



Microscope Components for Reflected Light Applications



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Select a Nikon microscope unit for your manufacturing equipment and other systems that require high precision

The development, manufacture, and evaluation of products require sub-micron precision, as symbolized by semiconductor manufacturing technology.

Nikon's microscope units support such high precision and can be integrated with a variety of equipment.

This catalog presents technical data on using Nikon's microscope units.

Select a microscope unit to integrate with Nikon equipment that supports the CFI60 and CF&IC optical systems – for experiments and research, as well as manufacturing and inspection.

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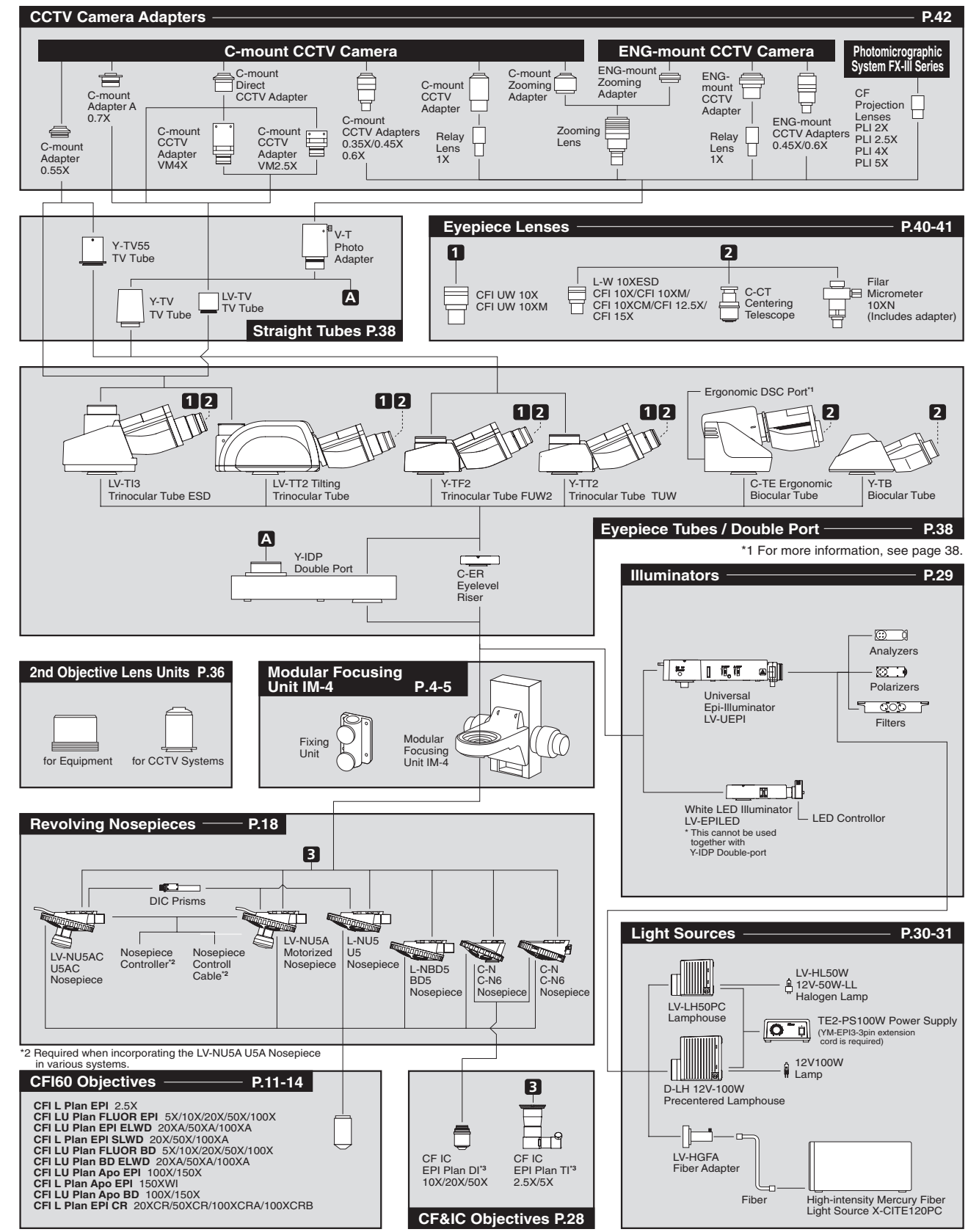
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CFI60
optical system
(for modular
focusing unit)

The term "CFI60" indicates a CF (Chromatic Aberration-Free), Infinity optical design with a parfocal distance of 60mm. The CFI60 optical system provides higher NA's and longer working distances while producing images that are crisp and clear with high contrast and minimal flare.

System Diagram & Index



Modular Focusing Unit IM-4

Accommodates an epi-illuminator and motorized nosepiece or a maximum load of 10kg by adding a balancer.
Accommodates the LV-UEPI or LV-EPILED universal illuminator as well as a motorized nosepiece.

- Fully compatible with the CFI60 optical system, a fusion of Nikon's CF design and infinity optics that significantly reduces flare.
- Attachment of the LV-UEPI Universal Epi-illuminator enables the use of brightfield, darkfield and, Nomarski DIC techniques.
- The built-in balancer ensures smoother vertical motion, even when the arm is heavily loaded.
- The standard maximum load is 4kg, which is expandable to 10kg by adding a balancer.
- A coarse motion stroke of 5.2mm per revolution improves the equipment's load handling capability and increases durability.
- The distance from the optical axis to the mounting surface is 141mm, the same distance as IM-3.

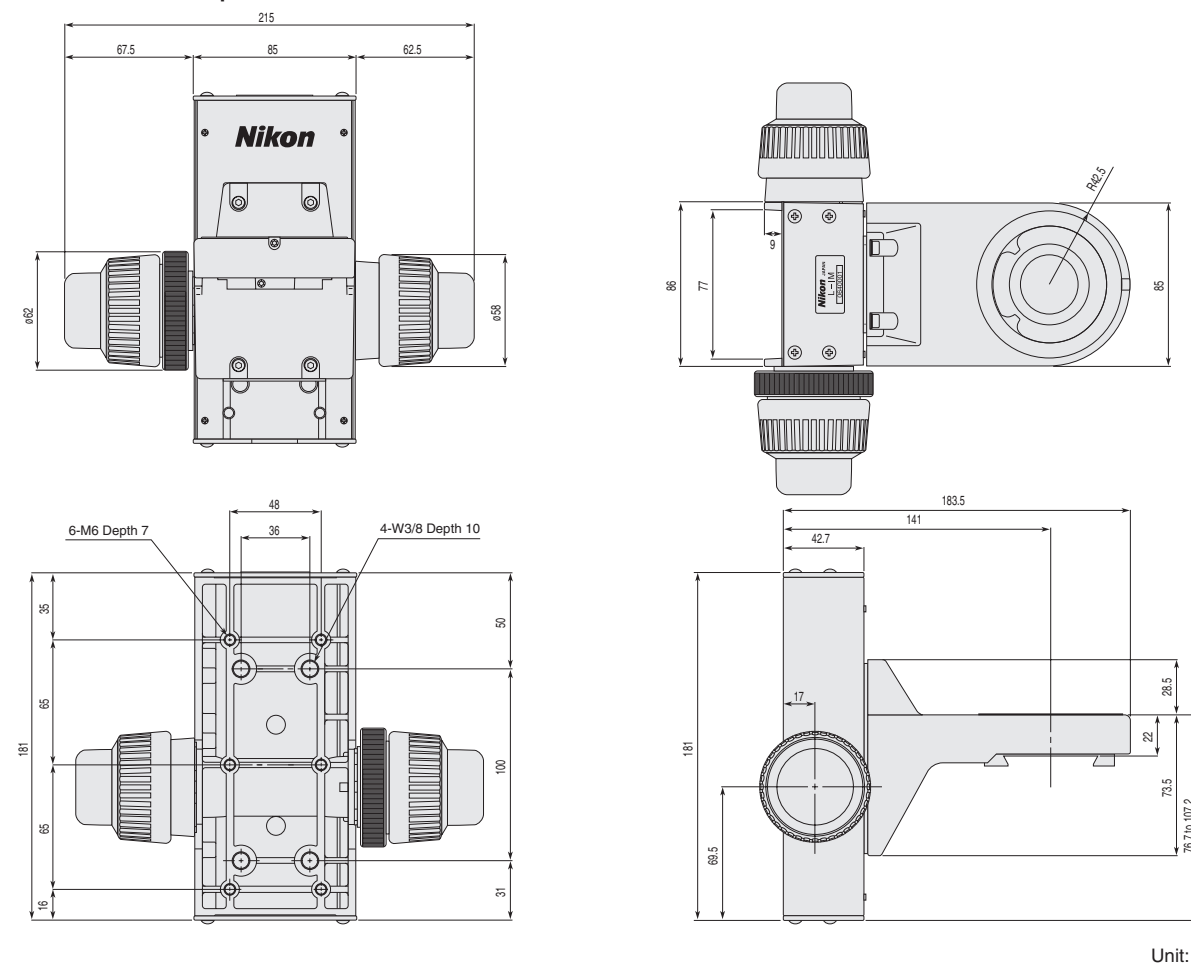
Note: For adding a balancer, consult your Nikon representative.



Modular Focusing Unit IM-4
MBD64010/2000g

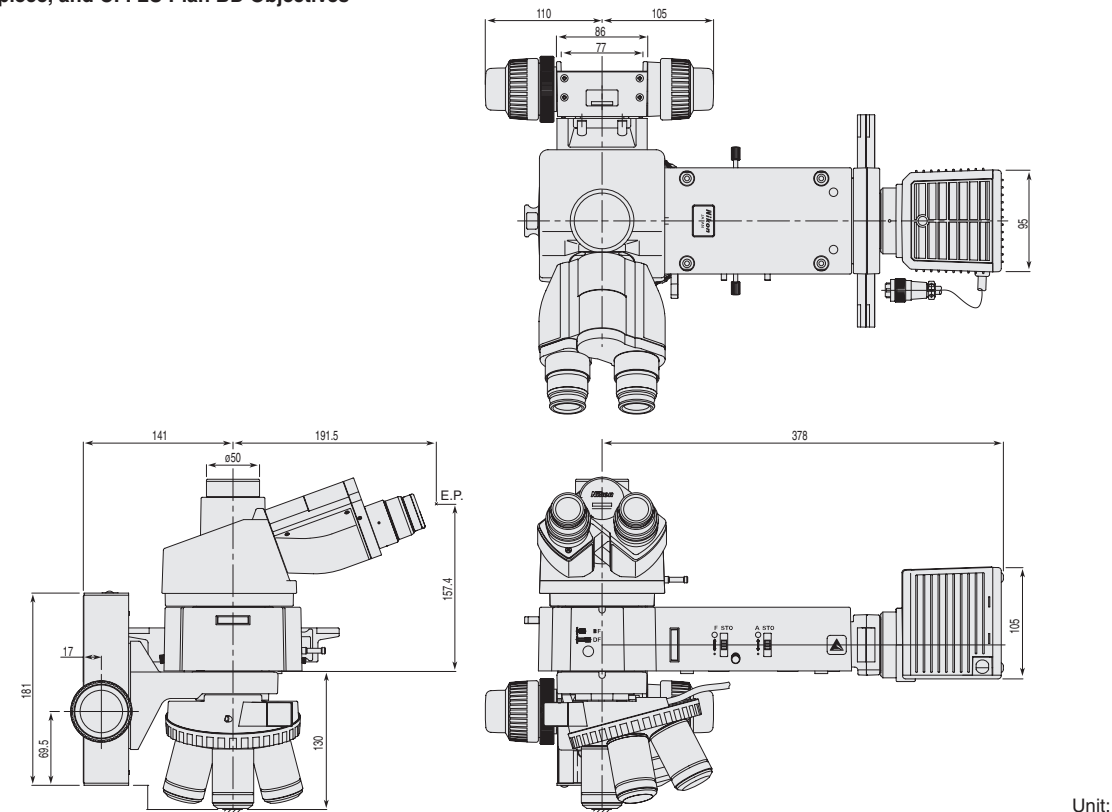
Stroke	30mm
Coarse focusing	5.2mm/rotation
Fine focusing	0.1mm/rotation
Scale	1μm

Dimensions of the IM-4 as a Separate Unit



Unit: mm

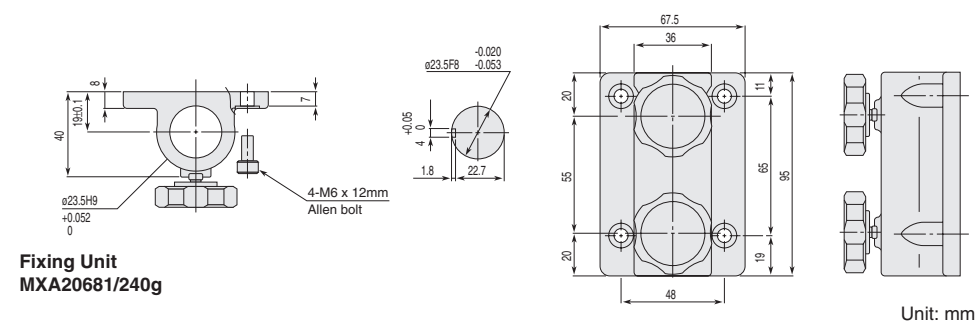
Modular Focusing Unit IM-4 configured with: LV-TI3 Trinocular Eyepiece Tube, LV-UEPI Epi-Illuminator, LV-LH50PC Precentered Lamphouse, L-NU5A U5A Nosepiece, and CFI LU Plan BD Objectives



Unit: mm

Fixing Unit (Option)

Used to attach the Modular Focusing Unit IM-4 to a ø23.5mm post.



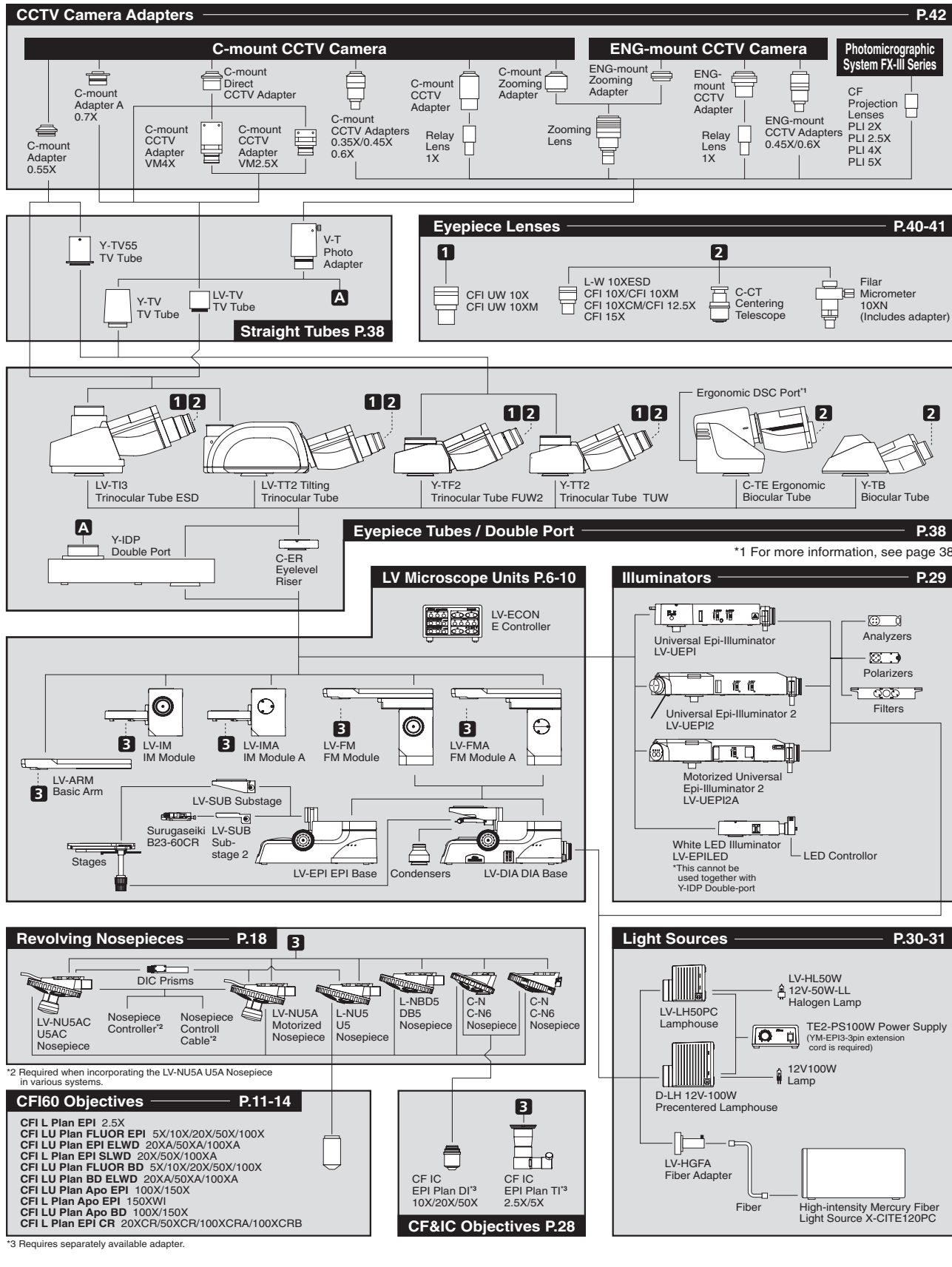
Fixing Unit
MXA20681/240g

Unit: mm



The term "CFI60" indicates a CF (Chromatic Aberration-Free), Infinity optical design with a parfocal distance of 60mm. The CFI60 optical system provides higher NA's and longer working distances while producing images that are crisp and clear with high contrast and minimal flare.

System Diagram & Index



LV-IM IM Modules

This focusing module is suitable for incorporation into systems. It enables the mounting of a universal illuminator (LV-UEPI/LV-UEPI2/LV-UEPI2A or LV-EPILED) and a motorized nosepiece.

LV-IMA IM Module A (Motorized)

- Selectable mounting surface (back or bottom).
- 20-mm vertical stroke.
- Dramatically improved rigidity enables the mounting of the LV-UEPI2A motorized universal illuminator, etc.
- External control is possible via LV-ECON E Controller.



LV-IMA IM Module A (Motorized)
MBD64070/4000g

Vertical stroke	20mm
Resolution	0.025 μ m
Max. speed	2.5mm/sec (Resolution 0.05 μ m)

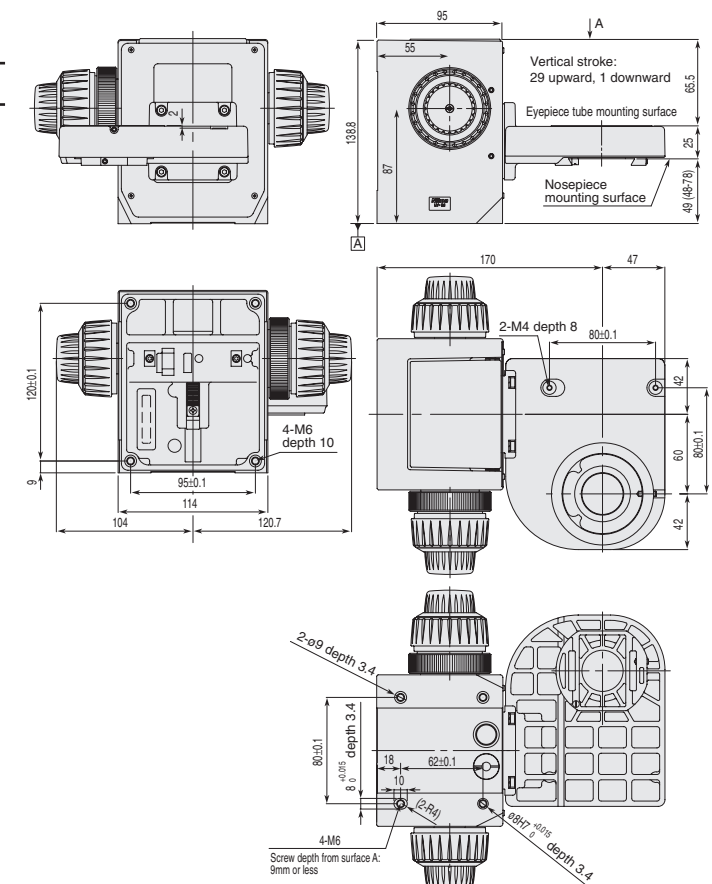
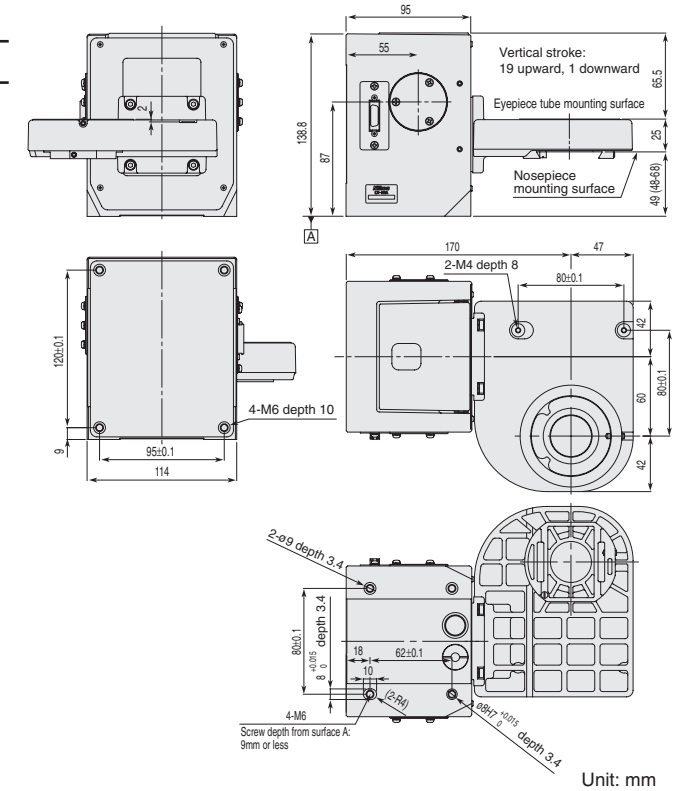
LV-IM IM Module (Manual)

- Selectable mounting surface (back or bottom).
- 30-mm vertical stroke.
- Dramatically improved rigidity enables the mounting of the LV-UEPI2A motorized universal illuminator, etc.



LV-IM IM Module (Manual)
MBD64080/4000g

Stroke	30mm
Coarse focusing	5.2mm/rotation
Fine Focusing	2.5mm/rotation
Scale	1 μ m

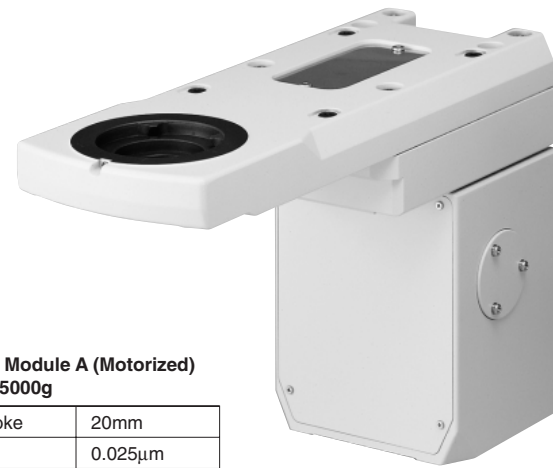


LV-FM FM Modules

This focusing module is suitable for incorporation into systems. It enables the mounting of a universal illuminator (LV-UEPI/LV-UEPI2/LV-UEPI2A or LV-EPILED) and a motorized nosepiece.

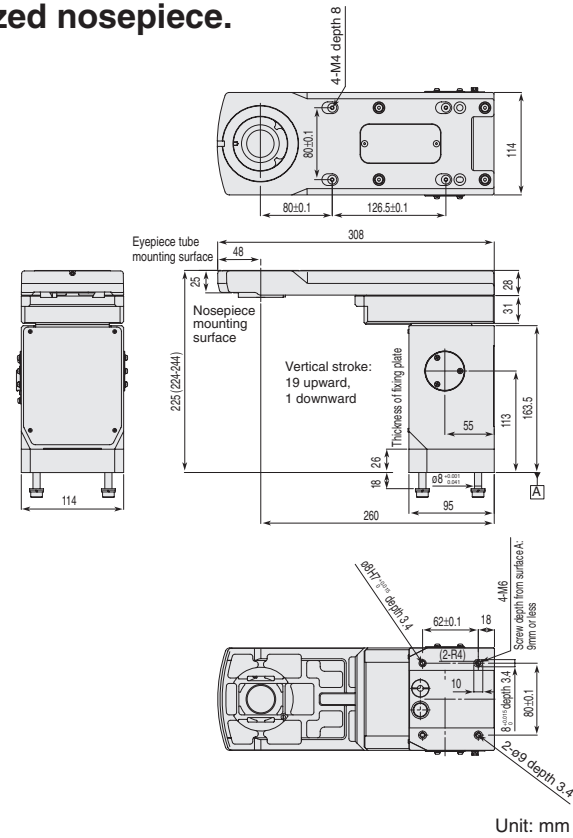
LV-FMA FM Module A (Motorized)

- Only the bottom mounting surface is supported.
- 20-mm vertical stroke.
- Enables an enhanced system with motorized up/down mechanism when combined with the LV-DIA DIA Base or LV-EPI EPI Base.
- External control is possible via the LV-ECON E Controller.



