



*MC Series  
Measurement Microscope  
Instruction Manual*



# *Table of Contents*

- 1.0 Introduction
  - 1.1 Microscope Features
  - 1.2 General Safety Guidelines
  - 1.3 Intended Product Use Statement
  - 1.4 Handling the microscope
  - 1.5 Warranty Notes
  
- 2.0 The Microscope and its Components
  - 2.1 Installation Site
  - 2.2 Unpacking
  - 2.3 Microscope Set Up
  - 2.4 Adjusting Interpupillary Distance
  
- 3.0 Microscope Operation
  - 3.1 Incident Light Operation – Brightfield
  - 3.2 Using the Polarizer / Slide-In Analyzer
  - 3.3 Photomicrography with 35mm SLR and Digital SLR Cameras
  - 3.4 Photomicrography with Digital Still Cameras
  - 3.5 Connecting a Video or Other Camera that uses a “C” type mount
  
- 4.0 Maintenance and Cleaning
  
- 5.0 Troubleshooting
  - 5.1 Replacing the mains fuse in the Fiber Optic Illuminator
  - 5.2 Incident Light does not work
  - 5.3 Replacing the 6V 30W Halogen Lamp – Fiber Optic Illuminator
  
- 6.0 Storage
  
- 7.0 Accessories and Replacements Parts
  
- 8.0 Technical Descriptions

# ***MC Series Measurement Microscope***

## ***1. Introduction***

The Meiji Techno MC Series Measurement Microscopes have a heavy duty industrial design. Easy measurement operations are achieved through use of optional digital micrometer heads to move the stage in X and Y directions. Z-axis measurement is accomplished with another optional micrometer attached to the microscope focus block.

Meiji's MC Series is well suited for a wide variety of metallurgical or industrial observation and measurement applications as well as high resolution video microscopy.

The MC Series Microscopes delivers crisp, distortion-free, high resolution images in Brightfield mode.

Meiji Techno supplies a variety of accessories including eyepiece micrometers and camera adapters.

### ***1.1 Microscope Features***

- Heavy Duty Rugged Design
- Optics can be raised or lowered to fit odd specimens
- S.Plan Episcopic Metallurgical Objectives
- Infinity Corrected Optical System
- Powerful 150W Incident or Transmitted Illumination via fiber optic lightguide
- Coaxial Coarse and Fine Focus Controls
- Smooth Operating Quintuple Nosepiece
- Flat Top Incident Light Stage or Transmitted Light Stage
- Binocular and Trinocular Viewing Heads
- Widefield High Eyepoint Eyepieces (HWF10X, F.N.18)
- Wide Range of Filters and Accessories

## ***1.2 General Safety Guidelines***

Meiji Techno products are designed for safe operation under normal operating conditions. The instrument and accessories described in this manual have been built and tested according to industry safety standards for electronic laboratory instruments. Incorrect usage or non-conformance to operating instructions can cause personal injury or damage to equipment or property. Keep this manual near your instrument for easy reference.

## ***1.3 Intended Product Use***

***Product Disclaimer:*** This product is designed and intended for use only as a metallurgical microscope system. Modifying this instrument in any way for use in any situation other than the original and intended product design will automatically void the warranty. In no event shall Meiji Techno be liable to any person or entity for any incidental, indirect or consequential damages, arising out of or in connection with the use or performance of a modified or altered product.

## ***1.4 Product Safety Information- Handling the Microscope***



**DO NOT OPERATE THE ILLUMINATOR UNLESS THE UNIT IS PROPERLY GROUNDED!**

Use only the specified power cord in a well grounded socket. Do not use in an ungrounded power receptacle or in cases where there is a break in the ground conductor or damage to the electrical wiring.

Only fuses of the specified type and rating are to be used as replacements. Switch off the power and disconnect the power cord before replacing fuses. Use of a non-compliant fuse may result in electrical shock or severe damage your equipment. Do not replace the bulb for at least 10 minutes after the unit has been turned off or injury may result.

## ***1.5 Warranty Statement***

Modifying the instrument in any way or unauthorized attempts to disassemble or use the instrument for applications other than its intended design will automatically void the warranty.

Meiji Techno warrants this product against defects in material and/or workmanship for the life of the instrument from the date of the original purchase to the original purchaser. Meiji Techno will repair or replace, at its option, any instrument which under normal conditions of use and service proves to be defective in material or workmanship. No charge will be made for labor or materials with respect to defects covered by this warranty, provided all repair work is done by Meiji Techno. This warranty does not cover expenses incurred in the removal or reinstallation of any instrument or instruments, whether or not proven defective. Replacement or repairs furnished under this warranty are subject to the same terms and conditions of the original warranty. This warranty supersedes any other warranty and is subject to the following terms and conditions:

### ***WARRANTY***

Warranty of Meiji Techno's product extends to the original purchaser of the product and is not transferable.

### ***WARRANTY DURATION***

Meiji Techno warrants this product against defects in material and/or workmanship for the life of the instrument from the date of original purchase to the original purchaser. The electrical warranty is one year.

### ***OWNER'S REGISTRATION CARD***

Return of the owner's registration card by the original purchaser within ten (10) days after the original purchase is a condition precedent to coverage under this warranty. Meiji Techno will at its option accept written proof of purchase from the original owner in lieu of a product registration card.

### ***EXCLUSIONS AND LIMITATIONS***

Specifically excluded from this warranty are failures caused by abuse, neglect, misuse, improper operation, normal wear, accident, improper maintenance or modifications of ANY type. This warranty does not cover repair or replacement where normal use has exhausted the life of a part or instrument. All mechanical devices need periodic parts replacement and service to perform well. Service life of an instrument is dependent upon the care it receives and the conditions under which it has to operate. In no event shall Meiji Techno be liable for incidental or consequential damages.

