



ryf ag
ryf
 Ryf AG
 Bettlachstrasse 2
 2540 Grenchen
 tel 032 654 21 00
 fax 032 654 21 09
 www.ryfag.ch

TTL Laser AF (Universal Type) is a Class 1 Laser Product

CLASS 1 LASER PRODUCT

LED Episcopic & Diascopic Illuminator is a Class 1 LED Product

CLASS 1 LED PRODUCT

8-segment LED Ring Light CYN-E1 is a Class 2 LED Product

**CAUTION - CLASS 2 LED RADIATION
 DO NOT STARE INTO THE BEAM**

ISO/IEC 17025 Certified

Nikon Corporation Instruments Company has been certified as an ISO/IEC 17025 accredited calibration laboratory for measuring microscopes by the Japan Accreditation Board for Conformity Assessment.
 (ISO/IEC 17025: International standard, which specifies the general requirements to ensure that a laboratory is competent to carry out specific tests and/or calibrations)

Date of accreditation: September 8, 2006
 Scope of accreditation: X/Y-axis indication accuracy of measuring microscopes
 Accredited section: Industrial Instruments CS 1st Engineering Section, Quality Assurance Department, Instruments Company
 Calibration site: Customer's laboratory (On site calibration service)
 An expanded uncertainty using a coverage factor, k=2 (CMC):
 X/Y-axis indication accuracy of measuring microscopes
 Linear scale up to 300mm: $(1.0 + 2.7 \times 10^{-3} \times L) \mu\text{m}$
 Micrometer up to 50mm: 2.0 μm
 (L = Displacement : mm)

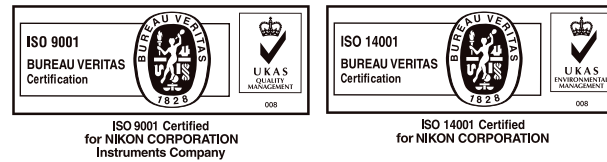


Nikon Measuring Microscopes
MM Series

Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. April 2013 ©2003-13 NIKON CORPORATION

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

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Digital Imaging & Metrology

Next-Generation Measuring Microscopes

MM Series

Nikon is proud to present the MM series of Measuring Microscopes, which incorporate key performance features expected in an advanced next generation measuring microscope:

- Greater Accuracy
- Digital Imaging and Vision Processing Metrology
- Larger Stage for Increased Workpiece Handling
- Non Contact Z-height Measurements
- Coordination with Data Processing Systems



MM-400/LV

MM-800/LMU

- The new Nikon measuring microscope can be equipped with a TTL Laser AF (universal type) and a new Focusing Aid mechanism that provides sharper and more accurate focusing. High precision Z-axis measurement is simpler than ever.
- Digital image capture using a Nikon digital camera and E-Max metrology software allows rapid measurement with precise auto edge detection.
- A fully motorized high power microscopy model is also available for digital imaging.
- By offering many options in illuminators and light sources, an expanded observation range has been achieved. 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 models) simplifies accurate vertical motion through the use of a dedicated controller.
- Added body strength enables the use of larger stages, such as the newly developed PS 12x8C stage, allowing for larger workpieces.
- Ease of operation has been greatly improved by use of various motorized controls and ergonomic design. Even the PS 12x8C stage is easy to manipulate despite its large size.
- Stands with the integrated MM Controller interface and the newly developed DP-E1 Data Processor or SC counters and PC-based E-Max data processing software provide excellent geometric data processing and storage.
- The compact and lightweight MM-200 ensures precise and easy usage, and offers the basic functions of the MM-400/800 series.



MM-200 E-MAX set with 8-Segment LED Ring Light CYN-E1

Function Icons

- AF** **Autofocus (Universal Type)**
TTL Laser AF (Autofocus) enables quick perfect focusing.
- FA** **Focusing Aid**
The Focusing Aid (FA) ensures accurate Z-axis focusing.
- UFA** **Universal Epi-illuminator Focusing Aid**
A universal epi-illuminator with Focusing Aid (FA) mechanism.
- V** **Variable Magnification**
Two objective lenses can be attached, making magnification changeover easy.
- Z** **Z-axis Motorized Motion**
A dedicated controller provides easy and accurate up/down movements.
- 2** **Dual Side Coarse/Fine Focus Knob**
Coarse/fine focus knobs are on both sides.
- L** **Built-in Z-axis Linear Scale**
Z-axis reading is possible for noncontact height measurement.
- T** **Trinocular Optical Head**
Ideal for configuration with photomicrography equipment.
- M** **Monocular Optical Head**
For applications where cost performance is priority.
- U-EPI** **Universal Epi-illuminator**
Supports a wide range of applications.
- LED** **LED Illuminator**
A high-intensity white LED illuminator for brightfield use.
- V** **Video Head**
Video head is available.
- LED** **LED Ring Light**
8-segment LED ring lighting source.
- DUAL** **Dual Knob**
Knob on both sides.

Stellar New Features Enhance Z-axis Measurement Accuracy

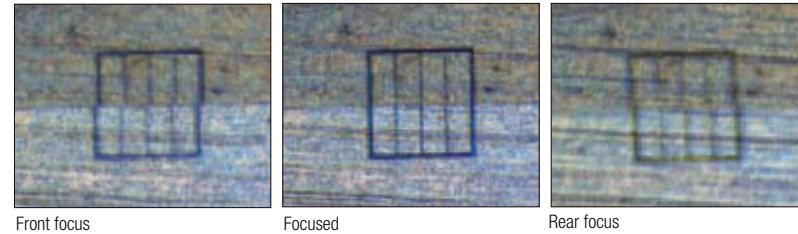
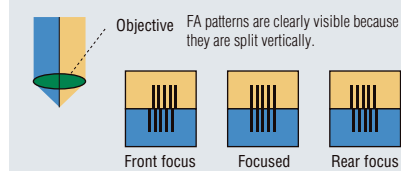
TTL Laser AF (Universal Type)

These are the first measuring microscopes to offer an optional TTL Laser Auto-Focus. This Laser AF system features a 0.5 second focusing speed with a repeatability as high as $0.5\mu\text{m}$ (2θ).

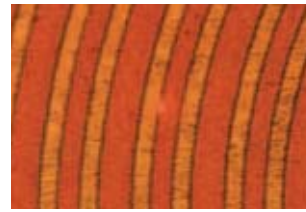
Focusing Aid (FA)

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

Split-prism Focusing Aid (FA) Mechanism



Low reflection surface can be precisely focused, too.



Laser AF Tracking on FPC



Motorized Z-Axis Movement (LM Model Stands)

A motorized vertical movement mechanism with a 10mm/sec. speed has been incorporated. Up/down control is accurately provided with a dedicated controller.

Improved Illuminators Broaden Observation Ranges

A high-intensity white LED illuminator is provided as standard for brightfield use. This illuminator features no bulb replacement 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 has been substantially improved, particularly at high magnifications.

Built-in Continuous Light Control

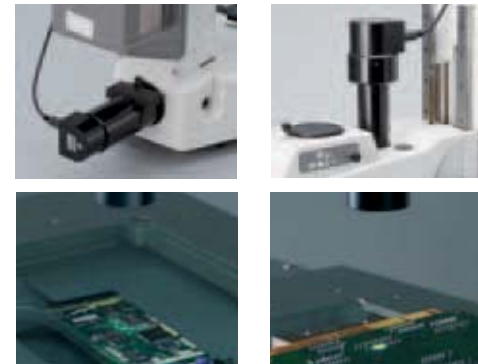
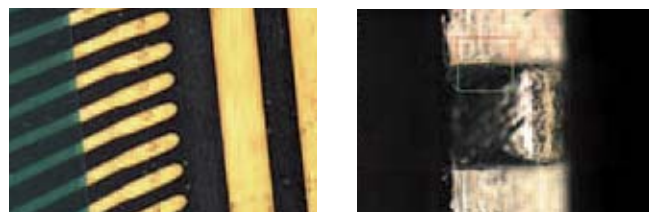
A continuous light control is built into the system, enabling light control from the PC without touching the dial on the main body. Measurements can now be made under the same conditions, assuring precise video edge detection for repeatable measurements.

LED Illuminator

This high-intensity illuminator uses white LED and comes with a quick light intensity control.

8-Segment LED Ring Light CYN-E1

This ring light enables illumination control from eight directions, eliminating the need to pull out and adjust the fiber illuminator each time a measurement is made.



Digital Imaging & Vision Processing

The use of a Nikon microscope digital camera and E-Max software will streamline your workflow from observation and capture, to the storage of high-definition digital images of your workpieces.

MM Controller Backpack Interface

Illumination, X/Y stage and Z data can be connected to the MM Controller as an interface to an external computer running E-Max software for data processing and system control.

New PS 12x8C Stage for Large Workpieces (MM-800 only)

An enhanced body design using Computer Aided Engineering (CAE) for stress analysis enables the mounting of a larger stage to accommodate larger workpieces. A 300 x 200mm (12" x 8") stroke stage can be mounted to the MM-800.

Improved Interface with Data Processor and Software

Interfacing to data processors and PC software has been greatly improved to include comprehensive support throughout the entire measurement process, from image capture and measurements, to analysis and data storage.

Data Processor DP-E1

The DP-E1 Data Processor is compact, yet easy to use. For quick measurements and data processing you can place the read-out display near the eyepiece while the control pad is placed at your fingertips. The DP-E1's seamless interface to a PC platform makes it easy to perform computations and management of your measurement results.

Data Processing Software E-MAX Series

Digital image measuring performance of the E-MAX software 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 Models)

The MM-400S, SL and MM-800S, SL models were created for use with HEIDENHAIN QUADRA-CHEK and other 3rd-party digital read-outs. They offer an economical alternative if non-Nikon data processors are used.

* QUADRA-CHEK is a trademark of HEIDENHAIN.

- Twist roller drive allows smooth changeover of coarse/fine stage movement
- Swivel plate comes as standard for PS 12x8C, PS 10x6B and PS 8x6B.
- The coarse/fine changeover lever and the RESET and SEND buttons are located near the X- and Y-axis knobs



X-axis knob (near buttons)

Y-axis knob (near buttons)

MM-400/800 High-Precision Type (Factory Option)

The MM-400/800 high-precision type provides increased flexibility in choosing modules for system configurations. It enables optimum system configuration according to user needs, and provides excellent reliability during measurements with configurations consisting of a digital camera and/or other accessories.

