Nikon

FPD/LSI Inspection Microscopes

ECLIPSE
L300N/L300ND
L200N/L200ND

CFI60

With improved observation and operation, and environmentally friendlier, the four ECLIPSE models are ideally suited for inspection of large FPD/LSI.

For ø300mm wafer/Episcopic illumination type

ECLIPSE L300N

For 17-inch FPD/Episcopic and Diascopic illumination type

ECLIPSE L300ND

For ø200mm wafer/Episcopic illumination type

ECLIPSE L200N

For ø200mm wafer/Episcopic and Diascopic illumination type

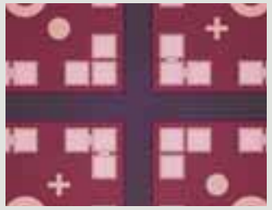
ECLIPSE L200ND

Enhanced observation performance

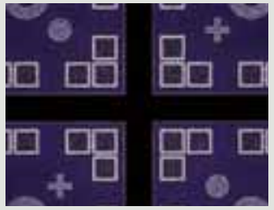
Epi-fluorescence observation widens inspection range—including 365 nm UV excitation (L300N/L300ND/L200ND only) NEW

- Diascopic illumination capability and various observation methods such as brightfield, darkfield, simple polarizing and DIC. Epi-fluorescence observation, including 365 nm UV excitation, is also possible (L300N/L300ND/L200ND only).
- Highly beneficial in inspection of semiconductor resist residues and organic electroluminescence displays

Objective lens: CFI LU Plan Fluor 10x



Brightfield observation of wafer pattern



Darkfield observation

DIC observation

Epi-fluorescence observation of organic substance on wafer

Motorized mercury fiber illuminator Intensilight for Epi-fluorescence observation (L300N/L300ND/L200ND only)

- A motorized mercury precentered fiber illuminator is employed.
- Lamp centering and focus adjustment are not necessary, even after lamp replacement.
- The light source can be placed away from the microscope, reducing heat near the microscope and preventing defocusing.
- Variable light intensity and shutter control provide excellent flexibility.
- The lamp has an average lifespan of 2000 hours.

Combination with the L200ND

Four times brighter than conventional Diascopic observation (L300ND only)

- The L300ND employs a new light source and advanced optics to provide four times brighter illumination for Diascopic observation.

CFI60 optics offer long working distance and high NA

- Nikon's original CFI60 optics offer both image brightness through high NA and wider sample range and access with long WD.
- Provides clear, high-contrast brightfield images by minimizing flare.
- The "fly-eye" lens array, which provides uniform illumination throughout the visual field, is employed for darkfield illumination optics, allowing remarkably bright, high-resolution darkfield images.

CFI60 objective CF & IC objective

Fly-eye lens

Enhanced environmental consideration and operation

High-intensity 12V-50W halogen illuminator is brighter than that of a standard 12V-100W illuminator NEW

- Employs the LV-LH50PC precentered lamphouse, which offers greater brightness than that of a 12V-100W illuminator at half the power consumption. It is adequate for observation of semiconductors and LCDs.
- Incorporating a lamphouse rear mirror and optimizing the size of the lamp filament allows effective and uniform illumination on the pupil plane, critical in an optical system. Objectives with a magnification of 50x or higher benefit from an increased brightness of 20 percent compared to the standard 12V-100W illuminator.
- Features environmentally-friendly design and reduces thermal induced defocus.

Antistatic coatings for stronger safeguards against contamination NEW

- Antistatic coatings have been applied to the body, stage, eyepiece tube and other various controls. These coatings strengthen safeguards against contamination and help prevent damage to samples caused by electrostatic charges, thus contributing to higher yields.

Tilting trinocular eyepiece tube for observation at optimum eyepoint level

- Ultra-wide 25-mm field of view and eyepiece angle adjustment between 0 ° and 30 °
- Allows operators to adjust eyepoint level to ensure a comfortable viewing position

Fixed-position X-Y fine movement control

- The X-Y fine movement control is positioned close to the operator.
- All controls are located near each other, allowing stage movements and focusing to be carried out with ease.

