

OLYMPUS®

Your Vision, Our Future

MICROMANIPULATION SYSTEM

ON3 SERIES

*A full line-up of models to meet every specific purpose,
from microinjection to patch clamping.*



The Right Model

In The Right Place

Olympus micromanipulation system ON3 series:
A line-up to meet every specific need.

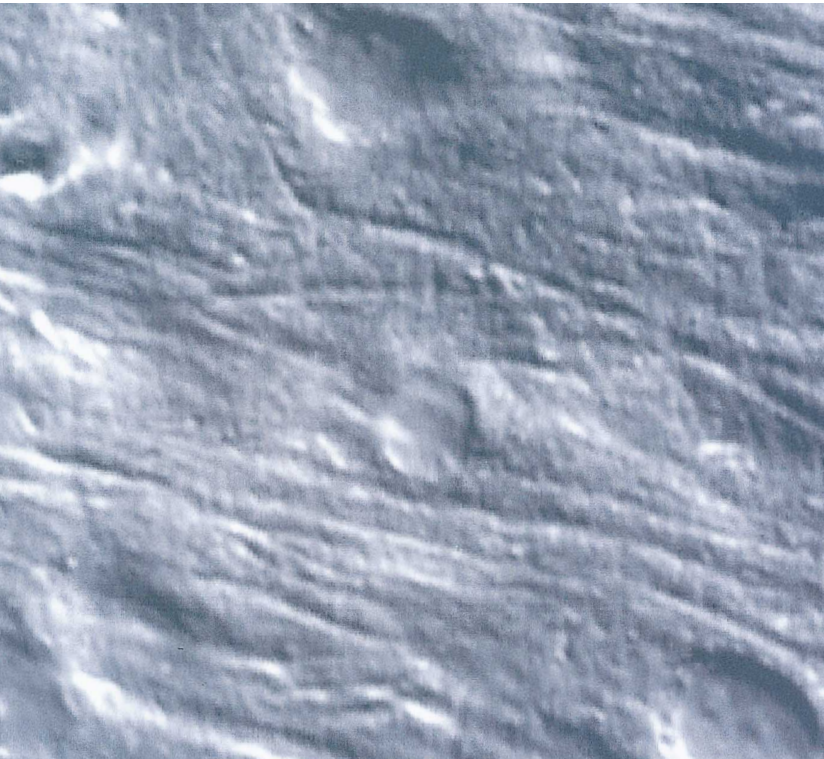
In Vitro Fertilization, patch clamping, injection...modern standards in easy-to-operate micromanipulators vary widely according to differences of research and operation. Olympus manufactures a wide variety of microscopes for use with carefully selected micromanipulators to carry out specific applications with the greatest possible ease and comfort. Reliability is a key characteristic of Olympus systems, whose development aims at progressive and practical improvements in micromanipulation techniques and operation.

IVF

In Vitro Fertilization (IVF) is rapidly becoming more common as a treatment for human infertility. One of the key procedures is ICSI (Intracytoplasmic Sperm Injection), which has proved particularly successful in treating couples who are diagnosed as having exceptional difficulty in fertilization and, therefore, a low likelihood of achieving pregnancy. Especially high fertilization rates are reported in cases where the primary cause of infertility is impaired sperm function. Since advanced operating skills and precise micromanipulations under the microscope are required for ICSI, the performance of the microscope and micromanipulators themselves are vital for a successful outcome. The combination of the Olympus inverted research microscope IX71 with carefully selected micromanipulation systems offers the superior optical performance and precise, comfortable micro-manipulations needed to ensure success in the growing field of IVF.

