Olympus Industrial Endoscopes meet needs across a wide range of areas, from maintenance to R & D.

Olympus technology has made it possible to obtain views from internal or difficult to reach areas, easily and quickly, without teardown or disassembly, and without destroying external features. Olympus Industrial Endoscopes are made from high-quality components, and all designed and made by Olympus, offer superior imaging and performance achieved through combining Olympus expertise in optics, electronics and precision mechanics, essential for typical applications. With the ease of use and durability of Olympus products, it is clear that Olympus Industrial Endoscopes can contribute to productivity, safety and reliability in your industry.

### SOME APPLICATION EXAMPLES

#### Aerospace Industries
For examination of Airframe and Gas turbines in research, production and maintenance for military and civil aircraft. Also for rockets and rocket engines.

#### Security
For detection of Narcotics and other contraband items, for bomb and weapons searches, and for locating those trapped following disasters.

#### Power Generation
For maintenance of heat exchange pipes, condensers, piping and turbines at nuclear, fossil fuel and hydroelectric power generation facilities.

#### Industrial Machinery
For quality control and maintenance of motors, boilers, heat exchangers and machine tools.

#### Refineries/Chemical Plants
For routine and urgent inspection of process piping, pressurised storage reservoirs, heat exchangers, boilers etc.

#### Automotive
For quality control examinations of engines, hydraulic components and injection nozzles, as well as detection of leaks, squeaks and rattles in assembled vehicles.

#### Electrical Equipment/Electronics Industries
For monitoring operation of equipment and factory automation through automatic inspection and positioning, as well as a wealth of R & D applications.

#### Gas Pumping & Delivery Systems
For monitoring corrosion inside and outside gas pipes, the presence of water infiltration and flaws in outlets, and for maintenance of gas turbines used for pumping.

#### Steel Industries
For equipment maintenance as well as quality control of pipes and tubes.

#### Architecture/Construction
For examination of walls, ducts, structured joints, as well as for viewing inside architectural models.

#### Education/Research
For monitoring animals and insects, root systems of plants etc. Also for historical and archaeological applications such as internal inspection of statues and tombs.

#### Railroad/Shipping
For routine inspection of motors, turbines, diesel engines, piping etc.

#### Water Supply/Drainage
For locating rust and blockages inside pipe systems. Useful for documentation before and after lining is coated.

---

**FIBERSCOPES AND RIGID BORESCOPES**

**Eyeball Observation System**

- Industrial Fiberscope
- Optical Adapter
- Light Guide Cable
- Light Source
- Eyeball Observation System

**Digital Photography System**

- Video System
- Film Photography System
- Digital Storage and Measurement System
- Image Recorder
- Image Recorder W-11
- VCR
- TV Camera
- PC
- Digital Camera
- Digital Camera Adaptor
- PCMCIA Memory Card
- Digital Storage and Measurement System DSM-2
- Frappy Disk
- Flash Path
Industrial Videoscopes - Providing comprehensive and remote visual inspection ability, with the highest quality colour images, accurate internal measurement, and PC interaction

Olympus Videoscopes provide bright, clear, full screen images, and offer the most versatile of inspection tools.

**MAIN FEATURES**

- **Ultra-compact CCD for image transmission.** High-resolution images are displayed on a TV monitor.
- **MAIN APPLICATIONS**
  - Ideal when higher resolution, longer insertion and brighter images than those obtainable with fiberscopes are required. TV monitor observation only.
- **For inspecting:**
  - Inside engines of vehicles, aircraft etc.
  - Inside long pipes, such as plant piping and condensers.
  - Inside precision machinery, such as fax machines and copiers.
  - For wide cavities, such as interiors of tanks, structures and large diameter pipes.
- **Inside piping, such as heat exchangers, steel pipes and drainage pipes.**

**MAIN FEATURES**

- **Ultra-high-quality images.**
  - The videoscope captures light reflected from a subject to a surface on the CCD. The CCD then converts the light into electrical signals and transfers this data to the videoscope control unit. The unit then sends a video output to the monitor.
- **MAIN APPLICATIONS**
  - Ideal when higher resolution, longer insertion and brighter images than those obtainable with fiberscopes are required. TV monitor observation only.
- **For inspecting:**
  - Inside engines of vehicles, aircraft etc.
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- **Inside piping, such as heat exchangers, steel pipes and drainage pipes.**
All-in-one design for easy transport and set up

Ultra-real three-dimensional observation with 3D Eye-Trek (for IPLEX)

Six stereo measurement modes

Scope operation, image recording, and measurement, and measurement can all be done using a PC. You can also create and edit reports, e-mail images and more.

Ultra-real three-dimensional observation with 3D Eye-Trek

*Industrial Videoscopes*

An all-in-one design that integrates everything you need for industrial endoscopic inspections.

- All-in-one design for easy transport and set up
- Compact, lightweight remote control for single-hand operation
- Four-way joystick-controlled angulation via remote control
- Stepless electronic zoom and variable brightness adjustment functions
- SW image recording, still image and voice annotation recording, and moving image recording
- Six stereo measurement modes
- Scope operation, image recording, and measurement, and measurement can all be done using a PC. You can also create and edit reports, e-mail images and more.
- Ultra-real three-dimensional observation with 3D Eye-Trek

**Industrial Videoscopes**

**IPLEX SERIES**

**INDUSTRIAL VIDEOSCOPE SYSTEM**

**IPLEX SA (STEREO MEASUREMENT)**

**IPLEX**

A videoscope system that integrates everything you need for industrial endoscopic inspections.

- All-in-one design for easy transport and set up
- Compact, lightweight remote control for single-hand operation
- Four-way joystick-controlled angulation via remote control
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- SW image recording, still image and voice annotation recording, and moving image recording
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- Ultra-real three-dimensional observation with 3D Eye-Trek

**BASIC PERFORMANCE**

**All-in-One Design**

All the components and functions you need for industrial inspection are built into IPLEX’s sophisticated all-in-one design. A retractable handle and integral wheels make transportation simple, while the streamlined design is optimised for easy maneuvering through tight spaces.

**EASY OPERATION**

**Single-Hand Operation**

IPLEX’s compact, lightweight remote control allows you to operate all inspection related functions with one hand, including insertion tube manipulation, observation, image recording, image management and measurement.

- High-precision motorised angulation
- Steepless electronic zoom
- Optical brightness adjustment
- Image recording (IPLEX SA)
- Data management (IPLEX SA)

**Set up is easy**

1. Open the lid
2. Adjust the monitor position
3. Connect a power supply
4. Take out the remote control and turn it on
5. Pull out the insertion tube from the integral drum

**Rugged design**

From its material and construction, IPLEX’s sophisticated all-in-one design is optimised for easy maneuvering through tight spaces.

**Narrow insertion tubes**

Narrow 4.4mm diameter insertion tube.

**RETRIEVAL TOOLS**

Various types of retrieval tools are available which can be used either internally, with 6.2mm or 7.3mm diameter videoscopes and fiberscopes, or externally, using a fixing kit, with instruments of 6mm diameter and above.

For details, consult your local Olympus sales representative.

**ACCESSORIES**

**Remote Control Extension Cable** (for IPLEX)

**MAJ-1091** Length: 1 m

Extends the remote control cable, allowing more freedom of movement during operation. Attaching this cable and removing the monitor from the monopod allows you to operate the main IPLEX unit while moving freely around a wider area.

**Note:** The remote control shown in the photograph is supplied as a standard part of the IPLEX system, and is also available as a spare part.

**FIBERSCOPE AND VIDEOSCOPE HOLDER**

This accessory enables mounting of a fiberscope and/or videoscope on commercially available tripods or other similar devices.

For details of the latest models, contact your local Olympus sales representative.

**CCTV EQUIPMENT**

Various CCD cameras, CRT and LCD monitors and video recording equipment products are available for TV observation.

For details of the latest models, contact your local Olympus sales representative.

**LIGHT GUIDE CABLE**

This accessory transmits light from a separate light source to a rigid borescope, but it is not required for a flexible videoscope or fiberscope. Different types and lengths are available for specific applications.

**MULTI-PURPOSE SLEEVE**

Useful to provide a constant insertion depth of rigid borescopes.

**LIGHT GUIDE CABLE**

This accessory transmits light from a separate light source to a rigid borescope, but it is not required for a flexible videoscope or fiberscope. Different types and lengths are available for specific applications.

**FIBERSCOPE AND VIDEOSCOPE HOLDER**

This accessory enables mounting of a fiberscope’s and Series 6 videoscope’s control section onto commercially available tripods or other similar devices.

For配件other than the above: MB-936

FOR FIBERSCOPES OTHER THAN THE ABOVE: MB-936

A separate holder is available for Series 5 borescopes (KN-29).
Industrial Videoscopes

**SPECIFICATIONS**

- **CFE738**
  - 21.1mm
  - 85-32 / 170-265V AC (auto voltage select)

- **F101**
  - 90°

- **IPLEX Equipment Components and Functions**
  - Distal End Slide
  - IPLEX Optical Adaptor Specifications
  - Insertion tube: 1013hPa (1atm)
  - 4~190mm Forward

- **GE90**
  - 4~190mm

- **501K**
  - 1.2/2.4x magnification (mirror image)

- **IV7635A**
  - 80°

- **IV7650A**
  - F402

- **IV7696**
  - 23.1mm

**POWER SUPPLY UNIT MAJ-522/PSU-PLUS**

The MAJ-522 power supply offers 110/300V auto switching AC input and has on the rear of the unit 2 x XLR connectors and 2 Hirose connectors for connection and operation of up to 4 Olympus products.

The MAJ-522 can be connected to a variety of Olympus products including the LH-2, 146, MA-594.2 and W-11 can be mounted into the System Case 2 for maximum system portability.

The PSU-PLUS is a multi-input power supply with the same inputs and connections as the MAJ-522 but with the added option to mount both AC and DC input voltage. With a 12V input on the front of the PSU-PLUS, battery products can be connected to the PSU-PLUS and offer stand-alone operation of the System Case 2.

