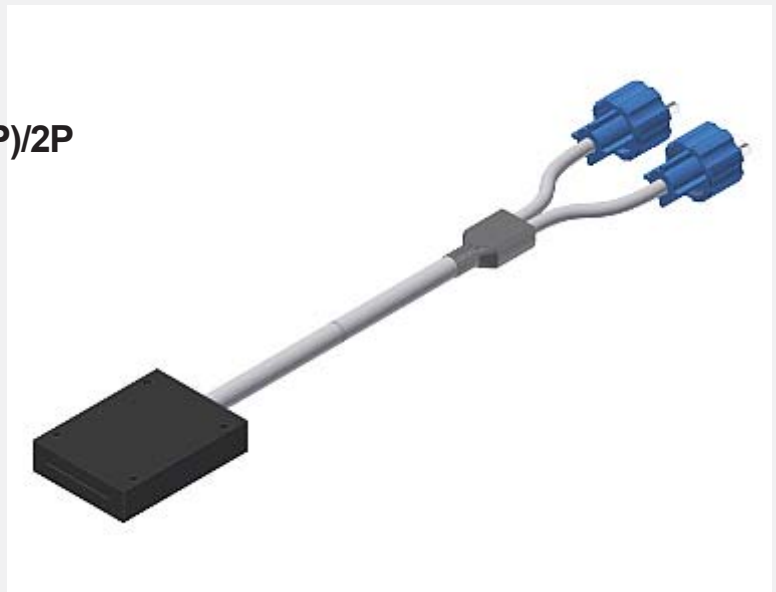


# FIO Series

## ▶ R-S-Q4-(28x0.2)-1200-Y-67°-(1P+1BP)/2P BICONE fiber optics

- BICONE fiber optics with 67° fibers (transmitter and receiver side) as well as a blind pin (transmitter side)
- Sensor head type Q4 (cross section converter):  
Cross-section of the fiber gap = 28 mm x 0.2 mm
- Silicone-metal sheath (highly flexible, high tensile, thermally stable up to 180°, liquid-tight)
- Superior quality
- Suitable for sensors of SPECTRO-2-FIO series, e.g. SPECTRO-2-FIO-(IR2+IR3)/IR
- Scan frequencies up to 130 kHz in connection with SPECTRO-2-FIO-... sensors



### Characteristics

#### General characteristics of fiber optics

Light-conducting glass fibers are optical components that allow the transmission of light through any curved path based on the principle of total reflection. The individual fiber is composed of high-break core glass and low-break cladding glass. The light beams entering the core glass within the critical angle are guided through the fiber by way of reflection at the core/cladding contact surfaces (step index fiber).

The highly flexible fiber optics are made of bundled individual glass fibers. The ends are each glued into a sensor head and a connector. The faces are optically polished. For protection against mechanical, chemical, or thermal destruction the optical fibers are provided with a corresponding protective sheath.

Fiber optics (optical fibers) offer solutions for difficult tasks in optoelectronics and are primarily used wherever compact devices are too big, too heavy, or technically unviable.

#### BICONE fiber optics

BICONE fiber optics primarily are used for distance measurements. The small dimensions of the respective fiber optics heads allow distance measurements at places where space is limited. Furthermore, the absence of electronics at the place of use also allows applications in Ex areas or for example at ambient temperatures of up to 400°C.



### Order Code

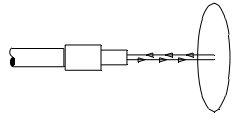
Function (R = reflected light operation)	s. page 2
Sheathing (S = Silicone-metal sheath)	s. page 2
Sensor head type (Q4) and cross section of fiber gap (28 mm x 0.2 mm)	s. page 2
Fiber optics total length (1200 mm)	s. page 3
Opening angle (67°)	s. page 3
Y version	s. page 4
BICONE fiber (1 blind pin)	s. page 4

**R-S-Q4-(28x0.2)-1200-67°-Y-(1P+1BP)/2P**

Fiber optics order code

Operation

R = Reflected light operation



Transmitter and receiver fibers are contained in one fiber optics cable. The light comes from the transmitter fibers, is reflected at the object to be measured, and reaches the evaluation amplifier through the receiver fibers.

