

# OLYMPUS FIBERSCOPES

## Standard Range

### Olympus Fiberscopes - Standard range - 6, 8 and 11mm diameter

Flexible fiberscopes allow remote visual inspection to be carried out in areas where the route to the area of interest includes negotiating a series of bends or where the length of instrument required is outside the limits of a rigid borescope.

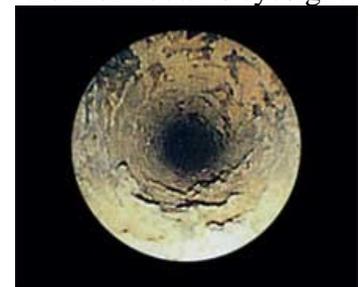
The construction of an Olympus fiberscope is a specialized process, requiring a combination of advanced optical and mechanical technologies, resulting in a finished product with many high performance design features:



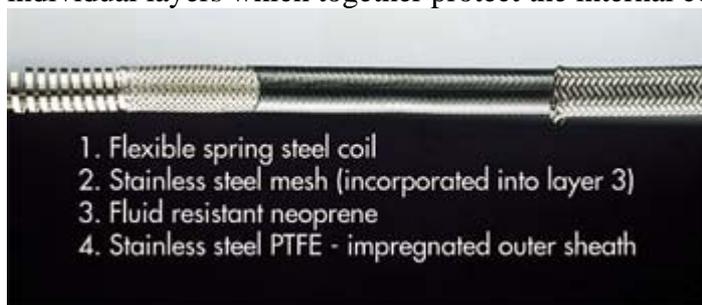
**Interchangeable optical tip adaptors.** The focus of the optical system is fixed, however, each inspection has different requirements with regard to depth of field and direction of view. For this reason, all standard model fiberscopes have interchangeable optical tip adaptors to provide versatility and are available in direct or side viewing configuration - just select the tip adaptor most suitable for the application. Separately, a diopter focus compensates for the individual's eyesight.

**Image size.** The Olympus image size is larger than most other fiberscopes. Due to the optical quality, the image of an Olympus fiberscope can be magnified and maintain a high resolution image.

**Tapered Flexibility.** This feature provides graduated flexibility along the length of the insertion tube, making the insertion tube more flexible towards the distal end.



**Four layer insertion tube.** The construction of the insertion tube (the part of the instrument inserted into the application area) is especially important to ensure reliability and durability, but without compromising flexibility. Olympus have excelled in this area, creating a design of four individual layers which together protect the internal components and provide fluid resistance.



**Four-way angulation.** All models feature four-way angulation of the distal end, which aids insertion and maneuverability and helps to steer the tip towards the inspection area.

The Series 5 range of industrial fiberscopes is available in a variety of diameters and working lengths. All instruments feature an eyepiece which allows compatibility with a range of CCTV and Photographic adaptors so that the image normally seen through the eyepiece can be recorded for future reference and reporting.

The table below shows the fiberscopes and optical tip adaptors available with their specification:

| Model Name | Diameter | Length | Tapered Flexibility | Angulation |
|------------|----------|--------|---------------------|------------|
|------------|----------|--------|---------------------|------------|

