Measuring Microscopes

MM-Series

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.

		Basic Model MM-400	Large-Stage Model MM-800	Compact Model MM-200
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

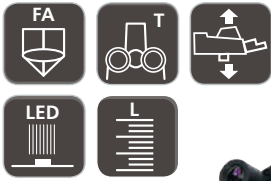With Nikon's optical technology stages, high-precision measurement can be achieved.

Universal Type

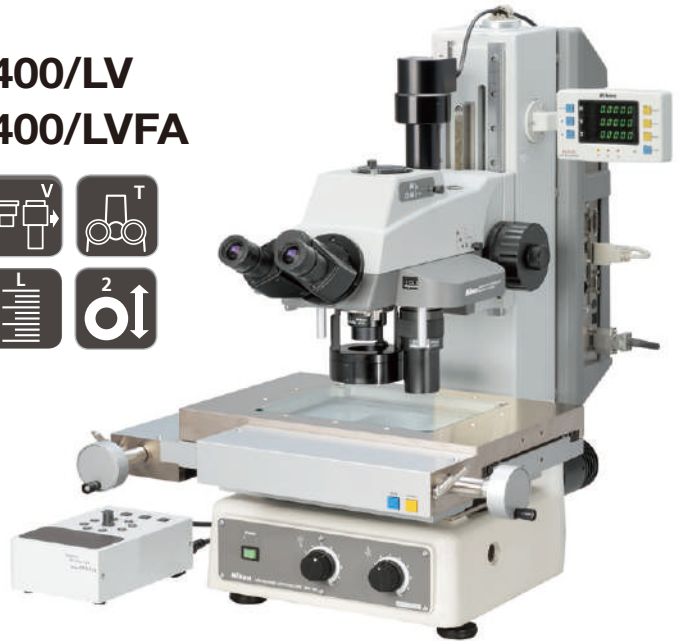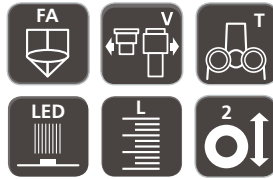Offers a lineup compatible with dimensional measurement and various observation methods.

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

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.

L — **Built-in Z-axis Linear Scale**
Z-axis reading is possible for non-contact height measurement.

T — **Trinocular Optical Head**
Ideal for configuration with photomicrography equipment.

M — **Monocular Optical Head**
For applications where cost performance is priority.

4

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
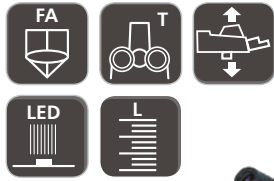
Supports a wide range of applications.

LED Illuminator

A high-intensity white LED illuminator for brightfield use.

MM-800/LM

Configured with PS 10x6B stage,
trinocular optical FA head

MM-800/LV
MM-800/LVFA
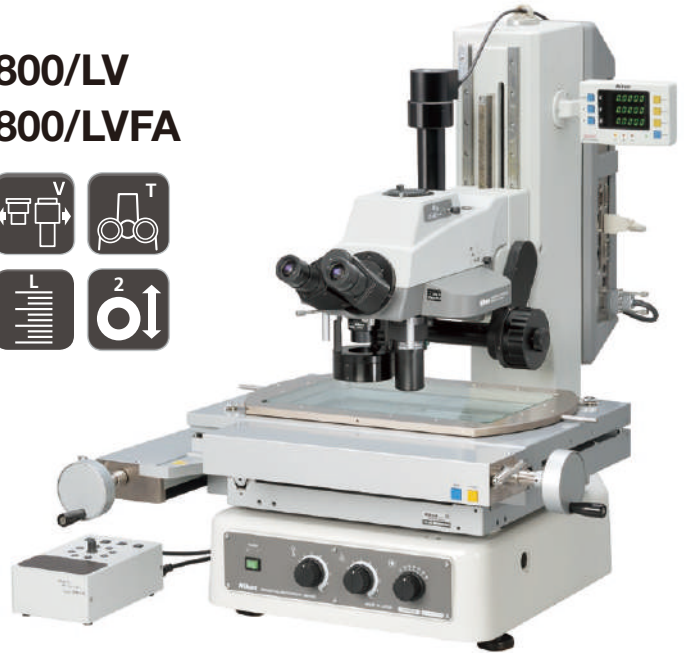
Function Icons

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.

L Built-in Z-axis Linear Scale

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

T Trinocular Optical Head

Ideal for configuration with photomicrography equipment.

M Monocular Optical Head

For applications where cost performance is priority.

MM-800/L
MM-800/SL

FA	T	LED

2	L

Configured with PS 8x6B stage, trinocular optical FA head

MM-800

T	LED	2

Configured with PS 8x6B stage, trinocular optical head

MM-800/S

T	LED	2

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

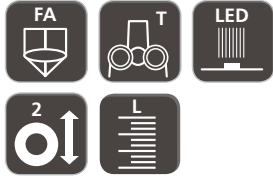A high-intensity white LED illuminator for brightfield use.