LV-FMA FM Module A (Motorized)
MBD65040/5000g

Vertical stroke	20mm
Resolution	0.025μm
Max. speed	2.5mm/sec (Resolution 0.05μm)



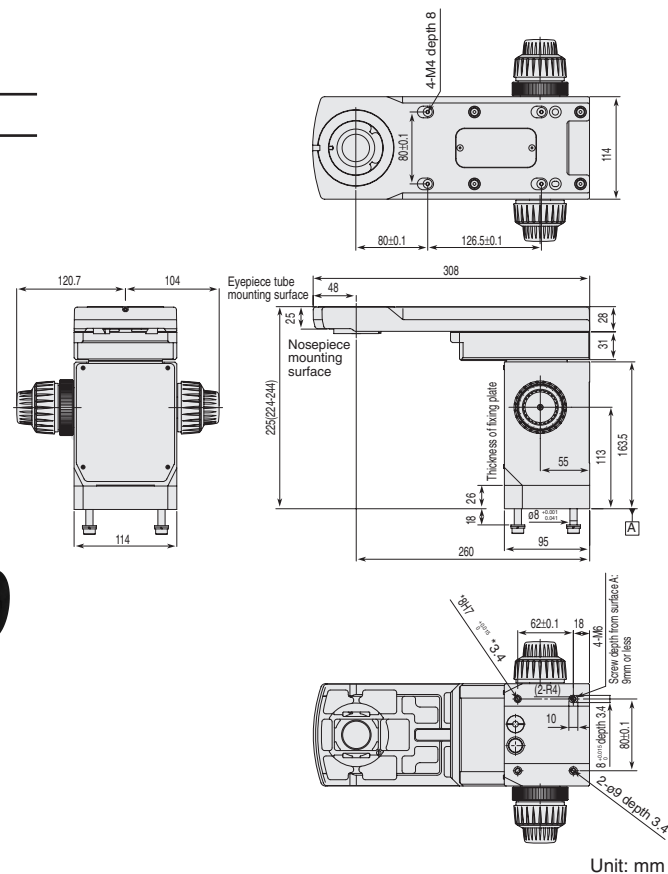
LV-FM FM Module (Manual)

- Only the bottom mounting surface is supported.
- 30-mm vertical stroke.
- Creates a system with revolving up/down mechanism that has an ultra-long vertical stroke of 68 mm when combined with the LV-DIA DIA Base or LV-EPI EPI Base. Optimal for operations such as semiconductor probe inspections.



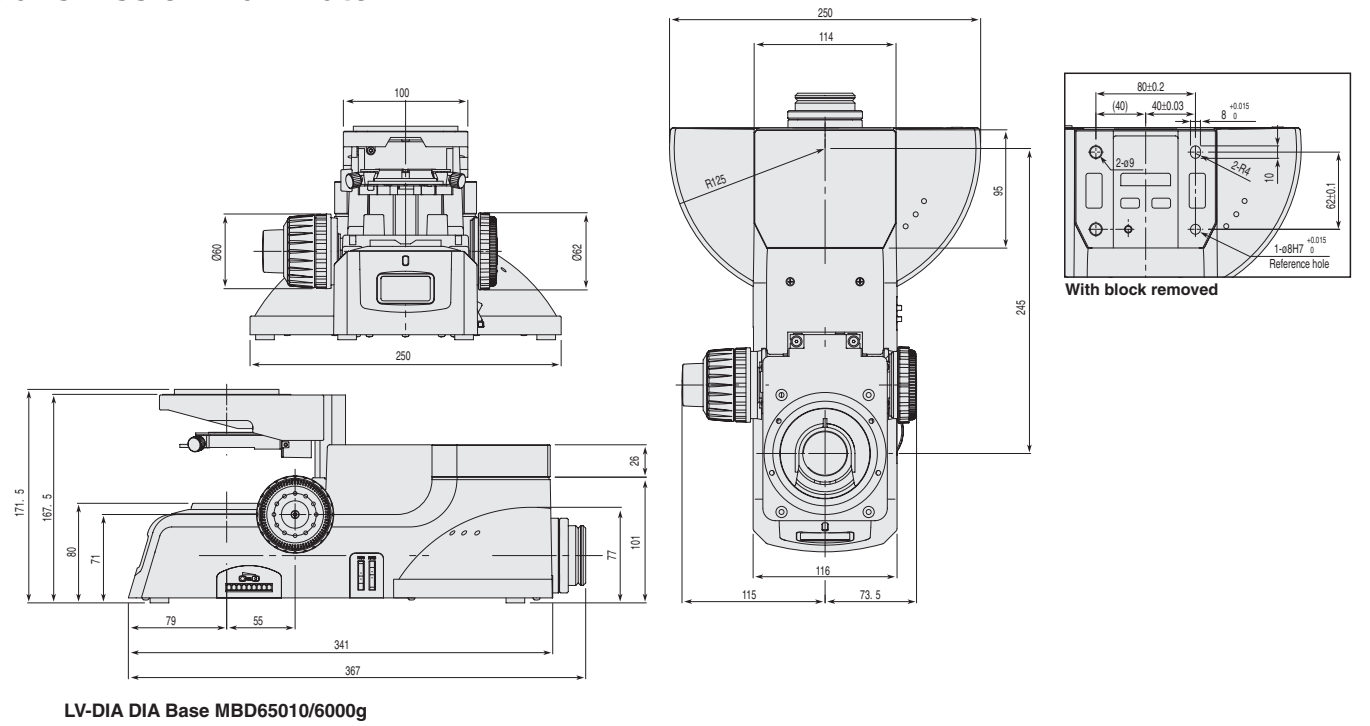
LV-FM FM Module (Manual)
MBD65050/5000g

Stroke	30mm
Coarse focusing	5.2mm/rotation
Fine Focusing	2.5mm/rotation
Scale	1μm



LV-DIA DIA Base

This base unit is for the ECLIPSE LV series of modular microscopes. The attachment of an optional power source enables the incorporation of a transmission illuminator.

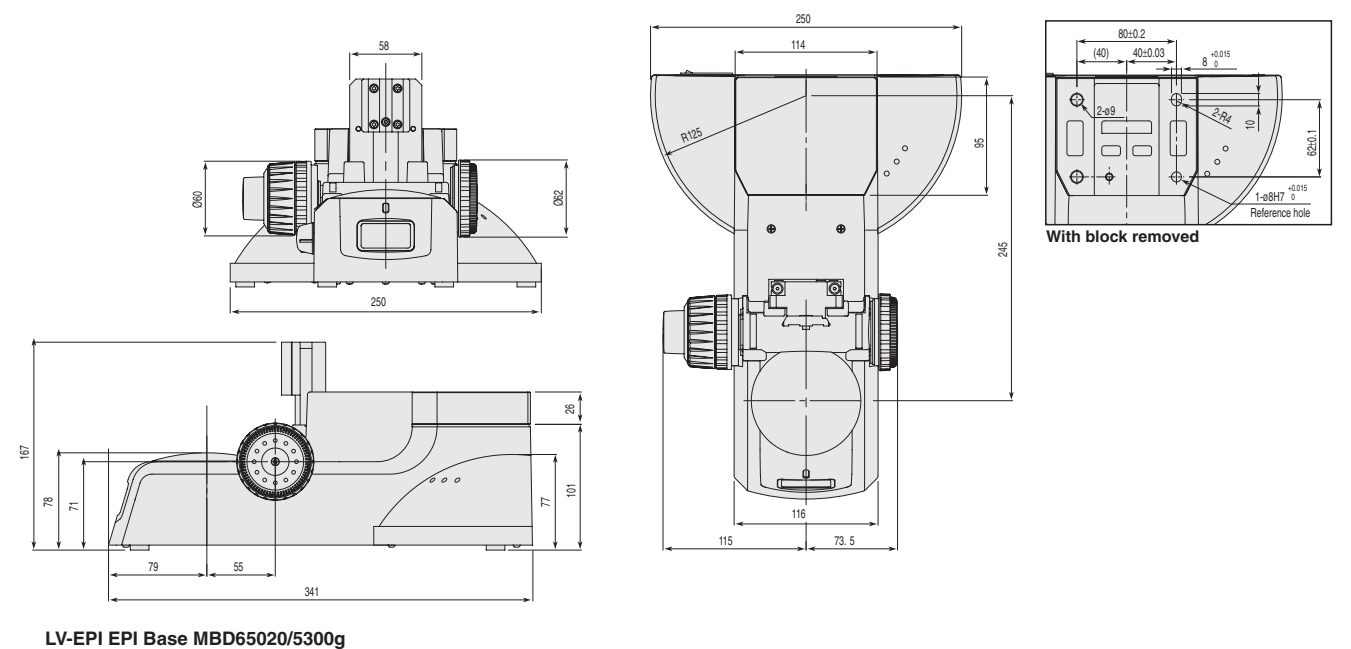


LV-DIA DIA Base MBD65010/6000g

Unit: mm

LV-EPI EPI Base

This base unit is for the ECLIPSE LV series of modular microscopes.

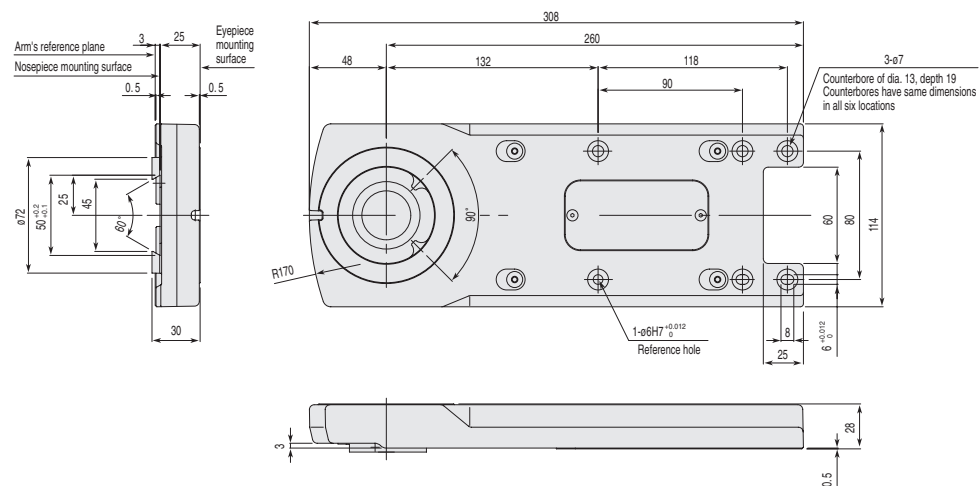


LV-EPI EPI Base MBD65020/5300g

Unit: mm

LV-ARM Basic Arm

This arm unit is for the ECLIPSE LV series of modular microscopes.



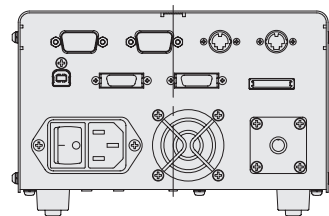
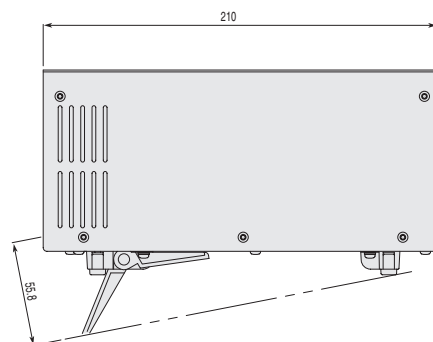
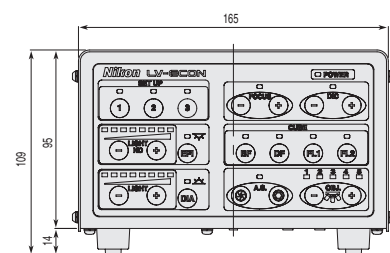
LV-ARM Basic Arm MBD65030/1400g

Unit: mm

LV-ECON E Controller

This controller enables external control of various units from a PC and other devices.

- Enables external control of motorized universal reflection illuminators and various light sources, universal motorized revolvers, and motorized focusing modules from a PC or other devices.
- Communication with PC possible via USB 1.1.
- Max. 11° inclination when using tilt (unit's feet).

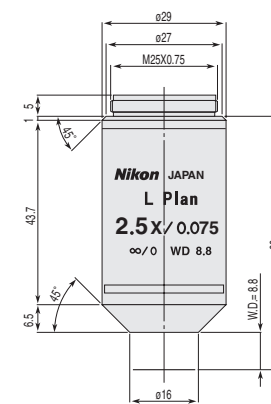


LV-ECON E Controller MBF12200/2000g

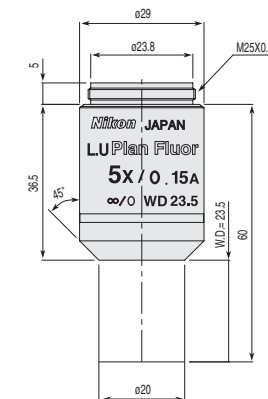
Unit: mm

CFI L Plan EPI/CFI LU Plan FLUOR EPI Brightfield Objectives

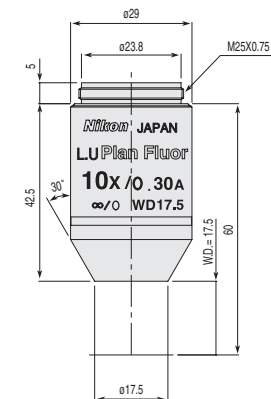
CFI60 objectives for brightfield use; Nomarski DIC is also possible with the LU type. Working distances of the 5X to 100X objectives have been extended significantly.



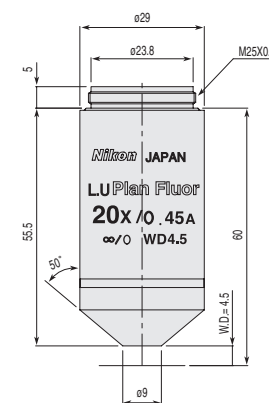
CFI L Plan EPI 2.5X



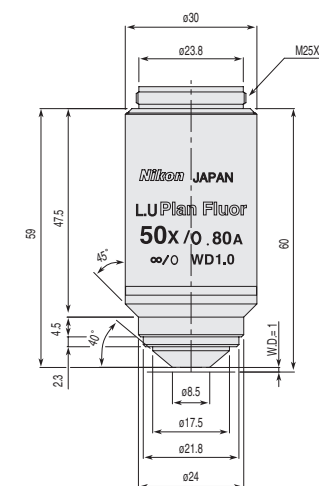
CFI LU Plan FLUOR EPI 5X



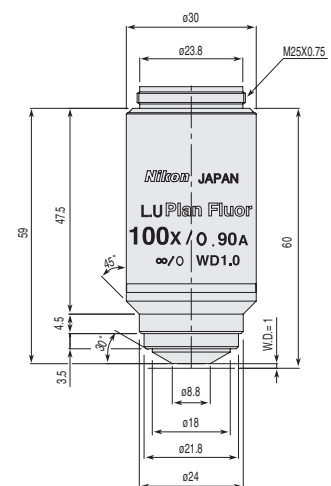
CFI LU Plan FLUOR EPI 10X



CFI LU Plan FLUOR EPI 20X



CFI LU Plan FLUOR EPI 50X



CFI LU Plan FLUOR EPI 100X

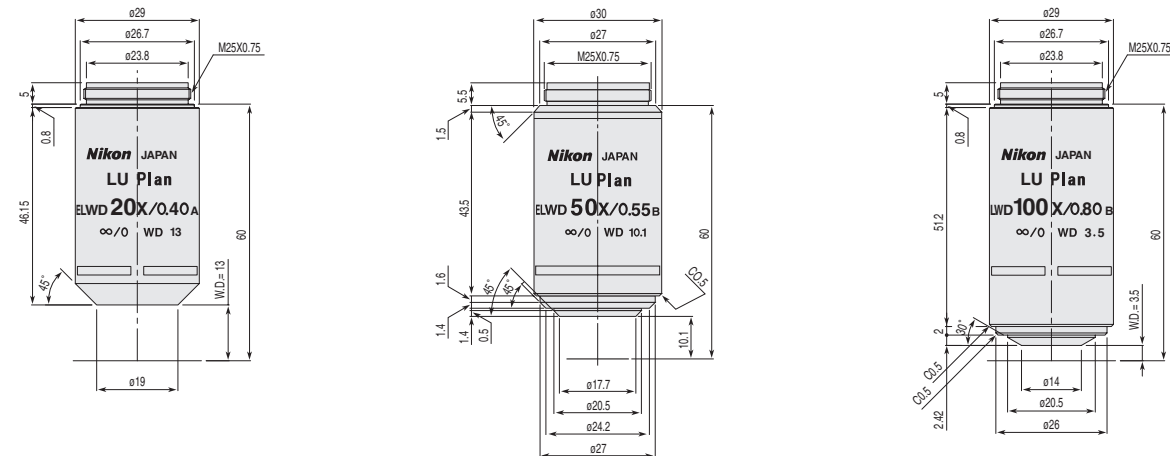
Unit: mm

Code No.	CFI60 Objectives						Widefield CFI eyepieces CFI 10X (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (omm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (omm)	Depth of focus (μm)
MUE00031	CFI L Plan EPI 2.5X	0.075	8.80	80.00	48.89	167.5	25X	8.80	125.08	25X	10.00	125.08
MUE10050	CFI LU Plan FLUOR EPI 5X	0.15	23.50	40.00	12.22	100	50X	4.40	31.27	50X	5.00	31.27
MUE10100	CFI LU Plan FLUOR EPI 10X	0.30	17.50	20.00	3.06	125	100X	2.20	7.82	100X	2.50	7.82
MUE10200	CFI LU Plan FLUOR EPI 20X	0.45	4.50	10.00	1.36	160	200X	1.10	2.95	200X	1.25	2.95
MUE10500	CFI LU Plan FLUOR EPI 50X	0.80	1.00	4.00	0.43	195	500X	0.44	0.79	500X	0.50	0.79
MUE10901	CFI LU Plan FLUOR EPI 100X	0.90	1.00	2.00	0.34	190	1000X	0.22	0.50	1000X	0.25	0.50

* CFI LU Plan FLUOR EPI P objectives are the same size as CFI LU Plan FLUOR EPI objectives of the same magnification.

CFI LU Plan EPI ELWD Long Working Distance Objectives for Brightfield/Nomarski DIC Use

Dramatically extended working distances facilitate observations of samples having irregular surfaces. Working distances have been extended significantly.



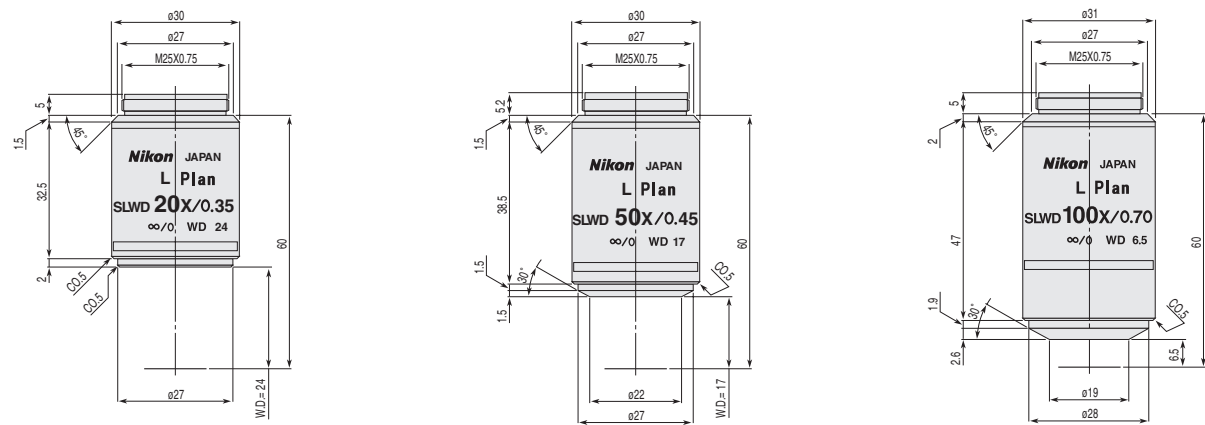
CFI LU Plan EPI ELWD 20XA CFI LU Plan EPI ELWD 50X CFI LU Plan EPI ELWD 100XA

Unit: mm

Code No.	CFI60 Objectives						Widefield CFI eyepieces CFI 10X (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)
MUE20201	CFI LU Plan EPI ELWD 20XA	0.40	13.00	10.00	1.72	130	200X	1.10	3.50	200X	1.25	3.50
MUE20500	CFI LU Plan EPI ELWD 50X	0.55	10.10	4.00	0.91	185	500X	0.44	1.43	500X	0.50	1.43
MUE20901	CFI LU Plan EPI ELWD 100XA	0.80	3.50	2.00	0.43	215	1000X	0.22	0.61	1000X	0.25	0.61

CFI L Plan EPI SLWD Ultra-long Working Distance Objectives for Brightfield Use

Ultra-long working distances. Particularly useful when observing the bottom of a depression in the sample. Working distances have been extended significantly.



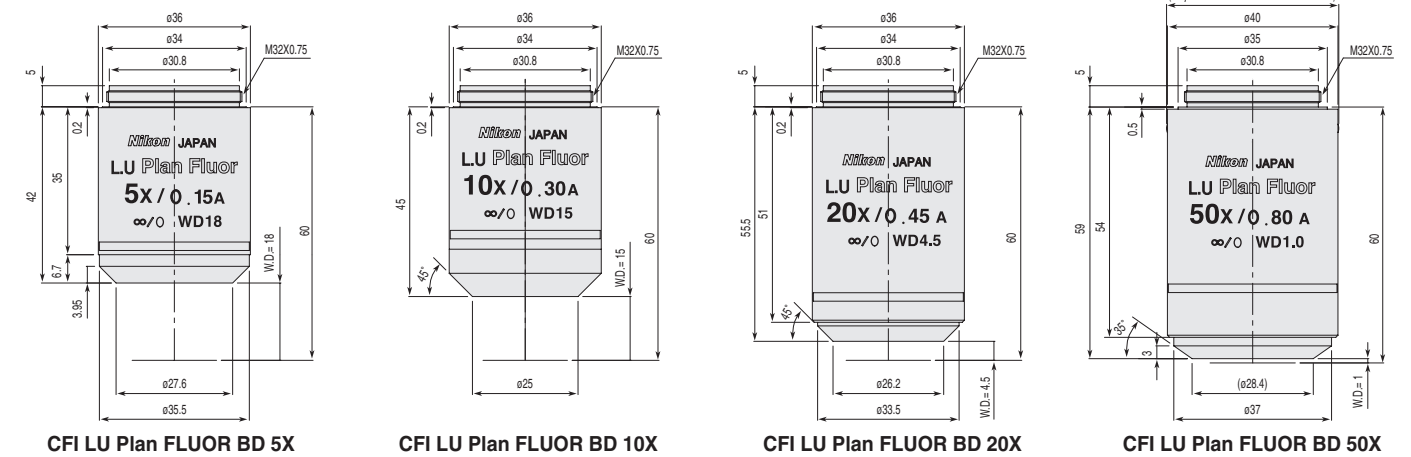
CFI L Plan EPI SLWD 20X CFI L Plan EPI SLWD 50X CFI L Plan EPI SLWD 100X

Unit: mm

Code No.	CFI60 Objectives						Widefield CFI eyepieces CFI 10X (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)
MUE30200	CFI L Plan EPI SLWD 20X	0.35	24.00	10.00	2.24	130	200X	1.10	4.29	200X	1.25	4.29
MUE30500	CFI L Plan EPI SLWD 50X	0.45	17.00	4.00	1.36	160	500X	0.44	1.99	500X	0.50	1.99
MUE30900	CFI L Plan EPI SLWD 100X	0.70	6.50	2.00	0.56	207.5	1000X	0.22	0.76	1000X	0.25	0.76

CFI LU Plan FLUOR BD Brightfield/Darkfield/Nomarski DIC Objectives

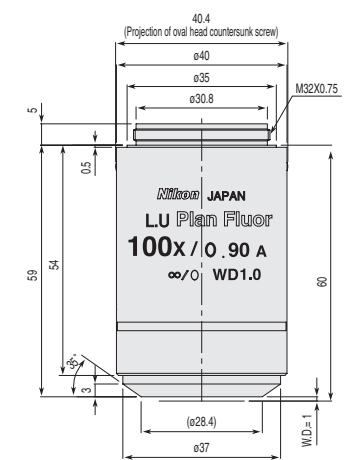
Perfect for brightfield, darkfield, and Nomarski DIC observations.



CFI LU Plan FLUOR BD 5X CFI LU Plan FLUOR BD 10X CFI LU Plan FLUOR BD 20X CFI LU Plan FLUOR BD 50X

Unit: mm

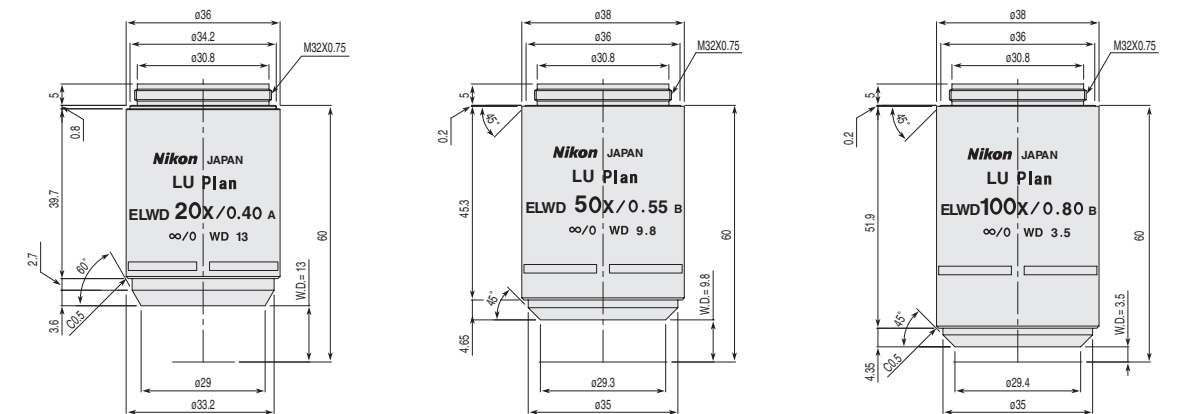
Code No.	CFI60 Objectives						Widefield CFI eyepieces CFI 10X (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)
MUE41050	CFI LU Plan FLUOR BD 5X	0.15	18.00	40.00	12.22	150	50X	4.40	31.27	50X	5.00	31.27
MUE41100	CFI LU Plan FLUOR BD 10X	0.30	15.00	20.00	3.06	170	100X	2.20	7.82	100X	2.50	7.82
MUE41200	CFI LU Plan FLUOR BD 20X	0.45	4.50	10.00	1.36	190	200X	1.10	2.95	200X	1.25	2.95
MUE41500	CFI LU Plan FLUOR BD 50X	0.80	1.00	4.00	0.43	292.5	500X	0.44	0.79	500X	0.50	0.79
MUE41901	CFI LU Plan FLUOR BD 100X	0.90	1.00	2.00	0.34	287.5	1000X	0.22	0.50	1000X	0.25	0.50



CFI LU Plan FLUOR BD 100X

CFI LU Plan BD ELWD Long Working Distance Objectives for Brightfield/Darkfield/Nomarski DIC Use

Extended working distances facilitate observations of samples having irregular surfaces.