***SERVICE***

To obtain service under this warranty, please contact Meiji Techno directly and ask for the Product Service Department. State the nature of the problem, model and serial number of the instrument, date of purchase and location and name of the distributor the instrument was purchased from. After verification of warranty registration, Meiji Techno will issue a return authorization number. Customer may then return the product postage prepaid and insured to the authorized repair facility.

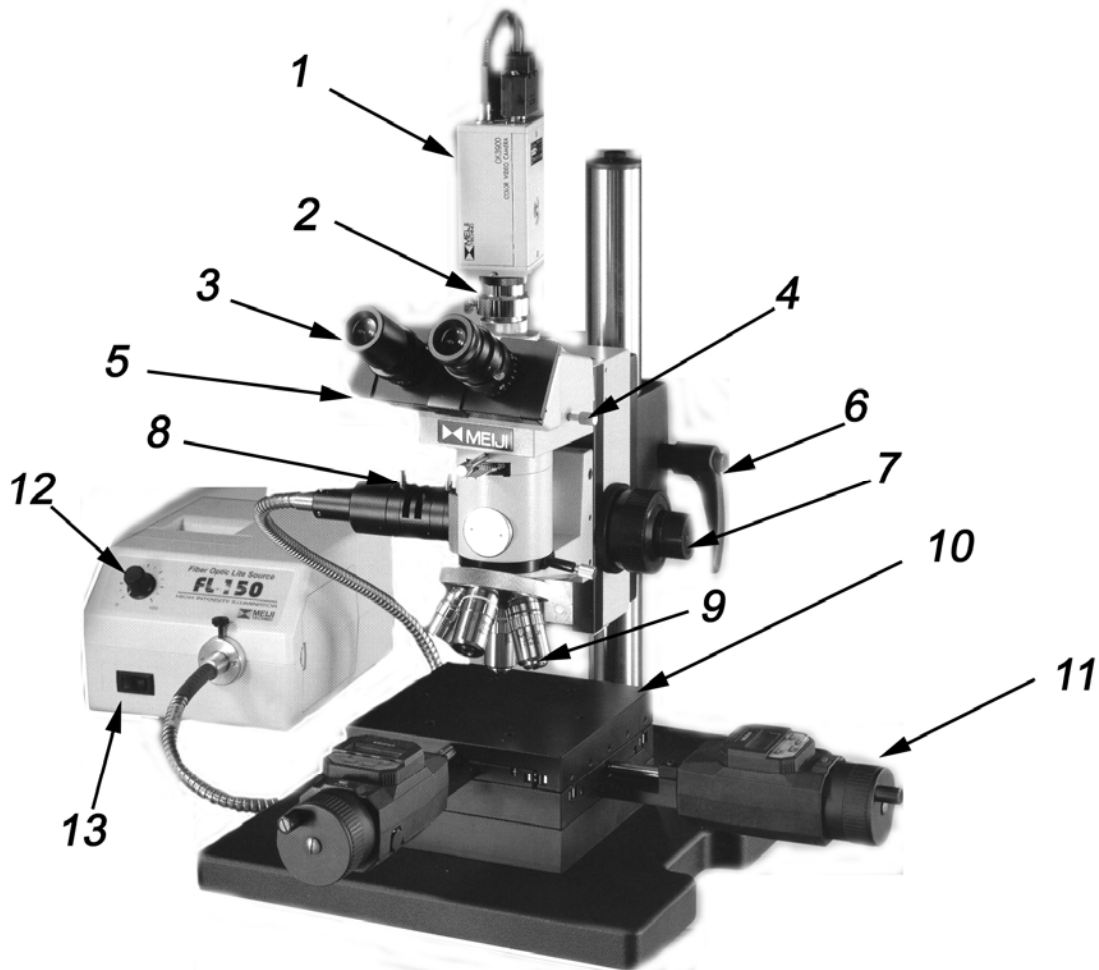
In most instances, requests for warranty service will be performed in a prompt and routine manner and merchandise will be returned in a reasonable period of time or at Meiji Techno's convenience. In some cases, requests for warranty service are received which are not justified. In these cases, Meiji Techno will provide an explanation for non-warranty action.

***WARRANTY TERMS***

The terms of this warranty may not be varied by any person, whether or not purporting to represent or act on behalf of Meiji Techno. The limited lifetime warranty provided is in lieu of any and all warranties, expressed or implied, whether for merchantability or fitness for a particular purpose or otherwise. Liability for consequential damages under any, and all warranties are excluded to the extent exclusions are permitted by law. This warranty gives you specific legal rights and you may also have other rights which vary from state to state. This warranty sets forth the customer's exclusive remedy, with respect to defective products. This limited warranty shall become null and void in the event of a violation of the provisions of this limited warranty.

## 2.0 The Microscope and its Components

The image below designates the main components of the MC Series:



**Model MC-50**

1. Optional Analog CCD Camera (CK3900N)
2. Optional "C-Mount" (MA151/10)
3. Eyepieces 10X (MA406 + MA413CF)
4. Phototube Control Lever
5. Trinocular Head
6. Height Adjustment Knob
7. Coaxial coarse and fine focusing controls
8. Incident Light Iris and Filter Tray
9. Infinity Corrected Objectives
10. Incident Light Stage MA728 (Transmitted Stage with Glass Plate MA729)
11. Optional Mitutoyo Digimatic Micrometer Heads (one each for X and Y directions)
12. Brightness Control for Fiber Optic Illumination
13. Power Switch for Fiber Optic Illumination

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## ***2.1 Installation Site***

The microscope should be operated in a room with as little dust and debris as practically possible. Keep your instrument away from solvents, chemical fumes and excessive humidity. Also try to avoid big swings in ambient temperature, direct sunlight and vibration as they can affect measurements and instrument performance.