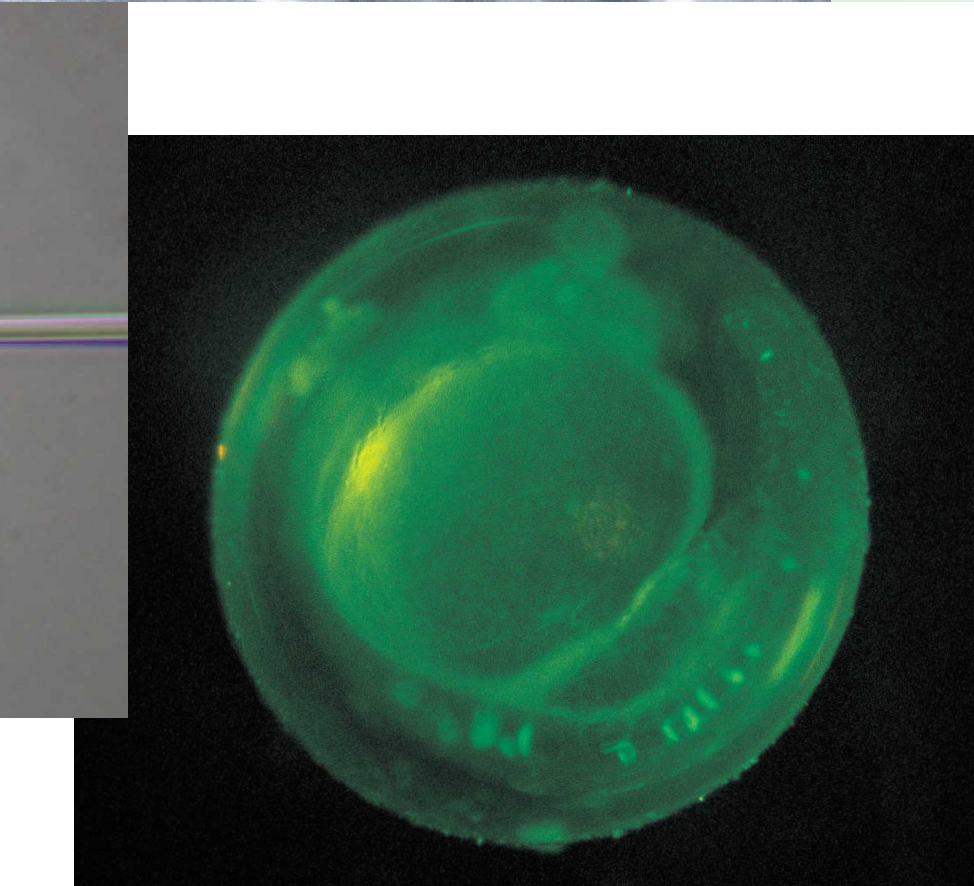


Photo courtesy of: Yuji Abe M.D.Ph.D.,
The 1st Department of Obstetrics & Gynecology School of Medicine,
Toho University



