OLYMPUS®

Your Vision, Our Future

IPLEX FX

iPLEX

Image-quality, Durability, and Functionality
Beyond Your Expectations

A Revolution in Remote Visual Inspection has arrived…

Introducing a videoscope system that combines portability with performance; modularity with reliability; simplicity with advanced functionality; ease of use with durability. Only one product does this — the IPLEX FX.

Rugged and Durable

Go Anywhere… Use Anywhere

Ease of Use

IPLEX FX

See Clearly and Accurately

Versatile Image Management

Multi Purpose Operation

1 Rugged and Durable

Designed to withstand the bumps, drops and falls of the everyday industrial workplace.

The IPLEX FX introduces new levels of durability to industrial videoscopes with its shock-resistant case design and wear-resistant scope exterior. Adding "strength-of-construction" to a frequently used, job-essential tool produces one tough, reliable and long-lasting piece of industrial inspection equipment.

Cast Magnesium-alloy Chassis for Impact Resistance

The main component of the IPLEX FX base unit chassis is magnesium — renowned for its strength and light weight. A typical material used for industrial environment equipment, magnesium was chosen to provide the impact resistance and solid base that withstands the knocks and bumps that commonly occur to industrial videoscopes. In addition to a crush-resistant chassis each corner is protected by rubber bumpers, further softening a drop and maximising product reliability while reducing potential for damage. The IPLEX FX survived the repetitive 4-foot drop test for compliance to MIL-STD 810G.*

The chassis corners are protected by rubber bumpers to reduce the impact force created by the typical bumps and knocks of an industrial workplace.

The crush resistant cast magnesium chassis is the core of the IPLEX FX mechanical design strength. The extra durability in construction results in extra protection against equipment damages.

*Military Standards (The United States Defense Standard) is used to help achieve standardisation objectives by the U.S. Department of Defense.

Abrasion Resistant Insertion Tube

The most critical component of any remote visual inspection tool is the insertion tube. It performs the basic requirement of accessing the inspection area and frequently navigating through narrow paths with abrasive and rough surfaces. The IPLEX FX insertion tube is the latest Olympus IPLEX design, with enhanced crush protection and fray resistance. Strength was added to the insertion tube without compromising the flexibility and ability to navigate through the most difficult inspections. As with all of our IPLEX products, the IPLEX FX is designed with the Olympus Tough TaperFlex graduated stiffness design for maximum scope flexibility towards the scope end. The IPLEX FX scope unit is available in three insertion tube diameters: 6.0 mm, 4.0 mm and a 6.2 mm model with internal working channel.*
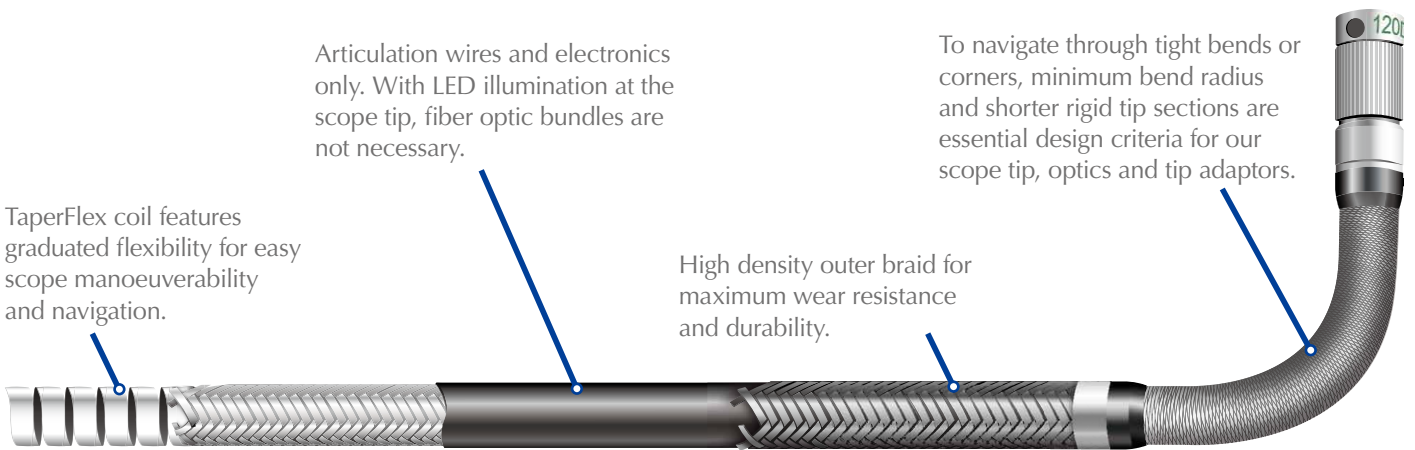
Articulation wires and electronics only. With LED illumination at the scope tip, fiber optic bundles are not necessary.