Sheathing

S = Silicone-metal sheathing



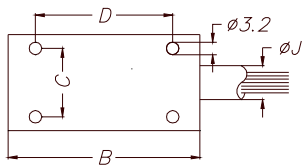
Metal spiral tube with glass-filament braiding and silicone-rubber sheathing. The bending radius is equal to three times the outside diameter of the sheathing.

Advantages:

- Highly flexible
- High resistance to kinking, high tensile and torsional strength
- Thermally stable from -40°C to +180°C
- Liquid-tight

Sensor Head Type Q4

Sensor head Type Q (end sleeve: aluminium)



Type	A	B	C	D	E	F	G	ØJ
Q1	12	25	9	15	15	5	0,5	depends on fiber cross-section
Q2	12	30	14	20	20	10	0,3	
Q3	12	35	24	25	30	18	0,3	
Q4	12	55	34	40	40	28	0,2	
Q5	12	55	44	40	50	38	0,15	
Q6	12	55	54	40	60	48	0,15	



## Standard Lengths

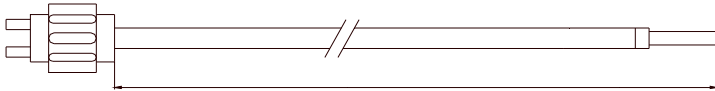
Available standard lengths are 600 mm or 1200 mm ((special cable lengths are also available), length tolerance +2%)



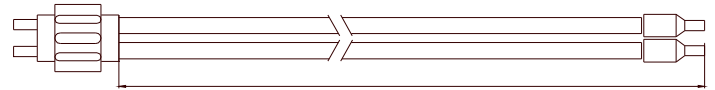
Total length l = 600 mm or 1200 mm



Total length l = 600 mm or 1200 mm



Total length l = 600 mm or 1200 mm



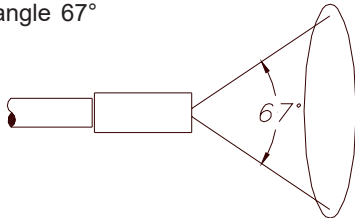
Total length l = 600 mm or 1200 mm



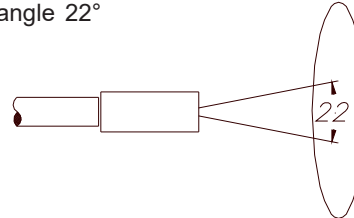
## Opening Angle

Depending on the glass-fiber material used, the following beam angles are available in the standard product range:

Schematic drawing:  
Opening angle 67°



Schematic drawing:  
Opening angle 22°



## Mounting Hints

### **Please note the following information on the usage and mounting of optical fibers:**

Fiber optics consist of a large number of single glass fibers with a diameter from 10 up to 70 µm. In spite of their high flexibility and resistance they have to be protected against tension, twist off, and bend.