MM-400/800 Series U-Type

MM-400/LMU
MM-800/LMU
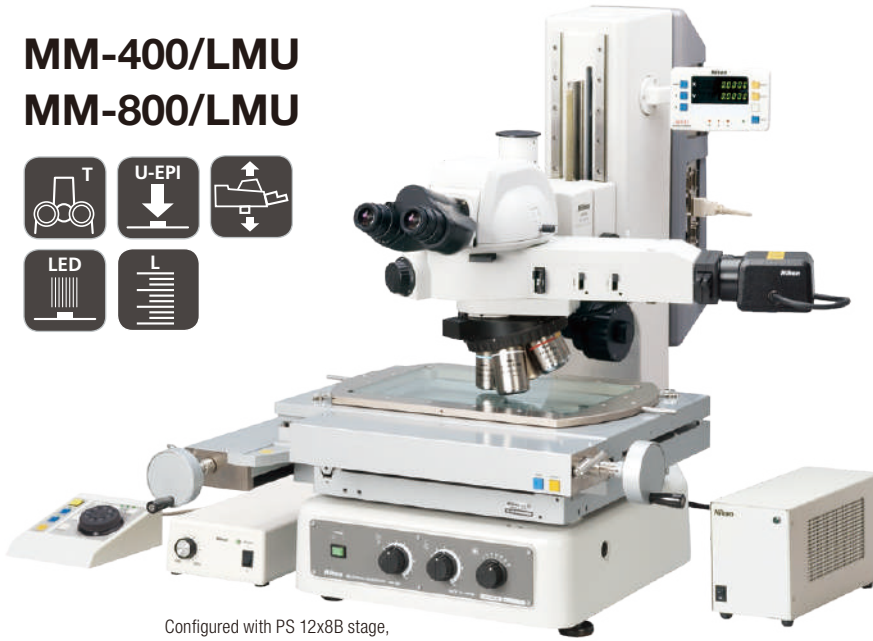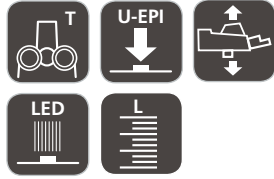
Configured with PS 12x8B stage,
LV-U EPI2 universal epi-illuminator

MM-400/U
MM-400/SU
MM-800/U
MM-800/SU
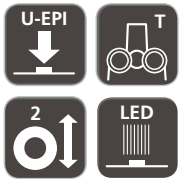
Configured with PS 12x8C stage, LV-U EPI2
universal epi-illuminator, tilting trinocular
eyepiece tube with built-in reticle

MM-400/LU
MM-400/SLU
MM-800/LU
MM-800/SLU
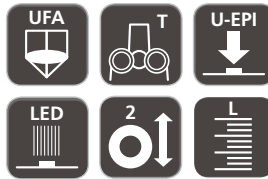
Function Icons

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.

L Built-in Z-axis Linear Scale
Z-axis reading is possible for non-contact height measurement.

T Trinocular Optical Head
Ideal for configuration with photomicrography equipment.

M 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 µm (Type 2)*1*2	PS 12x8C, PS 10x6B, PS 8x6B
• 2.0+L/50 µm (Type 1)*2 • 2.5+L/50 µm (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 that 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) µm
- ■ High-precision Type 1: (2.0+L/50) µm
- ◆ High-precision Type 2: (1.5+L/100) µm

Error

0

Travel distance
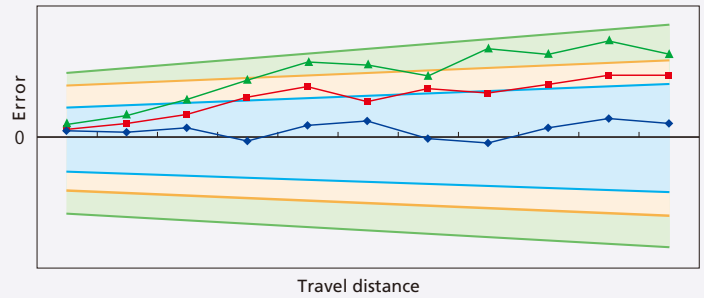
Plastic Gear Teeth with Smaller Module
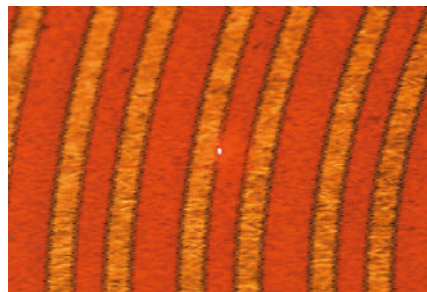
Laser AF Tracking on FPC
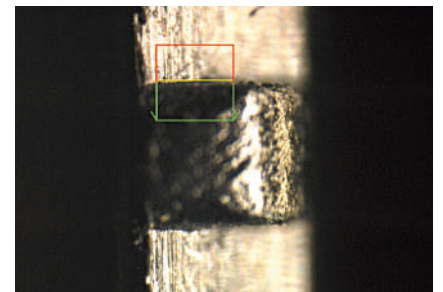
Black Injection Molding Parts - Connector
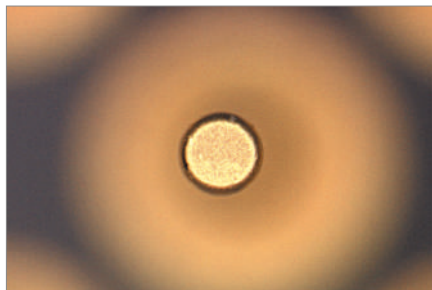
PGA - Insertion Pin
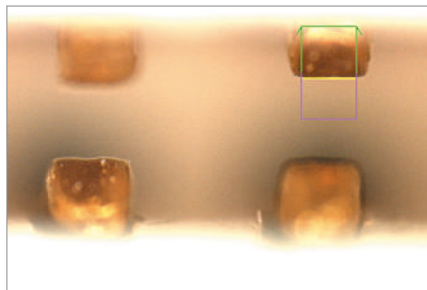
Connector - Housing Inside
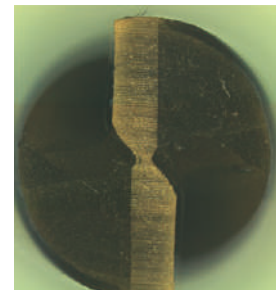
Drill Bits

