

# OLYMPUS®

Your Vision, Our Future

Industrial Videoscope

## IPLEX LX IPLEX LT



# Versatile conveying videoscopes: Compact, Tough, Easy-to-Use, and Feature Rich.

Combining superb ease of use with outstanding functionality, the IPLEX LX and LT provide accurate and advanced inspections, allowing smooth operation regardless of the user's experience level.



# IPLEX LX

# IPLEX LT

## A winning combination you expect from an IPLEX

A trusted leader in the industrial endoscope market, Olympus presents the IPLEX LX and LT, setting a new standard for small, lightweight videoscopes. The compact package includes features such as a 6.5 in. daylight-view monitor and interchangeable tip adaptors. Advanced options such as WiDER™ image processing, SmartTip™ technology, and Stereo Measurement are also available on the IPLEX LX.



### Convenient Portability

- Compact and lightweight
- Robust main unit
- Integrated carrying handle / stand
- Li-ion battery or AC operation



### Unsurpassed Ease of Use

- Multi-positioning design
- Ergonomic handset, weighing just 750 g (1.7 lb)
- TrueFeel™ precise scope tip articulation
- Quick-access menu buttons
- Intuitive icon-based menu commands



### Rugged Durability

- MIL-STD and IP55 environmental compliant
- 1.2 m (3.9 ft) drop survivability
- New high-durability insertion tube braid
- 100 °C (212 °F) capable insertion tube with temperature alert\*



### Exceptional Functionality

- Large 6.5 in. VGA daylight-view monitor
- Advanced WiDER™ image processing\*
- SmartTip™ Technology\*
- Interchangeable LED tip adaptors
- Still and movie image recording to USB flash drive
- Available Stereo Measurement option\*

\*IPLEX LX only



## Convenient Portability

Equipped with a removable Li-ion battery, the IPLEX LX and LT are ready for use wherever the inspection takes place. Whether the operator is crawling in confined spaces or working stationary in an aircraft hangar, the IPLEX LX and LT keep the size small without sacrificing features or functionality.

## Compact and Lightweight

The IPLEX LX and LT weigh just 2.7 kg (6.0 lb), including the two-hour running time Li-ion battery. They can be worn or carried with ease and set up almost instantly. The complete system, including all accessories and carrying case, is easily transported to job sites and small enough to fit in the overhead compartment of most aircraft.



## Small Size, Large Monitor

Despite being only 227 mm (8.9 in.) wide and 189 mm (7.4 in.) tall, the IPLEX LX and LT integrate a surprisingly large 6.5 in. monitor for exceptional visibility, whether at arm's length or across a workbench. At less than 100 mm (3.9 in.) thick including the pivoting handle/stand, the IPLEX LX and LT can be worn, stand upright, or be fastened to a tripod or mounting arm for operation in practically any environment.



## Unsurpassed Ease of Use

With their intuitive icon-based menu system, the IPLEX LX and LT require minimal or no training and can be easily operated by users of any experience level. Almost every menu and feature can be accessed by a maximum of three presses on the quick-access control buttons. And the TrueFeel™ scope tip articulation achieves easy and precise control.



## Choice of Connection and Positioning

The handheld controller can be operated either independently or attached to the main unit during inspections, offering a versatile choice of operation. The stand-alone monitor can always be positioned for optimum viewing and is also convenient for group inspections and training.



## Innovative Features at Operator Fingertips

The ergonomic lightweight handset with TrueFeel™ articulation control has been engineered for comfortable operation even during prolonged inspections. The user can operate diverse functions and scope tip articulations easily, quickly, and precisely. The controller maximizes the use of buttons, levers, and joystick for quick access to all essential menu functions. Image enhancements, recording buttons, and measurement capabilities are among the many basic-to-advanced features at the operator's fingertips.