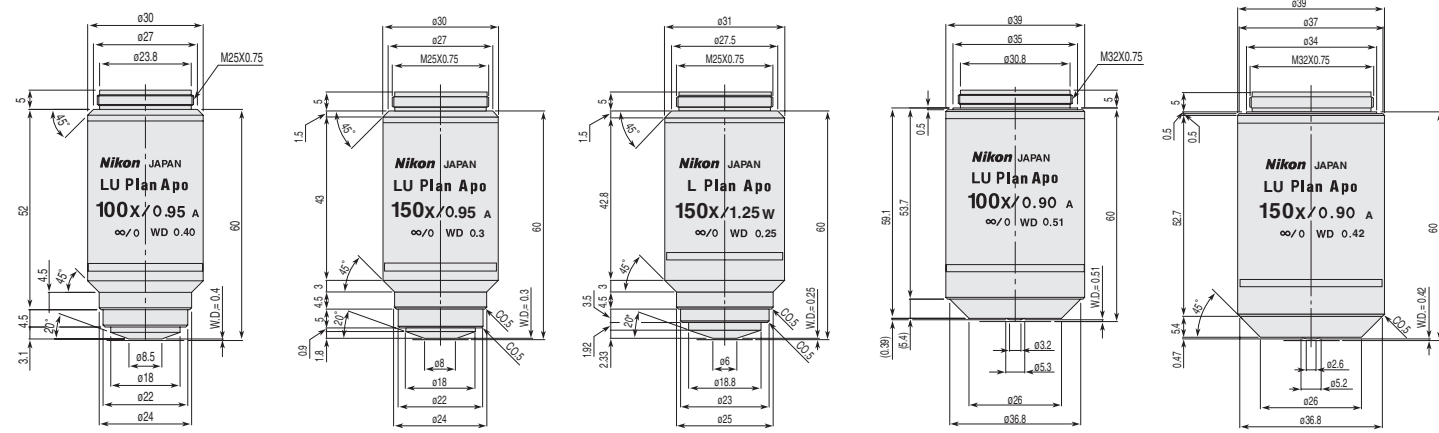


CFI LU Plan BD ELWD 20XA CFI LU Plan BD ELWD 50XA CFI LU Plan BD ELWD 100XA Unit: mm

Code No.	CFI60 Objectives						Widefield CFI eyepieces CFI 10X (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)
MUE60201	CFI LU Plan BD ELWD 20XA	0.40	13.00	10.00	1.72	162.5	200X	1.10	3.50	200X	1.25	3.50
MUE60501	CFI LU Plan BD ELWD 50XA	0.55	9.80	4.00	0.91	247.5	500X	0.44	1.43	500X	0.50	1.43
MUE60901	CFI LU Plan BD ELWD 100XA	0.80	3.50	2.00	0.43	282.5	1000X	0.22	0.61	1000X	0.25	0.61

CFI LU Plan Apo EPI/CFI L Plan Apo EPI/CFI LU Plan Apo BD High-Resolution Objectives for Brightfield or for Darkfield/Brightfield

Apochromat-type objectives virtually eliminate chromatic aberration and feature excellent resolution. Water-dipping type (WI) is also available. Nomarski DIC is also possible with the LU type.



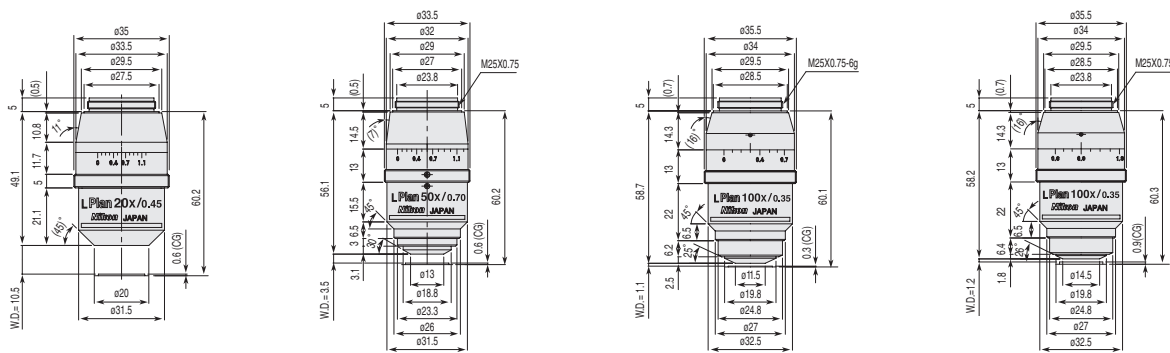
CFI LU Plan Apo EPI 100X CFI LU Plan Apo EPI 150X CFI L Plan Apo EPI 150XWI CFI LU Plan Apo BD 100X CFI LU Plan Apo BD 150X

Unit: mm

Code No.	CFI60 Objectives						Widefield CFI eyepieces CFI 10X (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (omm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (omm)	Depth of focus (μm)
MUC00900	CFI LU Plan Apo EPI 100X	0.95	0.40	2.00	0.30	235	1000X	0.22	0.46	1000X	0.25	0.46
MUC10150	CFI LU Plan Apo EPI 150X	0.95	0.30	1.33	0.30	217.5	1500X	0.15	0.40	1500X	0.17	0.40
MUC14150	CFI L Plan Apo EPI 150XWI	1.25	0.25	1.33	0.23	230	1500X	0.15	0.33	1500X	0.17	0.33
MUC40900	CFI LU Plan Apo BD 100X	0.90	0.51	2.00	0.34	325	1000X	0.22	0.50	1000X	0.25	0.50
MUC50150	CFI LU Plan Apo BD 150X	0.90	0.42	1.33	0.34	305	1500X	0.15	0.45	1500X	0.17	0.45

CFI L Plan EPI CR Objectives for LCD Inspection

The CFI L Plan EPI CR series employs a correction system to cope with the thinner coverglass for FDP and the increased integration and mounting density of devices.



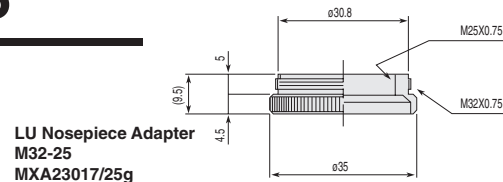
CFI L Plan EPI 20XCR CFI L Plan EPI 50XCR CFI L Plan EPI 100XCRA CFI L Plan EPI 100XCRB

Unit: mm

Code No.	CFI60 Objectives						Widefield CFI eyepieces CFI 10X (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (omm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (omm)	Depth of focus (μm)
MUE35200	CFI L Plan EPI 20XCR	0.45	10.9-10.0	10.00	1.36	240	200X	1.10	2.95	200X	1.25	2.95
MUE35500	CFI L Plan EPI 50XCR	0.70	3.9-3.0	4.00	0.56	240	500X	0.44	0.97	500X	0.50	0.97
MUE35900	CFI L Plan EPI 100XCRA	0.85	1.2-0.85	2.00	0.38	260	1000X	0.22	0.55	1000X	0.25	0.55
MUE35910	CFI L Plan EPI 100XCRB	0.85	1.3-0.95	2.00	0.38	260	1000X	0.22	0.55	1000X	0.25	0.55

LU Nosepiece Adapter M32-25

Adapter for attaching an EPI Plan objective to a brightfield nosepiece or universal nosepiece.

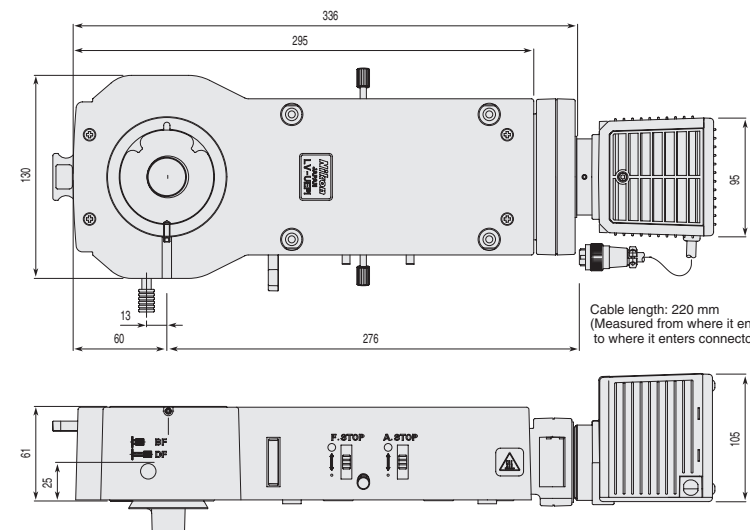
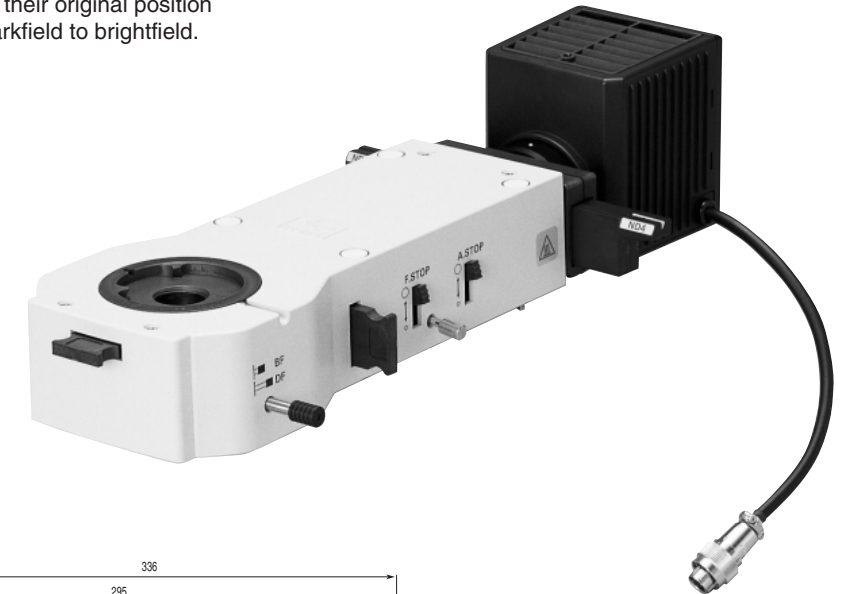


LU Nosepiece Adapter M32-25 MXA23017/25g

Universal Epi-Illuminator LV-UEPI

This universal illuminator supports the CFI60 optical system.

- Enables brightfield, darkfield, simple polarizing, and DIC observation.
- Automatic opening of field and aperture diaphragms when observation is switched from brightfield to darkfield.
- Return of field and aperture diaphragms to their original position when observation is switched back from darkfield to brightfield.



Configured with LV-LH50PC 12V-50W Lamphouse

Unit: mm

Universal Epi-Illuminator LV-UEPI MBE60200

Field diaphragm	Centerable and synchronized with B/D changeover
Aperture diaphragm	Synchronized with B/D changeover
Illumination	12V-50W high-intensity halogen lamp illuminator
Filter	Supports insertion of four ø25mm filters (NCB11, ND4, ND16), a polarizer/analyzer. Also supports ESD.
Weight	1,750g

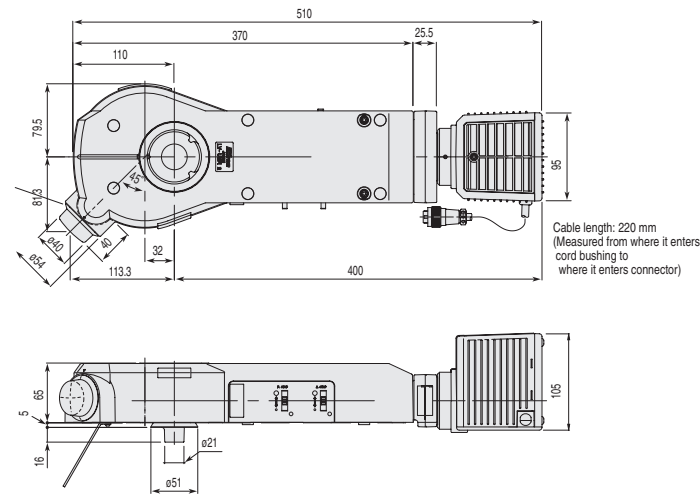
Items	Code No.	Weight (g)
LV-LH50PC 12V-50W Lamphouse	MBE65270	800
YM-NCB 25 NCB11-1	MBN66750	31
YM-ND 25 ND4/ND16	MBN66760	36
LV-HL50W 12V-50W Halogen Lamp	MXA23045	7
YM-PO Polarizer	MBN66921	29
L-AN Analyzer	MBN66922	14
L-DIC DIC Slider	MBP60170	120
YM-GIF 25 GIF	MBN66730	25
YM-EPI 3-3PIN Extension Cable	MXA29002	100

Universal Epi-Illuminator LV-UEPI2/LV-UEPI2A

This universal illuminator supports the CFI60 optical system.

LV-UEPI2

- Equipped with advanced optics suitable for a wide variety of observation methods, ranging from brightfield, darkfield, simple polarizing, sharp polarizing, and DIC, to epi-fluorescence.
- Includes a feature for automatically maintaining optimal illumination conditions for the field and aperture diaphragms, shutter, and UV cut filters, thereby reducing tedious microscope operations to an absolute minimum.

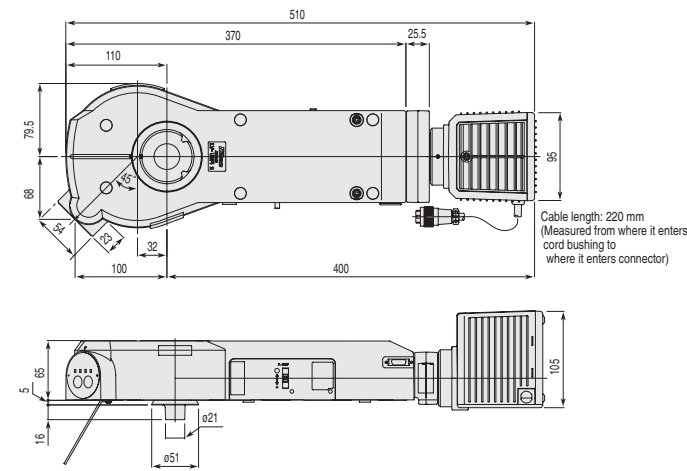


Configured with LV-LH50PC 12V-50W Lamphouse

Unit: mm

LV-UEPI2A

- Accurate reproduction of illumination conditions thanks to the motorization of the illumination changeover turret and aperture diaphragm and control of the illumination voltage.
- Automatic optimization of the aperture diaphragm according to the objective lens and illumination technique. Can also be changed manually depending on the sample and purpose.
- Control possible from the microscope or a PC when combined with LV100DA.
- External control also possible from a PC when combined with the LV-ECON E Controller.



Configured with LV-LH50PC 12V-50W Lamphouse

Unit: mm

Universal Epi-Illuminator LV-UEPI2/MBE60300 Universal Epi-Illuminator LV-UEPI2A/MBE60310

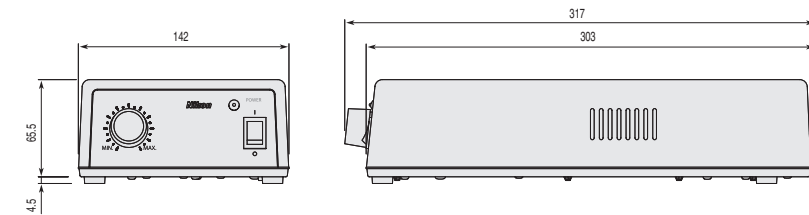
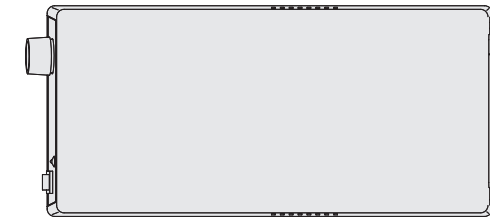
	LV-UEPI2	LV-UEPI2A
Field diaphragm	Centerable and synchronized with B/D changeover	
Aperture diaphragm	Centerable and synchronized with B/D changeover	Centerable and synchronized with motorized brightfield/darkfield changeover (Automatic optimization according to objective lens)
Illumination	12V-50W high-intensity halogen lamp illuminator	Motorized operation/control possible for 12V 50W high-intensity halogen lamp illuminator and illumination changeover turret
Filters	Supports insertion of four ø25mm filters (NCB11, ND4, ND16), two fluorescence filter cubes, a polarizer/analyzer, λ plate, or an excitation light balancer. Also supports ESD.	
Weight	2,400g	

Items	Code No.	Weight (g)
LV-LH50PC 12V-50W Lamphouse	MBE65270	800
YM-NCB 25 NCB11-1	MBN66750	31
YM-ND 25 ND4/ND16	MBN66760	36
LV-HL50W 12V-50W Halogen Lamp	MXA23045	7
LV-PO Polarizer	MBN66923	60
LV-FLAN FL Analyzer	MBN66925	20
LV-λ P λ Plate	MBN66924	15
LV-UVPO UV Polarizer	MBN66926	60
C-FL UV-2A	MBE41201	40

Items	Code No.	Weight (g)
C-FL V-2A	MBE42101	40
C-FL BV-2A	MBE43101	40
C-FL B-2A	MBE44501	40
C-FL G-2A	MBE45501	40
LV-PAB PA Cube	MBE64100	45
YM-GIF 25 GIF	MBN66730	25
YM-EPI 3-3PIN Extension Cable	MXA29002	100
L-DIC DIC Slider	MBP60170	120

TE2-PS100W Transformer

This transformer is for the LV-UEPI, LV-UEPI2, and LV-UEPI2A universal reflection illuminators.



TE2-PS100W Transmitter MEF42252/2000g

Items	Code No.	Weight (g)
Power Cord BJ/BE	MBF11250/MBF11300	160
Socket Adapter	MXA20560	160
YM-EPI 3-3PIN Extension Cable	MXA29002	100

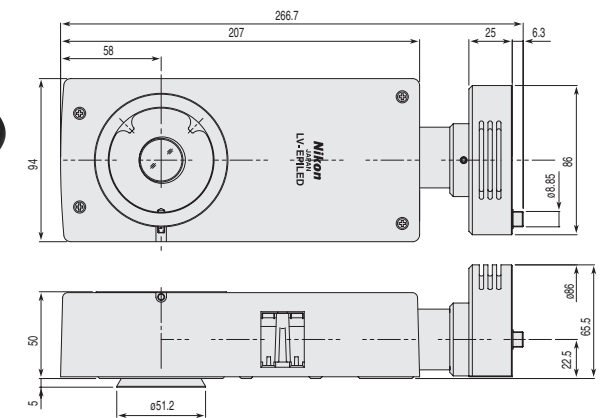
LV-EPILED White LED Illuminator

This LED illuminator supports the CFI60 optical system.

- Light-weight, compact white LED illuminator developed specially for brightfield observation.
- Operated via an attached power source controller.
- Can also be externally controlled via the LV-ECON E controller.
- Includes ND4 and ND16 filters.



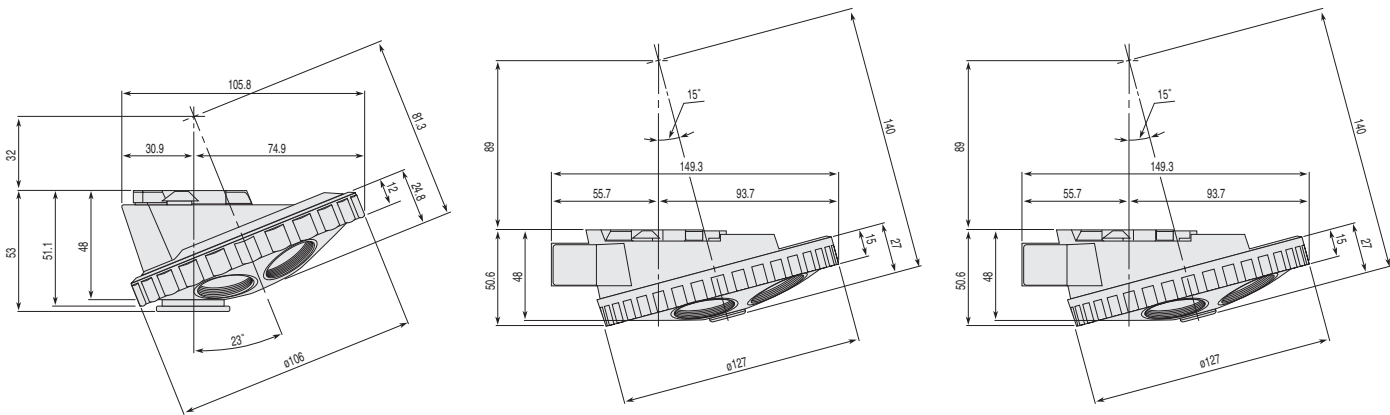
LV-EPILED White LED Illuminator MBE60500/1500g



Items	Code No.	Weight (g)
FA AC Adapter 2	MPF52601	670
Power Cord BJ/BE	MBF11250/MBF11300	160
Socket Adapter	MXA20560	160

Revolving Nosepieces

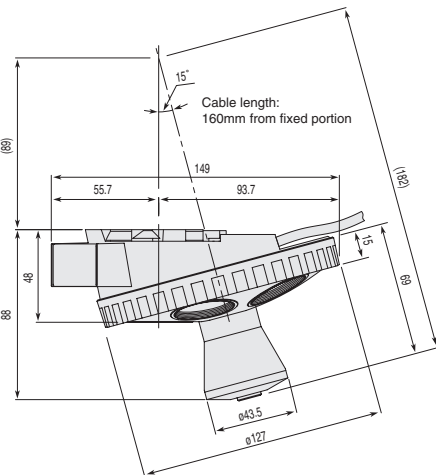
Six types of nosepieces – either manual or motorized – are available to choose from.



