

# MF-900

## Microforge

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# Precautions in Handling

The Model MF-900 Microforge is a finely adjusted precision instrument for micron level use. Please observe the following precautions so that the instrument can be used safely and successfully over a long period of time.

1. Exercise care to avoid dropping the instrument on your hands or feet to avoid serious injury.
2. Handle this instrument with care. Avoid dropping or subjecting it to any sudden or severe impact.
3. Do not loosen the structurally essential clamps of this instrument. Do not disassemble the instrument for repair or reconstruction.
4. Do not expose this instrument to blood, chemicals or water. Do not install it in a place where it may be exposed to blood, chemicals or water. If this instrument is contaminated with blood or chemicals, wipe it clean using alcohol or organic solvent. Do not sterilize this instrument by boiling.
5. Do not expose this instrument to direct sunlight, high temperatures and humidity, dust or vibrations. Refer to the operating environment in the following.  
Operating Environment:
  - Indoor use
  - Ambient temperature: 10°C to 40°C (50deg.F to 104deg.F)
  - Relative humidity: 30% to 80% (non-condensing)
6. Ensure that this instrument is installed on a level place. Installation on an unstable place where the instrument is subjected to thumps, bumps, or vibration will affect its performance.
7. Do not install this instrument near a strong magnetic source such as a monitor or loudspeaker.
8. Always use the proper input voltage when using this instrument. For details, refer to "7. Maintenance - (4) To Change the Working Voltage".
9. Always use a 100µm or 150µm platinum wire for this instrument. The use of a platinum wire with a thickness other than 100µm or 150µm may cause a failure in the circuit board. Be aware that such a failure is not covered by the warranty.
10. Always use a platinum wire for the heating element to be fitted to this instrument. The use of a heating element made of a different type of material may cause a failure in the circuit board. Be aware that such a failure is not covered by the warranty.
11. Never touch the illuminator unit as the light bulb emits heat while the illumination system is on, to avoid burning your hands. If the light bulb went out, turn off the main power and allow the heated light bulb to cool off completely before replacing it with a new light bulb. For details, refer to "7. Maintenance - (2) To Replace Light Bulbs".
12. Serious injury could occur if the very sharp tip of a micropipette is unintentionally contacted. Exercise added care to avoid causing injury when processing, fabricating, attaching or detaching a micropipette.
13. With this instrument, the micropipette is processed by the application of heat. While the heater is on, never touch the heating element. When replacing the heating element with a new one, turn off the main power and allow the heater to cool off completely before starting the procedure. For details, refer to "7. Maintenance - (1) To Replace Heating Elements".
14. The microscope focus adjustment knob employs a built-in gearbox for the sake of size reduction. Be aware that slight defocusing may be infrequently observed while manipulating the fine focus adjustment.