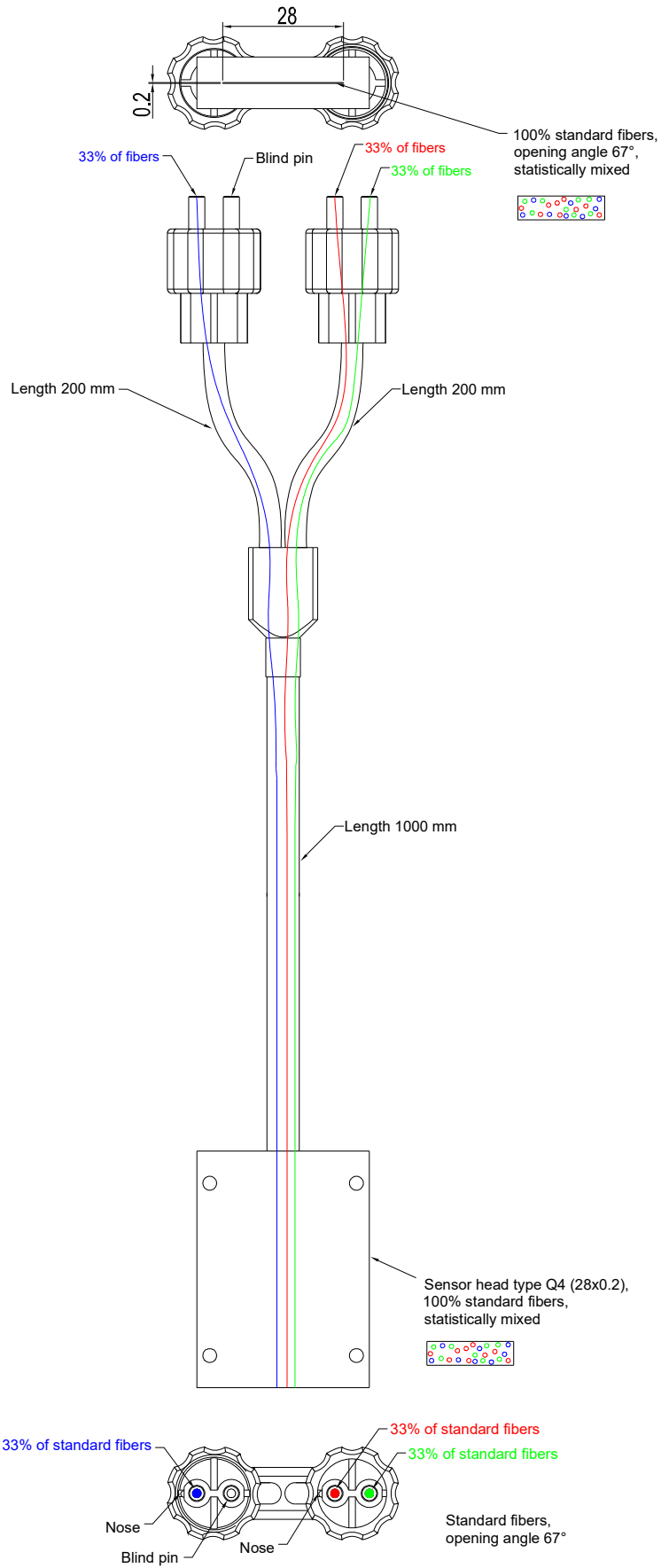


Bending radius: At least 4 times the sheath's outside diameter  
Mounting: Without heavy pressure to the fiber  
Installation: Tension-free!

For applications with heavy mechanical strain we recommend to use fiber optics with silicone-metal sheath.