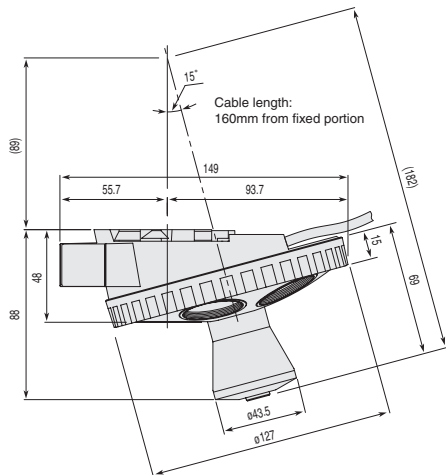
C-N Sextuple Nosepiece MBP71300/450g

L-NBD5 Quintuple Nosepiece ESD MBP60120/580g

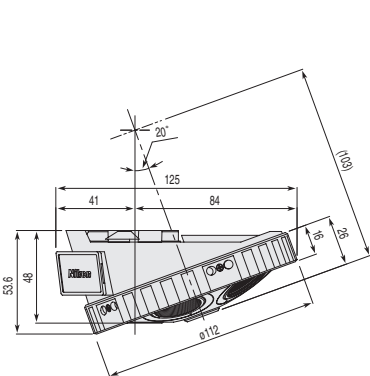
L-NU5 Universal Quintuple Nosepiece ESD MBP60110/580g



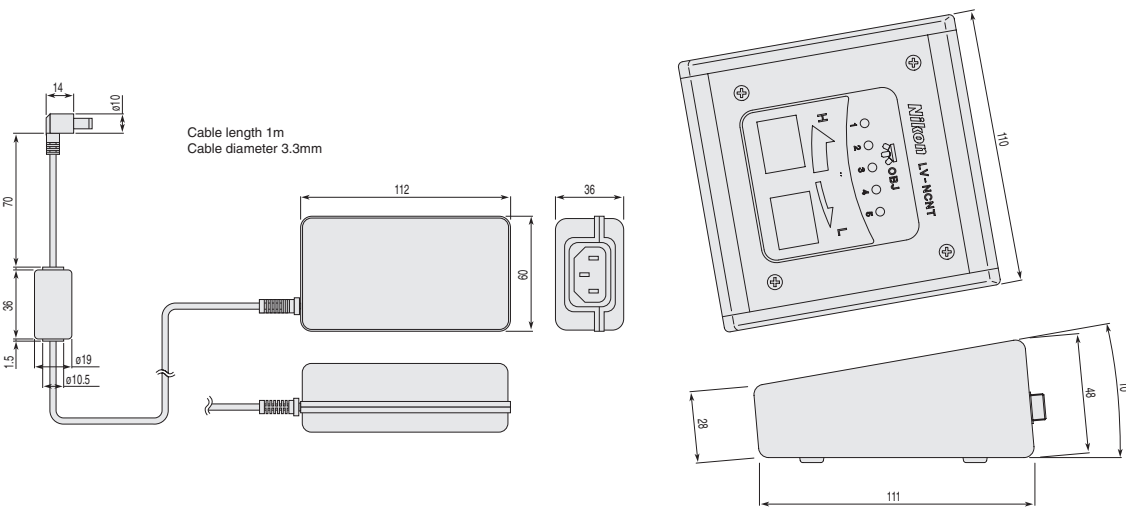
LV-NU5A Motorized Universal Quintuple Nosepiece MBP60101/800g



LV-NU5AC Motorized Universal Quintuple Nosepiece MBP60102/800g



P-N P-N5 Nosepiece MDP44200/600g



AC Adapter PSA (100-240V) MPF52061/278g

LV-NCNT Nosepiece Controller MBF65320/380g

Items	Code No.	Weight (g)
FA AC Adapter 2	MPF52061	670
Power Cord BJ/BE	MBF11250/MBF11300	160
Socket Adapter	MXA20560	160

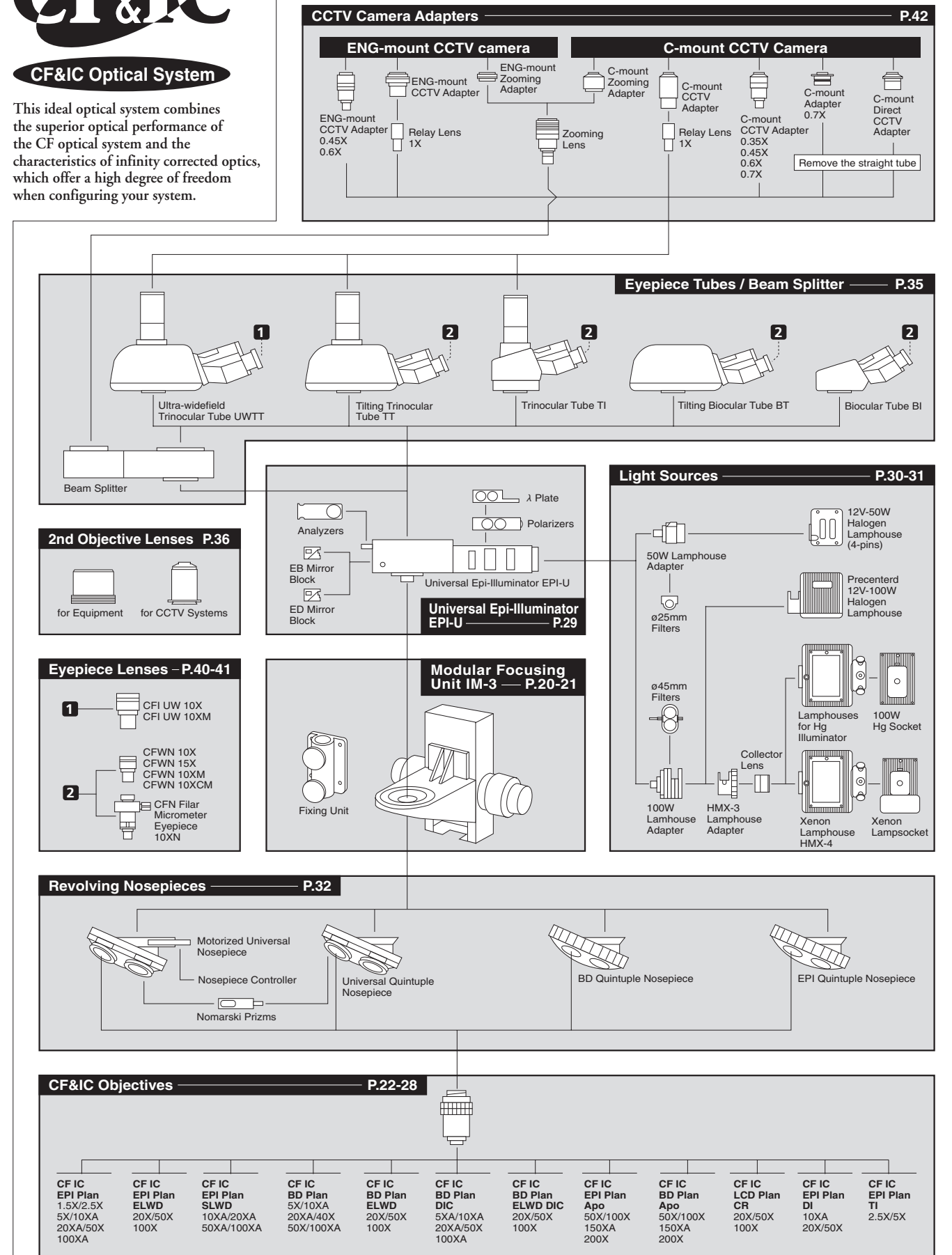
Unit: mm



CF&IC Optical System

This ideal optical system combines the superior optical performance of the CF optical system and the characteristics of infinity corrected optics, which offer a high degree of freedom when configuring your system.

System Diagram & Index



Modular Focusing Unit IM-3

Accommodates an epi-illuminator and motorized nosepiece or a maximum load of 8kg by adding a balancer.
Accommodates the Universal EPI-Illuminator EPI-U and a motorized nosepiece.

- Fully compatible with the CF&IC optical system, a fusion of Nikon's CF design and infinity optics that significantly reduces flare.
- Attachment of the Universal Epi-illuminator EPI-U enables the use of brightfield, darkfield and, Nomarski DIC techniques.
- The built-in balancer ensures smoother vertical motion, even when the arm is heavily loaded.
- The standard maximum load is 4kg, which is expandable to 8kg by adding a balancer.*
- A coarse motion stroke of 5.2mm per rotation improves the equipment's load handling capability and increases durability.
- The distance from the optical axis to the mounting surface is 141mm, the same distance as IM-2.

Note: For adding a balancer, consult your Nikon representative.

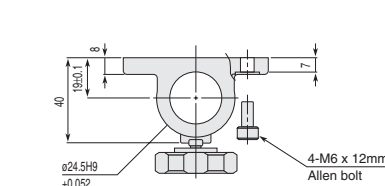


Modular Focusing Unit IM-3
MBD64000/2000g

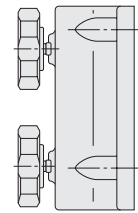
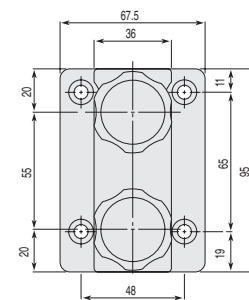
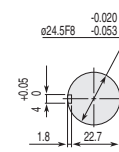
Stroke	30mm
Coarse focusing	5.2mm/rotation
Fine focusing	0.1mm/rotation
Scale	1μm

Fixing Unit (Option)

Used to attach the Modular Focusing Unit IM-3 to a ø24.5mm post.



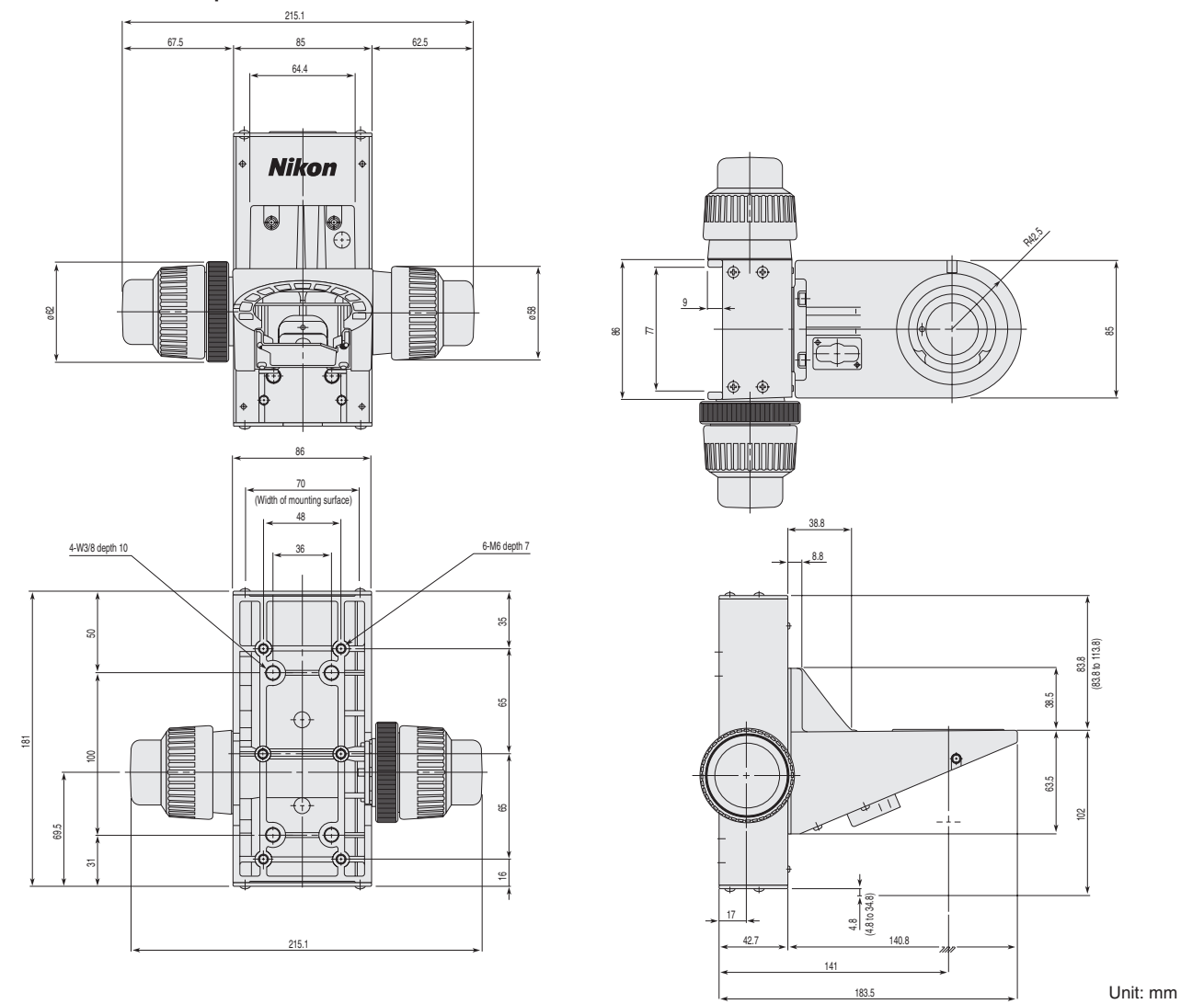
Fixing Unit
MXA20681/240g



Unit: mm

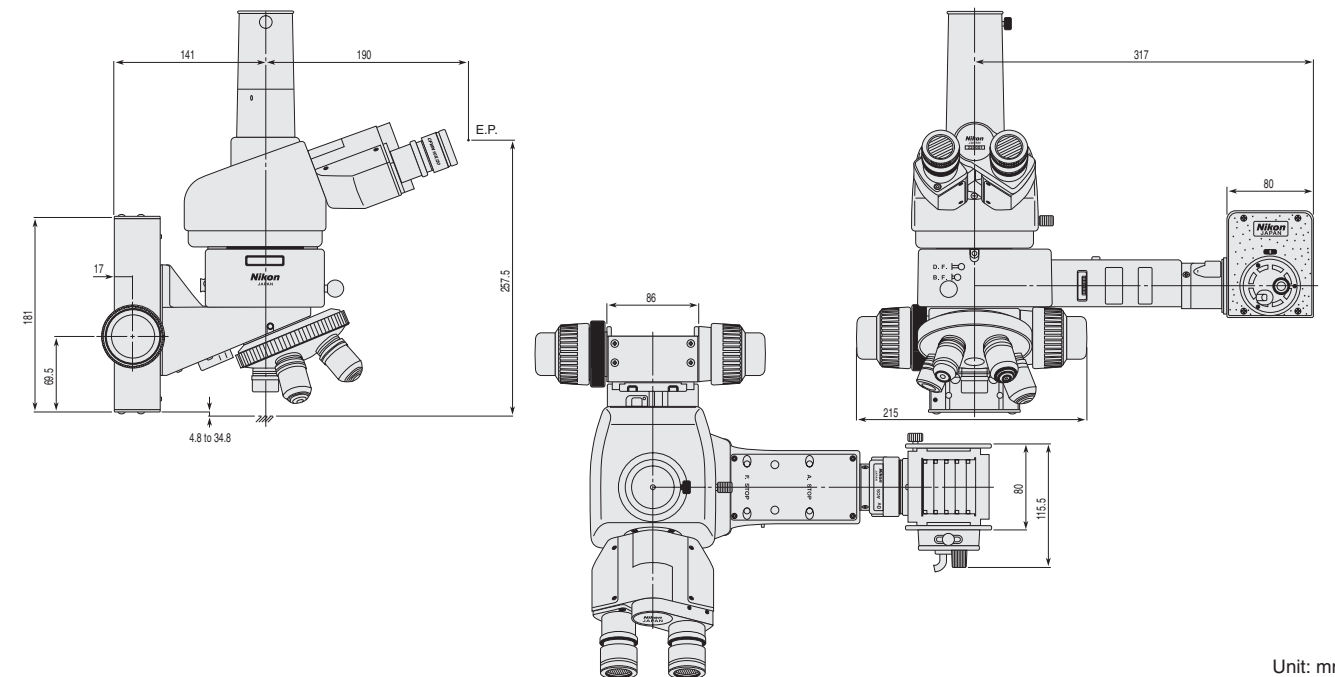


Dimensions of the IM-3 as a Separate Unit



Unit: mm

Modular Focusing Unit IM-3 configured with: Trinocular Tube TI, Epi-Illuminator EPI-U, 12V-50W Lamphouse, Quintuple Nosepiece, and CF IC EPI PlanObjectives

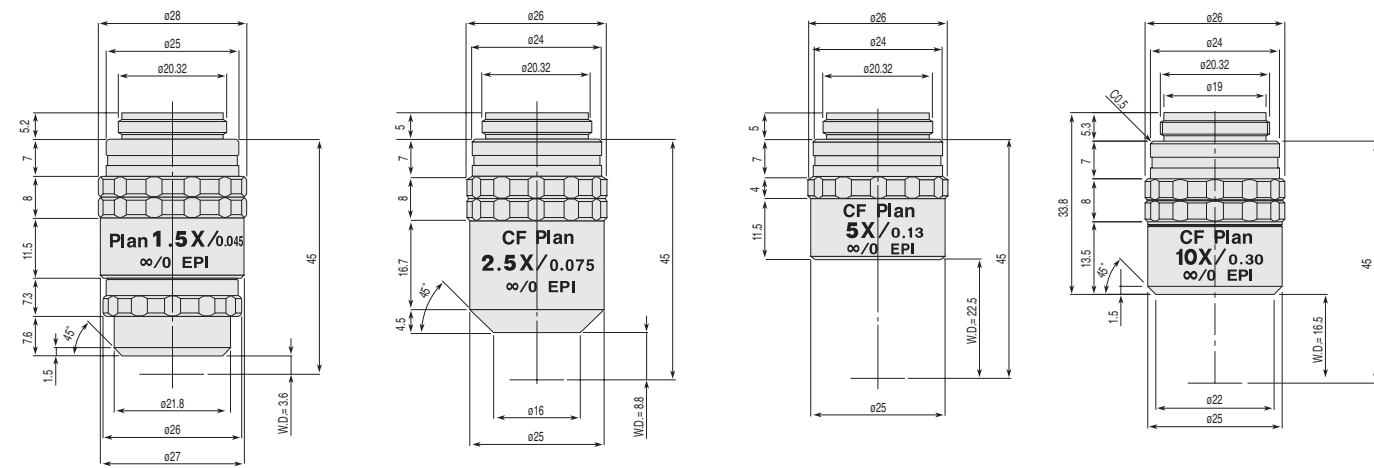


Unit: mm

CF IC EPI Plan Brightfield Objectives

CF&IC objectives for brightfield use.

NA of low to medium magnification objects has also been improved.

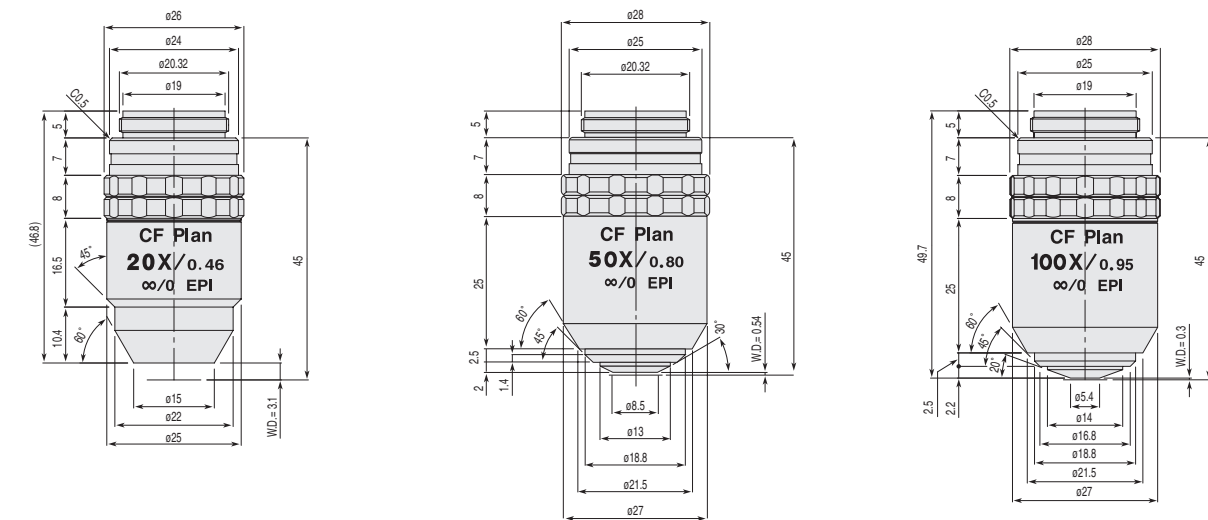


CF IC EPI Plan 1.5X

CF IC EPI Plan 2.5X

CF IC EPI Plan 5X

CF IC EPI Plan 10XA



CF IC EPI Plan 20XA

CF IC EPI Plan 50X

CF IC EPI Plan 100XA

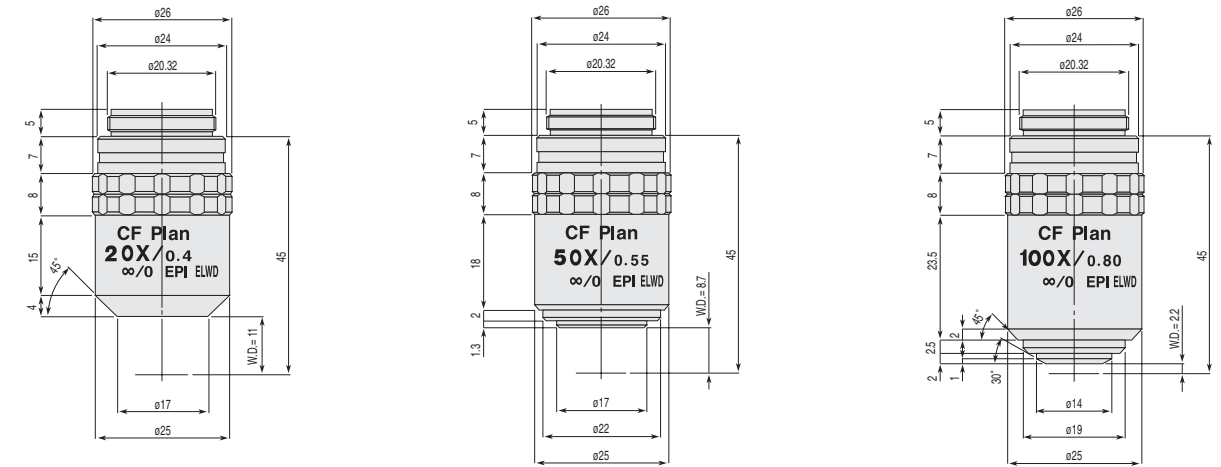
Unit: mm

Code No.	CF IC Objectives						Widefield CF eyepieces CFWN10X (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)
MUL00020	CF IC EPI Plan 1.5X*	0.045	3.60	133.33	135.80	145	15X	13.33	347.44	—	—	—
MUL00030	CF IC EPI Plan 2.5X	0.075	8.80	80.00	48.89	108	25X	8.00	125.08	25X	10.00	125.08
MUL00050	CF IC EPI Plan 5X	0.13	22.50	40.00	16.27	65	50X	4.00	38.25	50X	5.00	38.25
MUL00101	CF IC EPI Plan 10XA	0.30	16.50	20.00	3.06	90	100X	2.00	7.82	100X	2.50	7.82
MUL00201	CF IC EPI Plan 20XA	0.46	3.10	10.00	1.30	120	200X	1.00	2.85	200X	1.25	2.85
MUL00500	CF IC EPI Plan 50X	0.80	0.54	4.00	0.43	145	500X	0.40	0.79	500X	0.50	0.79
MUL00901	CF IC EPI Plan 100XA	0.95	0.30	2.00	0.30	140	1000X	0.20	0.46	1000X	0.25	0.46

* Includes polarizer/analyzer. For standard fields (20 fields).

CF IC EPI Plan ELWD Long Working Distance Objectives for Brightfield Use

Dramatically extended working distances facilitate observations of samples with irregular surfaces.



CF IC EPI Plan ELWD 20X

CF IC EPI Plan ELWD 50X

CF IC EPI Plan ELWD 100X

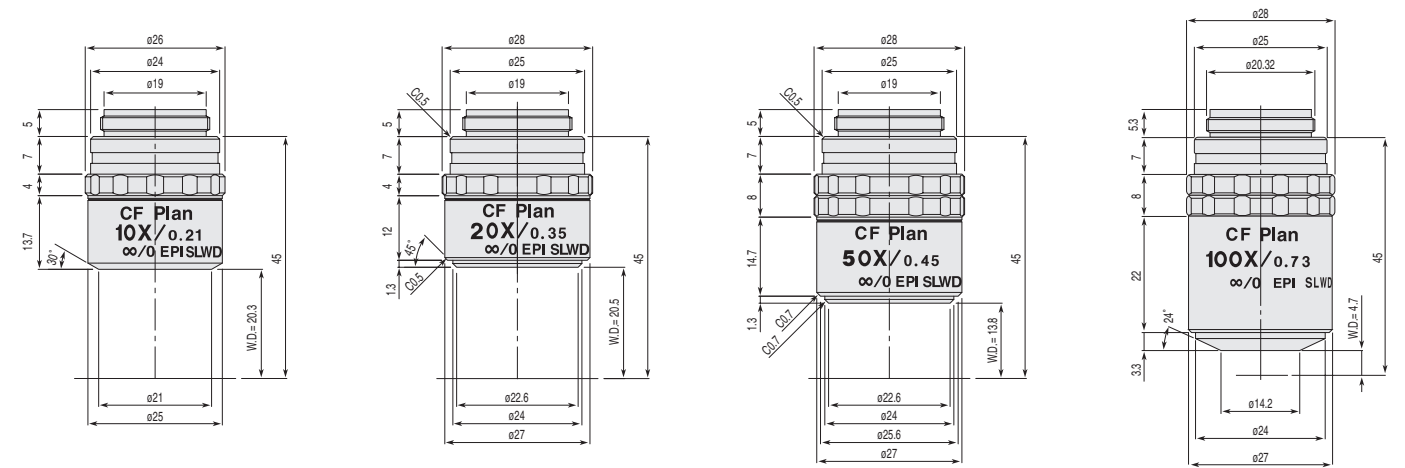
Unit: mm

Code No.	CF IC Objectives						Widefield CF eyepieces CFWN10X (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)
MUL03200	CF IC EPI Plan ELWD 20X	0.40	11.00	10.00	1.72	95	200X	1.00	3.50	200X	1.25	3.50
MUL03500	CF IC EPI Plan ELWD 50X	0.55	8.70	4.00	0.91	105	500X	0.40	1.43	500X	0.50	1.43
MUL03900	CF IC EPI Plan ELWD 100X	0.80	2.20	2.00	0.43	120	1000X	0.20	0.61	1000X	0.25	0.61

CF IC EPI Plan SLWD Ultra-long Working Distance Objectives for Brightfield Use

Ultra-long working distances.

Particularly useful when observing the bottom of a depression in the sample.