To navigate through tight bends or corners, minimum bend radius and shorter rigid tip sections are essential design criteria for our scope tip, optics and tip adaptors.

TaperFlex coil features graduated flexibility for easy scope manoeuverability and navigation.

High density outer braid for maximum wear resistance and durability.

*IPLEX scope diameters are specified as the minimum ring gauge diameter that the scope can pass through.

2 Go Anywhere… Use Anywhere

Rain, desert sand, dusty workshop, or even just a spilt drink. The IPLEX FX is designed to operate in the most demanding (or not-so-demanding) environments.

The simplicity and portability of Olympus videoscopes has seen their usage extend to areas not considered 'traditional' application areas. Go to these harsher environments, but take a system designed for the job… IPLEX FX.

True Portability — Compact, Lightweight, Battery-powered

Power is provided to the IPLEX FX by an internally mounted, Lithium-ion battery which provides over two hours run-time. The compact size of the IPLEX FX makes portable operation a reality — either body-wear the lightweight system or place it on a surface and allow the non-slip, rubber corners to hold it in place while you carry out your inspections.

Temperature Resistance

The IPLEX FX scope units are resistant to insertion in higher temperature environments — now 100° C meaning that inspections can take place sooner as you won't need to wait as long for the area to cool. Additionally, a temperature sensor provides a two-stage visual warning in order to prevent overheating.

High temperature warning display

Resistance to Harsh Environments

To prevent the ingress of debris, all mechanical joints are hermetically sealed and input/output connectors are covered.
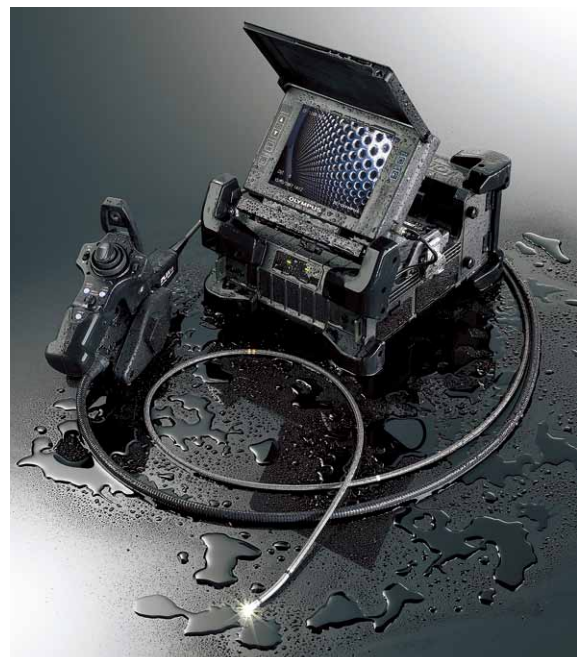
MIL STD COMPLIANT

IPLEX FX complies with internationally recognised Military Standards.* This compliance assures a greater level of environmental performance than regular industry standards and provides increased reliability against dust and fluid.

The inventive design of the FX has removed the need for a cooling fan, and therefore no air intake is required. This results in even greater environmental resistance.

IP55 water resistance testing

IPLEX FX under dust resistance testing

＊Military Standards (The United States Defense Standard) is used to help achieve standardisation objectives by the U.S. Department of Defense. Reference page 17 for MIL-STD compliance details.

3 See Clearly and Accurately

See the smallest details to make the best, most informed decisions — image quality that is synonymous with the Olympus name.

