



Inverted Metallurgical Microscopes ECLIPSE MA200/MA100N

Nikon <sup>(th)</sup>  
100  
anniversary

Inverted Metallurgical Microscopes  
**ECLIPSE**  
**MA200**  
**MA100N**



# MA200 / MA100N

## Model features



# MA200

Thanks to its unique, solid-box structure, the MA200 offers high stability, durability, and a smaller footprint than conventional models as well as easy access to the stage handle, the nosepiece, BF/DF change lever, and diaphragms located at front side.

Compatible observation methods

Brightfield	Darkfield	Simple polarizing	DIC	Fluorescence
○	○	○	○	○

\*DIA illuminator is available for transmitted light observation.

Compatible illuminators

- LV-LH50PC 12V50W Halogen Lamp Illuminator
- C-HGFI HG Precentered Fiber Illuminator (\*option)

Magnification module

- 1x/1.5x/2x

Compatible stages

- MA2-SR Mechanical Stage (stroke: 50 x 50 mm)



# MA100N NEW

The MA100N is a compact inverted microscope designated for bright field and simple polarizing observations. This model offers cost-effective solution to manufacturing and QA/QC situations in industries, such as automotive/ electronic parts and industrial machinery/tools. This simple but durable microscope enables high contrast image observation and capture.

Brightfield	Darkfield	Simple polarizing	DIC	Fluorescence
○	—	○	—	—

\*Dedicated reflected illumination models.

- High-intensity white LED Illuminator (internal power supply)

—

- MA-SR-N Rectangular 3-plate Stage N (stroke: 50 x 50 mm)
- MA-SP-N Plain Stage N
- TS2-S- SM Mechanical Stage (stroke: 126 x 78 mm)

\*Please use in combination with MA-SP-N Plain stage N.

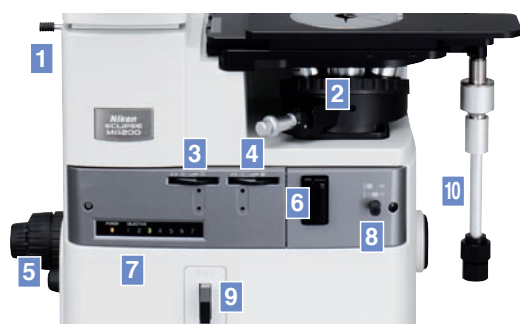
# ECLIPSE MA200

New solution from Nikon:  
An ideal inverted microscope



## Front Operation

All controls are on the front of the instrument. Delivers ease-of-use by placing all important controls on the front.



- |  |   |
|--|---|
| 1 Optical path changeover lever (vertical tube/binocular tube) | 6 Operation port for the polarizer/analyzer unit and the fluorescent unit |
| 2 Nosepiece  | 7 Display   |
| 3 Aperture diaphragm dial                                      | 8 BD field changeover lever   |
| 4 Field diaphragm dial   | 9 Scale slider slot   |
| 5 Brightness control dial                                      | 10 Flexible handle stage  |

### Quick Status Check



Automatically detects the address of the objective lens currently in use and displays it on the main unit front panel.

The observation position of the objective lens and sample can be checked easily from the microscope's front panel.

## Box Structure

Smaller footprint than conventional models: Three times free spaces left! Improved durability thanks to the unique box structure.

### Compact structure with a depth of 315 mm

A box shaped microscope, not only the width but also the depth is reduced dramatically: The foot print is only one-third of the conventional model!

### High stability/durability

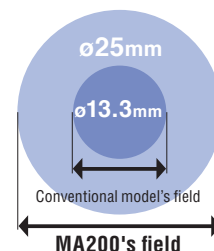
Vibration during high-power observation is reduced. Extremely high rigidity.

## Evolved Optical Performance

Basic performance dramatically improved. Provides a more ergonomic and clear image observation.

### Super-wide field of view

The ultra wide field of view eyepiece and with the combination of the newly developed 1x objective lens, a sample of 25mm diameter can be observed in a one field of view.