CF IC EPI Plan SLWD 10XA

CF IC EPI Plan SLWD 20XA

CF IC EPI Plan SLWD 50XA

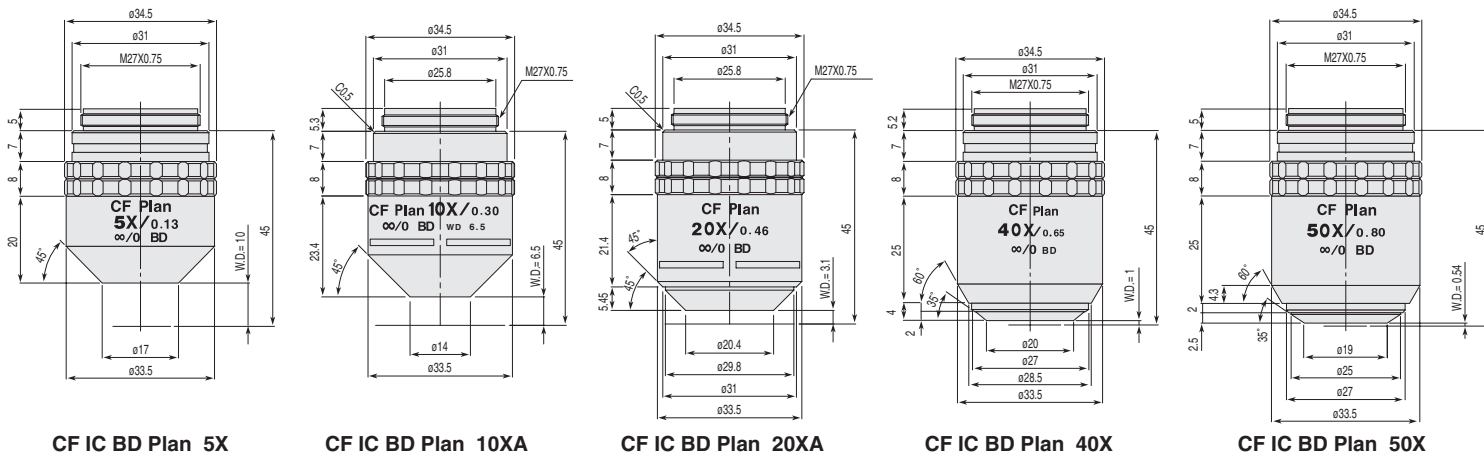
CF IC EPI Plan SLWD 100X

Unit: mm

Code No.	CF IC Objectives						Widefield CF eyepieces CFWN10X (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)
MUL04101	CF IC EPI Plan SLWD 10XA	0.21	20.30	20.00	6.24	85	100X	2.00	13.04	100X	2.50	13.04
MUL04201	CF IC EPI Plan SLWD 20XA	0.35	20.50	10.00	2.24	80	200X	1.00	4.29	200X	1.25	4.29
MUL04501	CF IC EPI Plan SLWD 50XA	0.45	13.80	4.00	1.36	110	500X	0.40	1.99	500X	0.50	1.99
MUL04900	CF IC EPI Plan SLWD 100X	0.73	4.70	2.00	0.52	135	1000X	0.20	0.71	1000X	0.25	0.71

CF IC BD Plan Brightfield/Darkfield Objectives

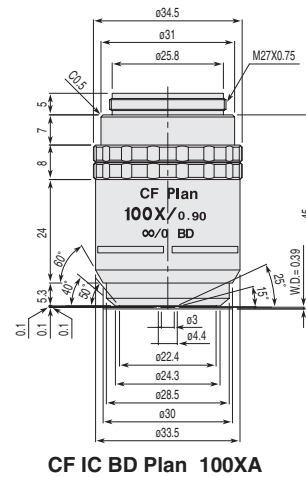
Perfect for brightfield and darkfield observations.



CF IC BD Plan 5X CF IC BD Plan 10XA CF IC BD Plan 20XA CF IC BD Plan 40X CF IC BD Plan 50X

Unit: mm

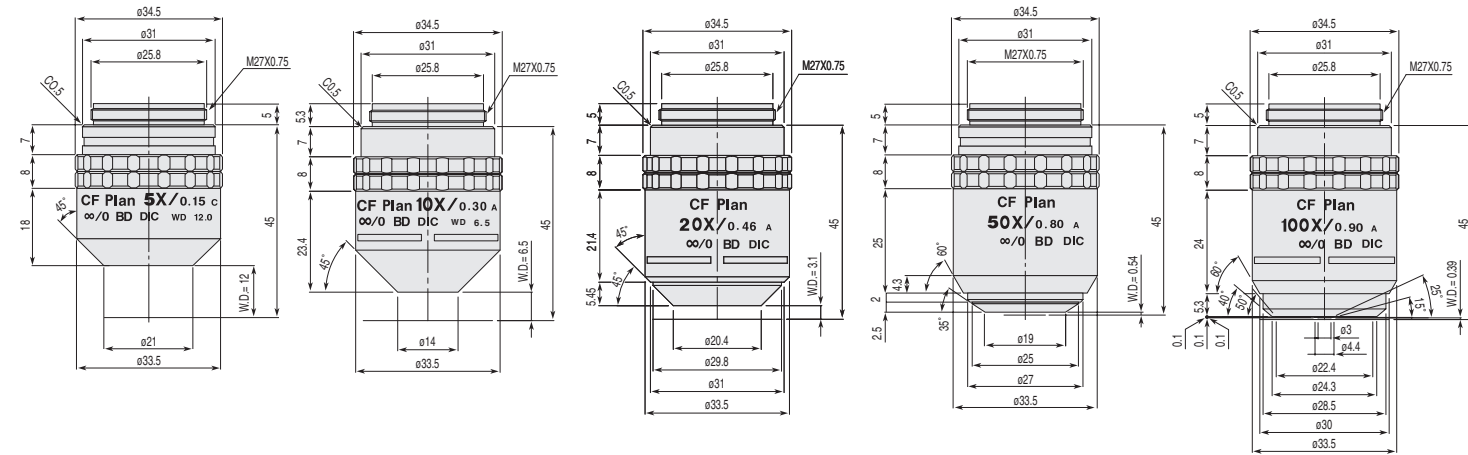
Code No.	CF IC Objectives							Widefield CF eyepieces CFWN10X (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	
MUM00051	CF IC BD Plan 5X	0.13	10.00	40.00	16.27	115	50X	4.00	38.25	50X	5.00	38.25	
MUM00102	CF IC BD Plan 10XA	0.30	6.50	20.00	3.06	135	100X	2.00	7.82	100X	2.50	7.82	
MUM00202	CF IC BD Plan 20XA	0.46	3.10	10.00	1.30	170	200X	1.00	2.85	200X	1.25	2.85	
MUM00400	CF IC BD Plan 40X	0.65	1.00	5.00	0.65	185	400X	0.50	1.20	400X	0.63	1.20	
MUM00501	CF IC BD Plan 50X	0.80	0.54	4.00	0.43	185	500X	0.40	0.79	500X	0.50	0.79	
MUM00902	CF IC BD Plan 100XA	0.90	0.39	2.00	0.34	180	1000X	0.20	0.50	1000X	0.25	0.50	



CF IC BD Plan 100XA

CF IC BD Plan DIC Reflective Polarizing Objectives

Objectives for Nomarski DIC observation suited to microscratches and irregularity on sample surfaces.



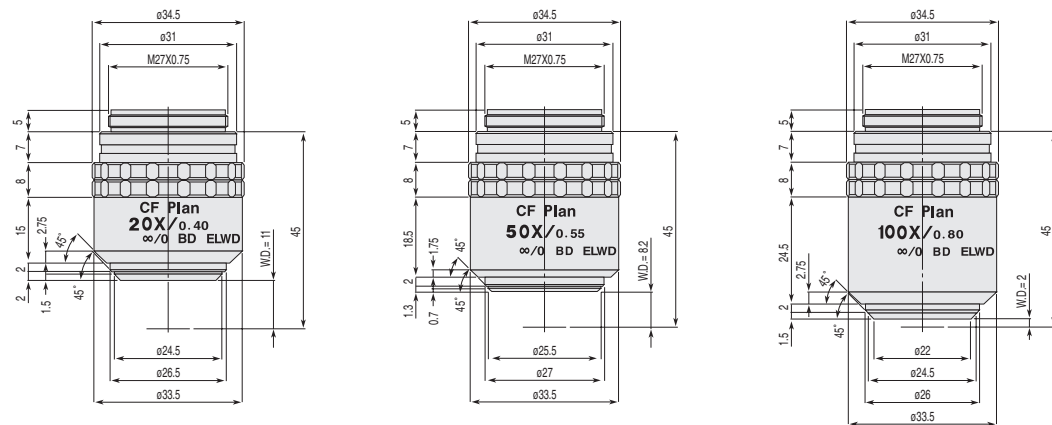
CF IC BD Plan DIC 5XA CF IC BD Plan DIC 10XA CF IC BD Plan DIC 20XA CF IC BD Plan DIC 50X CF IC BD Plan DIC 100XA

Unit: mm

Code No.	CF IC Objectives							Widefield CF eyepieces CFWN10X (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	
MUM20052	CF IC BD Plan DIC 5XA	0.15	12.00	40.00	12.22	125	50X	4.00	31.27	50X	5.00	31.27	
MUM20102	CF IC BD Plan DIC 10XA	0.30	6.50	20.00	3.06	135	100X	2.00	7.82	100X	2.50	7.82	
MUM20202	CF IC BD Plan DIC 20XA	0.46	3.10	10.00	1.30	170	200X	1.00	2.85	200X	1.25	2.85	
MUM20501	CF IC BD Plan DIC 50X	0.80	0.54	4.00	0.43	185	500X	0.40	0.79	500X	0.50	0.79	
MUM20902	CF IC BD Plan DIC 100XA	0.90	0.39	2.00	0.34	180	1000X	0.20	0.50	1000X	0.25	0.50	

CF IC BD Plan ELWD Long Working Distance Objectives for Brightfield/Darkfield Use

Extended working distances facilitate observations of samples with irregular surfaces.



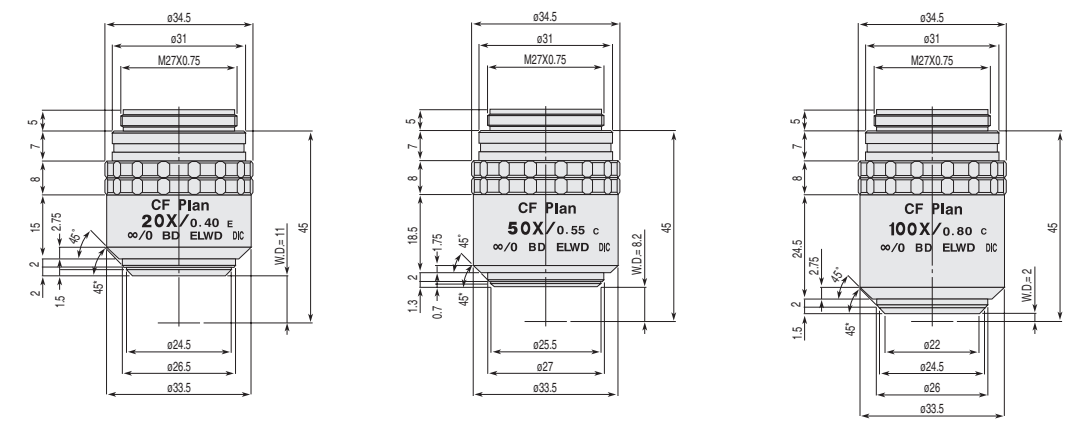
CF IC BD Plan ELWD 20X CF IC BD Plan ELWD 50X CF IC BD Plan ELWD 100X

Unit: mm

Code No.	CF IC Objectives							Widefield CF eyepieces CFWN10X (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	
MUM03201	CF IC BD Plan ELWD 20X	0.40	11.00	10.00	1.72	150	200X	1.00	3.50	200X	1.25	3.50	
MUM03501	CF IC BD Plan ELWD 50X	0.55	8.20	4.00	0.91	175	500X	0.40	1.43	500X	0.50	1.43	
MUM03901	CF IC BD Plan ELWD 100X	0.80	2.00	2.00	0.43	185	1000X	0.20	0.61	1000X	0.25	0.61	

CF IC BD Plan ELWD DIC Long Working Distance Objectives For Reflective Polarizing

Epoch-making long-working distance objectives that enable Nomarski DIC observation.



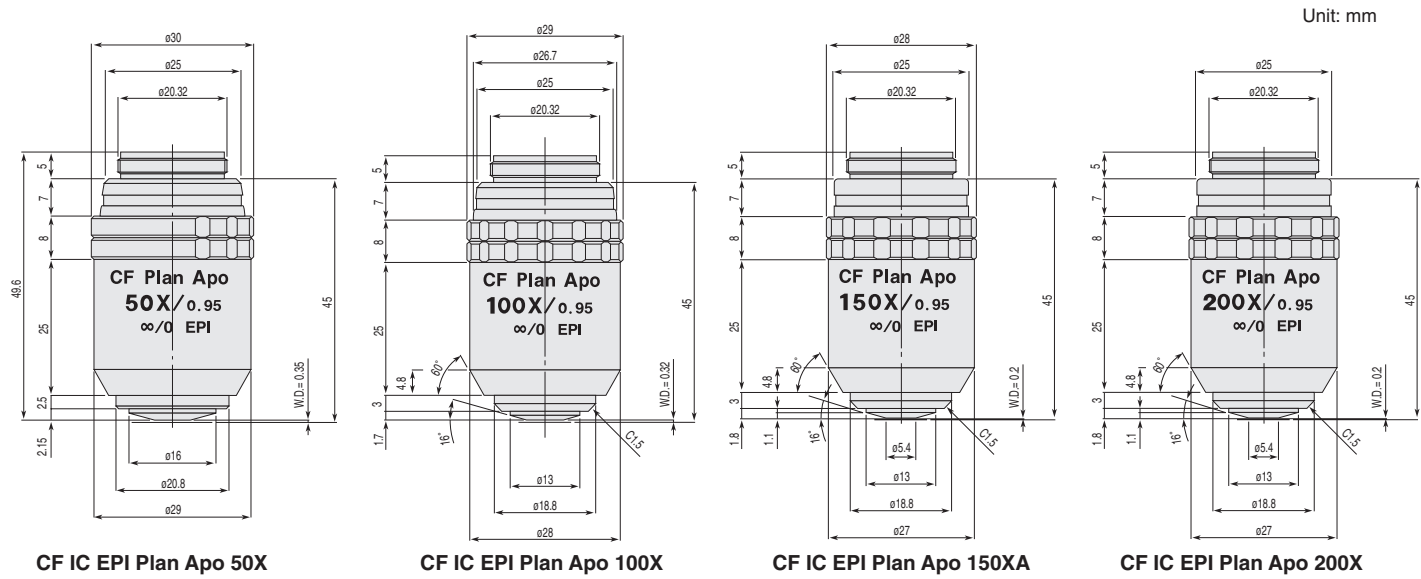
CF IC BD Plan ELWD DIC 20X CF IC BD Plan ELWD DIC 50X CF IC BD Plan ELWD DIC 100X

Unit: mm

Code No.	CF IC Objectives							Widefield CF eyepieces CFWN10X (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	
MUM23201	CF IC BD Plan ELWD DIC 20X	0.40	11.00	10.00	1.72	150	200X	1.00	3.50	200X	1.25	3.50	
MUM23501	CF IC BD Plan ELWD DIC 50X	0.55	8.20	4.00	0.91	175	500X	0.40	1.43	500X	0.50	1.43	
MUM23901	CF IC BD Plan ELWD DIC 100X	0.80	2.00	2.00	0.43	185	1000X	0.20	0.61	1000X	0.25	0.61	

CF IC EPI Plan Apo High-Resolution Brightfield Objectives

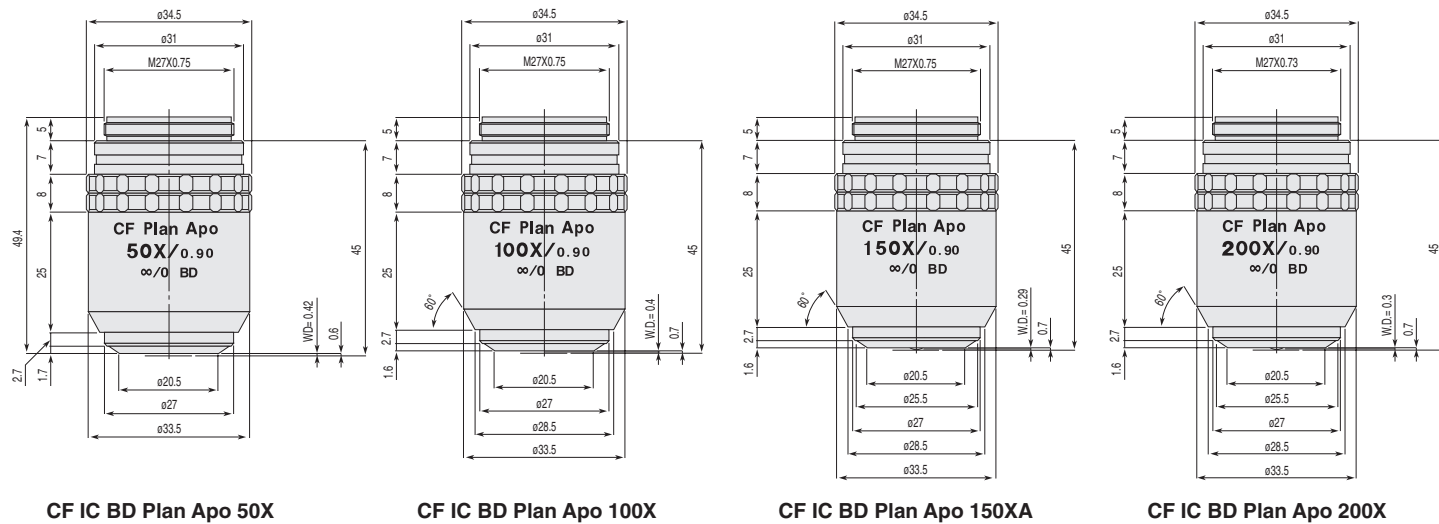
Apochromat-type objectives for brightfield use virtually eliminate chromatic aberration and feature excellent resolution.



Code No.	CF IC Objectives							Widefield CF eyepieces CFWN10X (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	
MUT10050	CF IC EPI Plan Apo 50X	0.95	0.35	4.00	0.30	170	500X	0.40	0.61	500X	0.50	0.61	
MUT10100	CF IC EPI Plan Apo 100X	0.95	0.32	2.00	0.30	170	1000X	0.20	0.46	1000X	0.25	0.46	
MUT10152	CF IC EPI Plan Apo 150XA	0.95	0.20	1.33	0.30	160	1500X	0.13	0.40	1500X	0.17	0.40	
MUT10200	CF IC EPI Plan Apo 200X	0.95	0.20	1.00	0.30	165	2000X	0.10	0.38	2000X	0.13	0.38	

CF IC BD Plan Apo High-Resolution Objectives for Brightfield/Darkfield/Nomarski DIC Use

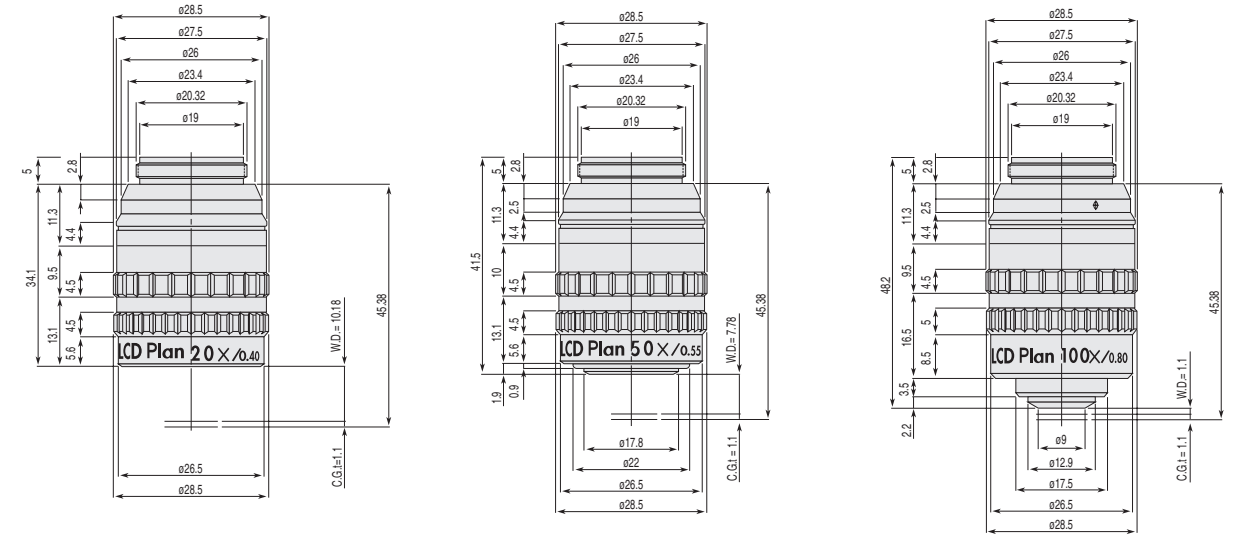
Apochromatic objective lenses with superior resolution and low chromatic aberration for both brightfield and darkfield observations.



Code No.	CF IC Objectives							Widefield CF eyepieces CFWN10X (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	
MUU10050	CF IC BD Plan Apo 50X	0.90	0.42	4.00	0.34	195	500X	0.40	0.66	500X	0.50	0.66	
MUU10100	CF IC BD Plan Apo 100X	0.90	0.40	2.00	0.34	195	1000X	0.20	0.50	1000X	0.25	0.50	
MUU10152	CF IC BD Plan Apo 150XA	0.90	0.29	1.33	0.34	190	1500X	0.13	0.45	1500X	0.17	0.45	
MUU10200	CF IC BD Plan Apo 200X	0.90	0.30	1.00	0.34	195	2000X	0.10	0.42	2000X	0.13	0.42	

CF IC LCD Plan CR for LCD Inspection

These objectives, developed specially for LCD inspection, enable the observation of a clear image under the coverglass.



Code No.	CF IC Objectives							Widefield CF eyepieces CFWN10X (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	
MUL50200	CF IC LCD Plan CR 20X	0.40	(10.18)*	10.00	1.72	140	200X	1.00	3.50	200X	1.25	3.50	
MUL50500	CF IC LCD Plan CR 50X	0.55	(7.78)*	4.00	0.91	170	500X	0.40	1.43	500X	0.50	1.43	
MUL50900	CF IC LCD Plan CR 100X	0.80	(1.1)*	2.00	0.43	165	1000X	0.20	0.61	1000X	0.25	0.61	

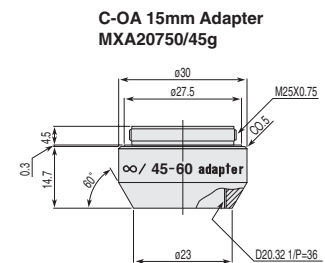
* Figures in parentheses are the working distance for a coverglass thickness of 1.1 mm. The correction range for cover glass thickness is 1.2 to 0.6 mm at all magnifications. The working distance varies by coverglass thickness. (See table below)

Working distance varies by coverglass thickness (W.D. : mm)

Objective magnification	Coverglass thickness 1.2 - 0.6mm
20X	10.11 - 10.54
50X	7.71 - 8.15
100X	1.10 - 1.12

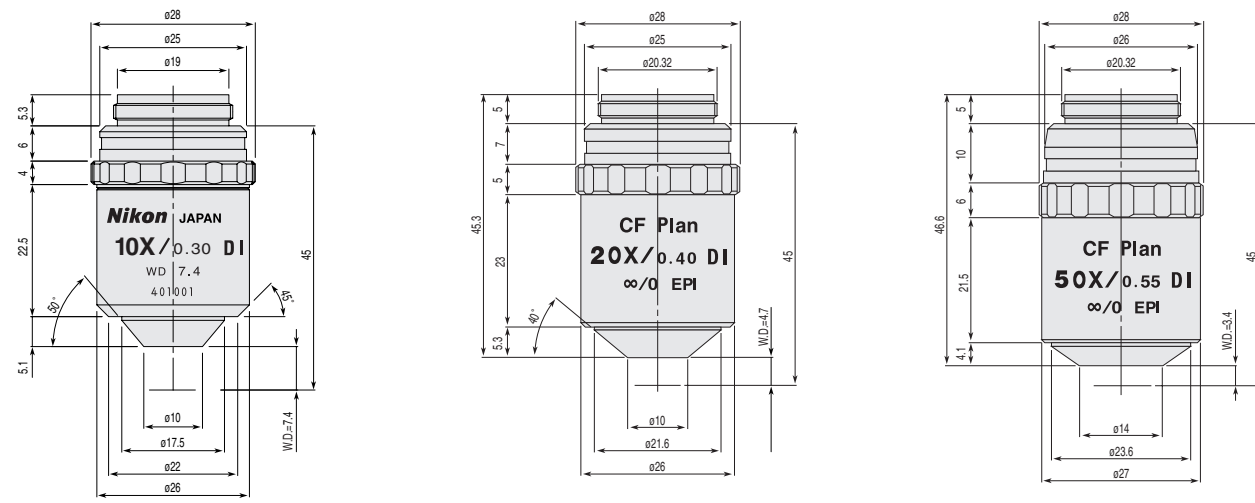
C-OA 15mm Adapter

An adapter for attaching CF & IC objectives to the C-N Sextuple Nosepiece (page 18) that supports the CFI optical system.



CF IC EPI Plan DI Double Interference Objectives

UW-compatible objectives with a low shielding factor of the reference mirror and improved optical performance, thanks to a large numerical aperture and long working distance.



