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# **INSTRUCTIONS**

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**MO-203**



**NARISHIGE CO., LTD.**

27-9, MINAMIKARASUYAMA 4-CHOME, SETAGAYA-KU, TOKYO, JAPAN.

TEL: (03)308-8383 CABLE: NARISHIGELABO

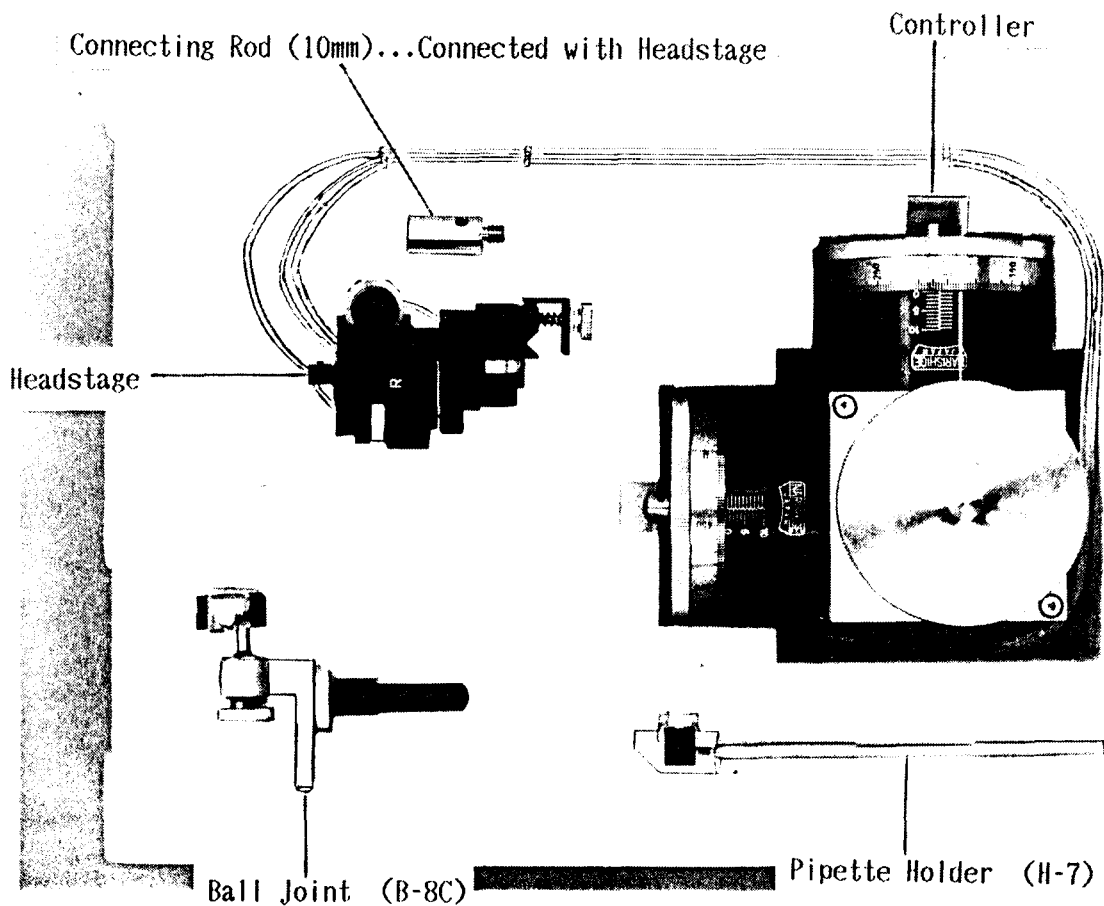
FACSIMILE: (03)308-8700

I n s t r u c t i o n   M a n u a l  
f o r  
M O - 2 0 3   T h r e e   D i m e n s i o n a l   H y d r a u l i c  
M i c r o m a n i p u l a t o r

Thank you for purchasing the Narishige MO-203 Hydraulic Micromanipulator. The MO-203 has been built with pride and should give you years of trouble-free operation. This manual is designed to help you get maximum performance from your MO-203. If after reading it you require further assistance, please never hesitate to call us directly to speak with one of our applications specialists.

Unpacking

The MO-203 has been carefully packed and inspected, a picture of the package contents is shown below. You should have one (1) of each of the items shown. Should any of the parts arrive in a damaged condition, contact your common carrier immediately. Do not call us since corrective action must start with the carrier. Be assured that we will cooperate completely to help correct the problem and to have you operational quickly.