**SPECIFICATIONS**

- **MAJ-522**
  - Input Voltage: 100 to 240V AC
  - Input Frequency: 50/60Hz
  - Rated output: 12V DC 13.3A (DC Output Terminal 1, 2; Max 3A)
  - Power Consumption: Max 20W
  - Dimensions: 174(W) x 55(H) x 230(D) mm
  - Weight: 2.6kg (Max)

- **PSU-PLUS**
  - Input Voltage: 85-32 / 170-265V AC (auto voltage select)
  - Input Frequency: 50/60Hz
  - Rated output: 12V DC 13.3A (DC Output Terminal 1, 2; Max 3A)
  - Power Consumption: Max 20W
  - Dimensions: 174(W) x 55(H) x 230(D) mm
  - Weight: 2.3kg

**Viewing Adaptors Specifications**

<table>
<thead>
<tr>
<th>Adaptor Name</th>
<th>Angle</th>
<th>Act Length (mm)</th>
<th>Magnification</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG2-180</td>
<td>90°</td>
<td>180mm</td>
<td>✔</td>
</tr>
<tr>
<td>AG2-90</td>
<td>90°</td>
<td>90mm</td>
<td>✔</td>
</tr>
<tr>
<td>AG2</td>
<td>90°</td>
<td>90mm</td>
<td>✔</td>
</tr>
<tr>
<td>AG2-F</td>
<td>90°</td>
<td>90mm</td>
<td>✔</td>
</tr>
<tr>
<td>AG2-00</td>
<td>Direct Viewing</td>
<td>90mm</td>
<td>✔</td>
</tr>
<tr>
<td>AG2-180D</td>
<td>Direct Viewing</td>
<td>1.5 to 26 magnification</td>
<td>✔</td>
</tr>
<tr>
<td>AG2-180RD</td>
<td>Direct Viewing</td>
<td>1.5 to 26 magnification</td>
<td>✔</td>
</tr>
<tr>
<td>AG2-180D</td>
<td>Slide</td>
<td>1.5 to 26 magnification (mirror image)</td>
<td>✔</td>
</tr>
<tr>
<td>AG2-180RD</td>
<td>Slide</td>
<td>1.5 to 26 magnification (mirror image)</td>
<td>✔</td>
</tr>
</tbody>
</table>

**POWER SOLUTION**

**ENGINE TURNING TOOLS**

The Olympus Electronic Engine Turning Tool (OTT) can offer increased speed and efficiency for all internal turbine inspections. Using a simple hand control each blade can be precisely positioned for an optimal view, allowing single operator inspections. The Engine Turning Tool is designed to be attached to engines quickly and easily - the engine-specific adaptor connect the drive motor directly to the engine’s gearbox. Turning point or air starter position. Once connected the operator can select rotation speed and direction (forward or reverse).

- **OTT-1**
  - This turning tool package is a high specification unit. A complete kit includes a Central Processing Unit, Hand Controller, Foot Pedal, Foot Switch, Engine Adaptor and all required cables. Features of this turning tool include video overlay, variable torque settings, interchangeable engine adaptor, backlash compensation, blade counting and tagging, auto indexing and adjustable rotation speed, direction and dwell time.

- **OTT-2**
  - This turning tool is specifically designed for the F100 engine. Features of this unit are the same as those of the OTT-1, but without the video overlay function.

- **OTT-3**
  - The OTT-3 is the most portable turning tool in the Olympus range. The unit is simple yet effective, employing the same engine adaptor as in the OTT-1 system. The use of these engine adaptors results in a turning tool with flexibility for use with a variety of engine configurations and inspection requirements. The base equipment can be expanded by the addition of further engine adaptors, to make the equipment suitable for use on various engines at little extra cost.

- **OTT-4**
  - The OTT-4 turning tool is a lightweight unit, targeted at specific engines, designed to achieve simple but efficient engine turning capabilities.

**Viewing Adaptors**

These adaptors allow the eye piece of a rigid borescope or flexible fibrescope to be extended or angled for a more comfortable viewing position.

- **Stereo measurement**
  - Measured when the 3D Eye-Trek face-mounted display is connected to the remote control. Surface contours that would normally be difficult to detect can be observed in three dimensions where they can be easily interpreted.

**3D EYE-TREK**

Olympus’s stereo measurement technology uses triangulation to measure image information captured by two parallax lenses. With six different measurement modes available, high-precision measurement capabilities are available from any angle.

- **Distance**
  - Measures the total length of a damaged or zone of damage.

- **Point-to-Plane**
  - Measures the distance between a hypothetical plane to the point required.

- **Depth**
  - Measure the depth of field, inspection requirements.

**PC SOLUTION**

All aspects of inspection operation can be controlled with a PC connected to IPLEX via a USB cable. Stored image data can also be transferred to a PC for more extensive processing and analysis.

- **Remote operation**
  - All PC functions including acquisition, image recording and data management can be operated from a connected PC.

- **Stereo measurement**
  - This can be operated on capture images at the inspection site. The image data can be downloaded to your PC for stereo measurements.

- **Database management**
  - IPLEX MANAGER allows you to build inspection databases. Create and edit inspection data.

- **PC equipment**
  - IPLEX MANAGER includes a template creation function so you can easily create your own report formats. Send inspection data by e-mail.

- **IPLEX MANAGER**
  - e-mail function lets you send image data and measurement data by e-mail. This makes it much easier to share data for comprehensive checking and analysis.

**IPLEX Optical Adaptor Set Specifications**

- **Generic**
  - Optical Adaptor

- **ICU**
  - Optical Adaptor

- **SPEY**
  - Optical Adaptor

- **SPEY**
  - Optical Adaptor

- **3D EYE-TREK**
  - 3D imaging

**ACCESSORIES**

- **OLYMPUS INDUSTRIAL ENDOSCOPY SYSTEM GUIDE**
  - 2005

**PRESENTATION**

- **OLYMPUS INDUSTRIAL ENDOSCOPY SYSTEM GUIDE**
  - 2005
IPLEX SX 4.4mm

Industrial Videoscopes

Purpose-built to meet the specific requirements of gas turbine inspection, the new IPLEX SX provides improved access to intricate engine interiors, enhanced hoisting and retrieval operation for exceptional ease of use, together with all high-quality capabilities synonymous with Olympus, such as advanced observation performance and proven stereo measurement.

- All features of the IPLEX SX model included stereo measurement plus working channel in 6.2mm model.
- Control unit can be removed from case for enhanced portability.

World’s slimmest (ø6.2mm) scope with channel incorporated

With a diameter of only 6.2 mm, this is the world’s slimmest videocope to incorporate a working channel. The channel port can be mounted on the remote control, further enhancing operability, while the hook assembly features a highly responsive Olympus-original design that optimizes hook operation for inspection of the second nozzle guide vane of the F100 engine.

Interchangeable with ø4.4mm scope

The IPLEX SX range includes a ø4.4mm scope (without a channel) that enables inspection of minute parts. Interchangeability between ø4.4mm scope and ø6.2mm scope makes for a simple and very cost effective system.

Digital Sleeve

Useful as an auxiliary insertion tool and also makes the scope easier to handle. Simply fit and lock the sleeve onto the tip of the insertion tube.

Optimized for jet engine inspection

Olympus’s innovative Tapered Flex technology is well known for its unique insertion capability. The IPLEX SX’s “Tapered Flex” tube has been designed to provide optimum flexibility in aircraft engine inspection and excellent resistance to crushing.

Various working tools available

Versatile tools are available to meet a wide range of inspection requirements such as retrieval of foreign objects and dropped objects. Snare basket, 3-prong grasper, magnet and aspirator forceps are available.

Belt holder for hands-free operation

The remote control with channel port mounted can be attached to a belt around your waist. This allows you to operate the scope without having to hold the remote control, and leaves your hands totally free for other tasks when you’re not operating the remote control.

Portable package design

An integrated all-in-one design offers superior portability and faster, more efficient set-up and take-down. Removing the control unit from the case allows you to carry the IPLEX SX on your shoulder, enhancing mobility in confined spaces and elevated locations.

### IPLEX SX Optical Adaptor Specifications

<table>
<thead>
<tr>
<th>Scope</th>
<th>Optical Adaptor</th>
<th>Field of View</th>
<th>Length</th>
<th>Insertion Tube Diameter</th>
<th>Working Channel Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3mm</td>
<td>3-036E1</td>
<td>200-190*</td>
<td>13.4mm</td>
<td>ø3.3mm</td>
<td>ø2.4mm</td>
</tr>
<tr>
<td>4.4mm</td>
<td>3-036E1</td>
<td>200-190*</td>
<td>13.4mm</td>
<td>ø4.4mm</td>
<td>ø3.7mm</td>
</tr>
<tr>
<td>6.2mm</td>
<td>3-036E1</td>
<td>200-190*</td>
<td>13.4mm</td>
<td>ø6.2mm</td>
<td>ø7.5mm</td>
</tr>
</tbody>
</table>

### Stereo Measurement Optical Adaptor Set Specifications

<table>
<thead>
<tr>
<th>Scope</th>
<th>Optical Adaptor</th>
<th>Field of View</th>
<th>Length</th>
<th>Insertion Tube Diameter</th>
<th>Working Channel Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3mm</td>
<td>8-122E1</td>
<td>4.0~120</td>
<td>10.2mm</td>
<td>ø3.3mm</td>
<td>ø2.0mm</td>
</tr>
<tr>
<td>4.4mm</td>
<td>8-122E1</td>
<td>4.0~120</td>
<td>10.2mm</td>
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<td>ø2.0mm</td>
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<td>4.0~120</td>
<td>10.2mm</td>
<td>ø6.2mm</td>
<td>ø2.0mm</td>
</tr>
</tbody>
</table>

### IPLEX SX Operating Environment

- **Operating Temperature**: Insertion tube: –25~80ºC, Remote control: –20~120ºC
- **Operating atmospheric pressure**: Insertion tube: –25~80ºC, Remote control: –20~120ºC
- **Liquid resistance**: Insertion tube: channel port, remote control: Machine oil, and 5% saline is attached.
- **Other parts than above**: The SX scope can also be used for photo-microscopy under oil, light oil and 5% saline is attached.
- **Waterproof**: Insertion tube can be used under water (NT4H6X1 only).
- **Depth of field**: Can be used in water but cannot be used under water.
- **Implosion**: May be allowed by external pressures.

### Specifications

<table>
<thead>
<tr>
<th>Compatible scope</th>
<th>AI-DC3/AK-DC3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camera</td>
<td>OLYMPUS CAMEDIA digital camera</td>
</tr>
<tr>
<td>Field of View</td>
<td>200~∞</td>
</tr>
<tr>
<td>Length</td>
<td>13.4mm</td>
</tr>
<tr>
<td>Insertion Tube Diameter</td>
<td>ø3.3mm</td>
</tr>
<tr>
<td>Working Channel Diameter</td>
<td>ø2.0mm</td>
</tr>
</tbody>
</table>

### Digital Camera Adaptor

**AI-DC3/AK-DC3**

Now you can take advantage of the superior image quality and high resolution of an Olympus CAMEDIA digital camera to document your inspection results. Simply connect the camera to your Olympus Industrial fiberscope or borescope via the AI-DC3 or AK-DC3 digital camera adaptor. Images are available immediately and are ready-made for e-mail, insertion into word processor documents, presentations and more.

- Endoscopic images can be documented using the high-resolution CAMEDIA digital camera.
- Fiberscope and borescope images can be turned into digital data at the touch of a button and downloaded to a PC without having to make prints.
- An inspection site’s external view can be documented with the camera alone, and the internal view can be documented when the camera is connected to the borescope.

### OM Adaptors

**For connection of SC35 still camera to Fiberscopes and Rigid Borescopes.**

![OM Adaptors](image)

**C-MOUNT ADAPTORS**

For connection of TV cameras to Fiberscopes and Rigid Borescopes.

![C-Mount Adaptors](image)
PIPE INSPECTION SYSTEM

OLYMPUS PT400

Pipe inspection at distances up to 40 metres and interchangeable camera heads for different pipe diameters.

- 40m working length.
- Immerasible up to 3m.
- Two interchangeable shock-resistant camera heads, 23mm diameter and 40mm diameter.
- Bottom indicating sensor built into the 40mm diameter camera head.
- Optional detachable centering devices keep the camera head in the centre of the pipe.
- Compact integrated design with the cable drum and control unit.
- Can be powered by a car cigarette lighter and 12V DC battery.

