Nikon

Microscope Components for Reflected Light Applications

CFI60-2 CFI60 CF&IC

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 brochure presents technical data on using Nikon's microscope units.

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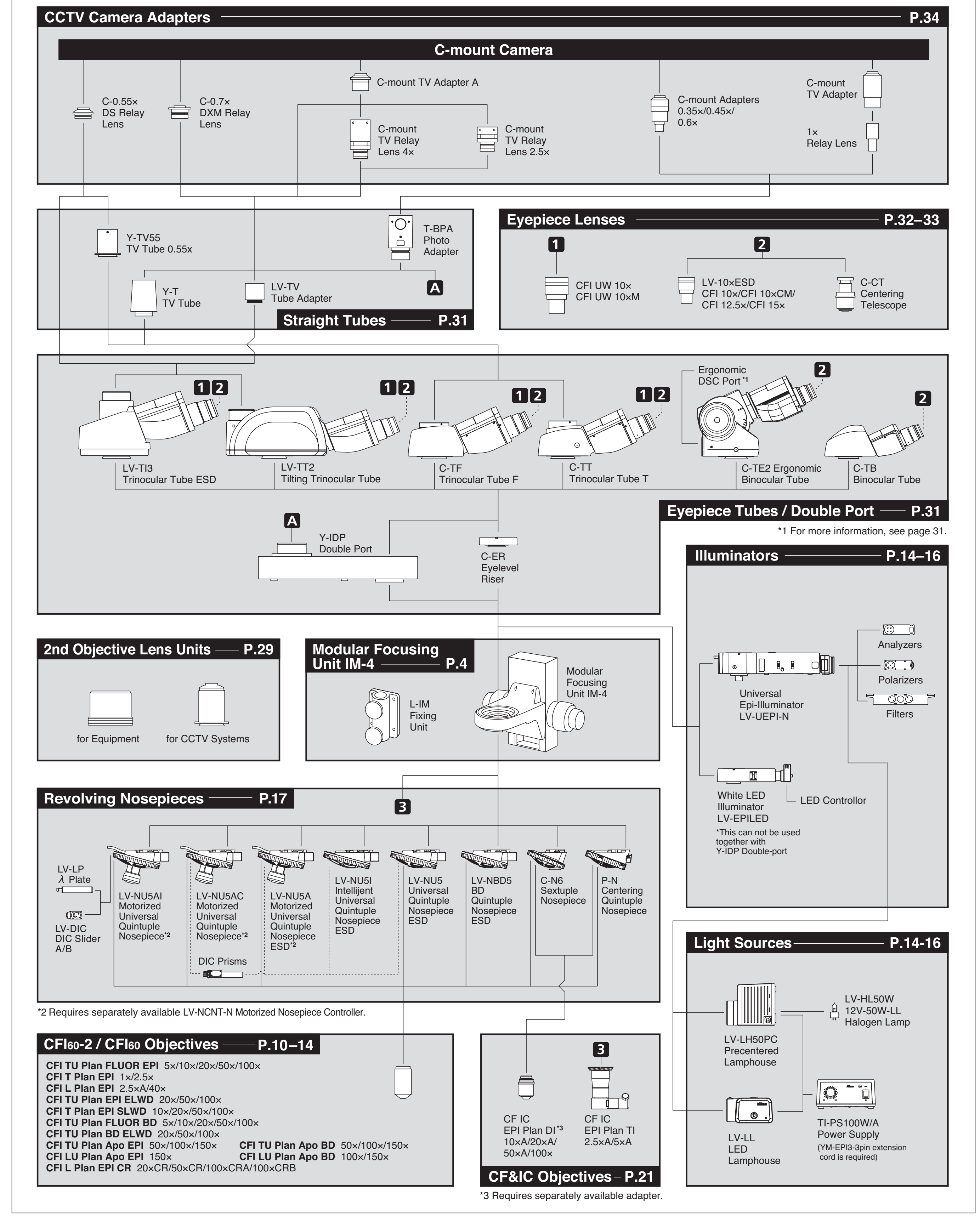
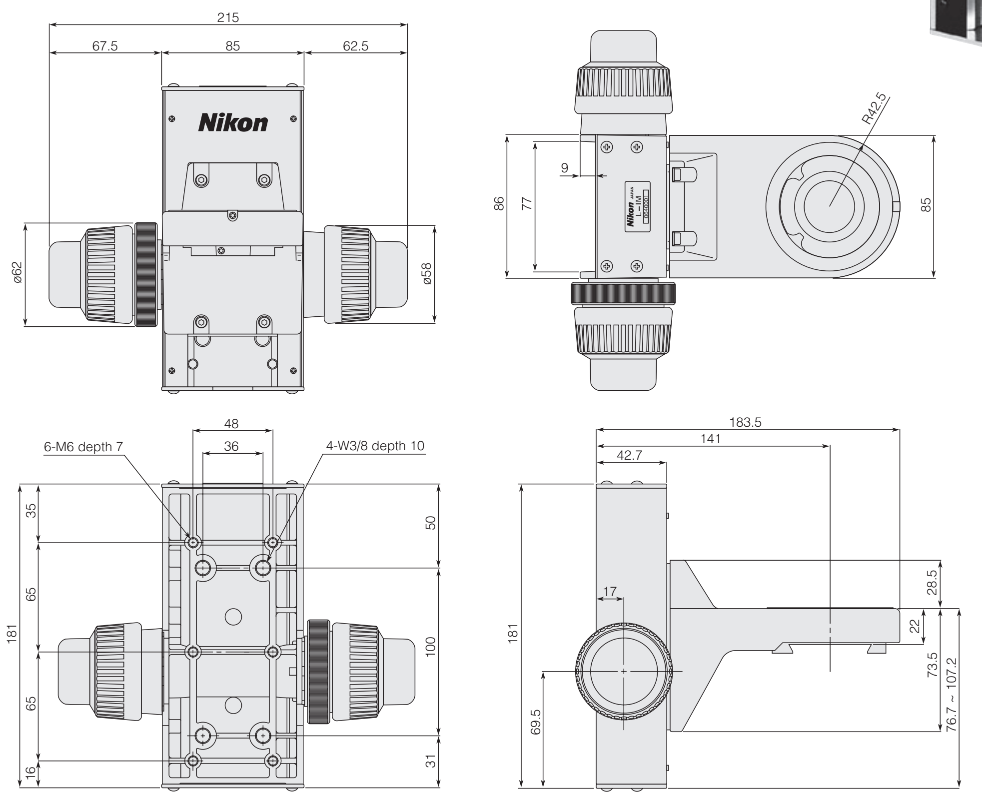


L-IM Modular Focusing Unit (IM-4)

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

- Attachment of the LV-UEPI-N 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 10 kg by adding a balancer.
- A coarse motion stroke of 5.2 mm per revolution improves the equipment's load handling capability and increases durability.
- The distance from the optical axis to the mounting surface is 141 mm.

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



L-IM Modular Focusing Unit
MBD64015 / 2000 g

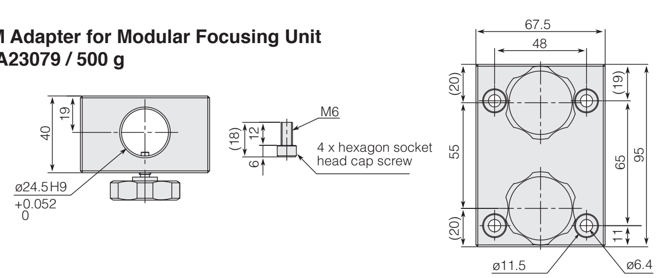
Stroke	30 mm
Coarse focusing	5.2 mm/rotation
Fine focusing	0.1 mm/rotation
Scale	1 µm

Unit: mm

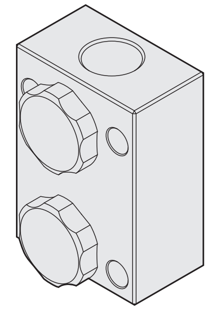
L-IM Adapter for Modular Focusing Unit (Option)

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

L-IM Adapter for Modular Focusing Unit
MXA23079 / 500 g



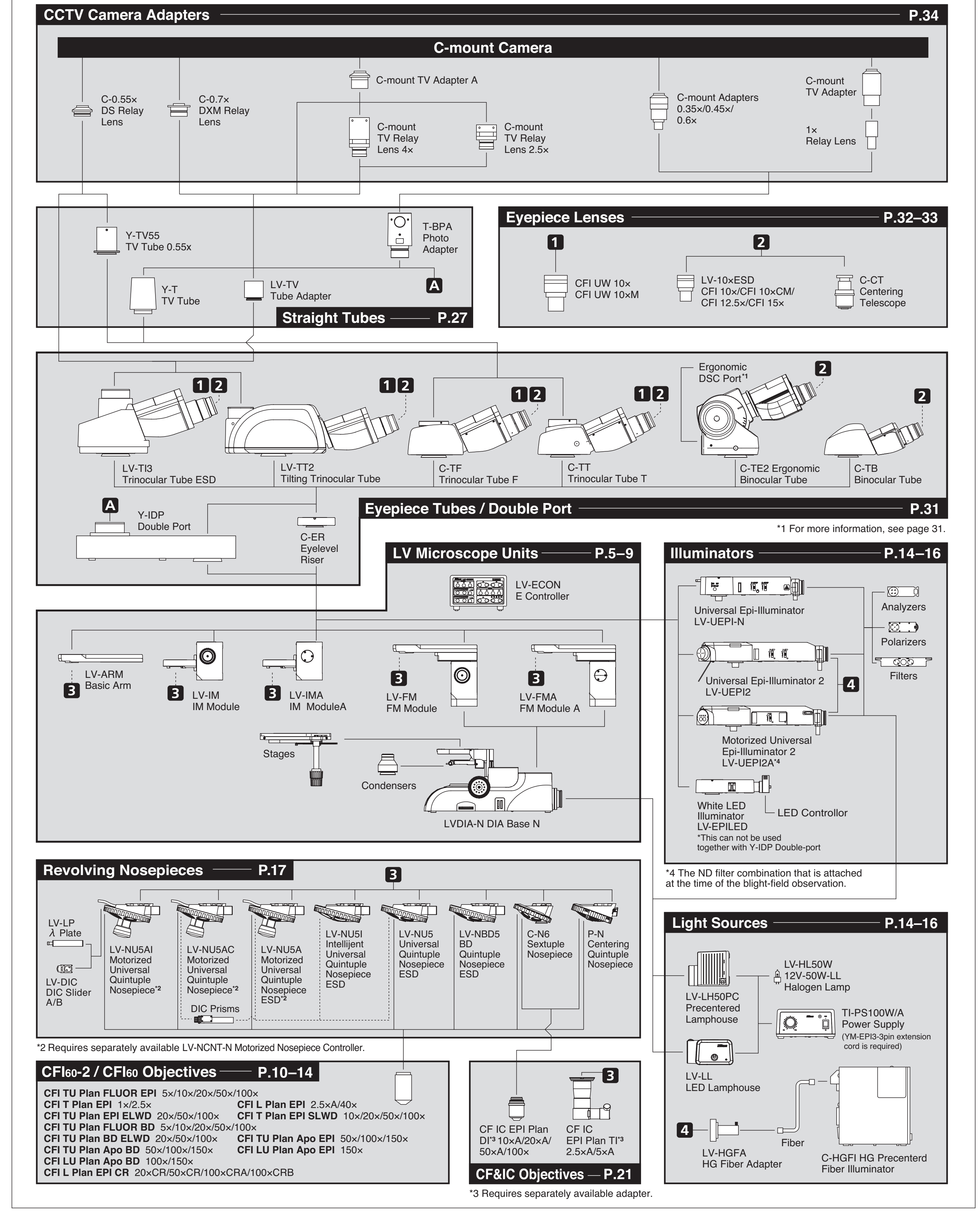
Unit: mm



CFI60-2 LV

CFI60-2/CFI60 Optical System (for LV modules)

System Diagram & Index



LV-IM IM Modules

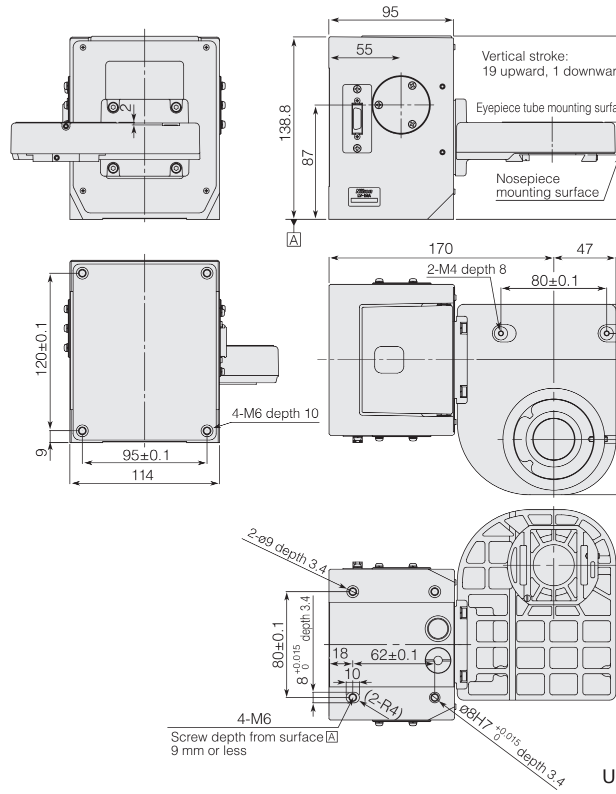
This focusing module enables the mounting of a universal illuminator (LV-UEPI-N/LV-UEPI2/ LV-UEPI2A or LV-EPILED) and a motorized nosepiece.

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.
- The standard maximum permissible weight is 4-7 kg, which is expandable to 10 kg by adding a balancer.

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

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



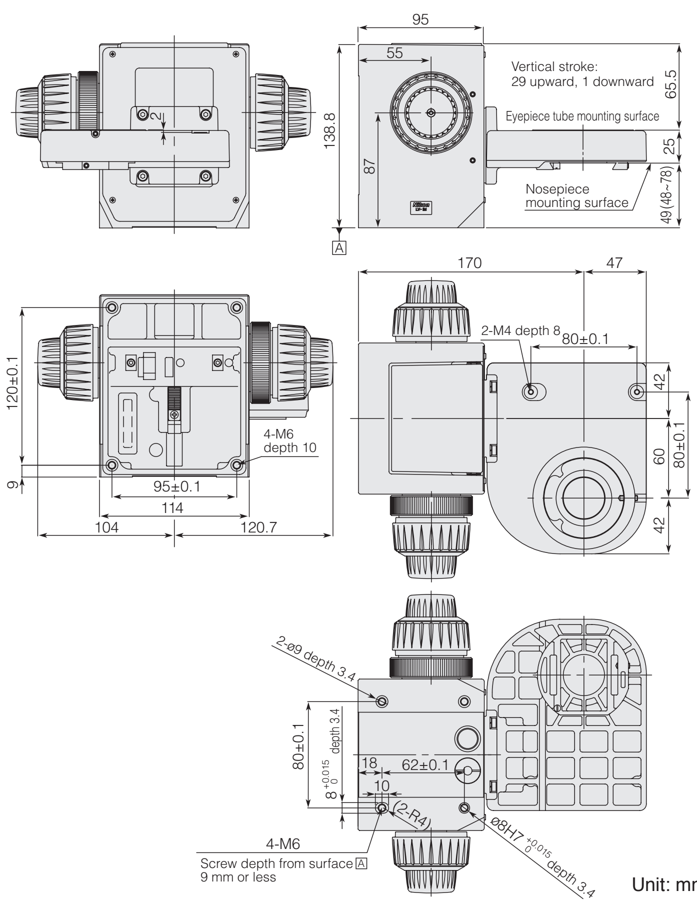
Unit: mm

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.
- The standard maximum permissible weight is 4-7 kg, which is expandable to 10 kg by adding a balancer.

