

DESCRIPTION

ACUCAL inverted fluorescent microscope uses fluorescence to study specimens, such as living cells at the bottom of a petri dish or tissue culture. The Inverted Fluorescent Microscope has similar components to those of other microscopes, and the only difference is the arrangement of the parts, which are placed in inverted positions.

The specimen is lit using a halogen lamp or LED as a light source. When light enters the microscope, it strikes a dichroic mirror, reflecting one range of wavelengths while allowing another to pass through. The ultraviolet light is reflected up to the specimen by the dichroic mirror. The UV light causes fluorescence in the specimen's molecules and the fluorescent-wavelength light generated is collected by the objective lens.



The ACUCAL ACUBL-I6 FL is particularly suitable for observing cell cultures and is very user-friendly and easy to handle. The microscope is prepared for use in sterile workbenches (Clean Bench, Laminar Flow). The UV-resistant coating ensures that the workstation can be sterilised with UV light without any problems.

*ACUBL-I6 FL is equipped with excellent Universal Infinity System (UIS) optical system, long working distance objectives and very long working distance condenser. Compact & steady main frame body is embodiment for shock resistance. The ideal ergonomics design is adopted in this unit and have easier operation & wide space. It can observe transparent and unfinished living specimen in culture bottle or culture utensil. It is used to identify *Phytophthora* spp, nematology extraction specimens such as vermiform, and to see *Mycobacterium tuberculosis*. It can be used in scientific research institutes, universities, medical treatment, agriculture and epidemic prevention, etc.*

TECHNICAL SPECIFICATION

Main Body

- Sturdy, durable Inverted metal body main frame, Compact, stable and suitable for clean bench, Highly rigid & rugged, Non Hinged type, vibration free Aluminium alloy casting, Robust mechanics combined with improved optical performance. Ergonomic design for comfortable handling, ruggedness and longevity.
- Touchpoint-treated, scratch resistant and acid & UV resistant texture paint.
- Spherical lens with field diaphragm & intensity controller and an on/off switch (in front) along with eco-illumination with ON/OFF & Delay Time feature and rubber feet for stability.
- The volume and weight of the body is reduced as much as possible by using High-grade materials that help avoid vibrations and the resulting image blur in principle of stability.
- Design supports all kinds of dishes, Flasks, Petri plates & Multi wells.

Optical System

- LWD Universal Plan Infinity corrected Phase Contrast Optical System providing chromatic-free and colour-corrected images.
- Infinity Phase Contrast, Epi- Fluorescence & Bright Field observation.
- Anti Fungal & Anti-Bacterial coated optics for enhanced durability (multi-layered hard coated).
- **Microscope Upgradable to dark field, phase contrast, Emboss contrast/DIC/IMC (pseudo 3-D), Hoffman observation technology, on-stage top incubator for live cell imaging.**

Observation Head: Trinocular

- Sidentopf Binocular Observation tube 45° inclined .
- Left Side Camera Port & C/CS-Mount Adapter with Light distribution: 100: 0 or 0:100 (100% for eyepiece or 100% for camera).
- Inter-pupillary distance from 48mm to 75mm.

Eyepiece

- Compensating Wide field 10X (paired) F.O.V. 20/22/23mm. Bright Field Br, Focusable Foc., Field of view number F.N. 20/22m/23mm, Eyepiece outer mounting barrel diameter or Inner diameter of ocular sleeve 30mm. Oculars can be rotated by 360°.
- Anti-fungal & Anti-reflection multi-layered hard coated conforming to IS: 8275/1976 (latest) for enhanced image quality and abrasion resistance
- Diopter adjustment facility (+5) on both eyepiece.
- High Quality & Anti mould eyepieces to get the Image of object well defined over the entire field with good contrast rendition and practically free from spurious color effects.

Nose Piece

- Quintuple, Ball Bearing loaded, interchangeable, Precise, Positive click stops for centred alignment.
- Inbuilt DIC/Plastic DIC slot and relief contrast/equivalent contrast for improved imaging
- Nosepiece provided with rubber grip for easy rotation mounted on a precision ball bearing mechanism for smooth and accurate alignment.
- **CODED NOSEPIECE** : Coded Intelligent Inward reverse Facing Quintuple can memorize the illumination brightness for each objective and automatically adjust the light intensity. This improves work efficiency and reduces visual fatigue (Optional).