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 contoller 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)[1]				
	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

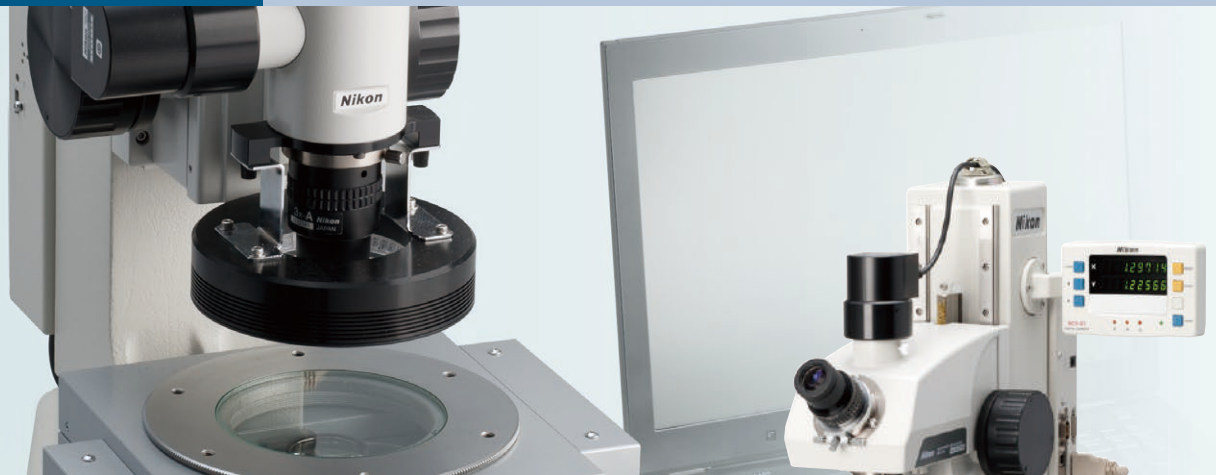| Type		MM-800	MM-800/S	MM-800/L	MM-800/SL	MM-800/LM
Z-axis movement		Manual (dual side coarse/fine focus knob)				Motorized (max. speed: 10 mm/sec)
MM contoller backpack interface		Built-in	—	Built-in	—	Built-in
Optical head		Monocular optical head, Trinocular optical head		Monocular optical head, Trinocular 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[2]				
Light source	Diascopic	LED diascopic illuminator (standard), 12V-50W halogen light source (option)[1]				
	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 diascopic 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[1], MM-LL LED Lamphouse (option for LV-U EPI and LV-U EPI2)[1]				
	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[2]						
	LED diascopic illuminator (standard), 12V-50W halogen light source (option)[1]						
	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)[1]						
	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

A3 Size

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 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 (WD)	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 mm (W x D x H), 40 kg	
Input voltage range	100 - 240 V (Max. 1.8 A)	

MM-200 System Diagram

MBJ99000
Eye Guard for
CFWN 10x Eyepiece

EDH20410
Concentric Circles
(0.2-4.6 mm diameters
in 0.2 mm increments)

EDD52000
Epi-illuminator for
MM Monocular
Optical Head

C-mount Camera   MM Camera V2

EDG20100
Eyepiece 10x

EDG40105
MM Eyepiece Lens 10x
for Monocular Head

EDC50100
MM-200
C-mount Video
Head

PPL00200 XY Reset Switch

PPL00100 Counter Remote Switch

EFE00202 Foot Switch 4

EDG20600
Protractor 10′ Reading

EDC50305
MM-200 Monocular
Optical Head

EDG20701
Protractor 1′ Reading A

PXA20224
Connection Cable for Simultaneous Use
of Remote and Foot Switch

EDG50700 Digital Protractor for
Monocular Head

EDF20010
TM Objective Lens 1x
EDF20031
TM Objective Lens 3x
EDF20052
TM Objective Lens 5x
EDF20102
TM Objective Lens 10x

EDF50001
Measuring Microscope
Objective Adapter

EFB50200
2-axis Digital Counter
SC2-E1

PPG40000
Tilting Center Fixture A

EXA20409
Illuminator Adapter

MME39610
C-FID Bifurcated
Fiber Light Guide

MNF52760 C-FLED LED2
Light Source for Fiber
Illuminator

EXK30024
8-segment
LED Ring Light

MXK60234
LED Ring
Illuminator

MMF34910
C-FRL Fluorescent
Ring Lamp 8 W

MME39610
C-FIR Ring Fiber
Illuminator Guide

MMF32920/MMF32940
C-FPS115/230
Fluorescent Ring
Illuminator with Transformer

EDA52000
MM-200 Stand
MM Controller Backpack Interface
Z: Manual Motion

EXA20411 E-BUS Cable

E-MAX
V2 Type → Desktop PC

E-MAX
D Type → Desktop PC

EFB51500
DP-E1A Data Processor Unit

PAE00102
MM AC Adapter

PAE08210
Power Cord (100-120V)
PAE08410
Power Cord (220-240V)