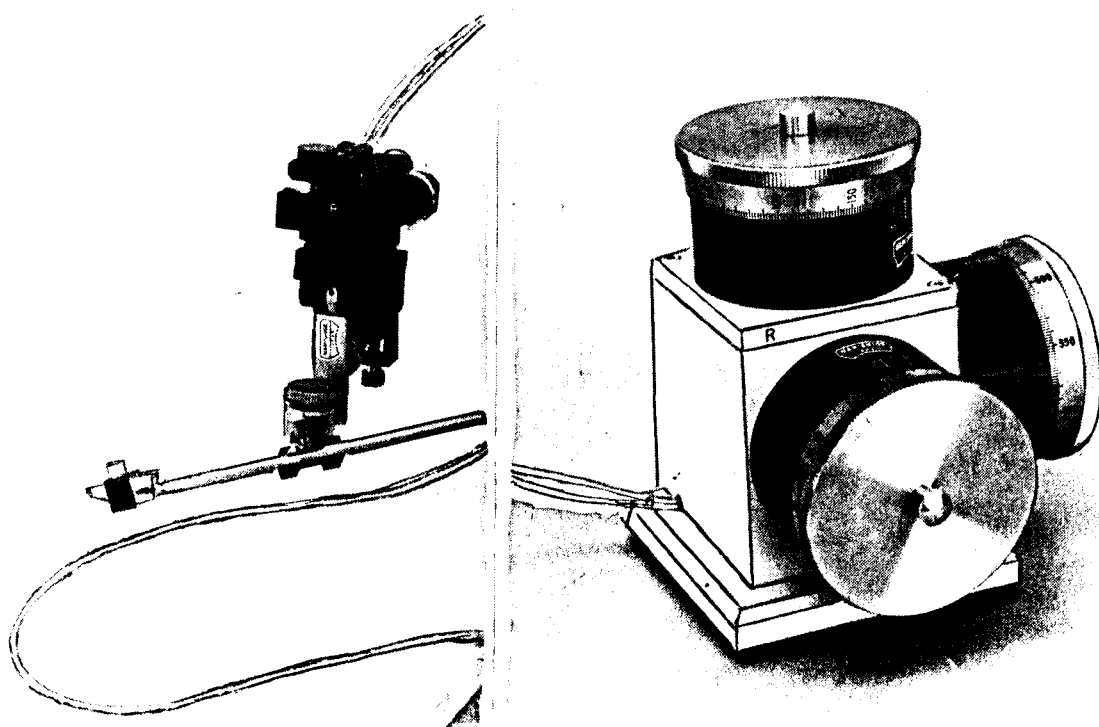


The M0-203 is a compact, vibration-free, three dimensional hydraulic micromanipulator. Smooth microdrive movement through a 10mm range is remotely and independently controlled for each of the X, Y and Z axes. The smooth vibration-free movement of the microdrive makes the M0-203 ideal for inserting microelectrodes into small cells or culture.

This manipulator is light-weight and is designed to be mounted on a microscope using specific adaptors which enhance the vibration-free movement.

This M0-203 manipulator is designed for both Right hand and Left hand use. Adjust both the headstage and controller so that the printed "R" is facing the user when Right hand use applies. Do the same for Left hand use while making sure that the printed "L" is facing the user.