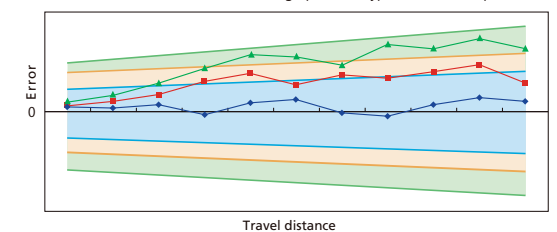
- $1.5+L/100\mu\text{m}$ (high-precision type 2)^{*1*} for PS 8x6B, PS 10x6B, PS 12x8C
- $2.0+L/50\mu\text{m}$ (high-precision type 1)^{*2}
- $2.5+L/50\mu\text{m}$ (standard type, calibration data included)

*1 When using MM400/800 for high precision type2, object lens 10x or higher, vibration isolation table and suitable temperature controlled room are required.

*2 Contact Nikon for details of system configuration.

Combination precision

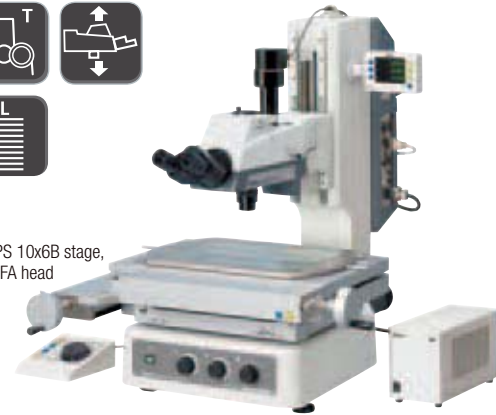
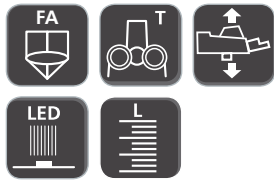
- Standard precision: $(2.5+L/50)\mu\text{m}$
- High-precision type 1: $(2.0+L/50)\mu\text{m}$
- High-precision type 2: $(1.5+L/100)\mu\text{m}$



LM Models 3-Axis and Z-Motorized Model

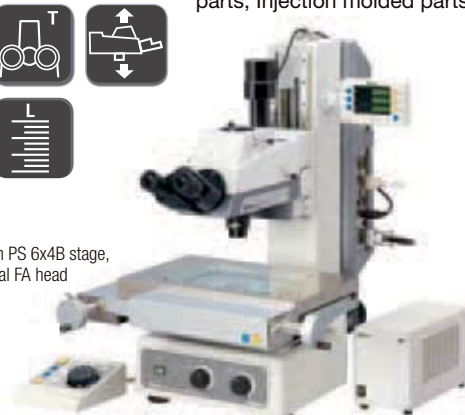
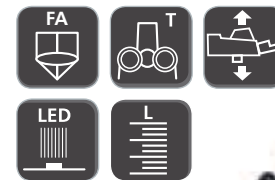
The LM models have a built-in motorized Z-axis scale, enabling accurate 3-axis measurements. In addition, the optional Focusing Aid uses a split prism to ensure Z-axis focusing accuracy and minimize measurement errors caused by the difference in the objective's depth of focus.

MM-800/LM



Configured with PS 10x6B stage, trinocular optical FA head

MM-400/LM



Configured with PS 6x4B stage, trinocular optical FA head

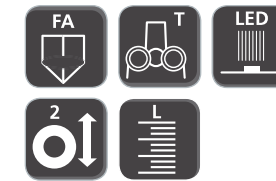
Applications:
Dies & molds, Finely machined parts, Stamped parts, Injection molded parts, Medical devices

L/SL Models 3-Axis Measurement Model

With a built-in Z-axis scale, this type is the basic standard for 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 SL model is recommended for 3rd-party (non-Nikon) digital read-outs and therefore does not include the MM controller that interfaces with the Nikon DRO.

MM-800/L

MM-800/SL with 3rd-party DRO



Plastic Gear Teeth with Smaller Module



Configured with PS 8x6B stage, trinocular optical FA head

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

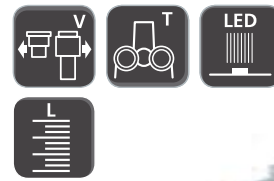
LV/LVFA Models Variable Magnification Models

These models allow two objective lenses (low and high magnification) to be mounted simultaneously, thus making magnification changeover easy. Both low-magnification wide-field-of-view measurement and high-magnification high-precision-height measurement can be performed on a single microscope. Please check specifications before purchasing a variable magnification model.



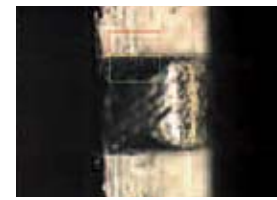
MM-800/LV

MM-400/LV



MM-800/LVFA

MM-400/LVFA



Black Injection Molding Parts - Connector

MM-400/L

MM-400/SL with 3rd-party DRO



Configured with PS 4x4B stage, trinocular optical head

Specifications

Type	MM-800/LM	MM-400/LM	MM-800/LV, MM-800/LVFA	MM-400/LV, MM-400/LVFA
Z-axis movement	Motorized (max. speed: 10mm/sec)		Manual (dual side coarse/fine focus knob)	
MM controller backpack interface	Built-in		—	
Optical head	Monocular optical head, Trinocular optical head, Trinocular optical FA head		Variable magnification optical head, Variable magnification optical FA head	
Z-axis linear scale	Built-in		—	
Eyepiece inclination angle	—		25°	
Eyepiece	CFWN10x (Field No. 20)			
Objective	Measuring microscope objectives			
Objective lens magnification (working distance)	—		1x (79mm), 3x (75mm), 5x (64mm), 10x (48mm), 20x (20mm), 50x (15mm), 100x (4mm)	
Stage	PS 12x8C, PS 10x6B, PS 8x6B	PS 6x4B, PS 4x4B, PS 2x2B	PS 12x8C, PS 10x6B, PS 8x6B, PS 6x4B, PS 4x4B, PS 2x2B	PS 6x4B, PS 4x4B, PS 2x2B
Light source	LED diascopic illuminator (standard), 12V-50W halogen light source (option)*			
Episcopic	LED episcopic illuminator			
Max. workpiece height	200mm	150mm	200mm	150mm
Dimensions (W x D x H)/weight	385 x 785 x 725mm/approx. 72kg	300 x 600 x 638mm/approx. 50kg	380 x 735 x 725mm/approx. 72kg	300 x 600 x 638mm/approx. 50kg

*TI-PS100W power supply is required

Specifications

Type	MM-800/L	MM-800/SL	MM-400/L	MM-400/SL
Z-axis movement	Manual (dual side coarse/fine focus knob)			
MM controller backpack interface	Built-in	—	Built-in	—
Optical head	Monocular optical head, Trinocular optical head, Trinocular optical FA head			
Z-axis linear scale	Built-in			
Eyepiece	CFWN10x (Field No. 20)			
Objective	Measuring microscope objectives			
Stage	PS 12x8C, PS 10x6B, PS 8x6B		PS 6x4B, PS 4x4B, PS 2x2B	
Light source	LED diascopic illuminator (standard), 12V-50W halogen light source (option)*			
Episcopic	LED episcopic illuminator			
Max. workpiece height	200mm		150mm	
Dimensions (W x D x H)/weight	385 x 785 x 725mm/approx. 72kg		300 x 600 x 638mm/approx. 50kg	

*TI-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. To meet your application and budget, various models are available—monocular or trinocular optical heads, plus 12x8 large stage or 2x2 small stage sizes are available. The 400S and 800S models are specifically for use with non-Nikon digital read-outs.

MM-800

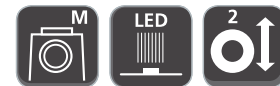


Configured with PS 8x6B stage, trinocular optical head

Applications:

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

MM-400



Configured with PS 2x2B stage, monocular optical head

MM-400/S with 3rd-party DRO



Configured with PS 2x2B stage, trinocular optical head, ND 1200 QUADRA-CHEK

MM-800/S with 3rd-party DRO



Configured with PS 8x6B stage, trinocular optical head, ND 1200 QUADRA-CHEK

Applications:

Stamped parts, Injection molded parts, Medical devices, Drills, Micro tooling, Automotive Components

Specifications

Type	MM-800	MM-800/S	MM-400	MM-400/S
Z-axis movement	Manual (dual side coarse/fine focus knob)			
MM controller backpack interface	Built-in	—	Built-in	—
Optical head	Monocular optical head, Trinocular optical head			
Z-axis linear scale	—			
Eyeiece	Dedicated 10x (Field No. 20)	CFWN10x (Field No. 20)	Dedicated 10x (Field No. 20)	CFWN10x (Field No. 20)
Objective	Measuring microscope objectives			
Stage	PS 12x8C, PS 10x6B, PS 8x6B	PS 12x8C, PS 10x6B, PS 8x6B	PS 6x4B, PS 4x4B, PS 2x2B	PS 6x4B, PS 4x4B, PS 2x2B
Light source	LED diascopic illuminator (standard), 12V-50W halogen light source (option)*			
	LED episcopic illuminator			
Max. workpiece height	200mm	150mm	200mm	150mm
Dimensions (W x D x H)/weight	385 x 785 x 725mm/approx. 72kg	385 x 785 x 725mm/approx. 72kg	300 x 600 x 638mm/approx. 50kg	300 x 600 x 638mm/approx. 50kg

*TI-PS100W power supply is required

MM-200 Compact, light, precise and easy to use measuring microscope for dimensioning and tolerancing

The new Nikon Measuring Microscope MM-200—Uniquely designed for all machining engineers and inspectors

Compact, Space-saving, 40-kg Body

The MM-200 features a space-saving design with a footprint equivalent to an A3-size sheet, or 420 x 297 mm (main body with monocular eyepiece tube). The affordable measuring microscope is now available from Nikon.

