Select the Injector

Choosing the correct injector is a crucial factor for successful outcome of the experiments.

Daily maintenance to keep the injectors in good condition is essential for smooth operation.
Easy maintenance is another important factor when choosing the injector.
Choose an injector appropriate for the application in order to operate correctly without stress.

1. Object, repeatability and quantify

● Sample is solid object - injection/transfer of cell, puncture to the cell membrane, isolation/pick-up of object, etc. ● Operate suction / injection with observation of pipette tip (changes and situation of cell) ● Suitable for individual operations with using mild change of pressure.	Type of sample and injection procedure	● Injection of fluid - DNA / mRNA / Fluorescent Dye / Virus Vector, etc. ● Suitable for injection requires repetition with a very small amount of fluid. Preset the pressure for injection/balance and intervals.
Manual Injector	Your Choices	Digital Injector

Proceed to #2

2. Pnumatic injector or Oil -type Injector

● Virtually maintenance free and no oily mess to deal with. ● Operability is comparable to the oil-type injectors thanks to the improved wide range of pressure variability.	Key features	● Quick and precise response to the operators control. ● Oil type injectors require regular maintenance such as removal of air bubble and filling of oil.
Pneumatic Injector	Your Choices	Oil-type Injector

Proceed to #3

3. Advantage of each injector

● Injector is attached to the manipulator joystick so the working space is less cluttered. ● Controlling the Injector and manipulator joystick simultaneously with one hand without switching hand from one to the other results faster operation.	Key features	● Handles a wide range of operations such as picking up of sperms/cells or holding the oocyte/embryo. ● Up to 25 times more pressure can be achieved by compressing the air by changing the position of the plunger, and choosing either fine or coarse handle
Exclusively for Holding Side	Your Choices	Suitable for manipulating of cells and other general purposes.

Type	Pneumatic Injector (for Holding)	Pneumatic Microinjector	Microinjector (Oil Type)	Electric Microinjector
Image	IM-HD1	IM-11-2	IM-21	IM-400 *Compressor/regulator is required.
	Manual Injector			Digital Injector
	Pneumatic Injector		Oil-type Injector	
	To hold oocyte	for injection or holding		
Key-words	[Pneumatic] [Manual] [Maintenance free][No Oily Mess]		[Oil-type] [Manual]	[Electric] [Digital] [Fluid/DNA]

Choose Adaptor

			Model of Microscope	Mounting Adaptor	
1	Inverted	Nikon	Ti2-E/A/U *3 Full setup on both sides of microscope	NN-H-5	
			Ts2R	NN-W	
			Ti-E/U/S *3 Full setup on both sides of microscope	NN-H-4	
			TE2000-E/U/S *3 Full setup on both sides of microscope		
		Evident (formerly Olympus)	IX73/83 *3 Left-side/motorized condenser	NO-PIX-5	
			IX71/81	NO-PIX-3	
2		Leica	DMi8 *1	NL-18	
			DMI3000B/ DMI4000B/ DMI6000B		
			DMi8 *2	NL-3	
		Zeiss	Axio Observer (3/5/7)	NZ-24	
			Axiovert200		
			Axio Vert.A1		
		*3	Manipulator Attachment	P-10	
3	Stereo	Nikon	Same for All * Mounting onto the illumination pillar may be possible. Please contact us.	Iron Plate IP	Magnetic Stand GJ-1
		Evident			
		Leica			
		Zeiss			

*1 100w Illumination Pillar *2 30w Illumination Pillar *3 For both-side/left-side setup, "P-10" is required (to avoid interference between the drive unit and condenser).

Optional Parts

Item / Part Number		Description
Injection Holder	HI-9	For pneumatic injector/Come with easy-to-attach mechanism.
End Cap with Stainless Steel Collar	HIC	For ø1 mm Pipette.
	HIC-1.2	For ø1.2 mm Pipette.
	HIC-1.5	For ø1.5 mm Pipette.
Injection Holder Set	IM-H3	For IM-21, Oil-type Injector.
Pipette Holder Clamper	HIK-5	Safe keep the injection holder tempo. (2 pcs/pkg)
Iron Plate	IP-5	To place the Injector, Magnetic Stand or Controller.
Tubing for pneumatic injector	CT-1	PTFE Tubing 2mm OD x 1M (for IM-21)
	CT-1-1.5	PTFE Tubing 2mm OD x 1.5M, for "Mild Response" (for IM-11-2, IM-HD1)
	CT-4	PTFE Tubing 2mm OD x 1.2M, for "Quick Response" (for IM-11-2, IM-HD1)