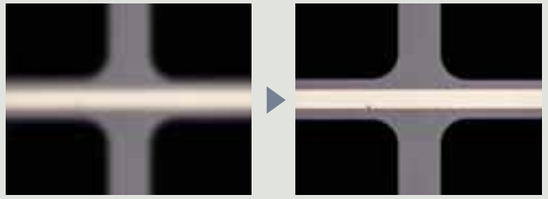
The X-Y fine movement controls are positioned close to the operator.

The motorized universal nosepiece is three times more durable than conventional models NEW

- Up to six objectives can be mounted.
- Centering mechanism is possible at three nosepiece positions (L300N/L300ND only)
- Improved centricity minimizes image shifting when the objective is changed, even with high magnification. This creates stable observations from high to low magnification.
- An anti-flash mechanism engages when the nosepiece is rotated, to protect the operator's eye.

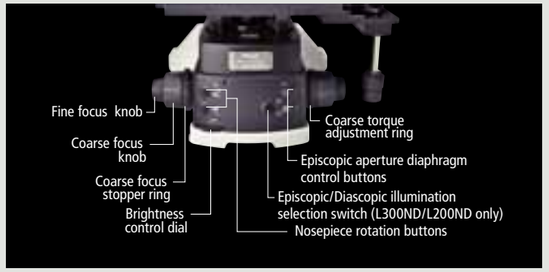
Target for easier focusing

- Inserting a focusing target in the optical path allows easy and accurate focusing on low-contrast samples, such as bare wafers.



Controls located at microscope front

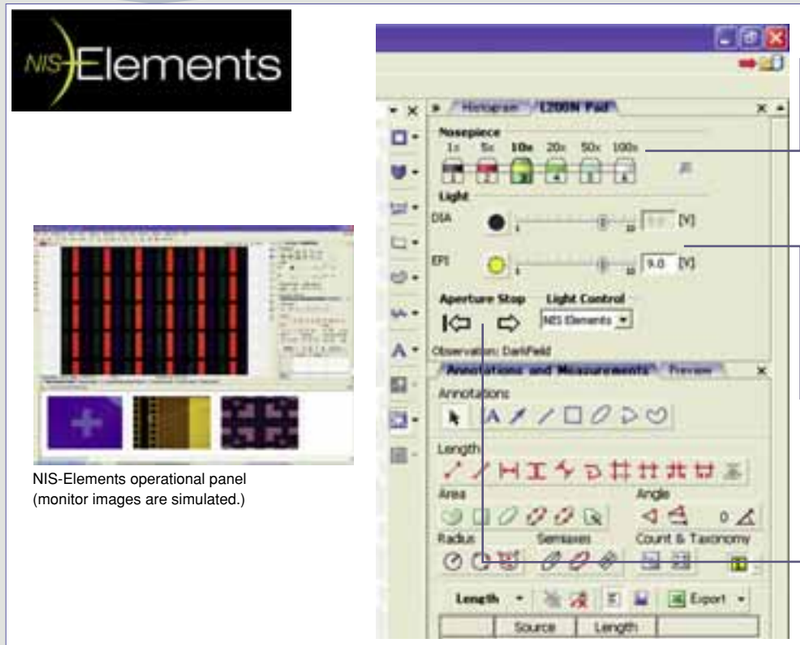
- The main control knobs and buttons are located at the front of the microscope for easy access.
- Quick and easy microscope operation while viewing samples is possible.
- Minimizes fatigue during lengthy observations.



Improved functionality between the microscope and digital cameras provides ideal imaging

Optimized workflow observation, image capture and analysis

- **Nikon's simultaneous development of microscopes, digital cameras and imaging software has enabled it to develop a highly functional easy-to-use digital imaging microscopy system.**
- **All aspects of image flow are supported, including setup for best viewing conditions, digital image capturing, processing and analysis.**



NIS-Elements operational panel
(monitor images are simulated.)

Objective configuration/ motorized nosepiece control

- Objective magnifications, which provide the most important information in measurement, can be saved, along with calibration configurations.
- When the objective magnification is changed, the appropriate spatial calibration data is automatically set. This prevents errors when changing scale size and configuration for measurement, and maximizes the digital camera's measurement performance.

Diascopic/Episcopic illumination switch, brightness control

- Illumination voltage, an important factor in observation, can be quantitatively configured.

Aperture diaphragm control

- Aperture diaphragm can be controlled from a PC.

