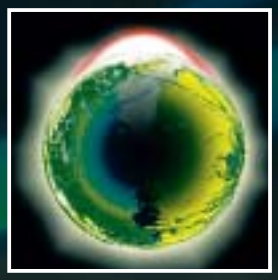
Nikon



ECLIPSE TS100

CFI60

Eclipse TS100. Adding new dimensions to inverted microscopes

CFI 60 objectives

In designing the new microscope, Nikon started with its optical performance. First, they incorporated their acclaimed CFI60 optical system—a fusion of CF optics with infinity optics—into this new, small-sized inverted microscope. These optics provide flat, sharp, and brilliantly clear images, while achieving longer working distances and higher numerical apertures. Furthermore, epi-fluorescence and HMC observations are now possible using accessories available as options. To improve observation under phase contrast microscopy, Nikon developed a series of Apodized Phase Contrast objectives, allowing minute details within a specimen to be observed with excellent contrast and wider tonal ranges. But Nikon didn't stop here. They redesigned the body, so that it is robust, rigid, and vibration-resistant, and placed all controls so that they fall naturally under your hand. To accommodate image documentation, Nikon offers a trinocular model as well. The TS100-F comes with a photo port and accepts various photomicrographic systems, including a CCTV camera, or a digital still camera.

Binocular type Model TS100

Trinocular type Model TS100-F

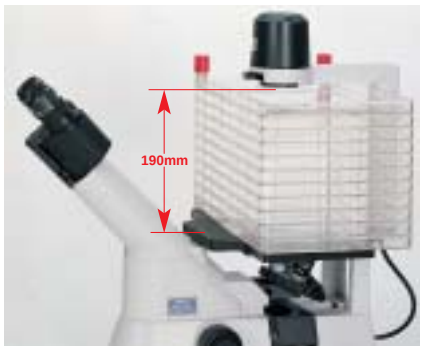
Operation is simpler, quicker, more precise, because there is less strain on the user

Coarse/fine focus knob

The coaxial coarse/fine focus knob, located in front of and close to the operator, makes operation at high magnifications more efficient and convenient than ever before.

Efficient, user-friendly stage

The stage features a low-profile design that is 195mm high, making it the ideal size for a lab bench or safety hood. Even cell cultures on the bottom of a tall flask or stacking chamber vessel can be viewed, because there is 190mm of space above the stage when the condenser is removed.

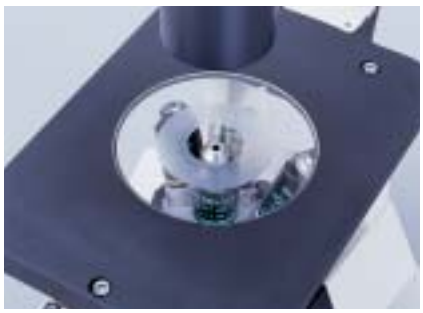


Ample space above the stage

Transparent stage ring

Two types of acrylic stage rings come with the main body. Because these stage rings are transparent, confirming which objective is being used is easy. The ring with the semicircular hole facilitates observation of the specimen in a chamber since it prevents the objective lens from striking the ring during magnification changes. A glass stage that minimizes the possibility of thermal deformation is also available as an option.

Acrylic stage ring set



Objective in use is easily identified through the transparent stage ring.

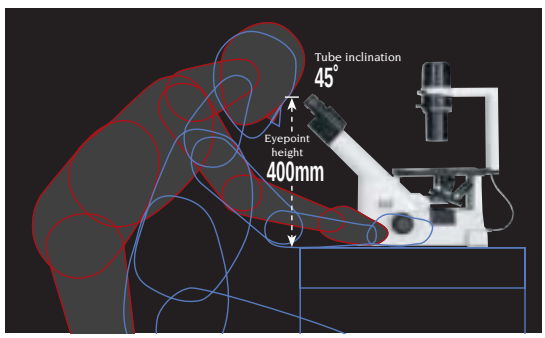
Easy-to-rotate nosepiece

The quintuple (5-position) backward-facing nosepiece offers plenty of clearance to allow the operator to rotate it from either side. Because there is ample space around the nosepiece, handling the nosepiece is easy, even for an operator with large or gloved hands.

Plenty of clearance around the nosepiece

Eyepiece tube

The Siedentopf-type eyepiece tube is inclined 45° and the eyepoint height is 400mm for easy, comfortable viewing in the sitting or standing position.