### **Operating Ambient Conditions**

**Temperature:** 10 - 36°C (50 – 96.8°F)

**Relative Humidity:** 0 – 80% up to 30°C (86°F)

## ***2.2 Unpacking***

Please check your packing slip to insure that all materials are present. Keep a copy for your records so that you have the proper information when ordering more equipment, ordering replacement parts or accessories or when calling for technical support. Please make sure that no small pieces or parts are left in the packing material. Keep the packing materials in a safe place for the purpose of storage and transporting the microscope and its accessories.



**ATTENTION** Avoid touching the surface of optical components such as lenses, filters and glass surfaces. Even very small traces of perspiration or finger oils can corrode the surfaces of optics in a short period of time.



## 2.3 Microscope Set Up

- As a first step, remove all components from the shipping container and remove the packing materials and place the microscope frame on a stable work surface.
- Loosen the clamp screw on the microscope limb and install the vertical illuminator (MA806). Once the thumbscrew is tightened, place the binocular or trinocular head (MA657/05 or MA655/05) onto the top of the illuminator and re-tighten the clamp screw while the head is in the correct position.
- Install the two eyepieces (MA406 and MA413CF) by sliding them into the head and then install the rubber eyeshields on top of each eyepiece. **The MA413CF focusing eyepiece installs on the right hand side. The shiny pin aligns the crosshair reticle into the slot on the eyetube.**
- Remove the objectives from their objective cases while being careful not to touch any part of the optics. Then, screw each objective into a nosepiece opening. Install them incrementally or in order of power (e.g. 5, 10, 20, and 50).
- Un-package each digital micrometer and install the two 164-162's into the stage. One may need to loosen the Allen bolts that clamp the micrometers into place. If a Z-axis micrometer was purchased, install it onto the focus block as seen at right.
- Insert the fiber optic light guide into the vertical illuminator and tighten it in place with the two Allen screws on the port. Next, plug the power cordset into the fiber optic light source and the other end into a grounded outlet.



### CAUTION

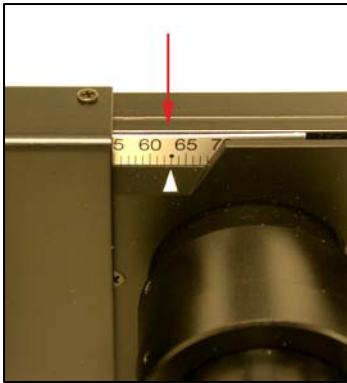
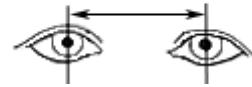
**The mains power cord should only be plugged into a known grounded outlet.**

A simple outlet tester can be used to verify correct outlet polarity and the presence of a grounded circuit. If no other accessories are going to be installed, the instrument is now ready for use.

## 2.4 Adjusting Interpupillary Distance

The Interpupillary Distance is essentially the distance between your two pupils expressed in millimeters. When set correctly, one will see one uniform round field of view or FOV. The adjustment is made by simply pulling apart or pushing together the eyetubes until a uniform round field is achieved.

**interpupillary distance**



Make note of the number marked on the viewing head so you can repeat the setting later. The number indicated on the microscope head is your IP expressed in millimeters.

That number will also need to be dialed up on the left eyetube as shown at right.



Once this is done, the microscope is adjusted to this user. Other users will have different IP's and different focusing abilities so re-adjustment is necessary.

### ***3.0 Operation***

Once the microscope has been setup in its working location with all of the components correctly installed, it is ready for use.

Your MC microscope is a precision instrument designed to last a lifetime. Always handle your microscope with care and avoid abrupt motion, vibration and shock.

Do not install any bulb in your instrument other than ones designated by Meiji Techno:

<b>FL150/70</b>	21V 150W Halogen	For Fiber Optic Illuminator FL150 or FT190 Series
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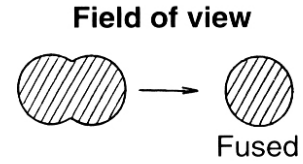


**CAUTION** *Avoid Dismantling*

Never attempt to dismantle the instrument. This will void your warranty and could possibly lead to the instrument no longer performing accurately.

### 3.1 Incident Light Operation – Brightfield

1. First, set your interpupillary distance on the microscope eyetubes by pulling them apart or pushing them closer together to fit your eyes. When set correctly, one will see one uniform round or “fused” field of view. Make note of the distance setting when adjusted to your liking so you can later repeat the setting.



2. Turn on the power to the fiber optic illuminator. Adjusting the brightness desired is done with the variable brightness control knob on the front of the illuminator power supply.
3. Make sure the field iris diaphragm on the vertical illuminator is opened all the way open to start.
4. We recommend that you initially use a flat, easily recognizable specimen like a coin to setup your microscope. Place that specimen on the stage.
5. Select a lower power “scanning” objective like the 5X or the 10X to find the area of interest on the specimen quickly. Be sure the objective “clicks” into place when you turn the objective nosepiece.
6. The aperture iris diaphragm located on the vertical illuminator can be “stopped down” or closed somewhat to give the observation of your specimen more or less contrast or resolving power. Stopping down the diaphragm decreases resolution and brightness but increases image contrast and depth of focus.

#### Possible Brightfield Mode Operational Problems

If normal adjustments are not getting the results you expect, check to see if these conditions exist:

- Incorrect components inadvertently installed
- Components not mounted flush (Vertical Illuminator to microscope frame, etc.)
- Dirty or smudged optics

#### MC Series S.Plan Metallurgical Brightfield Objectives

Brightfield Objectives – Plan Episcopic - Infinity Corrected - F = 200mm	
<b>MA330</b>	S.Plan M5X objective, NA: 0.10, WD = 20.0mm (included)
<b>MA337</b>	S.Plan Epi 10X objective, NA: 0.25, WD = 9.4mm (included)
<b>MA338</b>	S.Plan Epi 20X, objective, NA: 0.40, WD = 5.28mm (optional)
<b>MA339</b>	S.Plan Epi 40X objective, NA: 0.65, WD = 0.81mm (included)
<b>MA328</b>	S.Plan Epi 100X objective, NA: 0.75, WD = 0.27mm (optional)

### ***3.3 Using the Polarizer***

#### **Polarizer**

For certain specimens, the use of polarized light will enhance the contrast and facilitate viewing of difficult to see object features.