Camera Heads can be selected depending on use

High-definition cooled color camera head

DS-Ri1

2/3-inch 12.7-megapixel CCD

High-definition color camera head

DS-Fi1

2/3-inch 5.0-megapixel color CCD

High-speed color camera head

DS-Vi1

1/1.8-inch 2.0-megapixel color CCD

Camera control unit DS-U2

- **Operations, from advanced image capture to image processing and analysis, are all controlled from a PC.**
- **Control of the camera, peripherals and microscope are all integrated within NIS-Elements imaging software.**
- **Easy USB connection offers high-speed data transfer.**

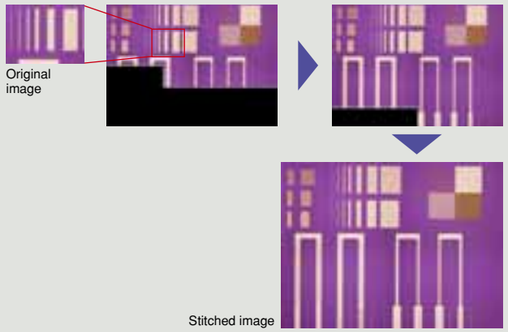
Imaging software for high-quality image acquisition, processing and analysis, NIS-Elements

Interactive measurement

NIS-Elements offers diverse measurement parameters, such as distance, area, radius and angle profile. Results can be saved as an Excel file.

Large image stitching

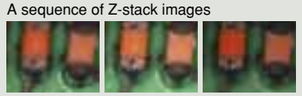
Composition of large-area images with high magnification is possible by stitching adjacent ultra high-resolution images.



EDF (Extended Depth of Focus) Option

Images that have been captured at different points along the Z-axis can be combined to create an all-in-focus image and a virtual 3D image.

A sequence of Z-stack images



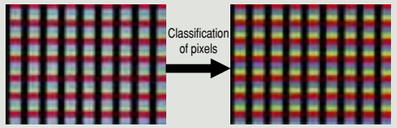
Automatic measurement Option

Some 80 different object and field features—length, area, density, RGB values, etc—can be measured automatically.

All-in-focus image 3D image

Classifier Option

The classifier allows segmentation of the image pixels according to different user-defined conditions and is based on different pixel features such as intensity values, RGB values, HSI values or HS values.

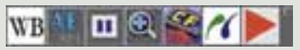


Camera control unit DS-L2

- **With a large, built-in, high-definition, 8.4-inch LCD monitor, the DS-L2 eliminates the necessity for a PC connection.**
- **With a simple click of an icon, Scene mode automatically sets the optimal imaging parameters for the chosen observation method.**
- **With data-rich interfaces such as USB and LAN, images can be shared over a network.**

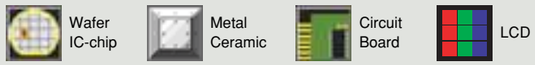
Easy-to-use shortcut menu

Frequently used functions can be displayed as buttons. They can be utilized without impeding the display of captured images. It is also possible to customize the buttons.



Scene mode provides optimal photography with ease

Optimal imaging parameters are preset for different sample types. Up to seven custom modes can be set.



Various measurement/positioning functions

Calibration of reference length (up to seven can be registered), allows easy measuring and positioning.

Scale display/positioning functions

Measurement functions

For LSI inspection

Wafer loaders NWL200 series

In combination with the ECLIPSE L200N, the NWL200 meets the requirements for inspection of the latest wafers.
Nikon's outstanding proprietary technology ensures reliable loading of ultra-thin 100 µm wafers.

Support for ultra-thin 100 µm wafers

- Nikon's new chuck system allows reliable loading of ultra-thin 100 µm wafers.
- In combination with the ECLIPSE L200N, the NWL200 series provides levels of safety and reliability that meet all requirements for inspection of the latest wafers.

Improved wafer-sensing functions

- With optimal arrangement of the wafer sensor beams, accurate detection of wafer distortion is possible.

The wafer-slot buttons offer improved operability

- The wafer-slot buttons allow operators to select any wafer from its slot with a single button.
- The large LCD panel allows operators to set conditions such as sampling and inspection patterns, and to check the operating status and content of errors at a glance.
- The screens are arranged in a hierarchical structure with one screen for each task, resulting in an intuitive dialogue for smooth progress through the steps.
- A comprehensive suite of file management functions for carriers, samples, etc is useful for automating inspections.