## Intuitive Icon-Based Menus

The IPLEX LX and LT feature a simple menu, utilizing intuitive, internationally recognized icons that make it easy for the operator to quickly choose the right menu option. Navigation is simplified by a dedicated joystick, which functions independently from the scope tip articulation.





# Rugged Durability

The durability and environmental resistance of the IPLEX LX and LT provides exceptional reliability even in the harshest environments. Whether you're conducting inspections outdoors in a variety of weather conditions, in a dusty or sandy climate, or in manufacturing areas, you can depend on the IPLEX LX and LT to function reliably in any surroundings.

## All Weather Resistance

You can confidently bring the IPLEX LX and LT to almost any difficult environment. They can be used in rain, sand, and dust, and withstand physical shocks caused by drops and falls, ensured by IP55 and MIL-STD compliance. With its low-reflection display, the daylight-view monitor reproduces clear, vivid images even under the brightest sunlight.



## Impervious to Environmental Hazards

Complying with internationally recognized military standards (MIL-STD-810G / MIL-STD-461F)\*, the IPLEX LX and LT pass a wide variety of environmental hazard tests, including blowing rain, humidity, salt fog, sand and dust, icing/freezing rain, and explosive atmosphere. They also withstand rough treatment such as vibration and being dropped from heights up to 1.2 m (3.9 ft).

\*Reference page 15 for MIL-STD compliance details



## Resistance to High Temperatures and Abrasion

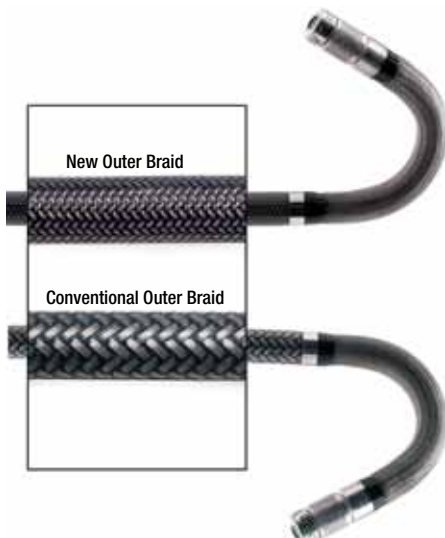
The insertion tubes of the IPLEX LX\*\* withstand temperatures up to 100 °C (212 °F). A high-temperature sensor cautions with an audible beep and displays a visual warning if the scope is in danger of becoming overheated.



The crush-proof insertion tubes of the IPLEX LX and LT are equipped with an innovative fine mesh tungsten outer braid that results in outstanding abrasion resistance. The tube's strength combined with its flexibility allows operation in the most difficult and hazardous inspection areas.

The IPLEX LX and LT are designed with the unique Tapered Flex™ achieving superb scope maneuverability with optimized stiffness and flexibility. In addition, the increased stiffness of the new 8.5 mm scope allows it to be easily pushed deep into an inspection area without the use of a guide tube, making it ideal for long pipe inspections.

\*\* The IPLEX LX IV88100L1 withstands temperatures up to 80 °C (176 °F).





## Exceptional Functionality – Viewing Capability

Building on decades of experience in optical imaging, the innovative IPLEX LX and LT design provides superb image quality of inspected objects.

### Excellent color reproduction and superb clarity

The industry-leading 6.5 in. daylight-view monitor is larger than comparable videoscopes on the market, always allowing for a comfortable viewing position and convenience for group viewing. Superb image clarity permits the accurate detection of very small defects.

ACTUAL SIZE





## Clear, Crisp Images

The IPLEX LX features our unique image processing capability, WiDER™ (Wide Dynamic Extended Range). This innovative technology brings out detail in shadowed and highlighted areas to produce bright, contrast-balanced images across the entire depth of field.