Monocular Eyepiece Head / C-mount Video Head

The monocular eyepiece tube model is available for those who prefer to measure with their own eye, while the C-mount video head model provides easy video monitoring.

MM Controller Backpack Interface for Digital Readout and Data Processing

The MM-200 has a backpack control interface unit for XY stage scale readout, illumination control, communication ports to external devices such as PC, digital readout and so on. Simply apply the data processing unit, the DP-E1, to complicated GD & T measurements. The E-MAX DS-V system allows easy-to-use advanced video edge detection technologies. Popular digital readouts such as HEIDENHAIN ND 1200 QUADRA-CHEK are also available.

* QUADRA-CHEK is a trademark of HEIDENHAIN.

White LED Lighting Sources

The built-in episcopic and diascopic light sources are all long-life white LEDs. The optional LED ring lights enhance edge observation through the use of an oblique illumination angle.

Applications

- Small Size Die & Mold
- Drill Bits
- Inserts
- Fine Pitch Connector
- Medical Devices
- Watch Parts
- Gears

Drill Bits



The image was generated by optional EDF/ Stitching Express software

PGA - Insertion Pin



Connector - Housing Inside



Plastic Gear Teeth with Smaller Module



MM-200 with Monocular Eyepiece Tube and DP-E1



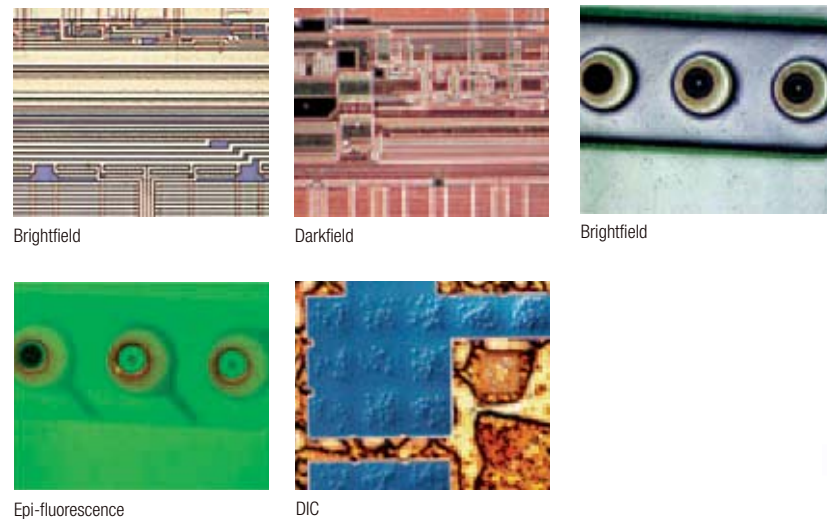
MM-200 with C-mount Video Head and E-MAX DS-V

Specifications

Type	Monocular Eyepiece Tube Type	C-mount Video Head Type
Optical head	MM-200 monocular optical head	C-mount video head for MM-200
XYZ stroke	50 mm x 50 mm x 110 mm	
Stage accuracy	2.5 + L/50 μm (with LEC), 3 + L/50 μm (L = measurement length in mm)	
Scale resolution	0.01/0.1 (default)/1/10 μm	
Max. loading weight	2 kg for guaranteed accuracy, 5 kg for operation	
Magnification accuracy	0.1 %	
Objective lenses (W.D.)	Standard: 3x (75.5 mm), Optional: 1x (79 mm), 5x (64 mm), 10x (48 mm)	
Light sources	Standard: diascopic/episcopic (white LED), Optional: 8-segmented ring light (white LED)	
Dimensions & weight	316 x 455 x 533 (W x D x H), 40 kg	
Input voltage range	100 - 240 V (Max. 1.8 A)	

High Power Microscopic Model with Universal Epi-Illuminator Motorized Z-axis & Microscopic Observation Mode Switchover

These “Universal” models combine a measuring stand with the best of Nikon’s metallurgical microscope components for high resolution imaging and critical measurements. Featuring the full range of Nikon advanced LU objectives and microscopy techniques including: brightfield, darkfield, DIC contrast, polarizing and epi-fluorescence. Up to five objectives may be mounted on the nosepiece. 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, digital field-of-view measurement and data storage.



A Wide Choice of Illuminators

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-U EPI 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 from brightfield to darkfield. When returning to brightfield, the previous field and aperture conditions are automatically restored.

LV-U EPI2 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, field and aperture diaphragms. This minimizes the complexity of operating a measuring microscope, allowing the user to concentrate on the observation.

LV-U EPI2A Motorized Epi-Illuminator

With the LV-U EPI2A, 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-U EPI FA Universal Epi-Illuminator Focusing Aid

This universal epi-illuminator is equipped with an optical split image prism Focusing Aid (FA) mechanism to provide greater accuracy in Z-axis measurements.

LV-EPI LED White LED Illuminator

The LV-EPI LED 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.

Centralized Control for Different Microscopic Observations, Motorized Motions

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 (Auto-Focus)

The MM-400/800 LMU models are the 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).

Universal Motorized Nosepiece

The LV-NU5A universal nosepiece simplifies objective changeovers. Programmed magnification changeover is available via the illumination & FA controller.



Motorized Z-axis Movement

The MM-400/800LM models feature a motorized focusing module, enabling Z-axis movement with a dedicated controller.



High-Intensity White LED Illuminator or 12V-50W Halogen Light Source Selectable



MM-LH50PC precentered lamphouse

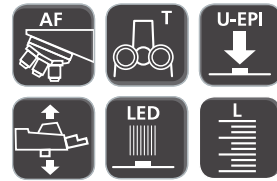
LED illuminator can be used as an episcopic light source, eliminating the need for lamp replacement while providing quick response and very low heat emission. Also, thanks to new optical design, the 12V-50W MM-LH50PC precentered lamphouse provides images brighter than ever before. The low power-consumption halogen light source contributes to the compact design of the microscope while also being friendly to the environment. Defocus induced by heat drift is substantially reduced.



LED illuminator for episcopic light source

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.

MM-800/LMU



Configured with PS 12x8B stage, TTL Laser AF, LV-U EPI2A motorized universal epi-illuminator

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

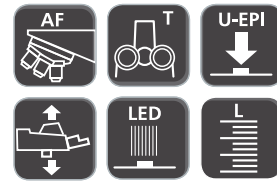


Metallized Patterns of FPC



CCD

MM-400/LMU



Configured with PS 6x4B stage, TTL Laser AF, LV-U EPI2A motorized universal epi-illuminator

Specifications

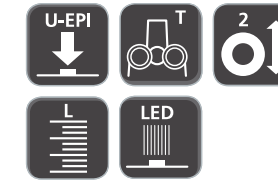
Type	MM-800/LMU	MM-400/LMU
Z-axis movement	Motorized (max. speed: 10mm/sec)	
MM controller backpack interface	Built-in	
Optical head	C-TB binocular tube, LV-T13 trinocular eyepiece tube, LV-TT2 tilting trinocular eyepiece tube (with built-in reticle)	
Z-axis linear scale	Built-in	
Eyepiece	CF110x (Field No. 22), CF110x CM (Field No. 22)	
Objective	CF160-2 TU Plan Fluor EPI series, CF160-2 TU Plan Fluor BD series, CF160 L Plan EPI CR series	
Stage	PS 12x8C, PS 10x6B, PS 8x6B	PS 6x4B, PS 4x4B, PS 2x2B
Light source	Diascopic	LED diascopic illuminator (standard), 12V-50W halogen light source (option)*
	Episcopic	White LED illuminator LV-EPI LED, Motorized universal epi-illuminator LV-U EPI2A*, Universal epi-illuminator LV-U EPI2*, Universal epi-illuminator U-EPI*, Universal epi-illuminator with Focusing Aid LV-U EPI FA
Max. workpiece height	200mm	150mm
Dimensions (W x D x H)/weight	385 x 785 x 725mm/approx. 72kg	300 x 600 x 638mm/approx. 50kg

*TI-PS100W power supply is required

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 images brighter than ever. LSU models are also available for connection to a 3rd-party DRO.

MM-800/LU

MM-800/SLU with 3rd-party DRO



Configured with PS 12x8C stage, LV-U EPI2 universal epi-illuminator, tilting trinocular eyepiece tube with built-in reticle

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



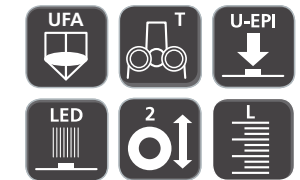
FPD-Cell Process



Color Filter

MM-400/LU

MM-400/SLU with 3rd-party DRO



Configured with PS 6x4B stage, LV-U EPI FA universal epi-illuminator with Focusing Aid

Specifications

Type	MM-800/LU	MM-800/SLU	MM-400/LU	MM-400/SLU
Z-axis movement	Manual (dual side coarse/fine focus knob)			
MM controller backpack interface	Built-in	—	Built-in	—
Optical head	C-TB binocular tube, LV-T13 trinocular eyepiece tube, LV-TT2 tilting trinocular eyepiece tube (with built-in reticle)			
Z-axis linear scale	Built-in			
Eyepiece	CF110x (Field No. 22), CF110x CM (Field No. 22)			
Objective	CF160-2 TU Plan Fluor EPI series, CF160-2 TU Plan Fluor BD series, CF160 L Plan EPI CR series			
Stage	PS 12x8C, PS 10x6B, PS 8x6B	PS 6x4B, PS 4x4B, PS 2x2B	PS 6x4B, PS 4x4B, PS 2x2B	PS 6x4B, PS 4x4B, PS 2x2B
Light source	Diascopic	LED diascopic illuminator (standard), 12V-50W halogen light source (option)*		
	Episcopic	White LED illuminator LV-EPI LED, Motorized universal epi-illuminator LV-U EPI2A*, Universal epi-illuminator LV-U EPI2*, Universal epi-illuminator U-EPI*, Universal epi-illuminator with Focusing Aid LV-U EPI FA		
Max. workpiece height	200mm	150mm	150mm	150mm
Dimensions (W x D x H)/weight	385 x 785 x 725mm/approx. 72kg	300 x 600 x 638mm/approx. 50kg	300 x 600 x 638mm/approx. 50kg	300 x 600 x 638mm/approx. 50kg

