



# Measuring Microscopes MM-Series



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## Nikon Measuring Microscopes

# MM Series

**Innovative measuring microscopes designed for industrial measurement and image analysis.**

- Greater accuracy
- Digital imaging and vision processing metrology
- Stage sizes to handle larger stages for increased sample handling
- Non-contact Z-height measurements
- Coordination with data processing systems



Focused on high-precision and easy operability, a wide range of MM products are available.



Stage Size/ Loading Capacity	50×50 mm / 5 kg	✓	✓	✓
	100×100 mm / 15 kg	✓	✓	—
	150×100 mm / 15 kg	✓	✓	—
	200×150 mm / 20 kg	—	✓	—
	250×150 mm / 20 kg	—	✓	—
	300×200 mm / 20 kg	—	✓	—
Maximum Sample Height		150 mm	200 mm	110 mm
Optical Head	Monocular	✓	—	✓
	Binocular	✓	✓	—
X-Y-Z	2-axis	✓	✓	✓
	3-axis	✓	✓	—
CCD		✓	✓	✓*
Obj. Magnification		1×/3×/5×/10×/20×/50×/100×		1×/3×/5×/10×

\*For C-mount video head only  
✓: Available / —: Not available

### MM Type

With Nikon's optical technology stages, high-precision measurement can be achieved.



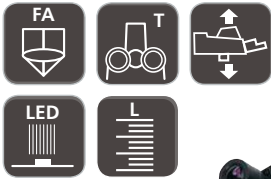
### Universal Type

Offers a lineup compatible with dimensional measurement and various observation methods.



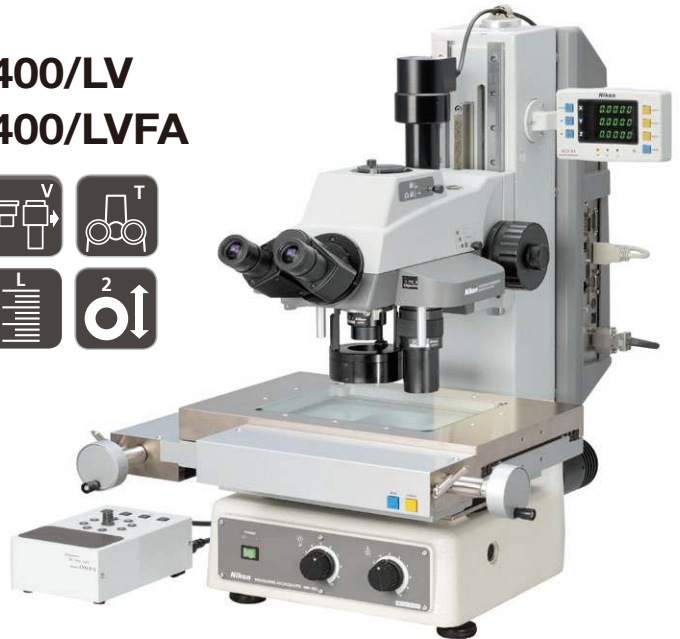
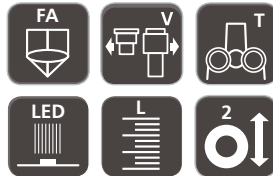
# MM-400 Series MM-Type

## MM-400/LM



Configured with PS 6x4B stage, trinocular optical FA head

## MM-400/LV MM-400/LVFA



### Function Icons



#### Focusing Aid

The Focusing Aid (FA) ensures accurate Z-axis focusing.



#### Universal Epi-illuminator Focusing Aid

A universal epi-illuminator with Focusing Aid (FA) mechanism.



#### Built-in Z-axis Linear Scale

Z-axis reading is possible for non-contact height measurement.



#### Trinocular Optical Head

Ideal for configuration with photomicrography equipment.



#### Monocular Optical Head

For applications where cost performance is priority.

## MM-400/L MM-400/SL



Configured with PS 4x4B stage,  
trinocular optical head

## MM-400



Configured with PS 2x2B stage,  
monocular optical head

## MM-400/S



Configured with PS 2x2B stage,  
trinocular optical head



### Variable Magnification

Two objective lenses can be attached, making magnification changeover easy.



### Z-axis Motorized Motion

A dedicated controller provides easy and accurate up/down movements.



### Dual Side Coarse/Fine Focus Knob

Coarse/fine focus knobs are on both sides.



### Universal Epi-illuminator

Supports a wide range of applications.

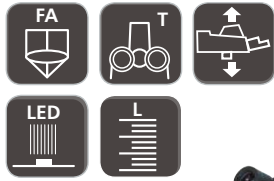


### LED Illuminator

A high-intensity white LED illuminator for brightfield use.

# MM-800 Series MM-Type

## MM-800/LM



Configured with PS 10x6B stage, trinocular optical FA head

## MM-800/LV MM-800/LVFA



### Function Icons



#### Focusing Aid

The Focusing Aid (FA) ensures accurate Z-axis focusing.



#### Universal Epi-illuminator Focusing Aid

A universal epi-illuminator with Focusing Aid (FA) mechanism.



#### Built-in Z-axis Linear Scale

Z-axis reading is possible for non-contact height measurement.



#### Trinocular Optical Head

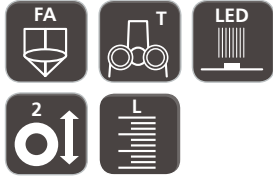
Ideal for configuration with photomicrography equipment.



#### Monocular Optical Head

For applications where cost performance is priority.

## MM-800/L MM-800/SL



Configured with PS 8x6B stage,  
trinocular optical FA head

## MM-800



Configured with PS 8x6B stage,  
trinocular optical head

## MM-800/S



Configured with PS 8x6B stage,  
trinocular optical head



### Variable Magnification

Two objective lenses can be attached, making magnification changeover easy.



### Z-axis Motorized Motion

A dedicated controller provides easy and accurate up/down movements.



### Dual Side Coarse/Fine Focus Knob

Coarse/fine focus knobs are on both sides.



### Universal Epi-illuminator

Supports a wide range of applications.

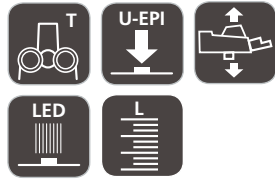


### LED Illuminator

A high-intensity white LED illuminator for brightfield use.

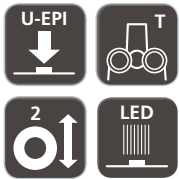
# MM-400/800 Series U-Type

## MM-400/LMU MM-800/LMU



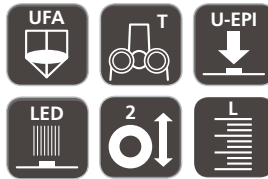
Configured with PS 12x8B stage,  
LV-U EPI2 universal epi-illuminator

## MM-400/U MM-400/SU MM-800/U MM-800/SU



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

## MM-400/LU MM-400/SLU MM-800/LU MM-800/SLU



### Function Icons



#### Focusing Aid

The Focusing Aid (FA) ensures accurate Z-axis focusing.



#### Universal Epi-illuminator Focusing Aid

A universal epi-illuminator with Focusing Aid (FA) mechanism.



#### Built-in Z-axis Linear Scale

Z-axis reading is possible for non-contact height measurement.



#### Trinocular Optical Head

Ideal for configuration with photomicrography equipment.



#### Monocular Optical Head

For applications where cost performance is priority.



# MM Series High-Precision Type

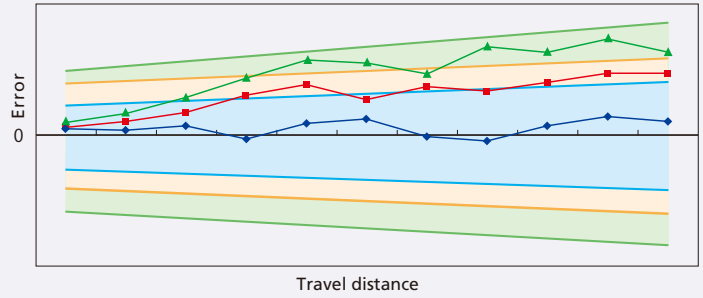
Nikon offers high-precision type measuring microscopes for customers who need higher precision. Type 1 is calibrated by a certified engineer for customer site. Type 2 (available only for MM-800) is calibrated with high-precision stage at Nikon factory before shipment.

Accuracy (with MM main body)	Stage
• $1.5+L/100 \mu\text{m}$ (Type 2)*1*2	PS 12x8C, PS 10x6B, PS 8x6B
• $2.0+L/50 \mu\text{m}$ (Type 1)*2 • $2.5+L/50 \mu\text{m}$ (Standard Type; calibration data included)	PS 12x8C, PS 10x6B, PS 8x6B, PS 6x4B, PS 4x4B, PS 2x2B

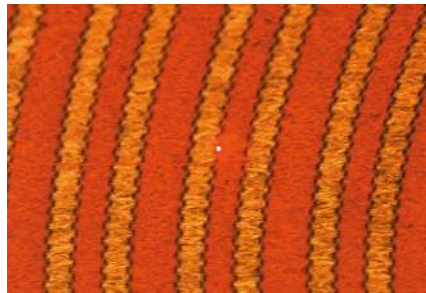
To ensure accuracy, both types require a temperature controlled room.  
 \*1 Type 2 requires objective lens higher than 10x and vibration isolation table.  
 \*2 Please contact Nikon for details regarding Type 1 and Type 2.

## Combination precision (example)

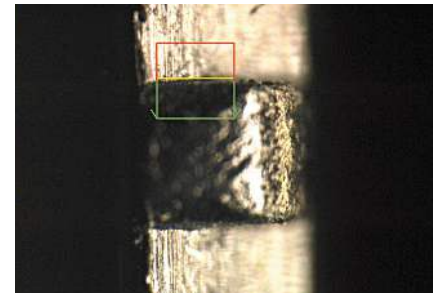
- Standard precision:  $(2.5+L/50) \mu\text{m}$
- High-precision Type 1:  $(2.0+L/50) \mu\text{m}$
- High-precision Type 2:  $(1.5+L/100) \mu\text{m}$



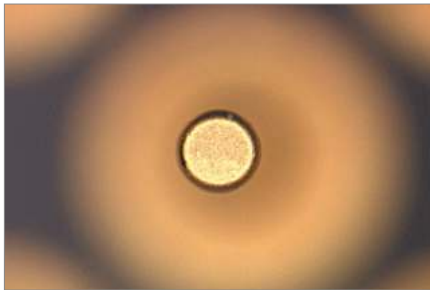
Plastic Gear Teeth with Smaller Module



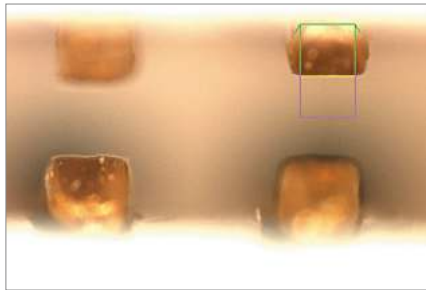
Laser AF Tracking on FPC



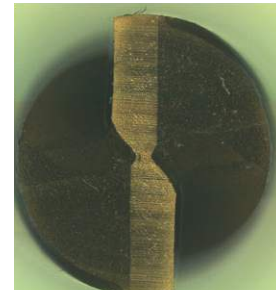
Black Injection Molding Parts - Connector



PGA - Insertion Pin



Connector - Housing Inside



Drill Bits



### Variable Magnification

Two objective lenses can be attached, making magnification changeover easy.