High throughput

- The exceptionally fast elevator, the quick and accurate alignment by non-contact centering mechanism, and the loading and unloading of wafers with complete precision by the multi-arm system all contribute to an efficient wafer transfer and exchange.
- Cycle time has been dramatically reduced, enabling a higher throughput than the previous model.

Remote access tool

- Because the loader is equipped with a Web server function, connecting a PC to a LAN makes it easy to create inspection recipes and backup data from a PC.
- Recipe preparation support functions
  A Web browser wizard guides the operator through the steps, which are reflected in the NWL200, enabling the preparation of optimal recipes safely and simply, while checking the status of the wafers.
- Equipment maintenance
  Inspection recipes can be easily backed up and restored.

Accessories

Objectives

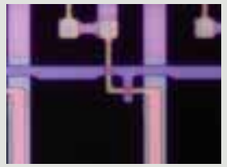
Model	Magnification	NA	Working Distance (mm)
CFI L Plan EPI	1x*	0.03	3.8
	2.5xA	0.075	8.8
	40x	0.65	1.0
CFI LU Plan Fluor EPI	5x	0.15	23.5
	10x	0.30	17.5
	20x	0.45	4.5
	50x	0.80	1.0
	100xA	0.90	1.0
CFI LU Plan EPI ELWD	20xA	0.40	13.0
	50xA	0.55	10.1
	100xA	0.80	3.5
CFI L Plan EPI SLWD	20xA	0.35	24.0
	50xA	0.45	17.0
	100xA	0.70	6.5
CFI LU Plan Apo EPI	100x	0.95	0.4
	150x	0.95	0.3
CFI LU Plan Fluor BD	5x	0.15	18.0
	10x	0.30	15.0
	20x	0.45	4.5
	50x	0.80	1.0
	100xA	0.90	1.0
CFI LU Plan BD ELWD	20xA	0.40	13.0
	50xA	0.55	9.8
	100xA	0.80	3.5
CFI LU Plan Apo BD	100x	0.90	0.51
	150x	0.90	0.4

*Requires use of polarizer/analyzer.

With correction mechanism
CFI L Plan EPI CR series

Model	Magnification	NA	Working Distance (mm)	Glass Thickness Correction Range (mm)
CFI L Plan EPI CR	20x	0.45	10.9-10.0	0-1.2
CFI L Plan EPI CR	50x	0.7	3.9-3.0	0-1.2
CFI L Plan EPI CRA	100x	0.85	1.2-0.85	0-0.7
CFI L Plan EPI CRB	100x	0.85	1.3-0.95	0.6-1.3

Without correction



With correction at 0.7 mm

Fluorescence filter blocks (L300N/L300ND/L200ND only)

C-FL UV-2A
C-FL B-2A
C-FL V-2A
C-FL G-2A
C-FL BV-2A

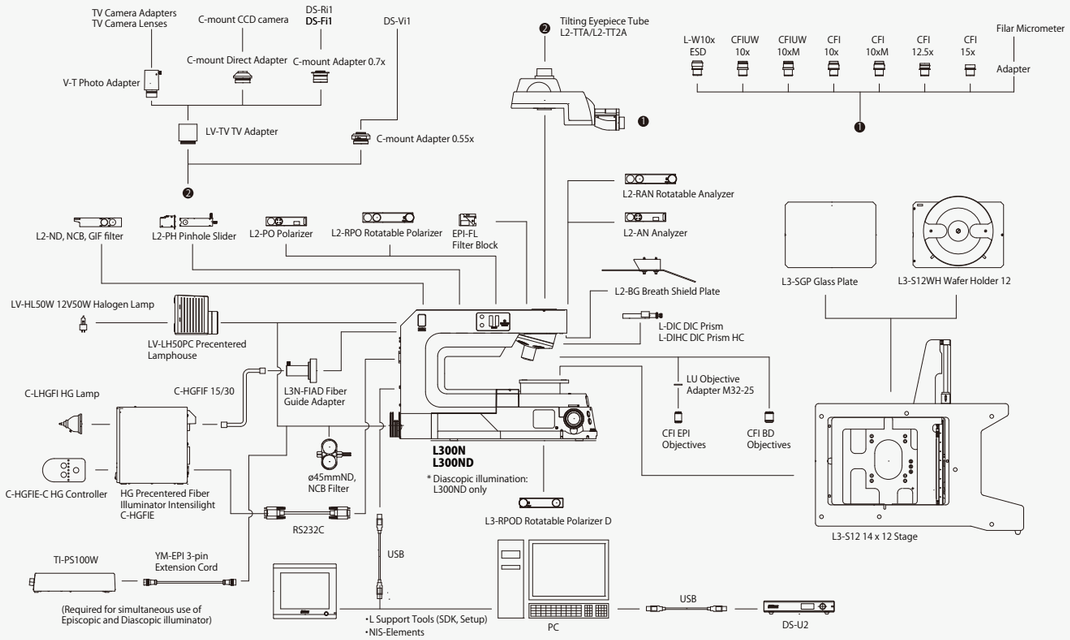
*Only one cube is attachable.