INFRA-RED TELESCOPIC CAMERA SYSTEM

For general visual inspection, the Infra-Red Telescopic Camera System (IRTC) features a CCD camera with integral infra-red illumination and a single rigid section. The complete system is supplied in a single rugged carrying case.

- Up to 12 metres viewing distance in darkness.
- Up to 2 hours battery life in continuous use.
- Field of view: 90°.
- Power input: 110-230V 50/60Hz or 12V DC.
- Dimensions: 470(H) x 435(W) x 220(D) mm
- Weight: 22kg (maximum depending on contents).
- Padded nylon with sun shield. Neck and waist straps with quick release buckles.
- Immersible up to 3m.

A wide range of videoscopes for specialist inspection

SERIES 6 VIDEOSCOPES

INDUSTRIAL VIDEOSCOPE

IV6C6-13/20/35/50/75

IV7D6X1-26 (NTSC type, LCD monitor mountable)

IV7D6X2-26 (PAL type)

IV5C6X1-15

Series 6 videoscopes can be used in a wide variety of specialist inspections, including AT00 (IV7D6X1-26) and T700/CT-7 (IV6C6X1-15) inspections.

- Full screen display.
- Four way angulation
- Tapered Flex (TF) Tube for enhanced insertion.
- Five button remote operation.
- Diameters of 5.1mm, 6mm, 7.3mm (with Channel) and 8.4mm.

Custom Packaging

Packaging has always been a very important part of the Olympus product range. We have therefore standardised our packaging to suit various customer needs including dedicated customised packaging for our product range. We have therefore standardised our packaging to suit various customer needs including dedicated customised packaging for different pipe diameters.

Olympus can offer a variety of hardcase and softbag solutions.

Pipe & Visual Inspection Systems
Remote control operation using the Series 6 scope

IV6C5X1-110

Direct/side viewing (convertible using optical adaptor)

Insertion tube: In air: 0~50

Freeze, store and play modes available.

Images and data can be down loaded to floppy disk or Smart-Media card for

Light guide system

Compatible with Series 5 scopes when MAJ-565 adaptor is used.

11000mm

Up 120

Drum type case

16000mm

ø

Quartz light guide system

A wide selection of image management functions include measure, recall, delete,

178 x 230 x 76mm

80W

Radioactivity resistance target value:

Capable of controlling the Digital Measuring Borescope (see page 15).

50W tungsten-halogen

Weight: 0.6kg

Dimensions: 178 x 230 x 76mm

Power Supply: 110V - 120V 50-60Hz, 115V 40-60Hz

IV6C5X1-75

11230mm

ø

Insertion tube:

900g (2lb)

Extended exposure time for darker areas.

Images stored on a PCMCIA memory card can be down loaded to a PC.

2.3kg

ø

Drum type case

2.8mm diameter

IV6C5-160

0.6kg

150W tungsten-halogen

11230mm

ø

Electric shutter automatically adjusts brightness on a monitor.

3VDC type battery

140 x 80 x 60mm

50Gy (5000 Rad).

The IV6C5X1 Series scopes are radiation-resistant up to

RADIATION RESISTANT VIDEOSCOPES

INDUSTRIAL VIDEOSCOPE

All portions except insertion tube:

Flexible

In water: 1013 (normal pressure)~1773hPa (1~1.75atm) (IV6C5X1-75)

In air: 1013hPa (normal pressure) (IV6C5-110/IV6C5-160)

Field of view

C or 50~86

º

Down 90

º

IV6C5-110

/100

/Down 120

º

∞

º

F)

º

IV6C5-110

(32~104

º

F).

Depth of field refers to the scope-tip-to-object distance range within which the image is clearly focused.

Specified working temperature:

-20°C to +40°C

Operating temperature: Insertion tube

In air: 8~40°C (5~102°F)

All portions except insertion tube: In air: 5~40°C (41~104°F)

All portions except insertion tube: In air: -10°C to +60°C (14~140°F)

Liquid resistance: Insertion tube

Withstands pulses of light: 250W 50Hz (duty cycle 1/10000)

Radiac. resistance target value:

RMS (see inside of box) (IV6C5X1-75)

Series 6 videoscopes require an IV-6A control unit and MAJ-565 adaptor for operation.

Control unit with every imaginable leading edge RFI function, the IV-6A is designed to

make your inspections as efficient and effective as possible.

Remote control operation using the Series 6 scopes’ “Five Button” control pad.

Extended exposure time for darker areas.

Automatic brightness adjustment.

Zooming and virtual panning (panning) with moving images.

Built-in image enhancement function.

Compatible with Series 6 scopes when MAJ-565 adaptor is used.

Compatible with fibrescopes and borescopes when OTC-6 C Mount CCD

Camera is used (see below).

ACCESSORIES FOR SERIES 6 & SERIES 5 VIDEOSCOPIES

DIGITAL STORAGE AND MEASUREMENT SYSTEM

DSM-2

Compact, lightweight and easy to use, this state of the art system offers an

impressive array of versatile functions to meet the most advanced RVI

requirements.

Easy to use, menu driven software for quick capture and storage of still video

images - up to 25 images along with accompanying audio annotations can be

stored in the internal memory.

Images and data can be then down loaded to floppy disk or Smart Media card for

later review of inspection results on a PC.

A wide selection of image management functions include measure, recall, delete,

export and import.

All functions controllable from the DSM-2’s front panel or the control pad on the

control section of an Olympus Series 6 Videoscope.

Capable of controlling the Digital Measuring Borescope (see page 15).

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All functions controllable from the DSM-2’s front panel or the control pad on the

control section of an Olympus Series 6 Videoscope.

Capable of controlling the Digital Measuring Borescope (see page 15).
High intensity light sources

ILH-2A/ILH-2B

The ILH-2A and ILH-2B light sources have a custom designed high output 50W metal halide arc lamp. This produces nearly 3 times the output of the LK-7. The unit is small in size and as well as being used with borescopes and fiberscopes, can be installed into the System Case 2 or used separately.

Both the ILH-2A and ILH-2B have two hirise power outputs offering a 12VDC 2 amp total for operation of Olympus ancillary equipment.

**SPECIFICATIONS**

**Lamp:**
- 50W Metal Halide
- Weight: 3kg
- Dimensions: 172 x 235 x 85mm
- Power Supply: ILH-2A – 110-230V 50-60Hz, 115V 400Hz
- ILH-2B – 110-230V 50-60Hz, 115V 400Hz (with AC Adaptor) 12VDC
- Power Consumption: 100W max

**SPECTRAL OUTPUT** (see Figure 7)

The spectral output of a lamp details the amount of electro-magnetic radiation produced across a range of wavelengths, from ultra-violet (UV), through the visible spectrum, to infra-red (IR). Radiation wavelengths are expressed in nanometres (nm), one nanometre being 10^-9 metres.

The visible spectrum is between approximately 380 and 780nm, with ultra-violet being below and infra-red being above this range. In order to give true colour images, the light source should have a relatively even distribution of output across the visible spectrum. Ideally, the amount of UV and IR radiation produced should be minimised, as IR radiation is converted to heat, which may then require a dissipation system, adding cost, volume and weight to the light source.

The spectral outputs of the three most frequently used lamp types are shown in Figure 1 and compared with that of the sun.

**COLOUR TEMPERATURE**

The colour temperature of a lamp is an indication of its radiance and is measured in degrees absolute (°K in SI units).

Typically, tungsten-halogen lamps have a colour temperature of 3,200°K, whilst metal-halide and UHP arc lamps are around 5,600°K. The colour temperature of the sun is 5,500°K.

With tungsten-halogen lamps, the colour temperature can be reduced by decreasing the voltage across the lamp filament. Some light sources use this method to adjust the intensity of the light output. Unfortunately, this ‘heatsnap’ type control increases the yellowing of the resultant illumination.

For this reason, all Olympus light sources use a mechanical shutter to control light output, as the full colour temperature of the lamp is preserved.

**POWER**

A lamp’s power rating refers to the power required to operate it – it is not a direct indication of a lamp’s illumination power. For instance, a 50W metal-halide or UHP lamp will produce a higher illumination level (in output per unit area) than a 500W tungsten-halogen lamp.

**ILP-1**

The ILP-1 light source has been specifically designed for large void inspections. Incorporating the latest UHP lamp technology it is now the brightest, most powerful light source ever produced by Olympus.

The ILP-1 has two hirise power outputs offering a 12VDC 4 amp total for operation of Olympus ancillary equipment.

**SPECIFICATIONS**

**Lamp:**
- 120W Ultra High-Performance (UHP)
- Weight: 4kg
- Dimensions: 197 x 285 x 105mm
- Power Supply: 100-120VAC, 200-240VAC, 115VAC 400Hz
- Power Consumption: 230W max

Olympus Industrial Endoscopy System Guide

Slim diameters, superior optics and maximum flexibility for ultimate control in industrial inspection

**MAIN APPLICATIONS**

Ideal for internal inspection of piping, machinery, structural members etc. Highly flexible for versatility and multi-purpose applications.

- For inspecting:
  - Inside water supply/drainage pipes and plant piping.
  - Inside engines of vehicles, aircraft etc.
  - Inaccessible areas within steel towers, buildings etc.
  - Operating conditions of machines etc.

**MAIN FEATURES**

High resolution Olympus high-performance optics technology, such as high-density glass fibre bundles, offers the world’s highest level of fibrescopic resolution and bright, sharp images.

TF Tube with superior insertability

IFS Series scopes (except IFS200) employ the proven TF (Tapered Flex) Insertion Tube. Ideal for insertion into multi-bend pipes, the flexibility changes continuously - being highly flexible at the tip and more rigid at the control section. As a result, IFS Series scopes can easily be passed through elbows and bends. At the same time, the gradually increasing rigidity of the tube as it approaches the control section assures easier transmission of pushing/rolling strength after the first bend. All scopes featuring the TF tube are marked with the logo shown below.

**Tip angulation**

The distal end can be moved in either two or four directions, by hand-held controls (all models except 0.6mm diameter).

Interchangeable optical adaptors

Facilitate a wide variety of steering angles and directions in just one scope (most models).

Fully waterproof insertion section

Photo and video documentation

High quality glass fibres for image transmission.

Observation through an eyepiece.

Each Olympus Industrial Fiberscope is comprised of the insertion tube (the distal end, bending section and flexible section), as well as the control and eyepiece section. Image guide fibres, light guide fibres and wires for tip angulation are all built in.

*The 0.6mm diameter IFS200 does not incorporate bending and control sections.*
### IF6C5X1 Scope Specifications
- **Outer diameter**: 8.7mm
- **Direction of view**: Direct/side viewing (convertible using optical adaptor)
- **Weight**: 8.8mm
- **Depth of field**: 9 to 130mm
- **Retro**: (110 mm)
- **Operating pressure**: See optical adaptor specifications (fixed focus)
- **Operating temperature**: Insertion tube: In air/water: 1013~1317hPa (1~1.3atm)
- **Drip-proof control section**: For durable performance in adverse conditions.