### Z-axis Motorized Motion

A dedicated controller provides easy and accurate up/down movements.



### Dual Side Coarse/Fine Focus Knob

Coarse/fine focus knobs are on both sides.



### Universal Epi-illuminator

Supports a wide range of applications.



### LED Illuminator

A high-intensity white LED illuminator for brightfield use.

# MM-400/800 Specifications

## MM-400 Series

Type	MM-400	MM-400/S	MM-400/L	MM-400/SL	MM-400/LM
Z-axis movement	Manual (dual side coarse/fine focus knob)				Motorized (max. speed: 10 mm/sec)
MM controller backpack interface	Built-in	—	Built-in	—	Built-in
Optical head	Monocular optical head, Trinocular optical head		Monocular optical head, Trinocular optical head, Trinocular optical FA head		
Z-axis linear scale	—		Built-in		
Eyepiece inclination angle	25°				
Eyepiece	MM Eyepiece for Monocular optical head, CFWN10x (Field No. 20) for Trinocular optical head				
Objective	Measuring microscope objectives				
Stage	PS 6x4B, PS 4x4B, PS 2x2B				
Light source	Diascopic	LED diascopic illuminator (standard), 12V-50W halogen light source (option)* <sup>1</sup>			
	Episcopic	LED episcopic illuminator			
Maximum sample height	150 mm				
Dimensions (W x D x H)	300 x 600 x 638 mm				
Weight (approx.)	50 kg				

\*1 TI-PS100W power supply is required

## MM-800 Series

Type	MM-800	MM-800/S	MM-800/L	MM-800/SL	MM-800/LM
Z-axis movement	Manual (dual side coarse/fine focus knob)				Motorized (max. speed: 10 mm/sec)
MM controller backpack interface	Built-in	—	Built-in	—	Built-in
Optical head	Monocular optical head, Trinocular optical head		Monocular optical head, Trinocular optical head, Trinocular optical FA head		
Z-axis linear scale	—		Built-in		
Eyepiece inclination angle	25°				
Eyepiece	MM Eyepiece for Monocular optical head, CFWN10x (Field No. 20) for Trinocular optical head				
Objective	Measuring microscope objectives				
Stage	PS 12x8C, PS 10x6B, PS 8x6B, PS 6x4B, PS 4x4B, PS 2x2B* <sup>2</sup>				
Light source	Diascopic	LED diascopic illuminator (standard), 12V-50W halogen light source (option)* <sup>1</sup>			
	Episcopic	LED episcopic illuminator			
Maximum sample height	200 mm				
Dimensions (W x D x H)	385 x 785 x 725 mm				
Weight (approx.)	72 kg				

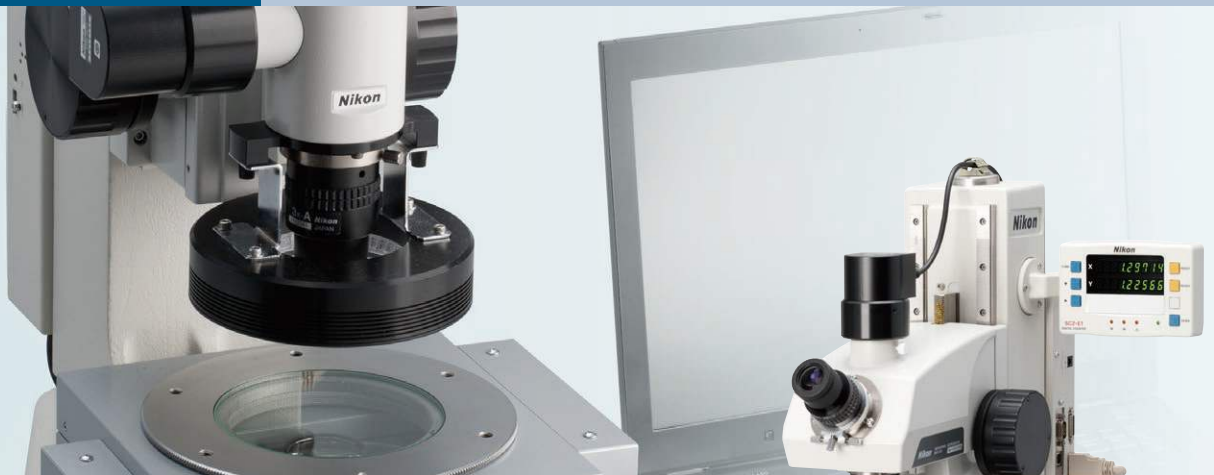
\*1 TI-PS100W power supply is required

\*2 For PS 6x4B stages or smaller, a stage adapter is required

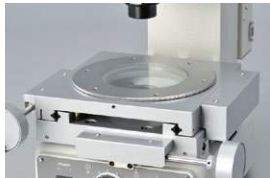
	MM-400/LV	MM-400/LVFA	MM-400/U	MM-400/SU	MM-400/LU	MM-400/SLU	MM-400/LMU
	Manual (dual side coarse/fine focus knob)		Manual (dual side coarse/fine focus knob)				Motorized (max. speed: 10 mm/sec)
	—		Built-in	—	Built-in	—	Built-in
	Variable magnification optical head, Variable magnification optical FA head		C-TB binocular tube, LV-TI3 trinocular eyepiece tube, LV-TT2 tilting trinocular eyepiece tube (with built-in reticle)				
	—		—		Built-in		
	25°		—				
	MM Eyepiece for Monocular optical head, CFWN10x (Field No. 20) for Trinocular optical head		CFI10x (Field No. 22), CFI10x CM (Field No. 22)				
	Low magnification: 1x, 3x, 5x, 10x High magnification: 5x, 10x, 20x, 50x, 100x		CFI60-2 TU Plan Fluor EPI series, CFI60-2 TU Plan Fluor BD series, CFI60 L Plan EPI CR series				
PS 6x4B, PS 4x4B, PS 2x2B							
LED diascope illuminator (standard), 12V-50W halogen light source (option)*							
	LED episcopic illuminator		White LED illuminator LV-EPI LED, Universal epi-illuminator LV-U EPI2*1, Universal epi-illuminator U-EPI*1, Universal epi-illuminator with Focusing Aid LV-U EPI FA <sup>1</sup> , MM-LL LED Lamphouse (option for LV-U EPI and LV-U EPI2)* <sup>1</sup>				
150 mm							
300 x 600 x 638 mm							
50 kg							

	MM-800/LV	MM-800/LVFA	MM-800/U	MM-800/SU	MM-800/LU	MM-800/SLU	MM-800/LMU
	Manual (dual side coarse/fine focus knob)		Manual (dual side coarse/fine focus knob)				Motorized (max. speed: 10 mm/sec)
	—		Built-in	—	Built-in	—	Built-in
	Variable magnification optical head, Variable magnification optical FA head		C-TB binocular tube, LV-TI3 trinocular eyepiece tube, LV-TT2 tilting trinocular eyepiece tube (with built-in reticle)				
	—		—		Built-in		
	25°		—				
	MM Eyepiece for Monocular optical head, CFWN10x (Field No. 20) for Trinocular optical head		CFI10x (Field No. 22), CFI10x CM (Field No. 22)				
	Low magnification: 1x, 3x, 5x, 10x High magnification: 5x, 10x, 20x, 50x, 100x		CFI60-2 TU Plan Fluor EPI series, CFI60-2 TU Plan Fluor BD series, CFI60 L Plan EPI CR series				
PS 12x8C, PS 10x6B, PS 8x6B, PS 6x4B, PS 4x4B, PS 2x2B* <sup>2</sup>							
LED diascope illuminator (standard), 12V-50W halogen light source (option)* <sup>1</sup>							
White LED illuminator LV-EPI LED, Universal epi-illuminator LV-U EPI2*1, Universal epi-illuminator U-EPI*1, Universal epi-illuminator with Focusing Aid LV-U EPI FA, MM-LL LED Lamphouse (option for LV-U EPI and LV-U EPI2)* <sup>1</sup>							
200 mm							
385 x 785 x 725 mm							
72 kg							

# MM-200



## Compact, light, precise and easy to use measuring microscope for dimensioning and tolerancing



Shortens measurement time with its built-in 50 x 50 mm stage and rotating table.



Built-in light sources are all long-life white LEDs. The optional LED ring light enhances edge observation with the use of an oblique illumination angle.



Features a space-saving design with a footprint equivalent to an A3 size sheet, or 420 x 297 mm\*.