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

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



Unit: mm

LV-FM FM Modules

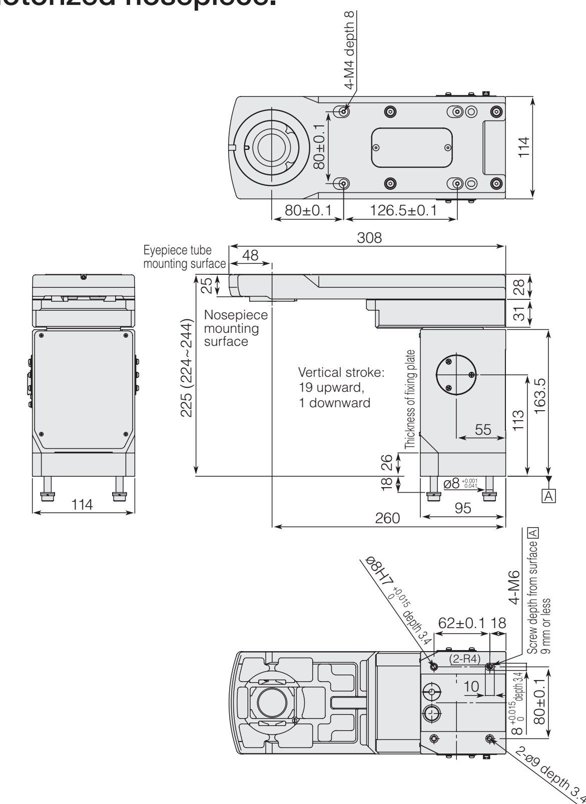
LV-FM FM Modules enable mounting of a universal illuminator (LV-UEPI-N/LV-UEPI2/LV-UEPI2A or LV-EPILED) and a motorized nosepiece.

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 LVDIA-N DIA Base N.
- External control is possible via the LV-ECON E Controller.
- The standard maximum permissible weight is 3-6 kg, which is expandable to 9 kg by adding a balancer.

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

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



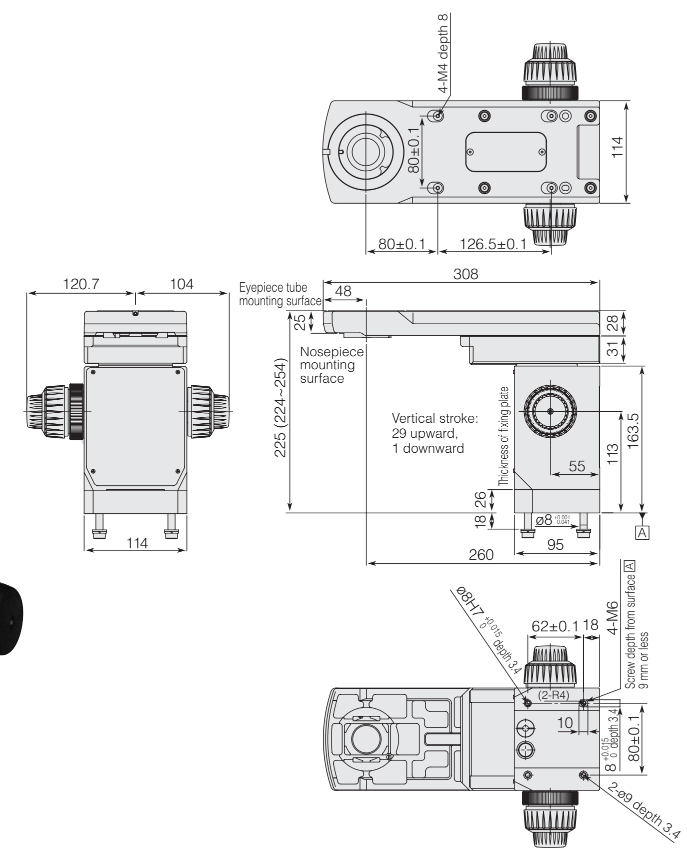
Unit: mm

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 LVDIA-N DIA Base N.
  Optimal for operations such as semiconductor probe inspections.
- The standard maximum permissible weight is 3-6 kg, which is expandable to 9 kg by adding a balancer.

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

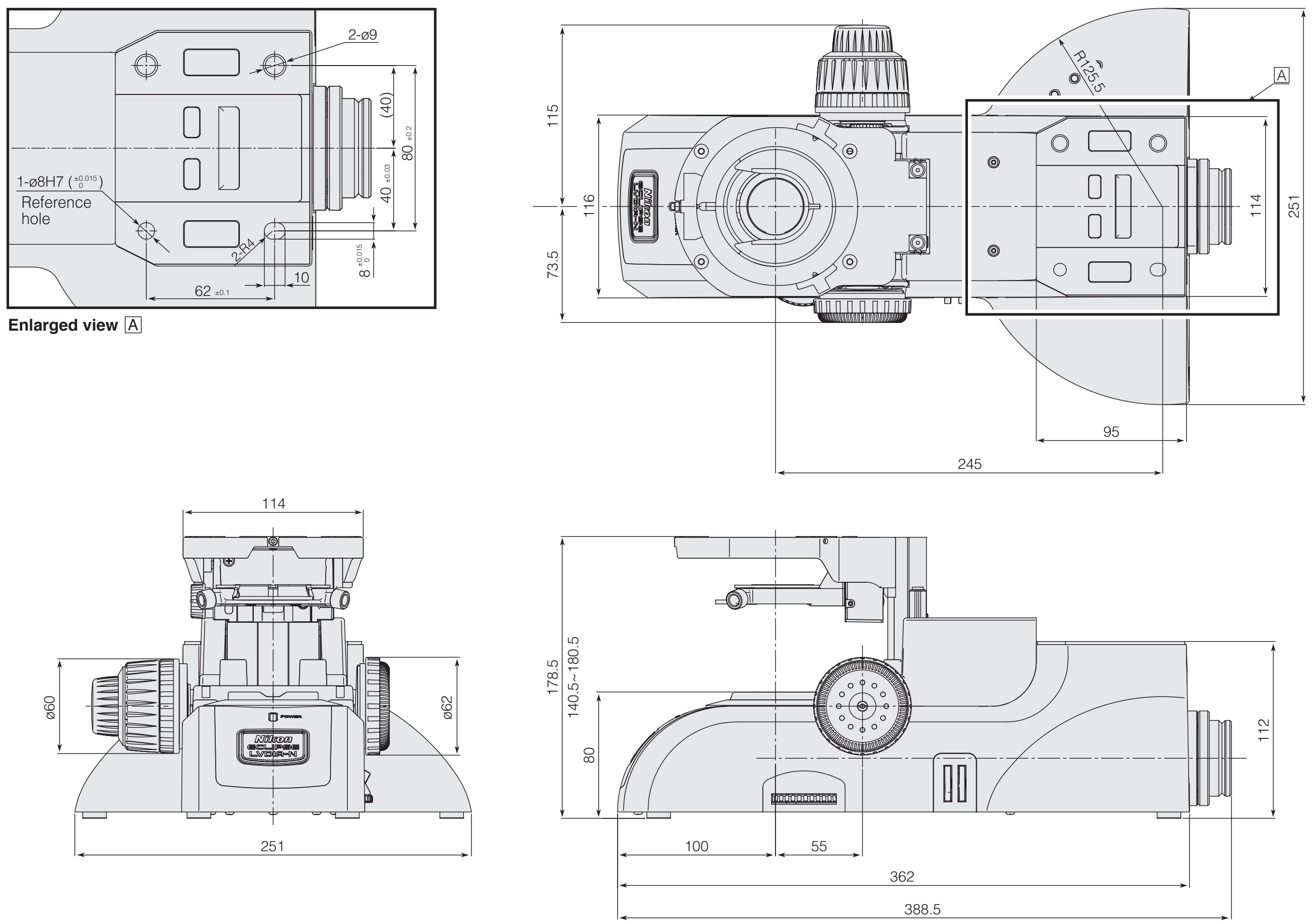
Stroke	30 mm
Coarse focusing	5.2 mm/rotation
Fine Focusing	0.1 mm/rotation
Scale	1 µm



Unit: mm

LVDIA-N DIA Base N

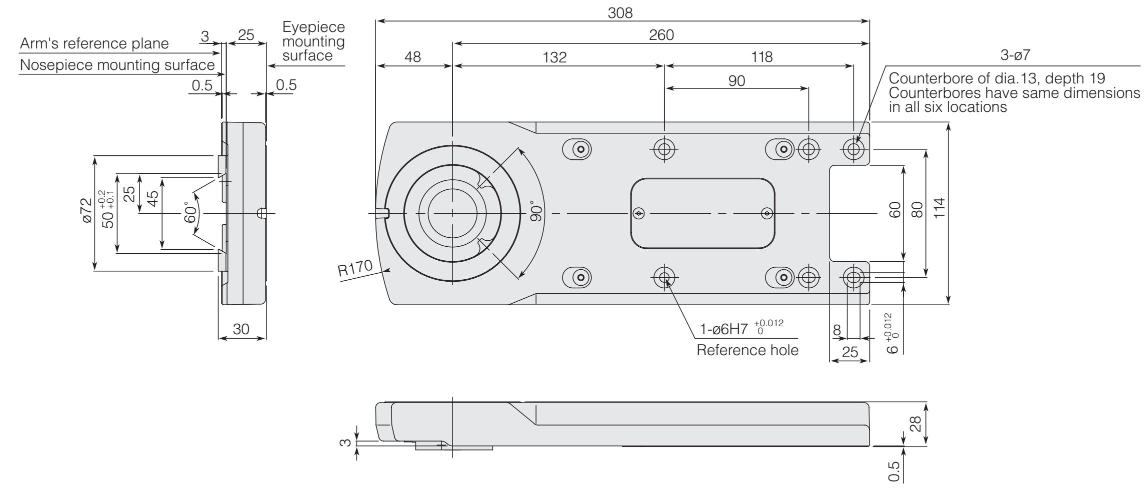
This base unit is for the ECLIPSE LV series of modular microscopes. The attachment of an optional power source enables the incorporation of a transmission illuminator.



LVDIA-N DIA Base N MBD65015 / 5600 g
Unit: mm

LV-ARM Basic Arm

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



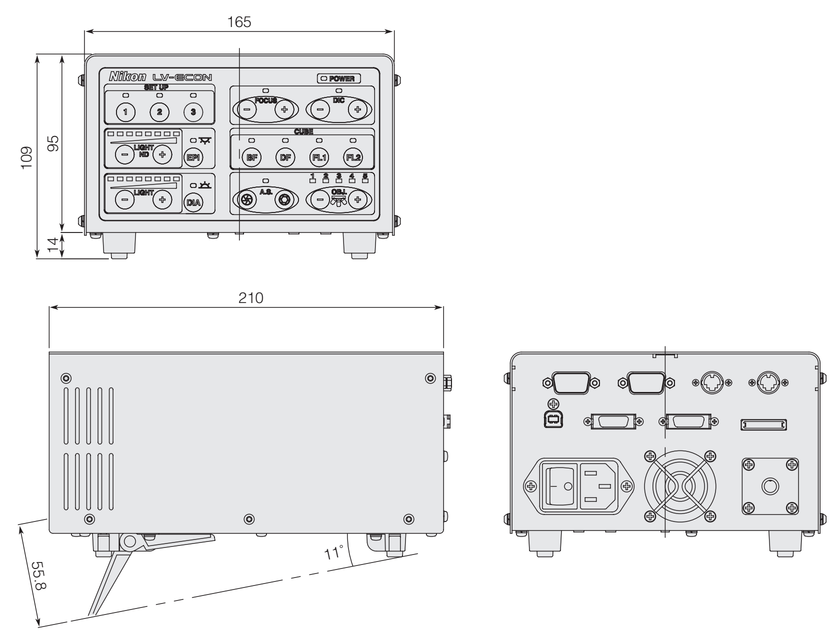
LV-ARM Basic Arm MBD65030 / 1400 g

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.
- Max. 11˚ inclination when using tilt (unit's feet).



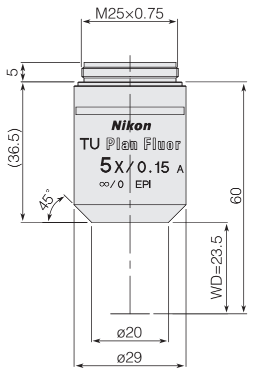
Unit: mm

LV-ECON E Controller MBF12200 / 2000 g

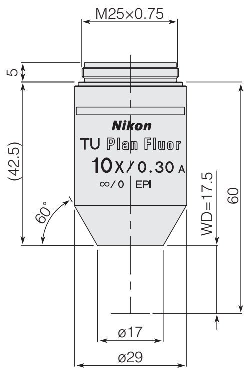
CFI T Plan EPI/CFI TU Plan Fluor EPI/CFI L Plan EPI

Brightfield Objectives

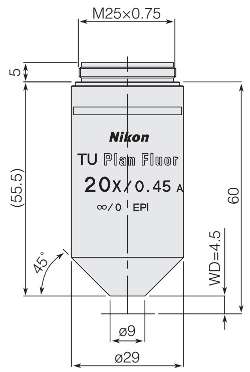
CFI60-2 / CFI60 objectives for brightfield use; Nomarski DIC is also possible with the TU type.



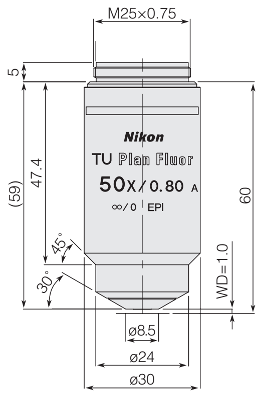
CFI TU Plan Fluor EPI 5×



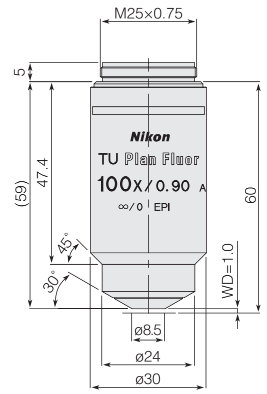
CFI TU Plan Fluor EPI 10×



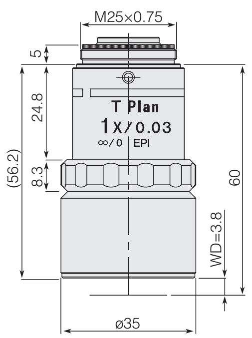
CFI TU Plan Fluor EPI 20×



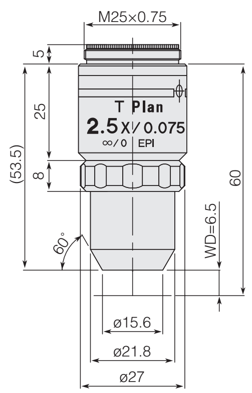
CFI TU Plan Fluor EPI 50×



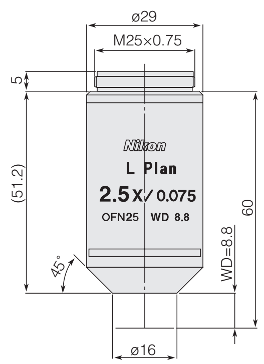
CFI TU Plan Fluor EPI 100×



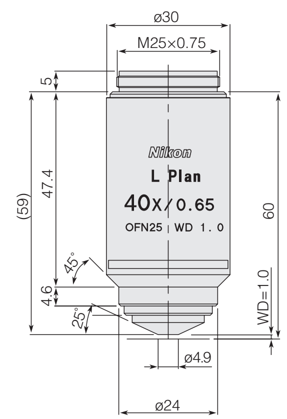
CFI T Plan EPI 1×



CFI T Plan EPI 2.5×



CFI L Plan EPI 2.5×A



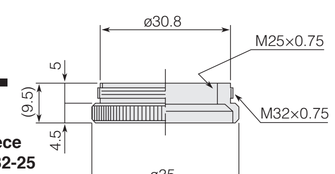
CFI L Plan EPI 40×

Unit: mm

Code No.	CFI60-2/CFI60 Objectives						Widefield CFI eyepieces CFI 10× (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10× (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)
MUE12050	CFI TU Plan Fluor EPI 5×	0.150	23.5	40	12.22	115.0	50×	4.40	31.27	50×	5.000	31.27
MUE12100	CFI TU Plan Fluor EPI 10×	0.300	17.5	20	3.06	120.0	100×	2.20	7.82	100×	2.500	7.82
MUE12200	CFI TU Plan Fluor EPI 20×	0.450	4.5	10	1.36	125.0	200×	1.10	2.95	200×	1.250	2.95
MUE12500	CFI TU Plan Fluor EPI 50×	0.800	1.0	4	0.43	150.0	500×	0.44	0.79	500×	0.500	0.79
MUE12900	CFI TU Plan Fluor EPI 100×	0.900	1.0	2	0.34	150.0	1000×	0.22	0.50	1000×	0.250	0.50
MUE12010	CFI T Plan EPI 1×	0.030	3.8	200	305.56	165.0	10×	22.00	781.75	10×	25.000	781.75
MUE12030	CFI T Plan EPI 2.5×	0.075	6.5	80	48.89	140.0	25×	8.80	125.08	25×	10.000	125.08
MUE00031	CFI L Plan EPI 2.5×A	0.075	8.8	80	48.89	167.5	25×	8.80	125.08	25×	10.000	125.08
MUE00400	CFI L Plan EPI 40×	0.650	1.0	5	0.65	200.0	400×	0.55	0.65	400×	0.625	0.65