Consumables

Part Number	Item	Description	Contents	Applicable Item
HI01PK01	Silicone Rubber Gasket	2.5mm OD x 5mm	10 pcs	HI-9、HIC
HI01PK02	Silicone Rubber Gasket	3mm OD x 5mm	10 pcs	HIC-1.2
HI01PK04	Silicone Rubber Gasket	3mm OD x 50mm	1 pcs	HIC-1.5
IMO4	O-ring		3 pcs	IM-21
IMO10	O-ring		3 pcs	IM-11-2

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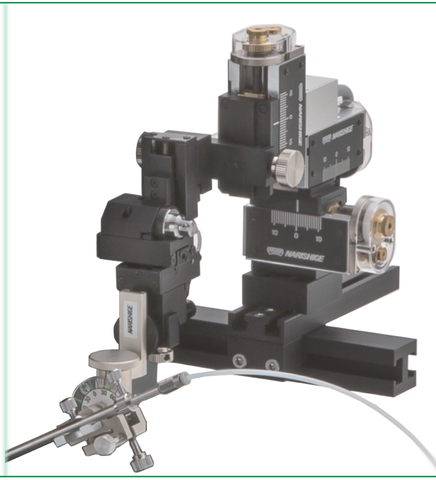
Injection System



Injection System

Offering suitable systems for all: either the beginner or the expert.

Choosing from a vast variety of products to accommodate the system whether for well-established or experimental research.

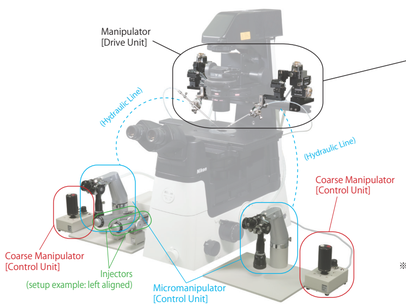
The standard system for cell handling / solution injection.

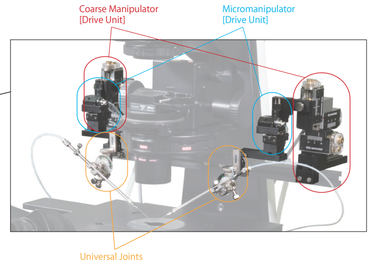
Combination of Motorized Coarse Drive that performs with agility and simple handling and Oil Hydraulic Fine Drive that performs with response true to an operator's hand. It has been achieving the high trust from laboratories worldwide in the field of Genetic, Animal Husbandry, Developmental Biology, Reproductive Biology, and so on.

Configuration of the Manipulation System

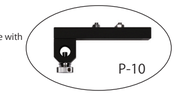
Setup for the Inverted Microscope (Traditional Model)

- Follow the flow chart to choose the perfect system for you easily and wisely.
- Build your own system: Motorized or Mechanical, 3-D or 4-D, add Return Mechanism, etc.



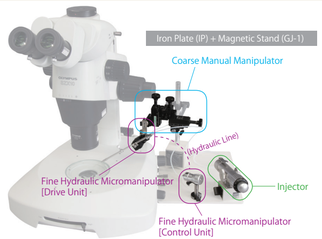


※ The attachment P-10 is required to avoid interference with different types of microscopes.
Check the mounting adapter chart on the back page.



Setup for the Stereo Microscope

- Accurate positioning is possible with added One-axis Oil Hydraulic Micromanipulator to the Three-axis Manual Coarse Manipulator.
- Eliminates vibration by remotely controlling with the One-axis Oil Hydraulic Micromanipulator.



- The flow Chart on the next page is designed to pick the popular system by the user's scope, application, size of the specimen, condition, etc. It is recommended for everyone.
- Or, you can hand pick each part by preferences from the diagram on the bottom. It is recommended for the experienced researchers.

