Nikon Measuring Microscopes

MM-400/800 Series
Digital Metrology Center

Nikon Measuring Microscopes

MM-400/800 Series
We proudly present the MM-400/800 series created by enhancing every point of features required in a measuring microscope of the next generation— e.g. greater accuracy, digital imaging and vision processing metrology, larger workpiece handling, non-contact Z-height measurement, and coordination with data processing systems.

Toward Digital Imaging & Metrology

Next-Generation Measuring Microscopes

MM-400/800 Series
• The new Nikon measuring microscope equipped with TTL Laser AF. It also boasts a new Focusing Aid mechanism that enables sharp and accurate focusing. High precision Z-axis measurement is simpler than ever.

• Digital image measuring with precise auto edge detection never realized before thanks to image capture using a Nikon digital camera and measurement support software E-MAX series.

• A fully motorized high power microscopy model is also available for digital imaging.

• An expanded observation range has been achieved by enhancement of various illuminators and light sources. These include a high-intensity white LED illuminator for brightfield observation, a universal epi-illuminator to respond to various observation needs, and a 12V-50W halogen light source.

• A motorized Z-axis movement mechanism (LM type) simplifies accurate vertical motion through the use of a dedicated controller.

• Added body strength enables the loading of larger stages, such as the newly developed 12x8 stage, allowing for larger workpieces.

• Maneuverability has been greatly improved due to various motorized controls and an ergonomic design that includes a dual axis coarse/fine focus knob and a stage that is easy to manipulate despite its large size.

• Enhanced interface with newly developed data processor DP-E1 and PC-based measurement support software E-MAX series provides strong support for management and usage of measurement data.
Stellar new features enhance Z-axis measurement accuracy

**TTL Laser AF (Universal Type)**
The first measuring microscope series equipped with TTL Laser AF, 0.75µm (theoretical, at 20x) spot diameter and a 0.5 sec. focusing speed, the new models accomplish focusing quickly with repeatability as high as 0.5µm (when a 20x objective is used).

**Focusing Aid (FA)**
The newly developed split-prism Focusing Aid (FA) delivers sharp FA patterns to ensure accurate focusing during Z-axis measurements. Measurement errors due to differences in the depth of focus of different objectives are minimized.

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**Improved illuminators broaden observation ranges**

A high-intensity white LED illuminator is provided as standard for brightfield use. This illuminator features quick reaction and constant color temperature, enabling measurement with high-precision and efficiency. For the universal type (except FA), a newly designed 12V-50W halogen light is included. Brightness at high magnifications, in particular, has been substantially improved.

**Built-in Stepless Light Control**
A stepless light control is built into the system, enabling light control from the PC without touching the dial on the main body. Observation under the same conditions—an essential requirement in video measurement—is possible.

**LED Illuminator**
This high-intensity illuminator uses 60 white LEDs and comes with a light intensity control to minimize flickering.

**8-Segment LED Ring Light CYN-2**
This ring light enables illumination control from eight directions, eliminating the need to pull out and adjust the fiber illuminator each time measurement is made.
Digital Imaging & Vision Processing

In combination with a Nikon digital camera for microscopes and the E-Max series of measurement support software, it will streamline your microscopic tasks extending from the observation and capture to the storage of high-definition digital images of your workpieces.

Rear-side MM Controller
Illumination, communication, data processing are all controlled by a rear-side controller. The rear-side controller enables future system upgrades.

New 12x8 Stage for Large Workpieces (MM-800 only)
Enhanced body solidity through CAE analysis has enabled the mounting of a large stage in a small space to accommodate the measuring of large workpieces. With the MM-800 model, in particular, it is possible to mount a 300x200mm stroke stage.

Improved Interface with Data Processor and Software
Interface with data processors and software has been greatly enhanced, enabling comprehensive support for the entire measurement process, extending from the measurement, image capture and analysis up to data storage.

Data Processor DP-E1
The DP-E1 is compact yet easy to use. You can place the display near the eyepiece and the control pad at your fingertips, for quick measurement and data processing. With smooth interface with a PC, the DP-E1 performs the job efficiently, from computation to the management of measurement results.

Measurement Support Software E-MAX Series
Digital image measuring performance of the E-MAX Series has been upgraded. Combined with Nikon's digital camera and measuring microscope, the system achieves digital image measurements with precision never before possible.

3rd-party DRO Connectable (S Type)
Also available is the S Type, to which a 3rd-party DRO is connectable, including the Metronics QuadraChek series. QuadraChek is a trademark of Metronics Inc.

High-Precision Type
The design of the MM-400/800 series has been revamped so that users have more freedom than ever in choosing modules to configure their system. You can configure the optimum system according to your needs, including a ultrahigh-precision system boasting precision as high as 1.5+L/100µm with combination correction.
Also, since the solidity of the microscope as a whole has been upgraded, the system exhibits excellent reliability during measurements with a digital camera and other accessories loaded.

* For details on system configuration, contact Nikon.
**LM Type 3-Axis and Z-Motorized Model**

The LM type has a built-in motorized Z-axis scale, enabling accurate 3-axis measurements. In addition, the optional Focusing Aid uses a split prism to ensure Z-axis focusing accuracy and minimize measurement errors caused by the difference in the objective's depth of focus.

**MM-800/LM**
- 10x6 stage
- Focusing Aid (FA) mechanism

**Applications:**
Dies & molds, Finely machined parts, Stamped parts, Injection molded parts, Medical devices

**MM-400/LM**
- 6x4 stage
- Focusing Aid (FA) mechanism

**Specifications**

<table>
<thead>
<tr>
<th>Type</th>
<th>MM-800/LM</th>
<th>MM-400/LM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorized Z-axis movement</td>
<td>Motorized (speed: 10mm/sec)</td>
<td>Motorized (speed: 10mm/sec)</td>
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<tr>
<td>Optical head</td>
<td>Trinocular optical head</td>
<td>Trinocular optical head with Focusing Aid</td>
</tr>
<tr>
<td>Tilting angle</td>
<td>25°</td>
<td>25°</td>
</tr>
<tr>
<td>Objective</td>
<td>Measuring microscope objectives: 1x M.W., 7x M.W., 7x M.W., 7x M.W., 15x S.W., 4x M.W., 20x W.W., 4x M.W., 20x W.W., 4x M.W., 4x M.W., 20x W.W.</td>
<td>Measuring microscope objectives: 1x M.W., 7x M.W., 7x M.W., 7x M.W., 15x S.W., 4x M.W., 20x W.W., 4x M.W., 20x W.W., 4x M.W., 4x M.W., 20x W.W.</td>
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<td>ME6120E, ME6510, ME6510M, ME6540, ME5124, ME6524</td>
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<tr>
<td>Light source</td>
<td>Diascopic, LED diascopic illuminator (standard), 12V-50W halogen lamphouse (option)*</td>
<td>Diascopic, LED diascopic illuminator, LED episcopic illuminator (option)*</td>
</tr>
<tr>
<td>Max. workpiece height</td>
<td>200mm</td>
<td>150mm</td>
</tr>
<tr>
<td>Dimensions (W x D x H)/weight</td>
<td>180 x 125 x 795mm/approx. 65kg</td>
<td>300 x 630 x 638mm/approx. 50kg</td>
</tr>
</tbody>
</table>