### IF8C5 Scope Specifications
- **Outer diameter**: 10.2mm
- **Direction of view**: Direct (000°)
- **Weight**: 8.1mm
- **Depth of field**: 9 to 130mm
- **Retro**: (110 mm)
- **Operating pressure**: Insertion tube: In air: -10~80°C
- **Drip-proof control section**: For durable performance in adverse conditions.

### IF11C5 Optical Adaptor Specifications
- **Outer diameter**: 8.7mm
- **Direction of view**: Direct (000°)
- **Weight**: 9 to 120mm
- **Depth of field**: 9 to 130mm
- **Retro**: (110 mm)
- **Operating temperature**: Insertion tube: In air: 709~1722hPa (0.7~1.7atm)
- **Drip-proof control section**: For durable performance in adverse conditions.

### IF6C5X1 Optical Adaptor Specifications
- **Outer diameter**: 8.7mm
- **Direction of view**: Direct viewing 60°, 135°
- **Weight**: 8.8mm
- **Depth of field**: 9 to 100mm
- **Retro**: (110 mm)
- **Operating temperature**: Insertion tube: In air/water: 1013~1317hPa (1~1.3atm)
- **Drip-proof control section**: For durable performance in adverse conditions.

### IF8C5 Optical Adaptor Specifications
- **Outer diameter**: 11.3mm
- **Direction of view**: Direct viewing 60°, 135°
- **Weight**: 8.1mm
- **Depth of field**: 9 to 130mm
- **Retro**: (110 mm)
- **Operating temperature**: Insertion tube: In air: 709~1722hPa (0.7~1.7atm)
- **Drip-proof control section**: For durable performance in adverse conditions.

### IF6C5X1-20 Scope Specifications
- **Outer diameter**: 8.7mm
- **Direction of view**: Direct/side viewing (convertible using optical adaptor)
- **Weight**: 8.8mm
- **Depth of field**: 9 to 130mm
- **Retro**: (110 mm)
- **Operating pressure**: See optical adaptor specifications (fixed focus)
- **Operating temperature**: Insertion tube: In air/water: 1013~1317hPa (1~1.3atm)
- **Drip-proof control section**: For durable performance in adverse conditions.

### IF8C5-10 Scope Specifications
- **Outer diameter**: 10.2mm
- **Direction of view**: Direct (000°)
- **Weight**: 8.1mm
- **Depth of field**: 9 to 130mm
- **Retro**: (110 mm)
- **Operating temperature**: Insertion tube: In air: -10~80°C
- **Drip-proof control section**: For durable performance in adverse conditions.

### MODULAR BORESCOPE
- **Operating range**: A compact 50W light source, viewing arm and a variety of probes and mirror sheaths giving viewing options unavailable in conventional rigid systems.
- **Use cases**: This borescope is particularly useful for hard to reach areas, such as petrol and diesel engines and can be supplied as customised kits to suit user requirements in a small robust carrying case.

### DIGITAL MEASURING BORESCOPE SYSTEM
- The Olympus Digital Measuring Borescope (DMBS) is the first endoscopic system capable of providing accurate and repeatable measurement data.
- Decisions which have major implications for operational efficiency and safety often rely on the measurement of defects and the monitoring and recording of component wear.
- The Olympus DMBS has been designed to meet critical measurement requirements, assisting in the creation of appropriate maintenance strategies.
- The sensor-incorporating swing prism borescope design allows you to measure both length and depth when the scope is connected to the control unit.
- All you have to do is focus and pivot the cursor at any two points on the subject. It’s simple and easy, but guaranteed to provide you with the highly accurate measurement results you need.
- The built-in swing prism at the distal end allows you to change the direction of view and the narrow 20° field of view provides large, magnified images.

### DIGITAL MEASURING BORESCOPE CONTROLLER
- The Digital Measuring Borescope Controller (DMBC) is compact, lightweight and simple to operate with cursor and functions controlled by front panel buttons, All connections, including power for the Digital Measuring Borescope, are direct to the controller making set-up quick and easy.
- The DMBC provides four modes of measurement including point-to-point linear, point to line, depth and 2D scaling. This covers the majority of measurements for turbine applications such as crack length, leading edge, displacement, lip loss, FOD depth and blade separation.

### MODULAR BORESCOPES
- **Model**: AT100D-FF-IF8C5
- **Model**: AT100D/NF-IF8C5
- **Model**: AT100S-FF-IF6C5
- **Model**: AT100S/NF-IF6C5
- **Model**: AT60S-IF6C5
- **Model**: AT60S/FF-IF6C5
- **Model**: AT60D-FF-IF8C5
- **Model**: AT60D/NF-IF8C5
- **Model**: AT100S-IF6C5
- **Model**: AT100D-IF6C5

### Light Source Specifications
- **Model**: AL-150
- **Model**: AL-250 (Stabilised quartz halogen lamp)
- **Model**: AL-510
- **Model**: AL-520 (Stabilised quartz halogen lamp)
- **Model**: AL-550

### MODULAR BORESCOPES - Metric Sheath Specifications
- **Model**: AT100S-FF-IF8C5 (100mm x 100mm x 300mm)
- **Model**: AT100D-FF-IF8C5 (100mm x 100mm x 300mm)
- **Model**: AT100D/NF-IF8C5 (100mm x 100mm x 300mm)
- **Model**: AT60S-IF6C5 (60mm x 60mm x 300mm)
- **Model**: AT60D-FF-IF6C5 (60mm x 60mm x 300mm)
- **Model**: AT60D/NF-IF6C5 (60mm x 60mm x 300mm)
- **Model**: AT100S-IF6C5 (100mm x 100mm x 300mm)
- **Model**: AT100D-IF6C5 (100mm x 100mm x 300mm)

### MODULAR BORESCOPES - English Sheath Specifications
- **Model**: AT100S-FF-IF8C5 (100mm x 100mm x 300mm)
- **Model**: AT100D-FF-IF8C5 (100mm x 100mm x 300mm)
- **Model**: AT100D/NF-IF8C5 (100mm x 100mm x 300mm)
- **Model**: AT60S-IF6C5 (60mm x 60mm x 300mm)
- **Model**: AT60D-FF-IF6C5 (60mm x 60mm x 300mm)
- **Model**: AT60D/NF-IF6C5 (60mm x 60mm x 300mm)
- **Model**: AT100S-IF6C5 (100mm x 100mm x 300mm)
- **Model**: AT100D-IF6C5 (100mm x 100mm x 300mm)

### DIGITAL MEASURING BORESCOPE SYSTEM Specifications
- **Insertion tube**
- **Flexibility**
- **Bendability**
- **Curvature**
- **Light guide system**
- **Working length**
- **Field of view**
- **Direction of view**
- **Light guide cable length**
- **Modular Borescopes Specifications**
- **Model**: AT100S-FF-IF8C5
- **Model**: AT100D-FF-IF8C5
- **Model**: AT60S-IF6C5
- **Model**: AT60D-FF-IF6C5
- **Model**: AT100S-IF6C5
- **Model**: AT100D-IF6C5
- **Model**: AT60S/FF-IF6C5
- **Model**: AT60D/NF-IF6C5
- **Model**: AT100D/NF-IF8C5
- **Model**: AT100S/NF-IF6C5
- **Model**: AT60S/NF-IF6C5
- **Model**: AT60D/FF-IF8C5
- **Model**: AT60D/NF-IF8C5
- **Model**: AT100S-IF8C5
- **Model**: AT100D-IF8C5

### Notes
- As with any fibreoptic, due to normal production characteristics all models may show a small number of broken fibres. The angulation angle decreases as the scope is coiled.
- The Olympus DMBS has been designed to meet critical measurement requirements, assisting in the creation of appropriate maintenance strategies.
- All you have to do is focus and pivot the cursor at any two points on the subject. It’s simple and easy, but guaranteed to provide you with the highly accurate measurement results you need.
### SMALL DIAMETER BORESCOPES

Ultra-thin Borescopes, as small as 0.9mm diameter for extremely tight spaces.

For applications where access to the area of interest is only possible through an aperture less than 4mm (0.16”), the Olympus range of small diameter borescopes offers a wide choice of specifications. These instruments are ideal for many applications, including the inspection of electronic components, fine castings, fuel injectors and hydraulic systems.

Small diameter borescopes are available in 0.9, 1.2, 1.7, 2.5 or 2.7mm (0.04, 0.05, 0.07, 0.10, or 0.11”) diameter insertion tubes and up to 250mm (10”) working length. The instrument’s direction of view can be direct (0°) or forward-oblique (65°) or lateral (90°) and with the introduction of a new range of instruments, two types of image transmission are available.

The X series range uses a high resolution fiber conduit image transmission system which provides excellent image quality and a more robust, semi-flexible insertion tube. This also allows smaller diameter models to be produced, including a new 0.9mm (0.04”) version which offers distinct advantages in some applications. K Series models use a ‘Selfoc’ optical lens system which offers exceptional image resolution and image brightness, but does not offer the same robustness as the fibre versions.

Any one of the Olympus light sources can be used with the small diameter borescopes including, on the X Series, the IKM-1 - a compact battery powered light source developed specifically for these instruments. All instruments include a 32mm eyepiece, which ensures compatibility with the full range of borescope accessories, including photographic, CCTV and viewing adaptors.

- **Fibre Conduit (X Series)**: Incorporates the very latest in condensed fibre conduit image transmission technology, for high resolution and durability.
- **Selfoc Lens (K Series)**: A continuous rigid rod lens for image transmission gives the highest resolution.

### IF5D4X1-14 Optical Adaptor Specifications (supplied as standard)

- **Waterproof insertion tube.**
- **In air: 1013hPa (1atm) & in water: 1013~1165hPa (1~1.5atm)**
- **Direct (0°) or lateral (90°) direction of view.**
- **All portions except insertion tube: In air -10~50°C, Water -10~40°C.**
- **Length of insertion tube: 250mm or 186mm.**
- **Angular range: Up 120°, Down 130°.**
- **Depth of field: 65mm or 50mm.**
- **Light guide system: Fully waterproof insertion section for underwater use (corrosion-protected against machine oil, kerosene and 5% saline).**

### Small Diameter Borescope Specifications - X Series

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Length</th>
<th>Direction of view</th>
<th>Depth of field</th>
<th>Field of view</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.9mm</td>
<td>99mm</td>
<td>Direct (0°) or lateral (90°)</td>
<td>60mm</td>
<td>15°</td>
</tr>
<tr>
<td>1.2mm</td>
<td>186mm</td>
<td>Direct (0°) or lateral (90°)</td>
<td>70mm</td>
<td>185°</td>
</tr>
<tr>
<td>1.7mm</td>
<td>250mm</td>
<td>Direct (0°) or lateral (90°)</td>
<td>70mm</td>
<td>185°</td>
</tr>
<tr>
<td>2.5mm</td>
<td>250mm</td>
<td>Direct (0°) or lateral (90°)</td>
<td>70mm</td>
<td>185°</td>
</tr>
</tbody>
</table>

### IF6PD4/IF2D5/IF4D5/IF4S5 (K Series)

- **Ultra-thin diameters.**
- **Light guide cable length: 2600mm.**
- **Light guide system: In air/water: 1013hPa (1atm normal pressure).**
- **Field of view: 3200mm.**
- **Direction of view: Up 185°, Down 130°.**
- **Depth of field: 65mm or 50mm.**
- **Light guide cable length: 3200mm.**