With our leading-edge optical and imaging technology, Olympus understands what is needed to deliver accurate and colour-rich images. This experience continues to be transferred to industrial inspection equipment.

Daylight-view High Resolution LCD Monitor

Clear observation in direct sunlight is made possible with the new 6.5-inch daylight-view LCD monitor — the minimum recommended screen size for accurate and reliable observation of fine detail. Colour reproduction and contrast are maintained, ensuring inspections are not compromised when working outdoors. The environmental resistance of the LCD also matches that of the IPLEX FX system.

6.5"
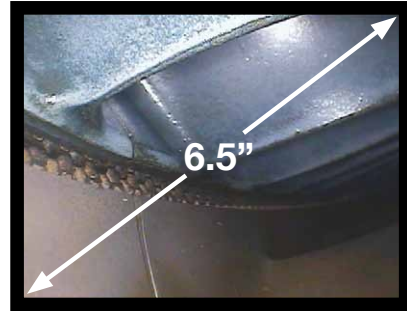
Optimised Images with Interchangeable LED Tip Adaptors

To provide high quality, faithfully reproduced images and accurate colour, the IPLEX FX features an outstanding optical system, noise reduction and our unique WiDER™ (Wide Dynamic Extended Range) image processing technology. WiDER™ delivers bright, contrast-balanced images across the entire depth of field.
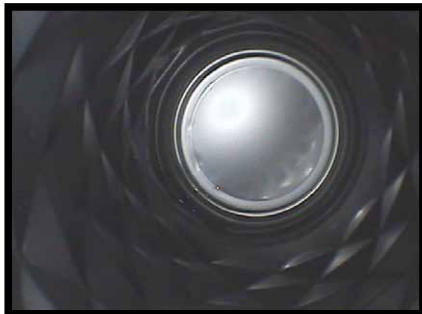

WiDER

Image at standard gain setting.

Image with WiDER™ gain applied. WiDER™ gain brightens the darker areas while maintaining the light level and details shown in the bright area.

New LED Illumination with SmartTip™ Optical Adaptors

Now the light source is in the SmartTip™ optical adaptor with LED's providing illumination, meaning lamp changes are no longer required. This revolutionary new design contributes to reduction in overall system size and power consumption, while maintaining the ability to change direction of view and field of view. This design applies to SmartTip™ optical adaptors for both standard inspections and Stereo Measurement for all three insertion tube diameters. Additionally, Hi-Beam mode boosts illumination up to 2x for expanded inspection capability.

4 Multi Purpose Operation

A wide variety of scopes and a feature-rich system increase your inspection capabilities.

The IPLEX FX can perform almost any kind of inspection thanks to a wide range of interchangeable scopes, including models up to 18 m long and one with a working channel. More than just another inspection tool, the IPLEX FX is a reliable, feature-rich system capable of precise, real-time measurement and foreign object retrieval.
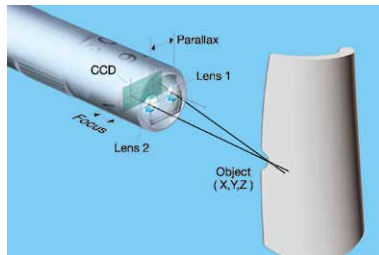
Measurement Accuracy

The IPLEX FX uses Stereo Measurement technology for easy defect measurement at any target angle. With the addition of the unique Multi and Offset Measurement modes, the IPLEX FX offers a more intuitive measurement environment with eight different modes for accurate evaluation of most inspection targets. Multi Measurement mode is a quick two-point defect identification technique that simultaneously calculates point-to-line, area and distance results. Stereo Measurement tip adaptors are available in direct and side view models for all three insertion tube diameters.

Multi Measurement mode

IPLEX FX Stereo Measurement Modes

- Distance
- Point-to-line
- Depth
- Area
- Lines
- Profile
- Multi
- Offset

Mechanism of Stereo Measurement

Our unique Spot-Ranging™ feature is the industry's only real-time tip-to-target distance measurement tool. As a rule, a videoscope's measurement accuracy depends on the scope's distance from the target. With the IPLEX FX, the user can easily determine whether the scope tip is close enough to calculate the most accurate measurement on the first try.