*TI-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-800/U

MM-800/SU with 3rd-party DRO



Configured with PS 12x8C stage, LV-U EPI2 universal epi-illuminator, tilting trinocular eyepiece tube with built-in reticle

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



MM-400/U

MM-400/SU with 3rd-party DRO



Configured with PS 6x4B stage, LV-U EPI universal epi-illuminator

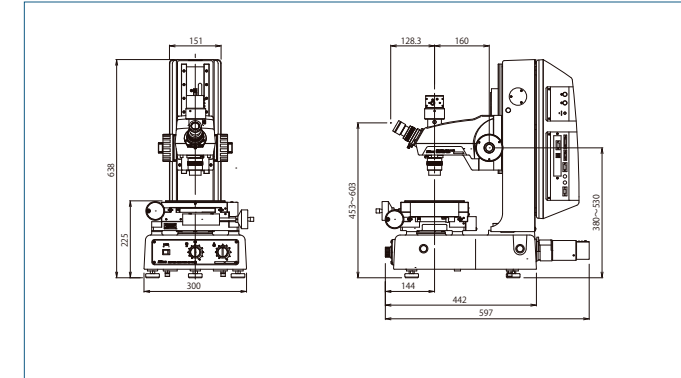


Dimensional Diagram

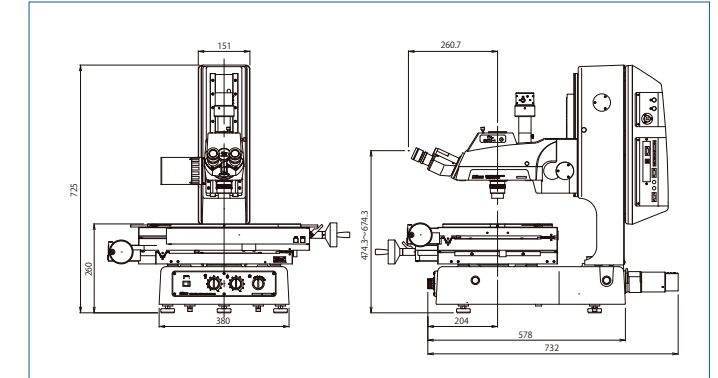
Note: Dimensions will vary, depending on which stage and eyepiece tube are used.

Unit: mm

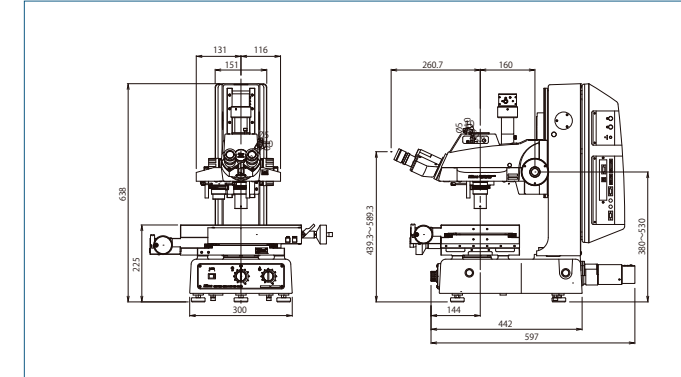
MM-400/M
PS 2x2B Stage



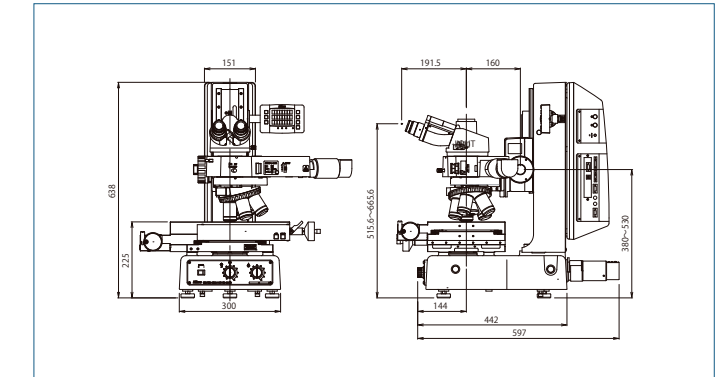
MM-800/LM
PS 12x8C Stage



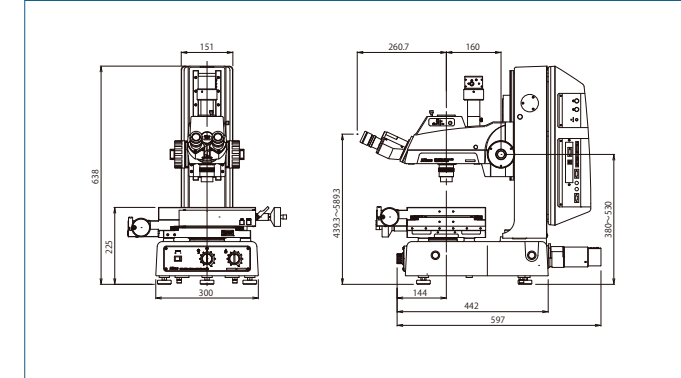
MM-400LV
PS 6x4B Stage



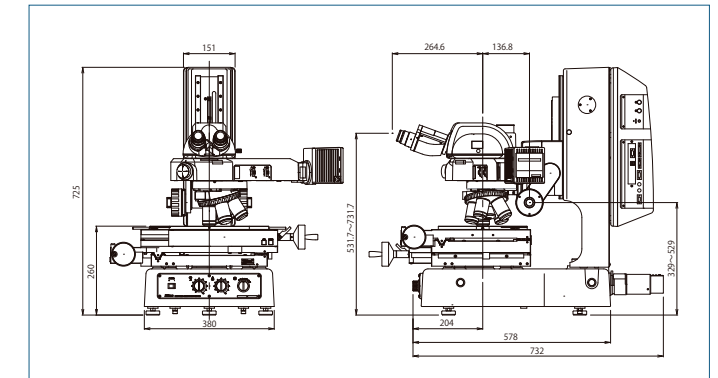
MM-400/LUFA
PS 6x4B Stage



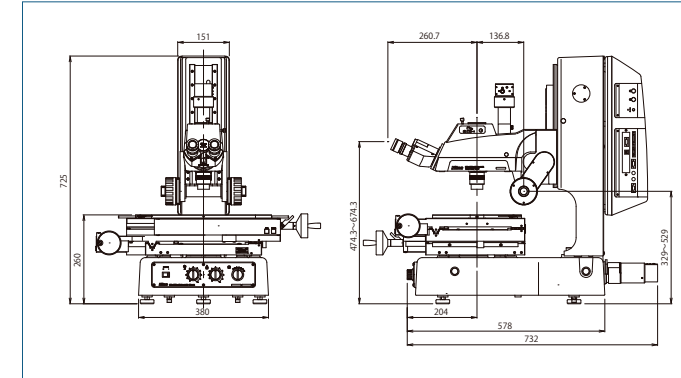
MM-400/L
PS 4x4B Stage



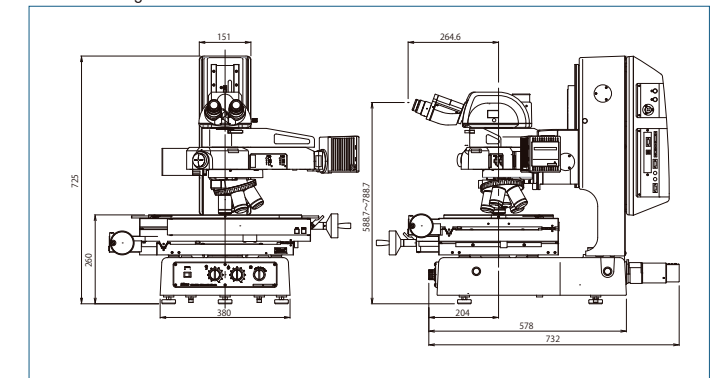
MM-800/LU
PS 8x6B Stage



MM-800/L
PS 10x6B Stage



MM-800/LMU
PS 12x8C Stage



Specifications

Type	MM-800/U	MM-800/SU	MM-400/U	MM-400/SU
Z-axis movement	Manual (dual side coarse/fine focus knob)			
MM controller backpack interface	Built-in	—	Built-in	—
Optical head	C-TB binocular tube, LV-T13 trinocular eyepiece tube, LV-TT2 tilting trinocular eyepiece tube (with built-in reticle)			
Z-axis linear scale	—			
Eyepiece	CF10x (Field No. 22), CF10x CM (Field No. 22)			
Objective	CF160-2 TU Plan Fluor EPI series, CF160-2 TU Plan Fluor BD series, CF160 L Plan EPI CR series			
Stage	PS 12x8C, PS 10x6B, PS 8x6B		PS 6x4B, PS 4x4B, PS 2x2B	
Light source	Diascopic	LED diascopic illuminator (standard), 12V-50W halogen light source (option)*		
	Episcopic	White LED illuminator LV-EPI LED, Motorized universal epi-illuminator LV-U EPI2A*, Universal epi-illuminator LV-U EPI2*, Universal epi-illuminator U-EPI*, Universal epi-illuminator with Focusing Aid LV-U EPI FA		
Max. workpiece height	200mm		150mm	
Dimensions (W x D x H)/weight	385 x 785 x 725mm/approx. 72kg		300 x 600 x 638mm/approx. 50kg	

*TI-PS100W power supply is required

New Series of High-performance Objective Lenses Enhances Optical Performance

Standard objective lens with improved transmission rate for UV wavelength

CFI60-2 TU Plan Fluor Series

The transmission rate in the UV wavelength range has been improved for the new CFI60-2 TU 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.



TU Plan Fluor EPI series

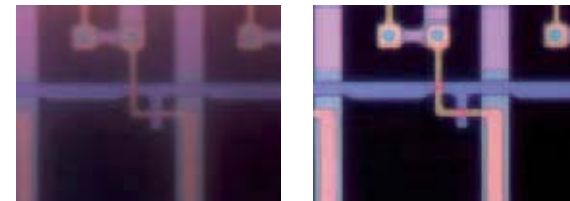
Objective lenses with correction ring

CFI60 L Plan EPI CR Series

The CFI60 series now includes the CFI60 L Plan EPI CR series objectives to cope with the thinner cover-glass used in liquid crystal displays and highly integrated, dense devices. Coverglass correction can be continuously made from 0 mm up to 1.2mm (0-0.7mm and 0.6-1.3mm 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.