### IF7D3X3-32 (Industrialscope)

- **For JT8D jet engine inspection.**
- **Light guide cable length: 3200mm.**
- **Direction of view: Up 185°, Down 130°.**
- **Depth of field: 65mm or 50mm.**
- **Light guide cable length: 3200mm.**
- **Direction of view: Up 185°, Down 130°.**
- **Depth of field: 65mm or 50mm.**

### IF5D4X1-14 Scope Specifications

- **Operating temperature: 2000mm.**
- **62mm or 58mm.**
- **1 ~ 50mm.**
- **670mm or 580mm.**
- **IF5D4X1-14 Optical Adaptor Specifications (supplied as standard)**
- **Waterproof insertion tube.**
- **In air: 1013hPa (1atm) & in water: 1013~1165hPa (1~1.5atm) Insertion tube: In air/water: 1013hPa (1atm normal pressure).**
- **Direction of view: Up 120°, Down 130°.**
- **Depth of field: 65mm or 50mm.**
- **Light guide system: Fully waterproof insertion section for underwater use (corrosion-protected against machine oil, kerosene and 5% saline).**
- **IF6PD4/IF2D5/IF4D5/IF4S5 Scope Specifications**
- **Light guide cable length: 2500mm.**
- **Direction of view: Up 120°, Down 130°.**
- **Depth of field: 65mm or 50mm.**
- **Light guide cable length: 2500mm.**
- **Direction of view: Up 120°, Down 130°.**
- **Depth of field: 65mm or 50mm.**

### IF6PD4/IF2D5/IF4D5/IF4S5 Specifications

- **Light guide cable length: 2600mm.**
- **Direction of view: Up 185°, Down 130°.**
- **Depth of field: 65mm or 50mm.**
- **Light guide cable length: 3200mm.**
- **Direction of view: Up 185°, Down 130°.**
- **Depth of field: 65mm or 50mm.**

### IF7D3X3-32 Specifications

- **Light guide cable length: 3200mm.**
- **Direction of view: Up 185°, Down 130°.**
- **Depth of field: 65mm or 50mm.**
- **Light guide cable length: 3200mm.**
- **Direction of view: Up 185°, Down 130°.**
- **Depth of field: 65mm or 50mm.**

### IF5D4X1-14

- **Specifically for P1-6 engine inspection.**
- **Light guide cable length: 2500mm.**
- **Direction of view: Up 120°, Down 130°.**
- **Depth of field: 65mm or 50mm.**
- **Light guide cable length: 2500mm.**
- **Direction of view: Up 120°, Down 130°.**
- **Depth of field: 65mm or 50mm.**

### IF7D3X3-32

- **For JT8D and JT9D inspection.**
- **Light guide cable length: 3200mm.**
- **Direction of view: Up 185°, Down 130°.**
- **Depth of field: 65mm or 50mm.**
- **Light guide cable length: 3200mm.**
- **Direction of view: Up 185°, Down 130°.**
- **Depth of field: 65mm or 50mm.**
Inside narrow-diameter holes and pipes. A fully integrated system. Swing-Prism and Zoom Swing-Prism Specifications. Aero-engine Model Specifications. Inside cast and hydraulic parts and honing-processed holes. Series 5 Swing Prism Borescope. Series 5 Engine Borescope. A wide range of robust, versatile instruments. Industrial Rigid Borescopes. Enhanced brightness and image clarity - the Series 5 industrial rigid borescopes deliver superb high-resolution images. Unbeatable relay lens optics for sharp image transmission with light guide fibres for bright illumination. Incorporating a multiple-element relay lens system in a durable stainless steel insertion tube, Series 5 industrial rigid borescopes deliver superb high-resolution images. Detachable light guide fibres transmit illumination from a separate light source directly to the site. MAIN APPLICATIONS. Ideal for internal inspection of sites that can be accessed head-on with relatively shallow insertion. Excellent images are delivered by eye or when a TV camera is attached. For inspecting: Inside narrow-diameter holes and pipes. Inside cast and hydraulic parts and honing-processed holes. Inside aircraft engines, hollow walls or buildings, machinery, structures etc. MAIN FEATURES. Ideal for TV monitor inspection. Up to ten times brighter images than conventional models. Clear, high-resolution images. Excellent internal reproduction. Sharp image is easy on the eyes, helping reduce inspector fatigue. Focus adjustment mechanism. Easy to use focus control. 370º orbital scan. Upward pointer keeps you oriented when using the rotation function (except direct view borescopes and R160 models). Increased field of view. Up to 115º field of view 4mm models and 96% larger field of view in 6mm models. Accurate image reproduction. Distortion at image edges has been dramatically reduced. Even illumination. New tip design ensures even illumination even when viewing close-to-subjects. Outstanding durability. Stainless steel insertion tube usable at temperatures between -20ºC and 150ºC as well as under pressures of up to 1.7 atmospheres. Ergonomic control section. Extremely comfortable and functional. Comprehensive range. Arrives 300 models available featuring various diameters, working lengths and viewing directions and angles. Rigid borescopes are used where there is straight line access to the inspection area. They provide cost effective solutions for applications as diverse as maintenance, quality control, research, development and security. The Series 5 product design provides: Large, bright, clear, high-resolution images. A wide range of robust, versatile instruments. A fully integrated system. To satisfy customer and application requirements, the Olympus Series 5 range also includes: Series 5 Swing Prism Borescope. Series 5 Zoom Swing Prism Borescope. Series 5 Engine Borescope. STANDARD SERIES 5 BORESCOPE. The Series 5 standard range is available in a choice of seven diameters from 4-16mm. The standard range also offers varying lengths and field of view and field of view. SERIES 5 SWING PRISM BORESCOPE. The Series 5 swing prism borescope has been designed to allow the operator to scan a large area, saving time and expense. The direction of viewing can be adjusted continuously between 45º to 115º, coupled with a field of view, this allows a total viewing arc of 120º to 140º. The Series 5 Swing borescope is available in both 4mm and 8mm diameters. SERIES 5 ZOOM SWING PRISM BORESCOPE. The Series 5 zoom swing prism borescope has been added to the successful swing prism range. It incorporates the same characteristics as the standard swing prism, but with the added feature of 3 x optical zoom. This allows the user to zoom onto an object of interest, providing a magnified view. SERIES 5 ENGINE BORESCOPE. The Series 5 engine borescope has been designed to meet manufacturer and user specification requirements specifically for a number of key military and commercial aero engines.
Enhanced brightness and image clarity - the Series 5 industrial rigid borescopes are ideal for eyeball or TV monitor inspection

**STRUCTURAL DRAWING**

![Diagram of a Series 5 industrial rigid borescope, showing various components and specifications.](image)

**MAIN APPLICATIONS**

Ideal for internal inspection of sites that can be accessed head-on with relatively shallow insertion. Excellent images are delivered by eye or when a TV camera is attached.

**MAIN FEATURES**

- Ideal for TV monitor inspection up to ten times brighter images than conventional models.
- Clear, high-resolution images:
  - Enhanced backlight reproduction: Sharp image is easy on the eyes, helping reduce inspector fatigue.
  - Focus adjustment mechanism: Easy to use focus control.
- 37º to 150º orbital scan:
  - Upward pointer keeps you oriented when using the rotation function (except direct viewing scopes and R160 models).
- Increased field of view:
  - Larger field of view in 4mm models and 96º larger field of view in 6mm models.
- Accurate image reproduction:
  - Stroboscopic image edges have been dramatically reduced.
- Even illumination:
  - New tip design ensures more even illumination even when viewing close-to subject ranges.
- Outstanding durability:
  - Stainless steel insert tube usable at temperatures between -20°C and 150°C as well as under pressure of up to 1.7 atmospheres.
- Ergonomic control section:
  - Extremely comfortable and functional.
- Comprehensive range:
  - Articulating models available featuring various diameters, working lengths and viewing directions and angles.

**Rigide borescopes are used where there is straight line access to the inspection area. They provide cost effective solutions for applications as diverse as maintenance, quality control, research, development and security.**

The Series 5 product design provides:
- Large, bright, clear, high-resolution images
- A wide range of robust, versatile instruments
- A fully integrated system

To satisfy customer and application requirements, the Olympus Series 5 range also includes:
- **Series 5 Swing Prism Borescope**
- **Series 5 Zoom Swing Prism Borescope**
- **Series 5 Engine Borescope**

**STANDARD SERIES 5 BORESCOPES**

The Series 5 standard range is available in a choice of seven diameters from 4.6mm. The standard range also offers varying lengths and direction of view and field of view.

**SERIES 5 SWING PRISM BORESCOPES**

The Series 5 swing prism borescope has been designed to allow the operator to scan a large area, saving time and expense. The direction of viewing can be adjusted continuously between 45º and 140º. The Series 5 Swing Prism borescope is available in both 4mm and 6mm diameters.

**SERIES 5 ENGINE BORESCOPES**

The Series 5 engine borescope has been designed to meet manufacturer and user specification requirements specifically for a number of key military and commercial aero engines.

**Borescope**

<table>
<thead>
<tr>
<th>Code</th>
<th>Diameter (mm)</th>
<th>Working Length (cm)</th>
<th>Field of View (degrees)</th>
<th>Operating Length (cm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>R120</td>
<td>039 - 090 - 35 ILG</td>
<td>180</td>
<td>60</td>
<td>105</td>
<td>Field of view: 45º to 115º, direction of view: 45º to 115º, working length: 180cm.</td>
</tr>
<tr>
<td>R160</td>
<td>039 - 090 - 35</td>
<td>200</td>
<td>70</td>
<td>210</td>
<td>Field of view: 45º to 115º, direction of view: 45º to 115º, working length: 200cm.</td>
</tr>
</tbody>
</table>

**Swing and Zoom Swing Prism Specifications**

- **Swing Prism**
- **Zoom Swing Prism**

**Aero-engine Model Specifications**

- **Engine**
  - TRENTER
  - CCM-1
  - CPFM-10
  - CPFM-20
  - CPFM-40
  - CPFM-60
  - CPFM-80

**Instrument**

- **Engine**
  - TRENTER
  - CCM-1
  - CPFM-10
  - CPFM-20
  - CPFM-40
  - CPFM-60
  - CPFM-80

**INTERNAL RIGID BORESCOPES**

- **Series 5 Zoom Swing Prism Borescope**
- **Series 5 Swing Prism Borescope**
- **Series 5 Engine Borescope**

**Unbeatable relay lens optics for sharp image transmission with light guide fibres for bright illumination.**

Wide selection available to suit any requirements. Incorporating a multiple-element relay lens system in a durable stainless steel insert tube, Series 5 industrial rigid borescopes deliver superb high-resolution images. Detachable light guide fibres transmit illumination from a separate light source directly to the site.

**MAIN FEATURES**

- **Direction of view (degrees)**
- **Field of view (degrees)**
- **Working length (cm)**

**MAIN APPLICATIONS**

- **Series 5 Borescope**
- **Direction of view (degrees)**
- **Field of view (degrees)**
- **Working length (cm)
SMALL DIAMETER BORESCOPES

Ultra-thin Borescopes, as small as 0.9mm diameter for extremely tight spaces.