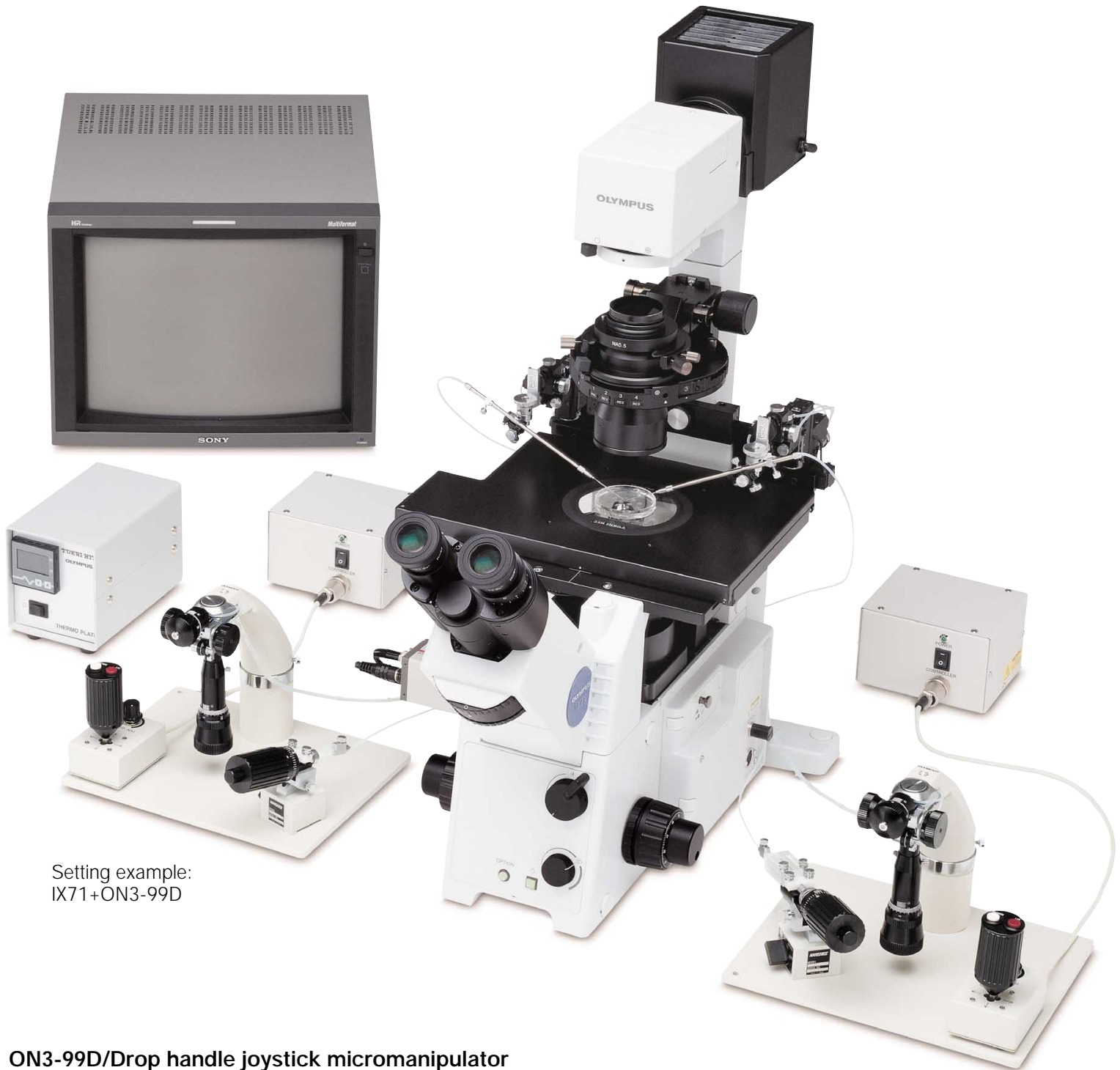
Patch Clamping

Patch Clamping plays a vital role in clarifying the detailed structures and mechanisms of human life. It requires equipment with compact design and long-term operating stability, and is often applied in multi-channel settings or combined with other research methods. For microscopes, the most important characteristics are high rigidity, solid fixing of the stage and compatibility with a range of supplementary electrical devices. To meet those needs with high-quality, high-precision performance, Olympus offers the ONU-31P ultrasonic linear motor micromanipulator, the BX51WI fixed stage upright microscope and the IX2 inverted system microscope.



Injection

Biotechnology is developing rapidly and bringing fruitful results in many different fields. In molecular biology and biochemical gene treatment, one of the main research themes is clearing the gene manifestation. In recent years, observation of live bodies and cells by means of fluorescence, employing the GFP gene, has greatly increased the need for micro injection procedures. To meet this need, Olympus provides a wide variety of microscopes and micromanipulation systems which can be operated smoothly, comfortably and quickly.