\*Value does not include handles

### E-MAX set

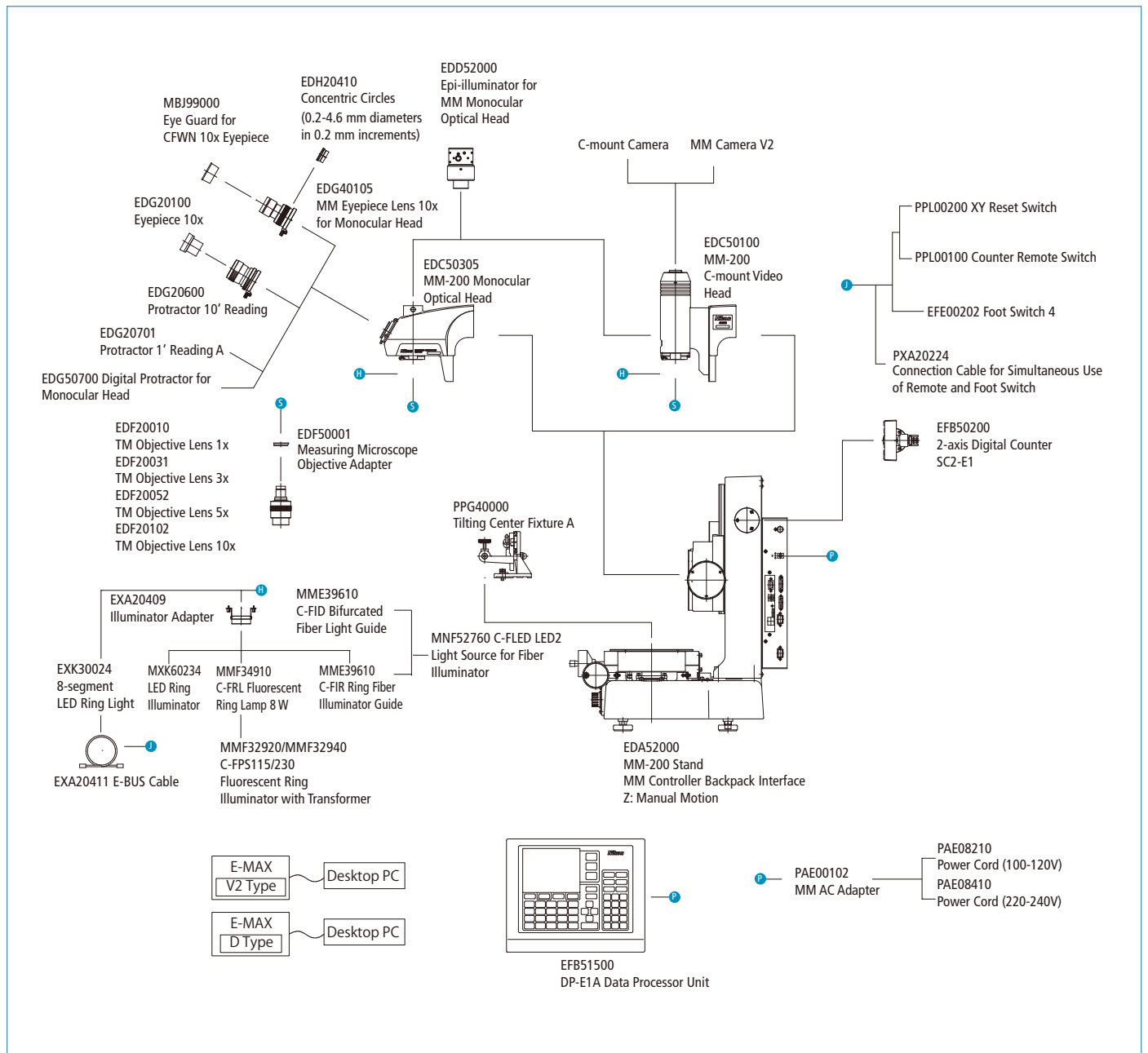
Combine digital camera with E-MAX software for advanced edge detection.



MM-200 with E-MAX V2 set

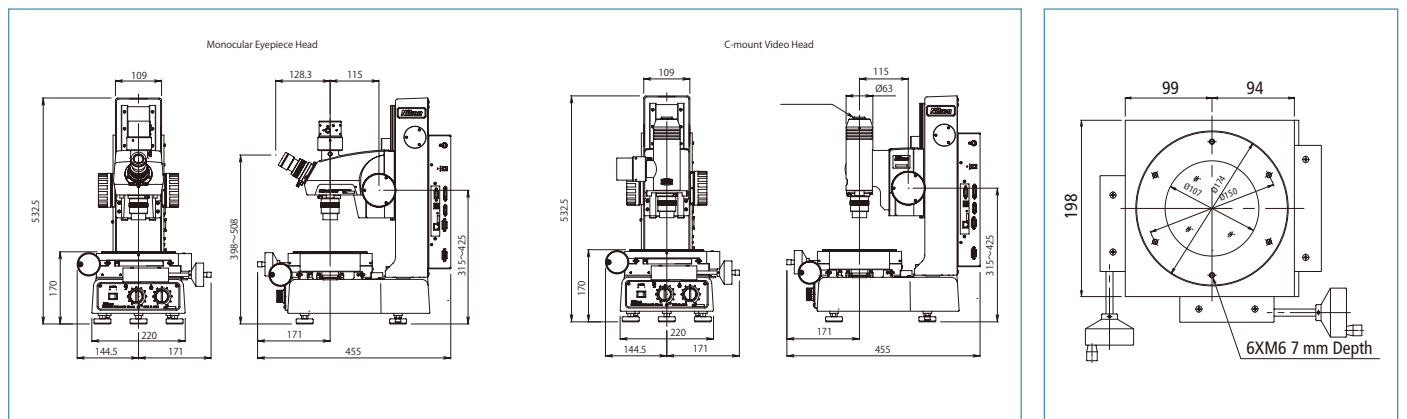
Type	Monocular Eyepiece Tube Type	C-mount Video Head Type
Optical head	MM-200 monocular optical head	C-mount video head for MM-200
XYZ stroke	50 x 50 x 110 mm	
Stage accuracy	2.5 + $L/50$ $\mu$ m (with LEC), 3 + $L/50$ $\mu$ m ( $L$ = measurement length in mm)	
Scale resolution	0.01 / 0.1 (default) /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

# MM-200 System Diagram



# MM-200 Dimensional Diagram

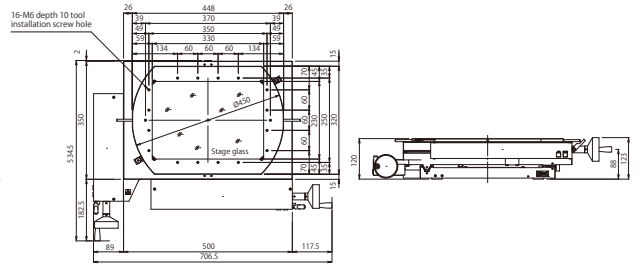
Unit: mm



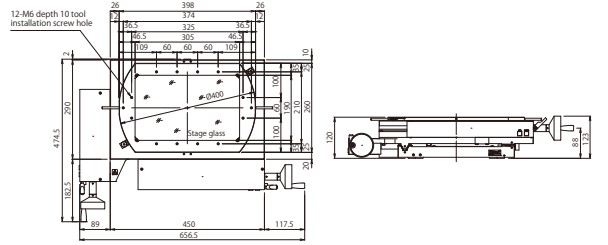
# Stages

Stages for  
MM-800  
series

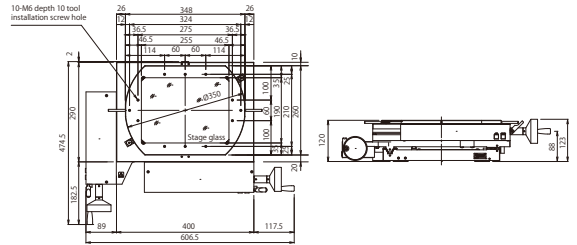
**PS 12x8C**  
Stage



**PS 10x6B**  
Stage

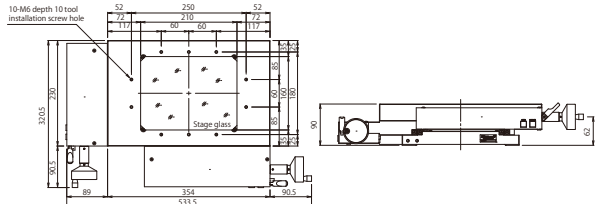


**PS 8x6B**  
Stage

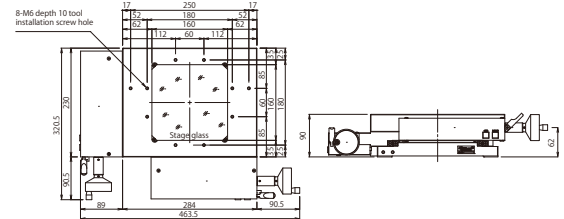


Stages for  
MM-400  
series

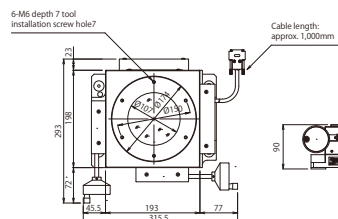
**PS 6x4B**  
Stage



**PS 4x4B**  
Stage



**PS 2x2B**  
Stage



## Stage specifications

Type	Surface area	Stage glass dimensions	Stroke	Reading method	Min. reading	Rotation range	Tool installation screw hole	Loading capacity	Weight (approx.)
PS 12x8C	448 x 320 mm	330 x 230 mm	300 x 200 mm	Linear encoder	0.0001 mm	$\pm 3^\circ$ (Swivel plate)	16-M6 depth 10	20 kg	67 kg
PS 10x6B	398 x 260 mm	305 x 190 mm	250 x 150 mm				12-M6 depth 10		52 kg
PS 8x6B	348 x 260 mm	255 x 190 mm	200 x 150 mm				10-M6 depth 10		49 kg
PS 6x4B	350 x 230 mm	210 x 160 mm	150 x 100 mm			—	10-M6 depth 10	15 kg	27.5 kg
PS 4x4B	284 x 230 mm	160 x 160 mm	100 x 100 mm				8-M6 depth 10		23.5 kg
PS 2x2B	$\varnothing 174$ mm	$\varnothing 107$ mm	50 x 50 mm			360°	6-M6 depth 7	5 kg	15.5 kg

## Stage Accessories

### Stage Adapter

Used to mount PS 6x4B, PS 4x4B, or PS 2x2B stages to MM-800.



### Rotating Tables

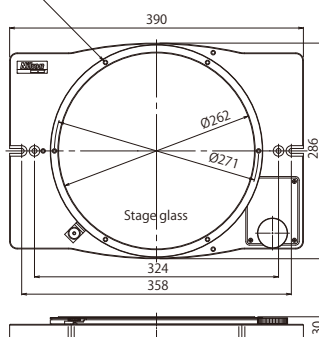
Used to rotate the sample and align it in the direction to which the stage moves.

#### Rotating Table Type 4

For PS 12x8C\*, PS 10x6B, PS 8x6B

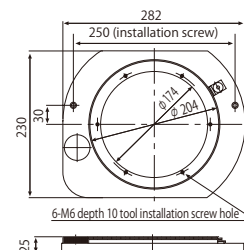


Tool installation screw holes (6-M6 depth 9) are located at six equidistant positions around the circumference.



#### Rotating Table Type 3

For PS 6x4B, PS 4x4B



\*When using rotating table type 4, stage stroke is limited for X and Y axis.