For applications where access to the area of interest is only possible through an aperture less than 4mm (0.16"), the Olympus range of small diameter borescopes offers a wide choice of specifications. These instruments are ideal for many applications, including the inspection of electronic components, fine castings, fuel injectors and hydraulic systems.

Small diameter borescopes are available in 0.9, 1.2, 1.7, 2.5 or 2.7mm (0.04, 0.05, 0.07, 0.10, or 0.11") diameter insertion tubes and up to 250mm (10") working length. The instrument's direction of view can be direct (000) or oblique (150) and with the introduction of a new range of instruments, two types of image transmission are available.

The X series range uses a high resolution fibre conduit image transmission system which provides excellent image quality and a more robust, semi-flexible insertion tube. This also allows smaller diameter models to be produced, including a new 0.9mm (0.04") version which offers distinct advantages in some applications. K series models use a Selfoc optical lens system which offers exceptional image resolution and image brightness, but does not offer the same robustness as the fibre versions.

Any one of the Olympus light sources can be used with the small diameter borescopes including, on the K series, the ILK-M1 - a compact battery powered light source developed specifically for these instruments. All instruments include a 32mm eyepiece, which ensures compatibility with the full range of borescope accessories, including photographic, CCTV and viewing adaptors.

- Selfoc Lens (K Series)
- A continuous rigid rod lens for image transmission gives the highest resolution.

INDUSTRIAL FIBEROSCOPE

IF5D4X1-14

Specifically for P1-6 engine inspection.

■ IF5D4X1-14 Scope Specifications
| Optical system | Field of view: 4.1mm (when looped once) | Length: 1.6mm |
| Illumination system | Light guide system: 1600mm (2000mm) | Length: 1.6mm |
| Direction of view | Down 120 | Length: 1.6mm |
| Field of view | 4 ~ 40mm | Length: 1.6mm |
| Depth of field | 2.6 diameter |
| Direction of view | Forward-oblique: 2 to 7 |
| Field of view | Down 130 |
| Depth of field | 2 ~ 50mm |

INDUSTRIAL FIBEROSCOPE

IF6PD4/IF2DS/IFD5/IF4S

Ultra-thin diameters.

■ Scope Specifications
| Optical system | Field of view: 4.1mm (when looped once) | Length: 1.6mm |
| Illumination system | Light guide system: 1600mm (2000mm) | Length: 1.6mm |
| Direction of view | Down 120 | Length: 1.6mm |
| Field of view | 4 ~ 40mm | Length: 1.6mm |
| Depth of field | 2.6 diameter |
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| Direction of view | Down 120 | Length: 1.6mm |
| Field of view | 4 ~ 40mm | Length: 1.6mm |
| Depth of field | 2.6 diameter |
| Direction of view | Forward-oblique: 2 to 7 |
| Field of view | Down 130 |
| Depth of field | 2 ~ 50mm |
**INDUSTRIAL FIBERSCOPES**

**IF6C5X1 Scope Specifications**

- **Optical system**: Direct view (variable focal length, continuous optical system)
- **Working length**: 2000mm
- **Internal diameter**: 13.7mm
- **Probe and mirror sheath**: Can be immersed for short periods in 5% saline.

**PF6C5X1 Optical Adaptor Specifications**

- **Model**: AT60S/FF-IF6C5
- **Field of view**: Direct (0°-100°), Lateral (0°-90°)
- **Field of view**: Direct: 11° to 250°, Lateral: 6° to 120°

**PF6C5X1/FF8C5X1 Operating Environment**

- **Operating temperature**: Insertion tube
  - At air: 18°C to 25°C
  - In water: 15°C to 30°C
- **Operating pressure**: Insertion tube
  - In air: 1510bar
  - In water: 1.0 bar to 1.7 bar

**PF6C5X1/FF8C5X1 Power Specifications**

- **Model**: 12V DC
- **Current consumption**: 1.5A
- **Light output**: 65W

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- **Optical system**: Direct view
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- **Internal diameter**: 13.7mm
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**PF6C5X1/FF8C5X1 Power Specifications**

- **Model**: 12V DC
- **Current consumption**: 1.5A
- **Light output**: 65W

**Digital Measuring Borescope System**

The Olympus Digital Measuring Borescope (DMBS) is the first endoscopic system capable of providing accurate and repeatable measurement data. Decisions which have major implications for operational efficiency and safety often rely on the measurement of defects and the monitoring and recording of component wear. The Olympus DMBS has been designed to meet critical measurement requirements, assisting in the creation of appropriate maintenance strategies.

- The sensor incorporating a swing prism borescope design allows you to measure both length and depth when the scope is connected to the control unit.
- If you have to do is focus and point the cursor at any two points on the subject. It’s simple and easy, but guaranteed to provide you with the highly accurate measurement results you need.
- The built-in swing prism at the distal end allows you to change the direction of view and the narrow 2D field of view provides large, magnified images.

**Digital Measuring Borescope Controller**

The Digital Measuring Borescope Controller (DMBC) is compact, lightweight and simple to operate with cursor and functions controlled by front panel buttons. All connections, including power for the Digital Measuring Borescope, are direct to the controller making set-up quick and easy.

The DMBC provides four modes of measurement including point-to-point linear, point to line, depth and 2D scaling. This covers the majority of measurements for tubular applications such as crack length, leading edge, displacement, lip-loss, FOD depth and blade separation.

**Modular Borescope Specifications**

- **Model**: AT100S/FF-IF11C5
- **Insertion tube**: 11.3mm (TF tube)

**Modular Borescope - Mirror Sheath Specifications**

- **Model**: AT30D/NF-IF8C5
- **Distal end**: 6.0mm

**Light Source Specifications**

- **Model**: AL-5-131
- **Supply voltage**: 8.0V

**Modular Borescope**

The Modular Borescope consists of a compact 50W light source, viewing arm and a variety of probes and mirror sheaths giving viewing options unavailable in conventional rigid systems. This borescope is particularly useful for hard to reach areas, such as petrol and diesel engines and can be supplied as customised kits to suit user requirements in a small robust carrying case.
In remote visual inspection applications the choice of light source is vital. When deciding which is the most appropriate, consideration must be given to size, weight and light output.

The Olympus range of light sources have been designed to meet the customers needs and requirements, from the high intensity range of light sources, which offer versatility and maximum light output, to the more economical, lower power consumption tungsten range.

- If viewing over longer distance, or in particularly dark areas, use a high intensity light source, which incorporates an arc lamp, such as metal halide or UHP.
- If a lower cost light source is required, and viewing distance is smaller, then use a Tungsten halogen light source.
- If using from a battery, or if low power consumption is required, then a low wattage lamp (such as ILH-2B) will offer longest battery life.

Remember that a high intensity arc lamp will provide much more light than a Tungsten halogen lamp, particularly with small diameter instruments. Contact your local distributor for selection advice, and try the complete system on a typical application.

SPECTRAL OUTPUT (see Figure 1)

The spectral output of a lamp details the amount of electro-magnetic radiation produced across a range of wavelengths, from ultra-violet (UV), through the visible spectrum, to infra-red (IR). Radiation wavelengths are measured in nanometres (nm), one nanometre being 10⁻⁹ metres.

The visible spectrum is between approximately 380 and 770nm, with ultra-violet being below and infra-red being above this range. In order to give true colour images, the light source should have a relatively even output across the visible spectrum. Ideally, the amount of IR radiation produced should be minimised, as IR radiation is converted to heat, which may then require a dissipation system, adding cost, volume and weight to the light source.

The spectral outputs of the three most frequently used lamp types are shown in Figure 1 and compared with that of the sun.

COLOUR TEMPERATURE

The colour temperature of a lamp is an indication of its radiance and is measured in degrees absolute (°K in SI units).

- Typically, tungsten-halogen lamps have a colour temperature of 3,200°K, whilst metal halide and UHP arc lamps are around 5,600°K. The colour temperature of the sun is 5,500°K.

With tungsten-halogen lamps, the colour temperature can be reduced by decreasing the voltage across the lamp filament. Some light sources use this method to adjust the intensity of the light output. Unfortunately, this ‘heatstat’ type control increases the yellowing of the resultant illumination.

For this reason, all Olympus light sources use a mechanical shutter to control light output, as the full colour temperature of the lamp is preserved.

POWER

A lamp’s power rating refers to the power required to operate it – it is not a direct indication of a lamp’s illumination power. For instance, a 50W metal halide or UHP lamp will produce a higher illumination level (in output per unit area) than a 500W tungsten-halogen lamp.

HIGH INTENSITY LIGHT SOURCES

ILH-2A/ILH-2B

The ILH-2A and ILH-2B light sources have a custom designed high output 50W metal halide arc lamp. This produces nearly 3 times the output of the ILK-7. The unit is small in size and as well as being used with endoscopes and fibrescopes, can be installed into the System Case 2 or used separately.

Both the ILH-2A and ILH-2B have two hirose power outputs offering a 12VDC 2 amp total for operation of Olympus ancillary equipment.

SPECIFICATIONS

- Lamp: 50W Metal Halide
- Weight: 3kg
- Dimensions: 172 x 225 x 85mm
- Power Supply: ILH-2A – 110-230V 50-60Hz, 115V 400Hz
  ILH-2B – 110-230V 50-60Hz, 115V 400Hz
- Power Consumption: 100W max

ILP-1

The ILP-1 light source has been specifically designed for large void Inspections. Incorporating the latest UHP lamp technology it is now the brightest, most powerful light source ever produced by Olympus.

The ILP-1 has two hirose power outputs offering a 12VDC 4 amp total for operation of Olympus ancillary equipment.

SPECIFICATIONS

- Lamp: 120W Ultra High Performance (UHP)
- Weight: 4kg
- Dimensions: 197 x 265 x 105mm
- Power Supply: 100-120VAC, 200-240VAC, 115VAC 400Hz
- Power Consumption: 230W max

Slim diameters, superior optics and maximum flexibility for ultimate control in industrial inspection

High quality glass fibres for image transmission. Observation through an eyepiece.

Each Olympus Industrial Fiberscope is comprised of the insertion tube (the distal end, bending section* and flexible section), as well as the control and eyepiece section. Image guide fibres, light guide fibres and wires for tip angulation are all built in.

*The 0.8mm diameter (TFHD-C) does not incorporate bending and control sections.

MAIN APPLICATIONS

Ideal for internal inspection of piping, machinery, structural members etc. Highly flexible for versatility and multi-purpose applications.

For inspecting:

- Inside water supply/drainage pipes and plant piping.
- Inside engines of vehicles, aircraft etc.
- Inside machines such as motors and boilers.
- Inaccessible areas within steel towers, buildings etc.
- Operating conditions of machines etc.

MAIN FEATURES

High resolution

Olympus high-performance optics technology, such as high-density fibre bundles, offers the world’s highest level of fibrescopic resolution and bright, sharp images.

TF Tube with superior insertability

IFS Series scopes (except IFS2D) employ the proven TF (Tapered Flex) Insertion Tube. Ideal for insertion into multiple-bend pipes, the flexibility changes continuously - being highly flexible at the tip and more rigid at the control section. As a result, IFS Series scopes can easily be passed through bends and elbows. At the same time, the gradually increasing rigidity of the tube as it approaches the control section assures easier transmission of pushing/twisting strength after the first bend. All scopes featuring the TF tube are marked with the logo shown below.