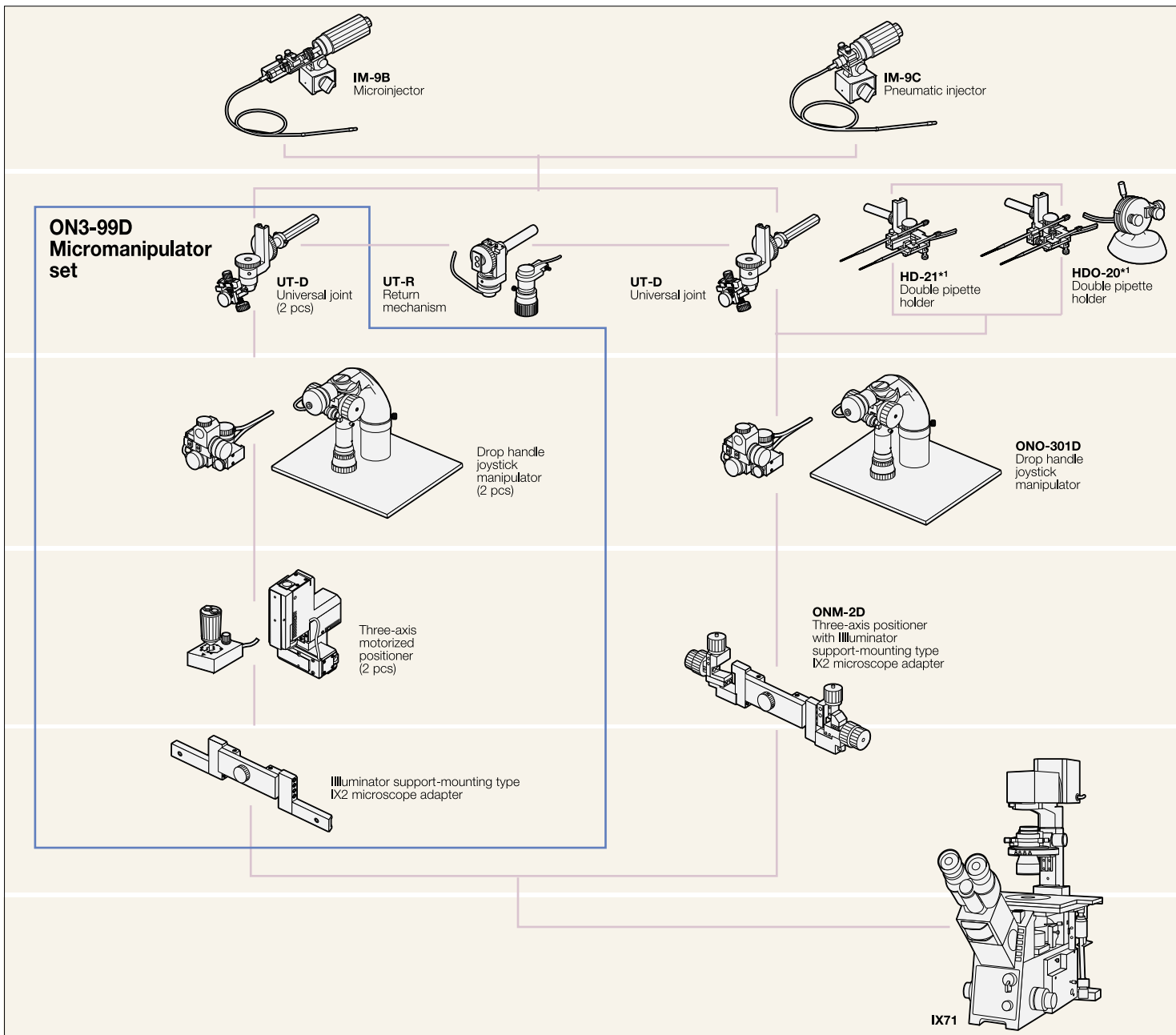
Setting example:
IX71+ON3-99D

ON3-99D/Drop handle joystick micromanipulator

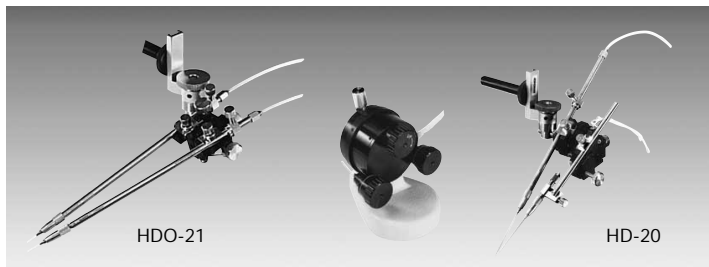
The specially selected adapter, a pair of motorized positioners, drop handle joystick micromanipulators and universal joints (UT-D) are combined here as a set.

The ON3-99D features outstanding operability: three-dimensional coarse movements are performed electrically and fine movements by an oil hydraulic mechanism. Both kinds of movement are joystick-controlled. This system enables exceptionally delicate manipulations and protects the oocyte and sperm by ensuring that pipette movement is free from vibrations. The movement ratio is easily adjusted using controls on the top of the drop handle joystick.

SYSTEM DIAGRAM



*1 HDO-20/HD-21 double pipette holders should replace UT-D universal joints.



HDO-20 /Oil hydraulic double pipette holder
HD-21/Double pipette holder

Embryo biopsy requires different size of pipettes. Quick and safe switchover of pipettes can be easily achieved by using double pipette holders. The HDO-20 sets and operates the pipette by oil hydraulic pressure, while the HD-21 offers the economy of setting the pipette position manually.



IM-9B/Microinjector

Commercially available syringes (outside diameter 7-14mm) can be attached. An 1060µl metal syringe is included.

- One rotation of knob: 500µm movement and 10µl control volume when 1060µl metal syringe is used.

IM-9C/Pneumatic injector

Crisp response with air pressure.

- One rotation of knob: 6mm movement and 480µl control volume.

IM-6/Microinjector

Narishige's traditional design of microinjector. An 800µl syringe is included.

- One rotation of knob: 500µm movement and 10µl control volume.

Patch Clamping



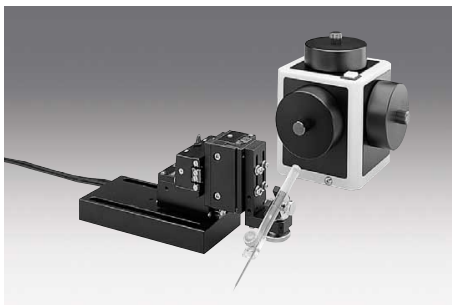
Setting example: IX71+ONU-31P



Setting example: BX51WI+ONU31P+
Burleigh GIBALTAR™ platform



Setting example: BX51WI+MHW3+ITS-O2

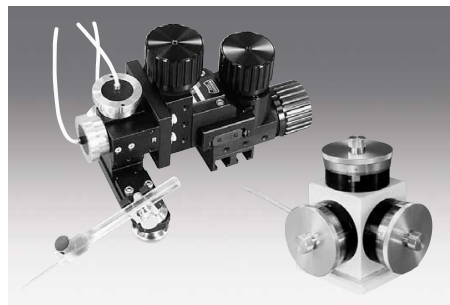


ONU-31P/Ultrasonic linear motor micromanipulator

An ultrasonic linear motor is used for movement in three (X, Y and Z) axes, as it provides the highest standard of drift-free movement. Two sets of micromanipulators can be connected via one control box.

- Accessory: Adjustable headstage holder
- Coarse, fine movement range: X, Y, Z axes 25mm
- Minimum graduation: 0.1µm

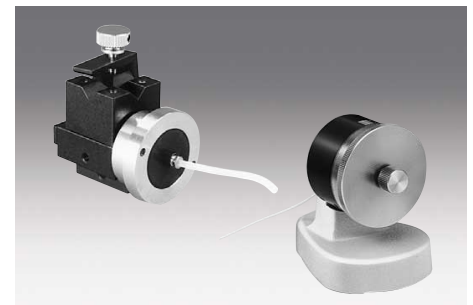
* Ball joint and electrode holder are sold separately.