|                          |                          |                      |              |                                      |
|--------------------------|--------------------------|----------------------|--------------|--------------------------------------|
| IF6C5X1-8                | 6.0mm (0.24")            | 800mm (31.5")        | Yes          | 120° Up/Down,<br>100° Left/Right     |
| IF6C5X1-13               | 6.0mm (0.24")            | 1300mm (51.2")       | Yes          | 120° Up/Down,<br>100° Left/Right     |
| IF6C5X1-20               | 6.0mm (0.24")            | 2000mm (78.7")       | Yes          | 120° Up/Down,<br>100° Left/Right     |
| IF6C5X1-30               | 6.0mm (0.24")            | 3000mm (118.1")      | Yes          | 120° Up/Down,<br>100° Left/Right     |
| IF8C5-10                 | 8.4mm (0.33")            | 1000mm (39.4")       | Yes          | 120° Up/Down,<br>100° Left/Right     |
| IF8C5-15                 | 8.4mm (0.33")            | 1500mm (59.0")       | Yes          | 120° Up/Down,<br>100° Left/Right     |
| IF8C5-20                 | 8.4mm (0.33")            | 2000mm (78.7")       | Yes          | 120° Up/Down,<br>100° Left/Right     |
| IF8C5-30                 | 8.4mm (0.33")            | 3000mm (118")        | Yes          | 120° Up/Down,<br>100° Left/Right     |
| IF11C5-10                | 11.3mm (0.44")           | 1000mm (39.4")       | Yes          | 120° Up/Down,<br>100° Left/Right     |
| IF11C5-20                | 11.3mm (0.44")           | 2000mm (78.7")       | Yes          | 120° Up/Down,<br>100° Left/Right     |
| IF11C5-30                | 11.3mm (0.44")           | 3000mm (118.1")      | Yes          | 120° Up/Down,<br>100° Left/Right     |
| <b>Tip Adaptor Model</b> | <b>Direction of View</b> | <b>Field of View</b> | <b>F. No</b> | <b>Depth of Field</b>                |
| IF6C5-AT30D              | Direct                   | 30°                  | 3.5          | 26 to 372mm (1.0 to 14.6")           |
| IF6C5-AT60D/NF           | Direct                   | 60°                  | 4            | 5 to 102mm (0.2 to 4.0")             |
| IF6C5-AT60D/FF           | Direct                   | 60°                  | 3            | 11mm to infinity (0.43" to infinity) |
| IF6C5-AT100D             | Direct                   | 100°                 | 2.5          | 4mm to infinity (0.16" to infinity)  |
| IF6C5-AT30S              | Side (90°)               | 30°                  | 3.5          | 21 to 138mm (0.83 to 5.43")          |
| IF6C5-AT60S/NF           | Side (90°)               | 60°                  | 3.5          | 4 to 85mm (0.16 to 3.35")            |
| IF6C5-AT60S/FF           | Side (90°)               | 60°                  | 2.5          | 9mm to infinity (0.35" to infinity)  |
| IF6C5-AT100S             | Side (90°)               | 100°                 | 3            | 4mm to infinity (0.16" to infinity)  |
| IF8C5-AT30D/NF           | Direct                   | 30°                  | 5            | 30 to 70mm (1.18 to 2.76")           |
| IF8C5-AT30D/FF           | Direct                   | 30°                  | 3            | 60 to 250mm (2.36 to 9.8")           |
| IF8C5-AT60D/NF           | Direct                   | 60°                  | 5            | 9 to 50mm (0.35 to 1.97")            |
| IF8C5-AT60D/FF           | Direct                   | 60°                  | 3            | 20mm to infinity (0.79" to infinity) |
| IF8C5-AT100D/NF          | Direct                   | 100°                 | 6            | 3 to 200mm (0.12 to 7.87")           |

|                  |            |      |     |                                     |
|------------------|------------|------|-----|-------------------------------------|
| IF8C5-AT100D/FF  | Direct     | 100° | 2.5 | 9mm to infinity (0.35" to infinity) |
| IF8C5-AT30S      | Side (90°) | 30°  | 2.5 | 45 to 90mm (1.77 to 3.54")          |
| IF8C5-AT60S/NF   | Side (90°) | 60°  | 5   | 8 to 40mm (0.31 to 1.57")           |
| IF8C5-AT60S/FF   | Side (90°) | 60°  | 3   | 20 to 240mm (0.79 to 9.45")         |
| IF8C5-AT100S/NF  | Side (90°) | 100° | 6   | 3 to 140mm (0.12 to 5.51")          |
| IF8C5-AT100S/FF  | Side (90°) | 100° | 2.5 | 9 to 200mm (0.35 to 7.87")          |
| IF11C5-AT30D/NF  | Direct     | 30°  | 6   | 38 to 70mm (1.50 to 2.76")          |
| IF11C5-AT30D/FF  | Direct     | 30°  | 3   | 65 to 120mm (2.56 to 4.72")         |
| IF11C5-AT60D/NF  | Direct     | 60°  | 6   | 11 to 45mm (0.43 to 1.77")          |
| IF11C5-AT60D/FF  | Direct     | 60°  | 3.5 | 27 to 390mm (1.06 to 15.35")        |
| IF11C5-AT100D/NF | Direct     | 100° | 7   | 5 to 70mm (0.2 to 2.76")            |
| IF11C5-AT100D/FF | Direct     | 100° | 2.5 | 16 to 300mm (0.63 to 11.8")         |
| IF11C5-AT30S     | Side (90°) | 30°  | 3   | 55 to 100mm (2.17 to 3.93")         |
| IF11C5-AT60S/NF  | Side (90°) | 60°  | 6   | 11 to 40mm (0.43 to 1.57")          |
| IF11C5-AT60S/FF  | Side (90°) | 60°  | 3.5 | 28 to 440mm (1.1 to 17.3")          |
| IF11C5-AT100S/NF | Side (90°) | 100° | 7   | 3 to 22mm (0.12 to 0.87")           |
| IF11C5-AT100S/FF | Side (90°) | 100° | 3   | 12 to 250mm (0.47 to 9.84")         |

**Environmental Specification:**

**Temperature:**

Insertion tube (in air): -10 to 80°C (14 to 176°F)

Complete instrument (in air): -10 to 50°C (14 to 122°F)

**Pressure:**

Insertion tube at 10 to 30°C: 1 to 1.3 bar absolute

**Fluid resistance:**

The insertion tube can be immersed for short periods, and control body wiped with, the following chemicals: Water, 5% salt water, machine oil and light oil

## Small Diameter

### Olympus Fiberscopes - Small diameter - 0.6, 2.4 and 4.1mm diameter

In some applications, the entry port size to the area of interest can be restricted and inserting a scope can be extremely difficult. This will often necessitate using an instrument of smaller diameter than conventional models.