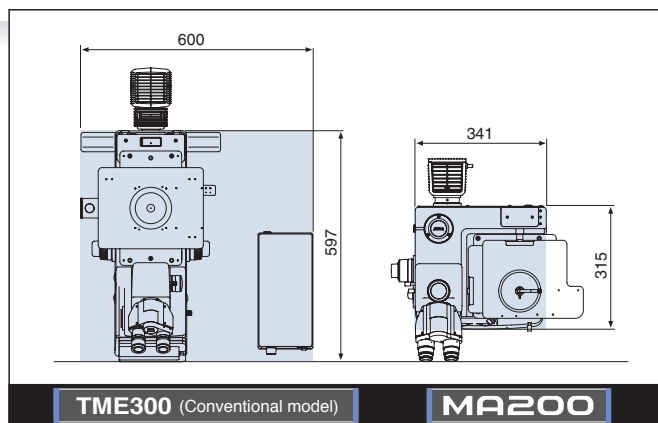
- T Plan EPI 1x
- Semi-Apochromat
- Wide field of view

### Even Illumination

Improved uniformity of illumination delivers clear images, especially for digital imaging.

### Combine up to eight images with the stitching feature

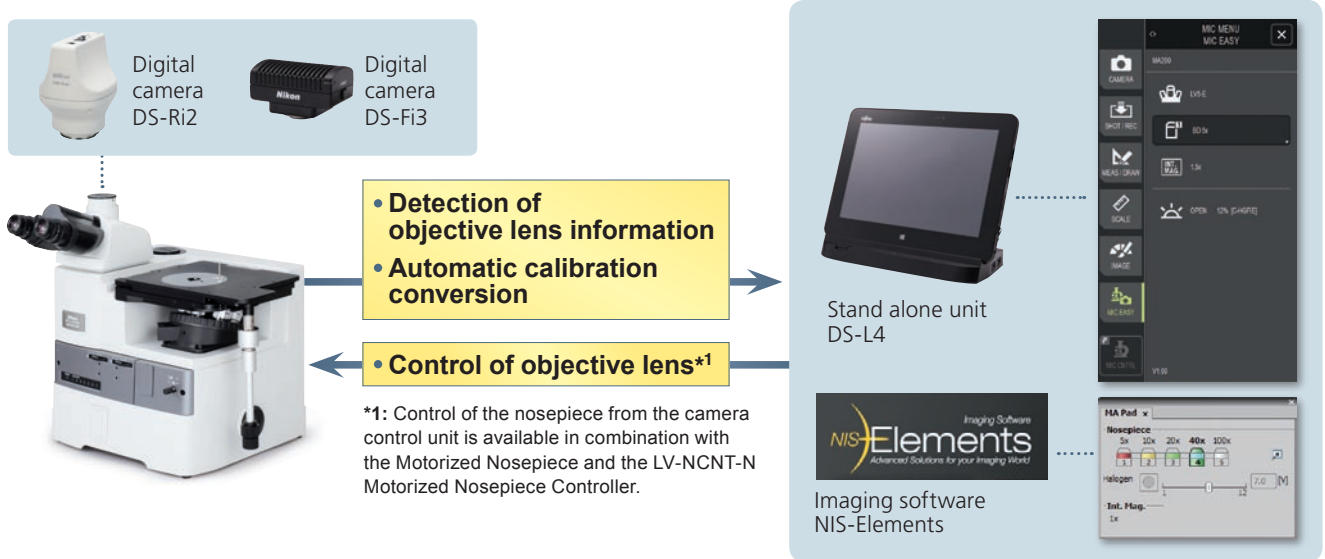
Combine up to eight images with the stitching feature. Get natural looking images with uniform lighting and no seams.



# Combination with Digital Camera

## Integration with digital camera for microscopy "Digital Sight series"

The MA200 allows detection of information and control of objective lenses via the camera control unit, enabling optimization of the conditions vital for image acquisition.



## Accessory

### Stage

The holder comes with a stage clip that enable sample rotation. This flexible handle stage delivers high durability needed to support heavy samples.

#### 1 MA-2 SR Stage



### HOLDERS

We offer a full lineup of holders that correspond to a variety of sample shapes.



### DIC

You can choose standard or high contrast type DIC prism for best match to the sample. It is effective for observation of minute step heights.

- 1 MA2-PA Unit
- 2 L-DIHC DIC Prism (High Contrast)
- 3 L-DIC DIC Prism



### Polarizing

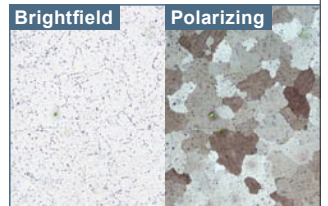
Polarizing observation is effective for birefringence samples. MA2-PA unit is suitable for observation of aluminium.