Comfortable operation

Eyepieces

Featuring a 22mm field of view, the widest in this class of microscope, the TS100/TS100-F ensures clear images up to the periphery of the field of view even when using higher magnification objectives.

Observation methods that provide the most informati

Phase contrast method

In addition to the conventional method, the new breakthrough “Apodized” method is now available

Nikon has successfully reduced image halos by using a process called “Apodization” to improve the phase ring of the objective. This improves vision during phase contrast microscopy by removing unwanted halos to make it possible to more clearly observe cell division activities within a specimen and view finer details within a thick specimen.

ELWD condenser and phase sliders

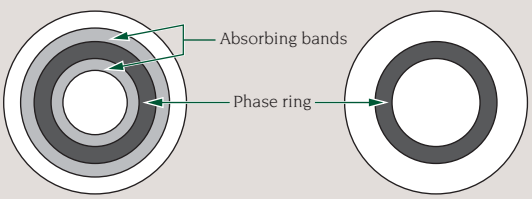
TS100 configured with a phase contrast set

The Principle of Apodized Phase Contrast Microscopy

In the conventional phase contrast method, direct light* that has been weakened by passing through a phase ring is made to interfere with diffracted light**, causing a phase shift and increasing image contrast.
The new Apodized method utilizes the property of diffracted light in which a decrease in specimen size results in a greater angle of diffraction. Two absorbing bands with different transmittance have been added either side of the conventional phase ring DL to reduce halos and increase contrast in the minute structure of the specimen.

*Light that travels retaining the original incident angle.

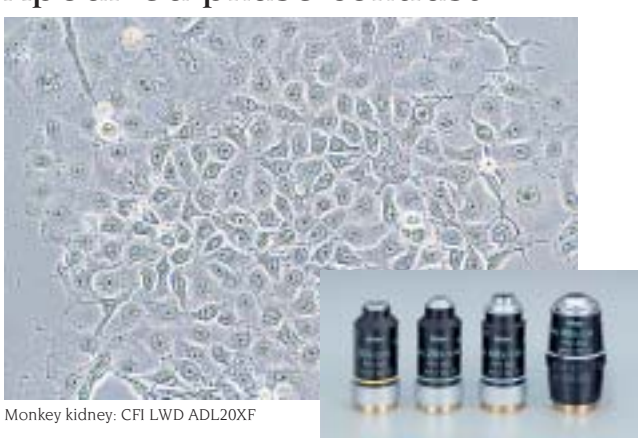
**Light that has been diffracted by the specimen



Phase ring ADL　　Phase ring DL

ADL objectives
① CFI Achromat ADL10X (N.A. 0.25, W.D. 6.2mm) Ph1
② CFI Achromat LWD ADL20XF (N.A. 0.4, W.D. 3.1mm) Ph1
③ CFI Achromat LWD ADL40XF (N.A. 0.55, W.D. 2.1mm) Ph1
④ CFI Achromat LWD ADL40XC (N.A. 0.55, W.D. 2.7-1.7mm) Ph2
⑤ CFI Plan Fluor ELWD ADL20XC (N.A. 0.45, W.D. 8.1-7.0mm) Ph1
⑥ CFI Plan Fluor ELWD ADL40XC (N.A. 0.6, W.D. 3.7-2.7mm) Ph2

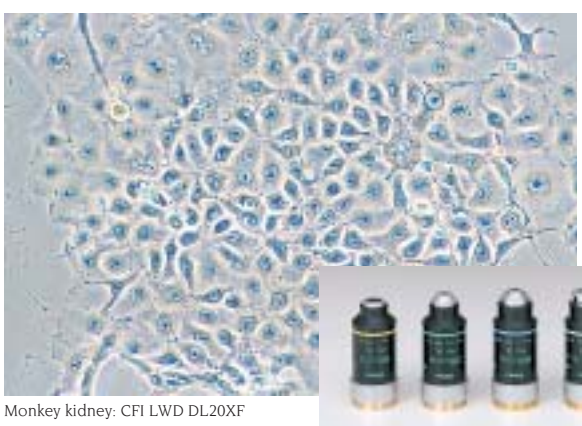
Apodized phase contrast



Monkey kidney: CFI LWD ADL20XF

ADL objectives for Apodized phase contrast

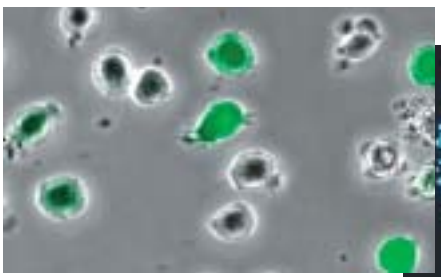
Phase contrast



Monkey kidney: CFI LWD DL20XF

DL objectives for phase contrast

Epi-fluorescence method



T lymphocyte cell (GFP)

Breast cancer screening (DAPI)

This method is ideal for identifying fluorescent tagged substances within a cell, green fluorescent protein (GFP), and a myriad of other clinical and research applications.
Epi-fluorescence observation utilizing UV-range light is also possible.