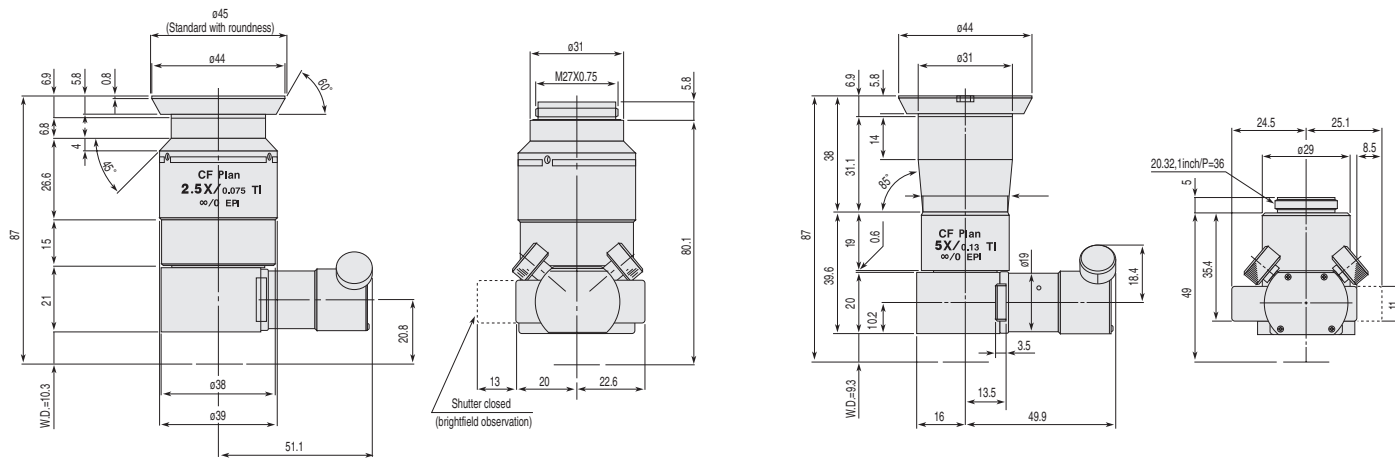
CF IC EPI Plan DI 10XA CF IC EPI Plan DI 20X CF IC EPI Plan DI 50X

Unit: mm

Code No.	CF IC Objectives						Widefield CF eyepieces CFWN10X (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)
MUL40101	CF IC EPI Plan DI 10XA	0.30	7.4	19.80	3.03	125	100X	2.00	3.04	100X	2.50	3.04
MUL40200	CF IC EPI Plan DI 20X	0.40	4.7	9.96	1.71	130	200X	1.00	1.71	200X	1.25	1.71
MUL40500	CF IC EPI Plan DI 50X	0.55	3.4	4.00	0.90	150	500X	0.40	0.90	500X	0.50	0.90

CF IC EPI Plan TI Interference Objectives

Parfocal interference objectives supporting an ultra wide field* (UW ø25), with the same focus as general objectives with a nosepiece (87mm).



CF IC EPI Plan TI 2.5X

MTI Plan TI 5X

Unit: mm

Code No.	CF IC Objectives						Widefield CF eyepieces CFWN10X (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10X (F.N. 25)		
	Objectives (Magnifications)	NA	W.D.(mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (mm)	Depth of focus (μm)
MUL42030	CF IC EPI Plan TI 2.5X	0.075	10.3	80	48.5	440	25X	8.00	48.6	—	—	—
MUL42050	CF IC EPI Plan TI 5X	0.13	9.3	40	16.2	280	50X	4.00	16.2	50X	5.00	16.2

* 2.5X supported up to a field number of ø22.

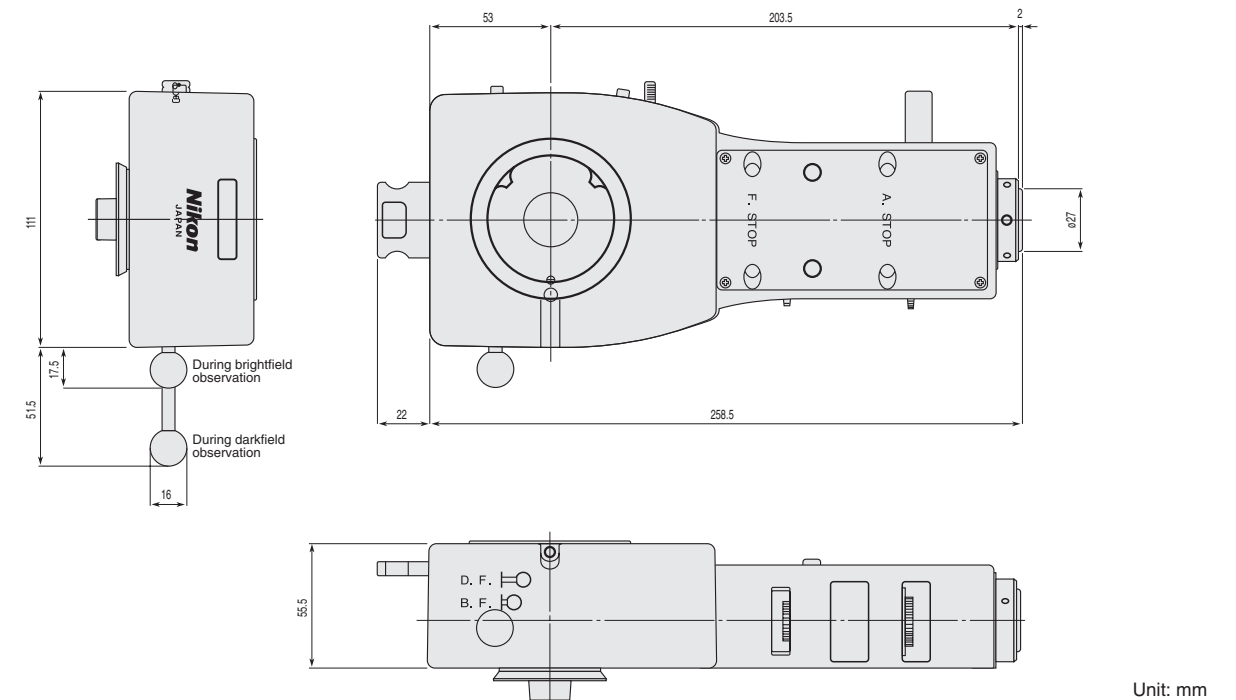
Universal Epi-Illuminator EPI-U

This universal illuminator supports the CF & IC optical system.

- Supports brightfield, darkfield, DIC, and simple polarizing observation.
- Centerable aperture diaphragm and field diaphragm. Universal illuminator supporting the CF & IC optical system.



When configured with a 12V-50W Halogen Lamphouse.



Unit: mm

Universal Epi-Illuminator EPI-U/MBE62200

Illumination blocks	Two (brightfield and darkfield). Up to two blocks can be loaded simultaneously.
Field diaphragm	Centerable
Aperture diaphragm	Centerable
Pinhole diaphragm	Can be attached to aperture diaphragm. Centerable.
Illumination	12V-50W halogen, 12V-100W halogen, and Hg/Xe high-intensity
Filters	12V-50W halogen illumination: two ø25mm filters can be installed (NCB11, ND2, ND4 included standard. GIF optional) 12V-100W halogen and Hg/Xe high-intensity illumination: three ø45mm filters can be installed (NCB11, ND2/ND4, ND8) Built-in anti-glare filter (ND8) for brightfield/darkfield changeover
Weight	1,070g

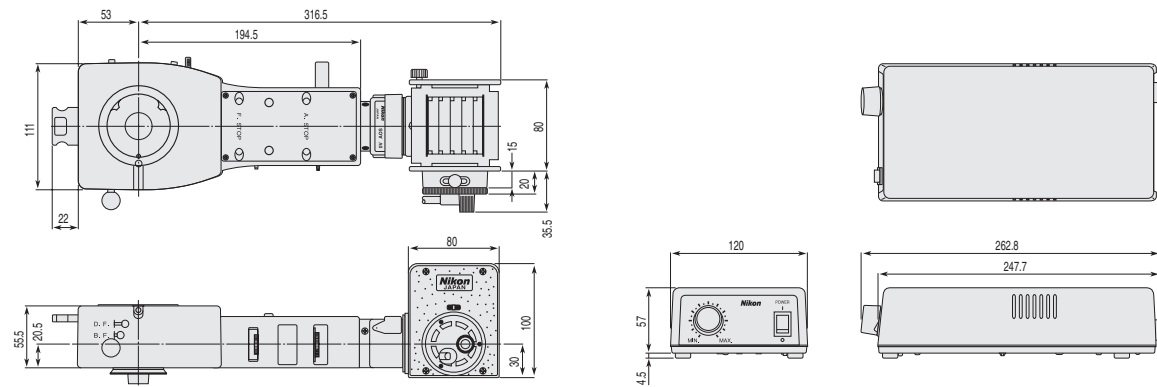
Items	Code No.	Weight (g)
Analyzer	MBN65921	15
Rotatable Analyzer	MBN62922	15
EB Mirror Block	MBE62010	60
ED Mirror Block	MBE62020	50
Pin Hole	MBE62250	5
λ Plate	MBN65922	10
Polalyzer	MBN65920	50

Illuminators

In addition to a 12V-50W halogen illuminator, four types of high-intensity illuminators are also available to best suit your applications.

12V-50W Halogen Illuminator

This is the standard illuminator for brightfield and darkfield observation.



Configured with the Universal EPI-illuminator EPI-U, 12V50W EPI Lamphouse and other components.

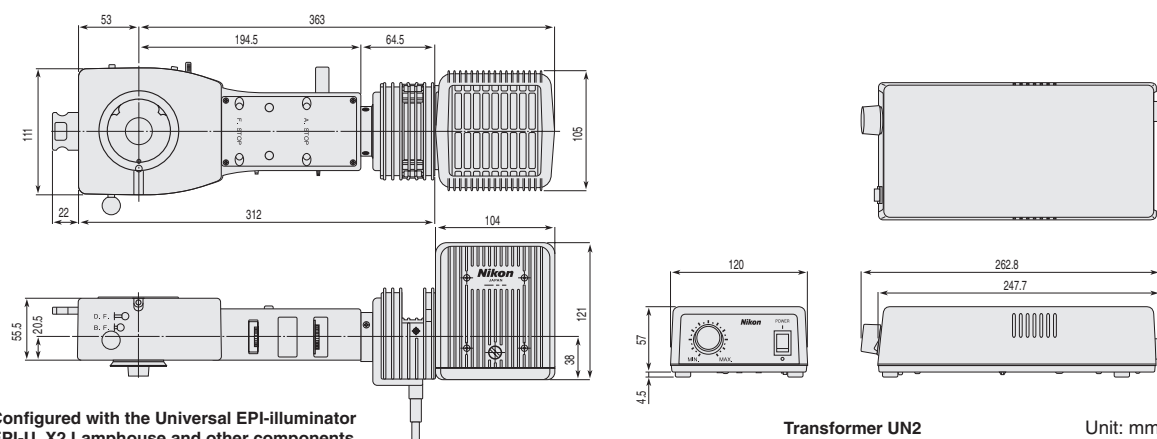
Items	Code No.	Weight (g)
Lamphouse Adapter 50	MBE65050	170
ø25mm EPI Filter GIF	MBN65200	5
ø25mm EPI Filter NCB11	MBN65700	5
ø25mm EPI Filter ND4	MBN65800	5
ø25mm EPI Filter ND2	MBN65810	5

Items	Code No.	Weight (g)
1 Epi-Lamphouse 50W	MBE65250	500
Halogen Lamp 12V50W-LL	MXA20145	5
Transformer UN2-PSD 100W	MBF12212	1030
Power Cord BJ/BE	MBF11250/11300	160
Socket Adapter	MXA20560	160
3-3pin Extension Cable	MXA29002	100

Transformer UN2 Unit: mm

12V-100W Halogen Illuminator

• Uses a pre-centered (no centering procedures are necessary) high-intensity lamphouse.



Configured with the Universal EPI-illuminator EPI-U, X2 Lamphouse and other components.

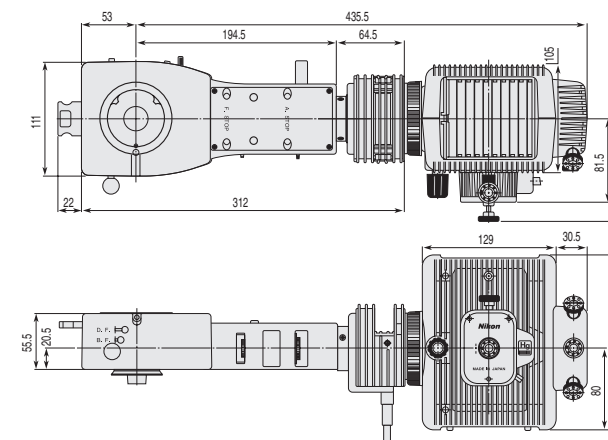
Items	Code No.	Weight (g)
Lamphouse Adapter 100	MBE65090	420
ø45mm Filter NCB11	MBN61700	25
ø45mm Filter ND2/4	MBN61800	35
ø45mm Filter ND8	MBN61810	25
X2 Lamphouse 12V100W BL	MBE15204	750

Items	Code No.	Weight (g)
Halogen Lamp 12V-100W LL	MXA20434	10
Transformer UN2-PSD 100W	MBF12212	1030
Power Cord BJ/BE	MBF11250/11300	160
Socket Adapter	MXA20560	160
3-3pin Extension Cable	MXA29002	100

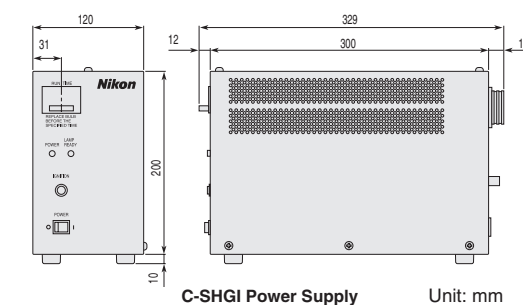
Transformer UN2 Unit: mm

100W Mercury Illuminator

• High-intensity light source that provides stable illumination.



Configured with the Universal EPI-illuminator EPI-U, Lamphouse HMX-4BL, Mercury Lamp Socket 100W, and other components.

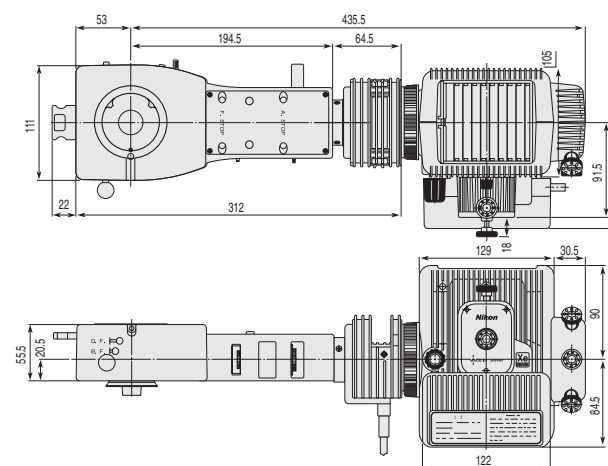


C-SHG1 Power Supply Unit: mm

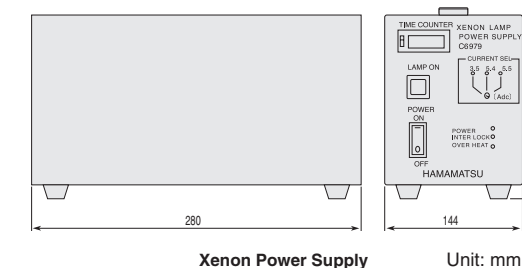
Items	Code No.	Weight (g)
Lamphouse Adapter 100	MBE65090	420
V2-A Halogen Lamphouse Adapter	MXA20425	100
Epi Collector Lens	MBE15004	200
Lamphouse HMX-4B with built-in back mirror	MBE25311	1050
Mercury Lamp Socket 100W A	MBF33342	780
C-SHG1 Power Supply	MBF12321	4600
C-LHG1 Mercury Lamp HG-100W	MBF14342	160
Power Cord BJ/BE	MBF11250/11300	160
Socket Adapter	MXA20560	160

75W Xenon Illuminator

• Delivers a constant spectrum of light extending from the ultraviolet to infrared range, ensuring observations almost identical to those under natural light.



Configured with the Universal EPI-illuminator EPI-U, Lamphouse HMX-4, Xenon Lamp Socket, and other components.

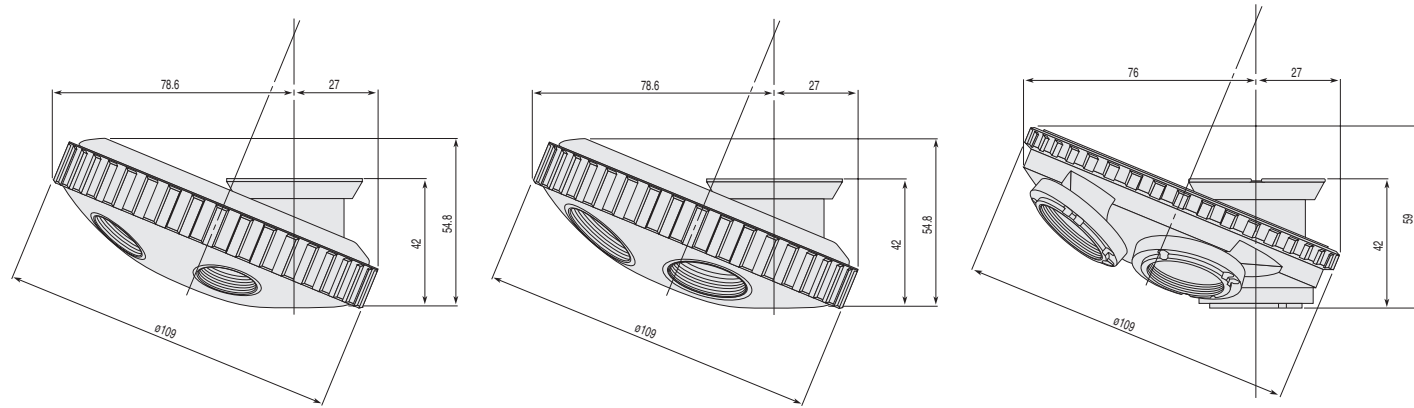


Xenon Power Supply Unit: mm

Items	Code No.	Weight (g)
Lamphouse Adapter 100	MBE65090	420
V2-A Halogen Lamphouse Adapter	MXA20425	100
Epi Collector Lens	MBE15004	200
Lamphouse HMX-4	MBE25100	700
Xenon Lamp Socket	MBF33441	770
Xenon Power Supply 75W	MXK23409	3800
Xenon Lamp L2194-11N	WAM30498	160
Power Cord BJ/BE	MBF11250/11300	160
Socket Adapter	MXA20560	160

Revolving Nosepieces

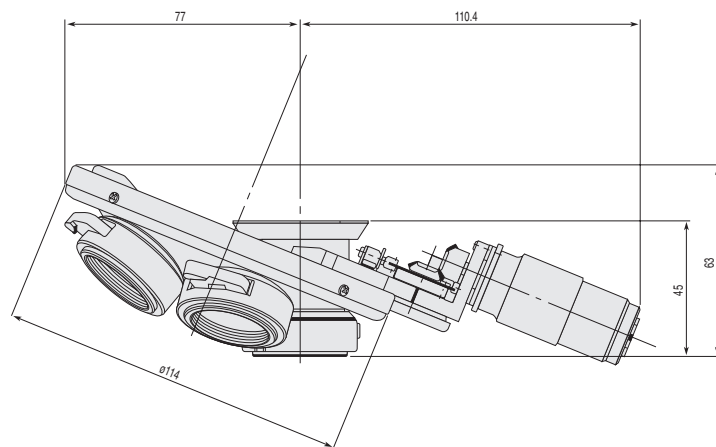
Four types of nosepieces – either manual or motorized – are available to choose from.



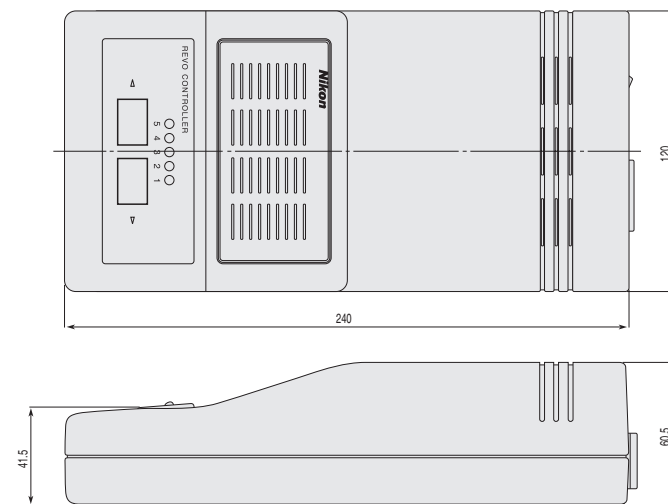
EPI Quintuple Nosepiece
MBP62210/910g

BD Quintuple Nosepiece
MBP61210/980g

Universal Quintuple Nosepiece
MBP63210/940g
Nomarski Prisms
MBH62210 the others
15g/piece



Motorized Universal Nosepiece
MBP68210/1450g



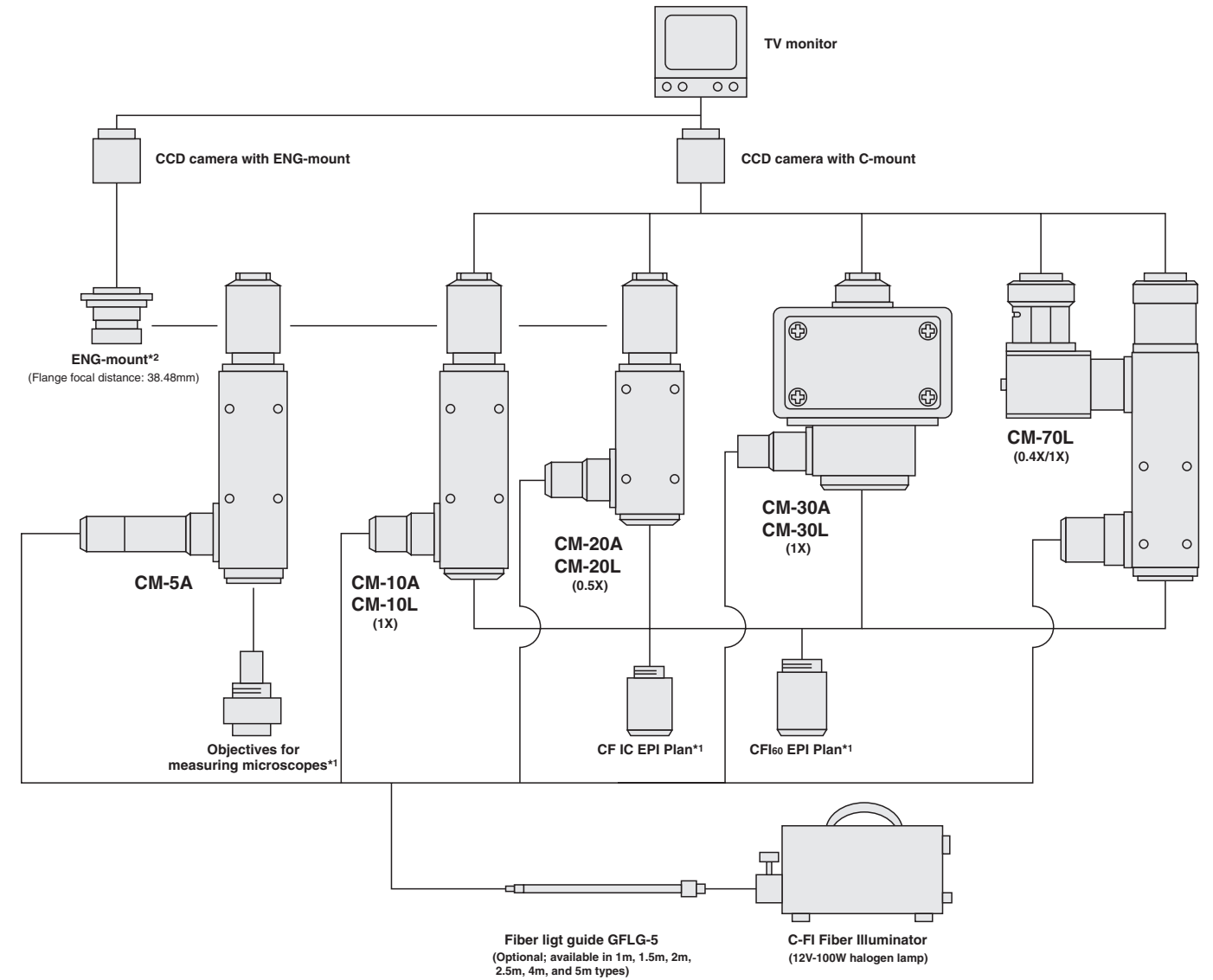
Motorized Nosepiece Controller
MBF65301/900g

Unit: mm

CM-Series Compact Reflected Microscopes

Ultra-compact reflected microscopes designed for integration into production lines to provide on-monitor observations.

- Ultra-compact and lightweight.
- C-mount video cameras having 1/4 to 1-inch CCDs are attachable as standard. ENG-mount video cameras can also be mounted via optional ENG-mount adapters.
- The Koehler Illumination Optical System offers a uniformly bright viewfield. The light source is connected to the microscope unit via a liquid fiber guide to minimize the influence of heat generated by the light source.
- Tread holes ideally located on the surface of the microscope facilitate attachment of various auxiliary equipment.

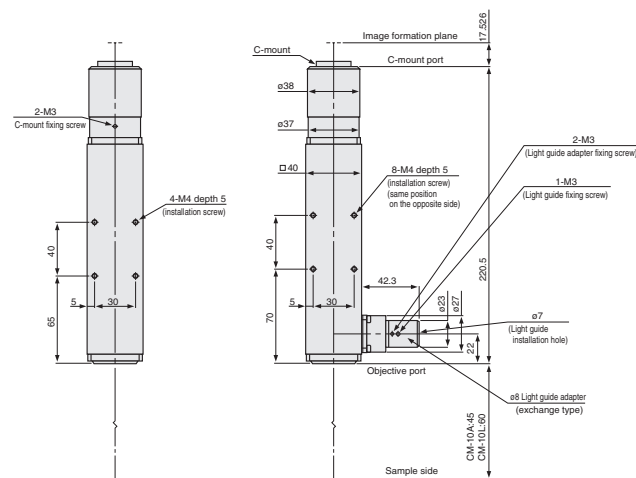


*1 Use an objective for measuring microscopes on the CM-5A and a CF IC EPI Plan lens on other A series units. In addition, use an EPI Plan lens from the CF160 series on L series units.