LU Nosepiece Adapter M32-25

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



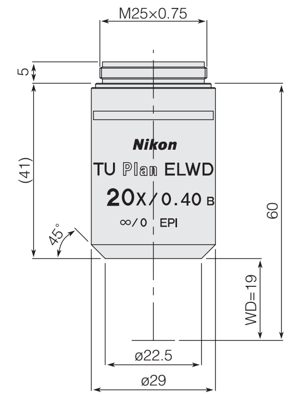
LU Nosepiece Adapter M32-25
MXA23017 / 25 g

Unit: mm

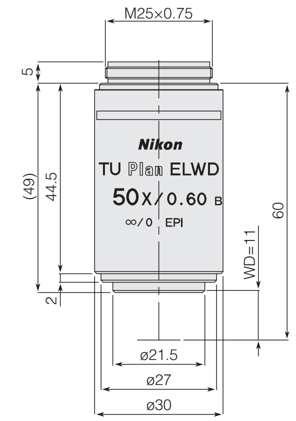
CFI TU Plan EPI ELWD

Long Working Distance Objectives for Brightfield/Nomarski DIC Use

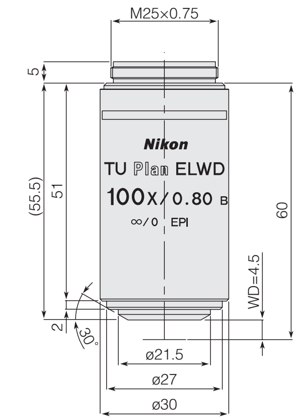
Dramatically extended working distances facilitate observations of samples having irregular surfaces. Working distances have been extended significantly.



CFI TU Plan EPI ELWD 20×



CFI TU Plan EPI ELWD 50×



CFI TU Plan EPI ELWD 100×

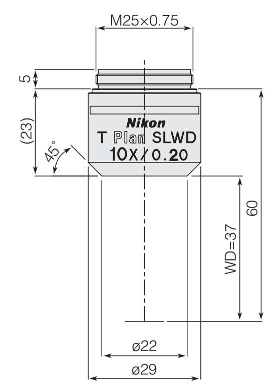
Unit: mm

Code No.	CFI60-2/CFI60 Objectives						Widefield CFI eyepieces CFI 10× (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10× (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)
MUE21200	CFI TU Plan EPI ELWD 20×	0.4	19.0	10	1.72	135	200×	1.10	3.50	200×	1.25	3.50
MUE21500	CFI TU Plan EPI ELWD 50×	0.6	11.0	4	0.76	130	500×	0.44	1.24	500×	0.50	1.24
MUE21900	CFI TU Plan EPI ELWD 100×	0.8	4.5	2	0.43	155	1000×	0.22	0.61	1000×	0.25	0.61

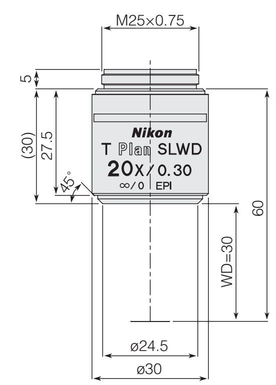
CFI T Plan EPI SLWD

Ultra-long Working Distance Objectives for Brightfield Use

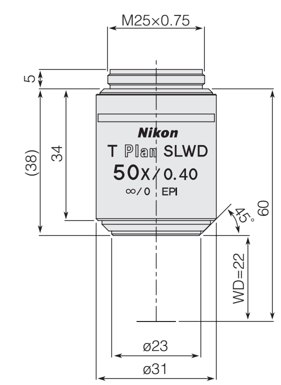
Ultra-long working distances.
Particularly useful when observing the bottom of a depression in the sample.
Working distances have been extended significantly.



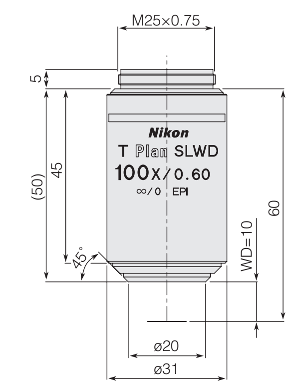
CFI T Plan EPI SLWD 10×



CFI T Plan EPI SLWD 20×



CFI T Plan EPI SLWD 50×



CFI T Plan EPI SLWD 100×

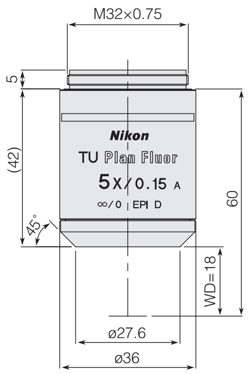
Unit: mm

Code No.	CFI60-2/CFI60 Objectives						Widefield CFI eyepieces CFI 10× (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10× (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)
MUE31100	CFI T Plan EPI SLWD 10×	0.2	37	20	6.88	80	100×	2.20	14.02	100×	2.50	14.02
MUE31200	CFI T Plan EPI SLWD 20×	0.3	30	10	3.06	115	200×	1.10	5.44	200×	1.25	5.44
MUE31500	CFI T Plan EPI SLWD 50×	0.4	22	4	1.72	120	500×	0.44	2.43	500×	0.50	2.43
MUE31900	CFI T Plan EPI SLWD 100×	0.6	10	2	0.76	135	1000×	0.22	1.00	1000×	0.25	1.00

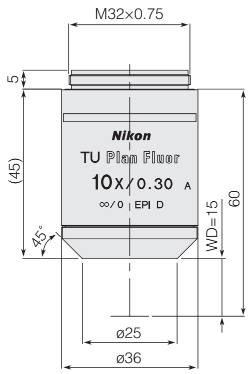
CFI TU Plan Fluor BD

Brightfield/Darkfield/Nomarski DIC Objectives

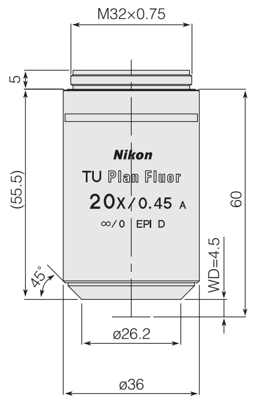
Perfect for brightfield, darkfield, and Nomarski DIC observations.



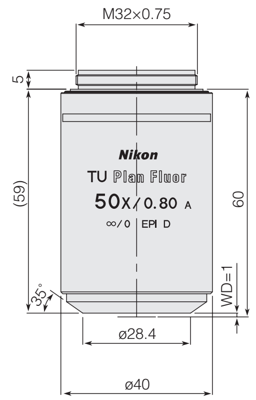
CFI TU Plan Fluor BD 5×



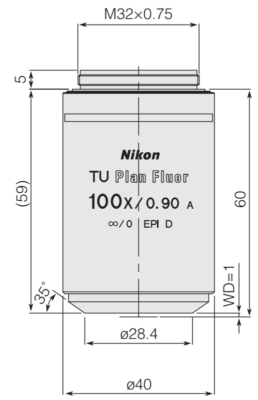
CFI TU Plan Fluor BD 10×



CFI TU Plan Fluor BD 20×



CFI TU Plan Fluor BD 50×



CFI TU Plan Fluor BD 100×

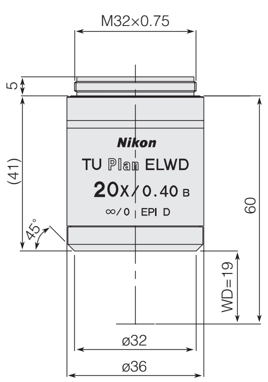
Unit: mm

Code No.	CFI60-2/CFI60 Objectives						Widefield CFI eyepieces CFI 10× (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10× (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)
MUE42050	CFI TU Plan Fluor BD 5×	0.15	18.0	40	12.22	150	50×	4.40	31.27	50×	5.00	31.27
MUE42100	CFI TU Plan Fluor BD 10×	0.30	15.0	20	3.06	140	100×	2.20	7.82	100×	2.50	7.82
MUE42200	CFI TU Plan Fluor BD 20×	0.45	4.5	10	1.36	185	200×	1.10	2.95	200×	1.25	2.95
MUE42500	CFI TU Plan Fluor BD 50×	0.80	1.0	4	0.43	200	500×	0.44	0.79	500×	0.50	0.79
MUE42900	CFI TU Plan Fluor BD 100×	0.90	1.0	2	0.34	200	1000×	0.22	0.50	1000×	0.25	0.50

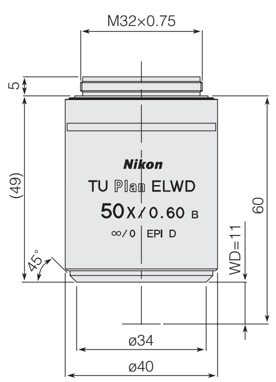
CFI TU Plan BD ELWD

Long Working Distance Objectives for Brightfield/Darkfield/Nomarski DIC Use

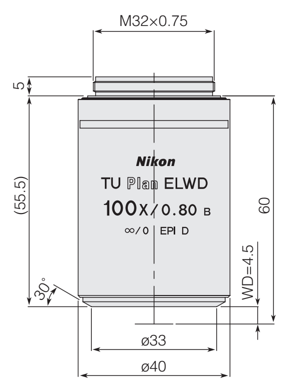
Extended working distances facilitate observations of samples having irregular surfaces.



CFI TU Plan EPI ELWD 20×



CFI TU Plan EPI ELWD 50×



CFI TU Plan EPI ELWD 100×

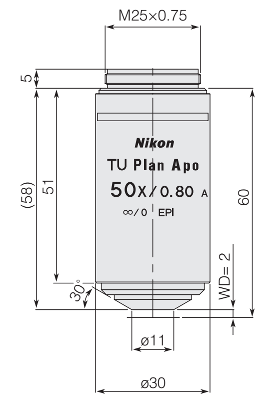
Unit: mm

Code No.	CFI60-2/CFI60 Objectives						Widefield CFI eyepieces CFI 10× (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10× (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)
MUE61200	CFI TU Plan BD ELWD 20×	0.4	19.0	10	1.72	155	200×	1.10	3.50	200×	1.25	3.50
MUE61500	CFI TU Plan BD ELWD 50×	0.6	11.0	4	0.76	180	500×	0.44	1.24	500×	0.50	1.24
MUE61900	CFI TU Plan BD ELWD 100×	0.8	4.5	2	0.43	205	1000×	0.22	0.61	1000×	0.25	0.61

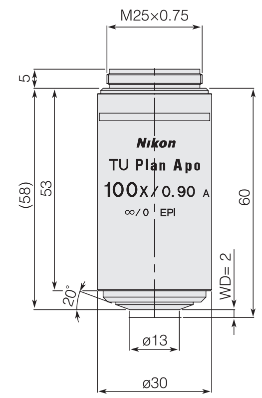
CFI TU Plan Apo EPI/CFI TU Plan Apo BD/ CFI LU Plan Apo EPI/CFI LU Plan Apo BD

High-Resolution Objectives for Brightfield or for Darkfield/Brightfield

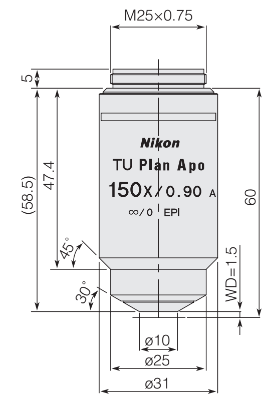
Apochromat-type objectives virtually eliminate chromatic aberration and feature excellent resolution. Nomarski DIC is also possible with the TU/LU type.



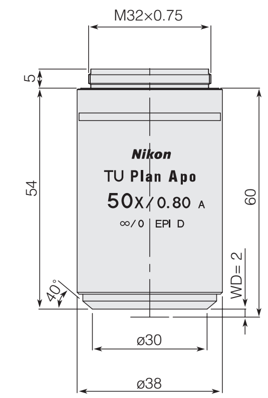
CFI TU Plan Apo EPI 50×



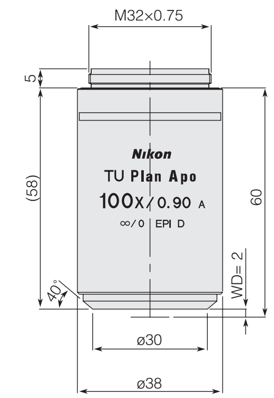
CFI TU Plan Apo EPI 100×



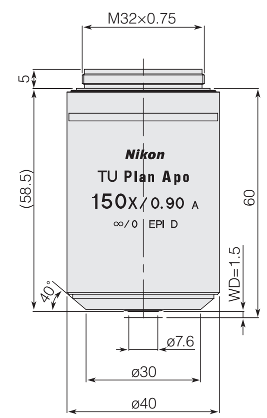
CFI TU Plan Apo EPI 150×



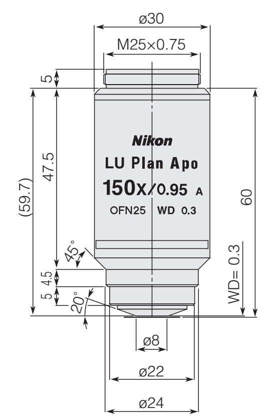
CFI TU Plan Apo BD 50×



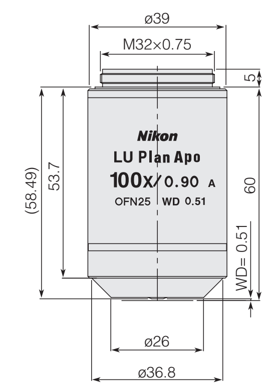
CFI TU Plan Apo BD 100×



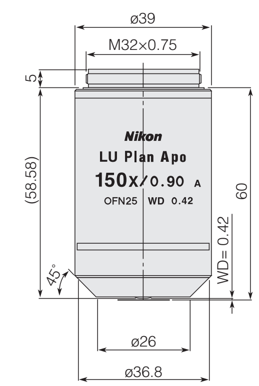
CFI TU Plan Apo BD 150×



CFI LU Plan Apo EPI 150×A



CFI LU Plan Apo BD 100×*



CFI LU Plan Apo BD 150×A*

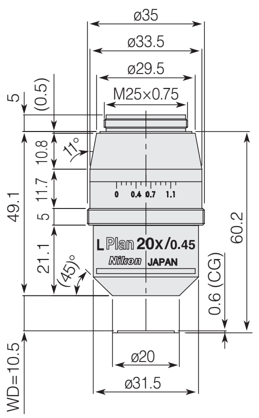
Unit: mm

Code No.	CFI60-2/CFI60 Objectives						Widefield CFI eyepieces CFI 10× (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10× (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)
MUC11500	CFI TU Plan Apo EPI 50×	0.80	2.00	4.00	0.43	150.0	500×	0.44	0.79	500×	0.50	0.79
MUC11900	CFI TU Plan Apo EPI 100×	0.90	2.00	2.00	0.34	175.0	1000×	0.22	0.50	1000×	0.25	0.50
MUC11150	CFI TU Plan Apo EPI 150×	0.90	1.50	1.33	0.34	160.0	1500×	0.15	0.45	1500×	0.17	0.45
MUC41500	CFI TU Plan Apo BD 50×	0.80	2.00	4.00	0.43	190.0	500×	0.44	0.79	500×	0.50	0.79
MUC41900	CFI TU Plan Apo BD 100×	0.90	2.00	2.00	0.34	220.0	1000×	0.22	0.50	1000×	0.25	0.50
MUC41150	CFI TU Plan Apo BD 150×	0.90	1.50	1.33	0.34	220.0	1500×	0.15	0.45	1500×	0.17	0.45
MUC10151	CFI LU Plan Apo EPI 150×A	0.95	0.30	1.33	0.30	217.5	1500×	0.15	0.40	1500×	0.17	0.40
MUC40900*	CFI LU Plan Apo BD 100×	0.90	0.51	2.00	0.34	325.0	1000×	0.22	0.50	1000×	0.25	0.50
MUC50151*	CFI LU Plan Apo BD 150×A	0.90	0.42	1.33	0.34	305.0	1500×	0.15	0.45	1500×	0.17	0.45

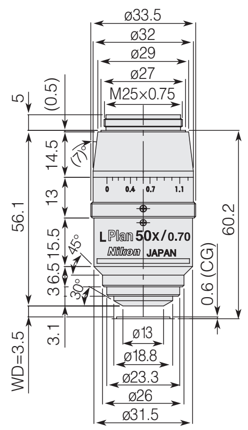
* This product have been discontinued, and only available from stock.