Image at standard gain setting



With WiDER™ gain applied

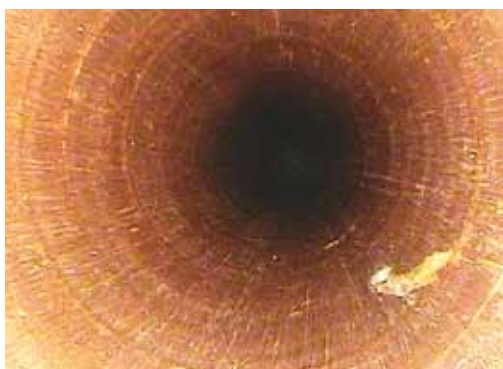


## Ultra-Bright, Interchangeable LED Tip Adaptors

For optimum magnification and direction suitable for a variety of inspection environments, the IPLEX LX and LT offer a comprehensive range of interchangeable optical adaptors. The integrated LED illumination system brightly light targets. For inspection of large voids where plenty of light is required, the 8.5 mm scope is an ideal solution. Fitted within the scope tip, it delivers vivid illumination regardless of scope length and eliminates the need for a fiber light guide.

In addition, the IPLEX LX is equipped with Hi-Beam mode boosting illumination up to 2X for expanded inspection capability, and the SmartTip™ automatic recognition function. Our unique SmartTip feature installed in optical adaptors permits recording of the adaptor information, along with captured images for inspection traceability.

## Diverse Applications



Heat exchanger



Gas turbine blade



Wind turbine gear box



Automotive part

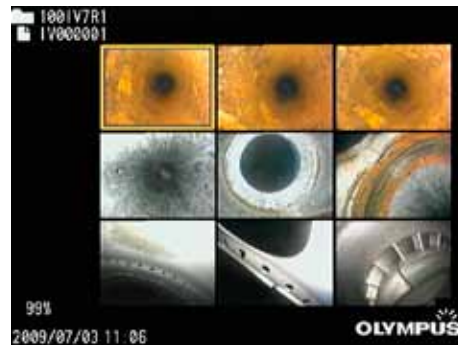
# Exceptional Functionality – Image Management

The versatile IPLEX LX and LT offer far more than just on-site inspection. From image archiving to defect measurement and image management on a PC, post inspection tasks are made easier after returning from the inspection site.

## High-Quality Images and Movies

The IPLEX LX and LT feature high-quality JPEG still images and MPEG-4 movies that record into a removable USB flash drive. Saving or retrieving images requires only a single button press, and the thumbnail view makes it easy to instantly review the inspection results.

Never before has a compact videoscope system offered such high-quality recording while retaining ease of use.



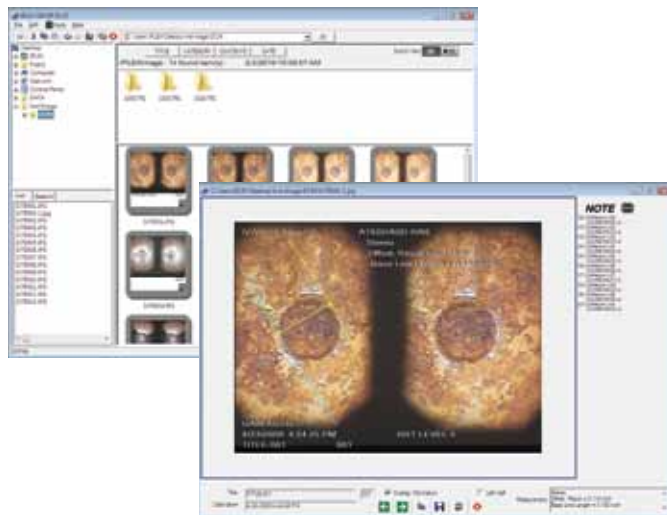
## Title Input Function

For off-site inspection efficiency and report generation, the IPLEX LX and LT let you quickly and easily input titles in captured images. You can quickly identify the inspection location or result through the title to assist in archiving images.

## Post-Inspection Image Management

IPLEX Viewer Plus software features image data management and precise measurement of objects in recorded images. Available from our website free of charge, it's the ideal tool for remote users to re-measure or validate existing saved measurement results.