Objectives: Long Working Distance Infinity Plan, Anti-fungus, Interchangeable & Par focal

- Infinity Plan Semi-Apochromatic FL objective 10X (N.A. 0.30), W.D. 7.4mm
- Infinity Plan Semi-Apochromatic FL objective 20X (N.A. 0.45), W.D. 8mm
- Infinity Plan Semi-Apochromatic FL objective 40X (N.A. 0.60), W.D. 3.6mm

- Objectives have Suitable prominent marking for easy identification : Color coded ring, magnification, NA and nature of objective mentioned
 - Unbreakable containers for storing the objectives.
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Condenser

- Long Working Distance 80mm (with condenser), 187mm (without condenser). Quickly detachable with a slot for sliders.
 - Numerical Aperture 0.3 or 0.45. Suitable for Bright field, phase contrast and integrated modulation/Plas DIC/hoffman modulation contrast. Universal 4-position Phase Contrast Slider Annular Plate : 4x (BF), 10x (PH0)/ 20x (PH1)/ 40x (PH2).
 - Pre-centered Phase contrast slider for phase observation. for the objectives from 10-40X for faster cell culture operations
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Mechanical Stage:

- Fixed, Scratch resistant Rectangular Mechanical Stage with right-hand low drive control, Size 250*170mm, Moving Range 130*84mm, Moving Stage Detachable.
 - Stage accepts different types of micro-test plate, TC vessels lifting type micro plate holder
 - emocytometer, counting chamber, petri dish holder, glass slide holder & culture flask holder, clear acrylic/glass circular insert, various stage inserts, holder for two side stages, micro-manipulator etc.
 - Culture Petri Dish Holder/ Slide Holder Dia.54mm
 - Culture Petri Dish Holder/ Slide Holder Dia.60mm (Optional)
 - Culture Petri Dish Holder Dia.90mm (Optional)
 - Universal Holder to accept all types of plates, multiwall plates, dishes, 6/12/24/38/96mm well plates, petri plate holder, glass slide holder, specimen holders (Optional)
 - Terasaki microplate Holder (Optional)
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Focusing Control:

- Coaxial Coarse & Fine knob Precise adjustment & for focusing system by the vertical movement of revolving nosepiece and fixed stage.
 - Tension Adjustable and Limit Stopper, Minimum fine Division 0.001mm, Ergonomically designed for easy grip.
 - Stroke per rotation: 37.5mm (coarse), 0.2mm (fine)
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Diascopic Illumination: Koehler Transmitted Fly-Eye Lens Design Illumination with constant color temperature, 3W/5W/10W Scientific Grade LED cool white light for bright field (brightness equivalent to 50W Halogen bulb), phase contrast studies, Brightness Adjustable with lifetime < 65,000 hours (with 40 working hrs/week).

Epi Fluorescence Attachment :

- Epi-Fluorescence Attachment, Turret slider 4 position (3+1), 3 Holes to configure 3 different fluorescent Filter Cubes & 1 separate for brightfield, With Noise Terminator Mechanism & With Attachable UV contrast Shield
- The exciting light spectrum range is 330nm-700nm & the fluorescent light spectrum range is 420nm-650nm. illumination is controlled through digital power supply with time display unit & trigger, easy to change (push & click), other filters on demand, 0 pixel shift technology.
- 3WLED fluorescence lamp house, life hrs. 30,000, built in flyeye (input voltage:100V ~240V)
- Fluorescence LED light (B light- wavelength 485nm at 3W)
- Fluorescence LED light (G light- wavelength 520nm at 3W)
- Fluorescence LED light (U light- wavelength 360nm at 3W)

Optional Filters :

- Zero Pixel shift corrected DAPI/Hoechst, GFP/FITC (Band Pass), and TRITC/Rhodamine fluorescence filters can be chosen

Name of part	Exciter	Dichroic	Emitter	Light
UV	EX375/28	DM415	EM435LP	halogen or LED
V	EX405/30	DM430	EM470LP	halogen or LED
B	EX450/60	DM505	EM520LP	halogen or LED
G	EX540/30	DM565	EM590LP	halogen or LED
FITC	EX480/30	DM505	EM535/40	LED
DAPI	EX375/28	DM415	EM460/50	halogen or LED
TRITC	EX540/25	DM565	EM605/55	halogen or LED
Cy5	EX620/50	DM655	EM690/60	LED
R (Texared)	EX560/40	DM595	EM635/60	halogen or LED
FishAqua	EX440/20	DM460	EM480/30	Halogen
FishGreen	EX490/20	DM510	EM530/25	LED
FishOrange	EX540/20	DM565	EM590/25	halogen or LED
FishRed	EX580/20	DM605	EM630/25	halogen or LED
Chroma39000 (UV)	EX375/28	DM415	EM460/50	halogen or LED
DAPI/Hoechst/AlexaFluor 350				
Chroma39002 (B)	EX470/40	DM505	EM535/40	halogen or LED
EGFP/FITC/Cy2/AlexaFluor 488				
Chroma39004 (G)	EX530/40	DM565	EM605/55	halogen or LED
TRITC/Cy3/TagRFP/AlexaFluor 546				
Chroma19008	EX450/50	DM485	EM495LP	LED
Auramine Longpass				

Electronics: SMPS Based power supply with Universal Input Rated Voltage 90V-250 V AC, 50/60 Hz.