The polarizing filter is engaged by dropping it into one of the filter slots located along the top of the illuminator tube as shown in the drawing below.

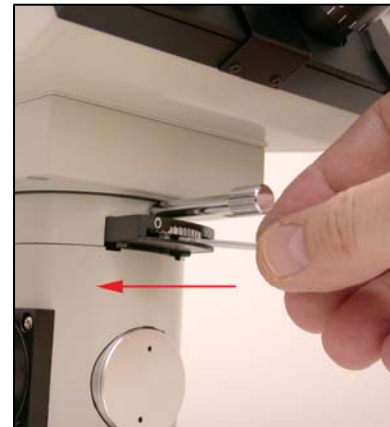


#### **Slide-In Analyzer**

The analyzer is mounted in a slider which is located right below the viewing head as shown. It can be inserted or withdrawn from the optical path by grabbing the chrome knob and sliding it east-west in its slot.

The lever on the side rotates the filter between 0 and 90 degrees as shown at right.

With the polarizing filter in place and the analyzer engaged and the lever set at 45 degrees, the polarizing elements are said to be “crossed” and the field of view will become darker or “extinguished”.



In this condition, the field of view is dark except for the optically active elements within the field which become visible against the dark background.

### ***3.4 Photomicrography with 35mm SLR and Digital SLR Cameras***

The MC Series microscopes can have a trinocular tube on top of the head for use in photomicroscopy.

In order to secure a 35mm SLR camera body to the trinocular or photo tube, an optional camera attachment tube (MA150/50 or MA150/60) will need to be used with the corresponding T2 Adapter Ring that matches the camera to be used.

The table below shows the different cameras and adapter rings that can be used:

#### **T2 Camera Adapter Rings**

<b>T2-1</b>	Canon
<b>T2-2</b>	Minolta
<b>T2-3</b>	Pentax K
<b>T2-4</b>	Pentax S (threaded)
<b>T2-5</b>	Nikon
<b>T2-6</b>	Olympus
<b>T2-7</b>	Contax, Yashica
<b>T2-8</b>	Konica
<b>T2-9</b>	Canon EOS
<b>T2-10</b>	Minolta Alpha / Maxim 2000

In addition, a photo eyepiece will be needed to make an image for the camera. The table below shows the different photo eyepieces that are available:

#### **Photoeyepieces**

<b>MA512</b>	2.5X Photo eyepiece
<b>MA508</b>	5X Photo eyepiece
<b>MA500</b>	3.3 Photo eyepiece

### 3.5 Photomicrography with Digital Still Cameras

In order to mount a consumer grade digital camera to a MC Series microscope, an optional camera adapter will be needed. The table below shows the different cameras that can be used and their corresponding adapter part number. Some adapters have three part numbers that comprise the adapter for your model camera:

Meiji Techno Digital Camera Adapter Chart	All Meiji Trinocular Tube Models (23.2mm ID, 25.2mm OD)	Eyetubes TM200 Series TM400 Series (23.2mm ID, 27.2mm OD Eyetubes)	Female "C" Mount Thread (25.4mm)	Eyetubes EM Series (30.5mm ID, 34.0mm OD Eyetubes)	Eyetubes RZ Series MX Series TC Series IM Series (30.0mm ID, 34.0mm OD Eyetubes)
Casio QV-5700 QV-4000 QV-3500EX	(52mm) <a href="#">J19</a> <a href="#">MD-M1A</a> <a href="#">MA151/30</a>	(52mm) <a href="#">J19</a> <a href="#">MD-M1A</a> <a href="#">MA151/30</a>	(52mm) <a href="#">J19</a> <a href="#">MD-M1A</a> <a href="#">MA151/40</a>	-	(52mm) <a href="#">J19</a> <a href="#">MD-M1A</a> <a href="#">MA151/50</a>
Canon Powershot A10, A20	(46mm) <a href="#">J18</a> <a href="#">MD-M2</a> <a href="#">MA151/30</a>	(46mm) <a href="#">J18</a> <a href="#">MD-M2</a> <a href="#">MA151/30</a>	(46mm) <a href="#">J18</a> <a href="#">MD-M2</a> <a href="#">MA151/40</a>	-	(46mm) <a href="#">J18</a> <a href="#">MD-M2</a> <a href="#">MA151/50</a>
Canon Powershot A30, A40	(46mm) <a href="#">J30</a> <a href="#">MD-M2</a> <a href="#">MA151/30</a>	(46mm) <a href="#">J30</a> <a href="#">MD-M2</a> <a href="#">MA151/30</a>	(46mm) <a href="#">J30</a> <a href="#">MD-M2</a> <a href="#">MA151/40</a>	-	(46mm) <a href="#">J30</a> <a href="#">MD-M2</a> <a href="#">MA151/50</a>
Canon Powershot A60, A70, A75, A85	(52mm) AUB52A60 MD-M1A MA151/30	(52mm) AUB52A60 MD-M1A MA151/30	(52mm) AUB52A60 MD-M1A MA151/40	-	(52mm) AUB52A60 MD-M1A MA151/50
Canon Powershot A80, A95	(52mm) <a href="#">J53</a> <a href="#">MD-M1A</a> <a href="#">MA151/30</a>	(52mm) <a href="#">J53</a> <a href="#">MD-M1A</a> <a href="#">MA151/30</a>	(52mm) <a href="#">J53</a> <a href="#">MD-M1A</a> <a href="#">MA151/40</a>	-	(52mm) <a href="#">J53</a> <a href="#">MD-M1A</a> <a href="#">MA151/50</a>
Canon Powershot A510, A520	(52mm) A52B510C MD-M1A MA151/30	(52mm) A52B510C MD-M1A MA151/30	(52mm) A52B510C MD-M1A MA151/40	-	(52mm) A52B510C MD-M1A MA151/50
Canon Powershot A610, A620, A540	(52mm) A52B610C MD-M1A MA151/30	(52mm) A52B610C MD-M1A MA151/30	(52mm) A52B610C MD-M1A MA151/40	-	(52mm) A52B610C MD-M1A MA151/50
Canon Powershot G1, G2	<a href="#">MA151/30/43</a>	<a href="#">MA151/30/43</a>	<a href="#">MA151/40/42</a>	<a href="#">MA151/45/42</a>	<a href="#">MA151/50/42</a>
Canon Powershot G3, G5	<a href="#">MA151/30/41</a>	<a href="#">MA151/30/41</a>	<a href="#">MA151/40/40</a>	<a href="#">MA151/45/40</a>	<a href="#">MA151/50/40</a>
Canon Powershot G6	MA151/30/31	MA151/30/31	MA151/40/30	MA151/45/30	(52mm) <a href="#">J55</a> <a href="#">MD-M1A</a> <a href="#">MA151/50</a>
Canon Powershot S1-IS	(52mm) AD52S1 MD-M1A MA151/30	(52mm) AD52S1 MD-M1A MA151/30	(52mm) AD52S1 MD-M1A MA151/40	-	(52mm) AD52S1 MD-M1A MA151/50
Canon Powershot S2-IS, S3-IS	(58mm) J62 MD-M5B MA151/30	(58mm) J62 MD-M5B MA151/30	(58mm) J62 MD-M5B MA151/40	-	(58mm) J62 MD-M5B MA151/50
Epson Photo PC	(52mm)	(52mm)	(52mm)	-	(52mm)