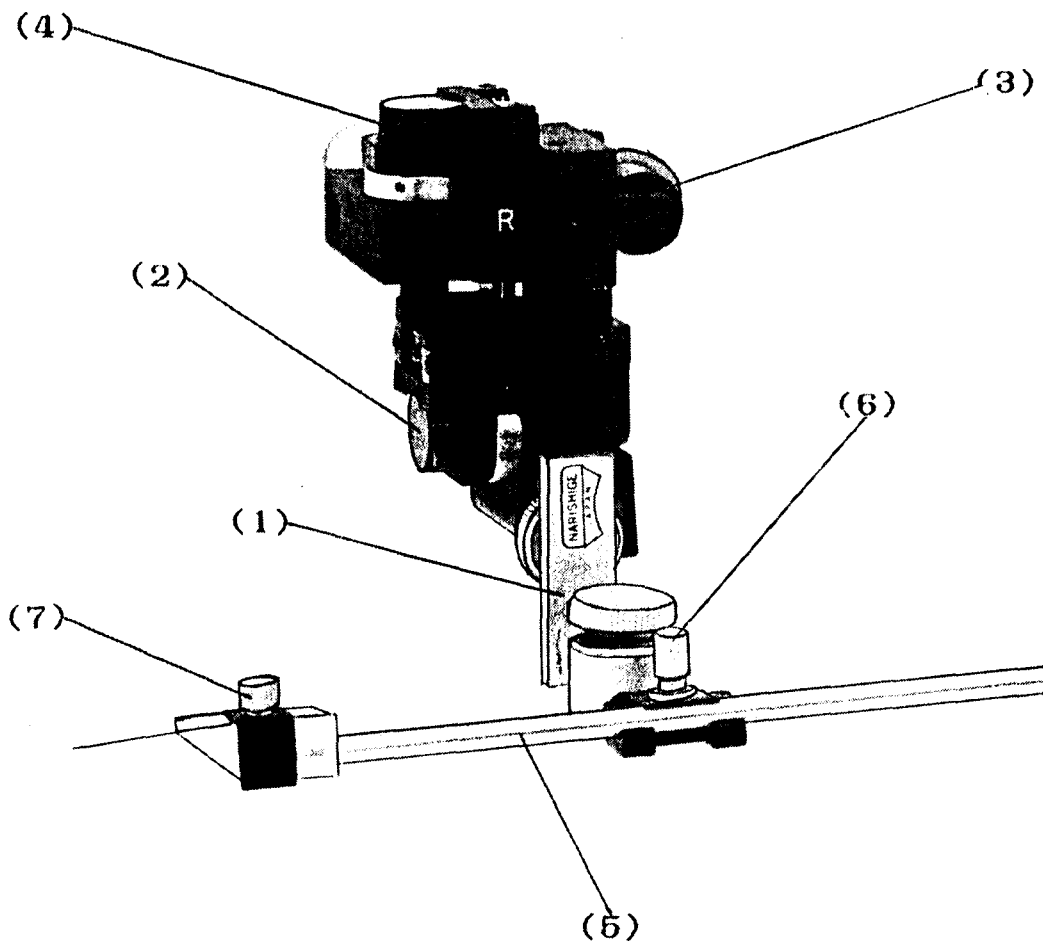
In order to connect the headstage with the coarse movement manipulator (MN-2), you should screw the connecting rod into the back of the headstage. In case of Right hand use, the connecting rod should be screwed into the hole indicated "R". In case of Left hand use, screw the connecting rod into the hole indicated "L".



### Principal Parts of the Headstage

When the headstage is positioned to face "R" in front, you can use it for Right hand use. When positioning to face "L" in front, you can use it for Left hand use.