MM-200 Dimensional Diagram

Unit: mm

Monocular Eyepiece Head

109

128.3   115

532.5

398~508

315~425

170

220

144.5   171

171

455

C-mount Video Head

109

115
Ø63

532.5

315~425

170

220

144.5   171

171

455

99   94

198

Ø107 Ø124 Ø150

6XM6 7 mm Depth
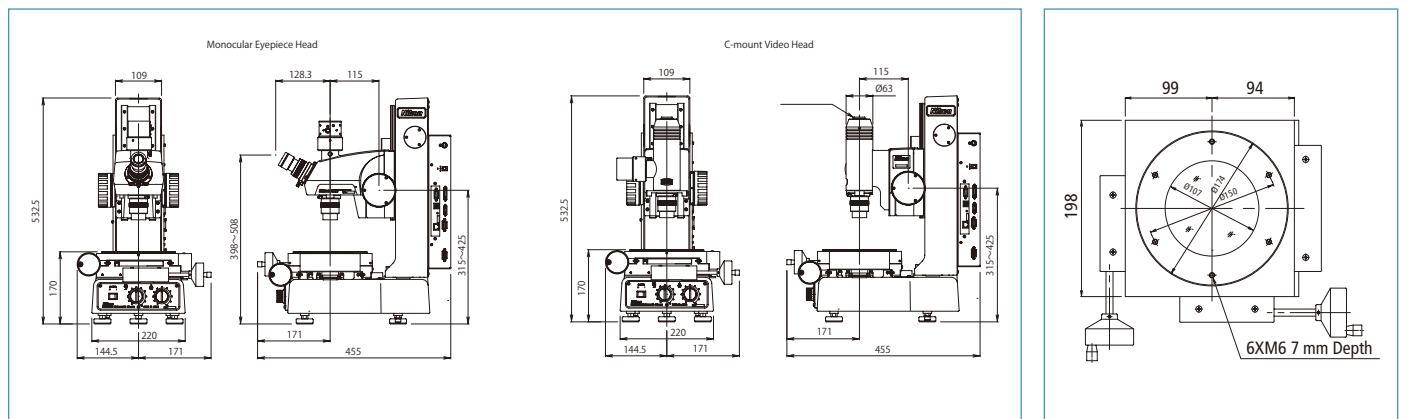
Stages

Stages for MM-800 series

PS 12x8C
Stage

16-M6 depth 10 tool installation screw hole

Stage glass

Ø450

PS 10x6B
Stage

12-M6 depth 10 tool installation screw hole

Stage glass

Ø400

PS 8x6B
Stage

10-M6 depth 10 tool installation screw hole

Stage glass

Ø350
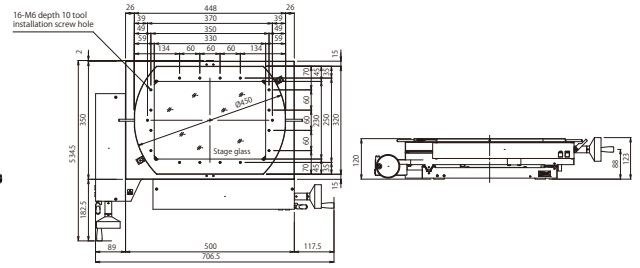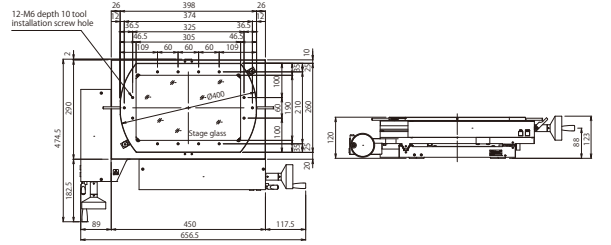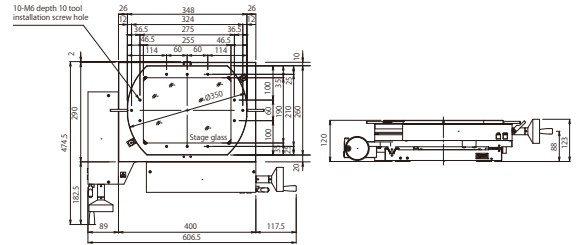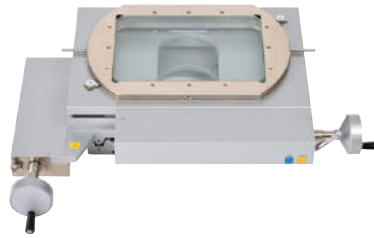
Stages for MM-400 series

PS 6x4B
Stage

10-M6 depth 10 tool installation screw hole

Stage glass

PS 4x4B
Stage

8-M6 depth 10 tool installation screw hole

Stage glass

PS 2x2B
Stage

6-M6 depth 7 tool installation screw hole7

Cable length: approx. 1,000mm
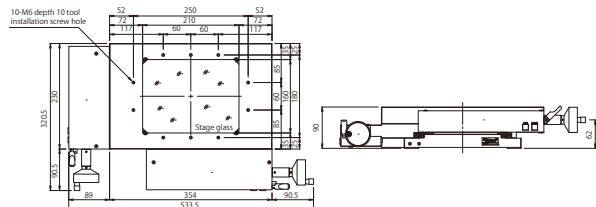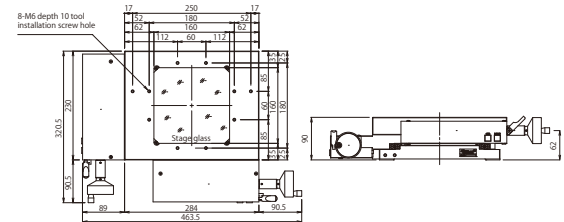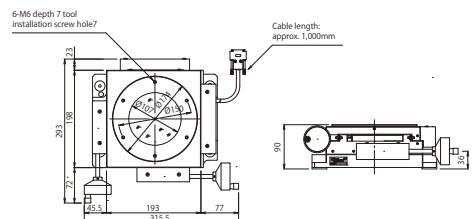
Stage specifications