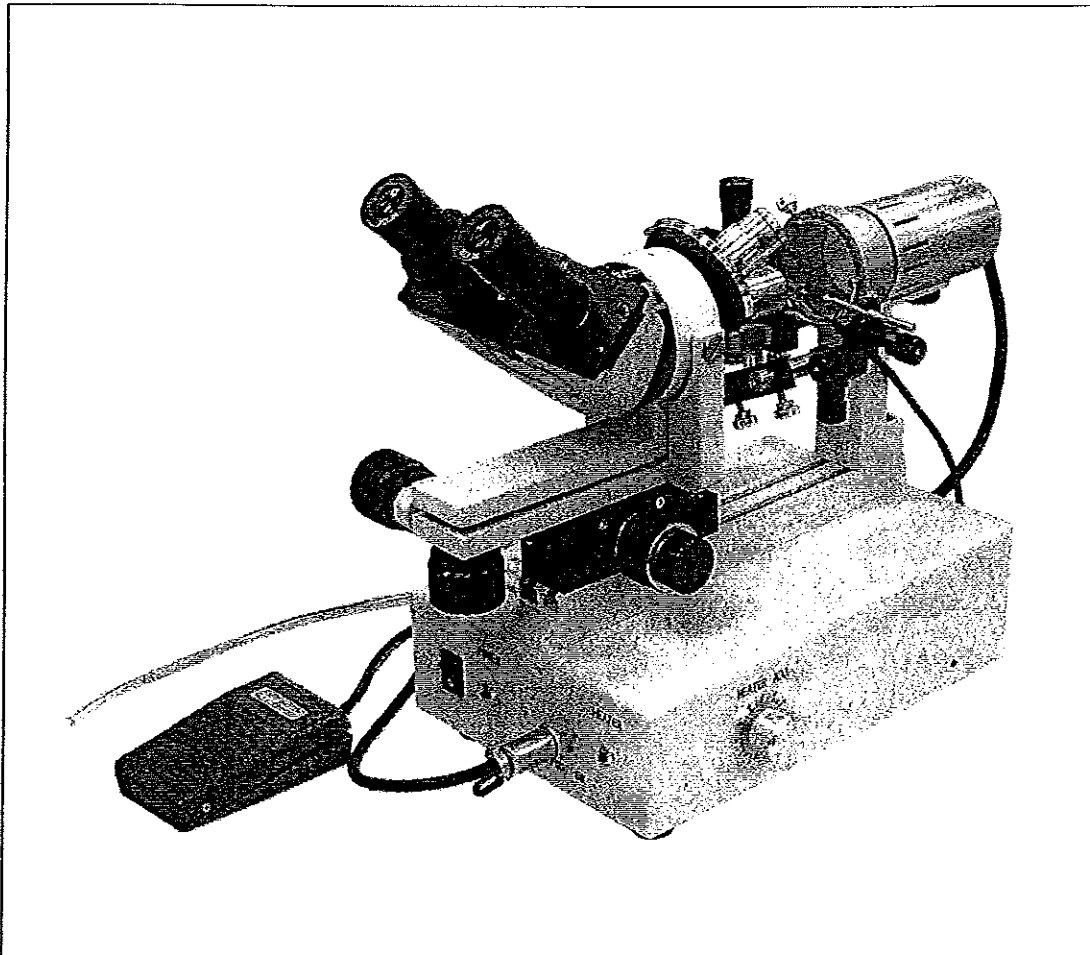
**Warning:** Do not position this equipment so that it becomes difficult to disconnect the mains power for servicing or in the event of a fault.

□ The design of the product is under constant review and whilst every effort is made to keep the instruction manual up to date, the right is reserved to change specifications and equipment at any time without prior notice.

# 1. General Description

Thank you for purchasing the Model MF-900 Microforge.

This instrument is used for fire-polishing the tips of glass micropipettes. Its outstanding features include the pipette manipulator and the heater manipulator that can be controlled independently. Especially, the heater manipulator permits fine micromanipulation with enhanced operability and stability. The microscope itself can also be moved in three dimensions. With the heater unit incorporated in the microscope unit, most fabrication work can be performed using the controls close to the operator. The pipette holder, greatly improved in operability, facilitates attaching and detaching a micropipette, as well as rotating the micropipette during fabrication. Improvements were made to the built-in stabilized power supply. The use of a  $150\ \mu\text{m}$  (in diameter) platinum wire heating element instead of the conventional  $100\ \mu\text{m}$  platinum wire heating element has permitted the heater to produce increased amount of heat and output. The conventional  $100\ \mu\text{m}$  platinum wire heating element remains usable with this instrument. The addition of a bright and easy-to-view transmitted illuminator (backlight) has made precision fabrication work easier. To improve operational efficiency, the heater and the light adjustment knobs are situated toward the front, on the right and left side of the power supply unit respectively, and the heater on-off operation is conveniently controlled by foot switch. The MF-900 Microforge is capable of diverse fabrication work including firepolishing and cutting so as to produce a variety of micropipettes in accordance with the intended use.