L Plan EPI CR series of objective lenses with correction ring



Without correction (50x)

With correction at 0.7mm (50x)

CFI60 Series Objectives

Brightfield

Type	Magnification	NA	W.D. (mm)
CFI L Plan EPI	2.5x	0.075	8.8
T Plan EPI	1x	0.03	4.0
	2.5x	0.075	6.5
TU Plan Fluor EPI	5x	0.15	23.5
	10x	0.30	17.5
	20x	0.45	4.5
	50x	0.80	1.0
TU Plan EPI ELWD	100x	0.90	1.0
	20x	0.40	19.0
T Plan EPI SLWD	50x	0.60	11.0
	100x	0.80	4.5
	10x	0.20	37.0
	20x	0.30	30.0
TU Plan Apo EPI	50x	0.40	22.0
	100x	0.60	10.0
	50x	0.80	2.0
	100x	0.90	2.0
	150x	0.90	1.5

With correction mechanism

Type	Magnification	NA	W.D. (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

Brightfield/Darkfield

Type	Magnification	NA	W.D. (mm)
TU Plan Fluor BD	5x	0.15	18.0
	10x	0.30	15.0
	20x	0.45	4.5
	50x	0.80	1.0
TU Plan BD ELWD	100x	0.90	1.0
	20x	0.40	19.0
	50x	0.60	11.0
TU Plan Apo BD	100x	0.80	4.5
	50x	0.80	2.0
	100x	0.90	2.0
	150x	0.90	1.5

Newly developed tilting trinocular eyepiece tube

LV-TT2 Tilting Trinocular Eyepiece Tube with Built-in Reticule

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 a monitor.



Bracket for illuminators

The newly developed bracket enables the LV-UEPI illuminator to be attached to the left or right side of MM-400/800 series microscopes.



Compatible microscopes

- 2-axis and 3-axis MM-400/800 series

Compatible illuminators

- Epi-illuminator LV-U EPI
- White LED illuminator LV-EPI LED

Selectable nosepieces

Highly Durable Motorized Universal Nosepieces LV-NU5A*/LV-NU5AC*

Two types of motorized universal quintuple nosepieces are available. The LV-NU5A boasts greater durability thanks to a new click mechanism and control system. Programmed magnification change with a controller is possible. The LV-NU5AC comes with a centering mechanism that suppresses image drift during objective changeover.

* Not available for S and SL models



LV-NU5A nosepiece



LV-NU5AC nosepiece

Manual Nosepieces

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



C-N6 nosepiece (brightfield)

L-NBD5 nosepiece (bright/darkfield)

L-NU5 nosepiece (universal)

Motorized Observation Controller*

This controller makes it possible to control the light source, motorized illuminator, nosepiece, Z-movement and TTL Laser AF. When E-MAX software is used, control is also possible through the software's teaching program.

* Not available for S and SL models

Connectable units

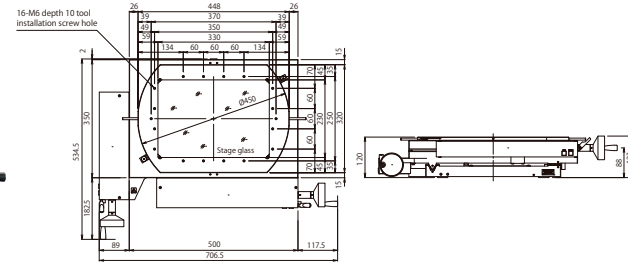
- Motorized universal epi-illuminator LV-U EPI2A
- Halogen lamphouse MM-LH50PC (TI-PS100W power supply is required)
- PC-control type high-intensity mercury fiber light source
- White LED illuminator LV-EPI LED
- Motorized universal nosepiece LV-NU5A, LV-NU5AC (with centering mechanism)
- TTL Laser AF (U-AF)
- Diascopic/episcopic illumination



Stages

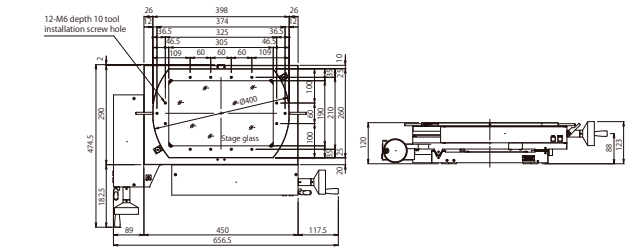
Stages for MM-800 series

PS 12x8C Stage

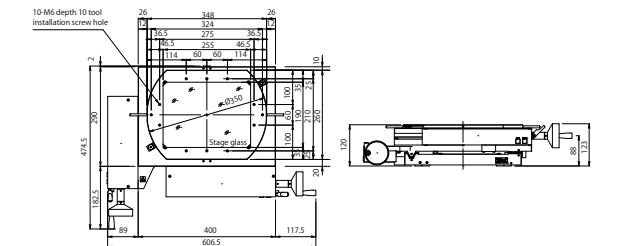


Nikon offers a broad range of stages to choose from including the new PS 12x8C stage. All models boast an outstanding accuracy of 2.5+L/50µm (L=measurement length). An optional high accuracy type (1.5+L/100µm) is also available.

PS 10x6B Stage

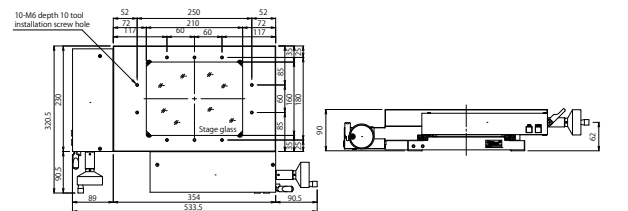


PS 8x6B Stage

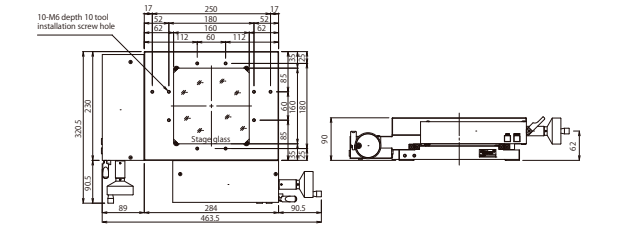


Stages for MM-400 series

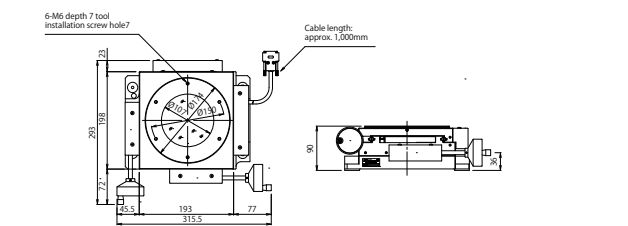
PS 6x4B Stage



PS 4x4B Stage



PS 2x2B Stage



Stage specifications

Type	Surface area (mm)	Stage glass dimensions (mm)	Stroke (mm)	Reading method	Min. reading (mm)	Swivel plate rotation range	Tool installation screw hall	Loading capacity (kg)	Weight (kg)
PS 12x8C	448 x 320	330 x 230	300 x 200	Linear encoder	0.0001	±3°	16-M6 depth 10	20	Approx. 67
PS 10x6B	398 x 260	305 x 190	250 x 150				12-M6 depth 10		Approx. 52
PS 8x6B	348 x 260	255 x 190	200 x 150				10-M6 depth 10		Approx. 49
PS 6x4B	350 x 230	210 x 160	150 x 100			—	15	8-M6 depth 10	Approx. 27.5
PS 4x4B	284 x 230	160 x 160	100 x 100					8-M6 depth 10	Approx. 23.5
PS 2x2B	ø174	ø107	50 x 50			360°	6-M6 depth 7	5	Approx. 15.5

Stage Accessories

Stage Adapter

This adapter is used to mount PS 6x4B, PS 4x4B, or PS 2x2B stage to the MM-800.



For MM-800

Rotating Tables

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

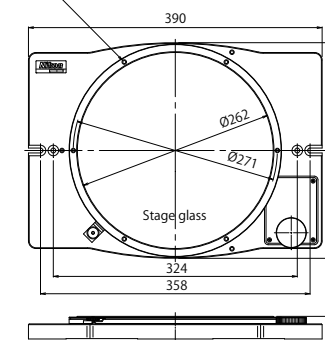
Rotating Table Type 4
For PS 12x8C*, PS 10x6B, PS 8x6B



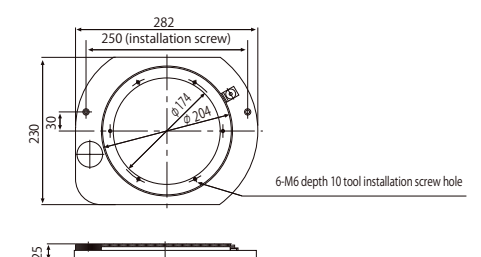
Rotating Table Type 3
For PS 6x4B, PS 4x4B



Tool installation screw holes (6-M6 depth 9) are located at six equidistant positions around the circumference.



*When using rotating table type 4, stage stroke is limited in X and Y axis. Please ask Nikon for detail.



Rotating table specifications

	Table size	Glass insert size	Rotation range	Tool installation screw hole	Weight
Rotating table type 4	ø282mm	ø262mm	360° (uncalibrated)	6-M6 depth 9	Approx. 8kg
Rotating table type 3	ø204mm	ø165mm	360° (uncalibrated)	6-M6 depth 10	Approx. 5kg

Large Stage Adjustment Knob

Enables fine adjustment of swivel plate rotation for PS 12x8C, PS 10x6B and PS 8x6B.



Tilting Center Fixture A

Used to hold machined workpieces.
For MM-200, PS 6x4B*, PS 4x4B* and PS 2x2B

* Rotating Table Type 3 is required for PS 6x4B and PS 4x4B.