MHW-3/Three-axis water hydraulic micromanipulator (5:1)

Designed for patch clamp, this water hydraulic micromanipulator features low-drift stability and long-term reliability. With an optional double-bar mounting adapter, the large coarse control unit can be mounted closer to the specimen with the fine movement controller.

- Accessories: H-11, B-9
- Coarse movement range: X, Y and Z axes 30mm
- Fine movement range: X, Y and Z axes 2mm
- Minimum graduation: 0.2µm

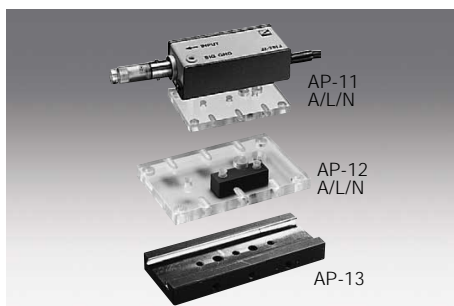
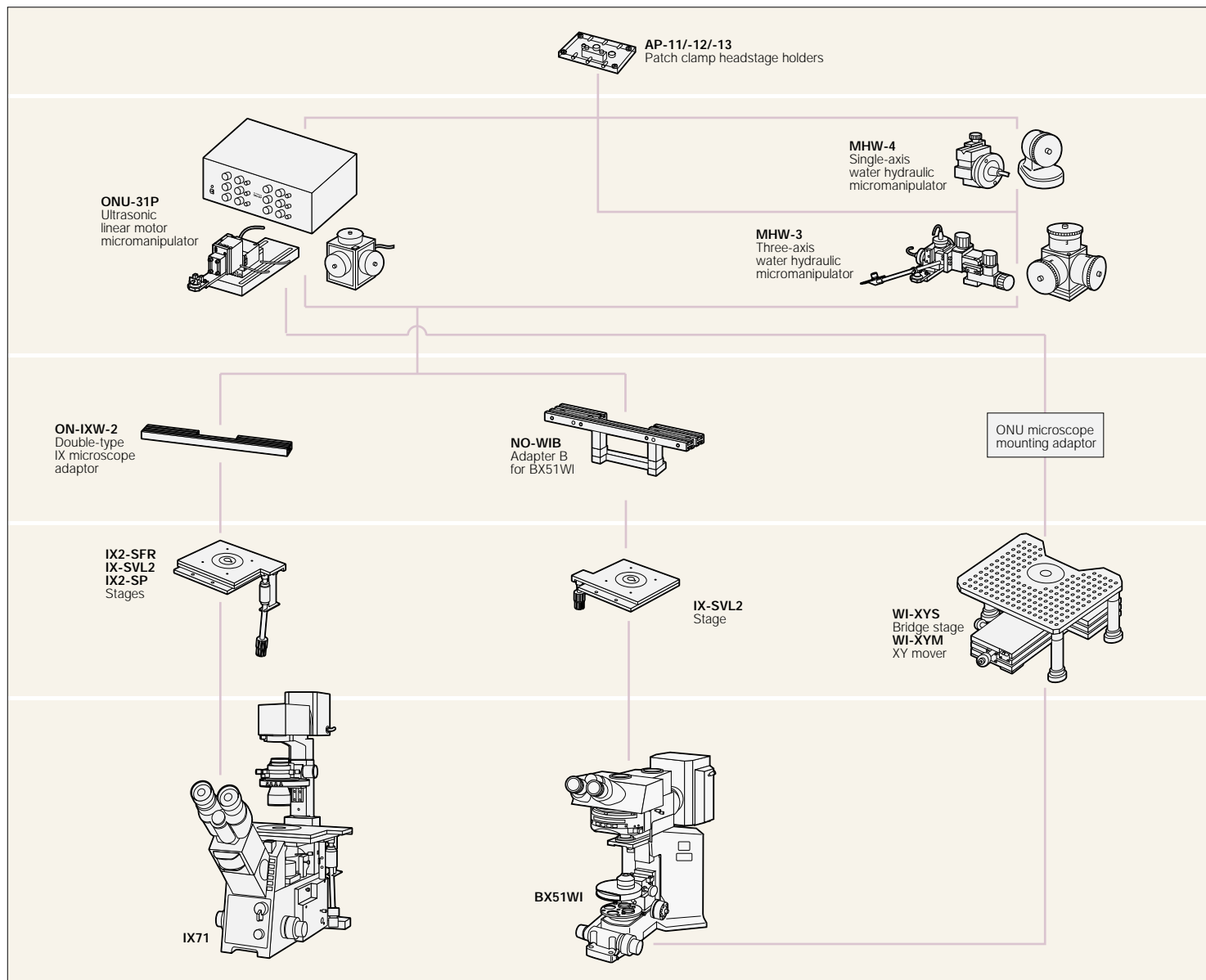


MHW-4/Single-axis water hydraulic micromanipulator (5:1)

Designed for patch clamp, the MHW-4 incorporates a hydraulic system and features low-drift stability and long-term reliability. Used with MHW-3 micromanipulator.