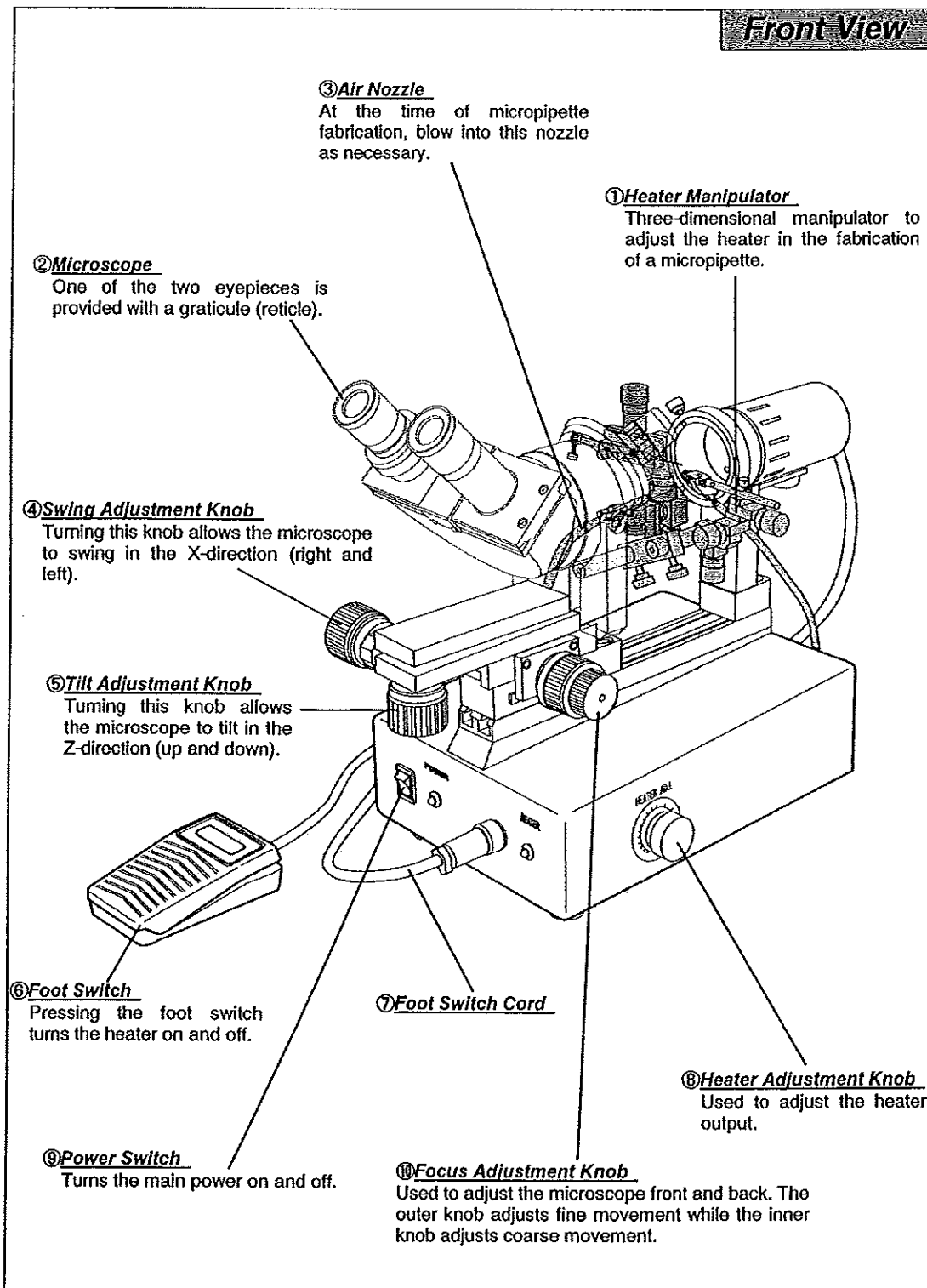


## 2. Items Supplied

The Model MF-900 comes complete with the items listed on this page. In the event of any of the following items missing in your package at the time of purchase, please contact your local Narishige representative.

<input type="checkbox"/> MF-900 Main Unit (Assembly of Power Supply, Microscope, and Illuminator)	1
<input type="checkbox"/> Eyepiece Lens (without graticule, 10x)	1
<input type="checkbox"/> Eyepiece Lens (with graticule, 10x)	1
<input type="checkbox"/> Objective Lens (5x)	1
<input type="checkbox"/> Objective Lens (10x)	1
<input type="checkbox"/> Heater Unit	1
<input type="checkbox"/> Air Nozzle	1
<input type="checkbox"/> Foot Switch	1
<input type="checkbox"/> Spare Heating Element ( $\phi$ 150 $\mu$ m)	1
<input type="checkbox"/> Spare Light Bulb	1
<input type="checkbox"/> Allen Wrench	2
<input type="checkbox"/> Power Cord	1
<input type="checkbox"/> Silicone Rubber Gasket	1 pack