- Single-action operation
- Aluminium sample

Links the attachment/release of the analyzer/polarizer.

- 1 MA2-PA Unit
- 2 MA2-UPA Unit\*
- 3 MA2-λ P λ Plate

\*It is suitable for inspecting aluminium sample.



### Nosepiece & Magnification Module

Enables communication of objective lens position, magnification and intermediate magnification module information with the DS-L3 control unit and NIS-Elements image software.

- 1 MA2-MC Magnification Module
- 2 LV-NU51 Intelligent Universal Quintuple Nosepiece



### Grain Size Reticle & Scale

Overlays a pattern onto the observed image. MA2-GR Grain Size Reticle is used for grain size analysis which is compliant to JIS G0551 and ASTM E112 standards. The MA2-MR Scale is used for scale display for each objective magnification.

- 1 MA2-GR Grain Size Reticle  
JIS G0551/objective lens 10x  
(100x magnification)  
ASTM E112/objective lens 10x  
(100x magnification)
- 2 MA2-MR Scale



# ECLIPSE MA100N

Introducing a durable, user-friendly Inverted Microscope with superior image quality, a small footprint and great cost performance.

The MA100N is a compact inverted microscope designated for bright field and simple polarizing of industries, Nikon developed this simple but durable model which enables high contrast image frequent lamp replacement.

## Illumination

Employment of high-intensity LED illumination (Eco-illumination)

Compared to conventional halogen illumination, these high intensity LED sources need only about one third of consuming electricity and last approximately 30 times longer. The MA100N ensures stable sample observation with uniform color temperature even in different light intensity.



## Stage

Stable control even with heavy samples  
A newly developed stage boasting superior durability

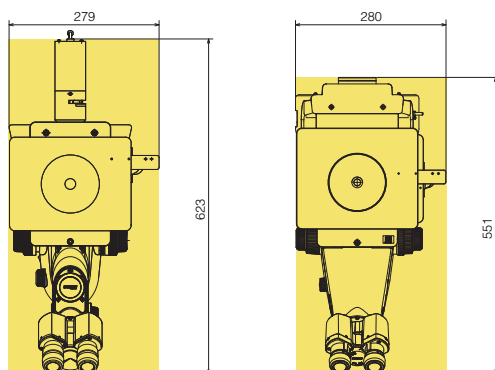
Nikon developed the new MA-SR-N Rectangular Stage especially for the MA100N. The three-plate structure gives the microscope superior control and durability for observation of heavy samples, such as a grinder resin mounted samples.



## Compact Body

Redesign to 11% smaller than the conventional models

The MA100N is a model designated for LED illumination, which enables to save about 11% of footprint and allows users to have more installation choices.



Previous model (MA100L)

MA100N

## Aperture Diaphragm

Aperture diaphragm coming standard

The epi illuminator comes standard with a variable aperture diaphragm to control image contrast and depth of field.





observations. Responding to the requests from manufacturing and QA/QC sections in a variety observation and capture. Further, the high intensity LED illumination reduces the need for

## Accessory



### Basic stage set

A triple-platform stage structure lets you use heavy samples.

- 1 MA-SR-N Rectangular Stage N
- 2 Specimen Holder (ø20/30/40mm aperture)
- 3 MA-SH3 Specimen Holder 3
- 4 MA-SRSH1 Universal Specimen Holder



### Grain size reticle

The class of grain size in a sample can be easily distinguished while observing its image.

- 1 MA100-EPRGS Grain Size Reticle



### Digital Camera for Microscopes

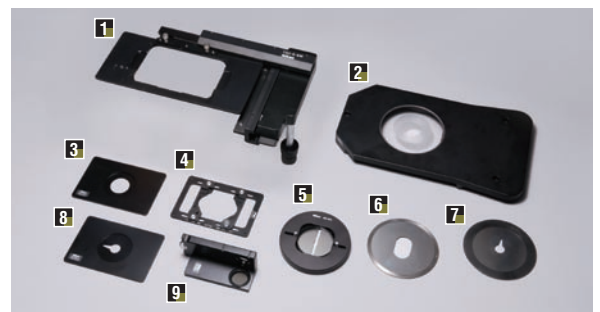
The digital camera is redesigned with new optical system suitable for sample observations. Also, the camera port is located on the side of the microscope to provide highly improved visibility of the stage.

