

Nikon

Upright Research Microscope for
Patch Clamp Experiments

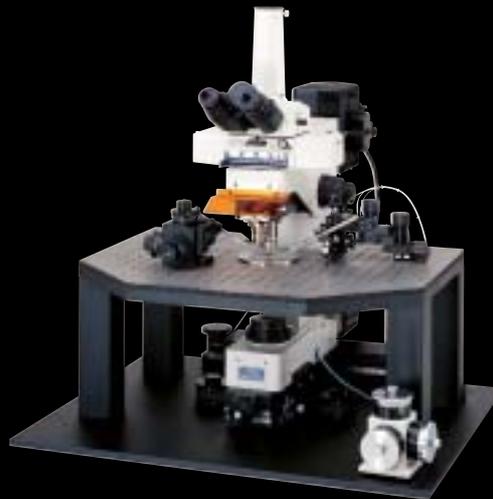


Upright Research Microscope for
Patch Clamp Experiments

ECLIPSE

PhysioStation E600FN

The world's first microscope designed expressly
for patch clamp experiments

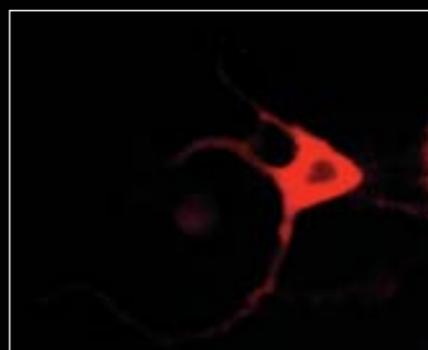


CFI60

System Flexibility. Ease of micromanipulation. Rock-solid construction. The ECLIPSE PhysioStation has been designed from the ground up to provide outstanding performance.

Nikon's "**ECLIPSE PhysioStation**" is the world's first microscope designed specifically for patch clamp experiments.

Rather than modifying existing equipment, Nikon went back to the drawing boards to custom design an upright research microscope for electrophysiological experiments involving specimens such as brain slices. The ECLIPSE PhysioStation features a generous clearance angle of 45°, the widest in the industry, making micromanipulation easier than ever before. And its rock-solid construction provides the ultimate in vibration-free observations.



Cultured rat hippocampus cell/epi-fluorescence illumination/Rhodamine 123 staining



Cultured rat hippocampus cell/epi-fl-DIC illumination/Rhodamine 123 staining



The CA1 region of a cultured rat hippocampus tissue/near-infrared DIC illumination



Rat hippocampus slice (400 μm thick)/near-infrared DIC illumination



Example of system configuration: With standard stage made by Nikon



Example of system configuration: With NARISHIGE products from Japan



Example of system configuration: With Luigs & Neumann products from Germany



Example of system configuration: With Burleigh products from the United States

Rock-solid construction and spacious working area for delicate micromanipulation tasks. Most controls are in front of the operator and within easy reach.

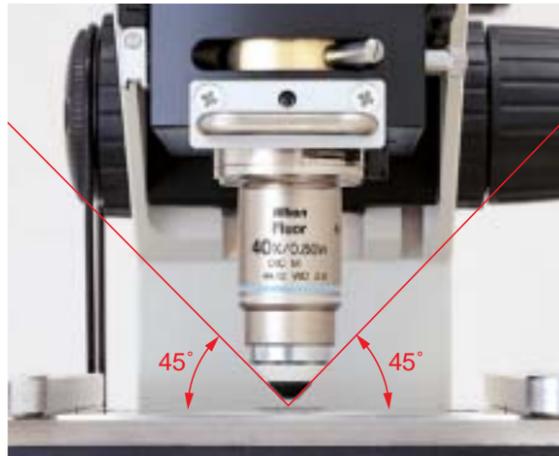


Solid cast body designed for physiology

Designed expressly for physiological research, Nikon's PhysioStation body features a focusing nosepiece and provides maximum accessibility from all angles for patch clamp experiments. Its design incorporates many features to insure vibration-free operation, while providing the rigidity necessary to meet the specific requirements of micromanipulation.