### 3. Names and Functions of Principal Parts

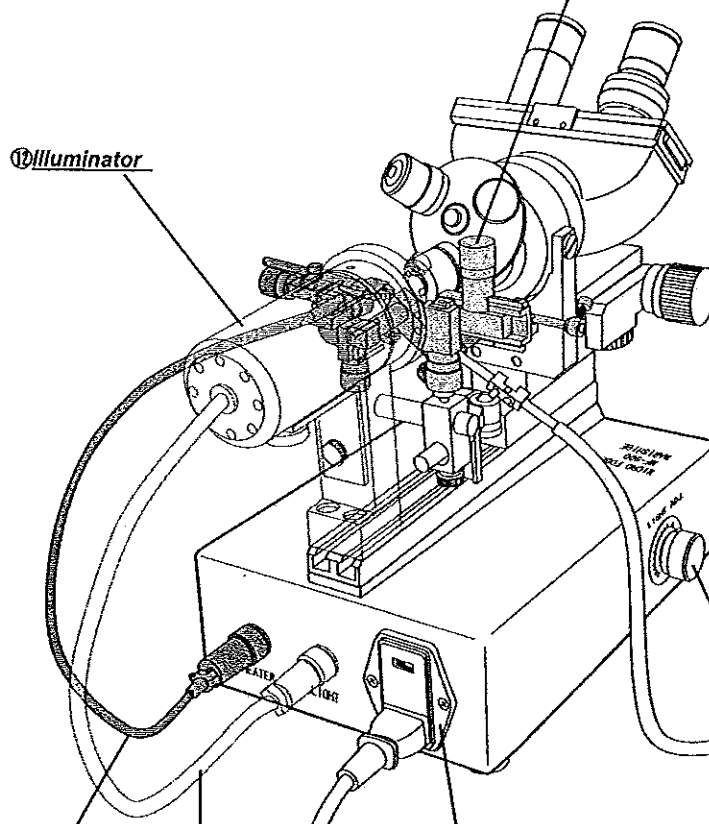


**Rear View**

**⑪ Pipette Manipulator**

Used to hold the micropipette and adjust it with the two-dimensional manipulator.

**⑫ Illuminator**



**⑬ Light Adjustment Knob**

Used to adjust the brightness.

**⑭ Light Cord**

**⑮ Heater Cord**

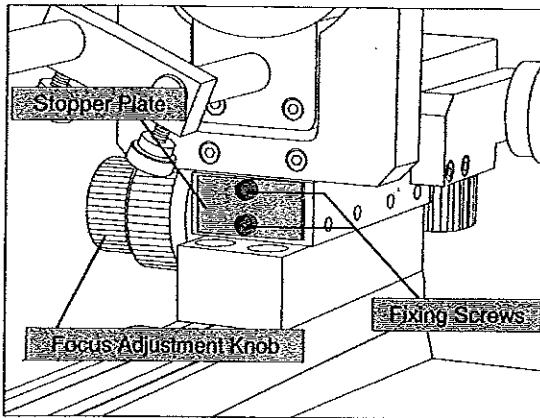
**⑯ AC Power Inlet**

Power Cord is plugged in.

## 4. Assembly

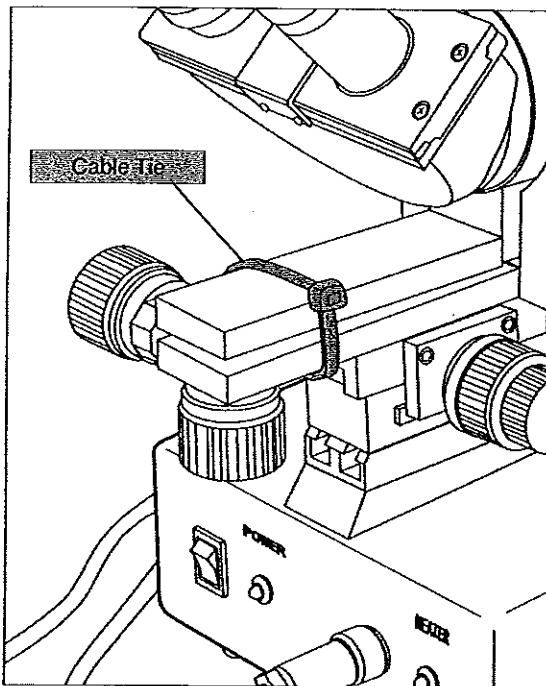
### (1) To Remove the Stopper Plate

This instrument comes factory-fastened with a stopper plate and a cable tie to protect the microscope adjustment mechanism from damage in transit. Before operating the microscope adjustment functions, be sure and remove the stopper plate and cable tie.