CFI L Plan EPI CR Objectives for LCD Inspection

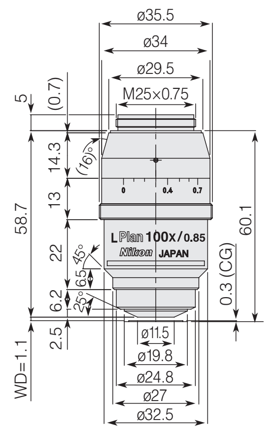
The CFI L Plan EPI CR series employs a correction system to cope with the thinner coverglass for FDP and the increased integration and mounting density of devices.



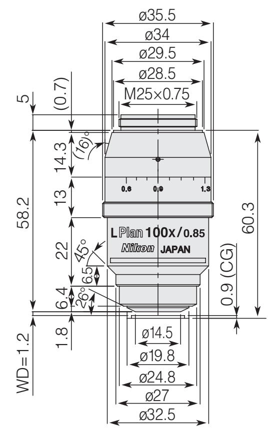
CFI L Plan EPI 20×CR



CFI L Plan EPI 50×CR



CFI L Plan EPI 100×CRA



CFI L Plan EPI 100×CRB

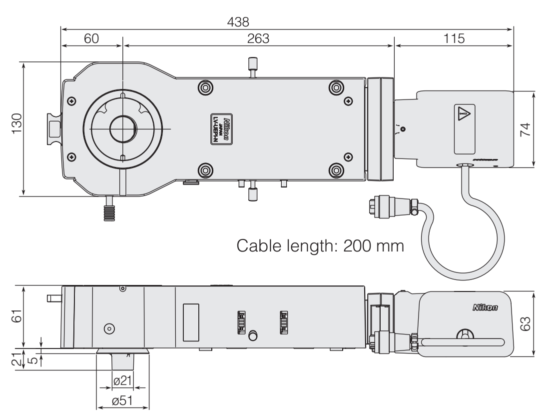
Unit: mm

Code No.	CFI60-2/CFI60 Objectives						Widefield CFI eyepieces CFI 10× (F.N. 22)			Ultra-Widefield CFI eyepieces CFI UW10× (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (µm)	Weight (g)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (µm)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (µm)
MUE35200	CFI L Plan EPI 20×CR	0.45	10.9~10.0	10.00	1.36	240	200×	1.10	2.95	200×	1.25	2.95
MUE35500	CFI L Plan EPI 50×CR	0.70	3.9~3.0	4.00	0.56	240	500×	0.44	0.97	500×	0.50	0.97
MUE35900	CFI L Plan EPI 100×CRA	0.85	1.2~0.85	2.00	0.38	260	1000×	0.22	0.55	1000×	0.25	0.55
MUE35910	CFI L Plan EPI 100×CRB	0.85	1.3~0.95	2.00	0.38	260	1000×	0.22	0.55	1000×	0.25	0.55

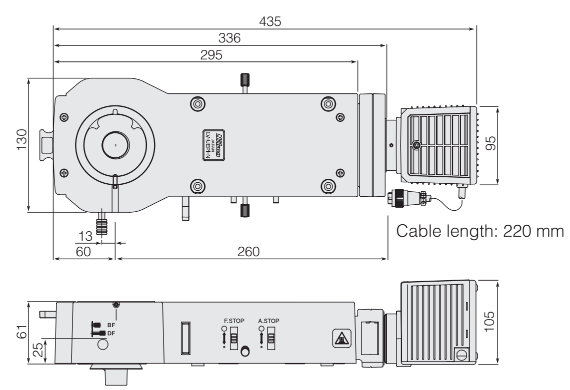
Universal Epi-Illuminator LV-UEPI-N

This universal illuminator supports the CFI60-2 / CFI60 optical system.

- Enables brightfield, darkfield, simple polarizing, and DIC observation.
- When observation is switched from brightfield to darkfield, the field and aperture diaphragms automatically open.
- When observation is switched back from darkfield to brightfield, the field and aperture diaphragms return to their original positions.



Configured with LV-LL LED Lamphouse



Configured with LV-LH50PC Precentered Lamphouse

Unit: mm

Universal Epi-Illuminator LV-UEPI-N/MBE60201

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	4x ø25 mm filters (NCB11, ND4, ND16), a polarizer/analyzer, ESD supported
Weight	1,750 g

Code No.	Items	Weight (g)
MBE65700	LV-LL LED Lamphouse	600
MBE65275	LV-LH50PC Precentered Lamphouse	800
MBN66750	YM-NCB ø25 mm Filter Slider NCB11	31
MBN66760	YM-ND ø25 mm Filter Slider ND4/ND16	36
MXA23045	LV-HL50W 12V50W Halogen Lamp	7
MBN66923	LV-PO Polarizer	60
MBN66922	L-AN Anaryzer	14
MBP60170	L-DIC DIC Slider	120
MBN66730	YM-GIF ø25 mm GIF Filter	25
MXA29002	YM-EPI 3-3PIN Extension Cable	100

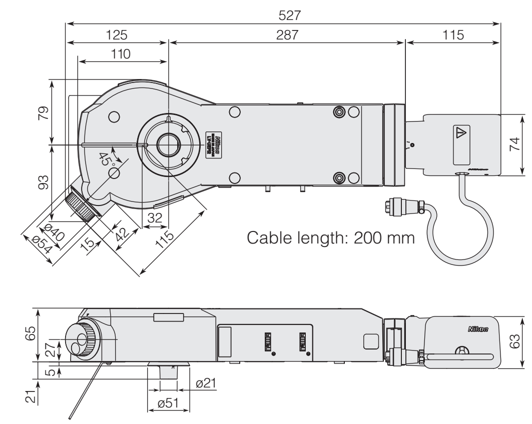
*Cable length: measured from lamphouse to power connector

Universal Epi-Illuminator LV-UEPI2/LV-UEPI2A

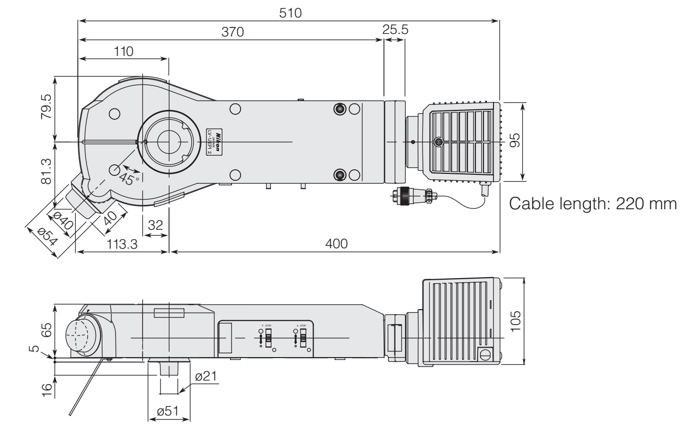
This universal illuminator supports the CFI60-2 / CFI60 optical system.

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.
- Automatically maintains optimal illumination conditions for the field/aperture diaphragms, shutter, and UV cut filters.



Configured with LV-LL LED Lamphouse

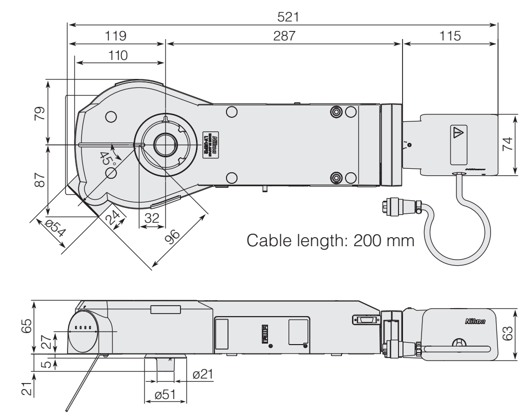


Configured with LV-LH50PC Precentered Lamphouse

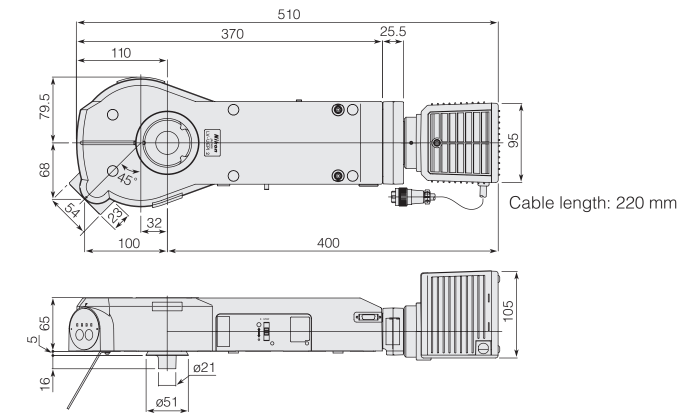
Unit: mm

LV-UEPI2A

- Accurate reproduction of illumination conditions enabled by the motorization of the changeover turret/aperture diaphragm and the control of the voltage.
- Aperture diaphragm is automatically optimized with the objective lens and illumination technique. Can be changed manually depending on sample and purpose.
- External control also possible from a PC when combined with the LV-ECON E Controller.



Configured with LV-LL LED Lamphouse



Configured with LV-LH50PC Precentered Lamphouse

Unit: mm

Universal Epi-Illuminator LV-UEPI2/MBE60300 Motorized 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	4x ø25 mm filters (NCB11, ND4, ND16), 2x Fluorescence filter cubes, polarizer/analyzer, λ plate, excitation light balancer, ESD supported	
Weight	2,400 g	2,570 g

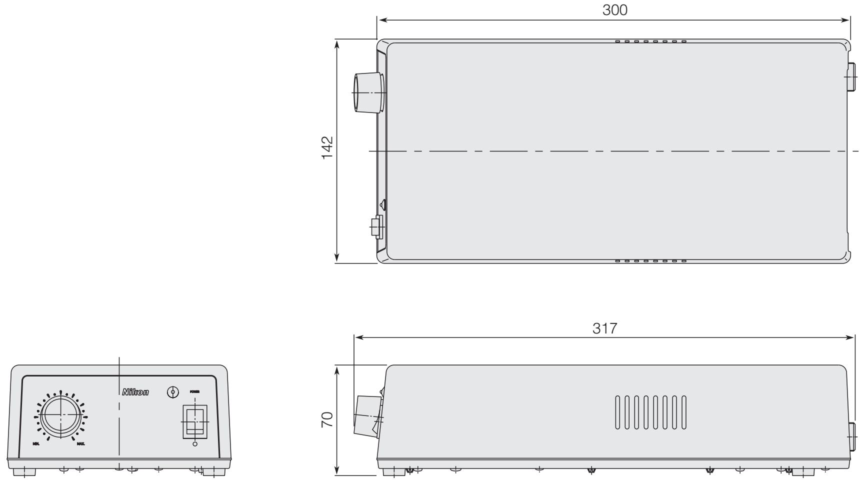
Code No.	Items	Weight (g)
MBE65275	LV-LH50PC Precentered Lamphouse	800
MBN66750	YM-NCB ø25 mm Filter Slider NCB11	31
MBN66760	YM-ND ø25 mm Filter Slider ND4/ND16	36
MXA23045	LV-HL50W 12V-50W Halogen Lamp	7
MBN66923	LV-PO Polarizer	60
MBN66925	LV-FLAN FL Analyzer	20
MBN66924	LV-LP λ Plate	15
MBE41201	C-FL UV-2A	40

Code No.	Items	Weight (g)
MBE65700	LV-LL LED Lamphouse	600
MBE42101	C-FL V-2A Filter Cube	40
MBE43101	C-FL BV-2A Filter Cube	40
MBE44501	C-FL B-2A Filter Cube	40
MBE45501	C-FL G-2A Filter Cube	40
MBE64100	LV-PAB Polarizer/Analyzer Cube	45
MBN66730	YM-GIF ø25 mm GIF Filter	25
MXA29002	YM-EPI 3-3PIN Extension Cable	100
MBP60170	L-DIC DIC Slider	120

*Cable length: measured from lamphouse to power connector

TI-PS100W/A Power Supply

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



Unit: mm

TI-PS100W/A Power Supply MEF52251 / 2000 g

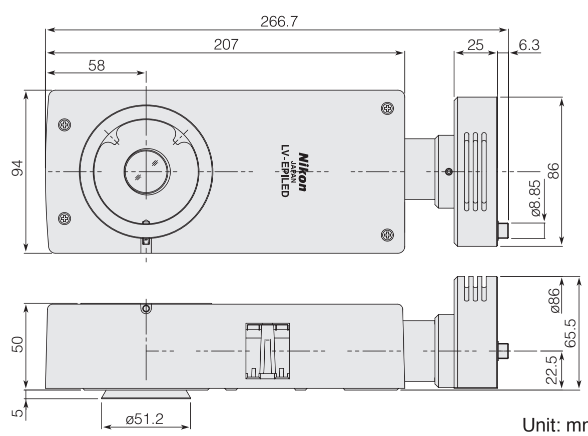
Code No.	Items	Weight (g)
MBF11250	Power Cord BJ	160
MXA29002	YM-EPI 3-3PIN Extension Cable	100
MEF51001	TI-100WRC 100W Remote Cable	100

LV-EPILED White LED Illuminator

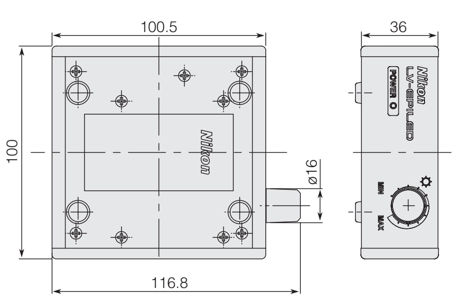
This LED illuminator supports the CFI60-2 / CFI60 optical system.