Standard Accessories : Operating & Instruction Manual, Vinyl Dust Cover, Guarantee Card, Styrofoam Molded pack, Electric Cable, Fuse, Blue Filter , Cleaning cloth, Allen keys

Optional Accessories

- Universal Emboss contrast slide, 10×, 20×, 40× Hoffman Condenser, Special objective,
- High Resolution Microscopy Camera
- ECO MODE (No Operator, Turn off the Light Source Automatically in 15 Minutes)
- Illumination Display with intensity memory function, auto off, LCD display-magnification, Timing sleep, upgradable to on-stage top incubator brightness indication & lock, modular design

PLAN ACHROMAT Infinity Bright Field Objectives: (Optional)

- ∞ L PL 4X(N.A. 0.10/0.13), W.D. 30mm
- ∞ L PL 10X(N.A. 0.25), W.D. 10.2mm
- ∞ L PL 20X(N.A. 0.40/0.45), W.D. 12mm
- ∞ L PL 40X(N.A. 0.60), W.D. 2.2mm
- ∞ L PL 100X(N.A. 1.25), W.D. 0.12mm

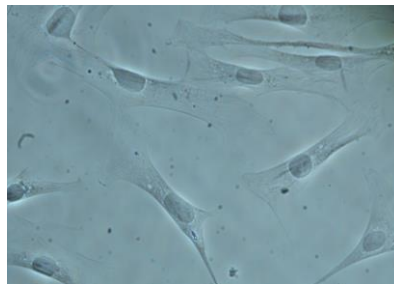
PLAN ACHROMAT Infinity Phase Contrast Objectives: (Optional)

- ∞L PL PHP 10X (N.A. 0.25), W.D. 10.2mm
- ∞L PL PHP 20X (N.A. 0.40), W.D. 5.8mm
- ∞L PL PHP 40X (N.A. 0.60), W.D. 2.2mm

SEMI APOCHROMATIC Infinity Fluorescence Phase Objectives: (Optional)

- ∞N-iPLFN PH 4X Semi-APO
- ∞N-iPLFN PH 10X (N.A. 0.25), W.D. 7.5mm Semi-APO
- ∞N-iPLFN1 PH 20X(N.A. 0.40), W.D. 5.0mm Semi-APO
- ∞N-iPLFN1 PH 40X (N.A. 0.60), W.D. 2.2mm Semi-APO
- ∞N-iPLFN PH 20X Semi-APO with adjustable
- ∞N-iPLFNPH40XSemi-APOwith adjustable
- ∞N-iPLFN PH 60X Semi-APO with adjustable

Transmission

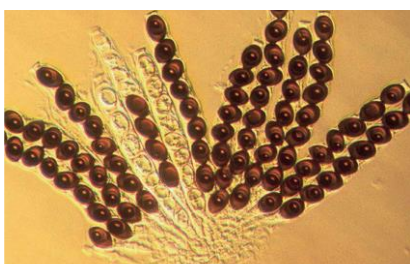


Phase Contrast

By using changes in the refractive index, high contrast microscopic images of transparent samples can be obtained with phase contrast observation technique. The advantage is that the details of live cell imaging can be obtained without staining and fluorescent dyes.

Application range: Living cells in culture, Microorganism, Tissue slide, Subcellular grains (including cell nuclei and organelles).

Optional



Hoffman Modulation Phase Contrast

With slant light, changing phase gradient into light intensity variety, it can be used to observe unstained cells and living cells.

Optional : 10x, 20x, 40x Hoffman Condenser, Special Objective

3D Emboss Contrast

Even without extra optical components, no glare 3D image can be obtained just through adding adjustment slider. Both glass and plastic Petri dishes are available.

Optional : Condenser and Eyepiece with Emboss Contrast 10x, 20x, 40x,
, Universal Emboss Contrast Slide



Features



- **Can be sterilized in the clean bench**
The compact body is with anti-UV coating and can be placed into the clean bench for sterilization under UV lamp.
- **Cell sampling and operation can be performed in clean bench**
The distance between the eye point to the operation button and the focusing knob is relatively short, and the distance from the stage is far away. It is available to make the viewing head and operating mechanism outside, and stage, objectives and sample inside. So realize cell sampling and operation inside and observing comfortably outside.
- **Various Holders for Different Culture Containers:** Various holders are available for different culture containers, such as Petri dishes, well plates, and culture flasks. As well as available for different size Petri dishes.
- **Detachable Condenser :** When culture flask is used, the condenser can be removed to increase working distance. It is also suitable for multilayer culture flask.
- **The Microscope Control Mechanism is Reasonable in Layout and Easy to Operate :** The frequently used control mechanisms are close to the user and in low-hand position. This kind of design makes operation more quickly and conveniently, and reduce the fatigue caused by the long observation. On the other hand, it reduces the airflow and dust caused by large amplitude operation, and it is very effective to reduce the probability of sample pollution. It is a strong guarantee for the accuracy and repeatability of the experimental results.
- **Professional Cell Observation : Ergonomic design, comfortable operation,** Frame of the microscope is compatible to view multilayer tissue flask with transmitted light column of minimum 450 mm.
- **Fly-Eye Lens Design illumination** i.e. 2D array of tiny lenses to spatially transform light from a non uniform to uniform irradiance distribution at an illumination plane over entire FOV.
- Integrated Carrying Handle for easy handling & placement of microscope.

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