### Rotating table specifications

	Table size	Glass insert size	Rotation range	Tool installation screw hole	Weight (approx.)
Rotating table type 4	$\varnothing 282$ mm	$\varnothing 262$ mm	360° (uncalibrated)	6-M6 depth 9	8 kg
Rotating table type 3	$\varnothing 204$ mm	$\varnothing 165$ mm	360° (uncalibrated)	6-M6 depth 10	5 kg

### 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 samples for MM-200, PS 2x2B, and Rotating Table Type 3.



Max. sample diameter and length when held level	Center height	Tilting angle	Weight (approx.)
$\varnothing 68$ x 120 mm	45 mm	10° (in 1° increment)	2.2 kg

# Accessories

## E-Max Series

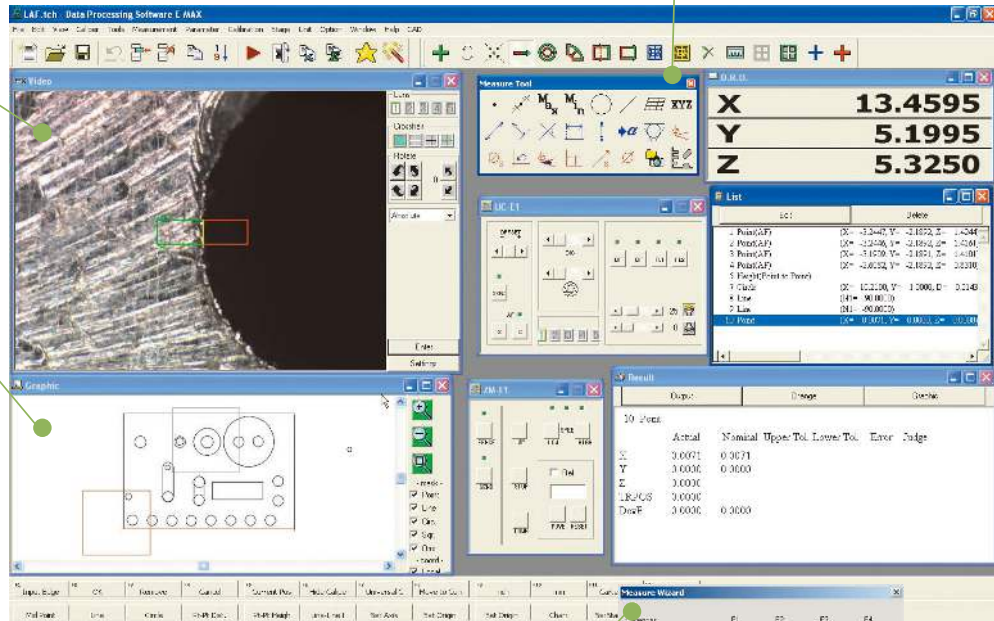
### FOV Measurement with advanced digital image processing technology

Combined with the V2 digital camera, E-MAX series software provides various advanced measurements and processing functions, ranging from 2D data processing and image measurement, to data storage. Automated edge detection with sub-pixel processing enables more precise and repeatable measurement.

Larger icons support touch screen operation environment

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

Navigation function



Interactive operation wizards

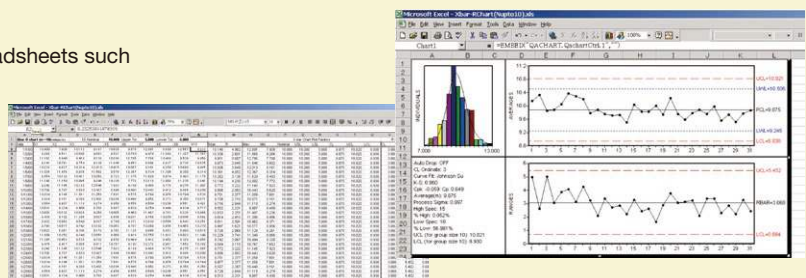


#### Functions provided by each set

	V2 set	D set
Data processing	✓	✓
Navigation during replay	✓	✓
Live video monitoring	✓	—
Chart measurement	✓	—
Automated video edge detection	✓	—

#### DDE (Dynamic Data Exchange) Function

Measured data can be immediately transferred to spreadsheets such as Microsoft Excel®, making real-time SPC analysis possible.





# DP-E1A

## Data Processor with improved accuracy and ease of use

Effectively used in combination with a measuring microscope/profile projector, the DP-E1A quickly calculates geometrical features with simple and interactive operations. Measurement results are automatically memorized as teaching steps and can be easily used as a measurement routine.

### Simple & interactive operation

Feature Oriented Operation allows the user to conduct measurements by following the graphics, providing a seamless measuring environment. Measurement results are automatically memorized as teaching steps and can be easily used as a measurement routine.

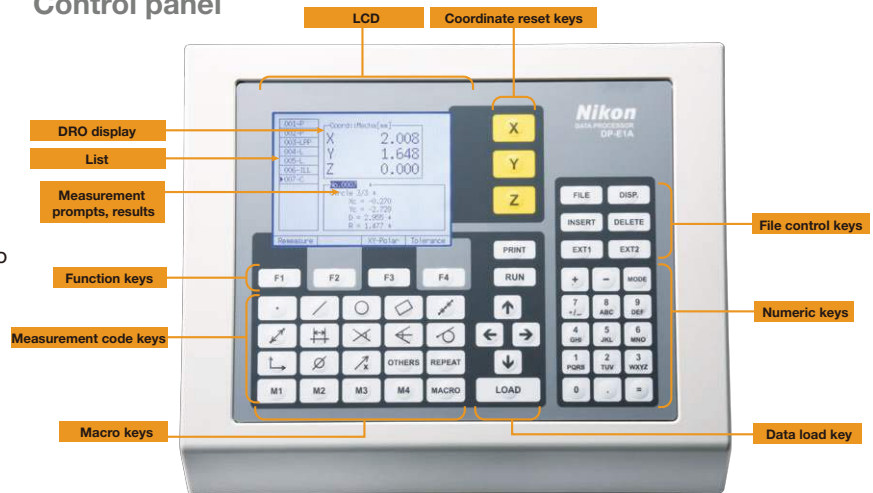
### GD&T compliance

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



<p><b>Measure code key</b></p> <p><b>[Basic feature elements]</b></p> <ul style="list-style-type: none"> <li><b>Point</b> Calculates entered measurement point, or average point from multiple points</li> <li><b>Line</b> Calculates line from two entered measurement points or from multiple points by least-square method</li> <li><b>Circle/arc</b> Calculates circle from three entered measurement points or from multiple points by least-square method</li> <li><b>Rectangle</b> Calculates square from entered five measurement points</li> </ul> <p><b>[Constructed elements]</b></p> <ul style="list-style-type: none"> <li><b>Mid-point</b> Calculates middle point from two measured points</li> <li><b>Pitch</b> Calculates pitch between multiple measured points</li> <li><b>Mid-line</b> Calculates middle line from two measured lines</li> </ul>	<ul style="list-style-type: none"> <li><b>Distance</b> Calculates distance between two measured points</li> <li><b>Intersection</b> Calculates intersection point from two measured lines Calculates intersection point from measured point and line Calculates intersection point from two measured circles</li> <li><b>Tangent</b> Calculates tangent point from measured point and circle Calculates circle to contact two measured lines Calculates circle to contact three measured lines</li> </ul> <p><b>[Coordinate systems]</b></p> <ul style="list-style-type: none"> <li><b>Set origin (datum)</b> Sets up origin of local coordinate system</li> <li><b>Set axis (datum)</b> Sets up axis of local coordinate system</li> <li><b>Displacement</b> Sets up move, rotation and reversion of local coordinate system</li> </ul>	<p><b>Macro code key</b></p> <ul style="list-style-type: none"> <li><b>Macro key</b></li> <li><b>Macro setup key</b> Registers combination of measurement codes for macro keys (M1 to M4)</li> </ul> <p><b>File key</b></p> <ul style="list-style-type: none"> <li><b>File run</b></li> <li><b>Run key</b> Runs teaching file</li> <li><b>Repeat key</b> Sets up repetition number of teaching file</li> <li><b>Print key</b> Conducts print output at discretionary timing during teaching</li> <li><b>File key</b> Shows menu to access file for file controls</li> <li><b>Insert key</b> Inserts measurement codes between list items</li> <li><b>Delete key</b> Deletes measurement code and entered measurement point Deletes file during file control</li> </ul>	<p><b>Display setting key</b></p> <ul style="list-style-type: none"> <li><b>Disp. key</b> Switches display settings</li> </ul> <p><b>Data input key</b></p> <ul style="list-style-type: none"> <li><b>Load key</b> Enters measurement points</li> </ul> <p><b>Accessory function key</b></p> <ul style="list-style-type: none"> <li><b>Ext1 key</b> Sets up print out of standard deviation</li> <li><b>Ext2 key</b> Reserved</li> <li><b>Others key</b> Reserved</li> </ul> <p><b>Function key</b></p> <ul style="list-style-type: none"> <li><b>Function key</b> Performance differs depending on displayed screen and item</li> </ul>
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### Retrofit Unit

To use DP-E1A with the following models, a Retrofit Unit is required as an interface:  
Measuring Microscopes MM-40/MM-60, MM-400S/SL, MM-800S/SL and Profile Projectors V-12B/V-20B

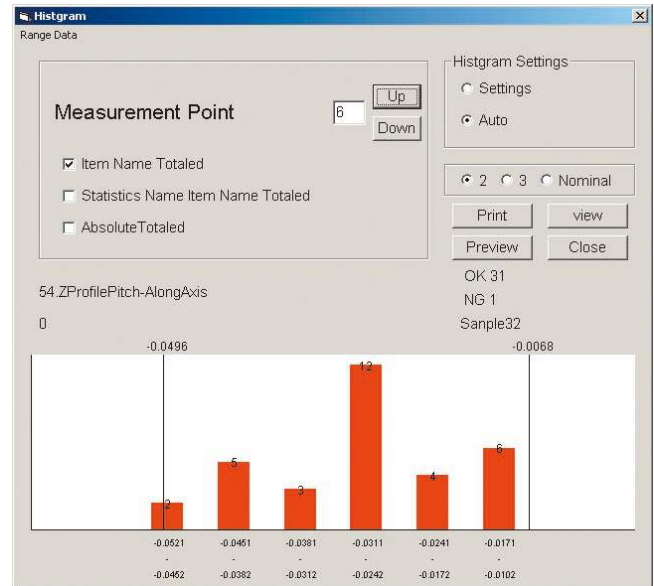
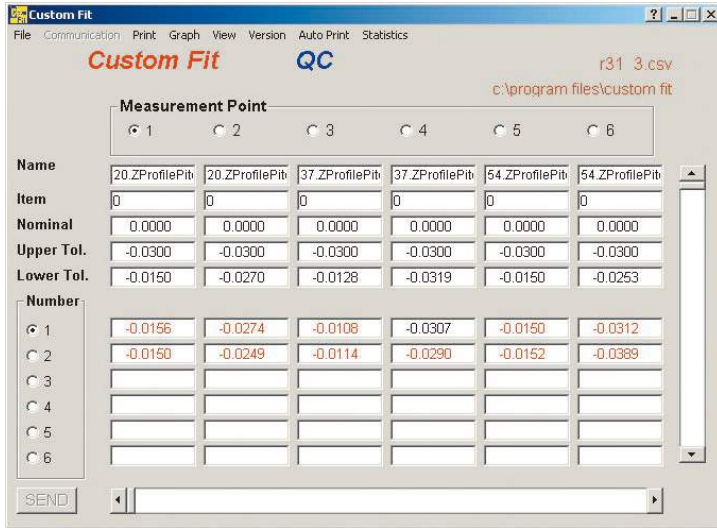