- 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.
- Standard cable length : 2.8 m

LV-EPILED White LED Illuminator MBE60500 / 1500 g



Unit: mm

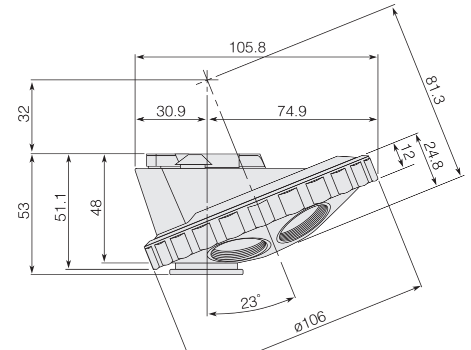


Controller

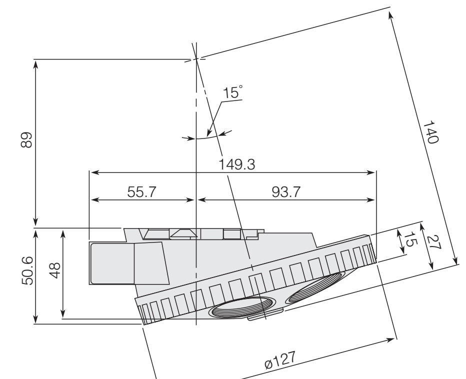
Code No.	Items	Weight (g)
MBF11250	Power Cord BJ	160
MQF52056	3-AC AC Adapter	200
MEF51001	TI-100WRC 100W Remote Cable	100

Revolving Nosepieces

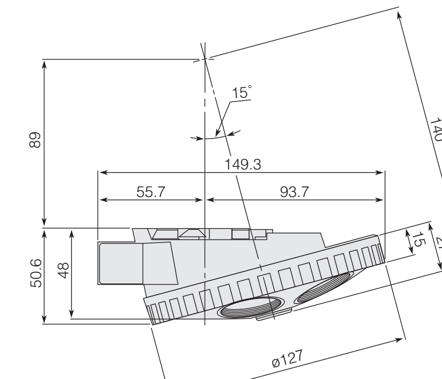
Eight types of nosepieces – either manual or motorized – are available to choose from.



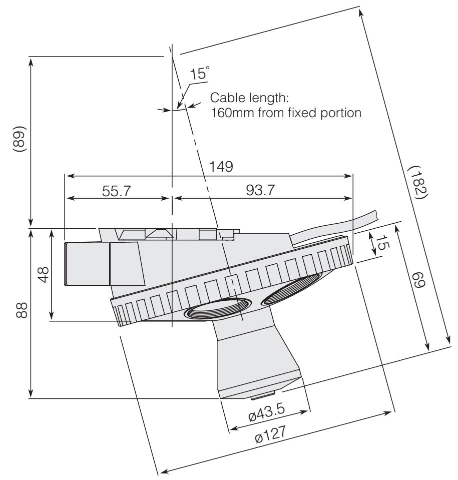
C-N6 ESD Sextuple Nosepiece
MBP71316 / 450 g



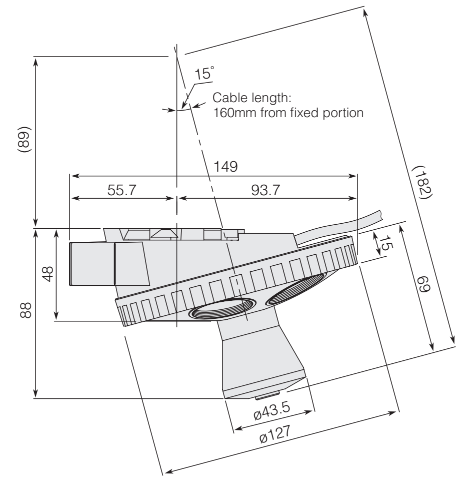
LV-NBD5 BD Quintuple Nosepiece ESD
MBP60125 / 580 g



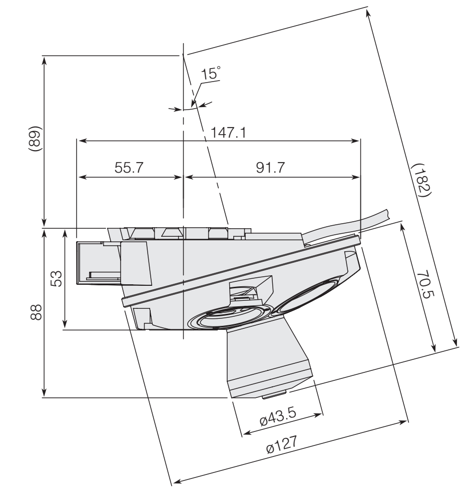
LV-NU5 Universal Quintuple Nosepiece ESD
MBP60115 / 580 g



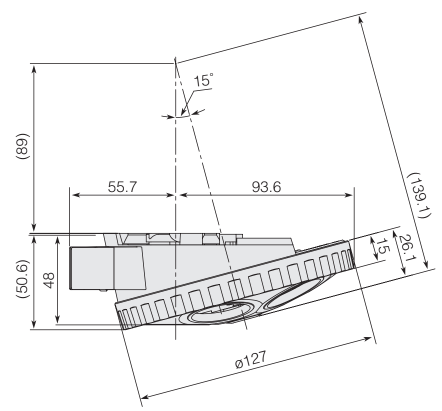
LV-NU5A Motorized Universal Quintuple Nosepiece ESD
MBP60105 / 800 g



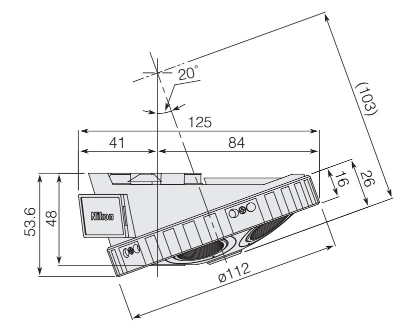
LV-NU5AC Motorized Universal Quintuple Nosepiece
MBP60106 / 800 g



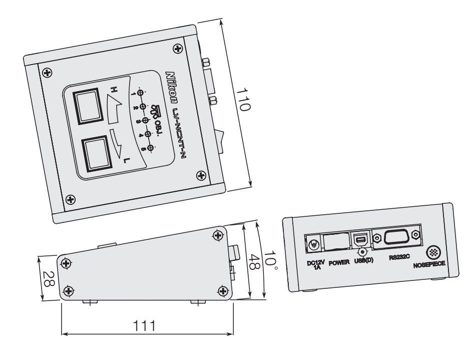
LV-NU5AI Motorized Universal Quintuple Nosepiece
MBP60107 / 890 g



LV-NU5I Intellijent Universal Quintuple Nosepiece ESD
MBP60108 / 600 g



P-N Centering Quintuple Nosepiece
MDP44205 / 600 g



LV-NCNT-N Motorized Nosepiece Controller
MBF65331 / 400 g
(Standard cable length : 1.5 m)

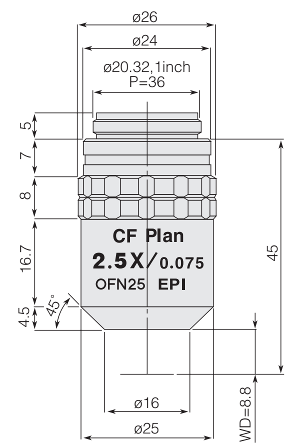
Unit: mm

Code No.	Items	Weight (g)
MBF11250	Power Cord BJ	160
MQF52056	3-AC AC Adapter	200

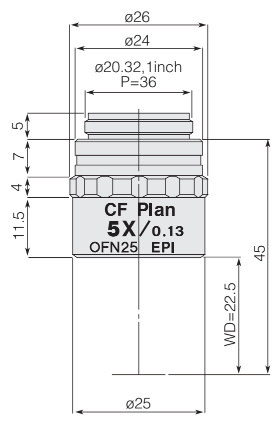
CF&IC Optical System

CF IC EPI Plan Brightfield Objectives

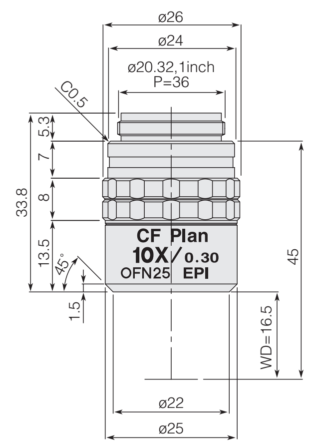
CF&IC objectives for brightfield use.



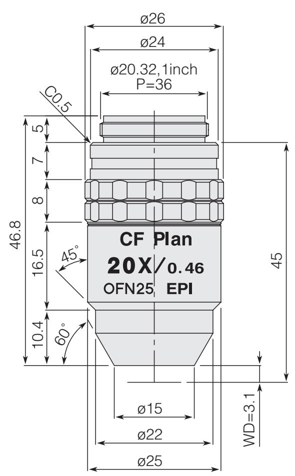
CF IC EPI Plan 2.5×A



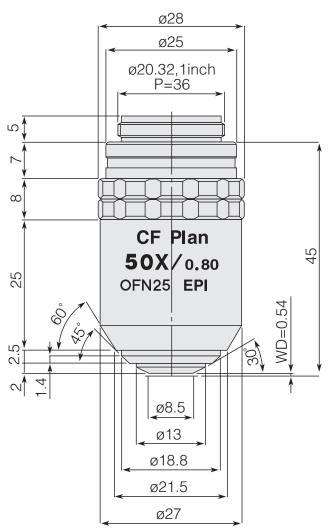
CF IC EPI Plan 5×A



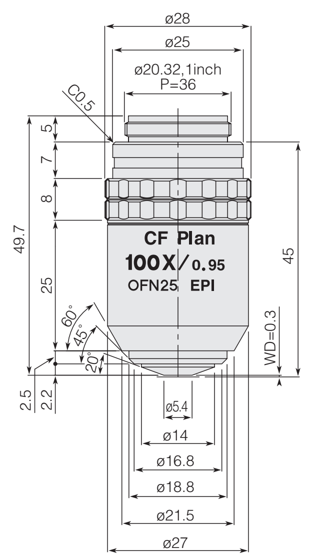
CF IC EPI Plan 10×A



CF IC EPI Plan 20×A



CF IC EPI Plan 50×A



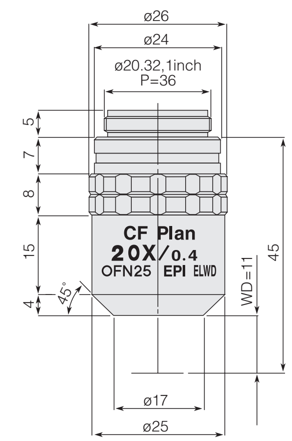
CF IC EPI Plan 100×A

Unit: mm

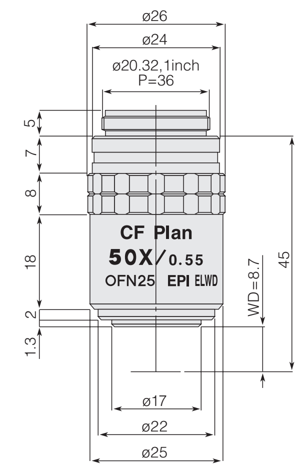
Code No.	CF IC Objectives						Widefield CF eyepieces CFWN 10× (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10× (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (µm)	Weight (g)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (µm)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (µm)
MUL00031	CF IC EPI Plan 2.5×A	0.075	8.80	80.00	48.89	108	25×	8.00	125.08	25×	10.00	125.08
MUL00051	CF IC EPI Plan 5×A	0.130	22.50	40.00	16.27	65	50×	4.00	38.25	50×	5.00	38.25
MUL00101	CF IC EPI Plan 10×A	0.300	16.50	20.00	3.06	90	100×	2.00	7.82	100×	2.50	7.82
MUL00201	CF IC EPI Plan 20×A	0.460	3.10	10.00	1.30	120	200×	1.00	2.85	200×	1.25	2.85
MUL00501	CF IC EPI Plan 50×A	0.800	0.54	4.00	0.43	145	500×	0.40	0.79	500×	0.50	0.79
MUL00901	CF IC EPI Plan 100×A	0.950	0.30	2.00	0.30	140	1000×	0.20	0.46	1000×	0.25	0.46

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

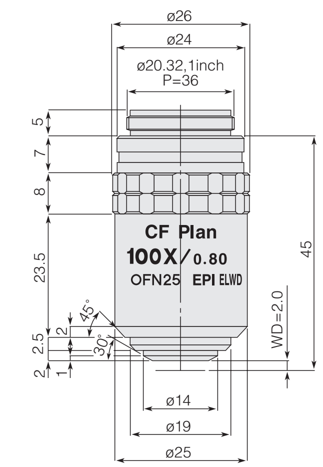
Extended working distances facilitate observations of samples with irregular surfaces.



CF IC EPI Plan ELWD 20×A



CF IC EPI Plan ELWD 50×A



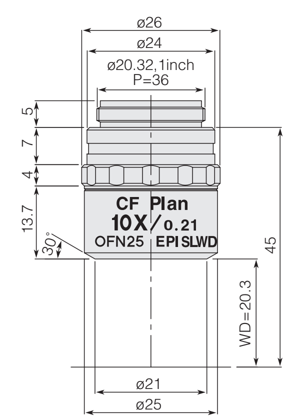
CF IC EPI Plan ELWD 100×A

Unit: mm

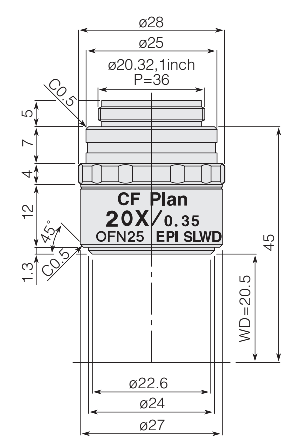
Code No.	CF IC Objectives						Widefield CF eyepieces CFWN 10× (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10× (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (µm)	Weight (g)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (µm)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (µm)
MUL03201	CF IC EPI Plan ELWD 20×A	0.40	11.0	10	1.72	95	200×	1.0	3.50	200×	1.25	3.50
MUL03501	CF IC EPI Plan ELWD 50×A	0.55	8.7	4	0.91	105	500×	0.4	1.43	500×	0.50	1.43
MUL03901	CF IC EPI Plan ELWD 100×A	0.80	2.0	2	0.43	120	1000×	0.2	0.61	1000×	0.25	0.61

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

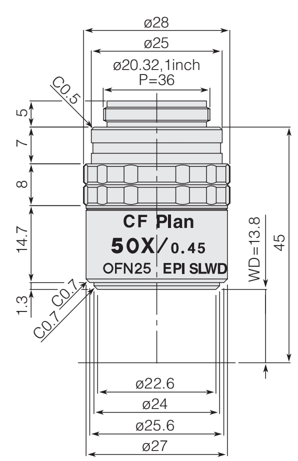
Ultra-long working distances.
Particularly useful when observing the bottom of a depression in the sample.



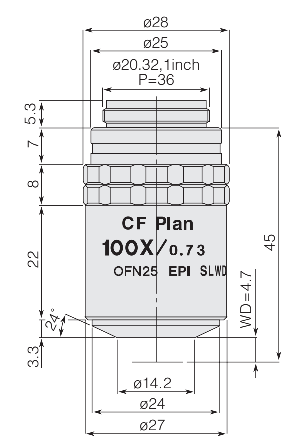
CF IC EPI Plan SLWD 10×A



CF IC EPI Plan SLWD 20×A



CF IC EPI Plan SLWD 50×A



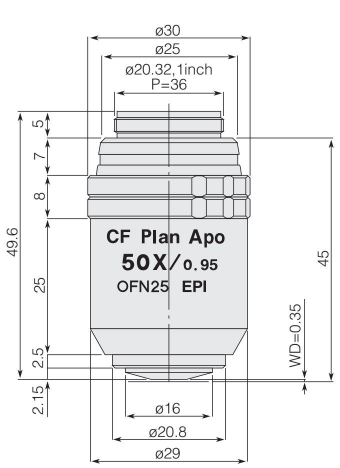
CF IC EPI Plan SLWD 100×A

Unit: mm

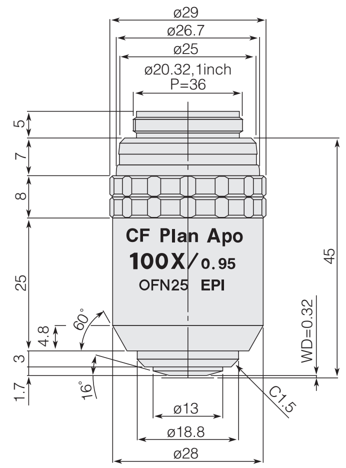
Code No.	CF IC Objectives						Widefield CF eyepieces CFWN 10× (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10× (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (µm)	Weight (g)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (µm)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (µm)
MUL04101	CF IC EPI Plan SLWD 10×A	0.21	20.3	20	6.24	85	100×	2.0	13.04	100×	2.50	13.04
MUL04201	CF IC EPI Plan SLWD 20×A	0.35	20.5	10	2.24	80	200×	1.0	4.29	200×	1.25	4.29
MUL04501	CF IC EPI Plan SLWD 50×A	0.45	13.8	4	1.36	110	500×	0.4	1.99	500×	0.50	1.99
MUL04901	CF IC EPI Plan SLWD 100×A	0.73	4.7	2	0.52	135	1000×	0.2	0.71	1000×	0.25	0.71

CF IC EPI Plan Apo High-Resolution Brightfield Objectives

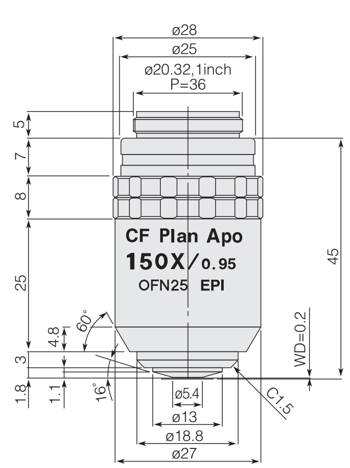
Apochromat-type objectives for brightfield use virtually eliminate chromatic aberration and feature excellent resolution.