Interchangeable Scopes

The IPLEX FX offers a range of interchangeable scopes, allowing you to choose the right one to fit the job. This means a single IPLEX FX can be configured for a variety of inspections. Scopes are available in diameters of 4.0 mm and 6.0 mm and in various lengths ranging from 2 m to 18 m.

Foreign Object Retrieval

Adding to the array of versatile IPLEX FX benefits is a 6.2 mm diameter scope featuring an internal working channel. Six retrieval tools allow you to remove foreign objects from inside inspection areas — ideal for helping avoid costly overhauls — and perform hook and drag inspections in engines. Both forward and side view Stereo Measurement tip adaptors are also available with the working channel scope, providing a complete inspection solution.
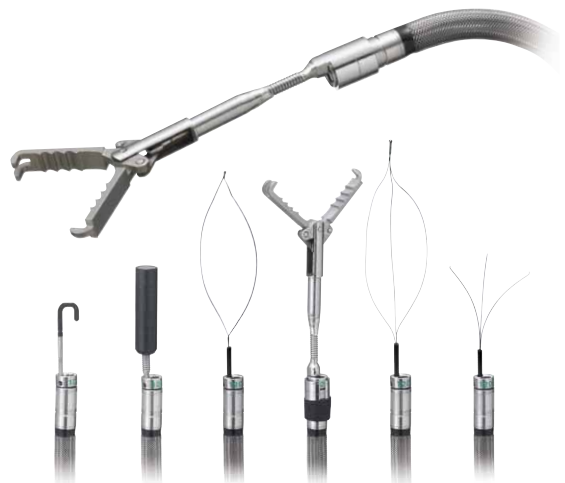
5 Versatile Image Management

Archiving, reporting and sharing inspection results made quick and simple.

These days, inspections don't end when you've packed up your videoscope. It's just the beginning. The IPLEX FX is equipped with an array of recording options and external interface solutions for a seamless transition to post-inspection analysis and archiving.

ImageNotepad™ for Extended Image Annotation

Information frequently needs to be added to videoscope images to aid post-inspection diagnosis and create reports. IPLEX FX makes this process an integral part of inspections with easy-to-use ImageNotepad™. Fields for titles and text are available for entering key words and phrases to allow extended descriptions of inspected objects. Additionally, text input is simplified by display of a list of predicted words each time a letter is entered. This valuable information is immediately accessible as part of each image when inspection data is transferred to a computer.
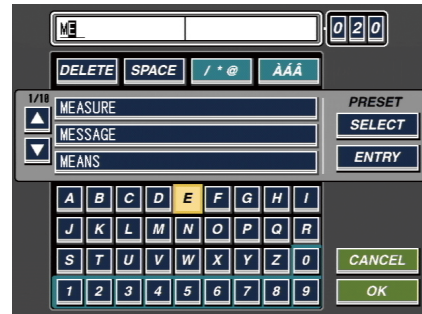
Inspection Recording Options

Archiving, sharing and reporting inspection results are made simple with the IPLEX FX. It features still image and movie recording to internal memory, removable compact flash cards or USB flash drives. Due to the rigours of the industrial inspection workplace, the IPLEX FX is designed to store images on solid-state media devices, ensuring that valuable data is not lost due to the instability of storage media with movable parts. All file formats are Windows-compatible (still format: JPEG, TIFF; movie format: AVI) and can be easily used in reports or attached to e-mail for instant sharing of inspection results. The IPLEX FX is also compatible with other recording devices via S-video and composite video outputs. For more efficient on-site viewing, the IPLEX FX's movie viewing functions now include pause, fast-forward and rewind.

S-video output

BNC output

CF Memory Card   USB Flash Memory

InHelp™ Inspection Assist Software

InHelp, the optional inspection data management and reporting software streamlines many aspects of remote visual inspections with the IPLEX FX. The software greatly improves work efficiency and simplifies inspections by organising stored images on the IPLEX FX and generating detailed inspection reports on a PC with simple click-operation.

Wireless LAN
Capability Ready

Confirmed with Toshiba
FlashAirWireless LAN SD card

6

Ease of Use

Built to fit our customer's needs, simplicity was a key element to the overall design of the IPLEX FX system.