- 1 Microscope Camera DS-Fi3
- 2 C-0.63x-TS2 C-mount Adapter
- 3 TS2-P-CF Camera port 100



### Other accessories

- 1 TI-SM Mechanical Stage CH
- 2 MA-SP-N Plain Stage N
- 3 MA-SH2-N Specimen Holder 2N
- 4 MA-S-HU Universal Holder
- 5 MA-SH3 Specimen Holder 3
- 6 MA-SRSH 25-40 Holder
- 7 MA-SRSH1 Universal Specimen Holder
- 8 MA-SH1-N Specimen Holder 1N
- 9 MA-P/A Simple Polarizer



# Accessory

## CFI60-2

Nikon's CFI60 optical system, highly evaluated for its unique concept of high NA combined with long working distance has further evolved to achieve the apex in long working distance and chromatic aberration correction.

Standard objective lenses

### TU Plan Fluor Series

**EPI/BD** 5x/10x/20x/50x/100x

These universal type standard objective lenses enable brightfield, darkfield, simple polarizing, sensitive polarizing, differential interference, and epi-fluorescence observation in one lens.



\* Depicted is the brightfield observation (EPI) objective lens.

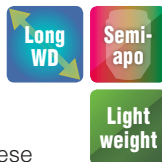
Model	Magnification	NA	Working Distance (mm)
TU Plan Fluor EPI (brightfield type)	5x	0.15	23.5
	10x	0.30	17.5
	20x	0.45	4.5
	50x	0.80	1.0
	100x	0.90	1.0
TU Plan Fluor BD (brightfield/ darkfield type)	5x	0.15	18.0
	10x	0.30	15.0
	20x	0.45	4.5
	50x	0.80	1.0
	100x	0.90	1.0

Long working distance objective lenses

### TU Plan ELWD Series

**EPI/BD** 20x/50x/100x

Through the use of phase Fresnel lenses, these objective lenses enable long working distances while offering higher-level chromatic aberration correction than conventional objective lenses. This further improves operability for samples with differences in level.



\* Depicted is the brightfield observation (EPI) objective lens.

Model	Magnification	NA	Working Distance (mm)
TU Plan EPI ELWD (brightfield type)	20x	0.4	19.0
	50x	0.6	11.0
	100x	0.8	4.5
TU Plan BD ELWD (brightfield/ darkfield type)	20x	0.4	19.0
	50x	0.6	11.0
	100x	0.8	4.5

Low-magnification objective lenses

### T Plan EPI **EPI** 1x/2.5x

These low-magnification objective lenses enable clear observation using a conventional analyzer/polarizer, as well as operability-oriented observation without need for an analyzer/polarizer.



Model	Magnification	NA	Working Distance (mm)
T Plan EPI (brightfield type)	1x	0.03	3.8
	2.5x	0.075	6.5

Apochromatic objective lenses

### TU Plan Apo Series

**EPI/BD** 50x/100x/150x

By using phase Fresnel lenses, these objective lenses achieve significantly longer operating distances while maintaining the superior chromatic aberration performance of apochromatic lenses. A 50x lens is new to the line-up.



\* Depicted is the brightfield observation (EPI) objective lens.

Model	Magnification	NA	Working Distance (mm)
TU Plan Apo EPI (brightfield type)	50x	0.8	2.0
	100x	0.9	2.0
	150x	0.9	1.5
TU Plan Apo BD (brightfield/ darkfield type)	50x	0.8	2.0
	100x	0.9	2.0
	150x	0.9	1.5

## Other Lens

Brightfield objective lens

### CFI L Plan EPI 40x

A 40x objective lens is best for metal analysis.

**NA: 0.65 W.D.: 1.0mm**





Digital cameras for microscopes

# DIGITAL SIGHT SERIES

Microscope camera

Stand-Alone Model

## DS-Ri2

Capable of expressing images as is, this microscope digital camera offers high resolution, color reproduction, and frame rate. The Stand-Alone Model is capable of high-definition image acquisition without a control unit.



16.25 megapixel **Color** High-resolution

Frame Rate	45fps (1636×1088)	30fps (1440×1024)
Max Recordable Pixels	4908×3264	2880×2048

Microscope camera

## DS-Fi3 NEW

Three main features of the previous models, high-resolution, high sensitivity and low noise, and high-speed live display are offered in 1 camera.