CF IC EPI Plan Apo 50×A



CF IC EPI Plan Apo 100×A



CF IC EPI Plan Apo 150×B

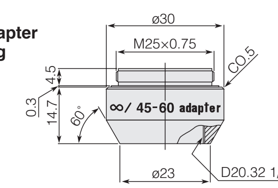
Unit: mm

Code No.	CF IC Objectives						Widefield CF eyepieces CFWN 10× (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10× (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)
MUT10051	CF IC EPI Plan Apo 50×A	0.95	0.35	4.00	0.3	170	500×	0.40	0.61	500×	0.50	0.61
MUT10101	CF IC EPI Plan Apo 100×A	0.95	0.32	2.00	0.3	170	1000×	0.20	0.46	1000×	0.25	0.46
MUT10153	CF IC EPI Plan Apo 150×B	0.95	0.20	1.33	0.3	160	1500×	0.13	0.40	1500×	0.17	0.40

C-OA 15 mm Adapter

An adapter for attaching CF & IC objectives to the C-N Sextuple Nosepiece (page 17) that supports the CFI optical system.

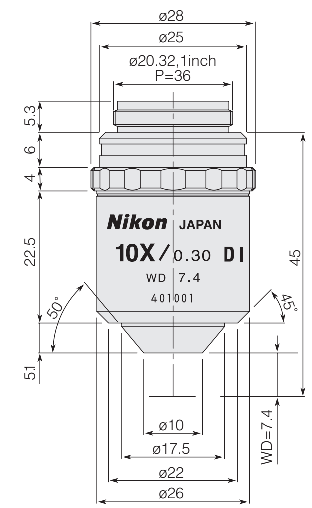
C-OA 15mm Adapter
MXA20750 / 45 g



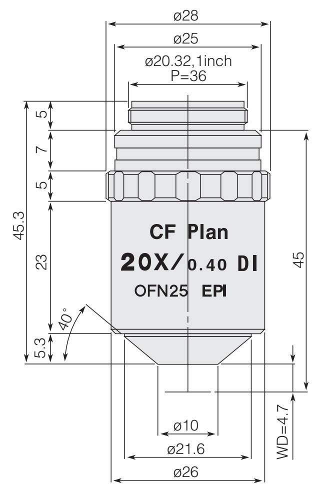
Unit: mm

CF IC EPI Plan DI Double Beam Interference Objectives

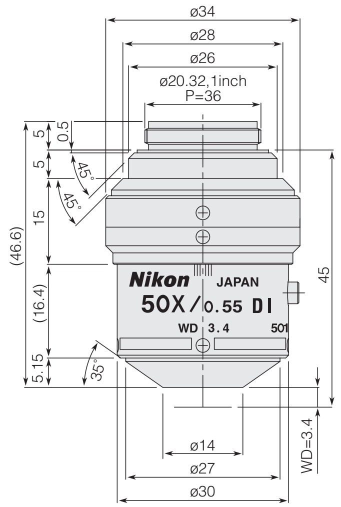
Double beam interference objectives that have large numerical aperture, long working distance and high optical performance.



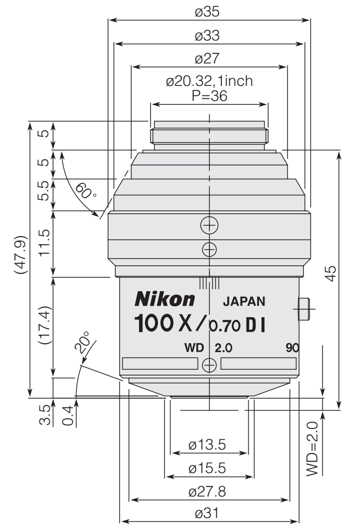
CF IC EPI Plan DI 10×A



CF IC EPI Plan DI 20×A



CF IC EPI Plan DI 50×A

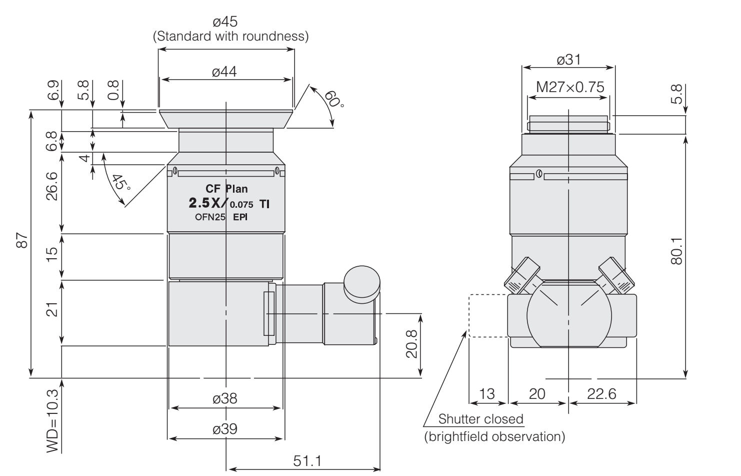


CF IC EPI Plan DI 100×

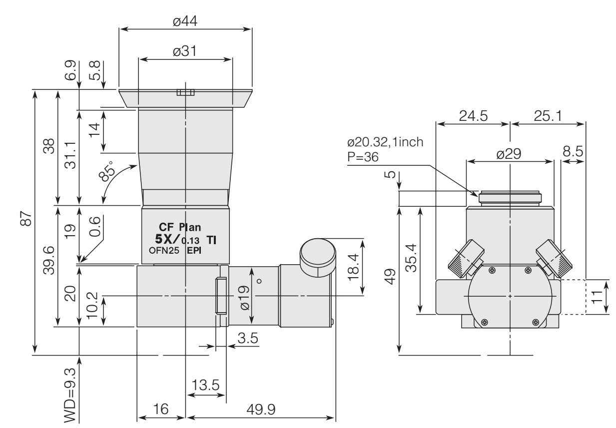
Unit: mm

Code No.	CF IC Objectives						Widefield CF eyepieces CFWN 10× (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10× (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)
MUL40101	CF IC EPI Plan DI 10×A	0.30	7.4	19.78	3.06	125	100×	2.00	3.04	100×	2.50	3.04
MUL40201	CF IC EPI Plan DI 20×A	0.40	4.7	9.97	1.72	130	200×	1.00	1.71	200×	1.25	1.71
MUL40501	CF IC EPI Plan DI 50×A	0.55	3.4	4.00	0.90	200	500×	0.40	0.90	500×	0.50	0.90
MUL40900	CF IC EPI Plan DI 100×	0.70	2.2	2.00	0.56	200	1000×	0.20	0.56	1000×	0.25	0.56

CF IC EPI Plan TI Interference Objectives



CF IC EPI Plan TI 2.5×A



CF IC EPI Plan TI 5×A

Unit: mm

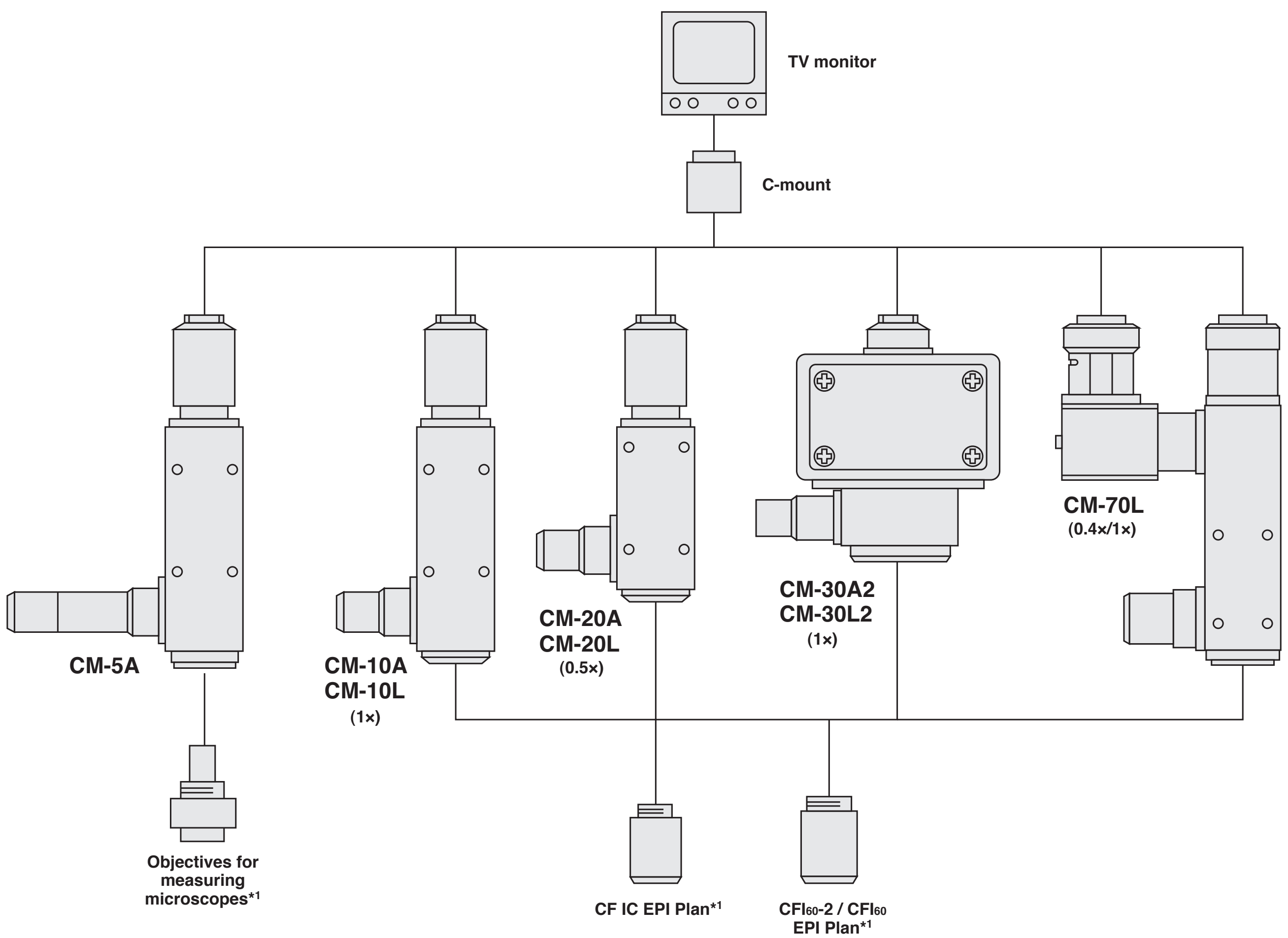
Code No.	CF IC Objectives						Widefield CF eyepieces CFWN 10× (F.N. 20)			Ultra-Widefield CFI eyepieces CFI UW10× (F.N. 25)		
	Objectives (Magnifications)	NA	WD (mm)	Focal length (mm)	Physical depth of focus (μm)	Weight (g)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)	Total magnification (M)	Actual field of view (ømm)	Depth of focus (μm)
MUL42031	CF IC EPI Plan TI 2.5×A*	0.075	10.3	80	48.5	440	25×	8.00	48.6	—	—	—
MUL42051	CF IC EPI Plan TI 5×A	0.13	9.3	40	16.2	280	50×	4.00	16.2	50×	5.00	16.2

* 2.5×A supported up to a field number of ø22.

CM-Series Compact Reflected Microscopes

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

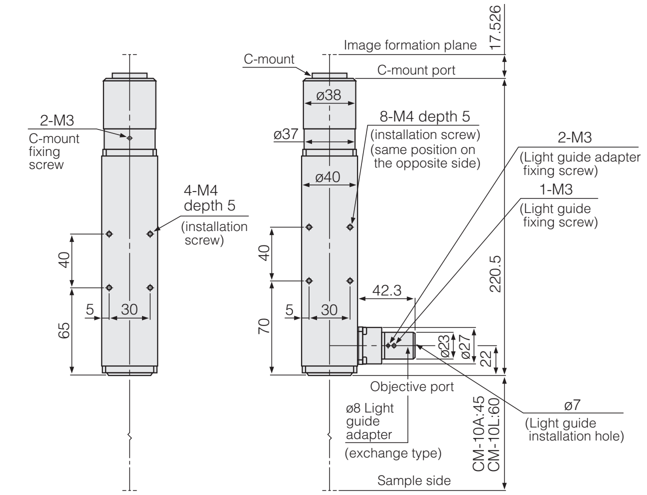
- Ultra-compact and lightweight.
- C-mount video cameras having 1/4 to 1-inch CCDs are attachable as standard.
- The Koehler Illumination Optical System offers a uniformly bright viewfield.
- Tread holes ideally located on the surface of the microscope facilitate attachment of virious auxiliary equipment.



*1 Use a 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 CFI60-2 / CFI60 series on L series units.

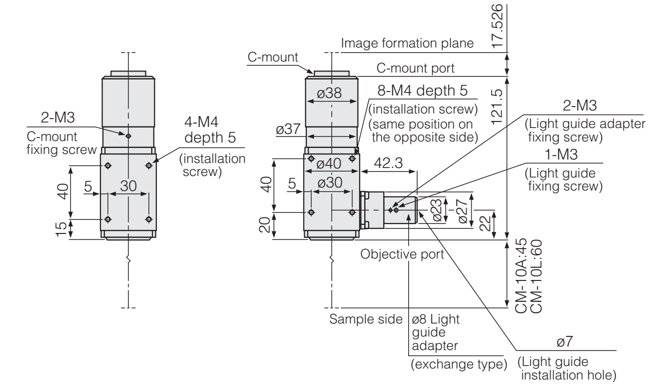
CM-10A/CM-10L

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



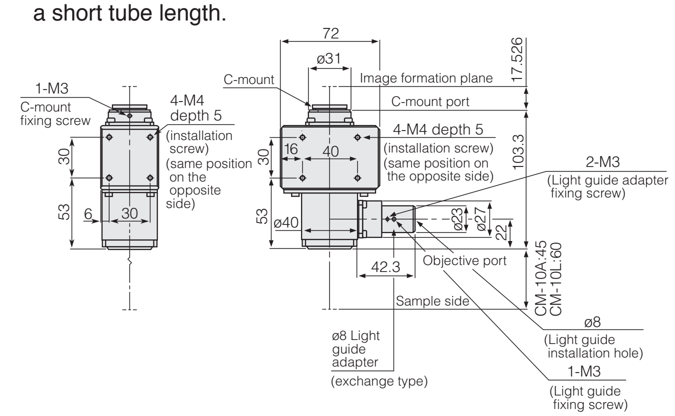
CM-20A/CM-20L

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



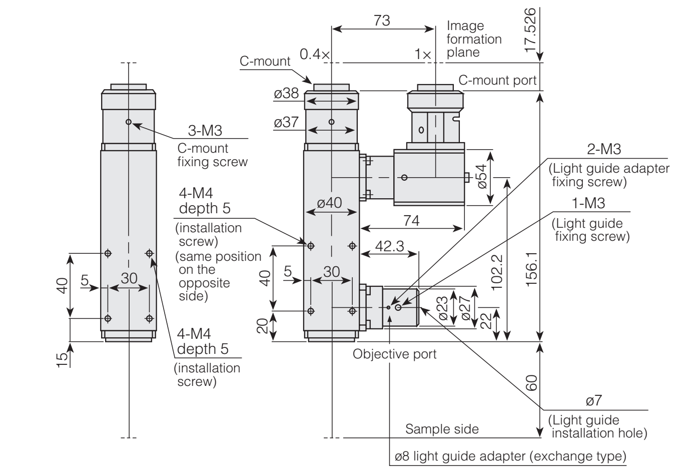
CM-30A2/CM-30L2

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

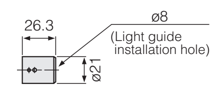


CM-70L

- Enables simultaneous observation at different imaging magnifications (1×/0.4×). For CFI60-2 / CFI60 EPI Plan.