3000Z, 3100Z	<a href="#">J13</a> <a href="#">MD-M1A</a> <a href="#">MA151/30</a>	<a href="#">J13</a> <a href="#">MD-M1A</a> <a href="#">MA151/30</a>	<a href="#">J13</a> <a href="#">MD-M1A</a> <a href="#">MA151/40</a>		<a href="#">J13</a> <a href="#">MD-M1A</a> <a href="#">MA151/50</a>
Fuji Finepix S602, 4900Z, 6900Z, S3000, S5000, S5200, S5600, S7000	<a href="#">MA151/30/81</a>	<a href="#">MA151/30/81</a>	<a href="#">MA151/40/80</a>	<a href="#">MA151/45/80</a>	<a href="#">MA151/50/80</a>
HP Photo Smart 850, 945	(52mm) AD5552FBLK MD-M1A MA151/30	(52mm) AD5552FBLK MD-M1A MA151/30	(52mm) AD5552FBLK MD-M1A MA151/40	-	(52mm) AD5552FBLK MD-M1A MA151/50
Kodak DX6490, DX7590, Z7590	(52mm) A6490K MD-M1A MA151/30	(52mm) A6490K MD-M1A MA151/30	(52mm) A6490K MD-M1A MA151/40	-	(52mm) A6490K MD-M1A MA151/50
Kodak DX7440, Z730	(52mm) A7440K MD-M1A MA151/30	(52mm) A7440K MD-M1A MA151/30	(52mm) A7440K MD-M1A MA151/40	-	(52mm) A7440K MD-M1A MA151/50
Kodak P850	(52mm) A52850K MD-M1A MA151/30	(52mm) A52850K MD-M1A MA151/30	(52mm) A52850K MD-M1A MA151/40	-	(52mm) A52850K MD-M1A MA151/50
Kodak P880	(52mm) A52880K MD-M1A MA151/30	(52mm) A52880K MD-M1A MA151/30	(52mm) A52880K MD-M1A MA151/40	-	(52mm) A52880K MD-M1A MA151/50
Minolta Konica Z1, Z2	(52mm) <a href="#">J47</a> <a href="#">MD-M1A</a> <a href="#">MA151/30</a>	(52mm) <a href="#">J47</a> <a href="#">MD-M1A</a> <a href="#">MA151/30</a>	(52mm) <a href="#">J47</a> <a href="#">MD-M1A</a> <a href="#">MA151/40</a>	-	(52mm) <a href="#">J47</a> <a href="#">MD-M1A</a> <a href="#">MA151/50</a>
Minolta Konica Z3	(52mm) <a href="#">J29</a> <a href="#">MD-M1A</a> <a href="#">MA151/30</a>	(52mm) <a href="#">J29</a> <a href="#">MD-M1A</a> <a href="#">MA151/30</a>	(52mm) <a href="#">J29</a> <a href="#">MD-M1A</a> <a href="#">MA151/40</a>	-	(52mm) <a href="#">J29</a> <a href="#">MD-M1A</a> <a href="#">MA151/50</a>
Nikon Coolpix 4300, 885	<a href="#">MA151/30/57</a>	<a href="#">MA151/30/57</a>	<a href="#">MA151/40/56</a>	<a href="#">MA151/45/56</a>	<a href="#">MA151/50/56</a>
Nikon Coolpix 800, 900, 950, 990, 995, 4500	<a href="#">MA151/30/50</a>	<a href="#">MA151/30/51</a>	<a href="#">MA151/40/50</a>	<a href="#">MA151/45/50</a>	-
Nikon Coolpix 5000	<a href="#">MA151/30/70</a>	<a href="#">MA151/30/71</a>	<a href="#">MA151/40/70</a>	<a href="#">MA151/45/70</a>	(52mm) <a href="#">J51</a> <a href="#">MD-M1A</a> <a href="#">MA151/50</a>
Nikon Coolpix 5400	(52mm) AU4552S MD-M1A MA151/30	(52mm) AU4552S MD-M1A MA151/30	(52mm) AU4552S MD-M1A MA151/40	-	(52mm) AU4552S MD-M1A MA151/50
Nikon Coolpix 5700, 8700	(52mm) RT5253NT MD-M1A MA151/30	(52mm) RT5253NT MD-M1A MA151/30	(52mm) RT5253NT MD-M1A MA151/40	-	(52mm) RT5253NT MD-M1A MA151/50
Nikon Coolpix 8400	(52mm) AU8487N MD-M1A MA151/30	(52mm) AU8487N MD-M1A MA151/30	(52mm) AU8487N MD-M1A MA151/40	-	(52mm) AU8487N MD-M1A MA151/50
Olympus Camedia C-2000, C-2020, C-3000, C- 3030, C-3040, C-3100, C-4040, C-4100, C-5050	<a href="#">MA151/30/61</a>	<a href="#">MA151/30/61</a>	<a href="#">MA151/40/60</a>	<a href="#">MA151/45/60</a>	(46mm) <a href="#">J64</a> <a href="#">MD-M2</a> <a href="#">MA151/50</a>
Olympus Camedia C-700, C-720, C-730, C-740, C-750, C-755, C-760, C-765, C-770, SP500UZ	<a href="#">MA151/30/63</a>	<a href="#">MA151/30/63</a>	<a href="#">MA151/40/62</a>	<a href="#">MA151/45/62</a>	<a href="#">MA151/50/62</a>
Olympus Camedia C-5060 C-7070	MA151/30/65	MA151/30/63	MA151/40/64	MA151/45/64	(52mm) <a href="#">J31</a> <a href="#">MD-M1A</a>