## Application Software for Measurement Support/Data Processing System

### Custom Fit QC: Report and chart generating

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

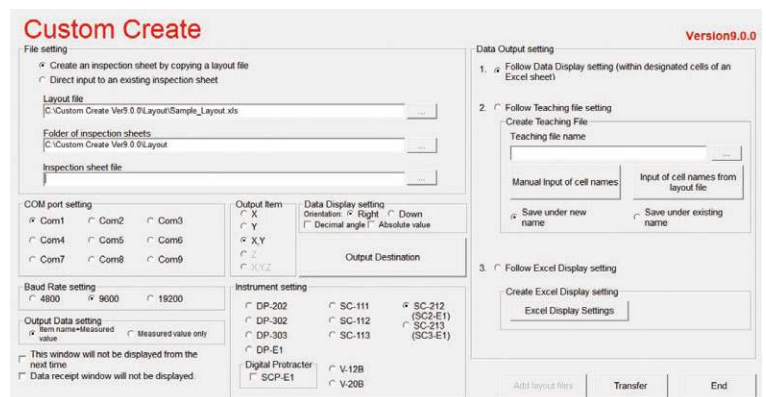
- Customization of inspection result sheets are possible, in addition to the 10 standard sheets
- BMP and JPEG files can be pasted onto the inspection result sheets
- Graphs can be automatically generated
- Displays are adjustable between degree/minute/second
- Easy to generate histograms, X-R control charts, and scatter diagrams



### Custom Create: Direct link to Excel worksheets

Measurement data from counters and/or data processors can be transferred directly to Excel sheets. Multiple worksheets can be transferred at once, achieving efficient measurements.

- Compatible measuring instruments: MM-400/800 series, DP-E1A, V-20B, V-12B
- Allows data transfer to customized inspection-result sheet forms
- 3 standard inspection result sheets are available



Operating environment: Windows®7 or Windows®10  
 Microsoft Excel® 2003 or later  
 Required memory: 512MB (min)  
 Codevelopment: Aria Co., Ltd.

# Counters

## 3-Axis/2-Axis Counters

The display unit can be mounted on either side of the main body. Counters can be connected with data processors and digital printers via the RS-232C port.



3-axis counter



2-axis counter

## XY Reset Switch

Can be attached to the main body to easily reset values while using the stage.



Y-axis



X-axis

## Counter Remote Switch

Enables remote control of the counter's RESET and SEND.



# Digital Thermal Printer TSP654II 2

Connect to the MM-400/800 control box to print out values from the counter.



TSP654II 2

# Calibration Scale 300mm

Used to calibrate feeding accuracy of stage up to 300mm. The scale is made of low expansion glass to minimize thermal error. Both 10mm-interval sensor patterns and calibrations are provided. Accuracy: Within 1µm against compensation values.



# Vibration Isolation Table

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

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



# Foot Switch

Used to send load command to DP-E1A. Frees both hands to enhance measurement efficiency.



# Accessories

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

These compact objectives feature long working distance and excellent resolution. Almost all have the same parfocal distances and come with lens adapters for quick and easy replacement.

- 3x objective is included with the measuring microscope

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



## Direct C-mount Adapter

Used to install C-mount camera on the measuring microscope.

- LV-TV tube is required



## Protractor Eyepieces (for MM Type only)

Note: Monocular adapter is required when using these eyepieces with trinocular tubes

### Digital Protractor Eyepiece\*

Rotate crosshairs in the viewfield to measure angles.

Display unit: 1 minute, 10 minutes

\*Not available for S and SL models



### 1-Minute Reading Eyepiece

Viewfield includes crosshairs and 60° lines. Angle indexes are read by appropriate microscopes.

Measuring range: 360°



### 10-Minute Reading Eyepiece

Viewfield includes crosshairs and angle indexes. When the knurled ring at the lower section of the eyepiece tube is turned, the crosshairs and the vernier both rotate 180°.



## Illuminators

### 8-Segment LED Ring Light

Enables illumination from eight directions.

- Can be used with MM-400/800 and E-MAX
- RS-232C cable comes standard
- E-BUS cable is required to control with E-MAX



### Fiber-optics Illuminator Set

Offers easily adjustable brightness. The ring fiber illuminator minimizes shadows caused by any unevenness on the sample surface. The bifurcated fiber enables illumination from two directions.

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



### Ring Illuminator Adapter

Can be used to mount fiber-optic, fluorescent lamp, and LED ring illuminator.

- Cannot be mounted with 8-segment LED Ring Light



### LED Ring Illuminator

Ideal for use in a production environment as LEDs have long product life. Uses white LEDs with a variable intensity control and constant color temperature.

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

# High-performance Objective Lenses

## Standard objective lenses

### CFI60-2 TU Plan Fluor Series

Suitable for various research, analysis, and examination needs, while maintaining Nikon's commitment to high NA and long working distance. Offering high resolution and ease of use, these objectives can be used for brightfield, darkfield, simple polarizing, DIC and UV epifluorescence observations.



TU Plan Fluor series

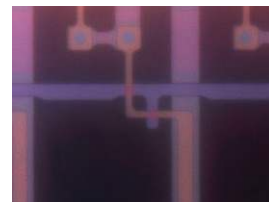
## Objective lenses with correction ring

### CFI60 L Plan EPI CR Series

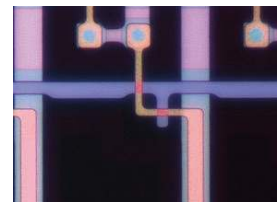
Objectives for use with thin cover-glass used in liquid crystal displays and highly integrated, dense devices. Coverglass correction can be continuously made from 0mm up to 1.2mm (0-0.7mm and 0.6-1.3mm for 100x). The 100x objective lens offers 0.85 high NA, while enabling high-contrast imaging of cells 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/CFI60-2 Series

### Brightfield

Type	Magnification	NA	W.D. (mm)
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
	100x	0.90	1.0
TU Plan EPI ELWD	20x	0.40	19.0
	50x	0.60	11.0
	100x	0.80	4.5
T Plan EPI SLWD	10x	0.20	37.0
	20x	0.30	30.0
	50x	0.40	22.0
	100x	0.60	10.0
TU Plan Apo EPI	50x	0.80	2.0
	100x	0.90	2.0
	150x	0.90	1.5

### 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
	100x	0.90	1.0
TU Plan BD ELWD	20x	0.40	19.0
	50x	0.60	11.0
	100x	0.80	4.5
TU Plan Apo BD	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

## Tilting trinocular eyepiece tube

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



## Manual nosepieces

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

	Brightfield	Darkfield	DIC
C-N6	○	—	—
L-NBD5	○	○	—
L-NU5	○	○	○

○ : Supported - : Not supported

## New light source for EPI illuminators

A newly designed compact LED EPI lamphouse for brightfield, darkfield, and DIC observations has been added to the existing lineup.

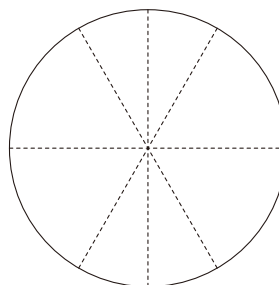


## Templates

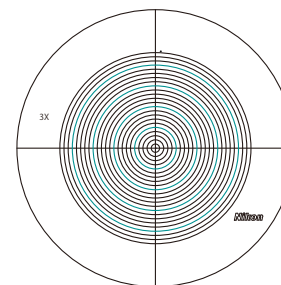
The following dedicated templates are available to facilitate profile comparison and measurements. Templates are designed for 3x objectives.

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

\*Cannot be attached to monocular type



Standard



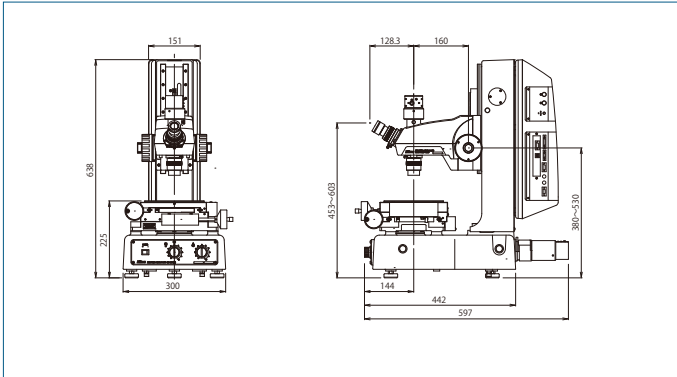
Concentric

# Dimensional Diagram

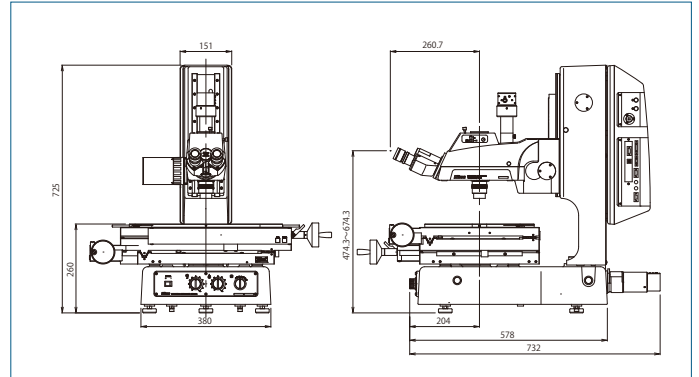
Note: Dimensions will vary, depending on which stage and eyepiece tube are used.