Type	Surface area	Stage glass dimensions	Stroke	Reading method	Min. reading	Rotation range	Tool installation screw hall	Loading capacity	Weight (approx.)
PS 12x8C	448 x 320 mm	330 x 230 mm	300 x 200 mm	Linear encoder	0.0001 mm	±3° (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	ø174 mm	ø107 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.
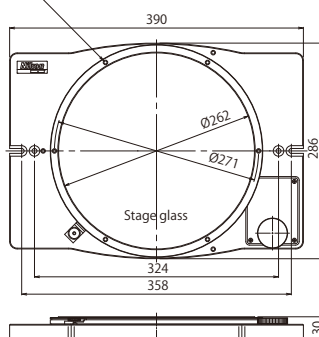
Rotating Table Type 3
For PS 6x4B, PS 4x4B
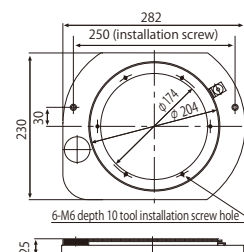
*When using rotating table type 4, stage stroke is limited for X and Y axis.

Rotating table specifications

	Table size	Glass insert size	Rotation range	Tool installation screw hole	Weight (approx.)
Rotating table type 4	ø282 mm	ø262 mm	360° (uncalibrated)	6-M6 depth 9	8 kg
Rotating table type 3	ø204 mm	ø165 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.)
ø68 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
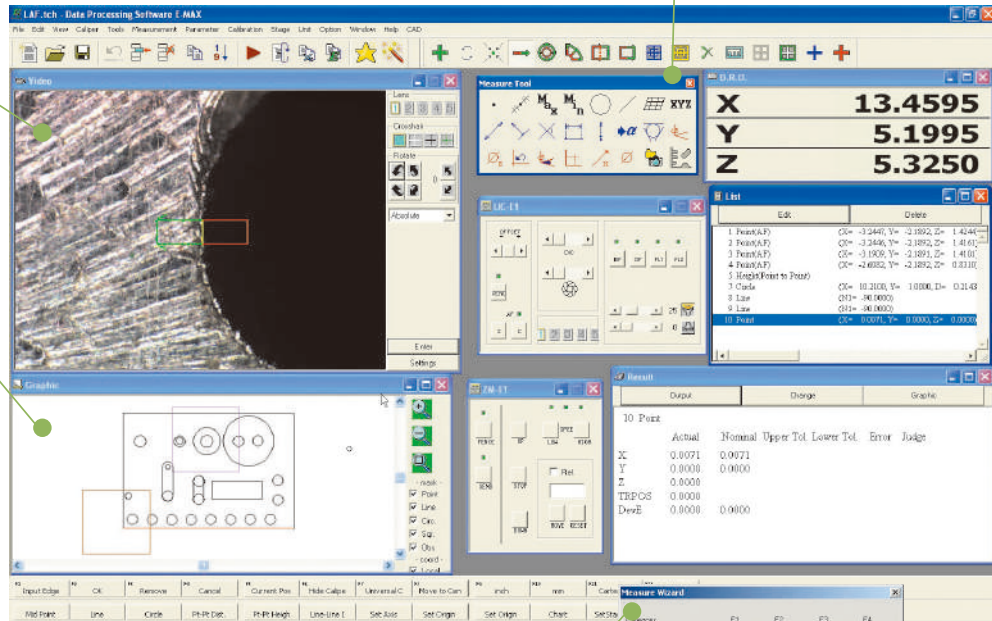
Interactive operation wizards

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.
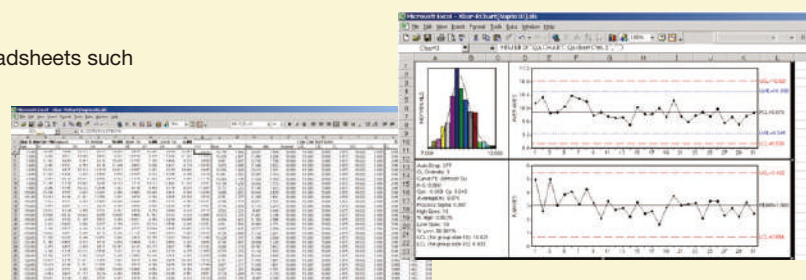
DP-E1A

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.
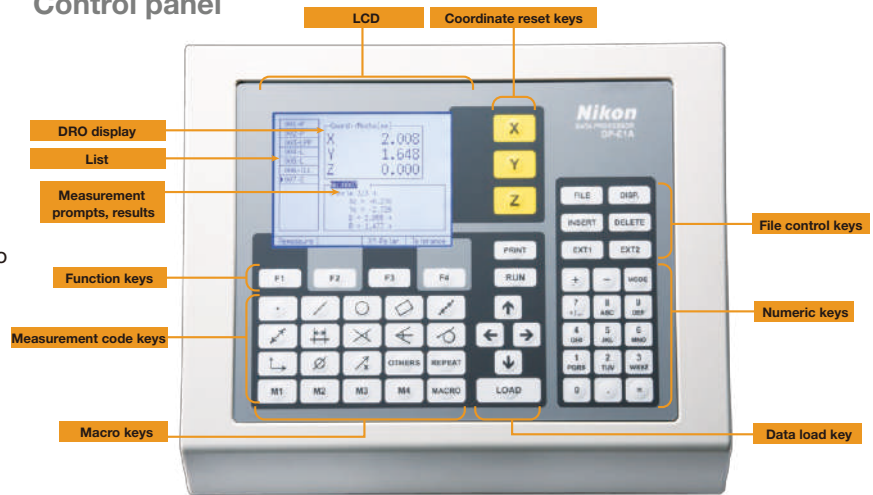
Multi-language support