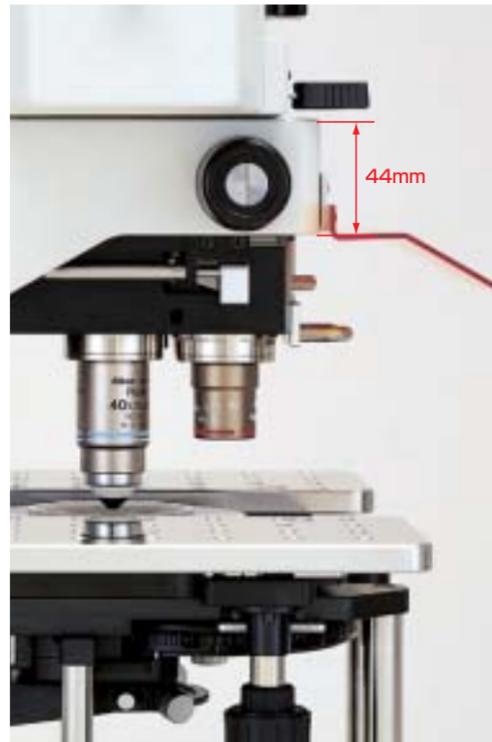
Access angle of 45°, the widest in the industry

CFI60 objectives enjoy a long parfocal distance of 60 mm, providing a spacious working area between the stage and the arm. Nikon's new 40x water-dipping objective (CFI Fluor 40xW) in particular boasts the world's widest access angle of 45°, permitting easy patch pipette manipulation.



Increased rigidity ensures stability

The thickness of the optical arm casting was increased to a robust 44mm, and the substage was fused with the main body to produce an extremely stable, rigid body, one strong enough to support a large cooled CCD video camera. Furthermore, the microscope can be secured easily to an isolation table using the screw holes at the bottom of the base or by using a supporting stand.



Click detents can be turned off to eliminate vibration during switching

Clicks that occur when operating the optical path changeover lever or sliding the nosepiece carrier can be turned off, preventing vibrations during switching. A soft pre-click is used instead to indicate approximate positioning.



Focusing by moving the objectives up or down

Focusing is accomplished by raising or lowering the nosepiece housing the two objectives. Only the nosepiece, not the entire arm, moves up and down in this stable focusing setup.

Selectable fine-focus knob position

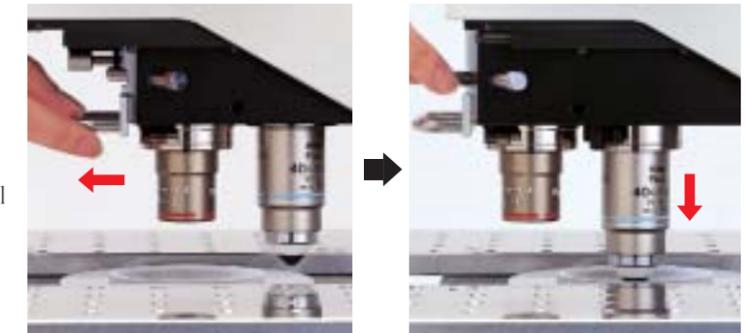
The position of fine-focus knob can be moved to the front of the main body or to the front of the base section. This eliminates the need to insert your hand in between various experimental attachments while working, thus preventing vibrations or possible accidents.

New front/back sliding nosepiece and objective raising assembly

Nikon's unique system solves the problem of finding the target area at low power, then changing to a high-magnification immersible objective without disturbing the experiment. A front mounted lever inserts or retracts the rear water-dipping objective into or out of the chamber—total movement 10.5mm—without disturbing the microelectrodes. To prevent accidental movement, the retraction mechanism locks the sliding two-position nosepiece when the water-dipping objective is in the down position.

Parfocal distance adjustment assembly for water-dipping objectives

When switching from a low-magnification to a high-magnification water-dipping objective, variations in parfocal distance occur, depending on the amount of water in the chamber. These discrepancies can easily be eliminated using the adjustment incorporated into the objective raising lever.



Front controls for epi-fluorescence and DIC microscopy

The epi-fluorescence attachment accepts up to four filter cubes, making filter switching and replacement easy. The fluorescent shutter control, used to prevent photo bleaching of the specimen, was conveniently positioned at the front of the body. The Senarmont method of contrast control for Nomarski DIC observations is employed. The contrast of the image can be changed by simply rotating the polarizer on the base of the microscope, contributing to easy operation and imaging stability.