	Max. workpiece diameter and length when held level	Center height	Tilting angle	Weight
A	ø68 x 120mm	45mm	10° (in 1° increment)	Approx. 2.2kg

FOV Measurement with Advanced Digital Image Processing Technology

Data Processing Software E-Max Series

In combination with Nikon's industrial digital camera DS-Vi1, the new E-MAX series software provides state-of-the-art image processing technology. Automated edge detection with sub-pixel processing enables more precise and repeatable measurement. Effectively used in conjunction with a measuring microscope/profile projector, the new E-MAX series software provides the user with various advanced measurements and processing functions, ranging from two-dimensional data processing and image measurements, to data storage.

Finer video images and fast image transfer with Nikon's innovative image processing technologies

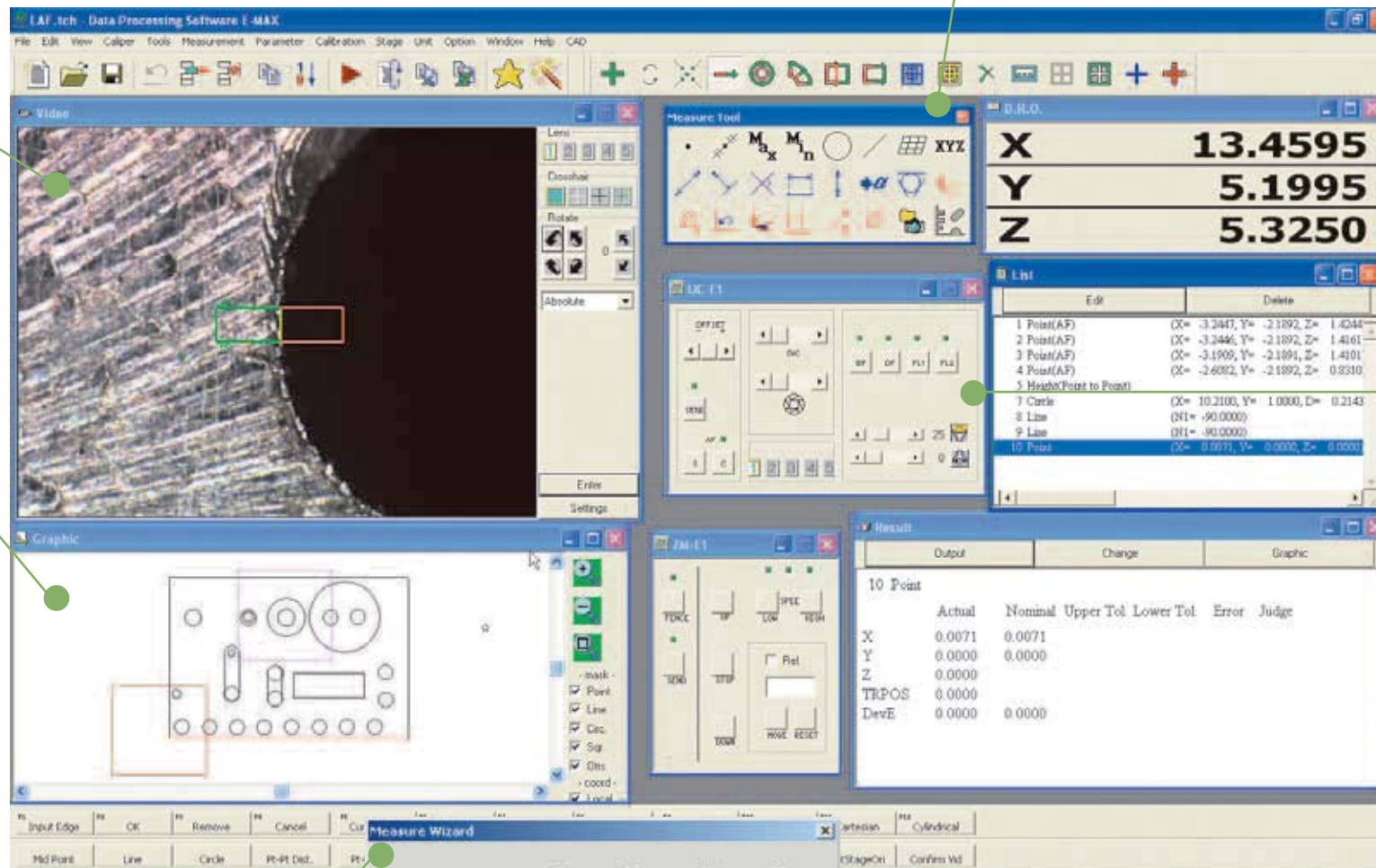
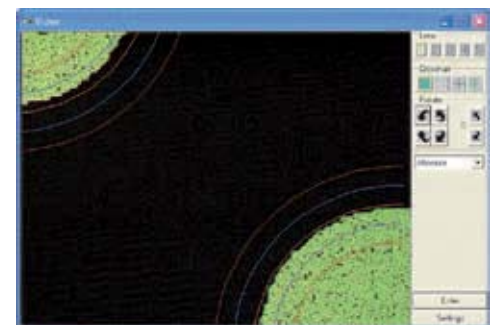
The new E-MAX DS-V software provides FOV (field-of-view) measurements without a dedicated image processing board. This allows the software to be installed in high performance PCs. SVGA (800 x 600) images from the digital camera can be captured via IEEE1394b at very fast frame rates and can be processed and measured using Nikon's latest Automated Video Edge Detection and measuring algorithms.

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.

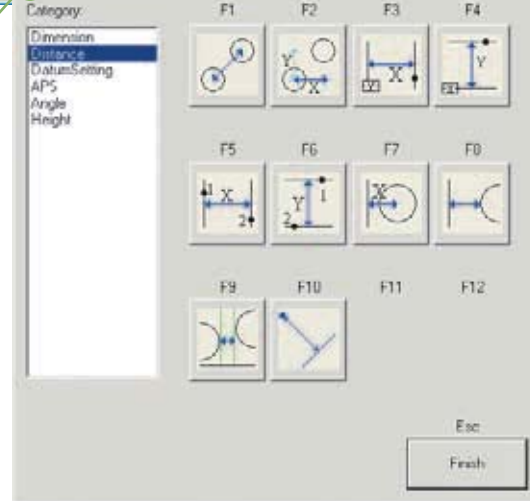
Chart measurement

A Chart with nominal shapes and tolerance lines can be generated from CAD data. It can be superimposed on the actual video image for easy and quick pass/fail judgments.



Interactive operation wizards

Depending on measurement requirements, operators can select "Quick Measure," "Teaching Measure" or "Run Teaching File" modes, with wizards.



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, motorized nosepiece, universal epi-illuminator, and 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, Laser AF, etc.

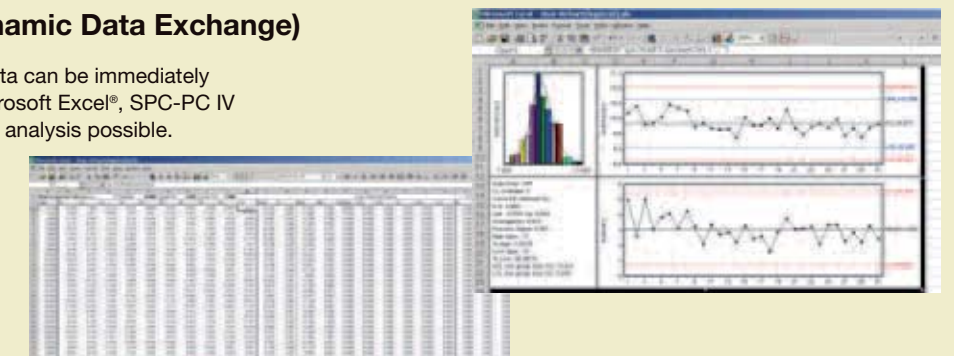
Functions provided by each set

	DS-V set	D set
Data processing	✓	✓
Navigation during replay	✓	✓
Live video monitoring	✓	-
Chart measurement	✓	-
Automated video edge detection	✓	-

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 Excel, and others, making real-time SPC analysis possible.

Note: SPC-PC IV Excel is a Quality America Inc. product.



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. 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 quickly calculates and processes measurement data.

Simple & interactive operation

Feature Oriented Operation of the DP-E1 allows the user to conduct measurements by following the graphics, providing a seamless measuring environment when used in combination with the NEXIV VMR/E-MAX series software. 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.

Control panel



Code

Measure code key	Macro code key	Display setting key
[Basic feature elements] • Point Calculates entered measurement point, or average point from multiple points.	M1 • Macro key Registers combination of measurement codes for macro keys (M1 to M4).	DISP. • Disp. key Switches display settings.
• Line Calculates line from two entered measurement points or from multiple points by least-square method.	MACRO • Macro setup key Registers combination of measurement codes for macro keys (M1 to M4).	LOAD • Load key Enters measurement points.
• Circle/arc Calculates circle from three entered measurement points or from multiple points by least-square method.	RUN • Run key Runs teaching file.	EXT1 • Ext1 key Sets up print out of standard deviation.
• Rectangle Calculates square from entered five measurement points.	REPEAT • Repeat key Sets up repetition number of teaching file.	EXT2 • Ext2 key Reserved.
[Constructed elements] • Mid-point Calculates middle point from two measured points.	PRINT • Print key Conducts print output at discretionary timing during teaching.	OTHERS • Others key Reserved.
• Pitch Calculates pitch between multiple measured points.	FILE • File key Shows menu to access file for file controls.	F1 • Function key Performance differs depending on displayed screen and item.
• Mid-line Calculates middle line from two measured lines.	INSERT • Insert key Inserts measurement codes between list items.	
• Distance Calculates distance between two measured points.	DELETE • Delete key Deletes measurement code and entered measurement point. Deletes file during file control.	
• Intersection Calculates intersection point from two measured lines. Calculates intersection point from measured point and line. Calculates intersection point from two measured circles.		
• Tangent Calculates tangent point from measured point and circle. Calculates circle to contact two measured lines. Calculates circle to contact three measured lines.		
[Coordinate systems] • Set origin (datum) Sets up origin of local coordinate system.		
• Set axis (datum) Sets up axis of local coordinate system.		
• Displacement Sets up move, rotation and reversion of local coordinate system.		