In addition, IPLEX Viewer PRO is now available as an option. This advanced software features information editing and report generation, enabling you to efficiently prepare inspection reports.



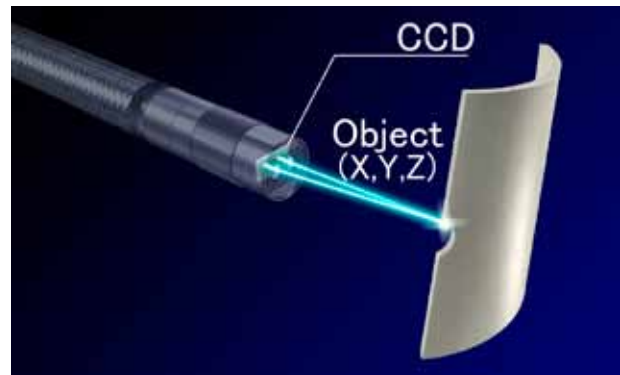
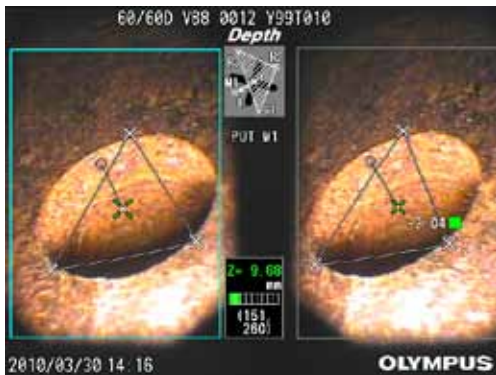
## Protection for Interior Components

The main unit's removable USB flash drive and Li-ion battery are contained inside a latched, sealed compartment for protection against environmental hazards and rough treatment.



## Proven Stereo Measurement

Our advanced Stereo Measurement technology offers outstanding reliability and accuracy for your inspections. By capturing image information through two parallax lenses, the IPLEX LX permits accurate measurement of almost any object from any angle.



## Accurate Measurement on the First Try

The measurement accuracy of a videoscope is greatly affected by the scope's tip-to-target distance. Our unique Spot-Ranging™ feature on the IPLEX LX, the industry's only real-time tip-to-target distance measurement tool, navigates the scope tip to the optimum distance from a target. The operator can then easily determine whether the tip is close enough to calculate the most accurate measurement on the first try.



# Accessories

The IPLEX LX and LT offer a number of complementary accessories, some included with the system and others available as options.

Standard case for the IPLEX LX/LT. Long Scope is supplied with an exclusive carrying case.

**Lithium-ion Battery\***  
**NC2040OL24 Battery charger\***  
**CH5000C (USA type) /**  
**CH5000X (European type)**  
 The battery provides long-lasting operations.

**Handheld Controller**  
**Holder\* MB-937**  
 Allows the controller to be affixed to a tripod, making it useful for prolonged inspections.

**Guide Tube for 6.0mm diameter Long Scope\***  
**MAJ-1825-75**  
 Protects the scope and assists in smooth entry when inserting it into a wide pipe. Available on the 6.0 mm diameter scope in 7.5 m length.

## Rigid Sleeve Sets\*

**MAJ-1253 (for 6.0 mm insertion tube)**

**MAJ-1737 (for 4.0 mm insertion tube)**

Sets are available for 6.0 mm and 4.0 mm scopes. Each set consists of three rigid sleeves of 250 mm (9.84 in.), 340 mm (13.38 in.) and 450 mm (17.71 in.) lengths.

## AC Power Adaptor

The IPLEX LX and LT can be operated with either the provided AC power adaptor or the battery.

## Carrying Case

Carrying case shown is included with the 2.0 and 3.5 m videoscopes. A carrying case for long scopes is also available.

