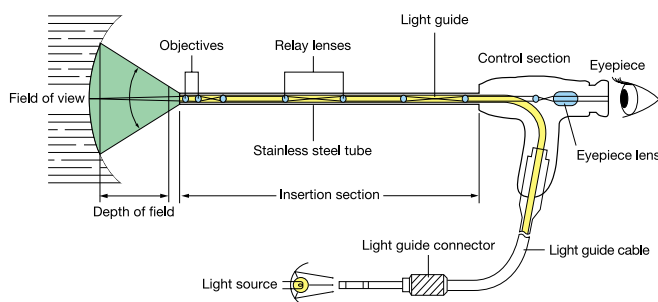


## Enhanced brightness and image clarity - the Series 5 industrial rigid borescopes are ideal for eyeball or TV monitor inspection



### STRUCTURAL DRAWING



**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 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 six times brighter images than conventional models.

#### Clear, high-resolution images

Excellent detail reproductions. Sharp image is easy on the eyes, helping reduce inspector fatigue.

#### Focus adjustment mechanism

Easy to use focus control.

#### 370° orbital scan

Upward pointer keeps you oriented when using the rotation function (except direct viewing scopes and R160 models).

#### Increased field of view

32% larger field of view in 4mm  $\varnothing$  models and 96% larger field of view in 6mm  $\varnothing$  models.

#### Accurate image reproduction

Distortion at image edges has been dramatically reduced.

#### Even illumination

New tip design ensures more even illumination even when viewing close-range subjects.

#### Outstanding durability

Stainless steel insertion 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

Almost 200 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 direction of view and field of view.



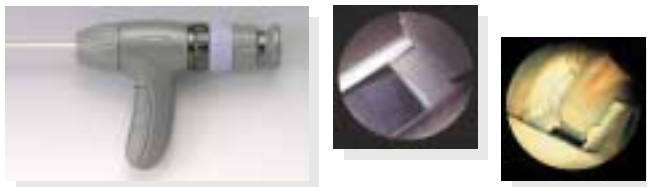
## SERIES 5 SWING PRISM BORESCOPE

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 45° to 115°, coupled with a field of view, this allows a total viewing arc of 120° to 140°. The Series 5 Swing borescope is available in both 6mm 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 2 x optical zoom. This allows the user to zoom onto an object of interest, providing a magnified view.



## 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 R120 - 039 - 090 - 35 ILG

① ② ③ ④ ⑤ ⑥

- ①: Series 5 Borescope      ④: Direction of view degrees (eg 90° lateral)  
 ②: Diameter 0.1mm (eg 12mm)      ⑤: Field of view degrees (eg 35°)  
 ③: Working length cm (eg 39cm)      ⑥: Integral light guide (12 & 16mm diameter only)

R040-021-000-60 R040-033-000-60 R040-022-045-60 R040-033-045-60 R040-022-090-60 R040-033-090-60	R080-104-045-50 R080-124-045-50 R080-144-045-50 R080-024-090-50 R080-025-090-35 R080-028-090-10 R080-034-090-50 R080-035-090-35 R080-044-090-50 R080-045-090-35 R080-048-090-10 R080-054-090-50 R080-064-090-50 R080-065-090-35 R080-074-090-50 R080-084-090-50 R080-104-090-50 R080-124-090-50 R080-144-090-50 R080-024-110-50 R080-034-110-50 R080-044-110-50 R080-054-110-50 R080-064-110-50 R080-094-110-50 R080-104-110-50 R080-124-110-50	R100-067-045-50 R100-095-045-50 R100-025-090-35 R100-025-090-50 R100-029-090-10 R100-039-090-50 R100-039-090-35 R100-043-090-10 R100-053-090-50 R100-053-090-35 R100-057-090-10 R100-067-090-50 R100-067-090-35 R100-081-090-35 R100-095-090-50 R100-095-090-35 R100-099-110-50 R100-095-110-50
R060-017-000-50 R060-032-000-50 R060-047-000-50 R060-063-000-50 R060-017-045-50 R060-032-045-50 R060-047-045-50 R060-063-045-50 R060-017-090-50 R060-032-090-50 R060-047-090-50 R060-063-090-50 R060-078-090-50	R080-024-000-50 R080-044-000-50 R080-064-000-50 R080-084-000-50 R080-124-000-50 R080-144-000-50 R080-024-045-50 R080-044-045-50 R080-064-045-50 R080-084-045-50	R120-039-090-35 ILG R120-053-090-35 ILG
		R160-059-000-35 ILG R160-101-000-35 ILG R160-143-000-35 ILG R160-059-090-35 ILG R160-101-090-35 ILG R160-122-090-35 ILG R160-143-090-35 ILG
	R100-038-000-50 R100-066-000-50 R100-039-045-50	