Brightfield

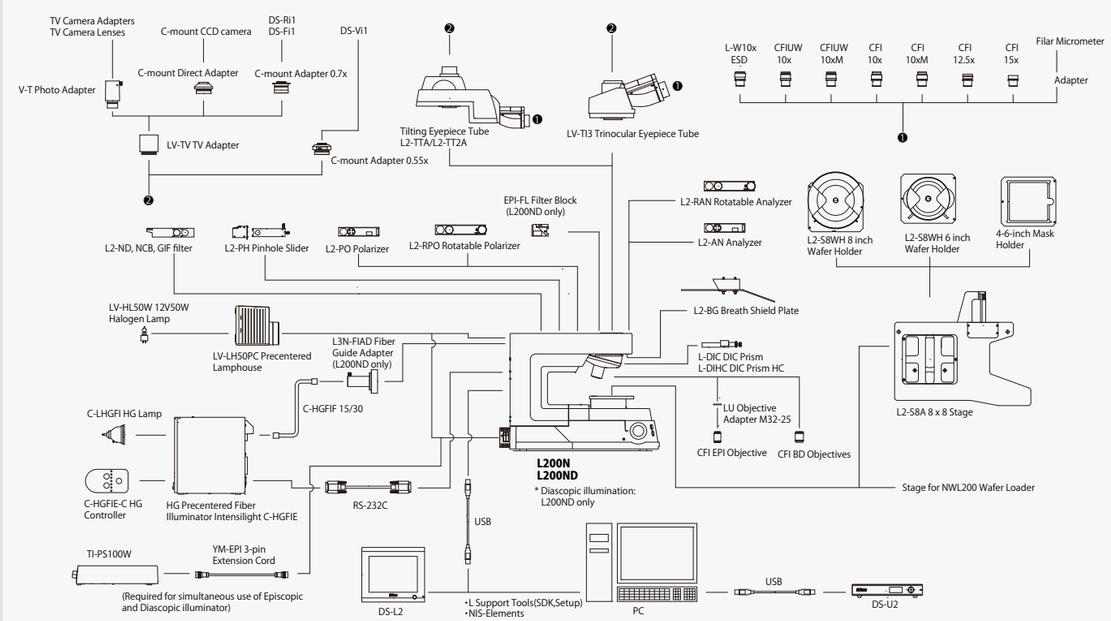
Epi-fluorescence UV-2A

System diagram

ECLIPSE L300N/L300ND



ECLIPSE L200N/L200ND

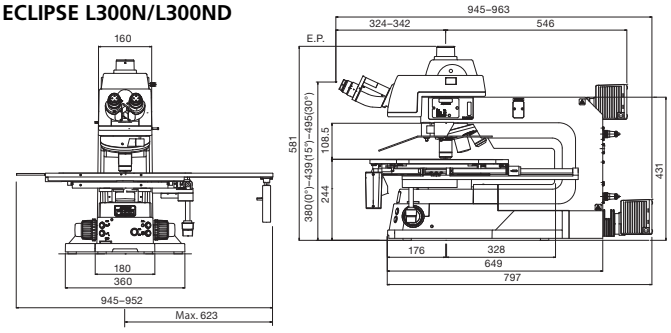


Specifications ECLIPSE L300N/L300ND/L200N/L200ND

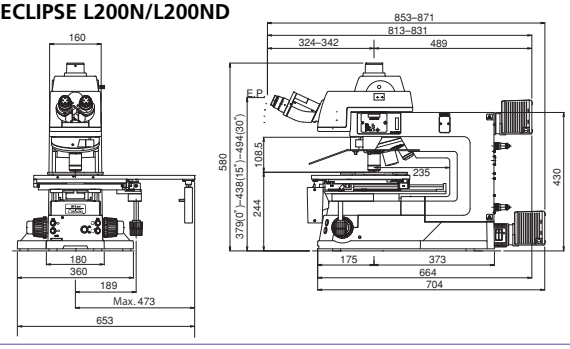
	ECLIPSE L300N (Episcopic illumination type)	ECLIPSE L300ND (Diascopic/Episcopic illumination type)	ECLIPSE L200N (Episcopic illumination type)	ECLIPSE L200ND (Diascopic/Episcopic illumination type)
Main body	12V-50W halogen lamp light source built in; Power sources for motorized control built in Motorized control for nosepiece, Light intensity control, Aperture diaphragm control			
	Nosepiece: Motorized universal sextuple nosepiece with nosepiece centering function		Nosepiece: Motorized universal sextuple nosepiece	
	—	Epi/Dia changeover	—	Epi/Dia changeover
Focusing mechanism	Cross travel: 29 mm Coarse: 12.7 mm per rotation (torque adjustable, refocusing mechanism provided) Fine: 0.1 mm per rotation (in 1 μm increments)			
Episcopic illuminator	12V-50W halogen lamp light source built in Motorized aperture diaphragm (centerable), Fixed field diaphragm (with focus target) Pinhole slider (optional), Four ø25 mm filters (NCB11, ND16, ND4), Polarizer and Analyzer can be mounted Observation methods: Brightfield, Darkfield, Simple polarizing, DIC, Epi-fluorescence* * L300N/L300ND/L200ND only			
Diascopic illuminator	—	12V-50W halogen lamp light source built in Aperture diaphragm built in LWD condenser built in	—	12V-50W halogen lamp light source built in Aperture diaphragm built in LWD condenser built in