5.9 megapixel **Color** High-resolution

Microscope camera control unit

## DS-L4 NEW

DS-Fi3 can be optionally connected to the DS-L4 tablet-style control unit, eliminating the need and space requirements of a desktop PC. DS-L4 has a large number of built-in security for network connectivity.



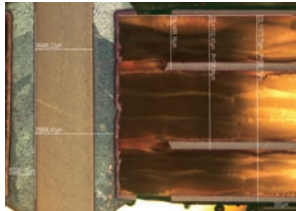
### Scene Mode

Optimal imaging parameters for each sample type and observation method can easily be set through the icons.

- Wafer/IC
- Metal, Ceramic/Plastic
- Circuit board
- Flat Panel Display

### Variety of Tool Features

Enables easy measurements directly on images, with input of lines and comments. These can also be written and saved with the image, and measurement data can also be output.



Measurement (two-point distance)

#### Measurement function

- Point to line distance
- Point to point distance
- Circle distance
- Angle
- Circle (Diameter, Radius)
- Area
- Pitch distance

#### Position and size comparison functions

- Scale indication
- Cross-hairs
- Grid
- XY scale
- XY measurement

#### Drawing functions

- Count marking
- Text input
- Pen drawing (Straight/Curved)

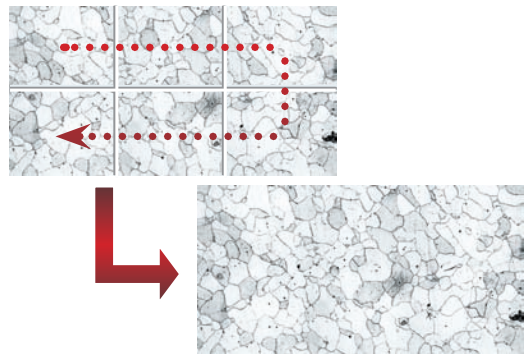
Imaging software

## NIS-Elements series



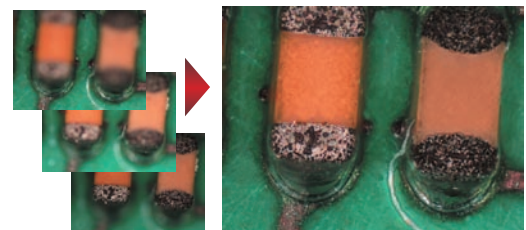
### Image Stitching

Stitches together images acquired from multiple fields of view to create one image.