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

Control panel

LCD / Coordinate reset keys / DRO display / List / Measurement prompts, results / Function keys / Measurement code keys / Macro keys / File control keys / Numeric keys / Data load key

---

Measure code key

[Basic feature elements]

• Point
Calculates entered measurement point, or average point from multiple points

• Line
Calculates line from two entered measurement points or from multiple points by least-square method

• Circle/arc
Calculates circle from three entered measurement points or from multiple points by least-square method

• Rectangle
Calculates square from entered five measurement points

[Constructed elements]
• Mid-point
Calculates middle point from two measured points

• Pitch
Calculates pitch between multiple measured points

• Mid-line
Calculates middle line from two measured lines

• Distance
Calculates distance between two measured points

• 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

Macro code key
• Macro key

M1

• Macro setup key
Registers combination of measurement codes for macro keys (M1 to M4)

MACRO

File key
[File run]
• Run key
Runs teaching file

RUN

• Repeat key
Sets up repetition number of teaching file

REPEAT

[File control]
• Print key
Conducts print output at discretionary timing during teaching

PRINT

• File key
Shows menu to access file for file controls

FILE

• Insert key
Inserts measurement codes between list items

INSERT

• Delete key
Deletes measurement code and entered measurement point
Deletes file during file control

DELETE

Display setting key
• Disp. key
Switches display settings

DISP.

Data input key
• Load key
Enters measurement points

LOAD

Accessory function key
• Ext1 key
Sets up print out of standard deviation

EXT1

• Ext2 key
Reserved

EXT2

• Others key
Reserved

OTHERS

Function key
• Function key
Performance differs depending on displayed screen and item

F1

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

Accessories

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
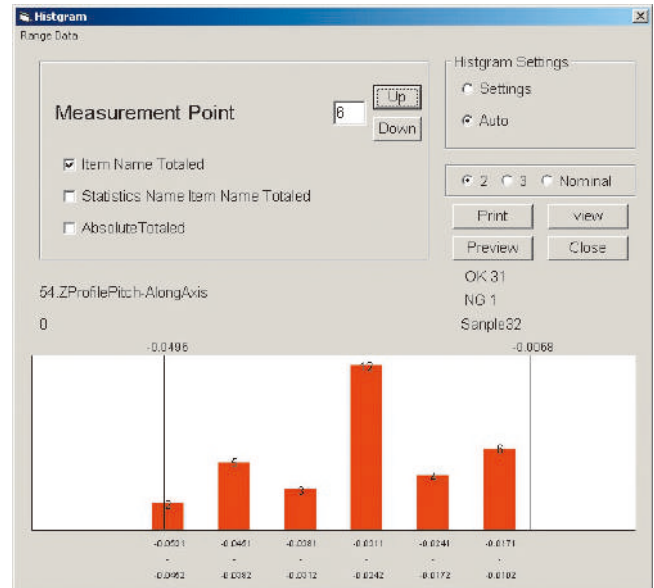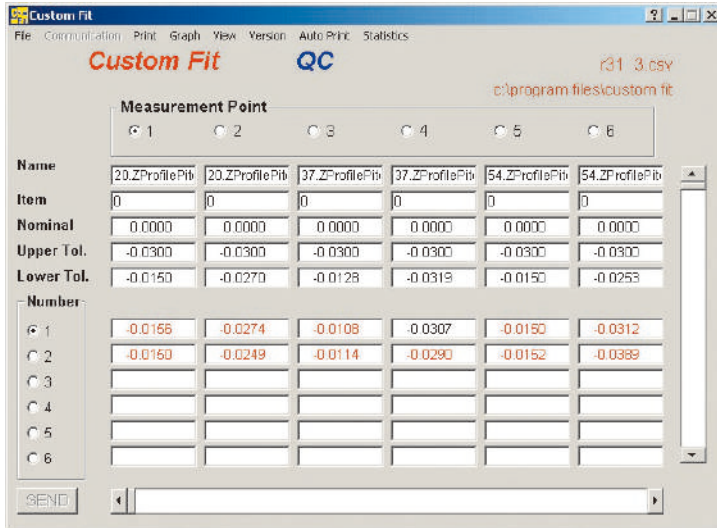
Custom Create: Direct link to Excel worksheets

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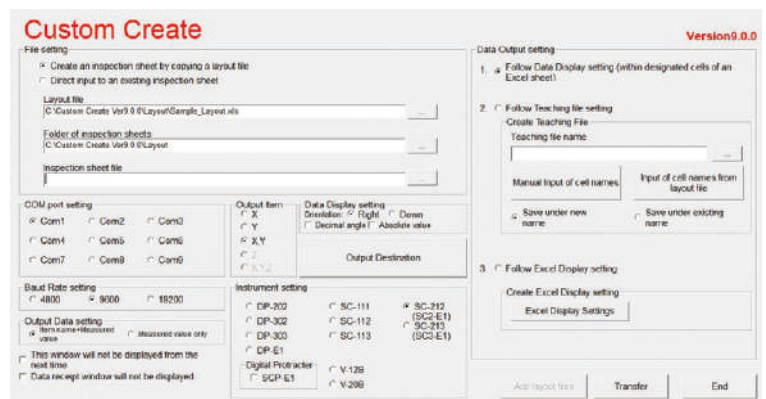
Operating environment: Windows®7 or Windows®10
Microsoft Excel® 2003 or later
Required memory: 512MB (min)
Codevelopment: Aria Co., Ltd.

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.