With the IPLEX FX quick access control buttons and intuitive software menu, inspectors of all skill levels can easily utilise the advanced software features that produce accurate and confident inspection results.

TrueFeel™ Scope Tip Articulation

The IPLEX FX features TrueFeel™ scope tip articulation for power-assisted manual articulation and precision control. With instant movement and accurate feel, the user takes full control of the scope position resulting in easier and faster inspections.

SmartTip™ Automatic Recognition Technology

The IPLEX FX introduces the industry's first intelligent tip adaptors. SmartTip™ optical tip adaptors are uniquely identified, allowing instant system settings change to match the tip adaptor optics and features without the need for manual user selection.

Quick-access Hot Buttons

The all-new controller maximises the use of buttons, levers and joysticks for quick access to all essential menu functions. Image enhancements, recording buttons and measurement features are among the many basic-to-advanced features that are at the tips of your fingers.

Dual Recording Button

The FRZ/REC button located on both sides of the IPLEX FX controller accommodate both left-handed and right-handed users.

One-handed Scope Control and Interface

The ergonomic 750g scope handset is comfortable to use even during prolonged inspections and provides quick access to all frequently used menu commands. The unique IPLEX FX dual joystick design separates tip articulation and menu navigation, providing a more intuitive and comprehensible interface.

IPLEX FX Features and Specifications

SCOPE UNIT

Model No.	IV8420	IV8435	IV8620	IV8635	IV8650	IV8675	IV86120[*1]	IV86180[*1]	IV8635X1
Scope diameter	φ4.0 mm		φ6.0 mm						φ6.2 mm
Scope length	2.0 m	3.5 m	2.0 m	3.5 m	5.0 m	7.5 m	12.0 m	18.0 m	3.5 m with working channel
Exterior	High durability tungsten braid								
Tube flexibility	Uniformed stiffness		Tapered Flex™ tube with flexibility gradually increasing toward the distal end.				Uniformed stiffness		Tapered Flex™ tube with flexibility gradually increasing toward the distal end.
Articulation angle UP/DOWN/RIGHT/LEFT	130°		150°	130°	110°	90°	70°	50°	120°
Approx. weight	1.7 kg	1.9 kg	1.7 kg	1.9 kg	2.0 kg	2.2 kg	2.6 kg	3.1 kg	1.9 kg
Articulation mechanics	TrueFeel™ scope tip articulation with electronic power-assisted, manual articulation								
Temperature sensor	2-stage indicator for high temperature warning								
Illumination	Multiple ultra-high intensity LEDs, 2-stage setting for extra-bright illumination								
Optical Tip Adaptor Identification	SmartTip™ automatic recognition technology								
Optical Tip Adaptor Locking Mechanism	Double threaded attachment with O-ring seal								

Handheld control unit		
	Dimensions	311 x 93 x 192 mm 365 x 93 x 192 mm
	Weight	Approx. 750g
	Quick access buttons	The following features have dedicated quick access buttons, levers or joysticks on the hand control unit: Live mode, WiDER™ Gain Control, Brightness, Zoom, Freeze Image, Record Still/Video, Articulation Control, Articulation Lock, Menu Access, Saved Recording Index Access, Quick Last Image Recall.

*1. Built-to-order

BASE UNIT

Model No.	IV8000-2
Dimensions (W x D x H)	250 mm x 160 mm x 285 mm
Approx. weight (with battery)	4.9 kg
LCD monitor	6.5-inch daylight-view LCD, anti-reflective type
Power supply	Internal battery: 14.8 V nominal, 150-minute operating time AC power: 100 V to 240 V, 50/60 Hz (with supplied AC adaptor)

Hardware connectors		
	Video output	S-Video, Composite BNC
	Audio input	External microphone, 3.5 mm mono jack
	Auxiliary connector	Two-way communication connector
	USB	One USB connector

Software controls		
	Image controls	3X digital zoom, 9 step digital brightness control, 5 step contrast adjustment for frozen and retrieved images
	Adjustable gain control	4 step adjustable gain control with exclusive WiDER™ brightness level balancing technology.
	Exposure control	Adjustable CCD exposure time. PAL: 20 ms to 500 ms, NTSC: 17 ms to 500 ms
	Colour enhancement	Monochrome mode or Colour Emphasis of red, blue or all primary colours