Application Software for Measurement Support/Data Processing System

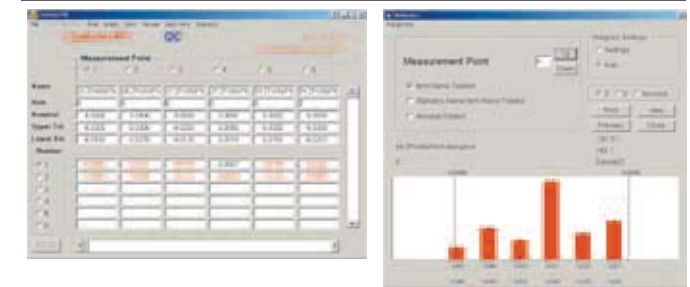
Metrology Software U-DP

Nikon Metrology Software U-DP is browser-based geometric dimensioning software. It can be effortlessly connected to desktop PCs, laptops or PDAs via Ethernet or even WiFi through a Web browser such as Safari, Internet Explorer or Firefox.



Interactive navigation enables immediate operation. Simple screen layout enables easy measurement result confirmation.

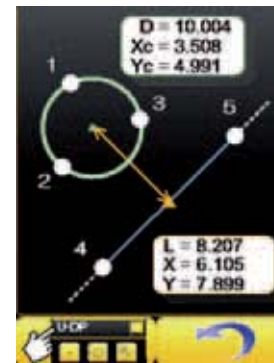
Custom Fit QC: Report and chart generating program



Suitable for lot control of inspection data such as maximum value, minimum value, range, standard deviation and process capability index.

- In addition to 10 standard inspection result sheet forms, it is possible to customize original forms.
- BMP and JPEG files can be pasted onto the inspection result sheet.
- Automatic generation of graph and changeable degree/minute/second display.
- Easy to generate histograms, X-R control charts and scatter diagrams.

Operating environment: Windows®XP, Windows®7
 Microsoft Excel 2003/2007/2010 or later
 Required memory: 512MB (min)
 Codevelopment: Aria Co., Ltd.



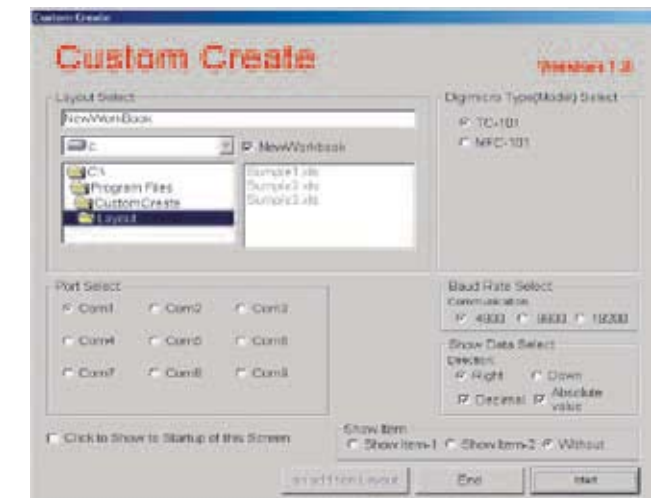
Measuring of circle center to line distance

Operating environment: Windows®XP, Windows®7
 Required memory: 2GB (min)
 Recommended browsers: Windows® Internet Explorer ver. 6.0.29 or later

Custom Create: Direct link to Excel sheet programs

Measurement data from counters and/or data processors can be transferred directly to Excel sheets.

- Usable measuring instruments: MM-400/800 series, DP-E1, V-20B, V-12B
- Allows data transfer to customized inspection-result sheet form
- Three standard inspection-result sheet forms are available
- Transfer from multiple worksheets allows for more efficient measurements



Operating environment: Windows®XP, Windows®7
 Microsoft Excel 2003/2007/2010 or later
 Required memory: 512MB (min)
 Codevelopment: Aria Co., Ltd.

Retrofit Unit

To use the DP-E1 data processor with Measuring Microscope models MM-40/60 or Profile Projector models, V-24B, V-12B, or V-12BS, a Retrofit Unit is required as an interface.



Digital Camera for Microscopes Digital Sight DS Vi1-L3

The all-in-one digital camera for microscopes enables display, measurement, image capture and storage with a simple touch of the finger or stylus. No PC connection is necessary.

Large, high-definition display for immediate microscopic observation

- Stand-alone camera control unit DS-L3 has 8.4-inch LCD monitor (XGA)
- DS-Vi1 camera head with 5.0-megapixel CCD provides high frame rate of 12fps and allows smooth focusing on monitor.

Scene mode provides optimal photography with ease

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



Wafer IC-chip Metal Ceramic Board FPD



DS-Vi1-L3 configured with MM-800/LM

Various measuring tools are available

- Scale and grid line display, two-point distance measurement, and other measuring tools are available as standard.
- Convenient tools such as text input, line and graphic drawing, and super-impose are supported.
- Measurement results can be stored as CSV file for easy report generation with other PC software.

Objectives 1x, 3x, 5x, 10x, 20x, 50x, 100x

These compact objectives feature long working distances and excellent resolution. All have almost the same parfocal distances, come with lens adapter for quick and easy replacement.

The 3x objective is standard with the microscope.



Magnification	1x	3x	5x	10x	20x	50x	100x
W.D. (mm)	79	75	64	49	20	15	4

TV Reticle Adapter

To reduce user eyestrain, a Video CCTV camera can be used to make measurements on a monitor with the use of a TV reticle. The TV reticle will project sharp lines onto the monitor enabling measurements to be made. The accuracy of the reticles projected onto the monitor is the same as those seen through the eyepiece.

Direct C-mount Adapter

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

Note: LV-TV tube is required.

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

Note: Monocular adapter (standard equipment) is required when using these eyepieces with trinocular tubes.

Digital Protractor Eyepiece*

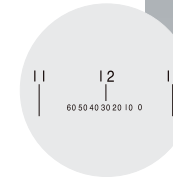
Rotate the crosshairs in the viewfield to measure the angle.
Display unit: 1 minute, 10 minutes

* Not available for S and SL models



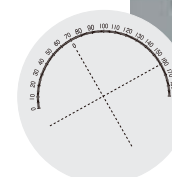
1-Minute Reading Eyepiece

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 Light CYN-E1

The CYN-E1 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.

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.
An E-BUS cable is required to control the illuminator with E-MAX.



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 20x, 50x and 100x measuring microscope objectives are used.



MM Adapter for External Illuminator (except 8-Segment LED Ring Light CYN-E1)

This adapter mounts standard Stereo Microscope Ring Illuminators onto the MM-400/800 stands with TM objectives. May be used to mount Fiber Optic Ring, fluorescent lamp ring and LED ring illuminators.



Fiber-optics Bifurcated and Ring Illuminators

As an LED illuminator 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.

Cannot be used with metallurgical microscope objectives.
Cannot be mounted when 20x, 50x and 100x measuring microscope objectives are used.



LED Ring Illuminator

This illuminator uses 60 high output white LEDs with a variable intensity control and constant color temperature. The LEDs have a very long service life making them ideal for a production environment as there are no bulbs to change.

Cannot be used with metallurgical microscope objectives.
Cannot be mounted when 20x, 50x and 100x measuring microscope objectives are used.



Counters

3-Axis/2-Axis Counters

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.



3-axis counter



2-axis counter

Digital Thermal Printers DPU-414/TSP651-24

Print out counter values once connected to rear control box of measuring microscope MM-400/800.



DPU-414

TSP651-24

Standard 300mm Scale

This scale is used to calibrate measuring stage travel up to 300mm. Both 10mm-interval sensor patterns and calibrations are provided. It is made of low expansion glass to minimize thermal error.

Accuracy: Within 1µm against compensation values.



Vibration Isolation Table

Provides a stable, even surface by reducing floor vibrations. It is compatible with measuring microscopes, data processing systems, external light modulators and computers.

	MM-400/800
Installation part	450 (W) x 689 (D) mm
Dimensions	1058 (W) x 689 (D) x 751 (H) mm



XY Reset Switch

An XY reset switch can be attached to the microscope body so that coordinates can be easily reset while stage is in operation.



Y-axis

X-axis

Remote Switch

Enables reset and SEND remote control of counter.



Foot Switch

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



Templates

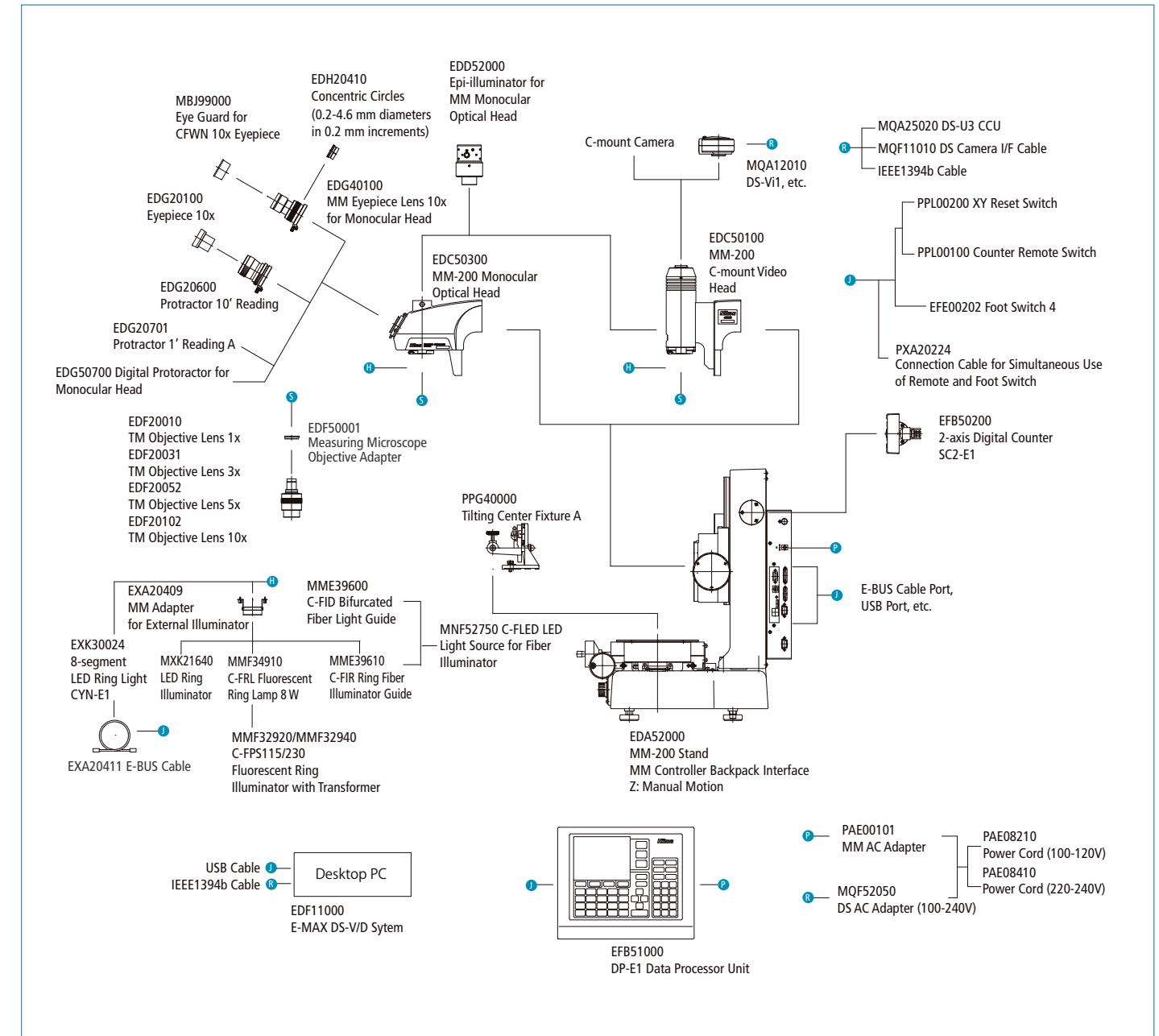
The following dedicated templates are available to facilitate profile comparison and measurements.