Epi-fl attachment

① CFI Plan Fluor DL4X (N.A. 0.13, W.D. 16.4mm) PhL
② CFI Plan Fluor DL10X (N.A. 0.3, W.D. 15.2mm) Ph1
③ CFI Plan Fluor ELWD DM20XC (N.A. 0.45, W.D. 8.1–7.0 mm) Ph1
④ CFI Plan Fluor ELWD DM40XC (N.A. 0.6, W.D. 3.7–2.7 mm) Ph2
⑤ CFI Plan Fluor 10X (N.A. 0.3, W.D. 16.0mm)
⑥ CFI Plan Fluor ELWD 20XC (N.A. 0.45, W.D. 8.1–7.0 mm)
⑦ CFI Plan Fluor ELWD 40XC (N.A. 0.6, W.D. 3.7–2.7 mm)
⑧ CFI Plan Fluor ELWD ADL 20XC (N.A. 0.45 W.D. 8.1-7.0mm) Ph1
⑨ CFI Plan Fluor ELWD ADL 40XC (N.A. 0.6 W.D. 3.7-2.7mm) Ph2

TS100 configured with epi-fl attachment

Hoffman Modulation Contrast® method

Hela cells in tissue culture vessel

Trichuris trichiura egg

This method is now possible even with a microscope of this class. HMC creates vivid, 3-dimensional-like images of living, transparent specimens, allowing observation in plastic petri dishes—something that DIC does not do well.

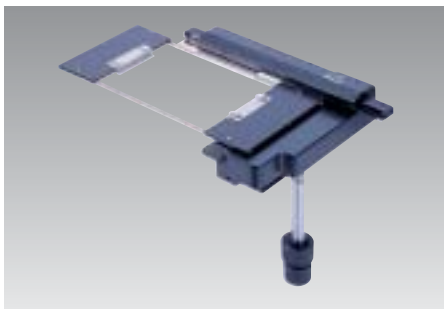
HMC condenser

① CFI HMC 10X (N.A. 0.25, W.D. 6.2mm)
② CFI HMC LWD 20XF (N.A. 0.4, W.D. 3.9mm)
③ CFI HMC LWD 40XC (N.A. 0.55, W.D. 2.7–1.7 mm)

TS100 configured with an HMC set

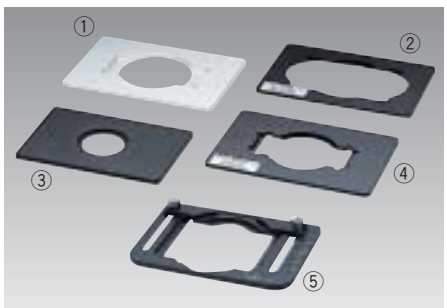
Note: Hoffman Modulation Contrast and HMC are registered trademarks of Modulation Optics Inc.

Accessories to expand your capabilities



Mechanical stage

By attaching appropriate holders, various specimen slides and micro testplates can be mounted on this stage.



Specimen plate holders

These specimen holders are available for use with the mechanical stage:

① Hemacytometer holder
② Terasaki holder (accepts ø65mm petri dish)
③ ø35mm petri dish holder
④ Slide glass holder (accepts ø54mm petri dish)
⑤ Universal holder

Auxiliary stages

For large specimens, you can widen the space on your plain stage by attaching a pair of auxiliary stages.

Micromanipulators

The Eclipse TS100/100-F can be configured with Nikon/Narishige micromanipulators and microinjectors for a variety of applications, including injections, aspiration, and incisions of cell tissues during cytoengineering, developmental and genetic engineering, electrophysiology, pharmacology, reproductive medicine, and neurochemistry.

Photomicrographic systems including a CCTV or digital still camera

TS100-F configured with Digital Camera DS-5M-L1

With a photomicrographic equipment H-III

With a CCTV camera

The TS100-F comes with a photo port that accepts photomicrographic systems such as the DS-5M-L1, a stand-alone type digital camera with which you can take photos without PCs.
Also a CCTV or photomicrographic equipment can be attached.