- Movement range: 2mm
- Minimum graduation: 0.2µm

SYSTEM DIAGRAM



AP-11 (A, L and N types)/ Patch clamp headstage holder

This is used to hold the patch clamp headstage for use with manipulators.

AP-12 (A, L and N types)/ Patch clamp headstage holder

This is used to connect the patch clamp headstage to the ball joints of manipulators such as MHW-3.

AP-13/ Patch clamp headstage holder

This adaptor is for installing the Axon 200B amplifier to patch clamp headstage.

*A: for Axon, B: for List, N: for Nihon Koden



WI-XYS/ Bridge stage

This stage is designed for small animal, in-vivo observations; Stage height can be lowered 50mm by simply detaching the column spacers. Designed for use with the XY mover (WI-XYM), the stage platform is compact requiring minimal desk space. Stage top is pre-tapped and ferro-magnetic for flexibility in mounting manipulators.

WI-XYM/ XY mover

The XY mover allows the movement of the microscope frame without moving either the specimen or electrodes. Especially useful for multiple patch clamping experiments, the XY mover has convenient frontal controls.

Injection



Setting example:
IX71+ONO-301D



Setting example:
IX71+MMO-203



MMO-202N-O/Ergonomic joystick micromanipulator (1:1)

The compact joystick with oil hydraulic mechanism can be held in the palm with independently maneuverable X and Y handles.

- Accessories: UT-2, IP plate
- Fine movement range: X, Y and Z axes 10mm
- Full rotation of knob: 250 μ m
- Minimum graduation: 2.5 μ m

* Injection holder is sold separately.



ONO-301D/Drop handle joystick micromanipulator (1:1)

Thanks to its symmetrical design, this micromanipulator can be attached on either the right or the left side. In combination with the optional universal joint (UT-D) and return mechanism (UT-R), it also provides a pipette return function.

- Accessory: IP plate
- Fine movement range: X, Y and Z axes 10mm
- Full rotation of knob: 250 μ m
- Minimum graduation: 2.5 μ m

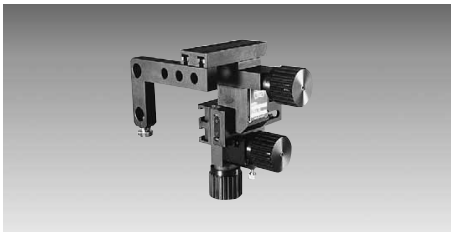


MMO-203/Three dimensional oil hydraulic micromanipulator (1:1)

This micromanipulator features a remote control system for smooth, vibration-free movements. The large handle makes linear repositioning more accurate and convenient.

- Accessories: B-8C, H-7
- Fine movement range: X,Y, Z axes 10mm
- Full rotation of knob: 250 μ m
- Minimum graduation: 1 μ m

Photo:
ONM-2D, ONO-301D, UT-D and UT-R configuration



ONM-1/Three-axis mechanical positioner

The ONM-1 quickly drives a hydraulic micromanipulator to the desired position.