Tip angulation

The distal end can be moved in either two or four directions, by hand-held controls (all models except 0.8mm diameter).

Interchangeable optical adapters

Facilitate a wide variety of steering angles and directions in just one scope (most models).

Fully waterproof insertion section

Photo and video documentation

CLASSIFICATION

Industrial Fiberscopes

Light Sources

Structural Drawing
Industrial Videoscopes

**SERIES 5 VIDEOSCOPES**

**INDUSTRIAL VIDEOC>>>
PIE INSPECTION SYSTEM

OLYMPUS PT400

Pipe inspection at distances up to 40 metres and interchangeable camera heads for different pipe diameters.
- 40m working length.
- Immersible up to 2m.
- Two interchangeable shock-resistant camera heads, 23mm diameter and 40mm diameter.
- Bottom indicating sensor built into the 40mm diameter camera head.
- Optional detachable centring devices keep the camera head in the centre of the pipe.
- Compact integrated design with the cable drum and control unit.
- Can be powered by a car cigarette lighter and 12V DC battery.

INFRA-RED TELESCOPIC CAMERA SYSTEM

For large vessel inspection. The Infrared Telescopic Camera System (IRTC) features a CCD camera with integral infrared illumination mounted on a telescopic arm, together with a compact monitor and battery module. The complete system is supplied in a single rugged carrying case.
- Up to 12 metres viewing distance in darkness.
- Up to 2 hours battery life in continuous use.
- High resolution monochrome monitor.
- Podbit carrying case.

CUSTOM PACKAGING

Packaging has always been a very important part of the Olympus product range. We have therefore standardised our packaging to suit various customer needs including dedicated customised packaging for system configurations. Olympus can offer a variety of hardcase and softbag solutions.

IV SYSTEM CASE 2

The IV System Case 2 is a compact, portable, easy to use system that can contain a videoscope (up to a length of 7.5m), collection of tips, ILH-2B light source, choice of IV-6 or IV-4A camera control unit, high resolution LCD screen, IV-W1 or D83M-2 image management system and either a MAJ-522 or PSU-PLUS power supply for operation.

SPECIFICATIONS

Dimensions: 470(H) x 435(D) x 220(D) mm
Weight: 22kg (maximum depending on contents)
Power input: 110-230V 50-60Hz or 12V DC

A wide range of videoscopes for specialist inspection

SERIES 6 VIDEOSCOPE INDUSTRIAL VIDEOSCOPE

IV6C6-13/20/35/50/75
IV6C6-20/35/50/75
IV7D6X1-26 (NTSC, type, LCD monitor mountable)
IV7D6X2-26 (PAL type)
IV5C6X1-15

Series 6 videoscopes can be used in a wide variety of specialist inspections, including P100 (IV6D6X1-36) and T700/CT-7 (IV6C6X1-15) inspections.
- Five button remote operation.
- Four way angulation
- Slide-Flex (TF) Tube for enhanced insertion.
- Optional detachable centring devices keep the camera head in the centre of the pipe.
- Compacts integrated design with the cable drum and control unit.
- Can be powered by a car cigarette lighter and 12V DC battery.

INDUSTRIAL VIDEOSCOPE

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- Compacts integrated design with the cable drum and control unit.
- Can be powered by a car cigarette lighter and 12V DC battery.
Industrial Videoscopes

IF6PD4 Fiberscope and borescope images can be turned into digital data at 80 AT60S/60S-IV76X1 1.0 3.1

Operating atmospheric pressure: ø 1.0 4~190mm 4 12

An inspection site

C-Mount adaptor

Insertion tube: In air: -25~80 ø 1.85 60

The SX case outer finish is resistant to machine oil, light oil and 5%

Control unit can be removed from case for enhanced portability.

4 20.2mm 1.8

Two components: stay-provided mount for scope eyepiece and

Distance: 1~20mm 11

and very cost effective system.

minute parts. Interchangeability between

Interchangeable with ø 4.4mm scope (without a channel) that enables inspection of

Various working tools available

Versatile tools are available to meet a wide range of inspection requirements such as

The remote control with channel port

Belt holder for hands-free operation

The remote control can be attached to a belt around

Portable package design

An integrated and new design offers superior portability and faster, more efficient set-up andakedown. Removing the

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Model name</th>
<th>Maximum length</th>
<th>External diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>SX Series</td>
<td>MAJ-1244S</td>
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<td>MAJ-1240S</td>
<td>2m</td>
<td>19.0mm</td>
</tr>
</tbody>
</table>

35mm SLR CAMERA

SC35 (Type 15)

By using an optional OM Adaptor, images observed by an Olympus Industrial fibroscope or borescope can be easily photographed with automatic exposure.

For connection of TV cameras to Fiberscopes and Rigid Borescopes.

C-MOUNT ADAPTORS

For connection of TV cameras to Fiberscopes and Rigid Borescopes.

Digital Camera Adaptor

AI-DC3/ AK-DC3

Now you can take advantage of the superior image quality and high resolution of an Olympus CAMEDIA digital camera to document your inspection results. Simply connect the camera to your Olympus Industrial fibroscope or borescope via the AI-DC3 or AK-DC3 digital camera adapter. Images are available immediately and are ready-made for e-mail, insertion into word processor documents, presentations and more.

Endoscopic images can be documented using the high-resolution CAMEDIA digital camera.

Fibroscope and borescope images can be turned into digital data at the touch of a button and downloaded to a PC without having to make prints.

An inspection site's external view can be documented with the camera alone, and the internal view can be documented when the camera is connected to the endoscope.

Industrial Videoscopes
**Viewing Adaptors Specifications**

<table>
<thead>
<tr>
<th>Adapter Name</th>
<th>Angle</th>
<th>Outer Diameter</th>
<th>Length/Magnification</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG-9-90</td>
<td>90°</td>
<td>19.7mm</td>
<td>20.2mm</td>
</tr>
<tr>
<td>AG-8-90</td>
<td>90°</td>
<td>19.7mm</td>
<td>20.2mm</td>
</tr>
<tr>
<td>AG-7-90</td>
<td>90°</td>
<td>19.7mm</td>
<td>20.2mm</td>
</tr>
<tr>
<td>AG-6-90</td>
<td>90°</td>
<td>19.7mm</td>
<td>20.2mm</td>
</tr>
</tbody>
</table>

**POWER SUPPLY UNIT MAJ-522/PSU-PLUS**

The MAJ-522 power supply offers 110/230V auto-switch AC input and has on the rear of the unit x 2 KL connectors and x 2 Hirose connectors for connection and operation of up to 4 Olympus products. The MAJ-522 can be connected to a variety of Olympus products including the LH-2, LV-1, IM-1, MA-1, and IW-1. The MAJ-522 can be mounted into the System Case 2 for maximum system portability. The PSU-PLUS is a multi-input power supply with the same inputs and connections as the MAJ-522 but will add the ability to run both AC and DC input voltage. With a 12V input on the front of the PSU-PLUS, battery products can be connected to the PSU-PLUS and offer stand-alone operation of the System Case 2.

**SPECIFICATIONS**

- **MAJ-522**
  - Input Voltage: 100 to 240V AC
  - Input Frequency: 50/60Hz
  - Rated output: 12V DC 13.3A (DC Output Terminal 1, 2; Max 5A) 12V DC 13.3A (DC Output Terminal 3, 4; Max 10A)
  - Power Consumption: Max 220W
  - Dimensions: 174(W) x 550(D) x 230(H) mm
  - Weight: 2.6kg (5.9lb)

- **PSU-PLUS**
  - Input Voltage: 85-12/170-265V AC (auto voltage select)
  - Input Frequency: 50/60Hz
  - Rated output: 12V DC 13.3A (DC Output Terminal 1, 2; Max 5A) 12V DC 13.3A (DC Output Terminal 3, 4; Max 10A)
  - Power Consumption: Max 220W
  - Dimensions: 174(W) x 550(D) x 230(H) mm
  - Weight: 2.3kg

**Engine Turning Tools**

The Olympus Electronic Engine Turning Tool (OTT) can offer increased speed and efficiency for all internal turbine inspections. Using a simple hand held controller each blade can be precisely positioned for an optimal view, allowing single operator inspections. The Engine Turning Tool is designed to be attached to engines quickly and easily - the engine-specific adaptor connect the drive motor directly to the engine's gearbox and unions turning point or air starter position. Once connected the operator can select rotation speed and direction (forward or reverse). The Olympus Turning Tool is suitable for use on most turbin engines for aerospace and power generation applications.

The Olympus Turning Tool uses an electric stepper motor rather than a compressed air, making its operation precise, quiet and efficient. The range consists of four different models, depending on the specific engine requirements. Features include blade de-identification, an easy to read LED, convenient tool switch, offering hands-free operation and many other specific features, outlined below.

- **OTT-1**
  - This turning tool package is a high specification unit. A complete kit includes a Central Processing Unit, Hand Controller, Foot Pedal, and a Power Supply Unit.
  - Features include blade de-identification, an easy to read LED, convenient tool switch, offering hands-free operation and many other specific features, outlined below.

- **OTT-2**
  - This turning tool is specifically designed for the F100 engine. Features of this unit are the same as those of the OTT-1, but without the video overlay function.

- **OTT-3**
  - The OTT-3 is the most portable turning tool in the Olympus range. The unit is simple yet effective, employing the same engine adaptor as in the OTT-1 system. The use of the same engine adaptor results in a turning tool with flexibility for use with a variety of engine configurations and inspection requirements. The base equipment can be expanded by the addition of further engine adaptors, to make the equipment suitable for use on various engines at little extra cost.

- **OTT-4**
  - The OTT-4 turning tool is a lightweight unit, targeted at specific engines, designed to achieve simple yet efficient engine turning capabilities. Note, however, that there is no compatibility with other turning tools in the Olympus Range.

**3D EYE-TREK**

When the 3D Eye-Trek face-mounted display is connected to the remote control, surface contours that would normally be difficult to detect can be observed in three dimensions where they can be easily interpreted.

**Testing**

Olympus’s stereo measurement technology uses triangulation to measure image information captured by two parallel lenses. With six different measurement modes available, high-precision measurement capabilities are available from any angle.

- **Distance**
  - Measures the total length of a defect or zone of damage.
  - Point-to-Line: Measure the distance between a hypothetical line from the point to the required point.
  - Line: Measure the length of a crack with complicated contours can be measured by pointing two points.

- **Profile**
  - The use of two rays or zones of damage can be measured by two points.

- **Area**
  - Calculates the area of a burn or zone of damage surrounded by multiple designated positions.

- **PC SOLUTION**
  - All aspects of inspection operation can be controlled with a PC connected to IPEX-IV via a USB cable. Stored image data can also be transferred to the PC for more extensive processing and analysis.

- **IPEX Equipment Components and Functions**

- **Database management:**
  - PC SOLUTION includes a database management program with the IPEX-IV and ST-EYE, allowing you to quickly build an inspection database.

- **Remote operation:**
  - IPEX SOLUTION includes a template creation function so you can easily create your own report formats.