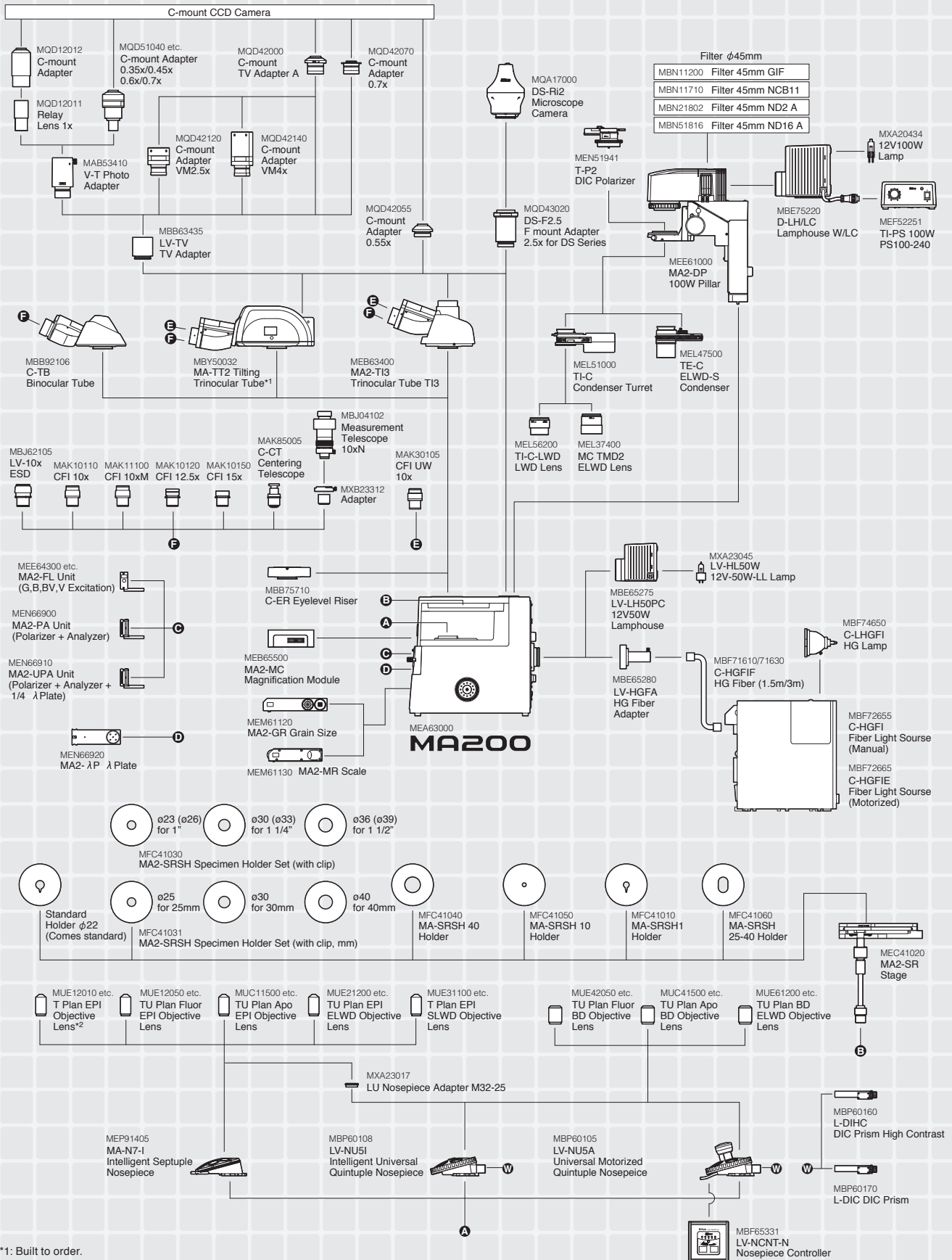
### EDF (Extended Depth of Focus)

Create a single, all-in-focus image from images of differing focus.