Large space under the condenser for adding equipment

A spacious area of 61.3mm is provided between the field lens and condenser so that shutters or illuminators for light excitation can easily be added.

Mounting of up to 3 filters for transmitted illumination

The filter cassette for transmitted illumination is removable. Up to three filters (25mm ϕ) of any type can be mounted to suit the observation technique.





Standard mechanical stage with extension plates

To insure the stage is resistant to any vibration, four rigid support pillars mount it solidly to the microscope body. Auxiliary side plates, drilled and tapped (M6 thread) with 32 holes each, make it easy to attach manipulators. The stage and side plate surfaces are made of magnetized stainless steel for use with magnetic base mounted accessories. The XY travel control, conveniently located at the front left-hand side, moves the stage mounted manipulators and specimen together. The auxiliary side plates can be removed if a compact size stage area is desired.

New water-dipping CFI60 objectives

The E600FN uses new **CFI60** water-dipping objectives that feature a long parfocal distance of 60mm. This design is ideal not only for near-infrared Nomarski DIC observations but permits sufficient transmittance in the ultraviolet range, indispensable for applications such as Ca²⁺ imaging.

Water-dipping objectives specifications

| Item | N.A. | Working Distance |
|----------------|------|------------------|
| CFI Fluor 10xW | 0.3 | 2mm |
| CFI Fluor 40xW | 0.8 | 2mm |
| CFI Fluor 60xW | 1.0 | 2mm |

Note: The CF Fluor 10xW will be available soon.



New objectives are isolated from thermal and electrical transmission to the specimen.

Suppression of electrical noise

To suppress electrical noise, the ECLIPSE PhysioStation employs an external power supply, making this microscope ideal for electrophysiological applications.



IR DIC imaging

IR polarizer and analyzer sets are available for near infrared Nomarski DIC imaging. Because tissue is transparent to the near infrared, the use of IR DIC allows imaging deep within thick tissues up to 300 or 400 μm. Extremely high quality DIC images can be obtained using the IR polarizing set (750–950 nm) with a dedicated IR-CCD camera for image detection.



Polarizer and analyzer specially designed for near-infrared DIC observations

Upright eyepiece tube can be mounted

The upright eyepiece tube UWTT can be mounted whenever observations of upright images are desired.