Right Hand Use

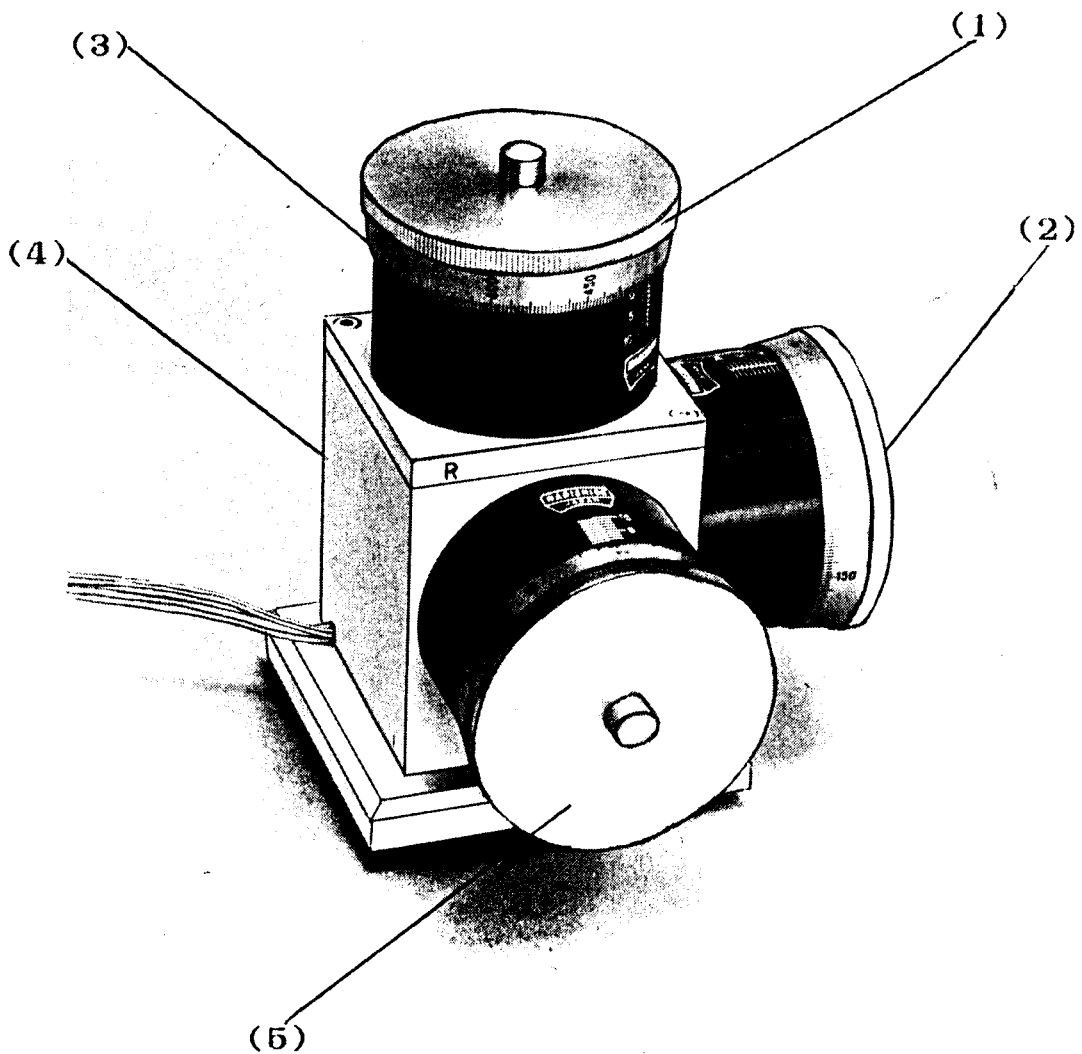


- (1) Ball Joint B-8C
- (2) X-unit for Right hand use, Y-unit for Left hand use
- (3) Y-unit for Right hand use, X-unit for Left hand use
- (4) Z-unit
- (5) Pipette Holder H-7
- (6) Pipette Holder Fixing Screw
- (7) Pipette Fixing Screw

## Principal Parts of the Controller

- (1) Z-axis Control Knob
- (2) X-axis Control Knob for Right hand use  
Y-axis Control Knob for Left hand use
- (3) Operation Scale
- (4) Controller Housing
- (5) Y-axis Control Knob for Right hand use  
X-axis Control Knob for Left hand use

Right Hand Use



## The Headstage

The headstage of the MO-203 is composed of three microdrive units which are assembled at right angles from each other, so as to represent X, Y and Z movements. A micropipette can be moved to any point within a 10mm sided cube by making use of hydraulic pressure which is directed from a remotely located controller.

The following parts are necessary when mounting the headstage to various microscopes.

- (1) Adaptor for type of Microscope (See catalog for applicable part number(s))
- (2) MN-2 (or MN-3) Coarse movement Manipulator

The headstage must be mounted so that the printed "R" is facing the user when Right hand use applies. In case of Left hand use, turn the headstage to the left 90 degrees so that the printed "L" is facing the user.

In order to connect the headstage with the coarse movement manipulator MN-2, you must screw the supplied connecting rod into the back of the headstage. When Right hand use applies, screw the connecting rod into the hole marked "R". For Left hand use, screw the connecting rod into the hole marked "L".

After mounting the headstage completely to the microscope, rotate the knobs of the Controller so as to make sure that each knob is controlling the correct axis.

## The Controller

The Controller is made up of three operation knobs (1) (2) (5) which control independent movement along all three axes.

### Working Distance

Headstage: X-axis

Y-axis

Z-axis

Fine Movement

Movable Distance 10mm each

Controller: X, Y and Z Direction

Fine Movement

Controllable Distance 10mm each

One rotation of the knob results in the movement of the microdrive by 500 microns, while the minimum scale of the control knob for X, Y and Z stands for 2 microns.

### Accessories

(1) Pipette Holder	H-7	1 ea
(2) Ball Joint	B-8C	1 ea

### Handling and Maintenance of the Instrument

This precision instrument is delicate and should be handled with care. Avoid any shock to the instrument. Be aware that pulling on the hydraulic lines can result in damaging the sealed hydraulic system. Keep in mind that this system is sensitive to temperature change. To minimize unwanted movement of the headstage, keep MO-203 in a stable temperature environment away from drafts and sun.

After long term use, the oil may change color. This is due to oxidation of the oil. This change should not affect the instrument's performance.

After each use turn all three vernier controls to their zero positions in order to prevent excessive oil leakage through diaphragm. (A small amount of oil leakage is inevitable and should not be regarded as a defect in the device.)

For best results when operating the M0-203 each of the vernier controls should be at the mid-range of their 10mm travel.

Never attempt to disassemble a control cylinder. If so, this will make re-adjustment very difficult.

The oil containers of the microdrives and controller are of a cartridge design so that repair is a matter of replacing the cartridge.

If problems occur with the system, please do not attempt to repair, but rather contact us and we will repair it for you.