\* See the "Digital Camera Digital Sight Series for Microscopes" catalog for details on Digital Sight features.

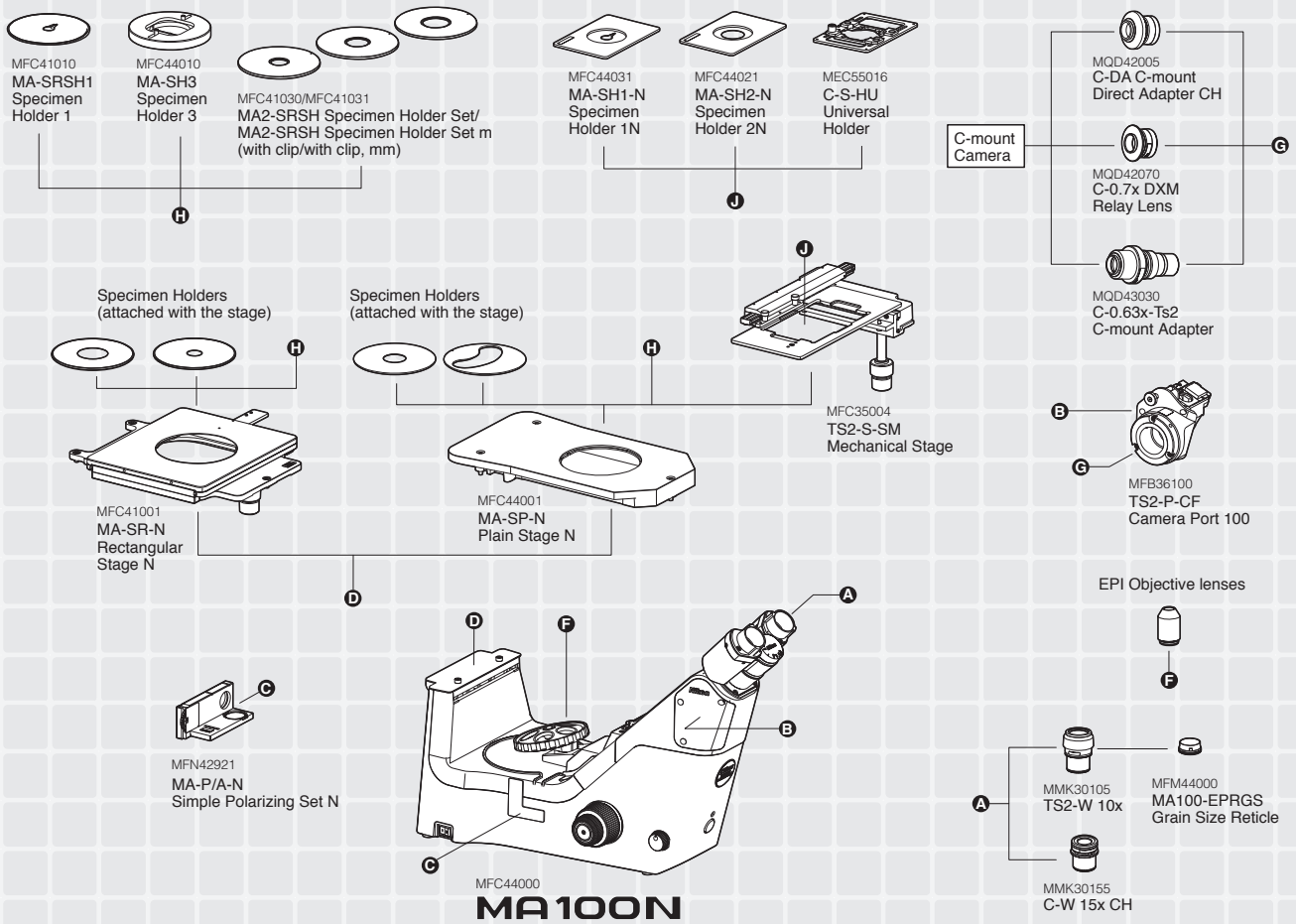
# System Diagram (MA200)