- Coarse movement range: X, Y and Z axes 30mm

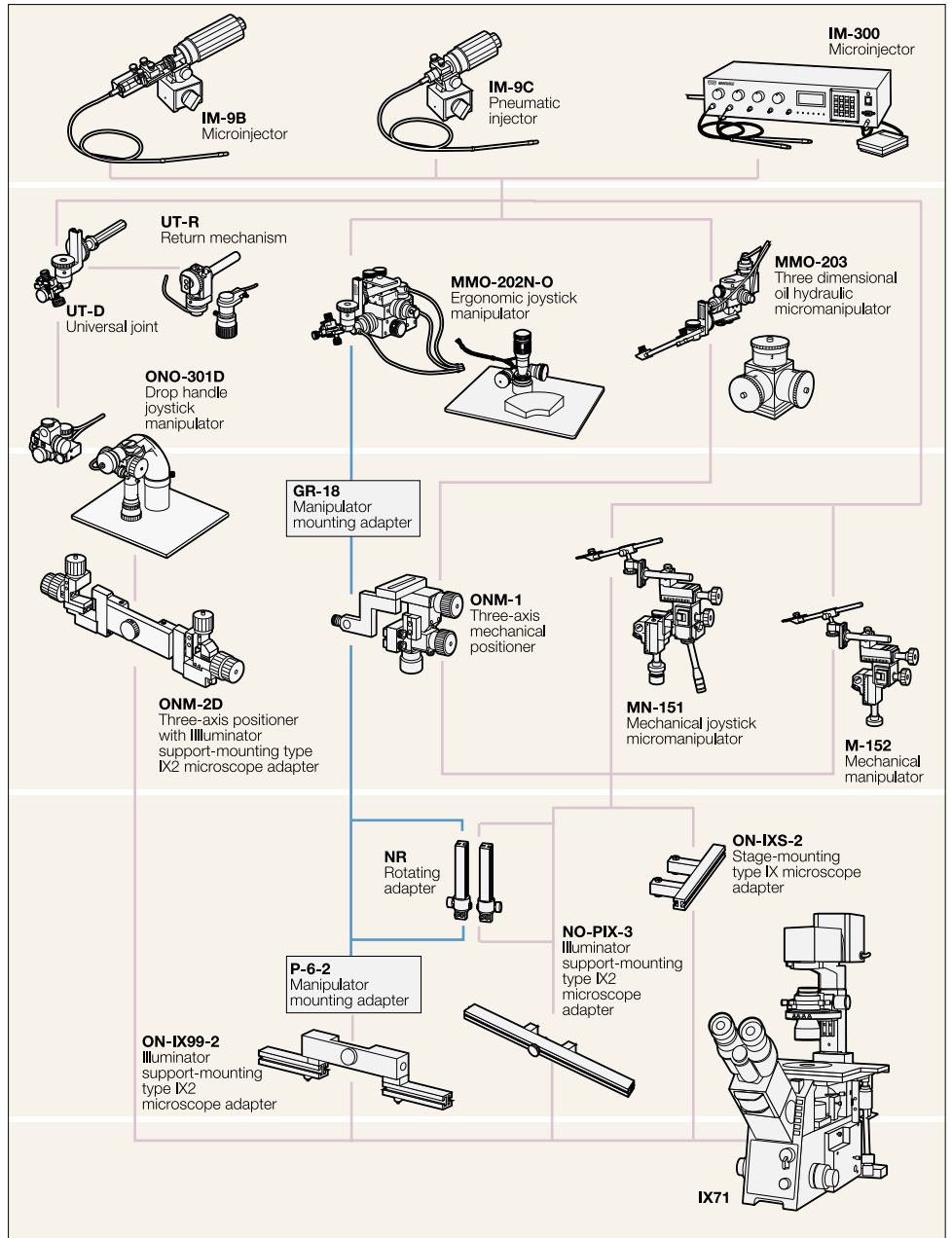


IM-300/Microinjector

This is used for repeated injection and extracting of small volumes of fluids from cells, embryos and cell components at a preprogrammed time and pressure, accurately and automatically.

- Two versions available: 100/120V or 220/240V

SYSTEM DIAGRAM



MN-151/Mechanical joystick manipulator

The MN-151 allows three-axis (X,Y and Z axes) coarse movement and two-axis (X and Y) horizontal plane fine movements via joystick.

- Accessories: H-7, B-8B, P-1A
- Coarse movement range: X and Z axes 25mm, Y axis 20mm
- Fine movement range: Z axis 8mm
- Minimum graduation: 5µm



M-152/Mechanical manipulator

Widely used as a three-axis manipulator, the M-152 moves the pipette quickly to the target position and can be used for three-axis coarse manipulations.

- Accessories: H-7, B-8B, P-1A
- Coarse movement range: X and Z axes 30mm, Y axis 20mm



IM-9B/Microinjector

Commercially available syringes (outside diameter 7-14mm) can be attached. An 1060µl metal syringe is included.

- One rotation of knob: 500µm movement and 10µl control volume when 1060µl metal syringe is used.

IM-9C/Pneumatic injector

Crisp response with air pressure.

- One rotation of knob: 6mm movement and 480µl control volume.

IM-6/Microinjector

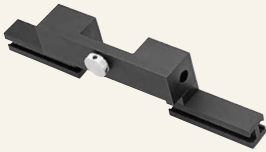
Narishige's traditional design of microinjector. An 800µl syringe is included.

- One rotation of knob: 500µm movement and 10µl control volume.

Accessories

Microscope mounting adapters

For IX71 and IX51



ON-IX99-2

For IX71 and IX51

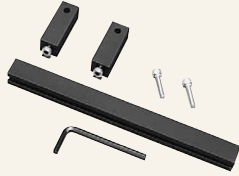
* Optional IX99-S1 screws are needed when mounting on IX70.