ø8 Light guide Adapter



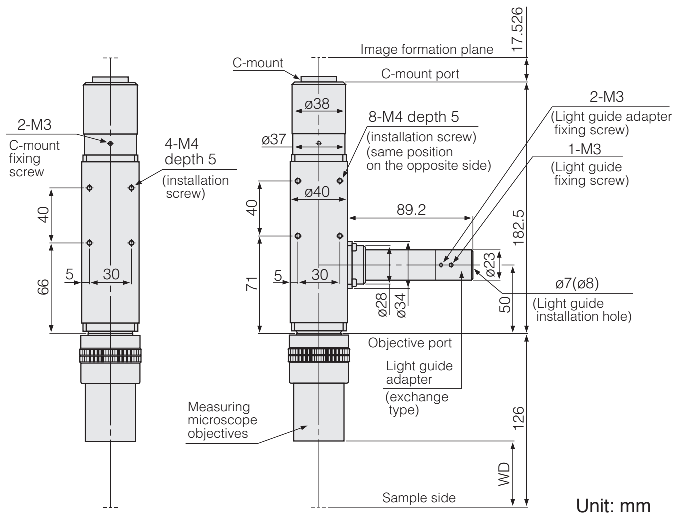
Unit: mm

	CM-10A/CM-10L	CM-20A/CM-20L	CM-30A2/CM-30L2	CM-70L
Camera mount	C-mount			
Tube lens focal length	200 mm	100 mm	200 mm	80/200 mm
Tube lens magnification	1×	0.5×	1×	0.4×/1×
Magnification on CCD surface	Same as objective magnification	Objective magnification × 0.5	Same as objective magnification	Same as objective magnification and 0.4×
Compatible objectives*	A series: CF IC EPI Plan objectives / L series: CFI60-2 / CFI60 EPI Plan objectives			
Illumination optical system	Koehler illumination (high-quality telecentric illumination)			
Attachment surfaces	3		4	3
Dimensions (WxDxH); Weight (Approx.)	40 × 40 × 224.5 mm: 440 g	40 × 40 × 125.5 mm: 290 g	40 × 40 × 107.3 mm: 400 g	40 × 117 × 156.1 mm: 690 g

Manufactured by: Nikon Engineering Co.,Ltd.

* On the above-mentioned A series and L series, use CF IC EPI Plan and CFI60-2 / CFI60 series EPI Plan Objectives, respectively.

CM-5A

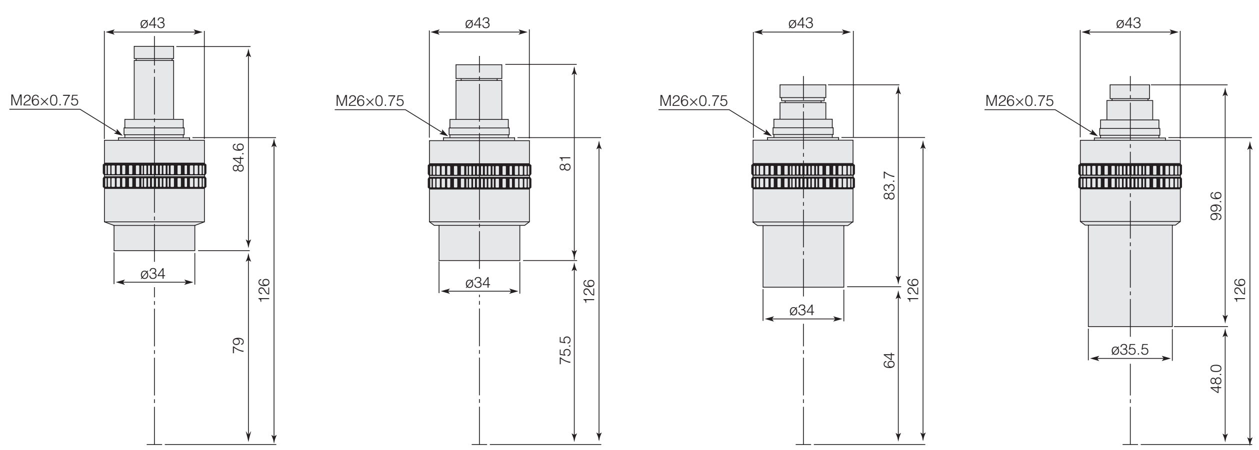


Unit: mm

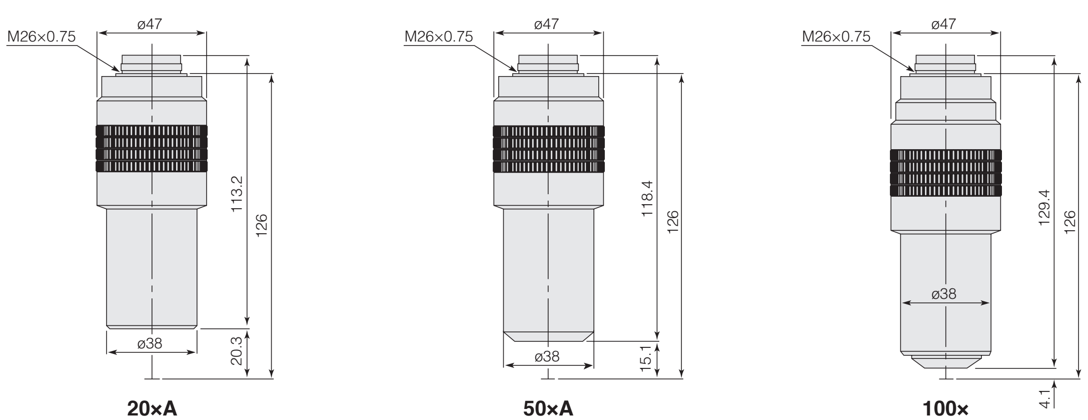
	CM-5A
Camera mount	C-mount
Tube lens focal length	——
Compatible objectives	Measuring microscope objectives
Illumination optical system	Koehler illumination (high-quality telecentric illumination)
Attachment surfaces	3
Dimensions (W×D×H); Weight (Approx.)	40 × 40 × 186.5 mm ; 410 g

Manufactured by: Nikon Engineering Co.,Ltd.

Objectives for Measuring Microscopes



1× 3×A 5×A 10×A



20×A 50×A 100×

Unit: mm

	1×	3×A	5×A	10×A	20×A	50×A	100×
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
WD (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

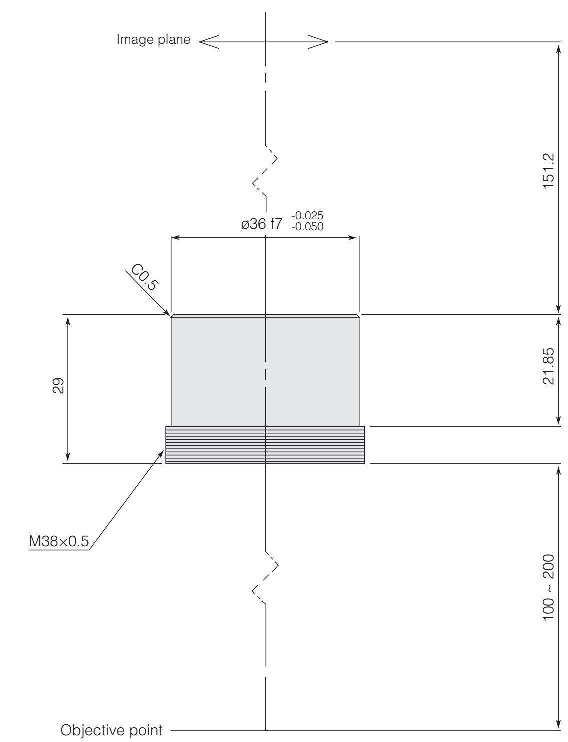
2nd Objective Lens Units

Used to focus parallel light beams coming through CFI60-2 / CFI60 objectives and CF&IC objectives onto the image plane.

Built-in Type 2nd Objective Lens Unit

- Compatible with CFI60-2, CFI60 and CF&IC infinity objectives.
- Focal length: f/200 mm.
- To obtain the optimal objective performance, keep the distance between the lens unit and the objective's shoulder within 100-200 mm as shown in the diagram at right.

Built-in Type 2nd Objective Lens Unit
MXA23081 / 70 g

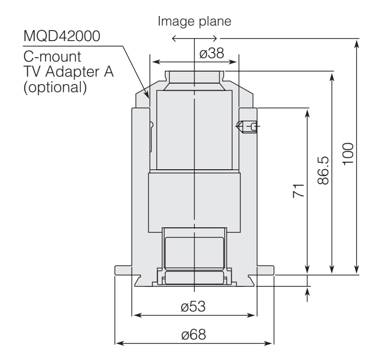


Unit: mm

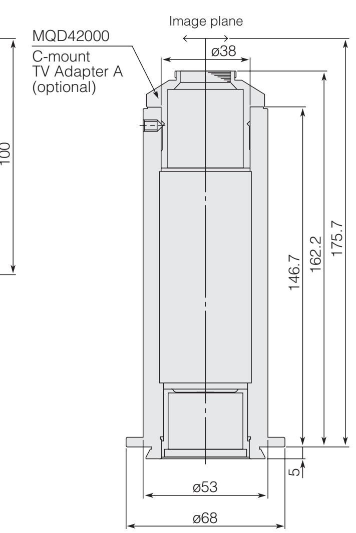
TV-Use 2nd Objective Lens Unit 0.5×/ TV Relay Unit 1×

- Image plane magnification: 0.5×; Focal length: f/100 mm.
- Image plane magnification: 1×; Focal length: f/200 mm.
- With a field number of 11 mm, 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: 60-160 mm (110 mm optimum).
- Compatible with Universal Epi-Illuminators (LV-UEPI-N, LV-UEPI2, LV-UEPI2A, and LV-EPILED).

TV-Use 2nd Objective Lens Unit 0.5×
MXA20714 / 100 g



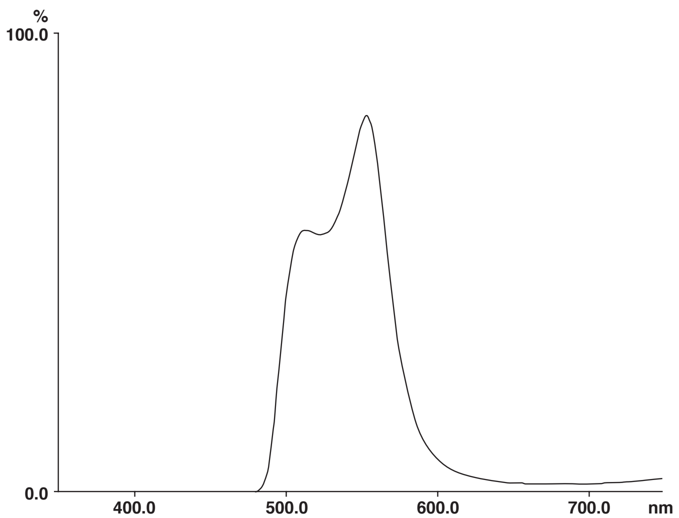
TV Relay Unit 1×
MXK60147 / 500 g



Unit: mm

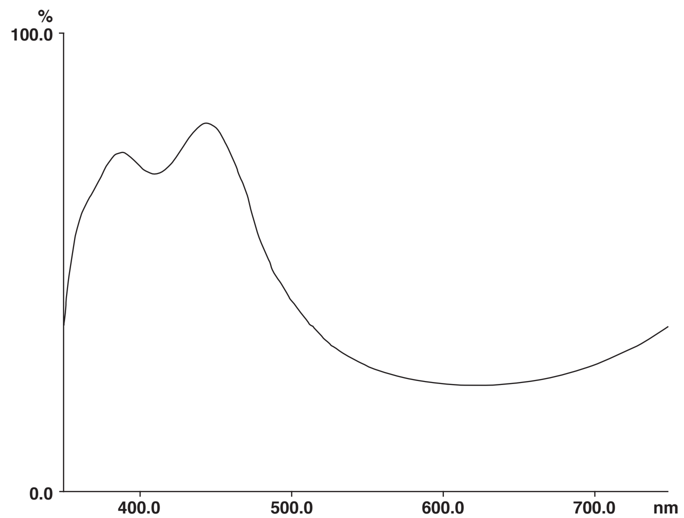
Filters

A color balance compensation filter and neutral density filter are available.



GIF Filter

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



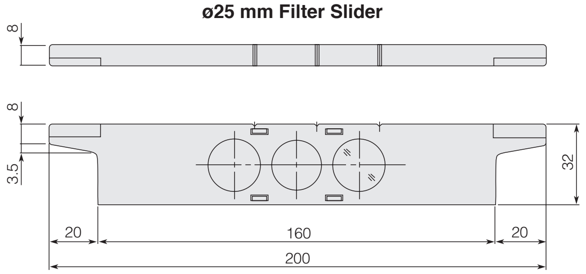
NCB11 Filter

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 9 V.

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).

ø25 mm Filter Slider



Unit: mm

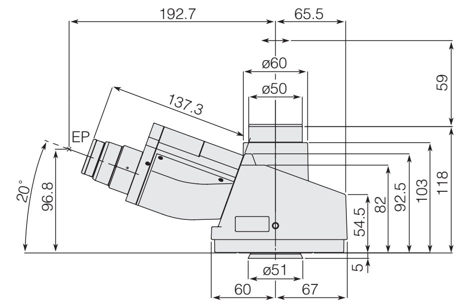
Code No.	Items	Weight (g)
MBN66750	YM-NCB ø25 mm Filter Slider NCB11	31
MBN66760	YM-ND ø25mm Filter Slider ND4/ND16	36
MBN66730	YM-GIF ø25 mm GIF Filter	25

Eyepiece Tubes/Double Port/Straight Tubes

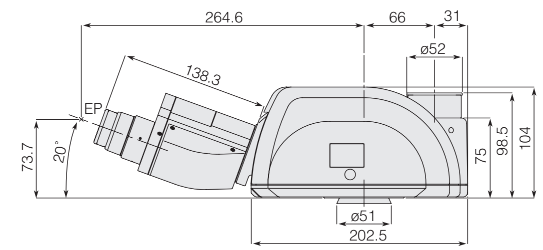
Sleeve diameterø (mm) 30

Illuminators LV-UEPI-N LV-UEPI2 LV-UEPI2A LV-EPILED

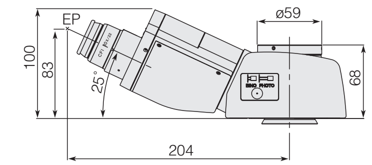
These lens tubes can be combined with illuminators such as the LV-UEPI, LV-UEPI2, LV-UEPI2A and LV-EPILED. The trinocular eyepiece tube supports both ultrawide and wide fields of view with a change of the eyepiece lens.