Recording management		
	Recording media	Compact Flash card (1 GB standard, compatible with recommended Compact Flash cards up to 4 GB). USB Flash Drive recommended.
	Internal memory	1 GB standard
	Image management functions	Search by date, Live/Saved image comparison
	Overlay	30-character title with date, time and system settings. ImageNotepad™ allows up to 10 descriptions to be added to an image, displayed by categories and contents.
	Thumbnail image display	Recorded images can be displayed as thumbnails.
	Still image recording	Resolution (pixel) -- NTSC: 640 x 480, PAL: 768 x 576
		Recording format -- JPEG: Super high quality, high quality, standard quality, TIFF: Uncompressed (for Stereo Tip Adaptors only)
	Video recording	Resolution (pixel) -- NTSC: 320 x 240/640 x 480, PAL: 384 x 288/768 x 576
		Recording format -- AVI format, Motion JPEG compression, Windows Media Player compatible
	Audio recording	Recording format -- WAV format, 60 sec max.

Stereo measurement		
	Distance	Distance between two points.
	Point-to-Line	Perpendicular distance between a point and a user-defined line.
	Depth	Orthogonal depth/height distance between a point and a user-defined plane.
	Area/Lines	Multiple point circumference and area measurement
	Profile	Plot of cross section between two points
	Multi	Multiple measurements (distance, point-to-line, area and line) between two points
	Offset	Point-to-Line measurement with a parallel line passing on a measurement point

Scaler measurement	Distance between two points based on a known measurement in the same plane.

OPERATING ENVIRONMENT

Operating temperature	**Insertion tube**	In air: -25 to 100°C, In water: 10 to 30°C
	Other parts	In air: -21 to 49°C
Relative humidity	**All parts**	15 to 90%
Liquid resistance	**All parts**	Operable when exposed to machine oil, light oil or 5% saline solution.
Waterproofing	**Insertion tube**	Operable under water with viewing tip adaptor attached.[1] Not operable underwater with stereo measurement tip adaptors. Water pressure resistance: IV84 series: Up to an equivalent to 3.5 m in depth IV86 series: Up to an equivalent to 7.5 m in depth
	Other parts	Operable in blowing rain conditions (Battery compartment must be closed). Not operable underwater.

*1. Excluding IV8675X1

MIL-STD COMPLIANCE
The operating environment performance is confirmed by the following MIL-STD-810F/G and MIL-STD-461F under battery operation.

Type	Method
Vibration	MIL-STD-810F, Method 514.5, Procedure I
Shock (Drop)	MIL-STD-810G, Method 516.5, Procedure IV
Rain and Blowing Rain	MIL-STD-810F, Method 506.4, Procedure I
Humidity	MIL-STD-810F, Method 507.
Salt Fog	MIL-STD-810F, Method 509.4.
Blowing Dust	MIL-STD-810G, Method 510.4, Procedure I
Icing/Freezing Rain	MIL-STD-810F, Method 521.2.
Electromagnetic interference (EMI)	MIL-STD-461F, RS-103, (Radiated susceptibility test for non-metallic below deck shipboard conditions).
Explosive atmosphere[1]	MIL-STD-810F, Method 511.4, Procedure I

*1. IPLEX FX is not explosion-proof.

Tip Adaptor Optical Specifications

OPTICAL TIP ADAPTOR VARIATION

		6.0 mm Viewing Tip Adaptors							
		AT40D-IV86	AT80D/NF-IV86	AT80D/FF-IV86	AT120D/NF-IV86	AT120D/FF-IV86	AT80S-IV86	AT120S/NF-IV86	AT120S/FF-IV86
Optical system	**Field of view**	40°	80°		120°		80°	120°	
	Direction of view	Forward					Side		
	Depth of field	200 to ∞ mm	8 to ∞ mm	35 to ∞ mm	4 to 190 mm	25 to ∞ mm	18 to ∞ mm	1 to 25 mm	5 to ∞ mm
Distal end	**Outer diameter**[*1]	ɸ6.0 mm							
	Distal end[*2]	19.8 mm					25.2 mm		