Interface	USB x 1, RS232C (for Intensilight) x 1			
Eyepiece tubes	L2-TT2A Ultrawidefield erect-image tilting trinocular eyepiece tube (tilt angle: 0-30 °) FOV: 22/25; Beamsplit ratio 100:0/20:80 L2-TTA Ultrawidefield erect-image tilting trinocular eyepiece tube (tilt angle: 0-30 °) FOV: 22/25; Beamsplit ratio 100:0/0:100 LV-TI3 Trinocular eyepiece tube (erect image) FOV: 22/25; Beamsplit ratio 100:0/0:100			
Eyepieces	CFI eyepiece lens series			
Objectives	CFI LU/L Plan series			
Stages	14 x 12 stage, stroke: 354 x 302 mm (Diascopic observation range: 354 x 268 mm) Coarse/Fine-movement changeover possible Fixed-position X-Y fine-movement controls		L2-S8A 8 x 8 stage, stroke: 205 x 205 mm (Diascopic observation range: 150 x 150 mm) Coarse/Fine-movement changeover possible Fixed-position X-Y fine-movement controls	
Antistatic mechanism	1000-10 V, within 0.2 sec			
Power consumption	1.2 A/90 W		1.2 A/90 W	
Dimensions	Approx. 360 (W) x 951 (D) x 581 (H) mm (at tilt angle 10 °)		Approx. 360 (W) x 860 (D) x 580 (H) mm (at tilt angle 10 °)	
Weight	Approx. 40 kg (Body only) Approx. 64 kg (When L2-S8A 8 x 8 stage and L2-TTA eyepiece tube are used)		Approx. 30 kg (Body only) Approx. 45 kg (When L2-S8A 8 x 8 stage and L2-TTA eyepiece tube are used)	

Dimensional diagrams Unit: mm

ECLIPSE L300N/L300ND



ECLIPSE L200N/L200ND



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

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*Products: Hardware and its technical information (including software)

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