### Borescope R080 - 044 - 045SW115 - 50ZM25

① ② ③ ④ ⑤ ⑥

- ①: Series 5 Borescope      ④: Direction of view degrees (eg 45° to 115°)  
 ②: Diameter 0.1mm (eg 8mm)      ⑤: Field of view degrees (eg 50°)  
 ③: Working length cm (eg 44cm)      ⑥: Field of view zoom range (eg 50° to 25°)  
 (zoom models only)

#### Swing-Prism and Zoom Swing-Prism Specifications

R060-023-045SW115-50 R060-031-045SW115-50 R060-046-045SW115-50 R060-077-045SW115-50 R060-024-045SW115-50ZM25 R060-032-045SW115-50ZM25 R060-047-045SW115-50ZM25 R060-062-045SW115-50ZM25	R080-043-045SW115-50 R080-044-045SW115-50 R080-053-045SW115-50 R080-063-045SW115-50 R080-064-045SW115-50 R080-083-045SW115-50 R080-103-045SW115-50 R080-024-045SW115-50ZM25 R080-034-045SW115-50ZM25 R080-044-045SW115-50ZM25 R080-054-045SW115-50ZM25 R080-064-045SW115-50ZM25
R080-023-045SW115-50 R080-024-045SW115-50 R080-033-045SW115-50	

#### Aero-engine Model Specifications

Instrument	Engine	Instrument	Engine
R055-047-000-55	Pegasus	R080-034-110-55	TRENT
R055-047-090-55	Pegasus/RB199	R100-017-090-35	TRENT
R055-085-090-55	Pegasus	R100-024-090-35V	CFM-56
R060-047-090-55	M88	RE080-012-090-60	CFM-56
R060-047-060-30	M88	RE080-029-060-60	CFM-56
R060-032-070-40GI	MTR-390	RE080-029-110-60	CFM-56
R055-017-090-60	MTR-390	RE100-041-090-35V	GE-90
R080-025-110-35GI	RTM-322	RE100-068-090-55	GE-90
R060-024-070-60	RTM-322	RE080-043-060-55	GE-90
R080-024-060-50	RTM-322	RE080-043-110-55	GE-90
R080-041-070-60	TRENT		

Note: Many aero-engine inspections use standard or swing-prism borescopes. Contact our application specialists for specific advice.

# Industrial Rigid Borescopes

## SMALL DIAMETER BORESCOPIES

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 instruments' direction of view can be direct (000°), fore-oblique (015°) or lateral (090°) 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 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.

- **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.



K Series



X Series



### Small Diameter Borescope Specifications - X Series

Outer diameter	Working length	Direction of view	Field of view	Depth of field
ø0.9mm	60mm or 150mm	Direct (0°) or Forward-oblique (15°)	70°	Direct: 3 to infinity
				Forward-oblique: 2 to 7
ø1.2mm	60mm or 150mm	Direct (0°) or Forward-oblique (15°)	70°	Direct: 3 to infinity
				Forward-oblique: 2 to 7
ø1.7mm	150mm or 250mm	Direct (0°) or Forward-oblique (15°) Lateral (90°)	70°	Direct: 4.5 to infinity
				Forward-oblique: 3 to 12
				Lateral: 3 to 12
ø2.5mm	150mm or 250mm	Direct (0°) or Forward-oblique (15°) Lateral (90°)	70°	Direct: 4.5 to infinity
				Forward-oblique: 3 to 12
				Lateral: 3 to 12

### Small Diameter Borescope Specifications - K Series

Outer diameter	Working length	Direction of view	Field of view	Depth of field			
ø1.2mm	96mm	Direct (0°) or Forward-oblique (15°)	45°	All models 1mm - 40mm			
			53°				
ø1.7mm	96mm or 186mm	Direct (0°)	62°				
			ø1.7mm		96mm or 186mm	Forward-oblique (15°)	80°
							ø1.7mm
ø2.7mm	186mm	Direct (0°)	62°				
			ø2.7mm		188mm	Forward-oblique (15°)	80°
							ø2.7mm

- **Operating temperature:** Insertion tube: In air: -10-80°C (14-176°F)  
In water: 10-30°C (50-86°F)  
All portions except insertion tube: In air: -10-50°C (14-122°F)
- **Operating pressure:** Insertion tube: In air/water: 1013hPa (1atm normal pressure)  
All portions except insertion tube: In air: 1013hPa (1atm normal pressure)

## 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 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 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, tip loss, FOD depth and blade separation.