## Optical Tip Adaptors\*

The wide range of the IPLEX LX and LT tip adaptors meets the optical requirements of any application.

## USB Flash Drive

A USB flash drive with 1 GB capability is supplied as standard.

## Centering Device for 8.5 mm diameter Long Scope\*

The Centering Device Set allows you to center the scope inside a pipe by attaching it to the scope distal end. The set consists of two devices in 75 mm (2.95 in.) and 140 mm finger (5.51 in.) lengths.

\*Option





# IPLEX LX/LT Features and Specifications\*

## SCOPE VARIATION

<b>IPLEX LX Model No.</b>	IV8420L1	IV8435L1	IV8620L1	IV8635L1	IV8675L1	IV8835L1	IV88100L1	IV88200L1 <sup>1</sup>
<b>IPLEX LT Model No.</b>	IV8420L2	IV8435L2	IV8620L2	IV8635L2	IV8675L2	IV8835L2	IV88100L2	IV88200L2 <sup>1</sup>
<b>Scope Diameter</b>	ø4.0 mm (0.157 in.)		ø6.0 mm (0.236 in.)			ø8.5 mm (0.335 in.)		
<b>Scope Length</b>	2.0 m (6.6 ft)	3.5 m (11.5 ft)	2.0 m (6.6 ft)	3.5 m (11.5 ft)	7.5 m (24.6 ft)	3.5 m (11.5 ft)	10 m (32.8 ft)	20.0 m (65.6 ft)
<b>Exterior</b>	High durability tungsten braid							
<b>Tube Flexibility</b>	Uniformed stiffness		Tough Tapered Flex™ tube with flexibility gradually increasing toward the distal end.					Uniformed stiffness
<b>Articulation angle UP/DOWN/RIGHT/LEFT</b>	130°		150°	130°	90°	140°	115°	70°
<b>Approx. System Weight (with battery)</b>	2.7 kg (6.0 lb)	2.8 kg (6.2 lb)	2.8 kg (6.2 lb)	2.9 kg (6.4 lb)	3.2 kg (7.1 lb)	3.0 kg (6.6 lb)	3.9 kg (9.0 lb)	5.2 kg (11.5 lb)

**IPLEX LX**

**IPLEX LT**

## INSERTION TUBE

<b>Articulation Mechanics</b>	TrueFeel™ scope tip articulation with electronic power-assisted, manual articulation	
<b>Temperature Sensor</b>	2-stage indicator for high temperature warning.	N/A
<b>Illumination</b>	Multiple ultra-high intensity LEDs, 2-stage setting for extra-bright illumination	Multiple ultra-high intensity LEDs
<b>Optical Tip Adaptor Identification<sup>1</sup></b>	SmartTip™ Automatic Recognition Technology	N/A
<b>Optical Tip Adaptor Locking Mechanism</b>	Double threaded attachment, with O-ring seal	

## HANDHELD CONTROL UNIT

<b>Dimensions (W x H x D)</b>	311 mm x 192 mm x 92 mm (12.2 in. x 7.6 in. x 3.7 in.)
<b>Weight</b>	Approx. 750 g (1.7 lb)
<b>Quick Access Buttons</b>	The following features have dedicated quick access buttons, levers or joysticks on the hand control unit: Live mode, WiDER™ Gain Control (IPLEX LX only), Brightness, Zoom, Freeze Image, Record Still/Video, Articulation Control, Articulation Lock, Menu Access, Saved Recording Index Access, Quick Last Image Recall.