You can find more detailed information in our General Catalog and Web Catalog. If you have any questions, contact us at:

https://narishige-group.com/

Flow Chart (Recommended for all)

1. Size and Transparency of the Specimen

● Small (up to200 µm) such as ovum/embryo of mammalian and ascidian, plant cell, etc. ● Light Transmittable	● Large (200 µm to mm) such as fish egg/insect (adult, egg)/amphibian egg, etc. ● Hard to pass light
Inverted microscope	Stereomicroscope

Inverted or Stereo

2. Fixation method

● Floating cell : to be held with the holding pipette.	● Adherent cell : Fixed to the Petri dish.
Both sides	one-side

Both-sides or One-side

3. What to be Injected

● DNA/mRNA/ fluorescent dye, etc. ● Liquid/Fluid	● Cell/ES-Cell/iPS-Cell/Sperm/ Foreign Substances, etc. ● Solid object of up to several tens of µm.
DNA-injection Set	Cell-transfer Set

DNA-injection or Cell-transfer

Choose by the Parts (for Expert)

Select Adaptor	Select Manipulator			Select Injector
	Coarse Drive	Fine Drive	Return Mechanism	
Select by model of the microscope	● both sides Or, ● One-side	● Motorized Or, ● Manual	● 3D Or, ● 3D + 1D	● Digital Or, ● Manual → Oil type or Pneumatic

List of the mounting adaptor is on the reverse side. Popular microscope has its own designated adaptor.

Selection of Coarse Drive

Coarse Manipulator

MM-94 (Motorized) or MN-4 (Manual)

Selection of Fine Drive

Three-axis Joystick Oil Hydraulic Micromanipulator

MMO-4 (Hanging Joystick) or MO-202U (Upright Joystick)

Select the Injector using the Flow Chart on the reverse side.

Coarse Manipulator
Suitable for Stereomicroscope

M-152 (Manual)

Choose by the Movement Range (fine/coarse)

One-axis Oil Hydraulic Micromanipulator

MMO-220A (Fine Drive) or MMO-220C (Coarse Drive)

250µm / rotation of knob | **1,000µm/ rotation of knob**

※ More selections are available other than listed in this catalog.

1 DNA Injection System for Inverted Microscope

Both-side | One-side | Inverted Microscope | DNA-injection

Example: Fine Drive setup on Nikon Ti2

Coarse Drive setup with MN-4 is also available.

For the microinjection such as DNA injection into pronucleus or cytoplasm of mouse embryo.
Standard system is 3D + 1D (direction of pipette) with digital injector for adherent cell using the straight pipette.

Recommended System <for floating cell> Both-sides | Fine Drive/3D

MM-94/MM-94B	1each
MMO-4	×2
IM-400	×1
IM-HD1	×1
Mounting Adaptor	

*It is required external pressure supply.

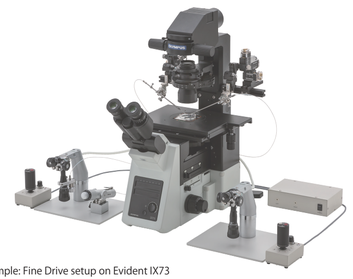
Popular System <for adherent cell> One-side | Fine drive/3D+1D

MM-94	×1
MMO-4	×1
MMO-220A	×1
IM-400	×1
Mounting adaptor	

*It is required external pressure supply.

2 Cell-Transfer System for Inverted Microscope

Both-sides | Inverted Microscope | Cell-Transfer



Example: Fine Drive setup on Evident IX73

Coarse Drive setup with MN-4 is also available.

For transferring and holding of floating cell such as somatic/ES cell of the mammalian (mice/rats/swine/bovine) embryos/oocytes.
Standard system includes two manipulators for each side of the scope, and two manual injectors for the injection and holding.

Recommended Setup <with Coarse-Motorized set>

MM-94/MM-94B	1each
MMO-4	×2
IM-11-2	×1
IM-HD1	×1
Mounting Adaptor	

Recommended Setup <with Coarse-Manual set>

MN-4	×2
MMO-4	×2
IM-11-2	×1
IM-HD1	×1
Mounting Adaptor	

3 DNA Injection System for Stereomicroscope

One-side | Stereomicroscope | DNA-injection

Example setup on Nikon SMZ1270

Example setup on Evident SZX10

Suitable for sample up to several millimeters such as fish/amphibian eggs, insects (adults/eggs), Echinoderm larvae under stereo microscope.
Suitable for DNA-injection for various animals utilizing genome editing technique CRISPR-Cas9. Installation using a Magnetic Stand gives the flexibility for the setups.

Recommended Setup

M-152	×1
(GJ-1/IP)	
MMO-220C	×1
IM-400 *	×1

* External pressure supply is required to use the IM-400.