**Design**

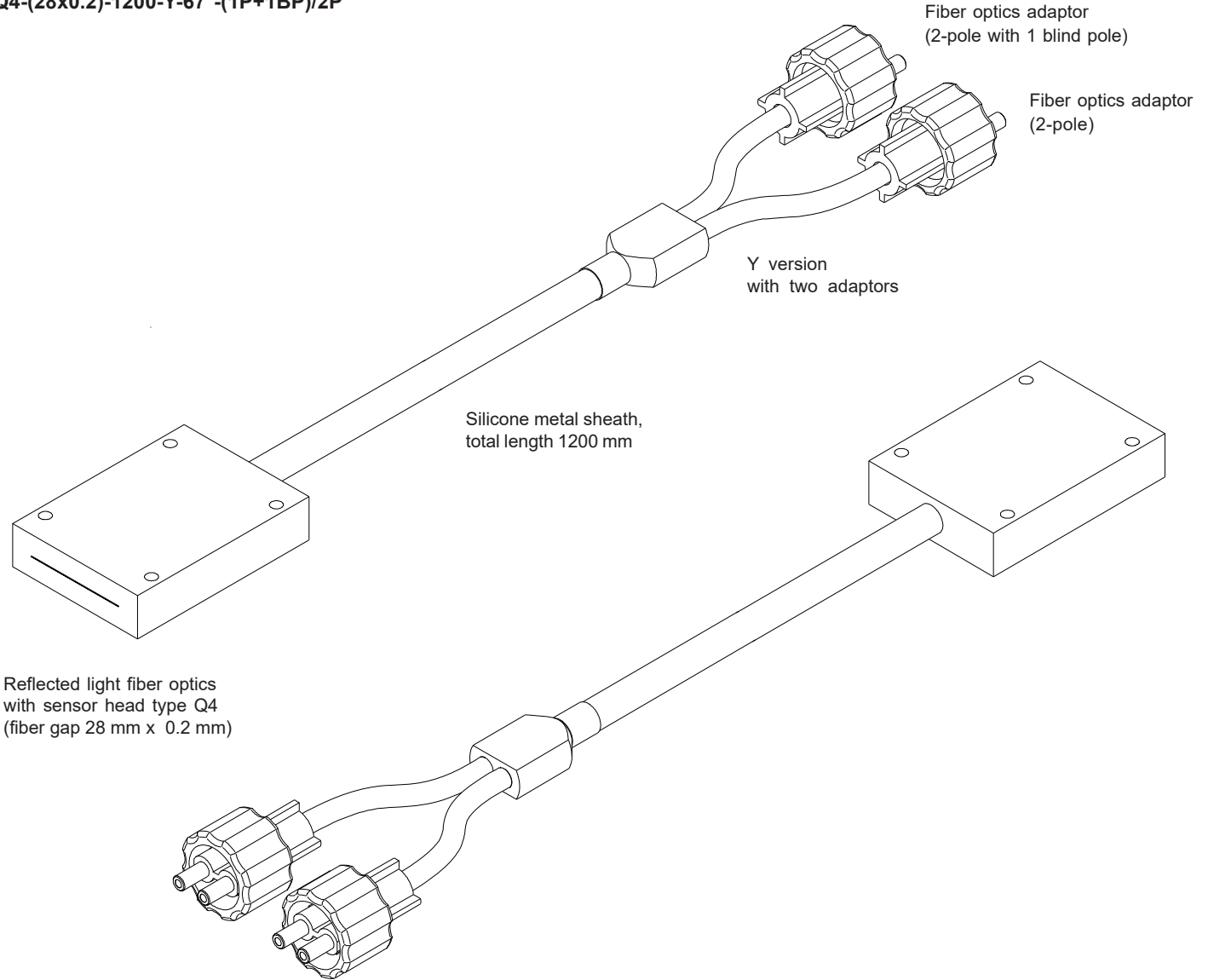
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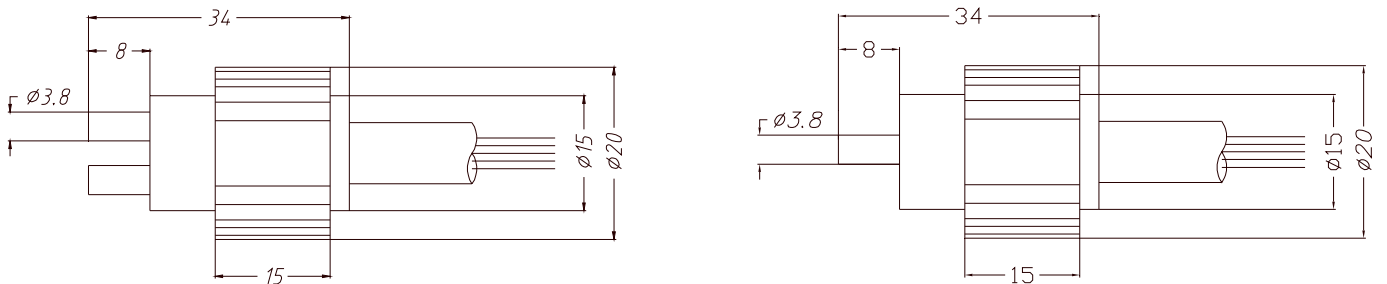
All dimensions in mm

Design

R-S-Q4-(28x0.2)-1200-Y-67°-(1P+1BP)/2P



Dimensions of Adapter



All dimensions in mm