### ■ Digital Measuring Borescope System Specifications

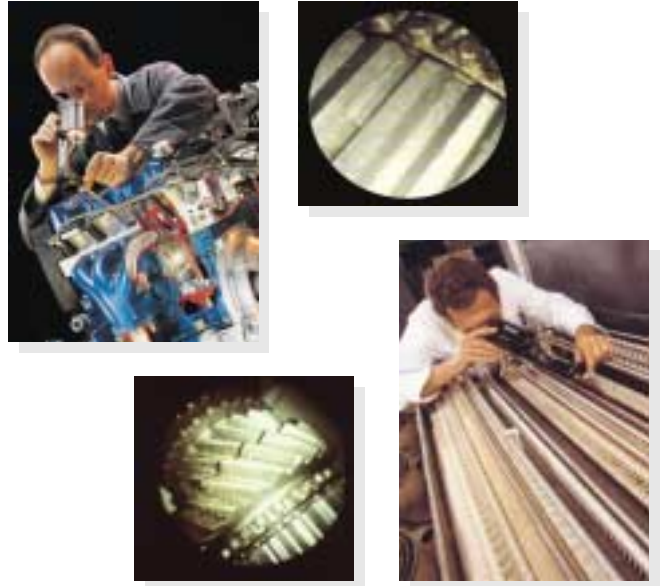
Insertion tube	Outer diameter	ø8.1mm
	Working length	246mm, 446mm
	Direction of view	50°-110°
	Field of view	20°
	Measurement range	10-180mm
Measurement	Accuracy	±4% (10-60mm Measurement range) ±8% (60-180mm Measurement range)

- **Operating temperature:** Insertion tube: In air: -20~150°C (-4~302°F)  
All portions except insertion tube: In air: 0~50°C (32~122°F)
- **Operating pressure:** In air: 709~1722hPa (0.7~1.7atm)  
In water: Up to 1722hPa (1.7atm)
- **Liquid resistance (insertion tube):** Withstands aviation fuels, machine oil, light oil and 5% salt water (normal pressure).

## 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.



### ■ Modular Borescopes Specifications

Model	Maximum diameter	Working length	Direction of view	Field of view	Minimum working length
T080-031-090-50	6.0mm	311mm	Lateral (090°)	50°	9 to 100mm
T080-010-000-50	8.1mm	104mm	Direct (000°)	50°	9 to 130mm
T080-020-000-50	8.1mm	204mm	Direct (000°)	50°	9 to 120mm
T080-030-000-50	8.1mm	305mm	Direct (000°)	50°	9 to 100mm
T086-010-090-50	8.8mm	104mm	Lateral (090°)	50°	9 to 130mm
T086-020-090-50	8.8mm	204mm	Lateral (090°)	50°	9 to 120mm
T086-030-090-50	8.8mm	305mm	Lateral (090°)	50°	9 to 100mm
T086-010-110-50	8.8mm	104mm	Retro (110°)	50°	9 to 130mm
T086-020-110-50	8.8mm	204mm	Retro (110°)	50°	9 to 120mm
T086-030-110-50	8.8mm	305mm	Retro (110°)	50°	9 to 100mm
T100-010-000-50	10.1mm	104mm	Direct (000°)	50°	9 to 130mm
T100-020-000-50	10.1mm	204mm	Direct (000°)	50°	9 to 120mm
T100-030-000-50	10.1mm	305mm	Direct (000°)	50°	9 to 100mm
T100-010-090-50	10.2mm	106mm	Lateral (090°)	50°	9 to 130mm
T100-020-090-50	10.2mm	204mm	Lateral (090°)	50°	9 to 120mm
T100-030-090-50	10.2mm	305mm	Lateral (090°)	50°	9 to 100mm

### ■ Modular Borescope - Mirror Sheath Specifications

Model	Maximum diameter	Working length	Direction of view	Field of view	Minimum working length
MT086-010-090	8.7mm	105mm	Lateral (090°)	As probe	0 to 121mm
MT086-020-090	8.7mm	207mm	Lateral (090°)	As probe	0 to 108mm
MT086-030-090	8.7mm	306mm	Lateral (090°)	As probe	0 to 91mm
MT110-010-090	11.2mm	106mm	Lateral (090°)	As probe	0 to 118mm
MT110-020-090	11.2mm	207mm	Lateral (090°)	As probe	0 to 108mm
MT110-030-090	11.2mm	306mm	Lateral (090°)	As probe	0 to 91mm

### ■ Light Source Specifications

Model	Lamp	Weight	Dimensions	Power supply	Power consumption	Light output control
KLS-131	50W Miniature quartz halogen, 12V	0.5kg	137mm long x 53mm diameter (approx)	12V DC ±10%	55W	Constant-colour temperature variable shutter

### ■ Modular Borescope

- **Operating temperature:** Probe/mirror sheath: -10 to +150°C (+14 to +302°F)  
Other parts: -10 to +40°C (+14 to +104°F)
- **Operating pressure:** Probe: In air: 0.7 to 1.7 bar (10.3 to 25 lb/in<sup>2</sup>)  
In water: 1.0 to 1.7 bar (14.7 to 25 lb/in<sup>2</sup>)
- **Fluid resistance:** Probe and mirror sheath can be immersed for short periods in 5% salt water, petrol, diesel, engine oil, brake fluid, ethylene glycol and methanol (at +10°C to +30°C, and atmospheric pressure)