Unit: mm

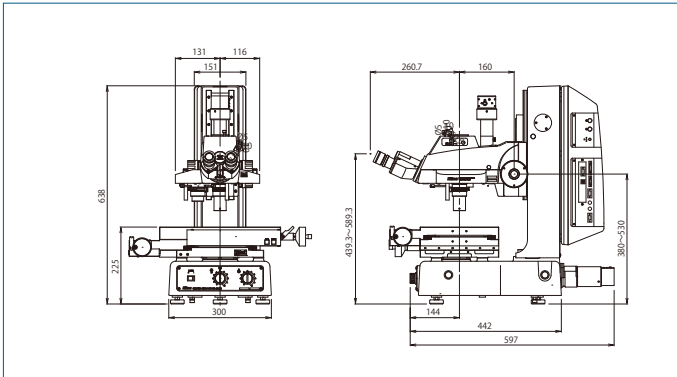
MM-400/M  
PS 2x2B Stage



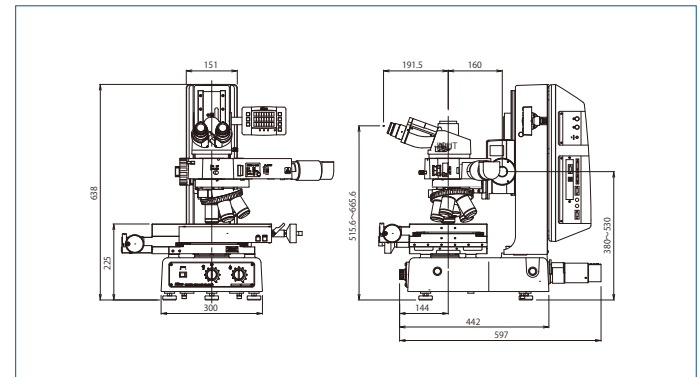
MM-800/LM  
PS 12x8C Stage



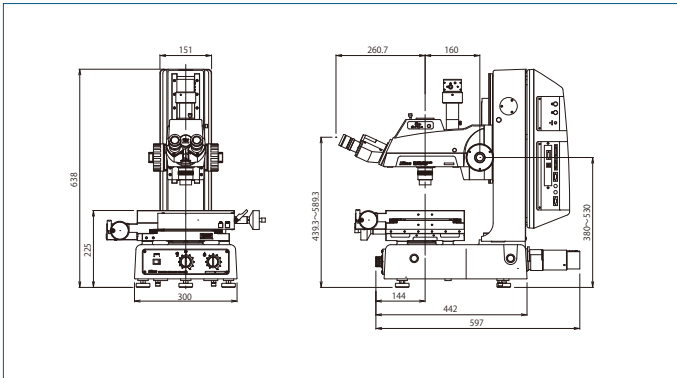
MM-400LV  
PS 6x4B Stage



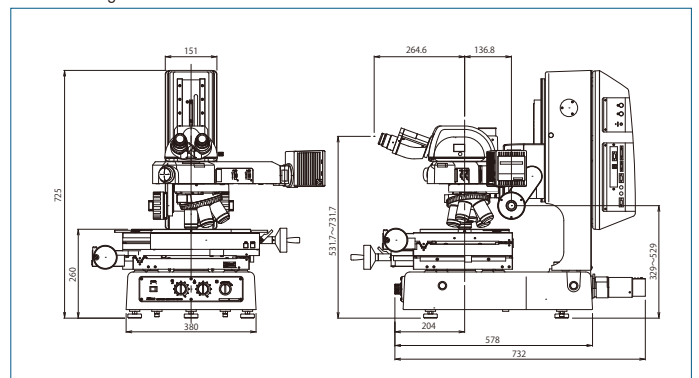
MM-400/LUFA  
PS 6x4B Stage



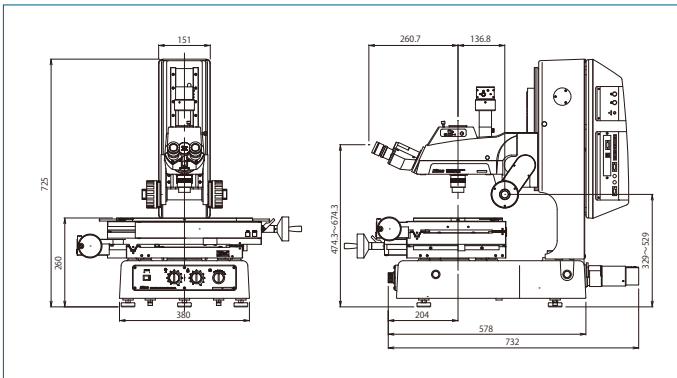
MM-400/L  
PS 4x4B Stage



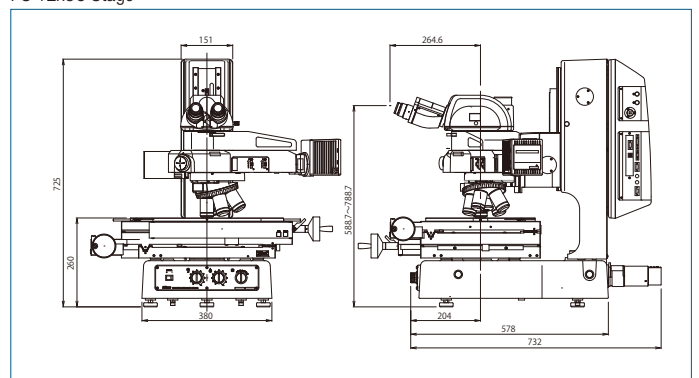
MM-800/LU  
PS 8x6B Stage



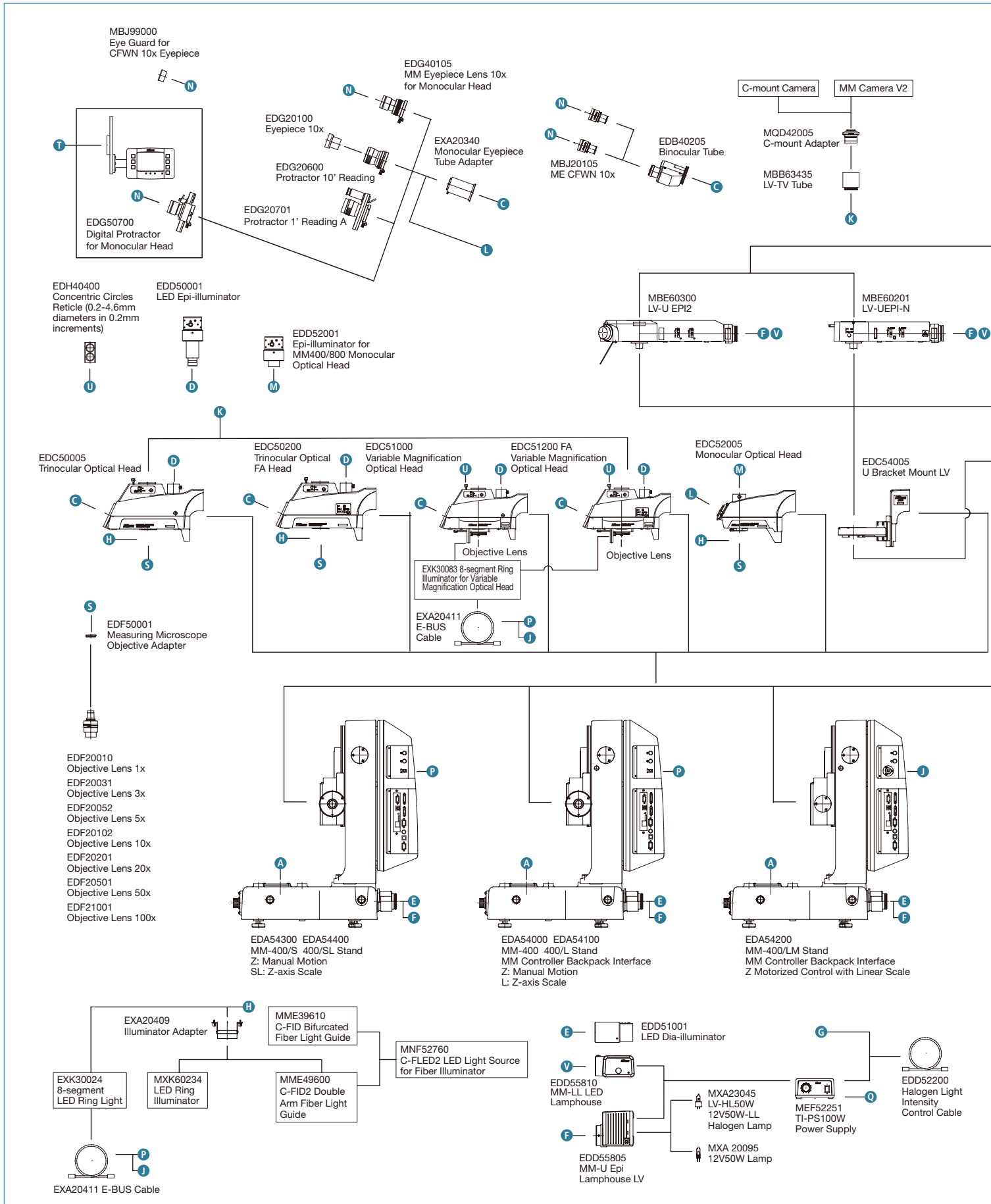
MM-800/L  
PS 10x6B Stage



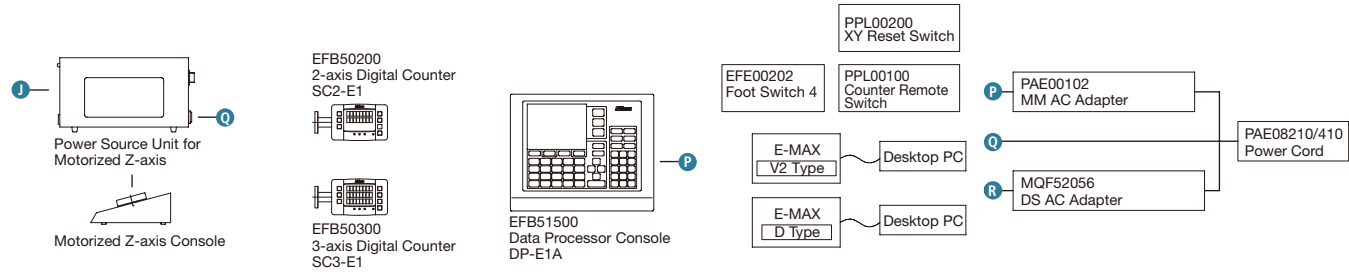
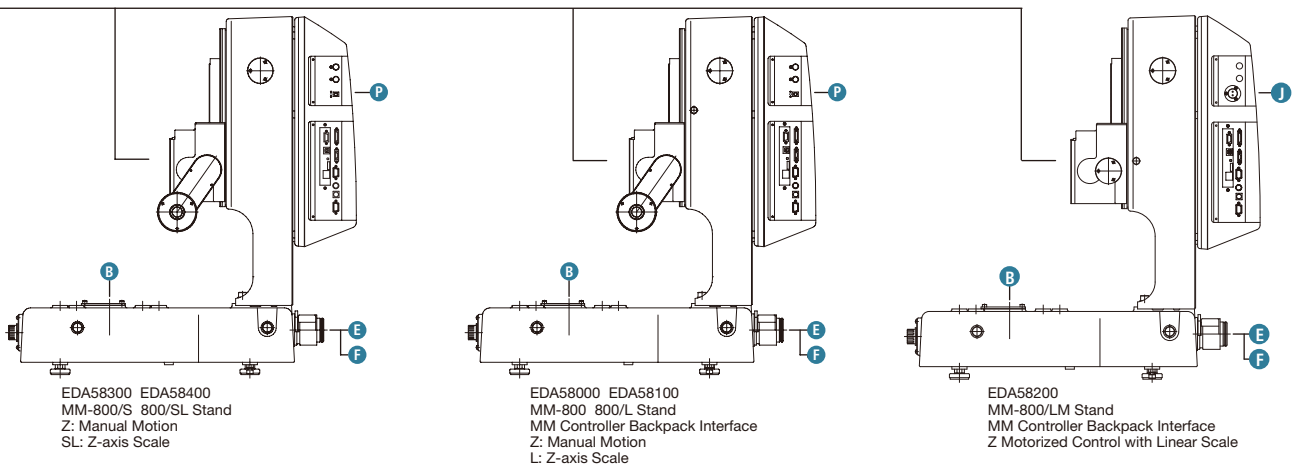
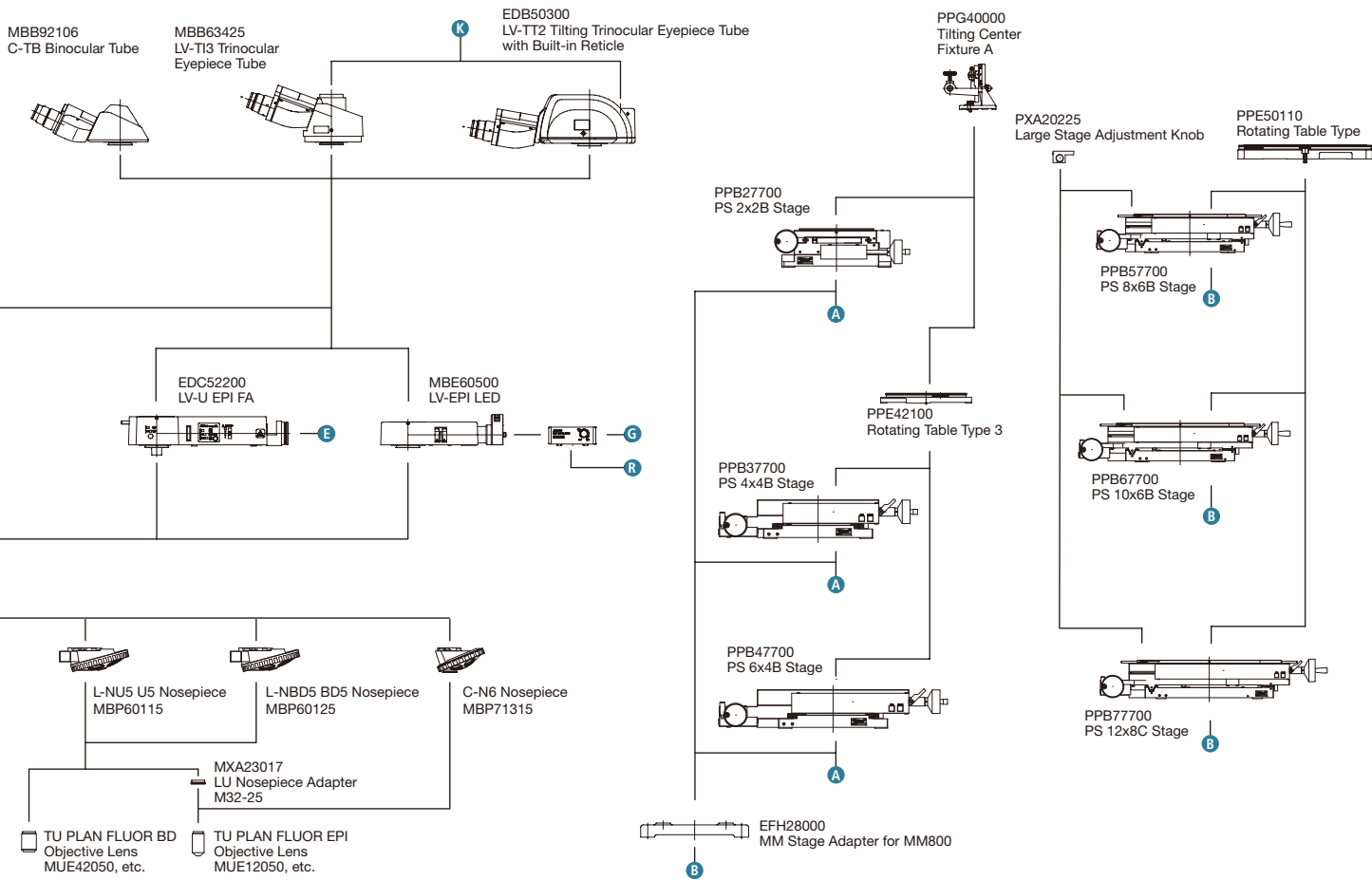
MM-800/LMU  
PS 12x8C Stage



# MM-400/800 System Diagram







# Suggested Configuration Chart

## MM-Type

	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	Manual	Manual	Manual	Motorized	Manual	Manual	Manual	Manual	Motorized
	Z-axis Scale	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes
	MM Controller Backpack Interface	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes
	Stage	PS 4x4B	PS 2x2B	PS 6x4B	PS 6x4B	PS 6x4B	PS 8x6B	PS 10x6B	PS 10x6B	PS 12x8C	PS 12x8C
	Head	Trinocular	Monocular	Trinocular	Trinocular	Trinocular	Trinocular	Trinocular	FA	Trinocular	FA
	Illuminators	-	-	Fiber Ring	-	8-seg. LED Ring	-	White LED Ring	-	8-seg. LED Ring	8-seg. LED Ring
	Product Code	Data Processors	-	DP-E1A	-	E-MAX V2	-	DP-E1A	-	E-MAX V2	E-MAX V2
Main Body Stand	EDA54000	MM-400 Stand	✓								
	EDA54100	MM-400/L Stand		✓							
	EDA54200	MM-400/LM Stand									
	EDA54300	MM-400/S Stand	✓								
	EDA54400	MM-400/SL Stand				✓					
	EDA58000	MM-800 Stand						✓			
	EDA58100	MM-800/L Stand								✓	
	EDA58200	MM-800/LM Stand									✓
	EDA58400	MM-800/SL Stand							✓		
	EDA58300	MM-800/S Stand						✓			
	PAE00102	MM AC Adapter	✓	✓	✓ 2pcs	✓		✓	✓ 2pcs	✓	✓
	PAE08210/410	Power Cable	✓	✓	✓ 2pcs	✓	✓	✓	✓ 2pcs	✓	✓
Optical Head and Eyepiece Tube/ Lenses Illuminators	EDC52005	Monocular Optical Head		✓							
	EDG40105	MM Eyepiece Lens 10x for Monocular Head		✓							
	EDC50005	Trinocular Optical Head	✓		✓	✓	✓	✓		✓	
	EDC50200	Trinocular Optical FA Head							✓		✓
	EDB40205	Binocular Tube	✓		✓	✓	✓	✓	✓	✓	✓