①The stopper plate is fastened to the drive unit of the focus adjustment knob. Unscrew the two fixing screws with the supplied Allen wrench and remove the stopper plate.

※In the event of relocating this instrument, be sure and refasten the stopper plate to this instrument.



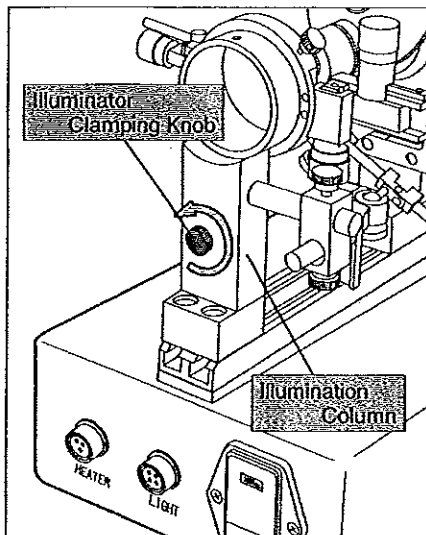
②The moving part to move the observation tube up and down as well as right and left comes factory-fastened with a cable tie. Cut the cable tie with scissors and remove it.

※In the event of relocating this instrument, be sure and refasten the microscope adjustment unit with a cable tie or the like.

### CAUTION!

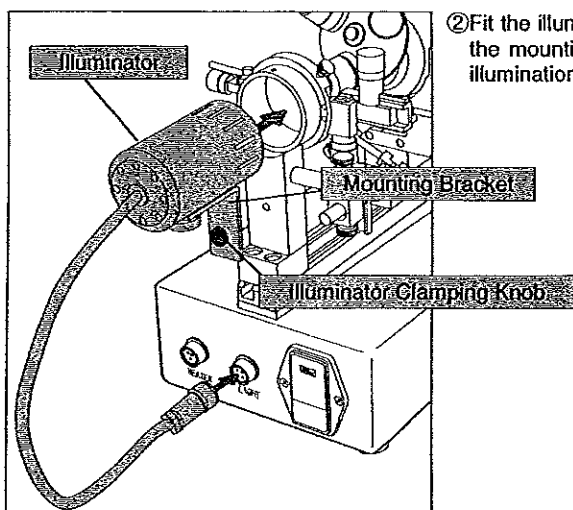
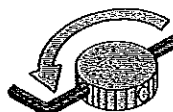
Do not turn the microscope focus adjustment knob before removing the stopper plate. Failure to observe this will cause breakage of the knob. Ensure that the stopper plate is removed before turning the knob.

## ② To Install the Illuminator

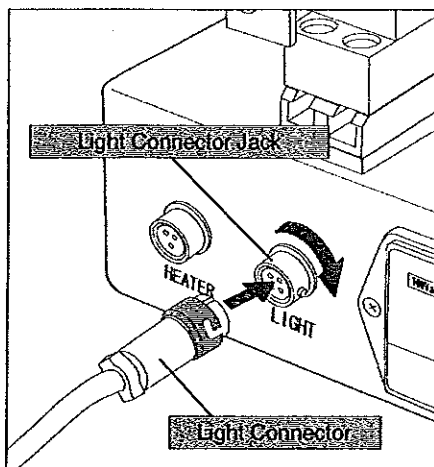


① When shipped from the factory, the illuminator clamping knob is fastened to the illumination column. To install the illuminator, turn the illuminator clamping knob counterclockwise to remove it.

※ The illuminator clamping knob is fastened securely to prevent loosening during transit. If it is difficult to loosen the knob by hand, insert the supplied Allen wrench into the hole in the knob and loosen the knob to remove it.



② Fit the illuminator clamping knob (removed in ①) into the hole in the mounting bracket and fasten the illuminator securely to the illumination column.



③ Put the light connector, with its slotted part facing upward, into the light connector jack marked "LIGHT" on the back panel. While carefully pressing the cover of the light connector, turn it clockwise to lock it firmly.