*TE2-PS100W power supply is required
L/SL Type  3-Axis Measurement Model

With a built-in Z-axis scale, this type is a standard line in Nikon’s measuring microscope series. Various models are available—with or without Focusing Aid, monocular or trinocular optical head. You can select the best one according to your measuring range, use and budget. The LS model accepts attachment of DRO made by other manufacturers.

**MM-800/L**

**MM-800/SL with 3rd-party DRO**

- 8x6 stage
- Focusing Aid (FA) mechanism

**Applications:**

Dies & molds, Finely machined parts, Stamped parts, Injection molded parts, Medical devices

**MM-400/L**

**MM-400/SL with 3rd-party DRO**

- 4x4 stage
- Trinocular optical head

### Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>MM-800/L, MM-800/SL</th>
<th>MM-400/L, MM-400/SL</th>
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<td>Focus movement</td>
<td>Manual (coarse/fine knob)</td>
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<tr>
<td>Optical head</td>
<td>Trinocular optical head, Trinocular optical head with Focusing Aid</td>
<td></td>
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<tr>
<td>Tilt angle</td>
<td>25°</td>
<td></td>
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<tr>
<td>Stage</td>
<td>MHS12x8, MHS10x6, MHS8x6, MHS6x4, MHS4x4, O3L, MHS2x2</td>
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<tr>
<td>Light source</td>
<td>Diascopic LED diascopic illuminator (standard), 12V-50W halogen lamphouse (option)*</td>
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<td>Max. workpiece height</td>
<td>200mm</td>
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<tr>
<td>Dimensions (W x D x H)/weight</td>
<td>380 x 370 x 725mm/approx. 64kg</td>
<td></td>
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</tbody>
</table>

*TE2-PS100W power supply is required
These are the basic models in the MM-400/800 series. High in cost performance, these models are expressly designed for 2-axis (XY) applications. Various models are available—monocular or trinocular optical head, 12x8 large stage or 2x2 small stage, according to application and budget. The S model accepts DRO made by other manufacturers.

**MM-800**

- 8x6 stage
- Focusing Aid (FA) mechanism

**Applications:**
Dies & molds, Finely machined parts, Stamped parts, Injection molded parts, Medical devices

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**MM-400**

- 2x2 stage
- Monocular optical head

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### Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>MM-800</th>
<th>MM-400</th>
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<tbody>
<tr>
<td>Type</td>
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<td>Diascopic LED</td>
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<td>Max. workpiece height</td>
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<tr>
<td>Dimensions (W x D x H)/weight</td>
<td>300 x 600 x 638mm/approx. 50kg</td>
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</table>

*TE2-P518W power supply is required.*
**MM-800/S**
- ????
- ????

**MM-400/S**
- O3L stage
- Trinocular optical head

**Applications:**
Stamped parts, Injection molded parts, Medical devices, Drills, Micro tooling

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**Specifications**

<table>
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<tr>
<th>Type</th>
<th>MM-800/S</th>
<th>MM-400/S</th>
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</thead>
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<tr>
<td>Z-axis movement</td>
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<td>Trinocular optical head</td>
<td>Trinocular optical head</td>
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<tr>
<td>Tilting angle</td>
<td>25°</td>
<td>25°</td>
</tr>
<tr>
<td>Stage</td>
<td>MHS6x4, MHS4x4, O3L, MHS2x2</td>
<td>MHS6x4, MHS4x4, O3L, MHS2x2</td>
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<tr>
<td>Light source</td>
<td>Diascopic LED diascopic illuminator (standard), 12V-50W halogen lamphouse (option)*</td>
<td>Diascopic LED diascopic illuminator (standard), 12V-50W halogen lamphouse (option)*</td>
</tr>
<tr>
<td>Max. workpiece height</td>
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<td>150mm</td>
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<tr>
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<td>300 x 600 x 638mm/approx. 50kg</td>
<td>300 x 600 x 638mm/approx. 50kg</td>
</tr>
</tbody>
</table>

*TE2-PS100W power supply is required
High Power Microscopic Model with Universal Epi-Illuminator

Motorized Z-axis & Microscopic Observation Mode Switchover

In addition to brightfield, darkfield, simple polarizing, and DIC, the universal type in the MM-400/800 series enables epi-fluorescence observation as well. Moreover, important controls in the microscope—e.g. Z-axis movement, focusing and illumination switchover—have been automated or motorized to streamline imaging operations such as digital image capture, FOV measurement and data storage.

Centralized Control via Illumination & FA Controller

Control of the motorized epi-illuminator and various light sources, universal motorized nosepiece and aperture diaphragm, DIC changeover, and other important operations can be performed at a single place via the illumination & AF controller.

TTL Laser AF
The first measuring microscope series equipped with TTL Laser AF, these models accomplish focusing quickly with repeatability as high as 0.5µm (when a 20x objective is used).

Focusing Aid (FA)
The newly developed split-prism Focusing Aid (FA) ensures accurate Z-axis focusing, minimizing measurement errors caused by the difference in the depth of focus of the objective in use.

Universal Motorized Nosepiece
The LV-NUSA universal nosepiece simplifies objectives changeover. Programmed magnification changeover is available via the illumination & FA controller.
A new lineup of motorized universal illuminators is available in addition to manual types. A white LED illuminator is available for brightfield use. Users can choose either a 12V-50W halogen or a white LED light source according to observation purpose and workpiece.

**LV-UEPI Universal Epi-Illuminator**
This universal epi-illuminator enables brightfield, darkfield, simple polarizing, and DIC observations. The illuminator automatically opens the field and aperture diaphragms when switching observation from brightfield to darkfield. When returning to brightfield, the previous field and aperture conditions are automatically restored.