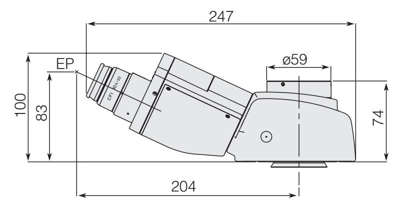
LV-TI3 Trinocular Tube ESD 30



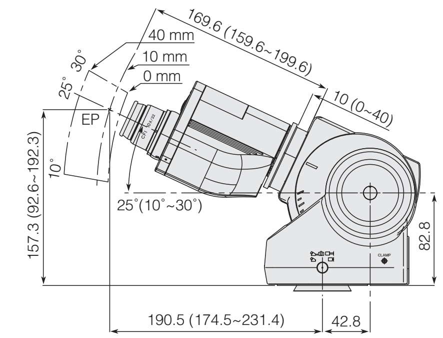
LV-TT2 Tilting Trinocular Tube 30



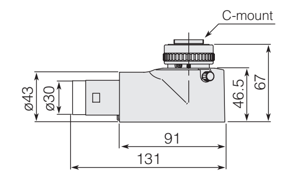
C-TF Trinocular Tube 30



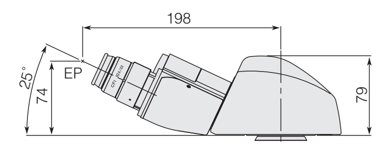
C-TT Trinocular Tube T 30



C-TE2 Ergonomic Binocular Tube 30



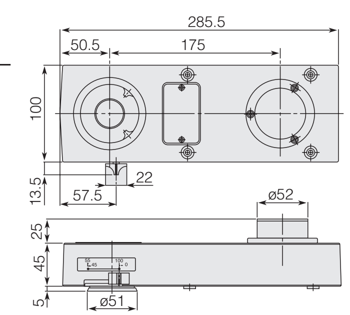
C-TEP2 DSC Port For Ergonomic



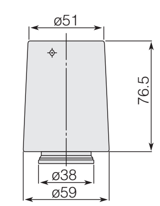
C-TB Binocular Tube 30

Double Port

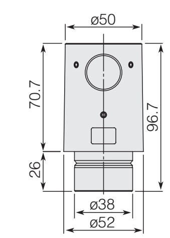
Installed between the epi-illuminator and the trinocular tube, the double port enables simultaneous attachment of CCTV and 35 mm cameras.



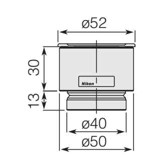
Straight Tubes



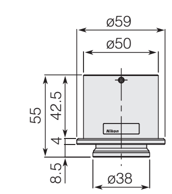
Y-T TV Tube
MBB73525 / 250g



T-BPA Photo Adapter
MED53130 / 190g



LV-TV Tube Adapter
MBB63435 / 100g



Y-TV55 TV Tube 0.55x
MBB73550 / 300g

Used to change the format of the straight tube of a trinocular tube.

(Unit: mm
EP: Eyepoint)

Code No.	Items	Weight (g)	Type	Image type	Field number	Tube's tilt angle	Beam split ratio (observation:photo)	Interpupillary distance
MBB63425	LV-TI3 Trinocular Tube ESD	1800	Siedentopf	Erect	22/25	20°	100:0/0:100	50~75 mm
MBB61000	LV-TT2 Tilting Trinocular Tube	2580	Siedentopf	Erect	22/25	10°~ 30°	100:0/20:80	50~75 mm
MBB93106	C-TF Trinocular Tube F	1850	Siedentopf	Inverted	22/25	25°	100:0/0:100	50~75 mm
MBB93115	C-TT Trinocular Tube T	2260	Siedentopf	Inverted	22/25	25°	100:0/20:80/0:100	50~75 mm
MBB93800	C-TE2 Ergonomic Binocular Tube	2100	Siedentopf	Inverted	22	10°~ 30°	—	50~75 mm
MBB92106	C-TB Binocular Tube	950	Siedentopf	Inverted	22	25°	—	50~75 mm

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

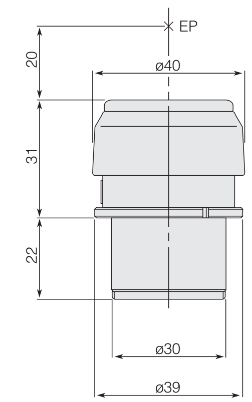
MBB96800	C-TEP2 DSC Port For Ergonomic	350	Specially for C-TE Binocular Ergonomic Tube, Equipment magnification: 0.7×, Beamsplit ratio (binocular: port) 50:50/100:0
MBB74100	Y-IDP Double Port	1300	Equipment magnification: 1×, Beamsplit ratio (observation: photo) 55:45/100:0
MBB74105	Y-IDP Double Port 0/100	1300	Equipment magnification: 1×, 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 10× and CFI UW 10×M are not suitable for use.

Eyepieces

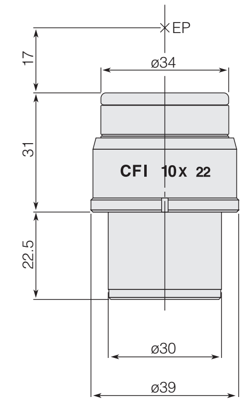
Sleeve diametero (mm) 30

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



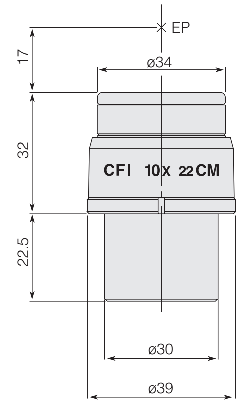
LV-10×ESD

30



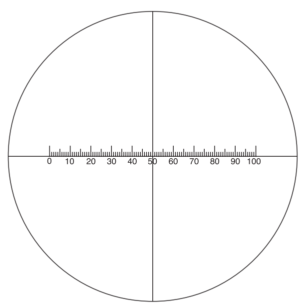
CFI 10×

30



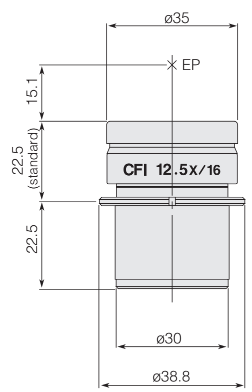
CFI 10×CM

30



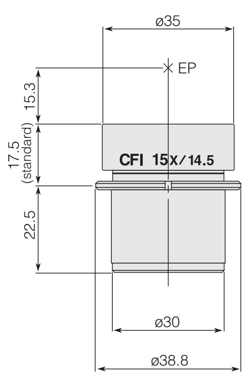
10 mm (in 100 um increment)

CFI 10×CM eyepiece reticle



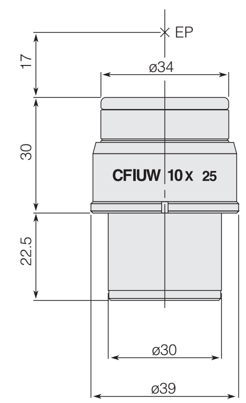
CFI 12.5×

30



CFI 15×

30



CFI UW10×

30

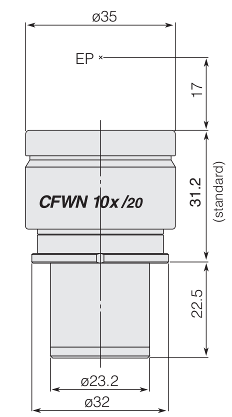
(Unit: mm
EP: Eyepoint)

Code No.	Items (field number)	Weight (g)	Code No.	Items (field number)	Weight (g)
MBJ62105	LV-10×ESD (22)	70	MAK10120	CFI 12.5× (16)	63
MAK10100	CFI 10× (22)	75	MAK10150	CFI 15× (14.5)	48
MAK12105	CFI 10×CM (22) with crosshair reticle	77	MAK30105	CFI UW10× (25)	100

Eyepieces

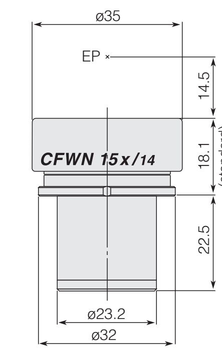
Sleeve diametero (mm) 23.2

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



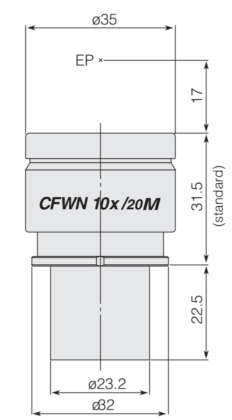
CFWN 10×

23.2



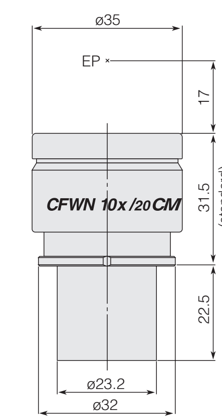
CFWN 15×

23.2



CFWN 10×M

23.2



CFWN 10×CM

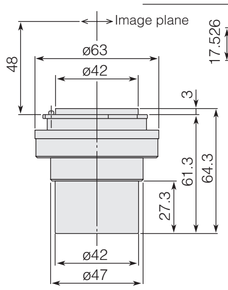
23.2

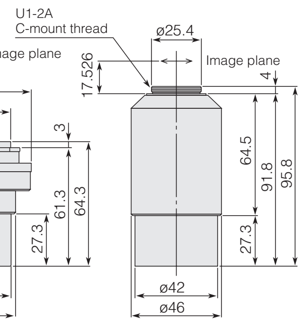
(Unit: mm
EP: Eyepoint)

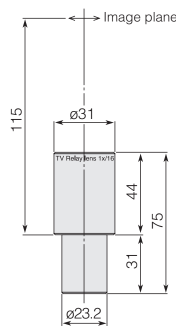
Code No.	Items (field number)	Weight (g)	Code No.	Items (field number)	Weight (g)
MBJ20105	CFWN 10× (20)	50	MBJ22100	CFWN 10×CM (20) with crosshair reticle	50
MBJ20150	CFWN 15× (14)	50	MXA23010	Adapter for CFN Filar Micrometer	40
MBJ21100	CFWN 10×M (20) with Photomask	50			

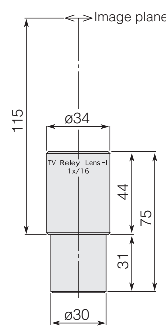
CCTV Camera Adapters

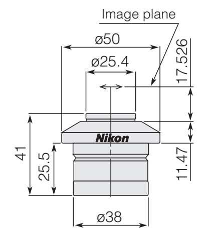
C-mount, ENG-mount, and F mount camera adapters are available.

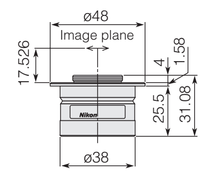


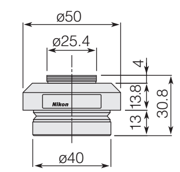




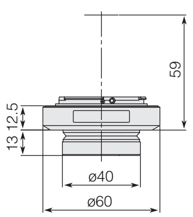


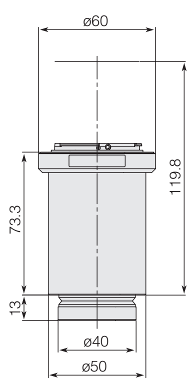


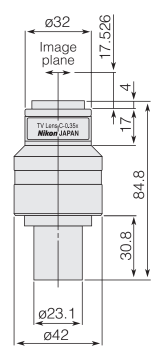


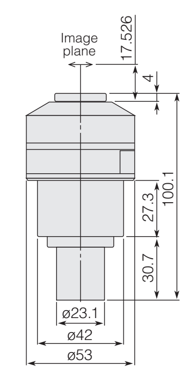


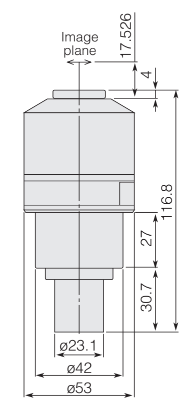
*limited stock **ENG-mount TV Adapter** **MQD12013 / 200 g**	**C-mount TV Adapter** **MQD12012 / 200 g**	*limited stock **1X Relay Lens** **MQD12011 / 100 g**	**Relay Lens 1×l** **MQD12014 / 100 g**	**C-mount** **TV Adapter A** **MQD42005/180g**	**C-0.7×** **DXM Relay Lens** **MQD42075 / 155 g**	**C-0.55×** **DS Relay Lens** **MQD42056 / 300 g**
ENG-mount TV Adapter and C-Mount TV Adapter are used in conjunction with 1x Relay Lens.				1x Relay Lens is not necessary.		For DS-Fi3 series.











DS-F F-mount Adapter
MQD43000 / 165 g

DS-F2.5 F-mount Adapter
MQD43020 / 165 g

C-mount Adapter 0.35×
MQD51045 / 300 g

C-mount Adapter 0.45×
MQD42045 / 620 g

C-mount Adapter 0.6×
MQD42066 / 650g

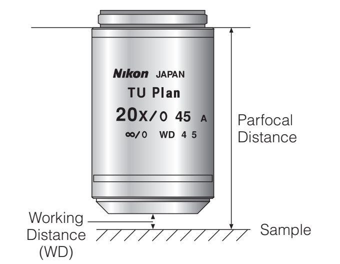
C-mount adapters feature a built-in reduction relay lens, enabling areas equivalent to those seen through the eyepiece to be viewed on the monitor.
Adapters for 1/3-inch (0.35×), 1/2-inch (0.45×), and 2/3-inch (0.6×) CCD cameras are available.

Unit: mm

Glossary

■ Working Distance (WD) and Parfocal Distance

Working distance is the distance between the top lens of the objective and the surface of the sample (or the cover glass) when in focus. The distance between the objective's shoulder and the sample (or the cover glass) when in focus is referred to as parfocal distance. Nikon's CF infinity objectives have a parfocal distance of 45 mm, while the CFI60-2 / CFI60 objectives feature a parfocal distance of 60 mm.



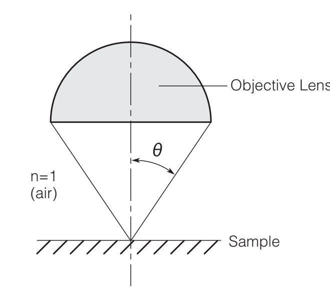
■ Numerical aperture (NA)

Numerical aperture is generally indicated by the equation below.

Where, $$NA = n \times \sin\theta$$

n = Refractivity of the substance existing between the sample 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.

$$\text{Resolving Power} = 0.61 \times \frac{\lambda}{NA}$$

Where,
λ = Light source's wavelength (generally 0.55 μm)
NA = Numerical aperture of objective

■ Depth of Focus (When observing with eyepieces)

The range in front of and behind the target plane of the sample, 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.

$$\text{Depth of focus} = \frac{n \times \lambda}{2 \times (NA)^2} + \frac{n}{7 \times NA \times M} \times 1000$$

λ = Light source's wavelength (generally 0.55 μm)
NA = Numerical aperture of objective
M = Total magnification
n = Refractivity of the substance existing between the sample and the objective. (n=1 for air)

■ Pupil Diameter

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

$$\text{Pupil diameter} = 2 \times f \times NA$$

f = Focal distance of objective lens
NA = Numerical aperture of objective

Refer to this brochure for the values of f and NA for each objective lens. In addition.

■ Total Magnification

When viewed through eyepieces

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

When viewed on monitors

Monitor observation magnification = objective's magnification × TV adapter magnification × 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	6.0 mm	4.8 mm	3.6 mm
1/2-inch	8.0 mm	6.4 mm	4.8 mm
2/3-inch	11.0 mm	8.8 mm	6.6 mm

■ Monitor magnification

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

N.B. Export of the products* in this brochure is controlled under the Japanese Foreign Exchange and Foreign Trade Law. Appropriate export procedures shall be required in case of export from Japan.
*Products: Hardware and its technical information (including software)

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

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