The Olympus range of small diameter fiberscopes is designed for these applications and are available in diameters 0.6, 2.4 and 4.1mm (0.02, 0.09 and 0.16") and lengths of up to 1.5m (4.9'). All instruments feature a high resolution coherent fiberoptic bundle for image transmission and a separate channel of non-coherent fibers for illuminating the inspection area. To aid insertion and maneuverability once inside the entry port, all instruments feature a strong, reliable insertion tube construction and in the case of the 2.4mm and 4.1mm, two-way angulation helps steer the tip towards the target area. Additionally, 4.1mm diameter models have the Olympus Tapered Flexibility insertion tube design, which means that the insertion tube becomes gradually more flexible towards the distal end - a feature not normally associated with small diameter instruments. All instruments have ocular focus to ensure that the individual operator's eyesight is accommodated and can be attached to CCTV and photographic equipment to allow the images to be permanently recorded. To illuminate the inspection area, any one of the Olympus [light sources](#) can be used.



The tables below show the models available and their specifications:

| Model Name | Diameter       | Length          | Tapered Flexibility | Angulation   | Direction of View | Field of View | Depth of Field     | Eyepiece style |
|------------|----------------|-----------------|---------------------|--------------|-------------------|---------------|--------------------|----------------|
| IF6PD4-6   | 0.64mm (0.02") | 490mm (19.3")   | No                  | No           | Direct            | 58°           | 1-50mm (0.03-2.0") | 32mm           |
| IF6PD4-11  | 0.64mm (0.02") | 990mm (39.0")   | No                  | No           | Direct            | 58°           | 1-50mm (0.03-2.0") | 32mm           |
| IF2D5-6    | 2.4mm (0.09")  | 600mm (23.6")   | No                  | 120° Up/Down | Direct            | 75°           | 2-50mm (0.08-2.0") | 32mm           |
| IF2D5-12   | 2.4mm (0.09")  | 1170mm (46.06") | No                  | 120° Up/Down | Direct            | 75°           | 2-50mm (0.08-2.0") | 32mm           |
| IF4D5-7    | 4.1mm (0.16")  | 700mm (27.6")   | Yes                 | 120° Up/Down | Direct            | 65°           | 5-60mm (0.2-2.4")  | OES Style      |
| IF4D5-15   | 4.1mm (0.16")  | 1500mm (59.0")  | Yes                 | 120° Up/Down | Direct            | 65°           | 5-60mm (0.2-2.4")  | OES Style      |
| IF4S5-7    | 4.1mm (0.16")  | 700mm (27.6")   | Yes                 | 120° Up/Down | Side (90°)        | 60°           | 4-40mm (0.16-1.6") | OES Style      |
| IF4S5-15   | 4.1mm (0.16")  | 1500mm (59.0")  | Yes                 | 120° Up/Down | Side (90°)        | 60°           | 4-40mm (0.16-1.6") | OES Style      |

### Environmental Specification:

|  | IF6PD4   | IF2D5  | IF4D5 / IF4S5  |
|--|--|--|--|
| <b>Temperature:</b><br>Insertion tube (in air)<br>Complete Instrument (in air)                                 | 0 to 40°C<br>(32 to 104°F)<br>10 to 30°C<br>(32 to 86°F) | -10 to 80°C<br>(14 to 176°F)<br>-10 to 50°C<br>(14 to 122°F) | -10 to 80°C<br>(14 to 176°F)<br>-10 to 50°C<br>(14 to 122°F) |
| <b>Pressure:</b><br>Insertion tube at 10-30°C  | 1 to 1.3 bar absolute                                    | 1 to 1.3 bar absolute  | 1 to 1.3 bar absolute  |
| <b>Fluid Resistance:</b><br>The insertion tube can be immersed for short periods, and control body wiped with: | Water  | Water  | Water<br>5% salt water<br>machine oil<br>light oil           |

## Special Feature Fiberscopes

There are some RVI applications that cannot be satisfied by a standard model fiberscope. Olympus has always been at the forefront of application solutions, and when a situation arises where a standard instrument will not provide the desired results, then Olympus has responded with advice on optimal instrument use in that application. This occasionally results in the introduction of a special instrument designed to meet that specific requirement - these are therefore known as special feature fiberscopes. This is not to say, however, that they cannot be used in other applications. The information below describes each model, together with its design application, but the specification may well suit a particular inspection you need to undertake.