**LV-UEPI2 Universal Epi-Illuminator**
In addition to brightfield, darkfield, simple polarizing, and DIC, this illuminator enables epi-fluorescence observation. The illuminator automatically sets optimum illumination through linkage to the shutter and field and aperture diaphragms. This minimizes the complexity of operating a measuring microscope, allowing the user to concentrate on observation.

**LV-UEPI2A Motorized Epi-Illuminator**
With the LV-UEPI2A, the illumination changeover turret, the aperture diaphragm and the illumination voltage control have been motorized, allowing optimum image capture conditions. The aperture diaphragm is automatically optimized through linkage with objective and observation. Also, illumination parameters can be arbitrarily changed according to observation purpose and workpiece. When loaded on the LM type measuring microscope, the illuminator can be controlled from the microscope operation panel or a connected PC. When the illumination & AF controller is used, the microscope can be controlled externally from a PC.

**LV-UEPI FA Universal Epi-Illuminator Focusing Aid**
This universal epi-illuminator is equipped with a Focusing Aid (FA) mechanism to provide greater accuracy in Z-axis measurements.

**LV-EPILED White LED Illuminator**
The LV-EPILED is a light, compact white LED illuminator exclusively designed for brightfield use. The white LED maintains constant color temperature to prevent any adverse effects on measurement. External control is possible either with the attached power supply controller or the illumination & AF controller.

**Motorized Z-axis Movement**
The microscope comes with a motorized focusing module, enabling Z-axis movement with a dedicated controller.

**High-Intensity 12V-50W Halogen Light Source: MM-LH50PC Precentered Lamhouse**
Although the MM-LH50PC Precentered Lamhouse is 12V-50W, the brightness is equivalent to or higher than that of 12V-100W. The low power-consumption halogen light source contributes to the compact design of the microscope while also being friendly to the environment. Defocus induced by heat is substantially reduced.
**MM-800/LMU**

- 12x8 stage
- TTL Laser AF
- LV-UEPI2A motorized universal epi-illuminator

**Applications:**
Semiconductor packages, Bonding placement, Loop height, FPD panel (LCM), MEMS, Wafer level CSP, HDD slider

**MM-400/LMU**

- 6x4 stage
- TTL Laser AF
- LV-UEPI2A motorized universal epi-illuminator

The motorized system satisfies digital image capture and data storage requirements. In combination with the motorized universal epi-illuminator, it is possible to set and reproduce illumination optimized for a selected observation method and/or objective lens. Focusing and objective changeover can be electrically performed with the illumination & AF controller.

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**Specifications**

<table>
<thead>
<tr>
<th>Type</th>
<th>MM-800/LMU</th>
<th>MM-400/LMU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z-axis movement</td>
<td>Motorized (max. speed: 10mm/sec)</td>
<td>Motorized (max. speed: 10mm/sec)</td>
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<tr>
<td>Optical head</td>
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<td>Y-18 binocular tube, LV-Y13 binocular eyepiece tube, LV-Y17 binocular eyepiece tube (with built-in reticle)</td>
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<td>Eyepiece</td>
<td>CFI10W No. 22, CFI10W CR No. 22</td>
<td>CFI10W No. 22, CFI10W CR No. 22</td>
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<tr>
<td>Objective</td>
<td>CFI60 LU Plan Fluor EPI series, CFI60 LU Plan Fluor BD series, CFI60 L Plan EPI CR series</td>
<td>CFI60 LU Plan Fluor EPI series, CFI60 LU Plan Fluor BD series, CFI60 L Plan EPI CR series</td>
</tr>
<tr>
<td>Stage</td>
<td>MHS12x8, MHS10x6, MHS8x6, MHS6x4, O3L, MHS4x4, MHS2x2</td>
<td>MHS12x8, MHS10x6, MHS8x6, MHS6x4, O3L, MHS4x4, MHS2x2</td>
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<tr>
<td>Light source</td>
<td>Diascopic LED diascopic illuminator (standard), 12V-50W halogen lamphouse (option)*</td>
<td>LED diascopic illuminator (standard), 12V-50W halogen lamphouse (option)*</td>
</tr>
<tr>
<td>Stage</td>
<td>Diascopic White LED illuminator LV-EPILED, Motorized universal epi-illuminator LV-UEPI2A, Universal epi-illuminator U-EPI, Universal epi-illuminator with Focusing Aid LV-UEPI1A *</td>
<td>Diascopic White LED illuminator LV-EPILED, Motorized universal epi-illuminator LV-UEPI2A, Universal epi-illuminator U-EPI, Universal epi-illuminator with Focusing Aid LV-UEPI1A</td>
</tr>
<tr>
<td>Max. workpiece height</td>
<td>200mm</td>
<td>150mm</td>
</tr>
<tr>
<td>Dimensions (W x D x H)/weight</td>
<td>380 x 735 x 725mm/approx. 65kg</td>
<td>300 x 600 x 638mm/approx. 50kg</td>
</tr>
</tbody>
</table>

*TE2-PS100W power supply is required*
**LU/LSU Type  3-Axis Measurement High Power Magnification Model**

The system is equipped with a universal epi-illuminator that responds to various observation needs such as brightfield, darkfield, simple polarizing and DIC, as well as epi-fluorescence. A bright 12V-50W halogen light source and a white LED light source are available depending on the workpiece or observation purpose. The 12V-50W halogen light source provides image brightness equivalent to or higher than that of 12V-100W. LSU type is also available for connection to a 3rd-party DRO.

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**MM-800/LU**
- 12x8 stage
- LV-UEPI2 universal epi-illuminator
- Dedicated erect image Focusing Aid optical head
- Manual nosepiece

**Applications:**
- Semiconductor packages, Bonding placement,
- Loop height, FPD panel (LCM), MEMS, Wafer level
- CSP, HDD slider

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**Specifications**

<table>
<thead>
<tr>
<th>Specifications</th>
<th>MM-800/LU</th>
<th>MM-400/LU</th>
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<tbody>
<tr>
<td>Type</td>
<td>Manual (coarse/fine control)</td>
<td>Manual (coarse/fine control)</td>
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<tr>
<td>Objective</td>
<td>CFI60 LU Plan Fluor EPI series, CFI60 LU Plan Fluor BD series, CFI60 L Plan EPI CR series</td>
<td>CFI60 LU Plan Fluor EPI series, CFI60 LU Plan Fluor BD series, CFI60 L Plan EPI CR series</td>
</tr>
<tr>
<td>Eyepiece</td>
<td>CFI10x (Field No. 22), CFI10x CM (Field No. 22)</td>
<td>CFI10x (Field No. 22), CFI10x CM (Field No. 22)</td>
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<td>Stage</td>
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<td>MHS12x8, MHS10x6, MHS8x4, MHS6x4, MHS4x4, O3L, MHS2x2</td>
</tr>
<tr>
<td>Max. workpiece height</td>
<td>200mm</td>
<td>150mm</td>
</tr>
<tr>
<td>Dimensions (W x D x H)/weight</td>
<td>380 x 735 x 725mm / approx. 65kg</td>
<td>300 x 600 x 638mm / approx. 50kg</td>
</tr>
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</table>

*TE2-PS100W power supply is required*
This model is designed exclusively for 2-axis high magnification measurement of fine geometries. It is equipped with a universal epi-illuminator that allows observations such as brightfield, darkfield, simple polarizing and DIC. A bright 12V-50W halogen light source and a white LED light source are available depending on the workpiece or observation purpose. The 12V-50W halogen light source provides image brightness equivalent to or higher than that of 12V-100W.