NO-PIX-3

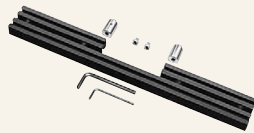
For IX71 and IX51

For IX2 and IX series



ON-IXS-2

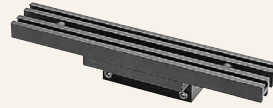
For IX71, IX51, IX70 and IX50



ON-IXW-2

For IX71, IX51, IX70 and IX50

For BX51WI



NO-WIA

For BX51WI



NO-WIB

For BX51WI

NR



NR

Rotating adapter

For IX70 and IX50



NO-PIX-4

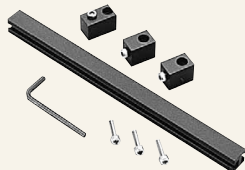
For IX70 and IX50

For inverted microscopes



NO-ADK

For CKX41, CKX31, CK40, CK30 and CK-2



NO-AD

For CKX41, CKX31, CK40, CK30, CK2 and IMT-2

For SZX



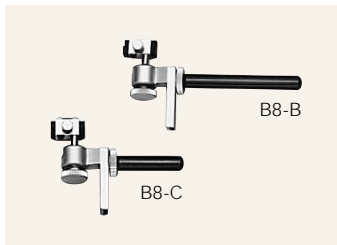
NO-SZXA (for transmitted light illumination)

For SZX12, SZX9 and SZX7



NO-SZXB (for reflected light illumination)

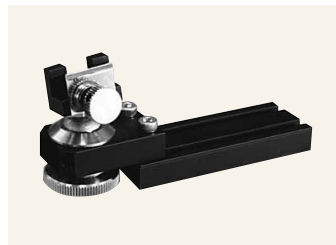
For SZX12, SZX9 and SZX7



B-8B,C/Ball joints

These products allow a pipette holder to be manipulated freely.

- B-8B: For attaching ø4mm pipette holder
- B-8C: Similar to type B with a shorter bar



B-9/Ball joint

This high rigidity ball joint is for use with MHW-3 hydraulic micro-manipulator. A special mechanism allows original position to be quickly restored.



UT-2/Universal joint

A dual rotation mechanism in the UT-2 enables the pipette holder to be operated freely. Can be finely adjusted in both swing and tilt axes.



UST-1/Solid universal joint

Swing and tilt mechanism is built on the tip of the UST-1. It is designed to be rigid.



P1-A/Manipulator mounting plate

These are for mounting manipulators such as MN-151 and M-152 directly to the appropriate microscope adapter. Height adjustment is possible.

* Included in MN-151 and M-152.



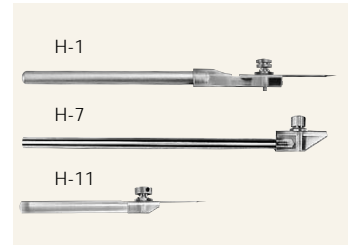
P-5/ Manipulator mounting adapter

This is used for attaching ONE-99 to bar mounting type manipulators.



GR-18/ Manipulator mounting adapter

Incorporating a stainless steel bar, the GR-18 is used for attaching the driving unit of ONO-231D and MMO-202N-O to ONM-1.



H-1, H-7, H-11/Electrode holders

- H-1: For 1mm electrodes, ø7mm bar
- H-7: For 1mm electrodes, ø4mm bar
- H-11: For 1mm electrodes, ø7mm bar



HI-7/Stainless injection holder

This injection holder is for 1mm pipette. Diameter is ø4mm.



MF-900/Microforge

Equipped with manipulators for both the micropipette and heater sections. The microscope position is adjustable for precise shaping and polishing of micropipette tips. Miniature tools such as cutters, or holding pipettes with round tips can be easily produced.

- 5X/10X objective and 10X eyepieces included
- Optionally 35X objective (MF-OPA) is available
- Voltage selectable: 100/200/220/240V



EG-44/Pipette grinder

The EG-44 accurately processes glass pipette tips fabricated with a micropipette puller. Tips can be ground at an angle to allow easier insertion into cells and sectioning.

- Two versions available: 100/120V or 220/240V



EG-400/Micropipette grinder

Monitoring progress via the built-in 30X microscope, the operator can easily achieve accurate grinding of micropipettes with tips as small as one to tens of microns, ensuring the correct shape and width for smooth insertion of the cell.

- Voltage selectable: 100/120/220/240V



PC-10/Micropipette puller

Enables easy single-stage pulling for injection needles and extra-fine electrodes, as well as two-stage pulling for producing holding needles and vacuum pump needles. It heats glass tube electrically and applies tension through a built-in weight system for pulling the glass off.

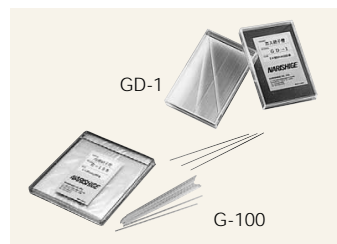
- Two versions available: 100/120V or 220/240V



PN-30/ Horizontal Micropipette Puller

By increasing the length of the heater, the operator can easily make long pipettes suitable for applications such as injection. All production values are digitally displayed.

- Voltage selectable: 100/120/220/240V



G-100/Capillary tubings

These capillary tubings have a larger inner diameter.

GD-1/Capillary tubings

These capillary tubings contain 100µm glass fibers.



Specifications are subject to change without any obligation on the part of the manufacturer.

OLYMPUS[®]

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