					<a href="#">MA151/50</a>
<b>Olympus Camedia C-5000, SP310, SP350</b>	(52mm) P06366 MD-M1A MA151/30	(52mm) P06366 MD-M1A MA151/30	(52mm) P06366 MD-M1A MA151/40	-	(52mm) P06366 MD-M1A MA151/50
<b>Panasonic DMC-FZ10 DMC-FZ15 DMC-FZ20</b>	(52mm) <a href="#">J41</a> <a href="#">MD-M1A</a> <a href="#">MA151/30</a>	(52mm) <a href="#">J41</a> <a href="#">MD-M1A</a> <a href="#">MA151/30</a>	(52mm) <a href="#">J41</a> <a href="#">MD-M1A</a> <a href="#">MA151/40</a>	-	(52mm) <a href="#">J41</a> <a href="#">MD-M1A</a> <a href="#">MA151/50</a>
<b>Sony DSC-S70 DSC-S75 DSC-S85 MVC-CD300 MVC-CD400 MVC-CD500</b>	<a href="#">MA151/30/91</a>	<a href="#">MA151/30/91</a>	<a href="#">MA151/40/90</a>	<a href="#">MA151/45/90</a>	<a href="#">MA151/50/90</a>
<b>Sony DSC-H1</b>	(52mm) RT5256H MD-M1A MA151/30	(52mm) RT5256H MD-M1A MA151/30	(52mm) RT5256H MD-M1A MA151/40	-	(52mm) RT5256H MD-M1A MA151/50
<b>Sony DSC-W1 DSC-W5 DSC-W7</b>	(52mm) P06366 MD-M1A MA151/30	(52mm) P06366 MD-M1A MA151/30	(52mm) P06366 MD-M1A MA151/40	-	(52mm) P06366 MD-M1A MA151/50
<b>Sony DSC-V1</b>	(52mm) RT5245VT MD-M1A MA151/30	(52mm) RT5245VT MD-M1A MA151/30	(52mm) RT5245VT MD-M1A MA151/40	-	(52mm) RT5245VT MD-M1A MA151/50
<b>Sony DSC-V3</b>	(52mm) RT5248V3 MD-M1A MA151/30	(52mm) RT5248V3 MD-M1A MA151/30	(52mm) RT5248V3 MD-M1A MA151/40	-	(52mm) RT5248V3 MD-M1A MA151/50

### ***3.6 Connecting a Video or Other Camera that has a “C” type mount***

In order to attach a camera that employs a standard “C” type camera mount to a MC Series microscope, one will need a trinocular head model with one of the below listed “C-mount” adapters:

<b>Optional "C" Mounts With Lenses - For all Meiji Trinocular Microscopes</b>	
<b>MA151/35/03</b>	"C" Mount Adapter with 0.30X lens (Slips over existing photo tube)
<b>MA151/35/04</b>	"C" Mount Adapter with 0.45X lens (Slips over existing photo tube)
<b>MA151/35/15</b>	"C" Mount Adapter with 1.0X lens (Slips over existing photo tube)
<b>MA151/35/20</b>	"C" Mount Adapter with 0.7X lens (Slips over existing photo tube)
<b>MA151/35/25</b>	"C" Mount Adapter with 2.5X lens (Slips over existing photo tube)

## ***4.0 Maintenance and Cleaning***

### **WARNING**

- Disconnect the power cord on your equipment prior to performing cleaning, maintenance or repair.
- Keep electrical components away from moisture or humidity.
- In warm humid climates, take special care to prevent your equipment from exposure to fungal growth by using desiccant in an airtight storage container or by other means.
- Clean the microscope after each use. Keeping your microscope clean will insure its proper operation over its lifetime.

### **Cleaning**

Dust, fibers and other debris can cause your field of view to get obstructed so keeping your microscope clean will help the overall quality of your work.

### **Cleaning of Painted Surfaces**

Use a soft brush or lint-free cotton cloth to removed dust and loose particles. Tough dirt can be removed with water and a mild detergent.

### **CAUTION**

**NEVER USE ACETONE OR OTHER HARSH CHEMICALS.**

Painted or plastic surfaces should not be tarnished or etched with cleaning agents that are too powerful.