**MM-400/U**

- 6x4 stage
- Manual nosepiece
- LV-UEPI universal epi-illuminator
- Dedicated erect image Focusing Aid optical head

**Applications:**
Semiconductor packages, Bonding placement, FPD panel (LCM), MEMS, HDD slider

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**Specifications**

<table>
<thead>
<tr>
<th>Type</th>
<th>MM-400/U</th>
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<tbody>
<tr>
<td>Z-axis movement</td>
<td>Manual (????knob)</td>
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<tr>
<td>Optical head</td>
<td>Y-TB binocular tube, LV-TI3 trinocular eyepiece tube, LV-TIM tilting trinocular eyepiece tube (with built-in reticule)</td>
</tr>
<tr>
<td>Eyepiece</td>
<td>CFI15 (Field No. 22), CFI15 G (Field No. 22)</td>
</tr>
<tr>
<td>Objective</td>
<td>CFI60 FL Plan Fluor EPI series, CFI60 FL Plan BD series, CFI60 FL Plan CR series</td>
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<tr>
<td>Stage</td>
<td>MHS6x4, MHS4x4, O3L, O3Lx4x4</td>
</tr>
<tr>
<td>Light source</td>
<td>Diascopic: LED diascopic illuminator (standard), 12V-50W halogen lamp (optional)</td>
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<td>Episcopic: White LED illuminator LV-EPLED, Rotated universal epi-illuminator LV-UEPIFA, Universal epi-illuminator LV-UEPI, Universal epi-illuminator with Focusing Aid LV-UEPIFA</td>
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<tr>
<td>Max. workpiece height</td>
<td>150mm</td>
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<tr>
<td>Dimensions (W x D x H)/weight</td>
<td>300 x 600 x 638mm/approx. 50kg</td>
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*TE2-PS100W power supply is required*
Dimensional diagram

Note: Dimensions will vary, depending on which stage and eyepiece tube are used. Unit: mm

MM-400/LM
Stage type MHS12x8

MM-800/LM
Stage type MHS12x8

MM-400/L
Stage type MHS6x4

MM-800/L
Stage type MHS6x4

MM-400/LMU
Stage type MHS12x8

MM-800/LMU
Stage type MHS12x8

MM-400/LU
Stage type MHS6x4

MM-800/LU
Stage type MHS6x4

MM-400/7M
Stage type MHS12x8

MM-800/7M
Stage type MHS12x8

MM-400/7MU
Stage type MHS12x8

MM-800/7MU
Stage type MHS12x8

Note: Dimensions will vary, depending on which stage and eyepiece tube are used. Unit: mm
New series of high-performance objective lenses enhances optical performance

Standard objective lens with improved transmission rate for UV wavelength
CFI LU Plan Fluor Series

The transmission rate in the UV wavelength range has been improved for the new CFI LU Plan Fluor series. These objective lenses are suitable for various research, analysis and examination needs, while maintaining Nikon's commitment to high NA and long working distance. Only one kind of objective lens is needed for brightfield, darkfield, simple polarizing, DIC and UV epi-fluorescence observations. These objective lenses offer high resolution and ease of use.

Objective lenses with correction ring
CFI L Plan EPI CR Series

The CFI60 series now includes the CFI L Plan EPI CR series to cope with the thinner coverglass used in liquid crystal displays, and highly integrated, and dense devices. Coverglass correction can be continuously made from 0 mm up to 1.2 mm (0-0.7 mm and 0.6-1.3 mm for 100x) with the correction ring. The 100x objective lens offers 0.85 high NA, while enabling high-contrast imaging of cells and patterns without being affected by the coverglass.

**CFI60 Series Objectives**

<table>
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<tr>
<th>Type</th>
<th>Magnification</th>
<th>NA</th>
<th>W.D. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFI L Plan EPI</td>
<td>3.5x</td>
<td>0.075</td>
<td>8.8</td>
</tr>
<tr>
<td>CFI LU Plan Fluor EPI</td>
<td>3x</td>
<td>0.15</td>
<td>2.35</td>
</tr>
<tr>
<td></td>
<td>10x</td>
<td>0.30</td>
<td>17.5</td>
</tr>
<tr>
<td></td>
<td>20x</td>
<td>0.45</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>50x</td>
<td>0.80</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>100x</td>
<td>0.90</td>
<td>1.0</td>
</tr>
<tr>
<td>CFI LU Plan EPI ELWD</td>
<td>20x</td>
<td>0.40</td>
<td>22.0</td>
</tr>
<tr>
<td></td>
<td>50x</td>
<td>0.55</td>
<td>10.1</td>
</tr>
<tr>
<td></td>
<td>100x</td>
<td>0.80</td>
<td>3.5</td>
</tr>
<tr>
<td>CFI L Plan EPI SLWD</td>
<td>20x</td>
<td>0.35</td>
<td>24.0</td>
</tr>
<tr>
<td></td>
<td>50x</td>
<td>0.45</td>
<td>17.0</td>
</tr>
<tr>
<td></td>
<td>100x</td>
<td>0.70</td>
<td>6.5</td>
</tr>
<tr>
<td>CFI LU Plan Apo EPI</td>
<td>100x</td>
<td>0.95</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>150x</td>
<td>0.95</td>
<td>0.3</td>
</tr>
<tr>
<td>CFI L Plan Apo EPI W</td>
<td>150x</td>
<td>1.25</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>20x</td>
<td>0.45</td>
<td>10.9-10.0</td>
</tr>
<tr>
<td>CFI L Plan EPI CR</td>
<td>50x</td>
<td>0.30</td>
<td>3.9-3.0</td>
</tr>
<tr>
<td>CFI L Plan EPI CR A</td>
<td>100x</td>
<td>0.85</td>
<td>1.2-0.85</td>
</tr>
<tr>
<td>CFI L Plan EPI CR B</td>
<td>100x</td>
<td>0.85</td>
<td>1.3-0.95</td>
</tr>
</tbody>
</table>
Newly developed tilting trinocular eyepiece tube  
LV-TT2 Tilting Trinocular Eyepiece Tube

The newly developed LV-TT2 tilting trinocular eyepiece tube (erect image) with built-in reticle offers comfort to all users, regardless of their stature or viewing positions. The optical path changeover of 100:0/20:80 allows simultaneous use of monitor.