	MBJ20105	CFWN 10x Eyepiece (2pcs)	✓		✓	✓	✓	✓	✓	✓	✓
	EDD51001	LED Dia-illuminator	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EDD50001	LED Epi-illuminator	✓		✓	✓	✓	✓	✓	✓	✓
	EDD52001	Epi-illuminator for MM400/800 Monocular Optical Head		✓							
	EXK30024	8-segment LED Ring Light (100-240V)					✓				✓
	EXA20411	E-BUS Cable			✓		✓		✓		✓
	PAE08210/410	Power Cable					✓				✓
	EXA20409	Illuminator Adapter			✓				✓		
	MME39610	C-FIR Ring Fiber Illuminator Guide			✓						
	MNF52760	C-FLED2 LED Light Source for Fiber Illuminator			✓						
	MXK60234	LED Ring Illuminator (100-240V) (ESD Type only)							✓		
Objective Lenses	EDF20031	Objective Lens 3x	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EDF20102	Objective Lens 10x							✓		✓
	EDF50001	Measuring Microscope Objective Adapter	✓	✓	✓	✓	✓	✓	✓ 2pcs	✓	✓ 2pcs
Stages and Rotating Tables	PPB27700	PS 2x2B Stage		✓							
	PPB37700	PS 4x4B Stage	✓								
	PPB47700	PS 6x4B Stage			✓	✓					
	PPB57700	PS 8x6B Stage					✓				
	PPB67700	PS 10x6B Stage						✓	✓		
	PPB77700	PS 12x8C Stage								✓	✓
	EFH28000	MM Stage Adapter for MM800 (PS 6x4B or smaller)									
	PXA20225	Large Stage Adjustment Knob						✓	✓	✓	✓
	PPE42100	Rotating Table Type 3			✓	✓	✓				
	PPE50110	Rotating Table Type 4						✓	✓	✓	
Data Processing System and Printer	EFB50200	2-axis Digital Counter SC2-E1		✓				✓			
	EFB50300	3-axis Digital Counter SC3-E1			✓		✓			✓	✓
	EFB51500	Data Processor Console DP-E1A			✓		✓				
	PXA20218	SC-213 Z-signal Cable				✓			✓		
	PPL00200	XY Reset Switch		✓							
	EFE00202	Foot Switch 4			✓		✓		✓		✓
	EXK30314	Thermal Printer Model TSP654II 2			✓			✓			
	EXA20478	9-25 Pins RS-232C Cross Cable (2m)			✓			✓			
	EXK30105	Printer Paper			✓			✓			
	PAE08210/410	Power Cable			✓			✓			
	EDF11000	Data Processing Software E-MAX					✓				✓
	EXA20371	E-MAX Calibration Plate					✓				✓
	EDE50100	MM Camera V2					✓				✓
	EDE50110	MM Camera V2 Cable					✓				✓
	MBB63435	LV-TV Tube					✓				✓
	MQD42005	C-mount Adapter					✓				✓

• MM Cable for Simultaneous Use (PXA20224) is required for simultaneous use of Foot Switch and [RESET/SEND] buttons.