- Standard angle templates (standard equipment)
- Concentric; diameter 0.2-4.6*

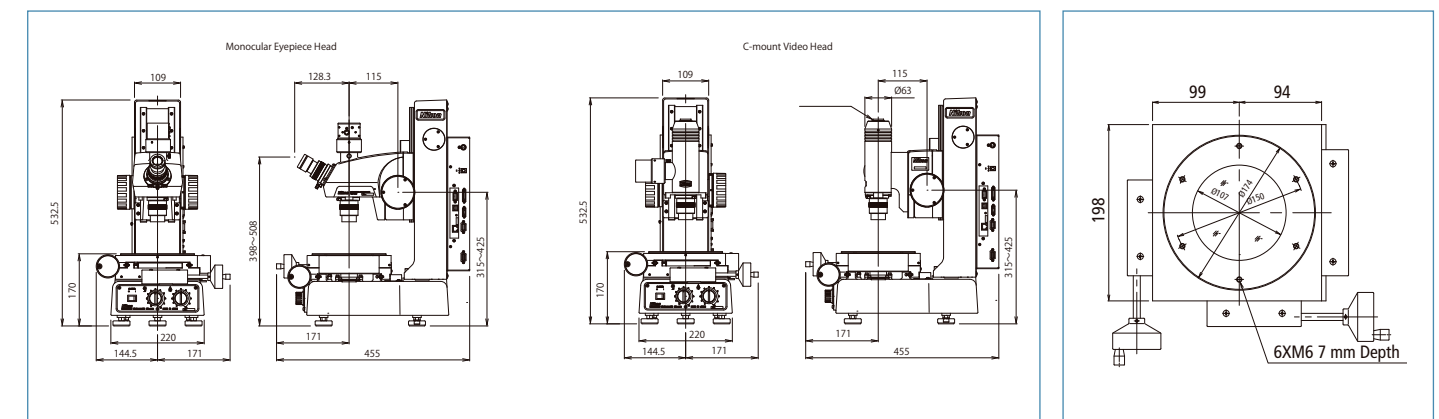
Note: Designed for 3x objectives.

*Cannot be attached to monocular type

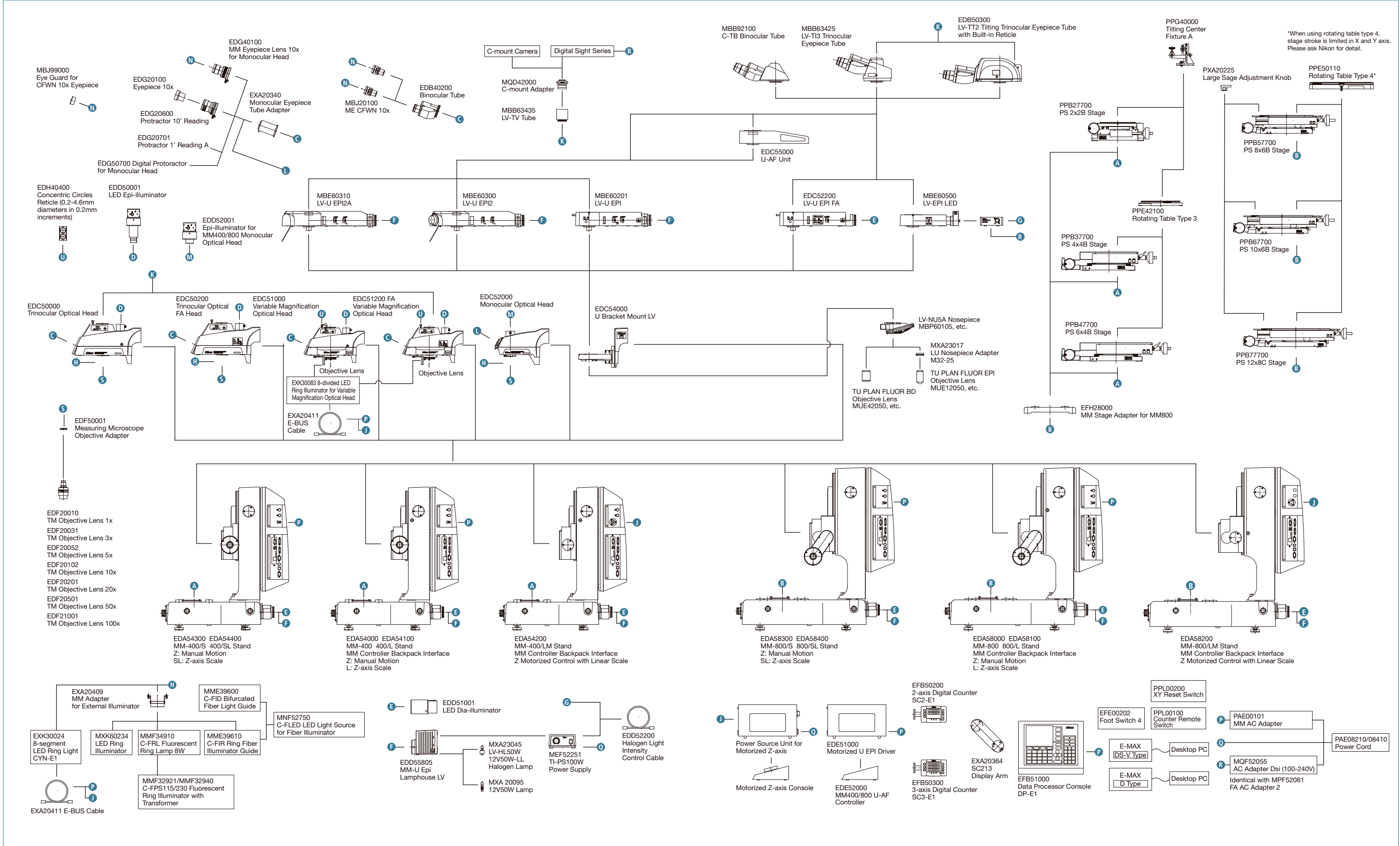
MM-200 System Diagram



MM-200 Dimensional Diagram



MM-400/800 System Diagram



Measuring Microscope MM-400/800 Suggested Configuration Chart

Measuring microscope

Model		MM-400/S	MM-400	MM-400/L	MM-400/SL	MM-400/LM	MM-800/S	MM-800	MM-800/SL	MM-800/L	MM-800/LM
Z-axis Motion	Manual					Motorized					
	Yes					Yes					
Z-axis Scale	Manual										
	Yes										
MM Controller Backpack Interface	Manual										
	Yes										
Stage	PS 4x4B										
	Yes										
Head	PS 2x2B										
	Yes										
Illuminator	PS 6x4B										
	Yes										
Data Processor	PS 6x4B										
	Yes										
Trinocular	PS 8x6B										
	Yes										
FA	PS 10x6B										
	Yes										
Trinocular	PS 10x6B										
	Yes										
8-seg. LED Ring	PS 12x8C										
	Yes										
8-seg. LED Ring	PS 12x8C										
	Yes										
Order		3rd Party	-	DP-E1	3rd Party	E-MAX DS-V	3rd Party	DP-E1	3rd Party	E-MAX DS-V	E-MAX DS-V

*With the combination of MM firmware Ver. 1.09.08 and E-MAX software Ver. 5.20 or later, 2-axis Digital Counter SC2-E1 and 3-axis Digital Counter SC2-E3 are not always required. E-MAX Software Ver. 5.20 or later supports DRO reset and MM settings.
** Some desktop PCs may be able to supply bus power to the DS-U3 via the IEEE1394b cable without the AC adapter Dsi. However, this should be verified beforehand.

High power measuring microscope

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 Motion	Manual										
	Yes										
Z-axis Scale	Manual										
	Yes										
MM Controller Backpack Interface	Manual										
	Yes										
Stage	PS 4x4B										
	Yes										
Head	PS 4x4B										
	Yes										
Illuminator	PS 6x4B										
	Yes										
Data Processor	PS 8x6B										
	Yes										
BF	PS 10x6B										
	Yes										
8-seg. LED Ring	PS 12x8C										
	Yes										
8-seg. LED Ring	PS 12x8C										
	Yes										
Order		BF	BD-DIC	BD-DIC-FL	BF	BD-DIC	BD	BD-DIC	BD	BD-DIC-FL	BF