Selectable nosepieces

Highly Durable Motorized Universal Nosepieces  
LV-NUSA/USAC

Two types of motorized universal quintuple nosepieces are available. The LV-NUSA boasts greater durability thanks to a new click mechanism and control system. Programmed magnification change with a controller is possible. The LV-NUSAC comes with a centering mechanism that suppresses image drift during objective changeover.

Manual Nosepieces

A variety of manual control nosepieces are available to suit all needs.

Illumination & FA Controller

This controller makes it possible to control the light source, motorized illuminator, nosepiece, Z-movement and TTL Laser AF. By connecting E-MAX software, auto switching is also possible.

Connectable units

- Motorized universal epi-illuminator LV-UEPI2A
- Halogen lamphouse MM-LH50PC (TE2-PS100W power supply is required)
- PC-control type high-intensity mercury fiber light source
- White LED Illuminator LV-EPILED
- Motorized universal nosepiece LV-NUSA, LV-NUSAC (with centering mechanism)
- TTL Laser AF (U-AF)
- Diascopic/episcope illumination
Nikon offers a broad range of stages to choose from including the new MHS12x8 stage. All models except the O3L boast an outstanding accuracy of 3+L/50µm (L = measurement length).

### Stages

#### Stages for MM-800 series

- **Stage type MHS12x8**
- **Stage type MHS10x6**
- **Stage type MHS8x6**
  - *Stage adapter is required.
- **Stage type MHS6x4**
- **Stage type MHS4x4**
- **Stage type O3L**
- **Stage type MHS2x2**

Cable length: approx. 2,000mm
Stage specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>Surface area (mm²)</th>
<th>Stage glass dimensions (mm)</th>
<th>Crosswise (mm)</th>
<th>Reading method</th>
<th>Min. position (mm)</th>
<th>Zero position adjustment (mm)</th>
<th>Stage top tool installation</th>
<th>Loading capacity (kg)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHS8x6</td>
<td>450 x 286</td>
<td>305 x 190</td>
<td>250 x 150</td>
<td>Linear encoder</td>
<td>0.0001</td>
<td>Discretionary</td>
<td>M6 (screw)</td>
<td>20</td>
<td>Approx. 50</td>
</tr>
<tr>
<td>MHS6x4</td>
<td>350 x 240</td>
<td>204 x 145</td>
<td>150 x 100</td>
<td>Linear encoder</td>
<td>0.0001</td>
<td>Discretionary</td>
<td>M6 (screw)</td>
<td>10</td>
<td>Approx. 23</td>
</tr>
<tr>
<td>MHS4x4</td>
<td>285 x 210</td>
<td>170 x 145</td>
<td>100 x 100</td>
<td>Linear encoder</td>
<td>0.0001</td>
<td>Discretionary</td>
<td>M6 (screw)</td>
<td>6</td>
<td>Approx. 13</td>
</tr>
<tr>
<td>O3L</td>
<td>285 x 192</td>
<td>170 x 120</td>
<td>100 x 50</td>
<td>Linear encoder</td>
<td>0.0001</td>
<td>Discretionary</td>
<td>Dovetail</td>
<td>5</td>
<td>Approx. 15</td>
</tr>
<tr>
<td>MHS2x2</td>
<td>195 x 192</td>
<td>101 x 120</td>
<td>50 x 50</td>
<td>Linear encoder</td>
<td>0.0001</td>
<td>Discretionary</td>
<td>360° rotatable M6 (screw)</td>
<td>5</td>
<td>Approx. 13</td>
</tr>
</tbody>
</table>

Stage Accessories

Stage Adapter

This adapter is used to mount MHS8x6, MHS6x4, MHS4x4, O3L, or MHS2x2 stage to the MM-800.

Rotating Tables

Used to rotate the workpiece and align it in the direction to which the stage moves.

<table>
<thead>
<tr>
<th>Rotating Table Type 3</th>
<th>For MHS6x4, MHS4x4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotating Table Type 4</td>
<td>For MHS10x6, MHS8x6</td>
</tr>
<tr>
<td>Goniometer Type 2</td>
<td>For O3L</td>
</tr>
</tbody>
</table>

Rotating table specifications

<table>
<thead>
<tr>
<th>Table diameter</th>
<th>Glass insert diameter</th>
<th>Rotation range</th>
<th>Tool installation</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotating table type 3</td>
<td>204mm</td>
<td>165mm</td>
<td>360° (uncalibrated)</td>
<td>Screw hole M6</td>
</tr>
<tr>
<td>Rotating table type 4</td>
<td>282mm</td>
<td>262mm</td>
<td>360° (uncalibrated)</td>
<td>Screw hole M6</td>
</tr>
<tr>
<td>Goniometer type 2</td>
<td>160mm</td>
<td>107mm</td>
<td>360° (calibrated)</td>
<td>Screw hole 2-M6</td>
</tr>
</tbody>
</table>

Tilting Center Fixture A

Used to hold machined workpieces.

<table>
<thead>
<tr>
<th>Max. workpiece diameter and length when held level</th>
<th>Center height</th>
<th>Tilting angle</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 66 x 12mm</td>
<td>45mm</td>
<td>10° (in 1° increment)</td>
<td>Approx. 2.2kg</td>
</tr>
</tbody>
</table>

Tilting Center Fixture A configured with goniometer type 2
FOV Measurement with Advanced Digital Imaging Processing Technology

E-Max Series

In combination with Nikon’s digital still camera DS-2Mv, the new E-MAX series provides state-of-the-art image processing technology. Automated edge detection with sub-pixel processing enables more precise and repeatable measurement. Effectively used in combination with a measuring microscope/profile projector, the new E-MAX series provides the user with various advanced measurement and processing functions from two-dimensional data processing and image measurement to data storage.