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
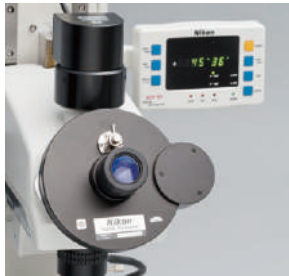
1-Minute Reading Eyepiece

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°.
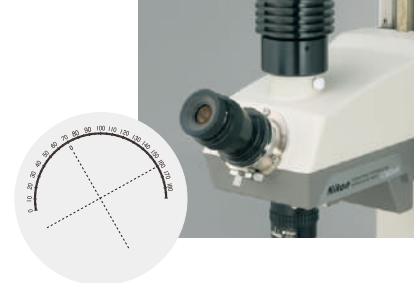
Illuminators

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
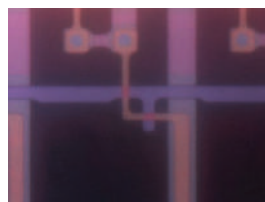
Without correction (50x)　　　With correction at 0.7mm (50x)
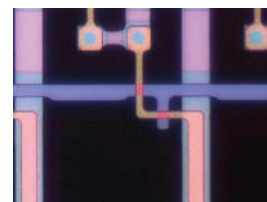
CFI60/CFI60-2 Series

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
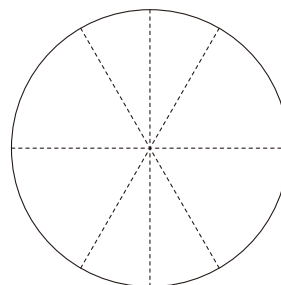
Standard
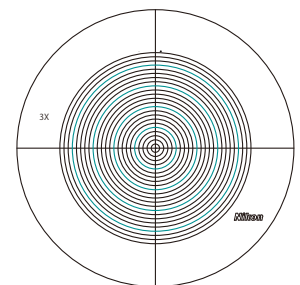
Concentric

Dimensional Diagram

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

MM-400/M
PS 2x2B Stage

MM-400LV
PS 6x4B Stage

MM-400/L
PS 4x4B Stage

MM-800/L
PS 10x6B Stage

MM-800/LM
PS 12x8C Stage
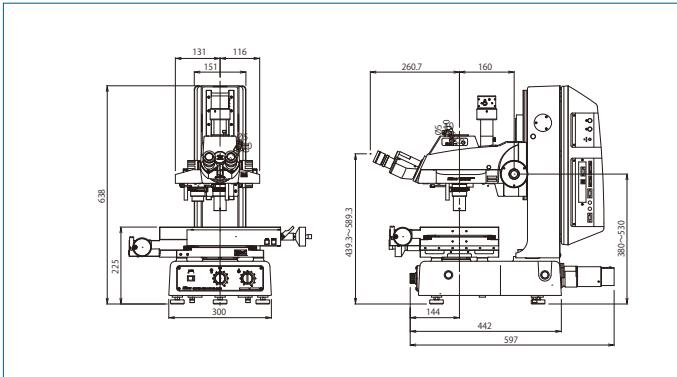
MM-400/LUFA
PS 6x4B Stage
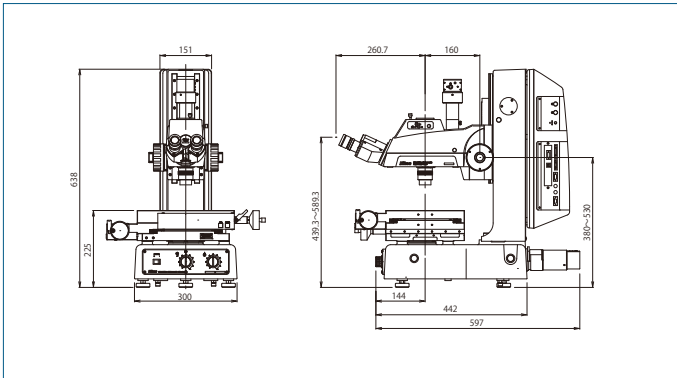
MM-800/LU
PS 8x6B Stage
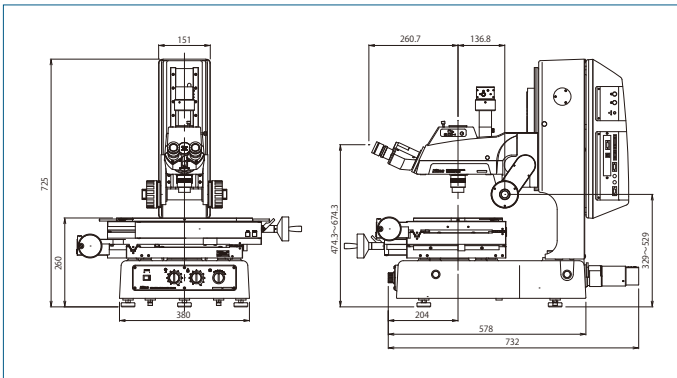
MM-800/LMU
PS 12x8C Stage

MM-400/800 System Diagram

MBJ99000
Eye Guard for
CFWN 10x Eyepiece

EDG40105
MM Eyepiece Lens 10x
for Monocular Head

C-mount Camera

MM Camera V2

EDG20100
Eyepiece 10x

EXA20340
Monocular Eyepiece
Tube Adapter

MQD42005
C-mount Adapter

EDG20600
Protractor 10' Reading

MBB63435
LV-TV Tube

MBJ20105
ME CFWN 10x

EDB40205
Binocular Tube

EDG20701
Protractor 1' Reading A

EDG50700
Digital Protractor
for Monocular Head

MBE60300
LV-U EPI2

MBE60201
LV-UEPI-N

EDH40400
Concentric Circles
Reticle (0.2-4.6mm
diameters in 0.2mm
increments)