To clean painted surfaces, use a moistened lint-free cotton cloth with mild soapy water.

### **Cleaning the Stage**

Use a soft brush or lint-free cotton cloth to removed dust and loose particles.

**DO NOT USE ACETONE OR OTHER HARSH CHEMICALS**, use a moistened lint-free cotton cloth with a solution of mild soapy water.

### **Cleaning of Glass Surfaces**

Use a soft brush or lint-free cotton cloth to removed dust and loose particles.

For tough dirt, use a soft lint-free cotton cloth moistened with distilled water.

If that fails, try using medical or reagent grade isopropyl alcohol.

## **Cleaning the Objectives**



Objectives should NEVER be disassembled for cleaning or for any other reason! We do not advise cleaning the inside surfaces of objectives or eyepieces.

Use a soft brush, bellows brush or a soft lint-free cotton cloth to removed dust and loose particles.

For tough dirt, use a soft lint-free cotton cloth moistened with distilled water.

If that fails, carefully try using medical or reagent grade isopropyl alcohol.

Wipe lenses immediately. Over time, water and solvents can dissolve optical cements that hold optics together so NEVER soak objectives with ANY type of fluid.

## ***5.0 Troubleshooting***

Meiji Techno products are manufactured exclusively in Japan under ISO9001 manufacturing standards. However, if you ever have any difficulty with any Meiji product, feel free to contact us at:

**MEIJI TECHNO CO., LTD.  
322-1, Chikumazawa,  
Miyoshi machi, Iruma-gun  
Saitama 354-0043, Japan**

**Phone:** 049-259-0111  
**Fax:** 049-259-0113  
**E-mail:** [meiji@meijitechno.co.jp](mailto:meiji@meijitechno.co.jp)  
**Web:** <http://www.meijitechno.co.jp>

**Meiji Techno America  
3010 Olcott Street  
Santa Clara, CA 95054-3207**

**Phone:** 800.832.0060  
**Fax:** 408.970.5054 FAX  
**E-mail:** [technicalsupport@meijitechno.com](mailto:technicalsupport@meijitechno.com)  
**Web:** <http://www.meijitechno.com>

Our technical staff is trained to assist you on mechanical or electrical issues you may have.

### **Operational Issues**

Please refer to the previous “Operations” chapters which coincide with the observation mode that you are using. The most common operational problems include the improper positioning of contrast accessories, the improper adjustment or the incorrect parts installed. If you are unable to obtain the desired image from the microscope, please refer to the corresponding chapters of this manual under the proper operation mode: brightfield, etc.

### **Electrical Problems**

Electrical problems can include:

- The lamp on the microscope is not working.
- No voltage is present.

Check the following probable causes:

- Check that all power cords are properly connected to the right spots.
- Make sure power is actually present at the wall outlet.
- Check to see if there is a fuse is blown.

## 5.1 Replacing the mains fuse on the illuminator power supply



**ALWAYS DISCONNECT YOUR EQUIPMENT BEFORE DOING ANY REPAIR.**

### Location of Mains Fuse

The mains fuse of the FL150 Fiber Optic Illuminator s is located on the back panel of the device as shown.



The mains fuse of the FT190 Fiber Optic Illuminator s is located on the back panel of the device as shown.



## Instructions to replace the mains fuse:

- Turn the power switch to the off position.
- Unplug the box from the wall outlet.
- Use a small screwdriver to pry open the fuse cap from the fuse holder.
- Remove the blown fuse from the fuse cap.
- Replace the fuse with the CORRECT type and rating which is:



**150W Halogen Systems** - IEC Standard 5 X 20mm 3 amp Slo-Blo (such as Littelfuse 239 Series).

- Reinstall the fuse holder with the new fuse in place.



**NEVER USE REPLACEMENT FUSES OF A DIFFERENT RATING.**

## *5.2 Illuminator Light does not work*

- Make sure your mains outlet indeed has power.
- Make sure the plug from the lamp is firmly plugged into the correct socket on the rear panel.
- Check to see if the mains fuse has blown.
- Check to see if the lamp has blown.

## 5.3 Replacing the Halogen Lamp



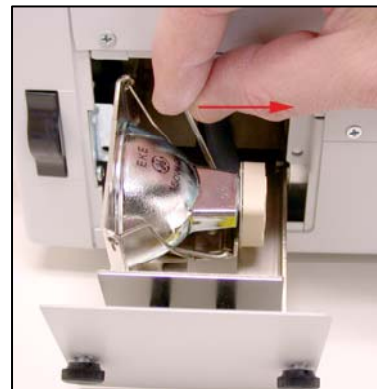
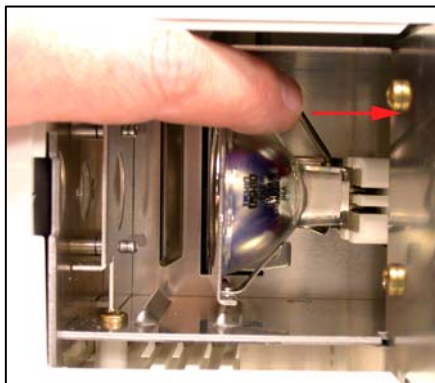
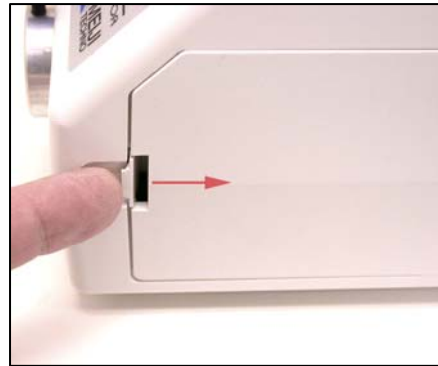
**ALWAYS DISCONNECT YOUR EQUIPMENT BEFORE DOING ANY REPAIR.**

Do not touch the glass envelope of the lamp during installation. Keep the protective sleeve or bag of the lamp during installation and remove it right after installation.