Finer video images and fast image transfer with Nikon’s original image processing technologies

SVGA (800 x 600) video images transferred directly to PC via USB2.0 can be proceeded for ?????? Automated Video Edge Detection by Nikon’s newly developed image processing algorithm. The new E-MAX DS-V set provides FOV measurement without a dedicated image processing board. Thus, it can even be installed in high performance laptop PCs, greatly saving working-space.

Navigation function

The graphic window displays the next measurement position in brown, preventing errors and allowing speedy measurement (during replay). The current position is displayed in pink.

Chart measurement

Chart measurement can be made easily in the video window.
Larger icons support touch screen operation environment

Larger Icon Mode is selectable for a touch screen operation environment. The mouseless operation enables operators to concentrate on measurements.

Illumination controls and motorized nosepiece, universal epi-illuminator, TTL Laser AF controls

White LED illumination control is possible from E-MAX software. With motorized nosepiece, universal epi-illuminator and/or TTL Laser AF, E-MAX controls magnification switchover, microscopic methods, aperture setting, and Laser AF, etc.

Interactive operation wizards

Depending on measurement requirements, operators can select “Quick Measure,” “Teaching Measure” or “Run Teaching File” mode with wizards.

Functions provided by each set

<table>
<thead>
<tr>
<th>Function</th>
<th>V set</th>
<th>D set</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data processing</td>
<td>✽</td>
<td>✽</td>
</tr>
<tr>
<td>Navigation during replay</td>
<td>✽</td>
<td>✽</td>
</tr>
<tr>
<td>Live video monitoring</td>
<td>✽</td>
<td>-</td>
</tr>
<tr>
<td>Chart measurement</td>
<td>✽</td>
<td>-</td>
</tr>
<tr>
<td>Automated video edge detection</td>
<td>✽</td>
<td>-</td>
</tr>
</tbody>
</table>

Compatible measuring instruments

<table>
<thead>
<tr>
<th>Instruments</th>
<th>V set</th>
<th>D set</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nikon profile projector</td>
<td>✽</td>
<td>✽</td>
</tr>
<tr>
<td>Nikon measuring microscope</td>
<td>✽*</td>
<td>✽</td>
</tr>
</tbody>
</table>

*Trinocular eyepiece tube type, TV eyepiece tube type
Data Processor with improved accuracy and ease of use

DP-E1

New DP-E1 data processor has been developed to improve accuracy and efficiency as a measuring system as a whole. A 0.1µm-reading counter display is built into the compact body. The 320 x 240-pixel LCD greatly improves ease of use. Effectively used in combination with a measuring microscope/profile projector, it realizes quick calculation and processing of measurement data.

Simple & interactive operation

Feature Construction Oriented Operation of the DP-E1 allows the user to conduct measurement by following the graphics, providing a seamless measuring environment when used in combination with the NEXIV VMR/E-MAX series. Measurement results are automatically memorized as teaching steps and can be easily used as a measurement routine.

GD&T compliance

Geometric Dimensioning & Tolerancing defined by the ANSI Y 14.5M Specification is supported. In addition to Location Tolerancing such as True Position, MMC and LMC, determination of Form, Orientation and Runout can be conducted interactively.

Multi-language support

English, German, Japanese and various other Asian and European languages are supported.

Data storage & software upgrades via USB disk

A USB disk can be used for storing measurement results and upgrading new functions.

Digital Printer

DPU-414 (option)

Prints out measurement results.

Control panel
## Accessories

### Cord

### Specifications

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>mm/inch</td>
<td>表示能力 : mm/m, 小数点以下3, 4, 5を選択可能, inch/m, 小数点以下4, 5, 6を選択可能.</td>
</tr>
<tr>
<td>角 度</td>
<td></td>
<td>面相 / Deg / Rad</td>
</tr>
<tr>
<td>キースイッチ</td>
<td>35個</td>
<td></td>
</tr>
<tr>
<td>ファンクションキー</td>
<td>4個</td>
<td></td>
</tr>
<tr>
<td>カウンタ表示器</td>
<td></td>
<td>DPシステム補助によりDPシステムのカウンタ値表示</td>
</tr>
<tr>
<td>外部プリンタ</td>
<td></td>
<td>RS-232C接続により測定結果出力</td>
</tr>
<tr>
<td>外部メモリ</td>
<td></td>
<td>USBモジュール, USBインタフェースを持つFloppyDiskDrive</td>
</tr>
<tr>
<td>液晶画面</td>
<td></td>
<td>Q_VGA(320x240) Monochrome LCD, パックライト色: 背, ノンインターカレ, 画面サイズ: 5.7型</td>
</tr>
<tr>
<td>電源</td>
<td></td>
<td>DC12V(リール300mV以下, 4A以下(専用ACアダプタ使用),リアルタイムクロック用バックアップ電池 CR2032 x2個</td>
</tr>
<tr>
<td>使用環境, 設置環境</td>
<td></td>
<td>使用環境: 温度0~40℃, 湿度70% (但し結露させないこと), 高度2000m以下</td>
</tr>
<tr>
<td>保管環境</td>
<td></td>
<td>温度: 20~60℃, 湿度90% (但し結露させないこと)</td>
</tr>
<tr>
<td>劣化度</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>尺寸(本体)</td>
<td></td>
<td>300( W ) x 99( H, 足を豊んだ状態 ) x 240( D ) mm</td>
</tr>
<tr>
<td>重量</td>
<td></td>
<td>2.5kg</td>
</tr>
</tbody>
</table>

### Retrofit Unit

To use the DP-E1 in combination with the conventional measuring microscope MM-40/60, Profile Projector V-24B, V-12BD and V-12BS, the Retrofit Unit is necessary.
Application Software for Measurement Support/Data Processing System

Custom Fit QC

Direct link to Excel sheet programs—DirecSheet II
For DP-E1, SC-212 and E-Max

Inputting data to inspection sheets manually is not necessary any longer. The Macro Script Program enables you to transfer data from Nikon counters and/or data processors directly to Excel sheets via RS-232C interface. Simple to use, yet greatly enhances productivity.

Note: SPC-PC IV and SPC-PC IV Excel are products of Quality America Inc.

This software enables the quick generation of inspection results sheets in various report forms including user-designed forms. Users can even customize the program for their own easier use by making macro scripts.

Real-time SPC via DDE (Dynamic Data Exchange)

Using a DDE Link function, measured data can be immediately transferred to spreadsheets such as Microsoft Excel®, SPC-PC IV, SPC-PC IV Excel, and others, making real-time SPC analysis possible.

Note: SPC-PC IV and SPC-PC IV Excel are products of Quality America Inc.