U-Type

		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	Manual	Motorized	Manual	Manual	Manual	Motorized	Manual	Manual	
	Z-axis Scale	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	
	MM Controller Backpack Interface	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	
	Stage	PS 4x4B	PS 4x4B	PS 6x4B	PS 8x6B	PS 12x8C	PS 10x6B	PS 12x8C	PS 12x8C	PS 12x8C	PS 10x6B	
	Head	C-TB	TT2	TI3	TI3	TT2	TT2	TT2	TT2	TT2	TI3	
	Illuminator	LV-EPI LED	LV-U EPI FA	LV-U EPI2	LV-U EPI	LV-U EPI FA	LV-U EPI FA	LV-U EPI FA	LV-U EPI FA	LV-U EPI2	LV-U EPI FA	
	Illuminators	-	E-MAX V2	E-MAX V2	-	E-MAX V2	-	E-MAX V2	E-MAX V2	E-MAX V2	-	
	Product Code	Data Processors	BF	BD-DIC	BD-DIC-FL	BF	BD-DIC	BD	BD-DIC	BD-DIC-FL	BF	
Main Body Stand, U-bracket and Illuminator	EDA54000	MM-400 Stand	✓									
	EDA54100	MM-400/L Stand		✓								
	EDA54200	MM-400/LM Stand			✓							
	EDA54400	MM-400/SL Stand										
	EDA58000	MM-800 Stand										
	EDA58100	MM-800/L Stand					✓					
	EDA58200	MM-800/LM Stand							✓			
	EDA58400	MM-800/SL Stand						✓			✓	
	EDA58300	MM-800/S Stand				✓						
	PAE00102	MM AC Adapter	✓	✓		✓	✓	✓			✓	
	PAE08210/410	Power Cable	✓		✓	✓	✓		✓	✓	✓	
EDC54005	U Bracket Mount LV	✓	✓	✓	✓	✓	✓	✓	✓	✓		
EDD51001	LED Dia-illuminator (used for U-FA as Epi-illuminator)	✓	✓ 2pcs	✓	✓	✓ 2pcs	✓ 2pcs	✓ 2pcs	✓	✓ 2pcs		
Stages and Rotating Tables	PPB37700	PS 4x4B Stage	✓	✓								
	PPB47700	PS 6x4B Stage			✓							
	PPB57700	PS 8x6B Stage				✓						
	PPB67700	PS 10x6B Stage					✓				✓	
	PPB77700	PS 12x8C Stage						✓				
	EFH28000	MM Stage Adapter for MM800 (PS 6x4B or smaller)					✓		✓	✓		
	PXA20225	Large Stage Adjustment Knob				✓	✓	✓	✓	✓	✓	
	PPE42100	Rotating Table Type 3		✓								
	PPE50110	Rotating Table Type 4						✓				
	EFB50200	2-axis Digital Counter SC2-E1	✓									
EFB50300	3-axis Digital Counter SC3-E1		✓	✓		✓		✓	✓			
PXA20218	SC-213 Z-signal Cable						✓			✓		
EFE00202	Foot Switch 4		✓	✓		✓		✓	✓			
EDF11000	Data Processing Software E-MAX		✓	✓		✓		✓	✓			
EXA20371	E-MAX Calibration Plate		✓	✓		✓		✓	✓			
EDE50100	MM Camera V2		✓	✓		✓		✓	✓			
EDE50110	MM Camera V2 Cable		✓	✓		✓		✓	✓			
MBB63435	LV-TV Tube		✓	✓		✓		✓	✓			
MQD42005	C-mount Adapter		✓	✓		✓		✓	✓			
Data Processing System and Printer	MBE60500	LV-EPI LED	✓									
	MQF52056	DS AC Adapter 2	✓									
	PAE08210/410	Power Cable	✓									
	MBE60201	LV-U EPI (BF DF DIC)				✓						
	EDC52200	LV-U EPI FA		✓				✓			✓	
	MBE60300	LV-U EPI2 (BF DF DIC FL)			✓					✓		
U-Epi Illuminators	MBN66750	YM-NCB25 NCB11			✓	✓				✓		
	MBN66760	YM-ND25 ND4/ND16			✓	✓				✓		
	EDD55805	MM-U Epi Lamphouse LV			✓	✓				✓		
	EDD55810	MM-LL LED Lamphouse			✓	✓				✓		
	EDD52200	Halogen Light Intensity Control Cable	✓		✓	✓				✓		
	MXA23045	LV-HL50W 12V50W-LL Halogen Lamp			✓	✓				✓		
	MEF52251	TI-PS100W Power Supply (100-240V)			✓	✓				✓		
	PAE08210/410	Power Cable			✓	✓				✓		
	Filters and Light Sources	MBB92106	C-TB Binocular Tube	✓								
		MBB63425	LV-TI3 Trinocular Eyepiece Tube		✓ 2pcs	✓	✓					✓
EDB50300		LV-TT2 Trinocular Tube with Built-in Reticle		✓	✓		✓	✓	✓			
MAK10110		CFI 10x Eyepiece	✓		✓	✓					✓	
MAK12105		CFI 10x CM Eyepiece with Crosshairs	✓		✓	✓					✓	
MBP60115		L-NU5 U5 Nosepiece ESD		✓	✓		✓		✓			
MBP60125		L-NBD5 BD5 Nosepiece			✓			✓				
MBP71316		C-N6 Nosepiece (up to 5 objective lenses)	✓		✓		✓				✓	
Tubes and Eyepiece Lenses	MUE12050	TU PLAN FLUOR EPI 5x	✓			✓					✓	
	MUE12100	TU PLAN FLUOR EPI 10x	✓			✓					✓	
	MUE21200	TU PLAN EPI ELWD 20xA	✓			✓					✓	
	MUE21500	TU PLAN EPI ELWD 50xA	✓			✓					✓	
	MUE42050	TU PLAN FLUOR BD 5x		✓	✓		✓	✓	✓	✓		
	MUE42100	TU PLAN FLUOR BD 10x		✓	✓		✓	✓	✓	✓		
	MUE61200	TU PLAN BD ELWD 20x		✓	✓		✓	✓	✓	✓		
	MUE61500	TU PLAN BD ELWD 50x		✓	✓		✓	✓	✓	✓		
	MUE61900	TU PLAN BD ELWD 100x		✓	✓		✓	✓	✓	✓		
	MBP60170	L2-DIC DIC Prism for Eclipse Microscopes		✓	✓		✓		✓	✓		
Objective Lenses and Accessories	MBN66923	LV-PO Polarizer for LV-U EPI2 (MBE60200)		✓	✓		✓		✓	✓		
	MBN66922	L-AN Analyzer for LV-U EPI2 (MBE60200)			✓					✓		
	MBN66921	YM-PO Polarizer for LV-U EPI FA (EDC52200)		✓			✓		✓			

LED Episcopic & Diascopic Illuminator is a Class 1 LED Product

**CLASS 1 LED PRODUCT**

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

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

**ISO/IEC 17025 Certified**

Nikon Corporation Industrial Metrology Business Unit is certified as an ISO/IEC 17025 accredited calibration laboratory for measuring microscopes and measuring projectors (profile projectors) 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)

<b>Date of Initial accreditation:</b>	September 8, 2006
<b>Scope of accreditation:</b>	Measuring microscopes
<b>Accredited section:</b>	Industrial Metrology Business Unit
<b>Calibration site:</b>	Customer's laboratory (field service)
<b>Expanded Uncertainty:</b>	<b>X/Y-axis indication accuracy of measuring microscopes</b> Linear scale up to 300 mm: $(0.70 + 5.0 \times 10^{-3} \times L) \mu\text{m}$

Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. August 2019 ©2003-19 NIKON CORPORATION

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

N.B. Export of the products\* in this catalog is controlled under the Japanese Foreign Exchange and Foreign Trade Law. Appropriate export procedure shall be required in case of export from Japan.  
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**NIKON CORPORATION**

Shinagawa Intercity Tower C, 2-15-3, Konan, Minato-ku, Tokyo 108-6290, Japan  
phone: +81-3-6433-3703 fax: +81-3-6433-3784  
<https://www.nikon.com/products/industrial-metrology/>

ISO 14001 Certified  
for NIKON CORPORATION

ISO 9001 Certified  
for NIKON CORPORATION  
Industrial Metrology Business Unit

**NIKON METROLOGY EUROPE NV**

Geldenaaksebaan 329, 3001 Leuven, Belgium  
phone: +32-16-74-01-00 fax: +32-16-74-01-03  
E-mail: [Sales.Europe.NM@nikon.com](mailto:Sales.Europe.NM@nikon.com)  
<http://www.nikonmetrology.com/en-gb>

**NIKON METROLOGY UK LTD.**

UNITED KINGDOM phone: +44-1332-811-349 fax: +44-1332-639-881  
E-mail: [Sales.UK.NM@nikon.com](mailto:Sales.UK.NM@nikon.com)

**NIKON METROLOGY SARL**

FRANCE phone: +33-1-60-86-09-76 fax: +33-1-60-86-57-35  
E-mail: [Sales.France.NM@nikon.com](mailto:Sales.France.NM@nikon.com)

**NIKON METROLOGY GMBH**

GERMANY phone: +49-6023-91733-0 fax: +49-6023-91733-229  
E-mail: [Sales.Germany.NM@nikon.com](mailto:Sales.Germany.NM@nikon.com)

**NIKON INSTRUMENTS S.p.A.**

ITALY phone: +39-055-300-96-01 fax: +39-055-30-09-93

**NIKON METROLOGY, INC.**

12701 Grand River Avenue, Brighton, MI 48116 U.S.A.  
phone: +1-810-220-4360 fax: +1-810-220-4300  
E-mail: [Sales.NM-US@nikon.com](mailto:Sales.NM-US@nikon.com)  
<http://www.nikonmetrology.com/en-us>

**NIKON CANADA INC.**

CANADA phone: +1-905-602-9676 fax: +1-905-602-9953  
**NIKON MEXICO-Metrology Showroom**  
MEXICO phone: +52 (442) 688 5067  
E-mail: [Sales.NM-MX@nikon.com](mailto:Sales.NM-MX@nikon.com)

**NIKON INSTRUMENTS (SHANGHAI) CO., LTD.**

CHINA (Shanghai branch) phone: +86-21-6841-2050 fax: +86-21-6841-2060  
(Beijing branch) phone: +86-10-5831-2028 fax: +86-10-5831-2026  
(Guangzhou branch) phone: +86-20-3882-0551 fax: +86-20-3882-0580

**NIKON INSTRUMENTS KOREA CO., LTD.**

KOREA phone: +82-2-2186-8400 fax: +82-2-555-4415

**NIKON SINGAPORE PTE LTD.**

SINGAPORE phone: +65-6559-3651 fax: +65-6559-3668  
[NSG.Industrial-sales@nikon.com](mailto:NSG.Industrial-sales@nikon.com)

**NIKON MALAYSIA SDN. BHD.**

MALAYSIA phone: +60-3-7809-3688 fax: +60-3-7809-3633

**PT. NIKON INDONESIA**

INDONESIA phone: +62-267-864-3949 fax: +62-267-864-3950  
[PTN.Instruments@nikon.com](mailto:PTN.Instruments@nikon.com)

**NIKON SALES (THAILAND) CO., LTD.**

THAILAND phone: +66-2633-5100 fax: +66-2633-5191

**NIKON INDIA PRIVATE LIMITED**

INDIA phone: +91-124-4688500 fax: +91-124-4688527