

# FINESCOPE FS-60FC, FS-60YC & FS-60FD

## Microscope unit with fiber illumination system

The FS-60FC is a microscope unit made for brightfield inspection. It is ideal for observing very minute sections, and especially suitable for the Prober and Failure Analysis Manufacturing applications. High magnification, long working distance, fiber optic cold light illumination ensures easy and accurate operation.

The FS-60FD offers the option for use of Mitutoyo's darkfield lenses. A special nosepiece is provided to accommodate these objectives.

The FS-60YC is designed for a YAG cutting laser. An infrared radiation compensation system is built into the FS-60YC optics. Note: 1X fixed magnification safety filter for laser.

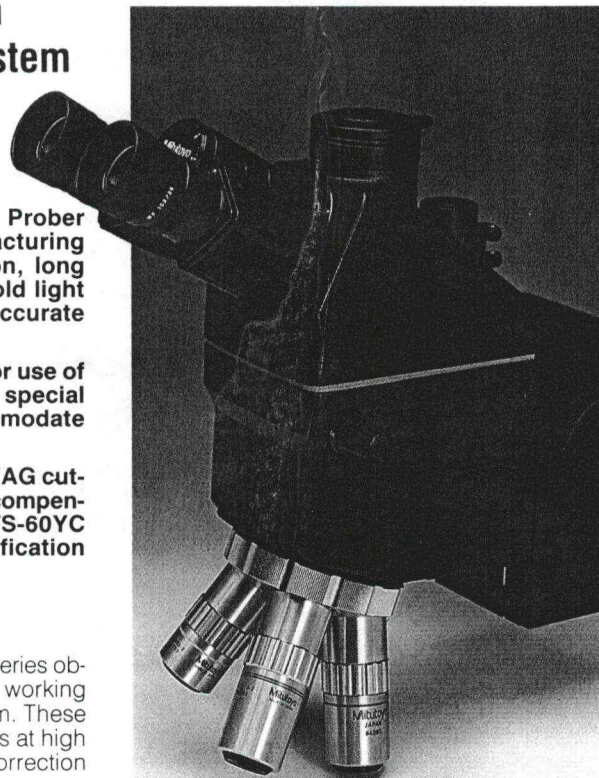
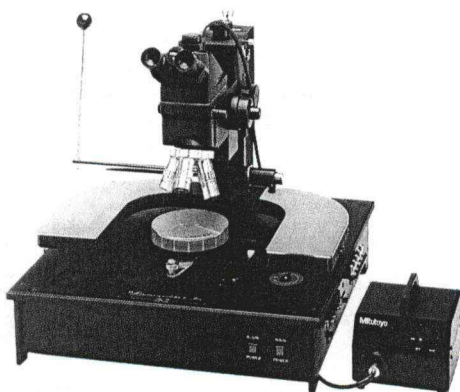
## FEATURES

The plan apochromatic FS-ULWD series objectives, have the world's longest working distance and an infinite tube system. These lenses provide flexible observations at high magnifications and independent correction of lateral chromatic aberration.

The field of view is extra wide and erect.

The fiber optic cold light illumination keeps the system free from thermal expansion caused by illumination heat. A color video system and photography unit are also available for this unit.

Application photograph courtesy of the Micromanipulator Co., Inc., Carson City, Nevada.



**5 YEAR WARRANTY**

## SPECIFICATIONS

### BODY

- (1) Focus adjustment  
Concentric coarse and fine controls:  
Coarse adjustment - 3.1mm/rot.  
Fine adjustment - 0.1mm/rot.  
Focusing 50mm
- (2) Erecting trinocular tube  
Pupil distance adjustment:  
Siedentopf type  
Adjustment range:  
51 to 76mm  
Fixed optical path:  
50 (observing) : 50 (photographing)
- (3) Tube magnification:  
1X to 2X changeable by zooming on FS-60FC, FS-60FD
- (4) Reflected illumination unit Koehler illumination, adopted optical system for the fiber illumination unit, built-in diaphragm aperture

### REVOLVING NOSEPIECE (BRIGHTFIELD)

- (1) With 4 lens mounts or optional 5 lens mounts

### OBJECTIVE (ULWD SERIES)

- (1) Infinite tube system, lateral chromatic aberration free
- (2) Strain-Free, Plan apochromat
- (3) Parfocal distance: 95mm

### EYEPIECE

- (1) Chromatic aberration free
- (2) High eye point with rubber eye cup
- (3) Diopter adjustment: -8D to +5D
- (4) Magnification - Field of View  
10X - 24mm  
15X - 16mm  
20X - 12mm

### OPTIONAL ACCESSORIES

- (1) Adapter (B) for video system/photography unit
- (2) Polarization unit
- (3) Reticle
- (4) Photographic Systems CB33 and 35mm