Report generating program: VMR Report Generator

Required software: Microsoft Excel 2000/XP
Required memory: 128MB or more
Manufacturer: Pronics Co., Ltd.

Operating environment:
Microsoft Excel 2000/XP
Memory space: 128MB or more

An example of macro scripts written by users: In order to input manually the data measured by other instruments and compile them into a complete report, the macro automatically makes cell blanks and display them in sky blue and a message prompts manual inputs.
Digital Sight DS Fi1-L2 Digital Camera for Microscopes

The all-in-one digital camera for microscopes enables display, measurement, image capture and storage with a simple mouse-click without PC connection.

**Large, high-definition display for immediate microscopic observation**

- Standalone camera control unit DS-L2 has 8.4-inch LCD monitor (XGA)
- DS-Fi1 camera head with 5.0-megapixel CCD provides high frame rate of 12fps and allows smooth focusing on monitor.

**Imaging mode provides optimal photography with single mouse-click**

- Optimal imaging parameters are preset for different sample types and observation methods including brightfield and darkfield to enable fast and easy photography with a single mouse-click.

**Imaging mode for industrial sample**

---

**Objectives 1XA, 3XA, 5XA, 10XA, 20XA, 50XA, 100XA**

These compact objectives feature long working distances and excellent resolution. All have almost the same parfocal distances, come with lens adapter and can be used with MM-400/800 microscopes.

The 3x objective is standard with the microscope.

*Adapter

---

**TV Reticle Adapter**

For measuring on a TV monitor by eye, the TV reticle offers sharp lines displaying reticles as optical images on the TV monitor. It enables measurements on a TV monitor, with identical precision to that through eyepiece lenses, while reducing user eyestrain.

---

**Direct C-mount Adapter**

Used to install a C-mount NTSC CCTV camera on the microscope. To use, replace the straight tube in a binocular tube with this adapter.

Note: LV TV TV tube is required.
## Accessories

### Protractor Eyepieces
(For all measuring microscopes except those with universal illumination.)

**1-Minute Reading Eyepiece**
The viewfield includes crosshairs and 60° lines, and angle indexes are read by appropriate microscopes. The measuring range is 360°.

**10-Minute Reading Eyepiece**
The viewfield includes crosshairs and angle indexes, and when the knurled ring at the lower section of the eyepiece tube is turned, the crosshairs and the vernier both rotate up to 180°.

### Illuminators

#### 8-Segment LED Ring Illuminator CYN-2
As CYN-2 enables flexible illumination from eight directions, it is not necessary to adjust the position of illumination fibers by hand at each measurement and/or observation. An LED light source with brightness control is used for objectives 1xA, 3xA, 5xA and 10xA. The working distance is 60mm.

- Can be used with measuring microscope MM-400/800.
- Can be used with E-max series software.
- The RS-312C cable is standard with the illuminator.

#### Fiber-optics Bifurcated and Ring Illuminators
Since a 15V-150W halogen lamp with reflective mirror is used, a bright light source is obtained and the brightness is adjustable. The ring fiber illuminator produces cone-shaped illumination, minimizing shadows caused by any unevenness on the workpiece surface. The bifurcated fiber enables flexible illumination from two directions.

- Fiber transformer: sequential adjustment of brightness from 7 to 14 volts.
- Cannot be used with metallurgical microscope objectives.

#### 8-Segment LED Ring Illuminator CYN-2
As CYN-2 enables flexible illumination from eight directions, it is not necessary to adjust the position of illumination fibers by hand at each measurement and/or observation. An LED light source with brightness control is used for objectives 1xA, 3xA, 5xA and 10xA. The working distance is 60mm.

- Can be used with measuring microscope MM-400/800.
- Can be used with E-max series software.
- The RS-232C cable is standard with the illuminator.

#### Fluorescent Lamp Illuminator
The ring fluorescent tube provides smooth, uniform illumination without shadows over the entire field. The fluorescent tube has a service life of approximately 2,000 hours and is easy to replace.

- Fluorescent lamp transformer: 120 (W) x 150 (D) x 70 (H)mm
- Cannot be used with metallurgical microscope objectives.
- Cannot be mounted when 20xA, 50xA and 100xA measuring microscope objectives are used.

#### External Illuminator Adapter
Commonly used to mount ring fiber illuminator, fluorescent lamp illuminator and LED ring illuminator.

#### LED Ring Illuminator
A high-luminance type that uses 60 white LEDs, this illuminator is provided with intensity control and features minimum flickers. The LED has a long service life of approximately 20,000 hours.

- LED transformer: 66 (W) x 115 (D) x 55 (H)mm
- Cannot be used with metallurgical microscope objectives.
- Cannot be mounted when 20xA, 50xA and 100xA measuring microscope objectives are used.
Counter
3-Axis/2-Axis Counter
2-axis and 3-axis counters are available. The separate display unit can be mounted on the measuring microscope. Counters can be connected with data processors and digital printers via the RS-232C port.

Remote Switch
Enables reset and SEND remote control of counter.

Digital Printer DPU-414
Prints out counter values once connected to rear control box of measuring microscope MM-400/800.

Foot Switch
Used to send load command to DP-E1 and DPU-414. Frees both hands to enhance measurement efficiency.

Standard 300mm Scale
Gauges stage travel accuracy up to 300mm. Both 10mm-interval sensor patterns and calibrations are provided. Made of low heat-expansion glass, for minimizing heat influence.
Accuracy: Within 1µm against compensation values.

Templates
The following dedicated templates are available to facilitate profile comparison and measurements.
• Standard angle templates (standard equipment)
• No. 1 Metric screw thread; pitch 0.2-2
• No. 4 Involute gear (20º); module 0.2-2
• No. 6 Concentric; diameter 0.2-4.6
Note: Designed for 3x objectives.
Microscopes other than MM-xxxx can use No. 6.
# Measuring Microscope Accessory Compatibility Chart