*2 The ENG-mount for CM is a made-to-order product. When ordering, please inform us of the flange focal distance of the camera that will be used.

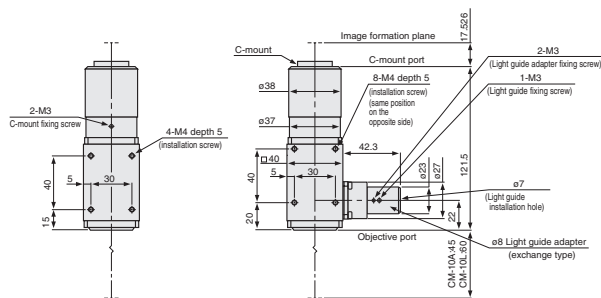
CM-10A/CM-10L

- Basic model with a tube lens focal length of f/200mm (1X)

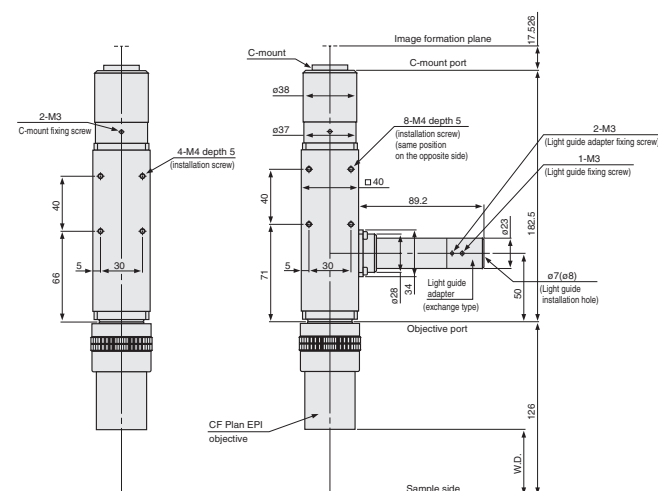


CM-20A/CM-20L

- Features a tube shorter than the CM-10, by setting the tube lens focal length at f/100mm (0.5X)



CM-5A

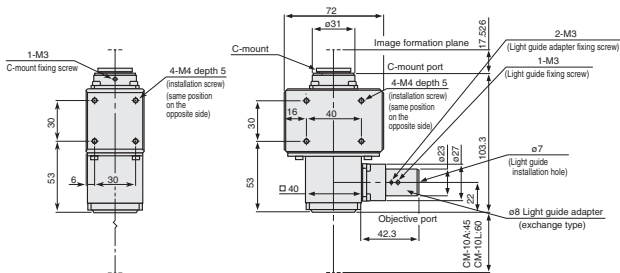


CM-5A	
Camera mount	C-mount (ENG-mount possible with option)
Tube lens focal length	—
Compatible objectives	CF Plan EPI Objectives
Illumination optical system	Koehler illumination (high-quality telecentric illumination)
Attachment surfaces	3
Dimensions (WxDxH) ; Weight (Approx.)	40x40x186.5mm ; 410g

Manufactured by: Nikon Engineering Co.,Ltd.

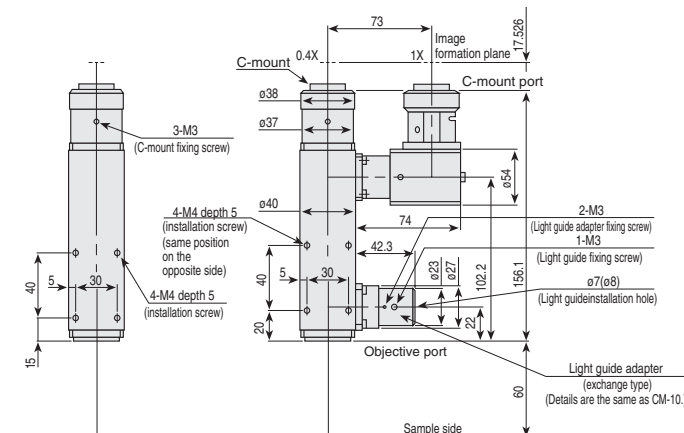
CM-30A/CM-30L

- Compact model based on the CM-10 that features a short tube length.

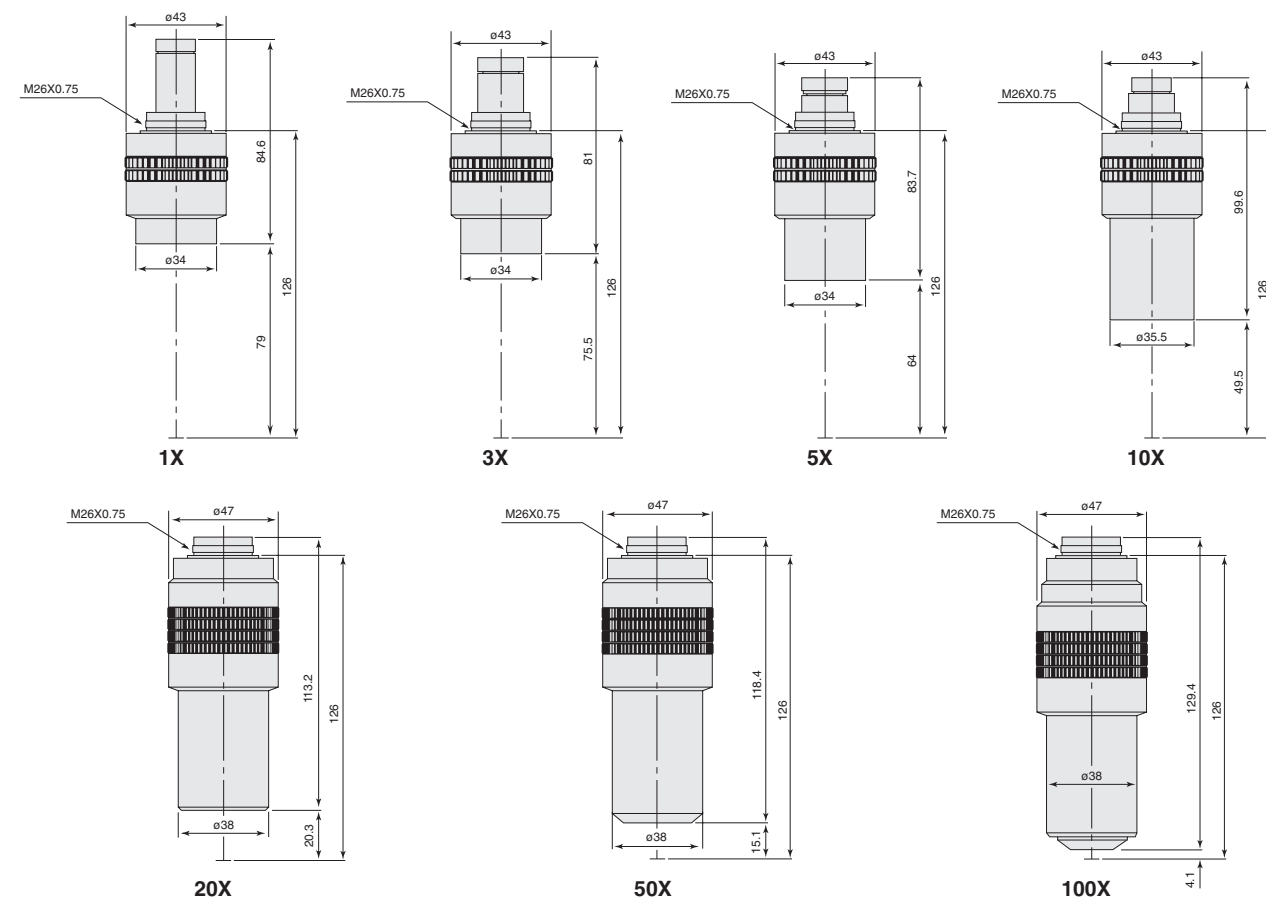


CM-70L

- Enables simultaneous observation at different imaging magnifications (1x/0.4x). For CFI60 EPI Plan.

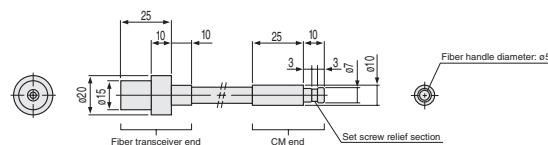


Objectives for Measuring Microscopes

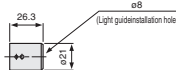


	1X	3X	5X	10X	20X	50X	100X
Focal length (mm)	158.2	66.2	42.3	20.2	10.98	4.3	2.15
NA	0.03	0.09	0.13	0.2	0.4	0.55	0.75
W.D. (mm)	79	75.5	64	48	20.3	15.1	4.1
Depth of focus (μm)	322	36	17	7	1.8	1	0.5
Parfocal distance (mm)	126						
Weight (g)	120	150	150	200	650	600	550

Fiber light guide



ø8 Light guide Adapter



	CM-10A/CM-10L	CM-20A/CM-20L	CM-30A/CM-30L	CM-70L
Camera mount	C-mount (ENG-mount possible with option)	C-mount	C-mount	C-mount
Tube lens focal length	200mm	100mm	200mm	80/200mm
Tube lens magnification	1X	0.5X	1X	0.4X/1X
Magnification on CCD surface	Same as objective magnification	Objective magnification x 0.5	Same as objective magnification	Same as objective magnification and 0.4X
Compatible objectives*	A series: CF IC EPI Plan objectives / L series: CFI60 EPI Plan objectives			
Illumination optical system	Koehler illumination (high-quality telecentric illumination)			
Attachment surfaces	3		4	
Dimensions (WxDxH) ; Weight (Approx.)	40x40x224.5mm ; 440g	40x40x125.5mm ; 290g	42x72x107.3mm ; 400g	40x117x156.1mm ; 690g

Manufactured by: Nikon Engineering Co.,Ltd.

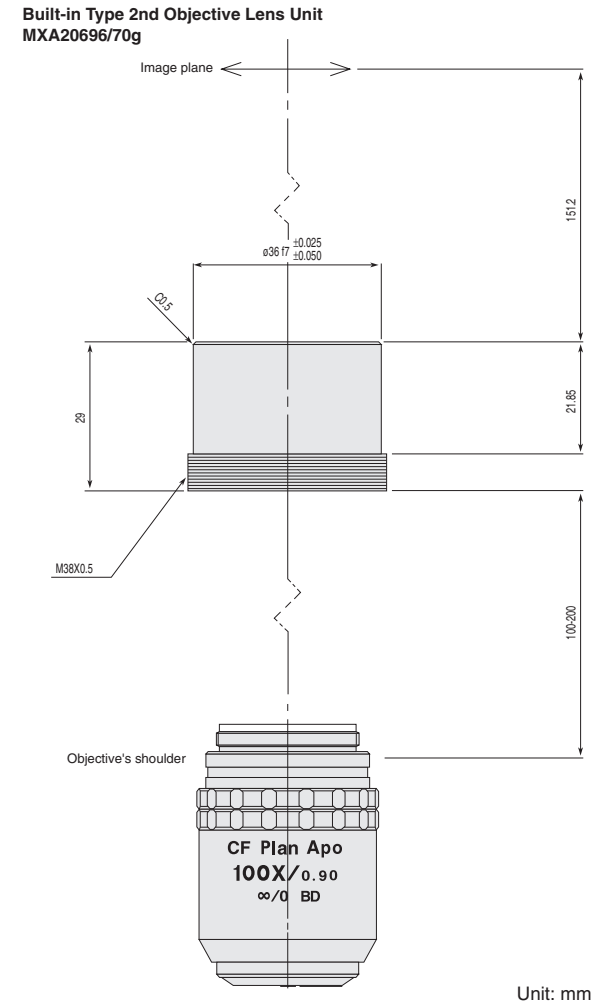
* On the above-mentioned A series and L series, use CF IC EPI Plan and CFI60 series EPI Plan Objectives, respectively.

2nd Objective Lens Units

Used to focus parallel light beams coming through CFI60 objectives and CF&IC objectives onto the image plane.

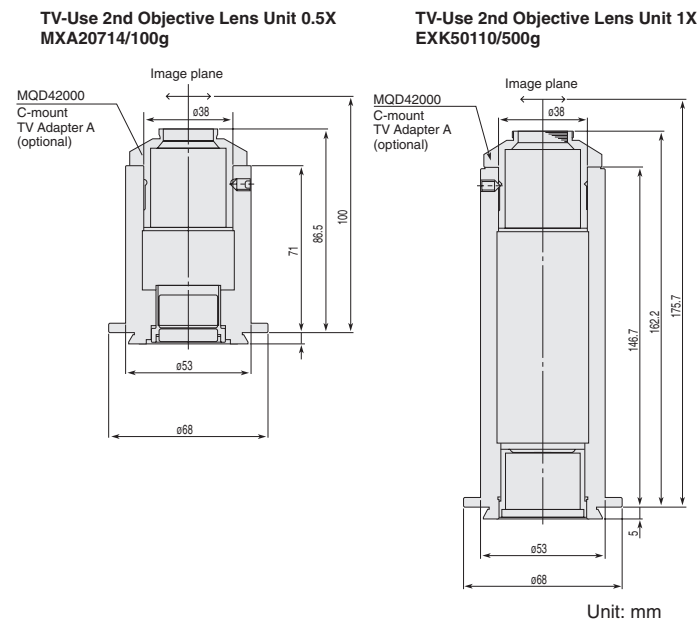
Built-in Type 2nd Objective Lens Unit

- Compatible with CFI60 infinity objectives.
- Focal length: f/200mm.
- To obtain the optimal objective performance, keep the distance between the lens unit and the objective's shoulder within 100-200mm as shown in the diagram at right.



TV-Use 2nd Objective Lens Units 0.5X/1X

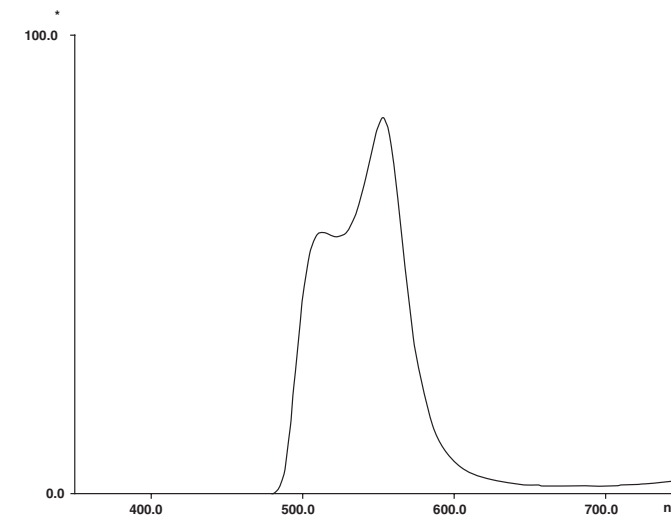
- Image plane magnification: 0.5X; Focal length: f/100mm.
- Image plane magnification: 1X; Focal length: f/200mm.
- With a field number of 11mm, this lens unit can be used with CCD cameras smaller than 2/3-inch types.
- Distance between the lens unit and the objective's shoulder: 60-160mm (110mm optimum).
- Compatible with Universal Epi-Illuminators (EPI-U, LV-UEPI, LV-UEPI2, LV-UEPI2A, and LV-EPILED).



Filters

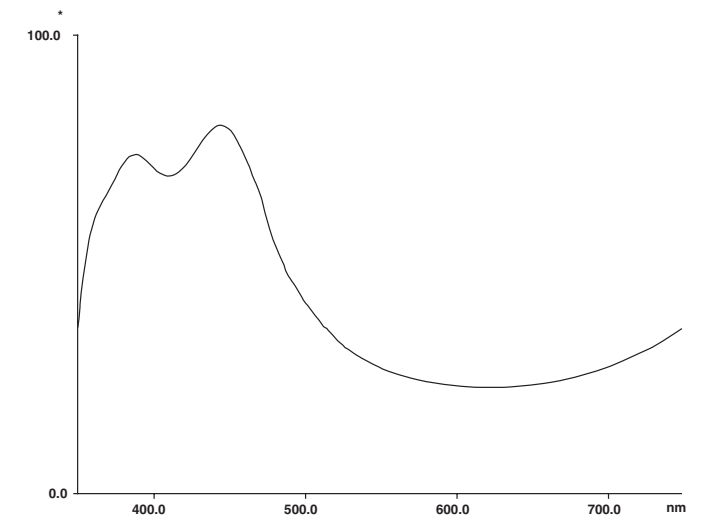
For the L-UEPI Universal Epi-Illuminator ESD, a color balance compensation filter and neutral density filter are available.

There are two types (ø25 mm and ø45 mm) depending on the illuminator that will be used.



GIF Filter

Allows only a green spectrum near the 546nm wavelength to pass through. Effective for increasing the contrast of monochrome photographs and black-and-white TV images.



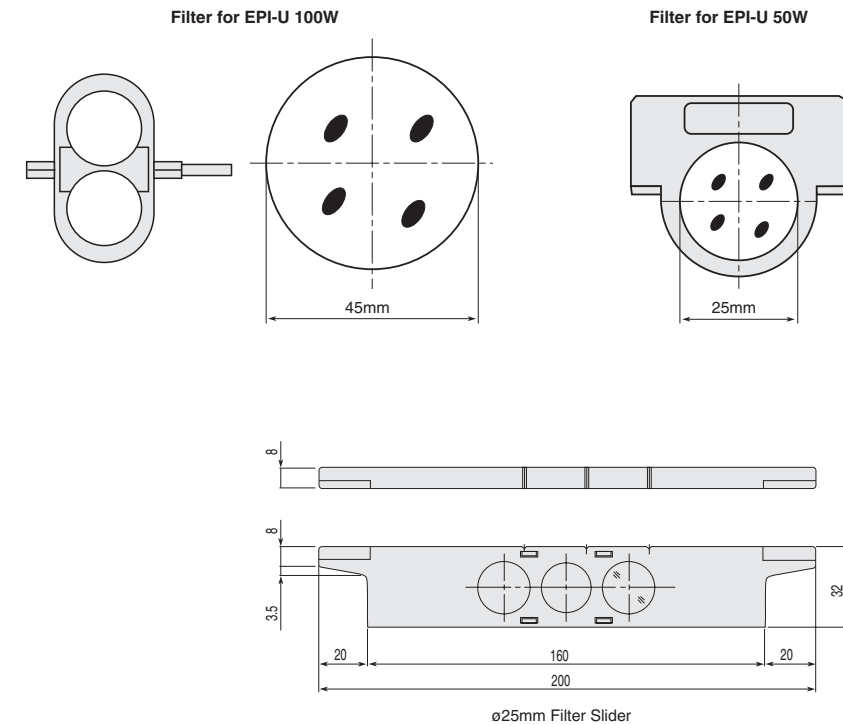
NCB11 Filter

This compensation filter maximizes the color reproduction of daylight-type color film, when the halogen lamp voltage of the brightfield light source is set to 9V.

ND Filters

This filter is for adjusting brightness during observation and photography by lowering the quantity of light without changing conditions, such as illumination light and spectral properties (color balance).

* The numbers (xx) in NDxx signify the light reduction. For example, 4 means a 1/4 reduction and 16 and 1/16 reduction.



Item	Code No.	Weight(g)
ø25mm EPI Filter GIF	MBN65200	5
ø25mm EPI Filter NCB11	MBN65700	5
ø25mm EPI Filter ND4	MBN65800	5
ø25mm EPI Filter ND2	MBN65810	5

Item	Code No.	Weight(g)
ø45mm Filter NCB11	MBN61700	25
ø45mm Filter ND2/4	MBN61800	35
ø45mm Filter ND8	MBN61810	25

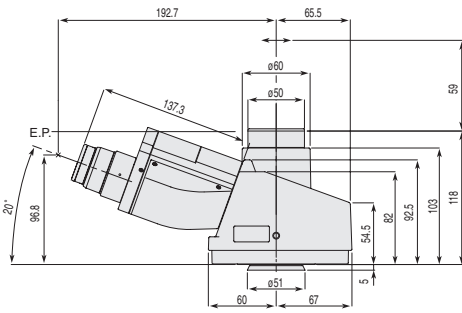
Item	Code No.	Weight(g)
YM-NCB25 NCB11-1	MBN66750	31
YM-ND25 ND4/ND16	MBN66760	36
YM-GIF 25 GIF	MBN66730	25

Eyepiece Tubes/Double Port/Straight Tubes

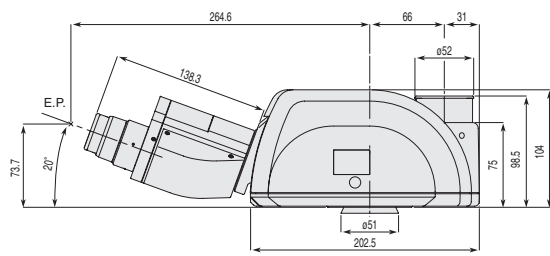
Sleeve diameter (mm) **30**
 Illuminators **LV-UEPI LV-UEPI2 LV-UEPI2A LV-EPILED**

These lens tubes can be combined with illuminators such as the LV-UEPI, LV-UEPI2, LV-UEPI2A and LV-EPILED. The trinocular eyepiece tube supports both ultrawide and wide fields of view with a change of the eyepiece lens.

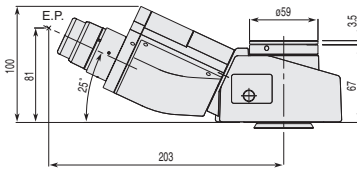
(Unit: mm
E.P.: Eyepoint)



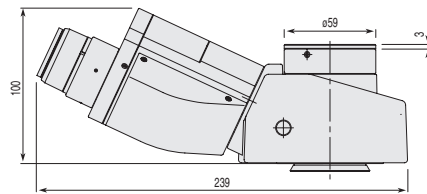
LV-TI3 Trinocular Tube ESD **(30)**



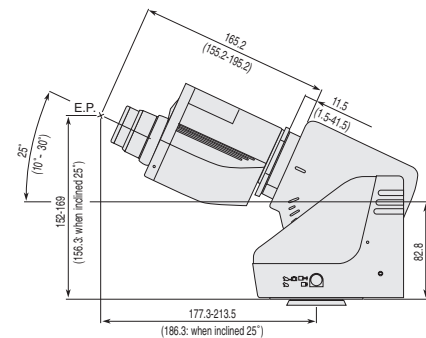
LV-TT2 Tilting Trinocular Tube **(30)**



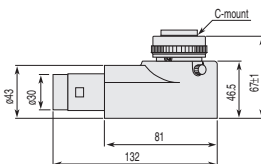
Y-TF2 Trinocular Tube FUW2 **(30)**



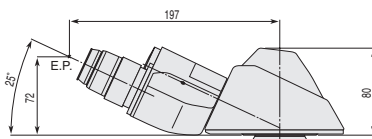
Y-TT2 Trinocular Tube TUW **(30)**



C-TE Ergonomic Biocular Tube **(30)***



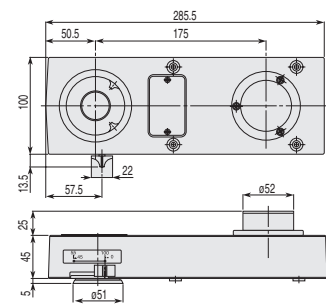
C-TEP Ergonomic DSC Port



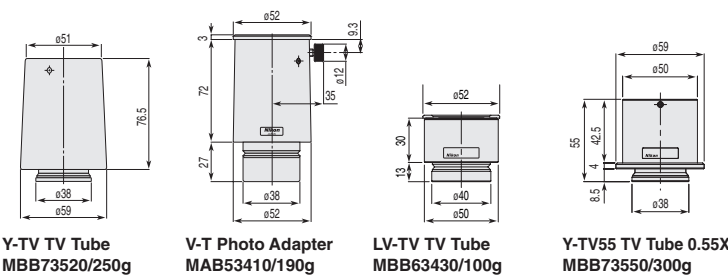
Y-TB Biocular Tube **(30)***

Double Port

Installed between the epilluminator and the trinocular tube, the double port enables simultaneous attachment of CCTV and 35mm cameras.



Straight Tubes



These attachments are used to change the format of the straight tube of a trinocular tube.

Code No.	Item	Weight(g)	Type	Image type	Field number	Tube's tilt angle	Beam split ratio (observation:photo)	Interpupillary distance
MBB63420	LV-TI3 Trinocular Tube ESD	1800	Siedentopf	Erect	22/25	20°	100:0/0:100	50-75mm
MBB61000	LV-TT2 Tilting Trinocular Tube	2580	Siedentopf	Erect	22/25	10°- 30°	100:0/20:80	50-75mm
MBB73101	Y-TF2 Trinocular Tube FUW2	2000	Siedentopf	Inverted	22/25	25°	100:0/0:100	50-75mm
MBB73111	Y-TT2 Trinocular Tube TUW	2400	Siedentopf	Inverted	22/25	25°	100:0/20:80/0:100	50-75mm
MBB76500	C-TE Ergonomic Biocular Tube	2100	Siedentopf	Inverted	22	10°- 30°	—	50-75mm
MBB72100	Y-TB Biocular Tube	950	Siedentopf	Inverted	22	25°	—	50-75mm

Focal distance of tube in the infinity corrected optics: 200mm, Equipment magnification: 1X, Diameter of the circular dovetail mount to the body: 51mm.