## MAIN UNIT

<b>Dimensions (W x H x D)</b>	Main Unit: 227 mm x 189 mm x 64 mm (8.9 in. x 7.4 in. x 2.5 in.) Maximum Dimension: 239 mm x 215 mm x 99 mm (9.4 in. x 8.5 in. x 3.9 in.)
<b>LCD Monitor</b>	6.5 in. daylight-view LCD, anti-reflective type
<b>Power Supply</b>	Battery: 10.8 V nominal. IV84 and IV86 Series: over 120-minute operating time. IV88 Series: over 100-minute operating time. AC power: 100 V to 240 V, 50/60 Hz (with supplied AC adaptor)
<b>Output Connector</b>	RCA composite video output
<b>USB Connector</b>	Type A connector, Version 2.0 standards

## SOFTWARE MANIPULATIONS

<b>Image Manipulations</b>	3 step digital zoom, 8 step brightness control	
<b>Adjustable Gain Control</b>	3 step adjustable gain control with exclusive WiDER™ brightness level balancing technology.	N/A
<b>Display Text Options</b>	30-character title display	

## RECORDING MANAGEMENT FUNCTIONS

<b>Recording Media</b>	USB flash drive (1 GB standard, compatible with recommended USB flash device).	
<b>Overlay</b>	Selectable 30 character title with date, time and system setting.	
<b>Thumbnail Image Display</b>	Recorded images can be displayed as thumbnails.	
<b>Still Image Recording</b>	Resolution — NTSC: H 640 x V 480 (Pixel), PAL: H 768 x V 576 (Pixel)	
	Recording Format — Compressed JPEG format	
	Size of a single image — Approx. 300 KB (Approx. 3,400 images per 1 GB memory)	
<b>Video Recording</b>	Resolution — H 640 x V 480 (Pixel)	
	Recording Format — AVI MPEG-4 format. Can be played on the Windows Media Player.	
	Size of a single image — Approx. 500 KB per second (Approx. 30 min. per 1 GB memory)	

## STEREO MEASUREMENT FUNCTIONS — Optional function for IPLEX LX

<b>Distance</b>	Distance between two points.	Note: Stereo Measurement functions are available by upgrading the IPLEX LX.
<b>Point-to-Line</b>	Perpendicular distance between a point and a user-defined line.	
<b>Depth</b>	Orthogonal depth/height distance between a point and a user-defined plane.	

1. On the 8.5 mm scope tip, the SmartTip function is limited to recognition of the tip adaptor attachment to the scope only and manual selection of the tip adaptor model is required by the user.



OPERATING ENVIRONMENT		
Operating Temperature	Insertion Tube	In air: -25 °C to 100 °C (-13 °F to 212 °F) IPLEX LX -25 °C to 80 °C (-13 °F to 176 °F) IPLEX LT and IPLEX LX IV88 series
	Other parts than above	In water: 10 °C to 30 °C (50 °F to 86 °F)
Operating Atmospheric Pressure	Insertion Tube	In air: 1013 hPa In water: IV84 series — 1013 to 1368 hPa IV86 series — 1013 to 1772 hPa IV88 series — 1013 to 2026 hPa
	Other parts than above	In air: 1013 hPa
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. Not operable underwater with stereo measurement tip adaptors.
	Other parts than above	Operable in blowing rain conditions (Battery compartment must be closed). Not operable underwater.

MIL-STD COMPLIANCE	
The operating environment performance is confirmed by the following MIL-STD-810G and MIL-STD-461F under battery operation.	
Type	Method
Vibration <sup>1</sup>	MIL-STD-810F, Method 514.5, Procedure I (General vibration test)
Shock	MIL-STD-810G, Method 516.5, Procedure IV (Transit drop test)
Water Resistance <sup>1</sup>	MIL-STD-810F, Method 506.4, Procedure I (Rain and Blowing rain test)
Humidity <sup>1</sup>	MIL-STD-810F, Method 507.4
Salt Fog <sup>1</sup>	MIL-STD-810F, Method 509.4
Sand and Dust <sup>1</sup>	MIL-STD-810G, Method 510.4, Procedure I (Blowing dust test)
Icing/Freezing Rain <sup>1</sup>	MIL-STD-810F, Method 521.2
Electromagnetic Interference (EMI) <sup>2</sup>	MIL-STD-461F, RS-103, (Radiated susceptibility test for non-metallic above deck shipboard conditions)
Explosive Atmosphere <sup>1</sup>	MIL-STD-810F, Method 511.4, Procedure I (Operation in an explosive atmosphere test)