**LAMP AND LAMP HOUSING MAY BE HOT TO THE TOUCH.**

- Switch off the microscope.
- Disconnect the power cord.
- Wait until the housing and bulb have cooled sufficiently.
- Open the lamp access door. The FL150 has a plastic door with latch and the FT190 has a metal door with two thumbscrews.
- Move the ejector lever as shown below to pop the bulb out of the socket.
- Remove the defective lamp and push the new lamp into place being sure that the pins and the glass reflector are squarely aligned in the socket or premature bulb failure will result.
- While placing a new lamp into the socket, avoid touching any the glass part. Notice the bulb is wrapped in plastic. Use it to avoid touching the glass parts during installation.
- Close or re-install the lamp cover door.
- Reconnect the power cord and switch on the microscope to verify proper illuminator operation.





## ***6.0 Storage***

- Protect your microscope from dust after each use by covering your instrument with the protective dust cover that came with your microscope.
- Store your microscope in a cabinet that has a stable temperature and low humidity.
- If you live in an area that has high humidity, consider storing your microscope in a sealed container along with a desiccant such as silica gel.
- It is also recommended that the objective and eyepieces be stored in a separate air tight container with desiccant.

## 7.0 Accessories and Replacements Parts

Part numbers and product descriptions for accessories and parts for MC Series Microscopes can be found listed below. Accessories and replacement parts for all Meiji Techno products are available through our dealer network. Feel free to contact us a call so we may direct you to the closest authorized Meiji Techno Dealer in your area. Or call us toll free (800) 832-0060 Monday through Friday 9am – 5pm PST.

<b>Accessories for MC Series</b>	
<b>Catalog Number</b>	<b>Description</b>
<b>Viewing Heads</b>	
<b>MA657/05</b>	Erect image binocular head with de-polarizer
<b>MA655/05</b>	Erect image binocular head with de-polarizer
<b>Eyepieces</b>	
<b>MA406</b>	DIN HWF 10X widefield eyepiece, FN: 18
<b>MA413CF</b>	Focusing eyepiece HWF10X-F with cross-line reticule and guide pin
<b>MA584</b>	Protractor eyepiece 10X
<b>S.Plan Infinity Corrected Objectives</b>	
<b>MA336</b>	S.Plan M4X, NA 0.10, working distance: 20mm
<b>MA330</b>	S.Plan M5X, NA 0.10, working distance: 20mm (included)
<b>MA337</b>	S.Plan M10X, NA 0.25, working distance: 9.4mm (included)
<b>MA338</b>	S.Plan M20X, NA 0.40, working distance: 5.2mm (included)
<b>MA339</b>	S.Plan M40X, NA 0.65, working distance: 0.81mm (included)
<b>MA722</b>	S.Plan LWD M40X, NA 0.45, working distance: 5.8mm
<b>MA344</b>	S.Plan M50X, NA 0.70, working distance: 0.36mm
<b>MA349</b>	S.Plan LWD M50X, NA 0.50, working distance: 6.0mm
<b>MA329</b>	S.Plan M60X, NA 0.85, working distance: 0.48mm
<b>MA328</b>	S.Plan M100X, NA 0.75, working distance: 0.28mm, dry
<b>Digimatic Indicators *</b>	
<b>MTI164-162</b>	Mitutoyo Digimatic Indicator for X-Y axis movement. Range: 50mm (2")
<b>MTI543-542</b>	Mitutoyo Digimatic Indicator for X-Y-Z axis movement. Range: 12.7mm (0.5")
<b>MA721</b>	Extension Rod for digital indicator, stem diameter 3/8"
<b>MA807</b>	Mounting bracket for digital "Z" axis indicator
<b>Eyepiece Micrometers</b>	

<b>MA279</b>	Cross-line reticle, 19mm diameter
<b>MA280</b>	10mm divided into 100 units, 19mm diameter
<b>MA281</b>	5mm divided into 100 units, 19mm diameter
<b>MA282</b>	10mm square divided into 400 units, 0.5mm square, 19mm diameter
<b>MA283</b>	10mm square divided into 100 units, 1.0mm square, 19mm diameter
<b>MA539</b>	Cross-line reticle with 0.1mm graduations, 19mm diameter
<b>MA253</b>	Cross-line reticle with dotted lines, 19mm diameter
<b>Stage Micrometers</b>	
<b>MA285</b>	Stage micrometer, 1mm divided into 100 units, each unit 0.01mm
<b>MA286</b>	Stage micrometer, 0.04" divided into 100 units, each unit 0.001 inch
<b>MA292</b>	Metal stage micrometer, 0.01mm, for reflected light applications
<b>Miscellaneous</b>	
<b>MA569</b>	Replacement glass stage plate for MA729 transmitted light stage
<b>FL150/70</b>	Spare bulb, 21V 150W

## 8.0 Technical Descriptions

### Filters and Applications

<u>Filter</u>	<u>Application</u>
ND50	Neutral Filter or ND Filter. Grey filters or neutral density filters are used to attenuate all frequencies of light equally resulting in preservation of color temperature. The ND50 filter would indicate a reduction of light transmission by 50 percent or a passage of light of 50 percent.
Clear Blue Filter	Clear Blue Filter. Suppresses red wavelengths. Used to achieve desired color balance. Adds alternative contrast to images.
Clear Green Filter	Clear Green Filter. In the past, used for adding contrast for use with Black & White film and still can be used to achieve desired color balance. Adds alternative contrast to images. A green filter usually improves resolution by restricting the waveband reaching the objective.
Polarizing Filter.	Polarizing Filter. Used in conjunction with a rotatable analyzer, the polarizing filter changes the angle of light seen in the field of view.



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