\*1: Built to order.

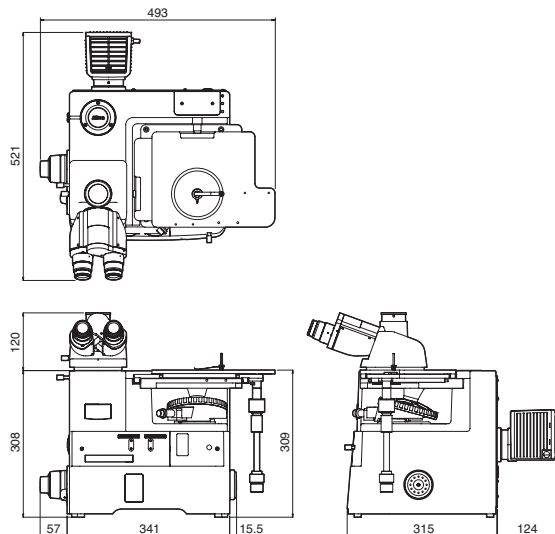
\*2: T Plan EPI 1x/2.5x enable clear observation using a conventional analyzer/polarizer, as well as operability-oriented observation without need for an analyzer/polarizer.

# System Diagram (MA100N)

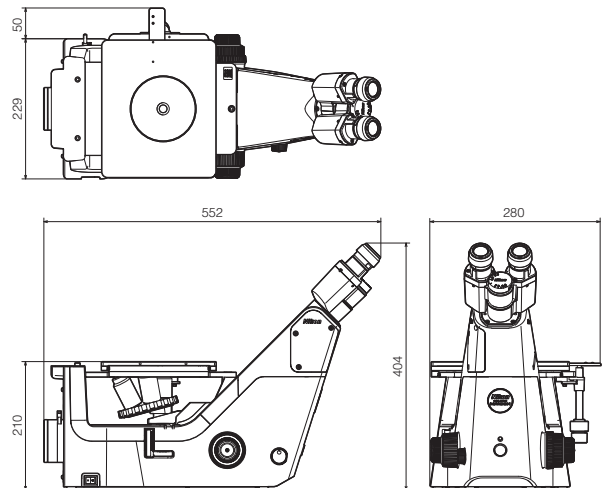


## Dimensions

### MA200



### MA100N



## Specifications (MA200)

		MA200
<b>Main body</b>	<b>Focusing mechanism</b>	Focusing nosepiece (Fixed stage) Coaxial coarse/fine adjustment knob (torque adjustable) Coarse adjustment of 4.0 mm per rotation, fine adjustment of 0.2 mm per rotation
	<b>Illumination</b>	With flare prevention, Built in UV cut filter Field diaphragm: dialing continuous variable (centerable), Aperture diaphragm: dialing continuous variable (centerable) Filter: Double turret (ND16, ND4/GIF, NCB, Additional option available), Polarizing block (Selectable with or without 1/4 λ Plate) Fluorescence filter blocks: B/G/V/BV, Built in 12V50W halogen lamp, C-HGFI HG Fiber Illuminator
	<b>Light distribution</b>	Eyepiece tube/Back port: 100/0, 55/45
	<b>Optics</b>	CFI60/CFI60-2 system
<b>Observation image</b>	Surface Image	
<b>Observation method</b>	Bright/Darkfield/Simple Polarizing/DIC/Epi-Fluorescence	
<b>Revolving nosepieces</b>	LV-NU5I: Bright/Darkfield/DIC 5 position nosepiece, LV-NU5A: Motorized Bright/Darkfield/DIC 5 position nosepiece MA-N7-I Brightfield 7 position nosepiece (Intelligent)	
<b>Stage</b>	MA2-SR Mechanical Stage (X/Y flexible handle) Dimension: 295×215mm, Stroke: 50mm×50mm (with distance graduation), Standard accessory: ø22 universal specimen holder (with sample clip)	
<b>Trinocular eyepiece</b>	Seidentopf, interpupillary distance adjustment 50-75mm	
<b>Power input</b>	100-240V, 50-60Hz	
<b>Electric power consumption</b>	1.2A 75W	
<b>Weight</b>	Approx. 26 kg (depends on combination)	
<b>Option</b>	<b>Intermediate magnification</b>	Turret (1x, 1.5x, 2x), Status detection (Output magnification information to main unit)
	<b>Scale</b>	MA2-GR Grain Reticle (ASTM E112-63 grain sizing numbers 1 to 8), Grid Reticle (20 lines, 0.5mm) MA2-MR Scale Reticle (compatible with 5-100x, Read in um, Dialing System)

## Specifications (MA100N)

		MA100N
<b>Optics</b>	CFI60/CFI60-2 system	
<b>Observation image</b>	Reversed image	
<b>Observation method</b>	Brightfield and polarization (with MA P/A simple polarizer/analyzer set)	
<b>Focusing</b>	Focusing nosepiece (fixed stage), coaxial coarse/fine adjustment knob with 8.5-mm stroke (Coarse adjustment of 37.7mm per turn, fine adjustment of 0.2mm per turn)	
<b>Nosepiece</b>	Brightfield 5-position nosepiece	
<b>Stage</b>	MA-SR-N Rectangular 3-plate Stage N: 50×50 mm stroke (includes two stage inserts (ø20mm and 40mm opening) and coaxial control handle on the right side The 3-plate design allows entire top surface to move. Optional Stage inserts: MA-SRSH1 Specimen Holder 1 with (ø15mm opening or MA-SH3 Specimen Holder 3 with 2mm to 32mm adjustable opening MA-SP-N Plain Stage N: 188×310mm - Includes two stage inserts (1) clear acrylic stage insert with ø30mm opening, (2) clear acrylic stage insert with crescent opening (width 30mm) to allow clearance for rotation of high magnification objectives Optional stage inserts: MA-SRSH1 Specimen Holder 1 with 15mm opening or MA-SH3 Specimen Holder 3 with 2mm to 32mm adjustable opening Accepts Attachable Mechanical Stage TI-SM TS2-S-SM Mechanical Stage: 126mm×78mm stroke, handle can be attached on the right or left side of the plain stage Optional Specimen Holders to fit Attachable Mechanical stage: MA-SH1-N Specimen Holder 1N (ø15mm opening) MA-SH2-N Specimen Holder 2N (ø30mm opening), or C-S-HU Universal Holder (30mm to 65mm adjustable opening)	
<b>Illuminator</b>	Internal power supply white LED light source, condenser built-in (lever operated), ø25mm filter can be inserted	
<b>Binocular body</b>	Built-in Siedentopf binocular, 45 inclination angle and 50 to 75-mm interpupillary adjustment, attachable camera port, eyepiece/Port: 100/0:0/100	
<b>Power consumption (max.)</b>	15W	
<b>External dimensions</b>	229×551×404 mm (W×D×H)	
<b>Weight</b>	Approx. 10kg	

Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. April 2017 ©2006-2017 NIKON CORPORATION

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



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



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