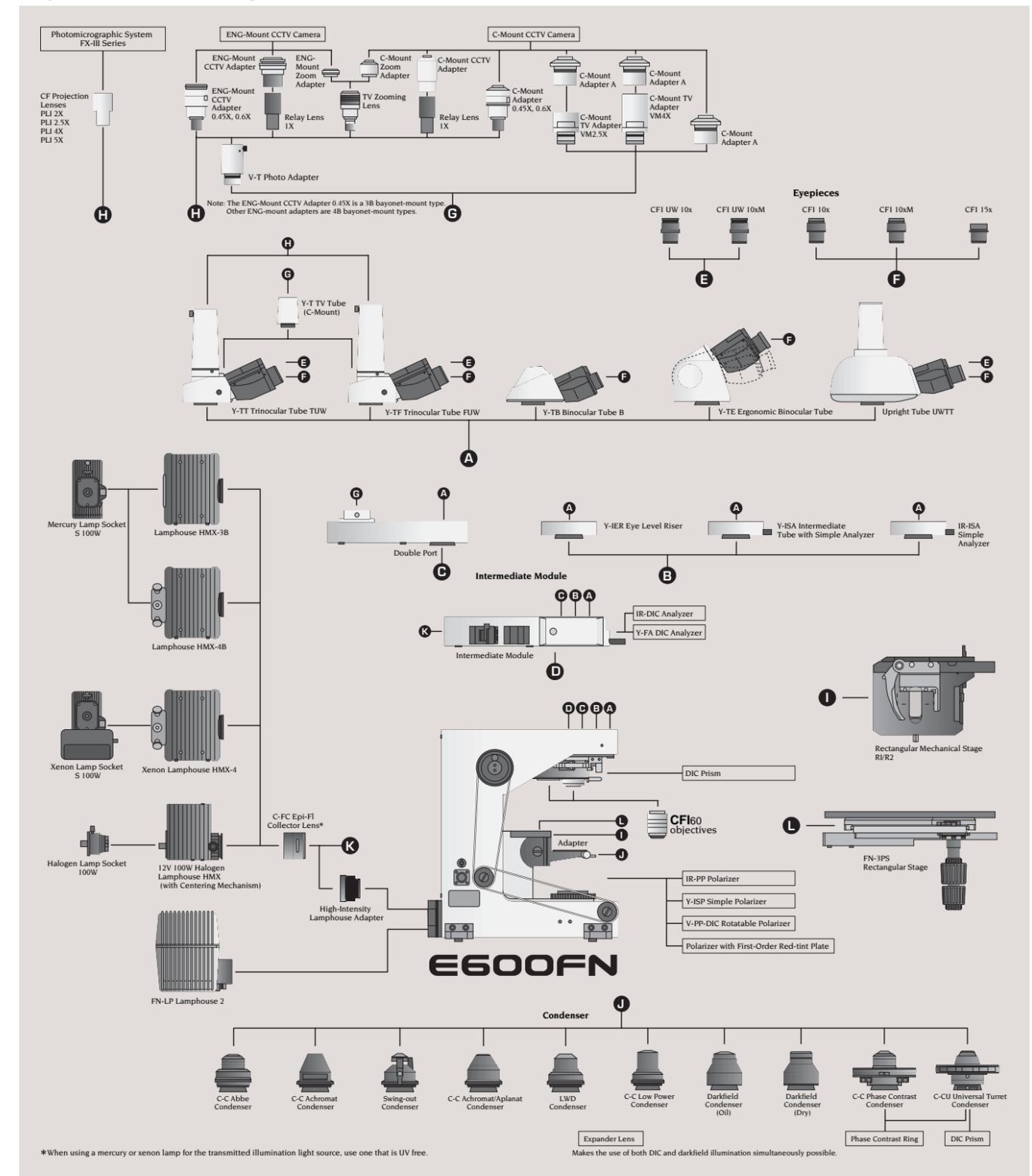


Screw holes for securing micromanipulators

Four screw holes (4-M4) on both the left and right sides of the microscope stand have been provided for mounting micromanipulators or other items required for experiments.