# Mitutoyo

Model	Order No.	Description
FS-60FC	378-134-4	Microscope unit for brightfield objectives
FS-60YC	378-136-4	Microscope unit for Yag cutting laser (brightfield)
FS-60FD	378-138-4	Microscope unit for brightfield/darkfield objectives

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# OBJECTIVE, EYEPIECE and TUBE LENS PERFORMANCE TABLE

M plan apochromat objective (for bright-field)					Eyepiece WF, wide view field								
					WF 10 X /24			WF 15 X /16			WF 20 X /12		
M	N.A.	WD	f	R( $\mu$ m)	Tube lens 1X			Tube lens 1X			Tube lens 1X		
					T.M.	$\phi$	F.D. ( $\mu$ m)	T.M.	$\phi$	F.D. ( $\mu$ m)	T.M.	$\phi$	F.D. ( $\mu$ m)
<b>FS ULWD Series</b>													
1X*	0.025	11 (.433)	200 (7.874)	11.0	10X	24 (.945)	1011	15X	16 (.630)	821.0	20X	12 (.472)	725.7
2X	0.055	34 (1.338)	100 (3.937)	5.0	20X	12 (.472)	220.8	30X	8 (.315)	177.5	40X	5 (.236)	155.8
5X	0.14	34 (1.338)	40 (1.575)	2.0	50X	4.8 (.189)	34.4	75X	3.2 (.126)	27.6	100X	2.4 (.094)	24.2
10X	0.28	33.5 (1.319)	20 (.787)	1.0	100X	2.4 (.094)	8.6	150X	1.6 (.063)	5.9	200X	1.2 (.047)	6.1
20X	0.42	20 (.787)	10 (.394)	0.7	200X	1.2 (.472)	3.3	300X	0.8 (.031)	2.7	400X	0.6 (.0236)	2.4
50X	0.55	13 (.512)	4 (.157)	0.5	500X	0.48 (.019)	1.4	750X	0.32 (.0126)	1.3	1000X	0.24 (.0094)	1.2
100X	0.7	5 (.236)	2 (.079)	0.4	1000X	0.24 (.0094)	0.8	1500X	0.16 (.0063)	0.7	2000X	0.12 (.0047)	0.7
<b>FS ULWD SL Series</b>													
SL20X	0.28	30 (1.181)	10 (.394)	1.0	200X	1.2 (.472)	6.1	300X	0.8 (.031)	5.2	400X	0.6 (.0236)	4.8
SL50X	0.42	20 (.787)	4 (.157)	0.7	500X	0.48 (.189)	2.2	750X	0.32 (.0126)	2.0	1000X	0.24 (.0094)	1.9
SL80X	0.5	15 (.570)	2.5 (.098)	0.55	800X	0.3 (.012)	1.6	1200X	0.2 (.0079)	1.3	1600X	0.15 (.0059)	1.3
SL100X	0.55	13 (.512)	2 (.079)	0.5	1000X	0.24 (.0094)	1.2	1500X	0.16 (.0063)	1.1	2000X	0.12 (.0047)	1.0

Unit: mm (inch)

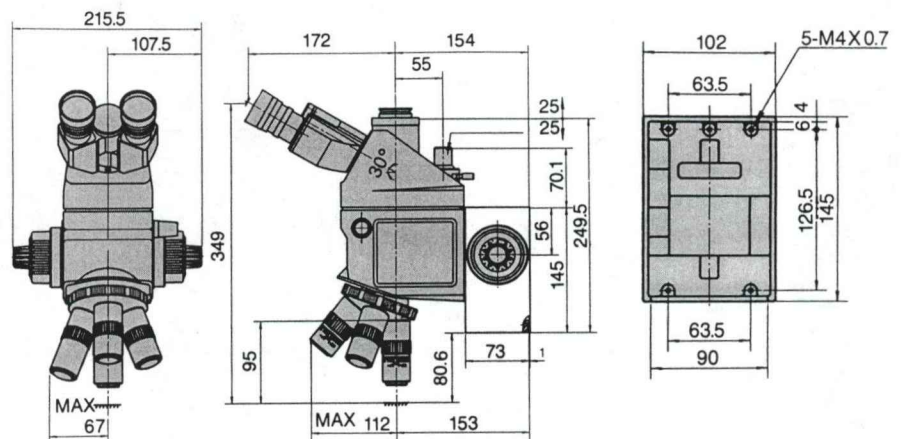
\*To be used with the polarization unit.

On the basis of 2 for resolution of eye.

- M: Magnification
- N.A.: Numerical aperture
- WD: Working distance mm (inch)
- f: Focal distance mm (inch)
- R: Resolution  $\mu$ m
- T.M.: Total magnification
- $\phi$ : View field  $\phi$ mm (inch)
- FD: Focal depth  $\mu$ m

**Note:**  
Darkfield lenses are available in the same specifications as shown above for use with the FS-60FD unit. Additionally, specially designed lenses are available for use with IR and visual laser cutting systems on the FS-60YC unit.

## DIMENSIONS



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