

## Accessories



- 1) Cutter is not included. Sold separately.
- 2) FU-Cutter can also be used as a fiber-unit sleeve bender.

| Lenses       |                                 |  |  |                 |   |
|--------------|---------------------------------|--|--|-----------------|---|
| Part No      | Description                     | Usage  |  | Dimensions (mm) | Suitable to be used with  |
| FUT-M4LENS   | Through-beam M4 fiber lens      | Attaching this lens to the transmitter fiber and to the receiver fiber will increase the scanning distance 4 times.            |  |                 | FUTO4-20<br>FUTO4-20/A<br>FUTO4-20/E<br>FUTD4-20<br>FUTD4-20A<br>FUTD4-20/E<br>FUTA4-20/A<br>FUTA4-20<br>FUTS4-20<br>FUTS4-20/A<br>FUTS4-20/E |
| FUT-M4SLENS  | Through-beam M4 fiber side lens | The axial fiber unit can be changed to a radial type by attaching this unit to the light emitter or receiver of the fiber unit |  |                 | FUTO4-20<br>FUTO4-20/A<br>FUTO4-20/E<br>FUTD4-20<br>FUTD4-20A<br>FUTD4-20/E<br>FUTA4-20/A<br>FUTA4-20<br>FUTS4-20<br>FUTS4-20/A<br>FUTS4-20/E |
| FUR-M3LENS-2 | Reflective M3 fiber lens        | The light signal will converge into a 0.5 mm dia. spot, provided the lens is attached to the fiber at a distance of 8 mm.      |  |                 | FURC3-20<br>FURC3-20/A<br>FURA3-20<br>FURA3-20/A<br>FURD3-20<br>FURD3-20/A<br>FURD3-20/E  |
| FUR-M3LENS-1 | Reflective M3 fiber lens        | The light signal will converge into a 2 mm dia. spot, provided the lens is attached to the fiber at a distance of 8 mm.        |  |                 | FURC3-20<br>FURC3-20/A<br>FURA3-20<br>FURA3-20/A<br>FURD3-20<br>FURD3-20/A<br>FURD3-20/E  |
| FUR-M4LENS   | Reflective M4 fiber lens        | The light signal will converge into a 0.7 mm dia. spot, provided the lens is attached to the fiber at a distance of 10 mm.     |  |                 | FURD4-20<br>FURD4-20/A<br>FURD4-20/E<br>FURA4-20/A<br>FURA4-20  |