		4.0 mm Viewing Tip Adaptors			
		AT120D/NF-IV84	AT120D/FF-IV84	AT120S/NF-IV84	AT120S/FF-IV84
Optical system	**Field of view**	120°			
	Direction of view	Forward		Side	
	Depth of field	4 to 190 mm	25 to ∞ mm	1 to 20 mm	6 to ∞ mm
Distal end	**Outer diameter**[*1]	ɸ4.0 mm			
	Distal end[*2]	19.7 mm	19.6 mm	22.2 mm	

		6.2 mm Viewing Tip Adaptors			
		AT120D/NF-IV86X1	AT120D/FF-IV86X1	AT80S-IV86X1	AT120S-IV86X1
Optical system	**Field of view**	120°		80°	120°
	Direction of view	Forward		Side	
	Depth of field	4 to 190 mm	25 to ∞ mm	18 to ∞ mm	6 to ∞ mm
Distal end	**Outer diameter**[*1]	ɸ6.2 mm			
	Distal end[*2]	20.6 mm	20.5 mm	24.7 mm	

		Stereo Tip Adaptors (4.0 mm, 6.0 mm and 6.2 mm)					
		AT50D/50D-IV84	AT50S/50S-IV84	AT60D/60D-IV86	AT60S/60S-IV86	AT60D/60D-IV86X1	AT60S/60S-IV86X1
Optical system	**Field of view**	50°/50°		60°/60°			
	Direction of view	Forward/Forward	Side/Side	Forward/Forward	Side/Side	Forward/Forward	Side/Side
	Depth of field	5 to ∞ mm	4 to ∞ mm	5 to ∞ mm	4 to ∞ mm	5 to ∞ mm	4 to ∞ mm
Distal end	**Outer diameter**[*1]	ɸ4.0 mm		ɸ6.0 mm		ɸ6.2 mm	
	Distal end[*2]	25.0 mm	28.8 mm	25.9 mm	32.2 mm	25.9 mm	32.9 mm

*1. The adaptor can be inserted into a ɸ4.0 mm, ɸ6.0 mm or ɸ6.2 mm hole when it is mounted on the scope.
*2. Indicates the length of the rigid portion at the scope's distal end when mounted.

Accessories

Rigid sleeve sets
MAJ-1737
(for 4.0 mm dia. insertion tube)
MAJ-1253
(for 6.0 or 6.2 mm dia. insertion tube)

Rigid sleeve sets are available for 6.2 mm, 6.0 mm and 4.0 mm scopes. Each set consists of three rigid sleeves — 250 mm, 340 mm and 450 mm lengths.

Handheld controller holder
MB-937

Allows the controller to be affixed to a tripod, making it useful for prolonged inspections.

Optical tip adaptors
The IPLEX FX has a complete and comprehensive range of tip adaptors to meet the optical requirements of any application.

Guide tube for inspection of JT8D engines
Provides a second movable joint for incredibly flexible control, which is ideal for inspecting the combustion chamber of JT8D engines. Available on the 2 m and 3.5 m scopes.

Note: Pratt & Whitney approved for JT8D engine inspection.

Retrieval tools
An assortment of versatile tools is available to remove foreign objects and facilitate inspections of complicated engines.
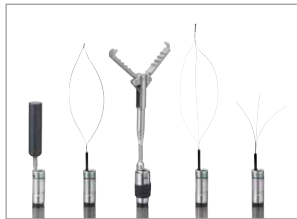
Magnet Snare Alligator Basket Grasper

Guide tube for long scope
MAJ-1824-50 (for IV8650)
MAJ-1824-75 (for IV8675)
MAJ-1824-120 (for IV86120)
MAJ-1824-180 (for IV86180)

Protects the scope and assists in smooth entry when inserting it into a wide pipe. Available on scopes in lengths from 5 m to 18 m.

Lithium-ion battery
NP-L7S
Battery charger
JL-2PLUS/OL-0 (115 V type)
JL-2PLUS/OL-1 (220 V type)

The carrying case is designed to carry one battery charger and two batteries. With a full set of batteries, the IPLEX FX system is ready for inspection anywhere, anytime.

www.olympus-ims.com

For enquiries-contact
www.olympus-ims.com/contact-us

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