## Measuring Microscope

<table>
<thead>
<tr>
<th>Model</th>
<th>MM-400/S</th>
<th>MM-400</th>
<th>MM-400</th>
<th>MM-400/L</th>
<th>MM-400/SL</th>
<th>MM-800/S</th>
<th>MM-800</th>
<th>MM-800/SL</th>
<th>MM-800/L</th>
<th>MM-800/LM</th>
<th>MM-800/LM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z-axis Scale</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Stage</td>
<td>4x4</td>
<td>2x2</td>
<td>4x4</td>
<td>6x4</td>
<td>6x6</td>
<td>6x6</td>
<td>6x6</td>
<td>6x6</td>
<td>6x6</td>
<td>6x6</td>
<td>6x6</td>
</tr>
<tr>
<td>Head</td>
<td>Trinocular</td>
<td>Trinocular</td>
<td>Trinocular</td>
<td>Trinocular</td>
<td>FA</td>
<td>Trinocular</td>
<td>Trinocular</td>
<td>Trinocular</td>
<td>Trinocular</td>
<td>FA</td>
<td>Trinocular</td>
</tr>
<tr>
<td>Illuminator</td>
<td>—</td>
<td>—</td>
<td>LED ring</td>
<td>Fiber ring</td>
<td>—</td>
<td>B-Sep. LED ring</td>
<td>B-Sep. LED ring</td>
<td>—</td>
<td>White LED ring</td>
<td>—</td>
<td>B-Sep. LED ring</td>
</tr>
<tr>
<td>Data Processor</td>
<td>No</td>
<td>—</td>
<td>DP-E1</td>
<td>DP-E1</td>
<td>—</td>
<td>E-MAX V</td>
<td>E-MAX V</td>
<td>—</td>
<td>OP-E1</td>
<td>—</td>
<td>E-MAX V</td>
</tr>
</tbody>
</table>

### Standard Eyepiece

- MM eyepiece lens 10x
- MM-LPFW lens 5x

### Optical Head & Eyepiece Tube Lenses

- Trinocular optical head
- Bino. objective lens
- Trinocular optical focus
- Trinocular tube
- Monocular eyepiece tube adapter
- WM protector 10" reading

### Objective

- TM objective lens (x3)
- TM objective lens (x10)
- TM objective lens (x1, x2, x5, x10x)
- Measuring microscope objective adapter

### Stage

- 2x2 stage
- 4x4 stage
- 6x4 stage
- 8x6 stage
- 10x6 stage
- 12x8 stage

### Stage Adapter

- WM stage adapter
- MM800 (8x6 or smaller)
- Rotating table type 3
- Rotating table type 4

### Data Processing & Printer

- Retrofit counter/DP unit
- retrofit digital counter SC2-E1
- Data processor: Bino. DP-E1
- DRO reset switch
- Foot switch 4

### Optional Illuminators

- Standard illuminators
  - LED dia-illuminator
  - LED epi-illuminator
  - Epi illum. PM400000 (manual)
  - LED illuminator
  - MM illuminator for EX II L13R
  - C-1230 fiber illuminator with fiber condenser
  - TRM-200W fiber illuminator

- Optional illuminators
  - B-Sep. LED ring (50V-100V)
  - B-Sep. LED ring (100V-240V)
  - B-Sep. LED ring (100V-240V) with power cable

### Notes

- Measuring microscope
  - LED dia-illuminator
  - LED epi-illuminator
  - Epi illum. PM400000 (manual)
  - LED illuminator
  - MM illuminator for EX II L13R
  - C-1230 fiber illuminator with fiber condenser
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  - B-Sep. LED ring (100V-240V) with power cable
<table>
<thead>
<tr>
<th>Model</th>
<th>MM-400/U</th>
<th>MM-400/LU</th>
<th>MM-400/LMU</th>
<th>MM-800/SU</th>
<th>MM-800/LU</th>
<th>MM-800/SLU</th>
<th>MM-800/LMU</th>
<th>MM-800/LMU</th>
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<tbody>
<tr>
<td>Z-axis scale</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>6x4</td>
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<tr>
<td>Head</td>
<td>F-7B</td>
<td>F-7B</td>
<td>F-13</td>
<td>F-7B</td>
<td>F-13</td>
<td>F-7B</td>
<td>F-13</td>
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<td>F-13</td>
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<td>Data processor</td>
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<td>E-MAX V</td>
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<td>E-MAX V</td>
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<tr>
<td>Microscopy</td>
<td>BF</td>
<td>BD-OC</td>
<td>BD-FL</td>
<td>BD</td>
<td>BD-OC</td>
<td>BD-OC</td>
<td>BD-OC</td>
<td>BD-OC</td>
<td>BD-FL</td>
</tr>
</tbody>
</table>

**Standard eyepieces**
- CF10X
- LF10X
- 1x80 50X

**Optical head & eyepiece tube lens**
- TT2 with reticle
- TI3 with reticle

**Objective**
- U Planfluor 10X
- U PLANFLUOR EPI 5X, 10X, 20X, 50X
- U PLAN FL EPI 100X
- U PLAN BD EPI 5X, 10X, 20X, 50X

**Stage**
- 7x stage
- 9x stage
- 15x stage
- 10x stage

**Stage adapter**
- 9x stage adapter MM800 (8X6 or smaller)

**Digital data processing unit**
- Mirror counter/LF unit
- Two-axis digital counter 1X, 2X-20X
- Three-axis digital counter 1X, 2X-20X
- SC-213 X signal cable
- DRO arm switch
- DRO foot switch
- Digital thermal printer model DP-404
- Printer paper for SC-1000 DPU-414
- 9.9 prs HS-2300, normal cable 30m

**Digital data processing system**
- E-MAX calibration plate, DS-240 color camera head, DS-240 CCD
- LV-113 TV adapter, C-mount adapter

**Standard illuminators**
- LV-N10A USA microscope
- LV-N15 USA microscope
- LV-N15 USA microscope
- LV-N15 USA microscope

**Manual control U-EPILAF system**
- LV-EPILAF
- LV-EPILAF BF, DF, DL
- LV-EPILAF BF, DF, DL

**High power measuring microscope system**
- Rebuilt U-EPILAF driver

**Accessories**
- BF-OC adapter
- BF-FL adapter
- BF-OC adapter
- BF-FL adapter
- BF-OC adapter
- BF-FL adapter
- BF-OC adapter
- BF-FL adapter

Power cable

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**Model MM-400/U MM-400/LU MM-400/LMU MM-800/SU MM-800/LU MM-800/SLU MM-800/LMU MM-800/LMU MM-800/SLU**


**Z-axis scale** No Yes Yes No Yes Yes Yes Yes No

**Controller** Yes Yes Yes No Yes Yes Yes Yes No

**Stage** 4x4 4x4 6x4 8x6 12x8 12x8 12x8 12x8 12x8

**Head** F-7B F-7B F-13 F-13 F-7B F-13 F-7B F-13 F-13


**Data processor** — E-MAX V E-MAX V E-MAX V — E-MAX V E-MAX V — E-MAX V E-MAX V

**Microscopy** BF BD-OC BD-FL BD BD-OC BD-OC BD-OC BD-OC BD-OC

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- BF-OC adapter
- BF-FL adapter

Power cable
Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. July 2006.

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

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