### **IF5D4X1-14:**

At 5.0mm (0.19") diameter and 1200mm (47") working length, this instrument was initially developed and approved for the Pratt & Whitney PT6 engine, but has since become used for the inspection of many small engines and fine diameter pipework. It features two-way angulation, and interchangeable optical tip adaptors, allowing direct or side view, both supplied as standard with the instrument.

### **IF7D3X3-26 / IF7D3X3-32:**

This 7.3mm (0.29") diameter instrument has been approved for use on the F100 and JT-9D aircraft engines and features an internal channel for introducing a working tool or guide hook into the inspection area to aid navigation around the engine. It features four-way angulation (130° up, down, left and right) and the optical system is set to a 66° field of view, fixed focus (depth of field 8mm to infinity).

### **IF8D3X2-23:**

The JT-8D engine inspection can be particularly difficult and is most effectively undertaken using an instrument in conjunction with a guide tube. The

IF8D3X2-23 fiberscope has been designed for this inspection and has been specified with an 80° field of view and a unique angulation range - 185° up, 105° down, left and right. This is then used with the MD-999 guide tube to achieve angulation in eight different directions.

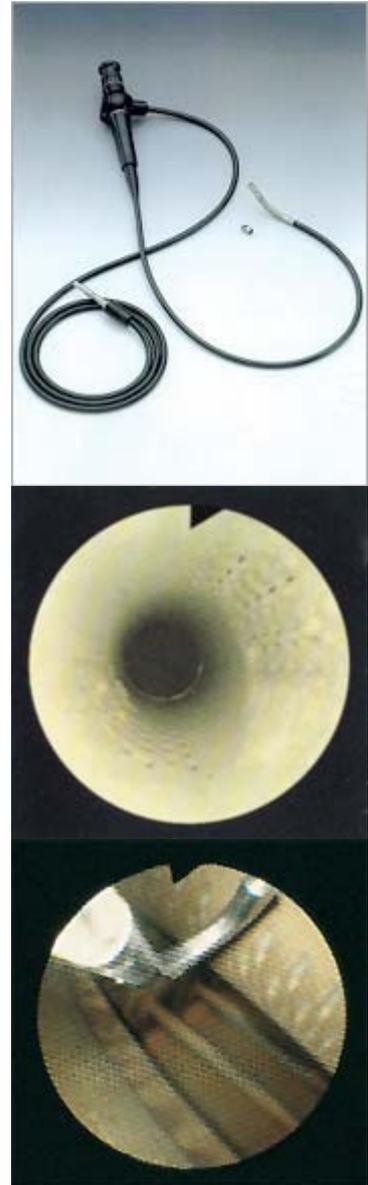
Visit the [Guide Tube](#) section of the product information to see details of the MD-999.

### **IF8D4X2-10:**

This instrument has been purpose-designed for use within the automotive industry, with an 8.5mm (0.33") diameter and 770mm (30") working length. It is a general diagnostic tool for troubleshooting as well as analysis of specific problems. Typical areas of use include intake and exhaust valves, cylinders, transmission systems and areas within the chassis. Unlike other fiberscopes of this diameter, the IF8D4X2-10 has a 32mm diameter eyepiece, which allows it to be connected to the standard range of accessories associated with rigid borescopes.

### **IF13D3-60:**

At 6050mm (19 ) length, the IF13D3-60 is the longest industrial fiberscope in production today. It is specifically designed for the visual inspection of plant such as pipes, boilers and heat exchangers, where the area of interest is some distance from the access point. It has four-way angulation of the distal end and is compatible with a wide range of 11mm diameter interchangeable optical tip



adaptors, providing the user with a variety of fields of view and depth of field characteristics.

Visit the [Ultra-Long Videoscopes](#) section for information on alternative long instruments.

### **UV (Ultra Violet) Fiberscope**

Glass fibers used in borescopes and standard specification fiberscopes attenuate UV light and can only therefore be used to view the fluorescing images, not to transmit UV illumination. In order to transmit ultra-violet illumination and view the images with one instrument, a special feature fiberscope is required.

The IF11D4-20UV fiberscope is available with or without an internal channel and features a quartz fiber bundle for effective ultra-violet illumination. The 11.3mm (0.44") diameter instrument is available in two lengths - 2.0m or 3.0m (6.6 or 9.8 ) and ,where specified, the internal channel can be used to introduce the dye and processing fluid necessary in this application.

**Please note that the UV fiberscope is only available as a special production item and is therefore subject to a longer delivery lead time.**

Olympus offers a special high power [UV light source](#) for use with this fiberscope for dye penetrant inspections.