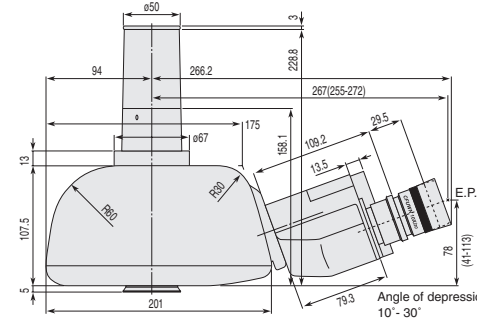
MBB76600	C-TEP Ergonomic DSC Port	350	Specially for C-TE binocular ergonomic tube, Equipment magnification: 0.7X, Beamsplit ratio (binocular: port) 50:50/100:0
MBB74100	Y-IDP Double Port	1300	Equipment magnification: 1X, Beamsplit ratio (observation: photo) 55:45/100:0
MBB74105	Y-IDP Double Port 0/100	1300	Equipment magnification: 1X, Beamsplit ratio (observation: photo) 100:0/0:100

* For attaching TV/video equipment to eyepiece tubes or Double Port, refer to the system diagram on page 3.
 * CFI UW 10x and CFI UW 10xM are not suitable for use.

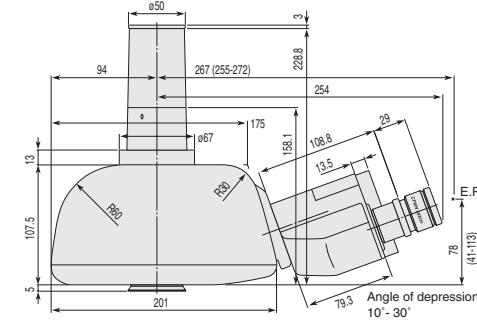
Eyepiece Tubes/Beam Splitter

Sleeve diameter (mm) **30 23.2**
 Illuminators **EPI-U**

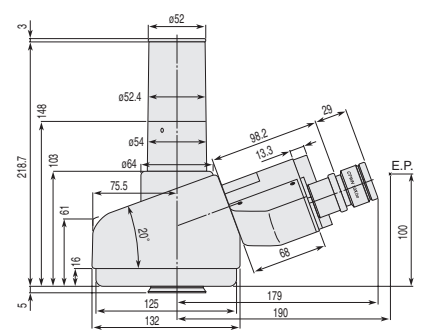
Four of the five eyepiece tubes are upright and three of the five include a tilt mechanism for adjusting the height of the eyepiece.



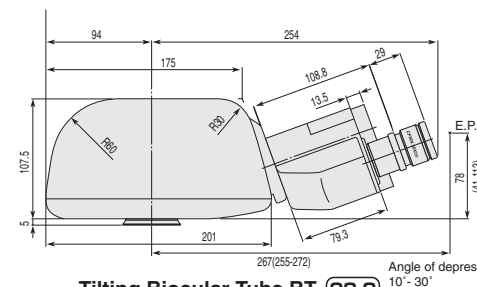
Ultra-widefield Trinocular Tube UWTT **(30)**



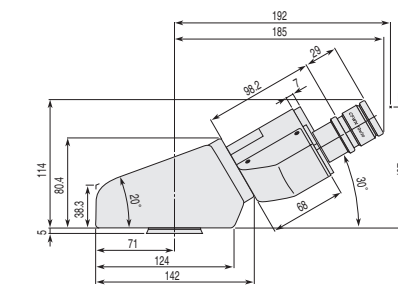
Tilting Trinocular Tube TT **(23.2)**



Trinocular Tube TI **(23.2)**



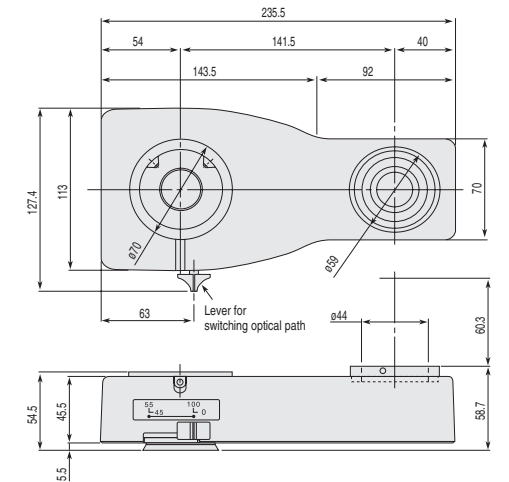
Tilting Biocular Tube BT **(23.2)**



Biocular Tube BI **(23.2)**

Beam Splitter

Enables the simultaneous mounting of eyepiece tubes and an ENG-mount/C-mount CCTV camera etc.



(Unit: mm
E.P.: Eyepoint)

Code No.	Item	Weight(g)	Type	Image type	Field number	Tube's tilt angle	Beam split ratio (observation:photo)	Interpupillary distance
MBB63600	Ultra-widefield Trinocular Tube UWTT	3000	Siedentopf	Erect	25	10°- 30°	100:0/20:80	51-80mm
MBB63500	Tilting Trinocular Tube TT	3100	Siedentopf	Erect	20	10°- 30°	100:0/20:80	51-80mm
MBB63300	Trinocular Tube TI	2000	Siedentopf	Erect	20	20°	100:0/0:100	51-75mm
MBB62500	Tilting Biocular Tube BT	2500	Siedentopf	Erect	20	10°- 30°	—	51-80mm
MBB62100	Biocular Tube BI	1300	Siedentopf	Inverted	20	30°	—	51-75mm

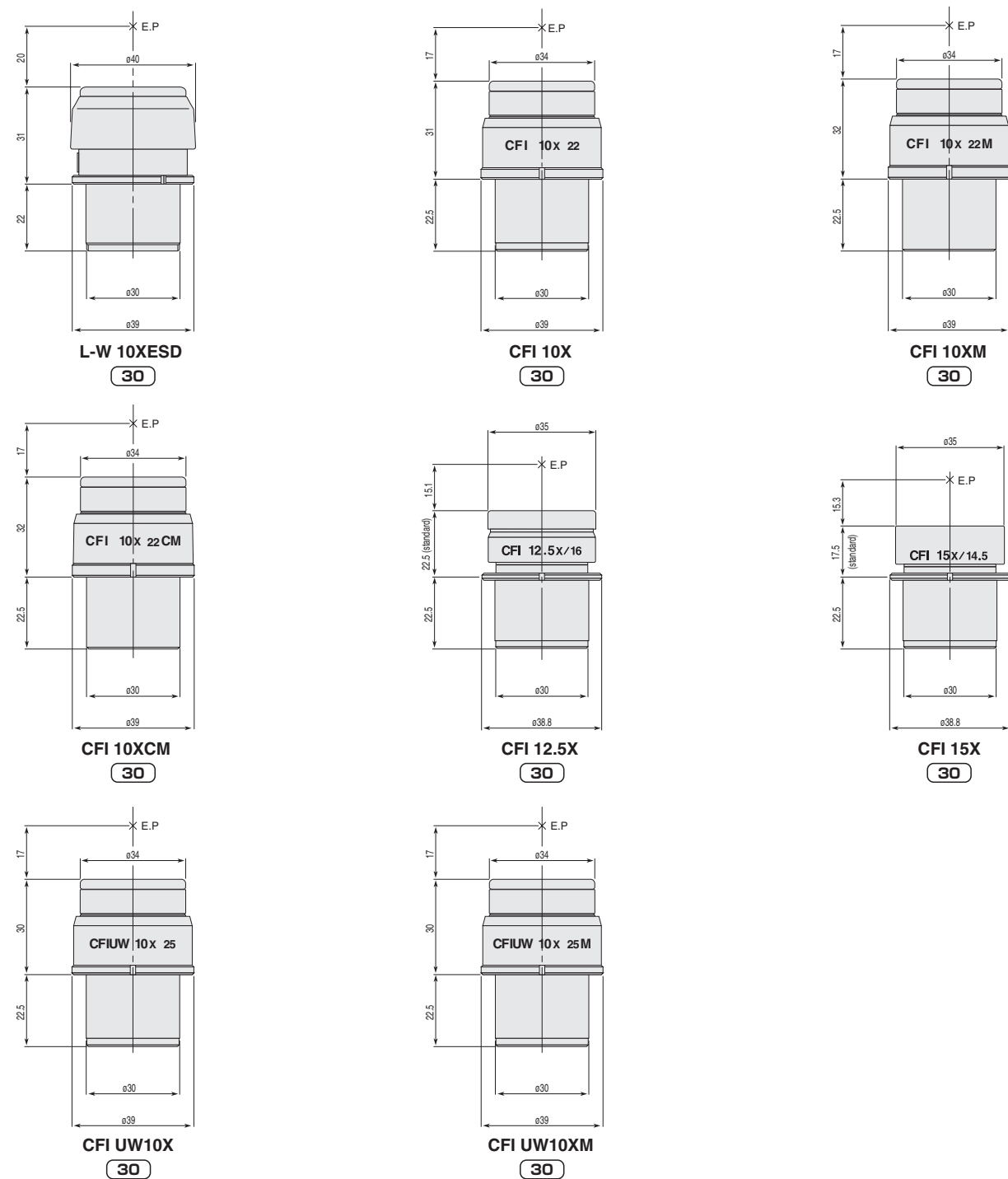
Focal distance of 2nd objective lens in the infinity corrected optics: 200mm, Equipment magnification: 1X, Eyepiece sleeve diameter: UWTT = 30mm/Other = 23.2mm, Diameter of circular dovetail mount to the body: 46mm, Mounting/dismounting of straight tube: Possible, Photographic focus on binocular tube: Not possible with TI

MBB65900	Beam Splitter	1240	Equipment magnification: 1X, Beamsplit ratio (observation: photo) 55:45/100:0
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* An ENG-mount zooming adapter (MQD12023) or C-mount zooming adapter (MQD12022) is required to attach a CCTV camera. (For more information on these adapters. See page 41.)
 * See page 19 "System Diagram" for information on attaching TV/video equipment, eyepiece tubes, illuminators, and other options to the beam splitter.

Eyepieces Sleeve diameter (mm) 30

These eyepieces have a 30mm sleeve diameter and maximize the performance of objective lenses.

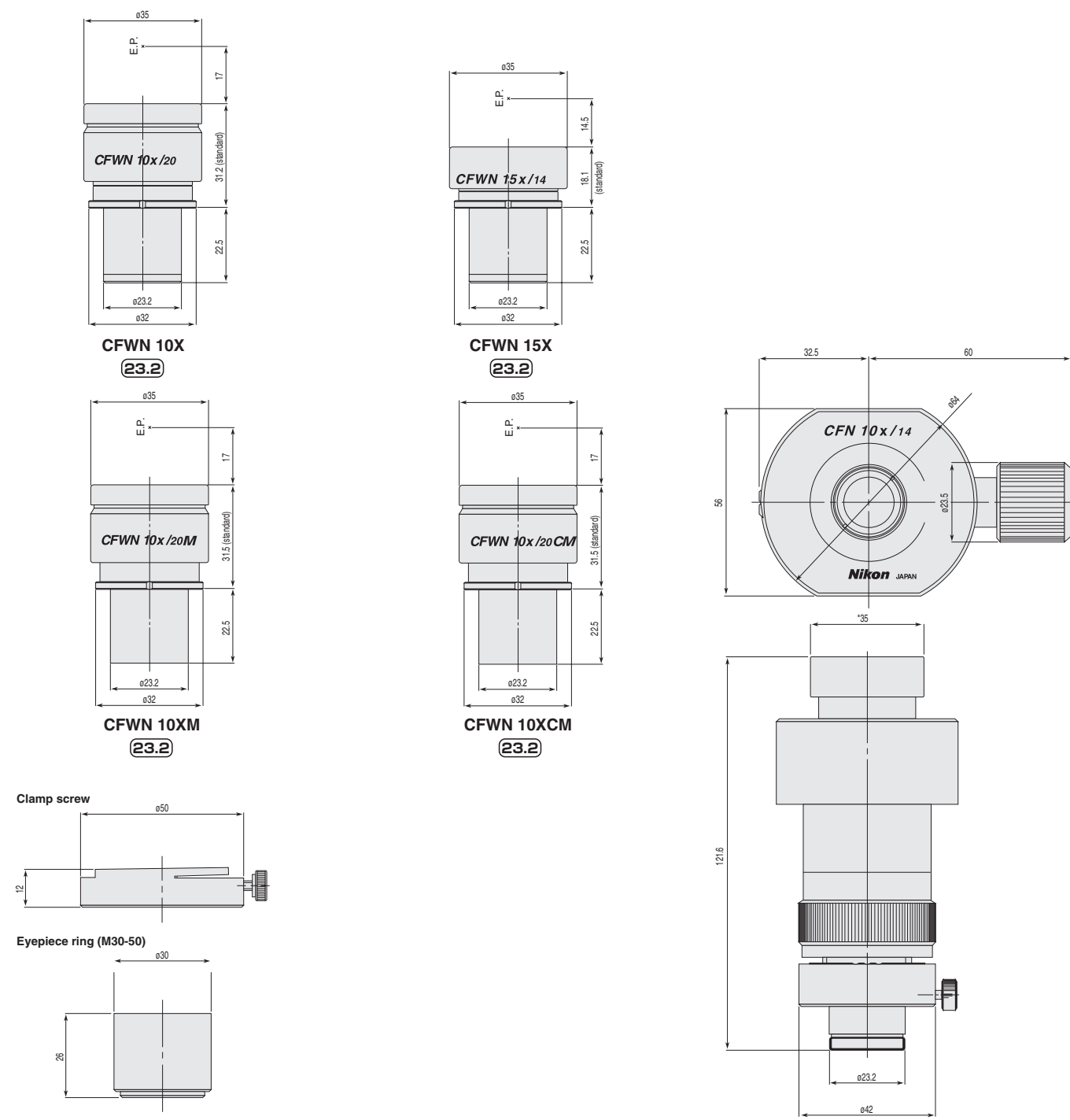


(Unit: mm
E.P.: Eyepoint)

Code No.	Item (field number)	weight (g)	Code No.	Item (field number)	weight (g)
MBJ62100	L-W 10XESD (22)	80g	MAK10120	CFI 12.5X (16)	63g
MAK10100	CFI 10X (22)	75g	MAK10150	CFI 15X (14.5)	48g
MAK11100	CFI 10XM (22) with Photomask	80g	MAK30100	CFI UW10X (25)	100g
MAK12100	CFI 10XCM (22) with crosshair reticle	77g	MAK31100	CFI UW10XM (25) with Photomask	105g

Eyepieces Sleeve diameter (mm) 23.2

These eyepieces have a 23.2mm sleeve diameter and maximize the performance of objective lenses.



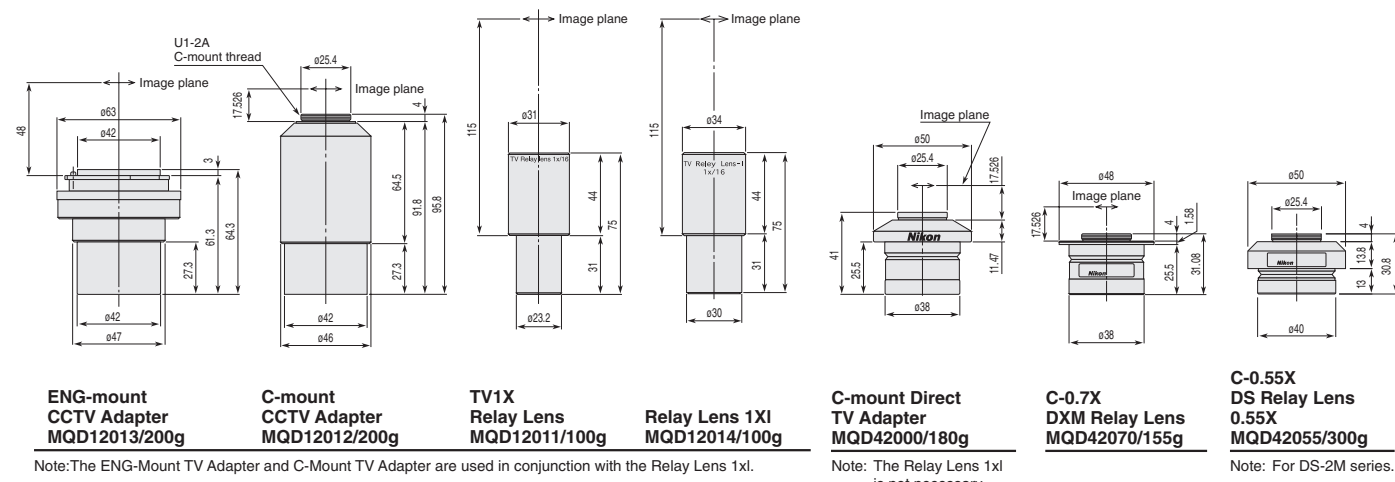
(Unit: mm
E.P.: Eyepoint)

Code No.	Item (field number)	weight (g)	Code No.	Item (field number)	weight (g)
MBJ20100	CFWN 10X (20)	50g	MBJ22100	CFWN 10XCM (20) with crosshair reticle	50g
MBJ20150	CFWN 15X (14)	50g	MXA23010	Adapter for CFN Filar Micrometer Eyepiece 10XA	40g
MBJ21100	CFWN 10XM (20) with Photomask	50g			
MBJ04102	Filar Micrometer 10XN	Combinable with objectives from 10 to 100X. When using 100X objective, 0.01 banya reading at 0.1μm			250g

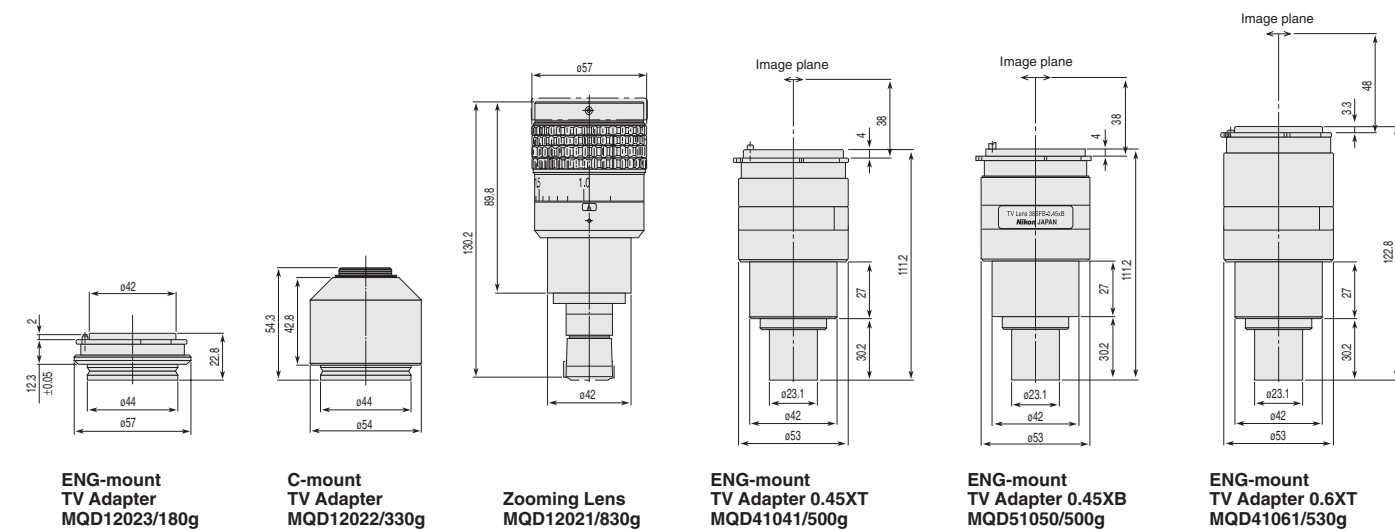
CCTV Camera Adapters

Both C-mount and ENG-mount types are available.

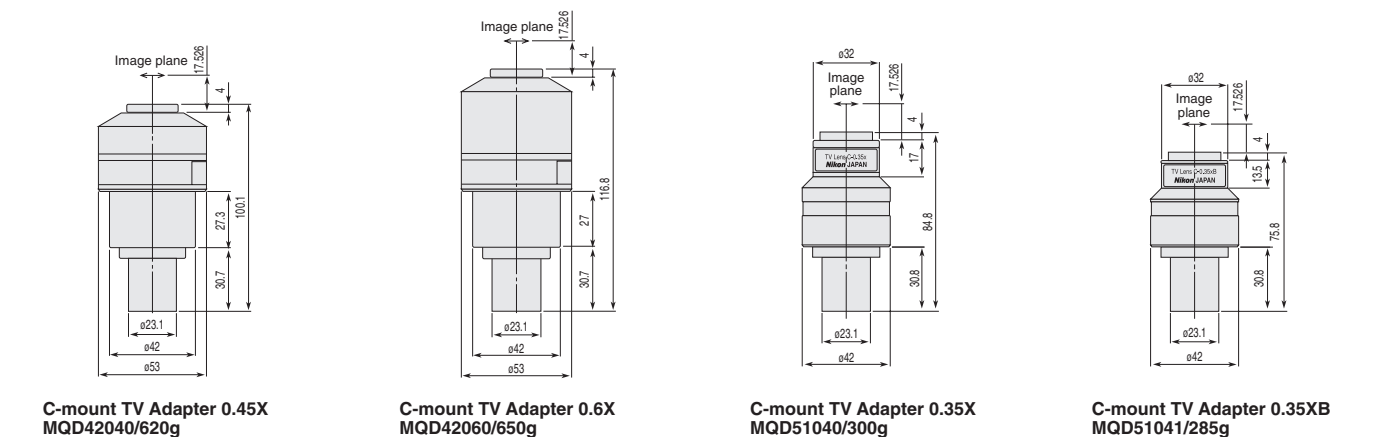
CFI60 CF&IC



Note: The ENG-Mount TV Adapter and C-Mount TV Adapter are used in conjunction with the Relay Lens 1x1.
 Note: The Relay Lens 1x1 is not necessary.
 Note: For DS-2M series.



Note: The ENG-Mount Zooming Adapter and C-Mount Zooming Adapter are used in conjunction with 0.9-2.25X TV zoom lenses.
 These ENG-Mount adapters feature a built-in reduction relay lens, enabling areas equivalent to those seen through the eyepiece to be viewed on the monitor. Adapters for 1/2-inch (0.45X) and 2/3-inch (0.6X) CCD cameras are available.



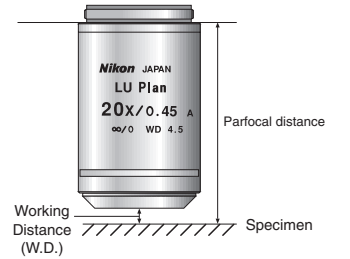
These C-Mount adapters feature a built-in reduction relay lens, enabling areas equivalent to those seen through the eyepiece to be viewed on the monitor. Adapters for 1/3-inch (0.35X), 1/2-inch (0.45X), and 2/3-inch (0.6X) CCD cameras are available.

Unit: mm

Glossary

Working Distance (W.D.) and Parfocal Distance

Working distance is the distance between the top lens of the objective and the surface of the specimen (or the cover glass) when the specimen is focused. The distance between the objective's shoulder and the specimen (or the cover glass) when the specimen is focused is referred to as parfocal distance. Nikon's CF infinity objectives have a parfocal distance of 45mm, while its CFI60 objectives feature a parfocal distance of 60mm.

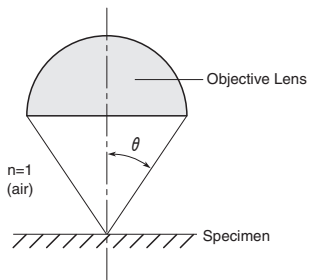


Numerical Aperture (NA)

Numerical aperture is generally indicated by the equation below.

Where, $NA = n \times \sin\theta$
 n=Refractivity of the substance existing between the specimen and the objective. (n=1 for air)
 $\sin\theta$ =Angle that is formed by the optical axis and the light ray that passes to the extreme periphery of the objective lens.

Numerical aperture is the most important factor in judging the objective's resolving power, brightness, and depth of focus.



Resolving Power

The closest proximity of two objects that can be seen as two distinct regions of the image. Resolving power is generally indicated by the equation below, where the larger the NA the greater the resolving power.

$Resolving\ Power = \frac{\lambda}{2 \times NA}$
 Where, λ =Light source's wavelength (generally 0.55μm)
 NA=Numerical aperture of objective

Depth of Focus

The range in front of and behind the target plane of the specimen, within which the observed structure can be sharply focused. The accommodation power of the human eye varies from person to person, so does depth of focus. Depth of focus is indicated by the equation below.

$Depth\ of\ focus = \frac{n \times \lambda}{2 \times (NA)^2} + \frac{n}{7 \times NA \times M}$
 λ =Light source's wavelength (generally 0.55μm)
 NA=Numerical aperture of objective
 M=Total magnification
 n=Refractivity of the substance existing between the specimen and the objective. (n=1 for air)

Pupil Diameter

The pupil diameter of the objective lens is expressed by the following equation:

$Pupil\ diameter = 2 \times f \times NA$
 f=Focal distance of objective lens
 NA=Numerical aperture of objective

Refer to this catalog for the values of f and NA for each objective lens. In addition, more information on pupils is available on the Nikon Corporation Instruments Company / Nikon Instec Web site at <http://www.nikon-instruments.jp/instech/>

Total Magnification

When viewed through eyepieces

Eyepiece observation magnification (M) = objective's magnification x eyepieces magnification

When viewed on monitors

Monitor observation magnification = objective's magnification x TV adapter magnification x monitor magnification

Monitor magnification varies depending on the imaging device size of the TV camera used and the monitor size. For information, see the table below.

Imaging device size

Type	Diagonal length	Longer side	Shorter side
1/3-inch	6.0mm	4.8mm	3.6mm
1/2-inch	8.0mm	6.4mm	4.8mm
2/3-inch	11.0mm	8.8mm	6.6mm

Monitor magnification

Imaging device size	Monitor Size		
	9-inch	14-inch	20-inch
1/3-inch	38.1X	59.2X	84.6X
1/2-inch	28.6X	44.4X	63.5X
2/3-inch	20.8X	32.3X	46.2X