CCTV adapters

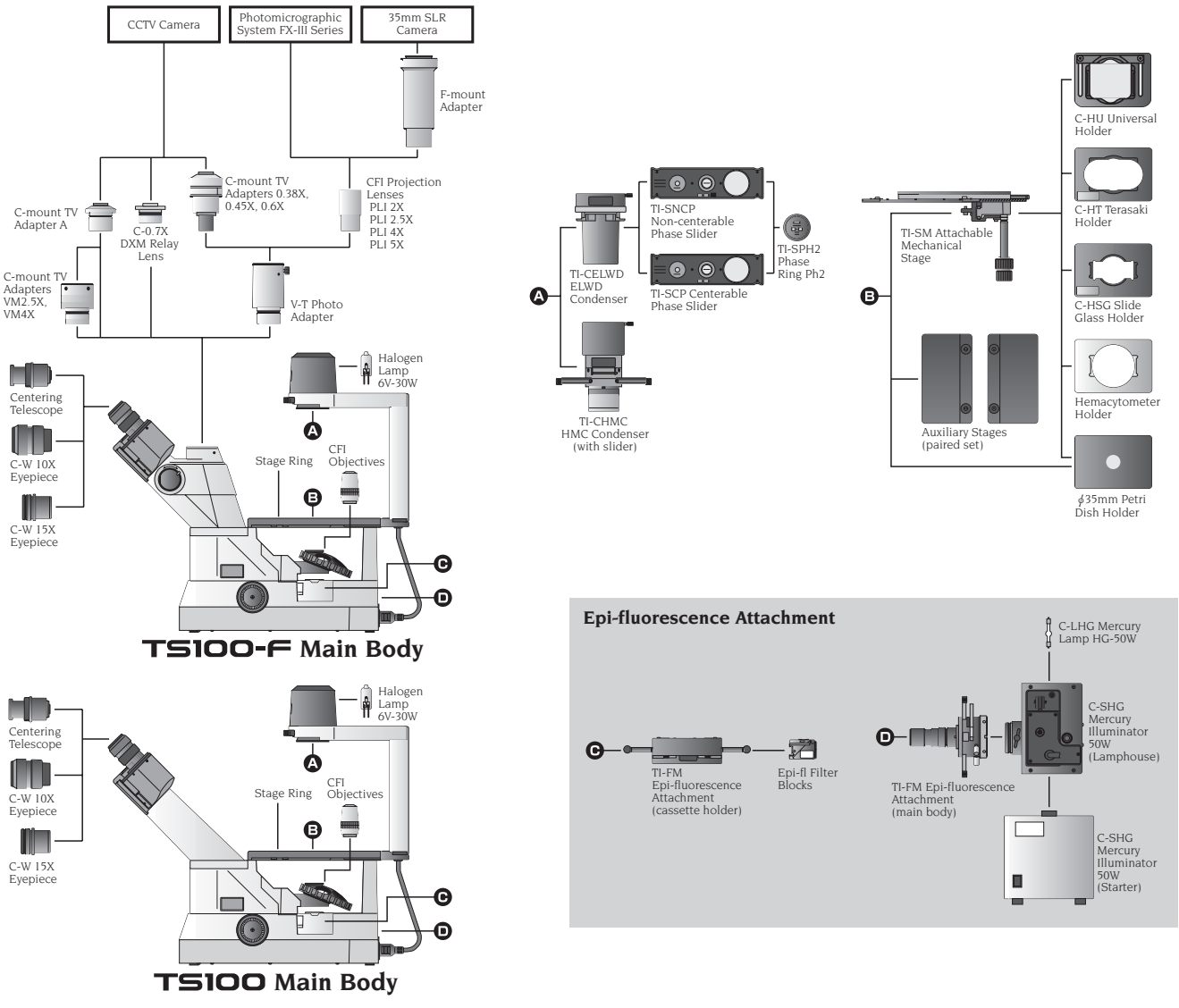
These CCTV adapters are available as options:

- C-mount TV adapter 0.6X—recommended for 2/3" CCD camera*
- C-mount TV adapter 0.7X—recommended for 2/3" CCD camera
- C-mount TV adapter 0.45X—recommended for 1/2" CCD camera*
- C-mount TV adapter 0.38X—recommended for 2/3" CCD camera*
- C-mount TV adapter VM4X**
- C-mount TV adapter VM2.5X**
- C-mount TV adapter A
- C-mount TV adapter used with Relay Lens 1X*
- ENG-mount TV adapter 0.6X—recommended for 2/3" CCD camera*
- ENG-mount TV adapter 0.45X—recommended for 1/2" CCD camera*
- ENG-mount TV adapter used with Relay Lens 1X*