- **Send inspection data by e-mail:**
  - IPEX SOLUTION includes a mail function that lets you image data and measurement data by e-mail. This makes it much easier to share data for comprehensive checking and analysis.

**IPEX Optical Adapter Specifications**

<table>
<thead>
<tr>
<th>Adapter Name</th>
<th>Angle</th>
<th>Field of View</th>
<th>Depth of Field</th>
<th>Magnification</th>
<th>Power Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV7650A</td>
<td>120°</td>
<td>9.2~5.9</td>
<td>90~3.1</td>
<td>1.2/2.4x</td>
<td>12V DC 13.3A</td>
</tr>
<tr>
<td>IV7696A</td>
<td>120°</td>
<td>9.2~5.9</td>
<td>90~3.1</td>
<td>1.2/2.4x</td>
<td>12V DC 13.3A</td>
</tr>
<tr>
<td>IV7675A</td>
<td>120°</td>
<td>9.2~5.9</td>
<td>90~3.1</td>
<td>1.2/2.4x</td>
<td>12V DC 13.3A</td>
</tr>
<tr>
<td>IV7635A</td>
<td>120°</td>
<td>9.2~5.9</td>
<td>90~3.1</td>
<td>1.2/2.4x</td>
<td>12V DC 13.3A</td>
</tr>
</tbody>
</table>

**Stereo Measurement Optical Adapter Set Specifications**

<table>
<thead>
<tr>
<th>Adapter Name</th>
<th>Angle</th>
<th>Field of View</th>
<th>Depth of Field</th>
<th>Magnification</th>
<th>Power Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV7650A</td>
<td>120°</td>
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<td>120°</td>
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<td>90~3.1</td>
<td>1.2/2.4x</td>
<td>12V DC 13.3A</td>
</tr>
</tbody>
</table>

**Other parts than above:**

- **LIQUID RESISTANCE:**
  - Can be used in water.

- **GASKETLESS TORSIONAL TENSIONER:**
  - Can be used in oil but cannot be used under water.

- **Non-Waterproof:**
  - Not waterproof nor drip-proof.
## Industrial Videoscopes

### IPELEX SERIES

**INDUSTRIAL VIDEOSCOPE SYSTEM**

**IPELEX 5A** (STEREO MEASUREMENT)

**IPELEX**

A videoscope system that integrates everything you need for industrial endoscopic inspections.

- All-in-one design for easy transport and set up
- Compact, lightweight remote control for single-hand operation
- Four-way joystick-controlled angulation via remote control
- Stepless electronic zoom and variable brightness adjustment functions
- SW image recording, still image and voice annotation recording, and moving image recording
- Six stereo measurement modes
- Scope operation, image recording and management, and measurement can all be done using a PC. You can also create and edit reports, e-mail images and more.
- Ultra-real three-dimensional observation with 3D Eye-Trek

### Ultra-real three-dimensional observation with 3D Eye-Trek

**Six stereo measurement modes**

- NTSC
- PAL

**All-in-one design for easy transport and set up**

- Compact, lightweight remote control for single-hand operation

**Four-way joystick-controlled angulation via remote control**

- Stepless electronic zoom and variable brightness adjustment functions

**SW image recording, still image and voice annotation recording, and moving image recording**

**Six stereo measurement modes**

**Scope operation, image recording and management, and measurement can all be done using a PC. You can also create and edit reports, e-mail images and more.**

**Ultra-real three-dimensional observation with 3D Eye-Trek**

### BASIC PERFORMANCE

**Single-Hand Operation**

IPELEX’s compact, lightweight remote control allows you to operate all inspection related functions with one hand, including insertion tube manipulation, observation, image recording, image management and measurement.

**Stepless electronic zoom**

The stepless zoom enables smooth continuous magnification adjustment from 1X to 20X at the touch of a button on the remote control.

**Optical brightness adjustment**

Various brightness adjustment functions such as gain control, automatic brightness control and extended exposure are available to suit different inspection environments. All of these functions can be operated from the remote control.

**Image recording (IPELEX 5A)**

During observation, you can use the remote control to access the menu screen and record instantly. Still images, with voice annotations and moving images can be recorded on the large-capacity memory card.

**Data management (IPELEX 5A)**

Data management functions such as thumbnail display, folder search and moving, moving and copying images can be operated using the remote control.

### RETRIEVAL TOOLS

Various types of retrieval tools are available which can be used either internally, with 6.2mm or 7.3mm diameter videoscopes and fiberscopes, or externally, using a fixing kit, with instruments of 6mm diameter and above.

For details, consult your local Olympus sales representative.

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**REMOTE CONTROL EXTENSION CABLE** (for IPELEX)

**MAJ-1091** Length: 1m

Extends the remote control cable, allowing more freedom of movement during operation. Attaching this cable and removing the monitor from the monopod allows you to operate the main IPELEX unit while moving freely around a wider area.

Note: The remote control shown in the photograph is supplied as a standard part of the IPELEX system, and is also available as a spare part.

**FIBERSCOPE AND VIDEOSCOPE HOLDER**

The accessory transmits light from a separate light source to a rigid borescope, but is not required for a flexible videoscope or fiberscope. Different types and lengths are available for specific applications.

**LIGHT GUIDE CABLE**

Useful to provide a constant insertion depth of rigid borescopes.

**MULTI-PURPOSE SLEEVE**

A separate holder is available for Series 5 borescopes (KN-29).

**FIBERSCOPE AND VIDEOSCOPE HOLDER**

This accessory enables mounting of a fiberscope’s and Series 6 videoscope’s control section onto commercially available tripods or other similar devices.

For IV6C6, IV8C6, IV7D6, IV6C5-110/160, IV6C5XI, IF8C5: MB-937

For IV6C5 and similar devices:

- IPLEX SA: MAJ-1291 (for 4.4mm dia. insertion tube)
- IPLEX: MAJ-1253 (for 6mm and 6.2mm dia. insertion tube)

Useful as an auxiliary insertion tool and also makes the scope easier to handle. Simply fit and lock the sleeve over the scope insertion tube tip.

**3D EYE-TREK** (for IPELEX)

**FMD-3DN** (NTSC)

**FMD-3DP** (PAL)

Allows you to confirm the conditions of an inspection site with super-real three-dimensional images. 3D Eye-Trek makes it easier to get an accurate sense of distance, also facilitating insertion of the scope and access to the site.

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**INDUSTRIAL VIDEOSCOPE SYSTEM**

**IPELEX SA** (STEREO MEASUREMENT)

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- Scope operation, image recording and management, and measurement can all be done using a PC. You can also create and edit reports, e-mail images and more.

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**ACCESSORIES**

**Narrow insertion tubes**

Narrow insertion tubes are available in six different observation purposes. The IPELEX Series includes the narrow 4.4mm diameter insertion tube.
**Industrial Videoscopes** - Providing comprehensive and remote visual inspection ability, with the highest quality colour images, accurate internal measurement, and PC interaction.

Olympus Videoscopes provide bright, clear, full screen images, and offer the most versatile of inspection tools.

**Ultra-compact CCD for image transmission.**
High-resolution images are displayed on a TV monitor.

The videoscope captures light reflected from a subject through an objective lens and directs it to the surface on the CCD. The CCD then converts the light into electrical signals and transfers this data to the videoscope control unit. The unit then sends a video output to the monitor.

**MAIN APPLICATIONS**
Ideal when higher resolution, longer insertion and brighter images than those obtainable with fibrescopes are required. TV monitor observation only.

For inspecting:
- Inside engines of vehicles, aircraft etc.
- For wide cavities, such as interiors of tanks, structures and large diameter pipes.
- Inside long pipes, such as plant piping and condensers.
- Inside precision machinery, such as fax machines and copiers.

**MAIN FEATURES**

- **Bright, high-resolution images**
  - The bright, high-resolution images captured by the high-performance CCD are larger, clearer and easier to view with full-screen colour display.

- **Interchangeable optical adaptors**
  - You can easily change optical adaptors to suit the observation requirements such as direction of view, angle of view and depth of field.
  - Simultaneous direct and side-viewing and super-wide-angle adaptors are also available.

- **TTF tube with superb insertability and durability**
  - The superior insertability of the Olympus-designed TTF (Tapered Flex) tube allows you to easily negotiate bends. Incorporated in the IPLEX TX/3FG tube, the new TTF (Tough Tapered Flex) tube design features a braided tungsten exterior and is three times more durable than conventional tubes.

- **Observation functions including zoom and brightness adjustment**
  - In addition to zoom observation and various image adjustment functions such as brightness and sharpness adjustment, the IPLEX system offers a convenient comparison function that displays live and recorded images simultaneously.

- **Digital image recording with voice annotation**
  - Digital still and movie image recording provides flexible and powerful image management. Voice annotation recording is also possible.

- **Stereo measurement capability**
  - Up to six different stereo measurement modes are available to facilitate high-precision measurement, including distance, height and depth.

**4 Way Tip Angulation**
- The tip of the videoscope can be moved in four directions, controlled by the user, allowing the negotiation of difficult access routes and scanning during the inspection.
Olympus Industrial Endoscopes meet needs across a wide range of areas, from maintenance to R & D.

Olympus technology has made it possible to obtain views from internal or difficult to reach areas, easily and quickly, without teardown or disassembly, and without destroying exterior features. Olympus Industrial Endoscopes range from videoscopes, fiberscopes and borescopes, with a range of pneumatic, electric, video and hard copy equipment. The scopes, all designed and made by Olympus, offer superior imaging and performance achieved through combining Olympus expertise in optics, electronics and precision mechanics and manufacturing capabilities. With the ease of use and durability of Olympus products, it is clear that Olympus Industrial endoscopes can make a large contribution to productivity, safety and reliability in your industry.

Aerospace Industries
For examination of Airframe and Gas turbines in research, production and maintenance for military and civil aircraft. Also rockets and rocket engines.

Security
For detection of Narcotics and other contraband items, for bomb and weapons searches, and for locating those trapped following disasters.

Power Generation
For maintenance of heat exchange pipes, condensers, piping and turbines at nuclear, fossil fuel and hydroelectric power generation facilities.

Industrial Machinery
For quality control and maintenance of motors, boilers, heat exchangers and machine tools.

Refineries/Chemical Plants
For routine and urgent inspection of process piping, pressurised storage reservoirs, heat exchangers, boilers etc.

Automotive
For quality control examinations of engines, hydraulic components and injection nozzles, as well as detection of leaks, squeaks and rattles in assembled vehicles.

Electrical Equipment/Electronics Industries
For monitoring operation of equipment and factory automation through automatic inspection and positioning, as well as a wealth of R & D applications.

Gas Pumping & Delivery Systems
For monitoring corrosion inside and outside gas pipes, the presence of water infiltration and flaws in outlets, and for maintenance of gas turbines used for pumping.

Steel Industries
For equipment maintenance as well as quality control of pipes and tubes.

Architecture/Construction
For examination of walls, ducts, structural joints, as well as for viewing inside architectural models.

Education/Research
For monitoring animals and insects, root systems of plants etc. Also for historical and archaeological applications such as internal inspection of statues and tombs.

Railroad/Shipping
For routine inspection of motors, turbines, diesel engines, piping etc.

Water Supply/Drainage
For locating rust and blockages inside pipe systems. Useful for documentation before and after lining is coated.