1. Excluding IV88 series.

2. Excluding IV8675L1, IV8675L2, and IV88 series.

## 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°	80°	120°	120°	80°	120°	120°
	Direction of view	Forward	Forward	Forward	Forward	Forward	Side	Side	Side
	Depth of field <sup>3</sup>	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 <sup>4</sup>	ø6.0 mm	ø6.0 mm	ø6.0 mm	ø6.0 mm	ø6.0 mm	ø6.0 mm	ø6.0 mm	ø6.0 mm
	Distal end <sup>5</sup>	19.8 mm	19.8 mm	19.8 mm	19.8 mm	19.8 mm	25.2 mm	25.2 mm	25.2 mm

4.0 mm Viewing Tip Adaptors										
		AT120D/ NF-IV84	AT120D/ FF-IV84	AT120S/ NF-IV84	AT120S/ FF-IV84	AT80D/ FF-IV88	AT120D/ NF-IV88	AT120D/ FF-IV88	AT120S/ NF-IV88	AT120S/ FF-IV88
Optical system	Field of view	120°	120°	120°	120°	80°	120°	120°	120°	120°
	Direction of view	Forward	Forward	Side	Side	Forward	Forward	Forward	Side	Side
	Depth of field <sup>3</sup>	4 to 190 mm	25 to ∞ mm	1 to 20 mm	6 to ∞ mm	35 to ∞ mm	4 to 190 mm	25 to ∞ mm	1 to 25 mm	5 to ∞ mm
Distal end	Outer diameter <sup>4</sup>	ø4.0 mm	ø4.0 mm	ø4.0 mm	ø4.0 mm	ø8.5mm	ø8.5mm	ø8.5 mm	ø8.5 mm	ø8.5 mm
	Distal end <sup>5</sup>	19.7 mm	19.6 mm	22.2 mm	22.2 mm	22.9 mm	22.9 mm	22.9 mm	29.5 mm	29.5 mm

Stereo Tip Adaptors (4.0 mm, 6.0 mm, and 8.5 mm)							
		AT50D/50D-IV84	AT50S/50S-IV84	AT60D/60D-IV86	AT60S/60S-IV86	AT60D/60D-IV88	AT60S/60S-IV88
Optical system	Field of view	50°/50°	50°/50°	60°/60°	60°/60°	60°/60°	60°/60°
	Direction of view	Forward/Forward	Side/Side	Forward/Forward	Side/Side	Forward/Forward	Side/Side
	Depth of field <sup>3</sup>	5 to ∞ mm	4 to ∞ mm	5 to ∞ mm	4 to ∞ mm	5 to ∞ mm	4 to ∞ mm
Distal end	Outer diameter <sup>4</sup>	ø4.0 mm	ø4.0 mm	ø6.0 mm	ø6.0 mm	ø8.5 mm	ø8.5 mm
	Distal end <sup>5</sup>	25.0 mm	28.8 mm	25.9 mm	32.2 mm	28.9 mm	36.5 mm

3. Indicates the viewing distance with optimal focus.

4. The adaptor can be inserted into a ø4.0 mm, ø6.0 mm or ø8.5 mm hole when it is mounted on the scope.

5. Indicates the length of the rigid portion at the scope's distal end when mounted.

#### Environmentally Friendly Olympus Products Signature

This logo distinguishes Olympus products manufactured in accordance with the company's highest standards of environmental conservation. The IPLEX LX and LT comply with the European RoHS Directive. The use of lead, mercury, cadmium, hexavalent chromium, PBBs, and PBDEs is restricted.



OLYMPUS NDT INC. is ISO 9001 and 14001 certified.

**OLYMPUS**

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