EDD50001
LED Epi-illuminator

EDD52001
Epi-illuminator for
MM400/800 Monocular
Optical Head

EDC50005
Trinocular Optical Head

EDC50200
Trinocular Optical
FA Head

EDC51000
Variable Magnification
Optical Head

EDC51200 FA
Variable Magnification
Optical Head

EDC52005
Monocular Optical Head

EDC54005
U Bracket Mount LV

Objective Lens

Objective Lens

EXK30083 8-segment Ring
Illuminator for Variable
Magnification Optical Head

EDF50001
Measuring Microscope
Objective Adapter

EXA20411
E-BUS
Cable

EDF20010
Objective Lens 1x

EDF20031
Objective Lens 3x

EDF20052
Objective Lens 5x

EDF20102
Objective Lens 10x

EDF20201
Objective Lens 20x

EDF20501
Objective Lens 50x

EDF21001
Objective Lens 100x

EDA54300 EDA54400
MM-400/S 400/SL Stand
Z: Manual Motion
SL: Z-axis Scale

EDA54000 EDA54100
MM-400 400/L Stand
MM Controller Backpack Interface
Z: Manual Motion
L: Z-axis Scale

EDA54200
MM-400/LM Stand
MM Controller Backpack Interface
Z Motorized Control with Linear Scale

EXA20409
Illuminator Adapter

MME39610
C-FID Bifurcated
Fiber Light Guide

MNF52760
C-FLED2 LED Light Source
for Fiber Illuminator

EDD51001
LED Dia-illuminator

EXK30024
8-segment
LED Ring Light

MXK60234
LED Ring
Illuminator

MME49600
C-FID2 Double
Arm Fiber Light
Guide

EDD55810
MM-LL LED
Lamphouse

MXA23045
LV-HL50W
12V50W-LL
Halogen Lamp

MEF52251
TI-PS100W
Power Supply

EDD52200
Halogen Light
Intensity
Control Cable

EDD55805
MM-U Epi
Lamphouse LV

MXA 20095
12V50W Lamp

EXA20411 E-BUS Cable

MBB92106
C-TB Binocular Tube

MBB63425
LV-TI3 Trinocular
Eyepiece Tube

EDB50300
LV-TT2 Tilting Trinocular Eyepiece Tube
with Built-in Reticle

K

PPG40000
Tilting Center
Fixture A

PXA20225
Large Stage Adjustment Knob

PPE50110
Rotating Table Type

PPB27700
PS 2x2B Stage

PPB57700
PS 8x6B Stage

B

A

EDC52200
LV-U EPI FA

MBE60500
LV-EPI LED

E

G

R

PPE42100
Rotating Table Type 3

PPB37700
PS 4x4B Stage

PPB67700
PS 10x6B Stage

B

A

PPB47700
PS 6x4B Stage

L-NU5 U5 Nosepiece
MBP60115

L-NBD5 BD5 Nosepiece
MBP60125

C-N6 Nosepiece
MBP71315

PPB77700
PS 12x8C Stage

B

MXA23017
LU Nosepiece Adapter
M32-25

A

TU PLAN FLUOR BD
Objective Lens
MUE42050, etc.

TU PLAN FLUOR EPI
Objective Lens
MUE12050, etc.

EFH28000
MM Stage Adapter for MM800

B

P

P

J

B

B

B

E

E

E

F

F

F

EDA58300 EDA58400
MM-800/S 800/SL Stand
Z: Manual Motion
SL: Z-axis Scale

EDA58000 EDA58100
MM-800 800/L Stand
MM Controller Backpack Interface
Z: Manual Motion
L: Z-axis Scale

EDA58200
MM-800/LM Stand
MM Controller Backpack Interface
Z Motorized Control with Linear Scale

PPL00200
XY Reset Switch

J

Q

Power Source Unit for
Motorized Z-axis

EFB50200
2-axis Digital Counter
SC2-E1

EFE00202
Foot Switch 4

PPL00100
Counter Remote
Switch

PAE00102
MM AC Adapter

P

PAE08210/410
Power Cord

Q

E-MAX
V2 Type

Desktop PC

Motorized Z-axis Console

EFB50300
3-axis Digital Counter
SC3-E1

EFB51500
Data Processor Console
DP-E1A

P

E-MAX
D Type

Desktop PC

MQF52056
DS AC Adapter

R

Suggested Configuration Chart

MM-Type

	Product Code	Data Processors / Description	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
		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

Section	Product Code	Description	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
		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	No
		MM Controller Backpack Interface	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No
		Stage	PS 4x4B	PS 4x4B	PS 6x4B	PS 8x6B	PS 12x8C	PS 10x6B	PS 12x8C	PS 12x8C	PS 10x6B
		Head	C-TB	TT2	TI3	TI3	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 EPI2	LV-U EPI FA
		Illuminators	–	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						✓			
Data Processing System and Printer	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		✓	✓		✓		✓	✓	
U-Epi Illuminators	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)			✓					✓	
Filters and Light Sources	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		✓	✓					✓	
Tubes and Eyepiece Lenses	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	✓		✓	✓					✓
Revolving Nosepiece	MBP60115	L-NU5 U5 Nosepiece ESD		✓	✓		✓		✓		
	MBP60125	L-NBD5 BD5 Nosepiece						✓			
	MBP71316	C-N6 Nosepiece (up to 5 objective lenses)	✓			✓					✓
Objective Lenses and Accessories	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		✓	✓		✓		✓	✓	
	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)

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

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/

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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
Email: 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

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

NIKON METROLOGY GMBH
GERMANY phone: +49-6023-91733-0 fax: +49-6023-91733-229
E-mail: 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
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

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

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

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