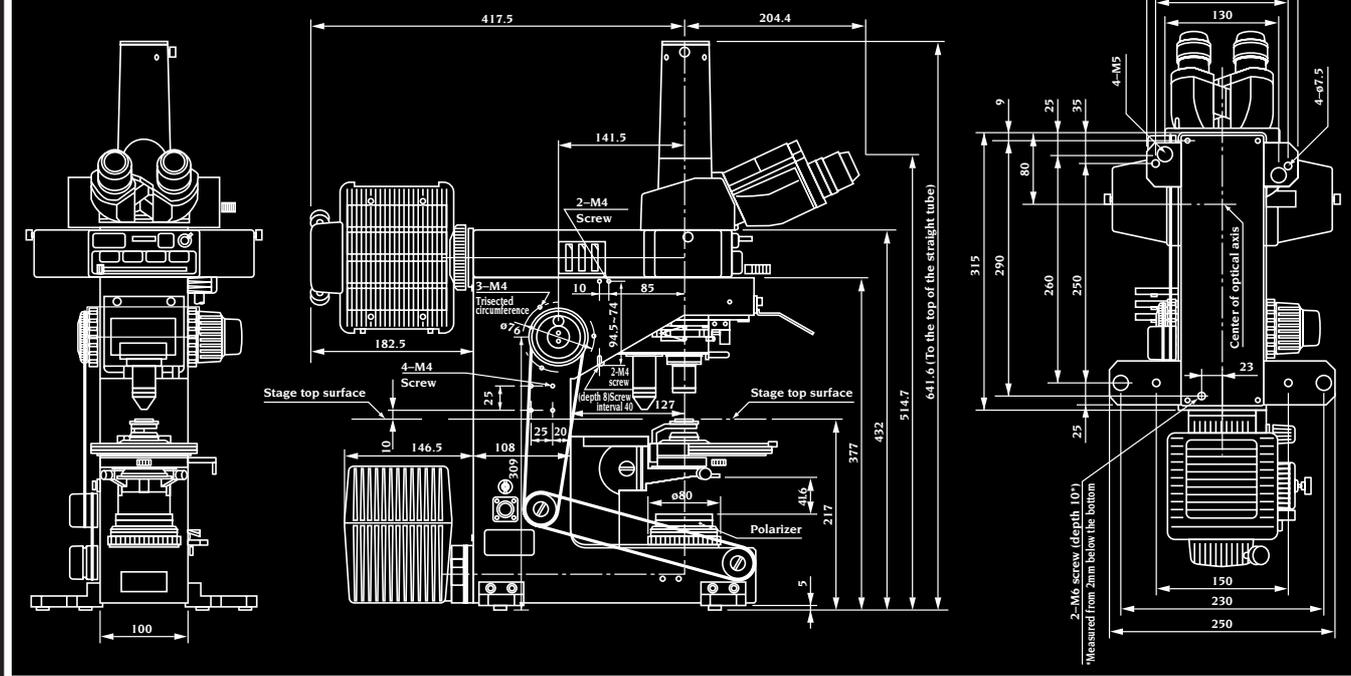
System Diagram



ECLIPSE PhysioStation E600FN

Unit: mm

Dimensional Diagram



E600FN Main Specifications

| | |
|------------------|---|
| Main body | I-shaped; external power supply configuration |
| Nosepiece | Front/back sliding type; accepts two objectives; clicks can be canceled |
| Focusing | Via nosepiece up/down movement |
| Stage | Three-plate mechanical stage; Stroke: 30 (X) x 30 (Y)mm |

| | |
|----------------------------|---|
| Objective/N.A./W.D. | CFI Fluor 10xW/0.3/2mm* CFI Fluor 40xW/0.8/2mm CFI Fluor 60xW/1.0/2mm |
| Filter units | Heat absorbing filter, GIF, NCB11 Optional: ND2, ND4, ND8, ND16 |
| Illumination | 12V 100W halogen lamp |
| IR-DIC (optional) | IR polarizer; IR analyzer |

*The CFI Fluor 10xW will be available soon.

Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. September 2002. ©1998-2002 NIKON CORPORATION

WARNING TO ENSURE CORRECT USAGE, READ CORRESPONDING MANUALS CAREFULLY BEFORE USING YOUR EQUIPMENT.



NIKON INSTECH CO., LTD.

Parale Mitsui Bldg., 8, Higashida-cho, Kawasaki-ku, Kawasaki, Kanagawa 210-0005, Japan
phone: +81-44-223-2167 fax: +81-44-223-2182
<http://www.ave.nikon.co.jp/inst/>

NIKON SINGAPORE PTE LTD

SINGAPORE phone: +65-5593618 fax: +65-5593668

NIKON MALAYSIA SDN. BHD.

MALAYSIA phone: +60-3-78763887 fax: +60-3-78763387

NIKON INSTRUMENTS EUROPE B.V.

P.O. Box 222, 1170 AE Badhoevedorp, The Netherlands
phone: +31-20-44-96-222 fax: +31-20-44-96-298
<http://www.nikon-instruments.com/>

NIKON FRANCE S.A.

FRANCE phone: +33-1-45-16-45-16 fax: +33-1-45-16-00-33

NIKON GMBH

GERMANY phone: +49-211-9414-0 fax: +49-211-9414-322

NIKON INSTRUMENTS S.p.A.

ITALY phone: +39-55-3009601 fax: +39-55-300993

NIKON AG

SWITZERLAND phone: +41-1-913-62 00 fax: +41-1-910-37 44

NIKON UK LTD.

UNITED KINGDOM phone: +44-20-8541-4440 fax: +44-20-8541-4584

NIKON INSTRUMENTS INC.

1300 Walt Whitman Road, Melville, N.Y. 11747-3064, U.S.A.
phone: +1-631-547-8500; +1-800-52-NIKON (within the U.S.A. only) fax: +1-631-547-0306
<http://www.nikonusa.com/>

NIKON CANADA INC.

CANADA phone: +1-905-625-9910 fax: +1-905-625-0103