* V-T photo adapter is neccessary
** C-mount TV adapter A is neccessary

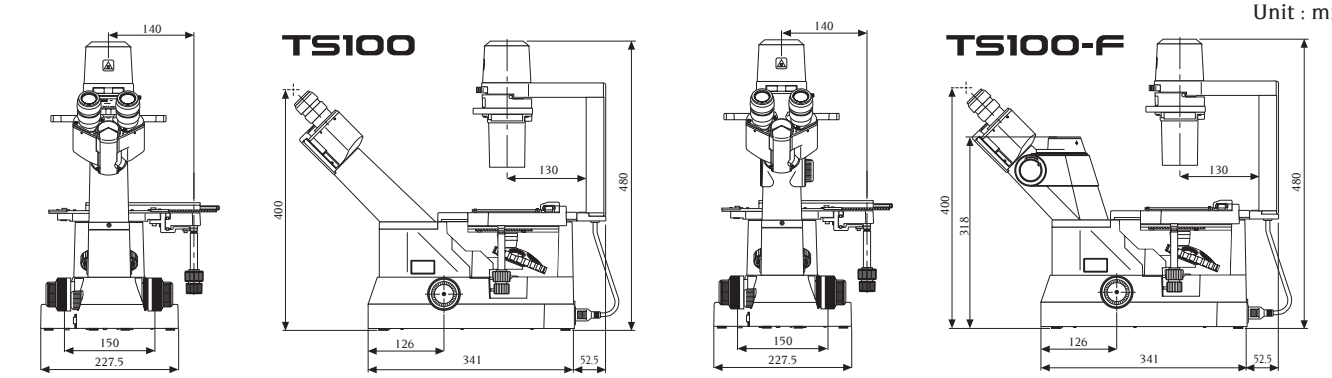
System Diagram/Dimensions

System Diagram



Dimensions

Unit : mm



Specifications

	TS100 (Binocular model)	TS100-F (Trinocular model)
Optical system	CFI60 infinity system, parfocal distance 60mm	
Main body		
Main body	Square box type with both-end support stage	
Focusing	Vertical objective movement	
	Coarse stroke: 37.7mm per rotation, Fine stroke: 0.2mm per rotation	
Eyepiece tube	Siedentopf-type binocular tube	Siedentopf-type trinocular tube (light distribution, bino/photo: 100/0, 0/100)
	Interpupillary distance: 50–75 mm, Eyepoint height: 400mm from table, Inclination: 45˚ from horizon	
Nosepiece	Quintuple nosepiece, backward-facing type	
Plain stage	Stage size: 170 x 225 mm, Stage height: 195mm from table, Auxiliary stage attachable	
Illumination	Pre-centered 6V-30W halogen lamp, Filter frame (accepts 2 filters), Heat absorbing filter and diffuser	
Slider	Non-centerable phase slider (PhL, Ph1, 1 empty position)	
	Centerable phase slider (PhL, Ph1, 1 empty position), Ph2 ring (optional)	
	HMC slider (MC1, MC2, MC3)	
Attachable mechanical stage	Stage movement: 126 x 80 mm	
	Accepts several micro-testplate holders	
Holder	ϕ35mm Petri Dish holder, Universal holder, Terasaki holder (accepts ø65mm petri dish), Slide glass holder (accepts ø54mm petri dish), Hemacytometer holder	
Filter	45mm NCB11, ND8 and GIF (green interference)	
Eyepiece lens	C-W 10X (F.O.V. 22mm), C-W 15X (F.O.V. 16mm)	
Condenser (without condenser O.D. 190mm)	ELWD condenser: N.A. 0.3 (O.D. 75mm)	
	HMC condenser: N.A. 0.4 (O.D. 44mm)	
Epi-fluorescence attachment	Field diaphragm, Fluorescence filter block holder (2 filter blocks mountable, 1 empty position), Heat absorbing filter, Lamphouse for 50W mercury lamp, Light shielding plate, UV-cut filter (detachable)	

Note: Hoffman Modulation Contrast and HMC are registered trademarks of Modulation Optics, Inc.

Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. December 2004.

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Printed in Japan (0412-02)T

Code No. 2CE-MTAH-8

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