

Levenhuk 700 Series Biological Microscopes

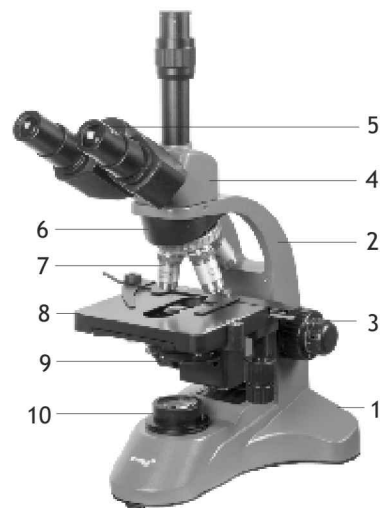
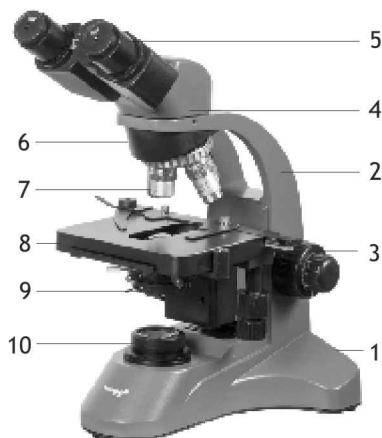
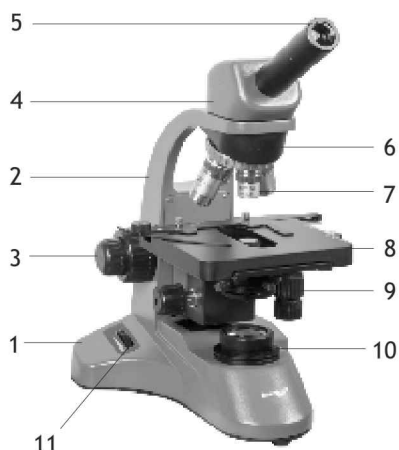


Levenhuk 700M
Levenhuk 720B
Levenhuk 740T
Levenhuk D740T

User Manual
Návod k použití
Bedienungsanleitung
Guía del usuario
Instrukcja obsługi
Инструкция по эксплуатации

*Radost zaostřit
Zoom ran und hab Fun!
Amplie y disfrute
Radość przybliżania
Приближает с удовольствием*

levenhuk[®]
Zoom&Joy[®]



EN

- 1 Base
- 2 Arm
- 3 Focus adjustment knob
- 4 Eyepiece head
- 5 Eyepieces
- 6 Revolving nosepiece
- 7 Objectives
- 8 Stage
- 9 Abbe condenser
- 10 Illumination
- 11 Brightness adjustment

CZ

- 1 Stativ
- 2 Rameno
- 3 Šroub ostření
- 4 Okulární hlava
- 5 Okuláry
- 6 Otočná hlavice
- 7 Čočky objektivu
- 8 Pracovní stolek
- 9 Abbeův kondenzor
- 10 Osvětlení
- 11 Regulace jasu

DE

- 1 Sockel
- 2 Stativarm
- 3 Fokusspannungsring
- 4 Okularkopf
- 5 Okulare
- 6 Objektivrevolver
- 7 Objektivlinsen
- 8 Objektisch
- 9 Abbe-Kondensator
- 10 Beleuchtungsquelle
- 11 Helligkeitseinstellung

ES

- 1 Base
- 2 Brazo
- 3 Mando de enfoque
- 4 Cabezal
- 5 Oculares
- 6 Revólver giratorio
- 7 Objetivos
- 8 Platina
- 9 Condensador Abbe
- 10 Iluminación
- 11 Ajuste de brillo

PL

- 1 Podstawa
- 2 Ramię mikroskopu
- 3 Pokrętło regulacji ostrości
- 4 Głowica okularowa
- 5 Okulary
- 6 Miska rewolwerowa
- 7 Soczewki obiektywowe
- 8 Stolik
- 9 Kondensator Abbego
- 10 Oświetlenie
- 11 Regulacja jasności

RU

- 1 Основание
- 2 Опорная стойка
- 3 Ручка регулировки фокуса
- 4 Окулярная насадка
- 5 Окуляры
- 6 Револьверная головка
- 7 Объективы
- 8 Предметный столик
- 9 Конденсор Аббе
- 10 Подсветка
- 11 Регулировка яркости

- (EN) **Caution:** Please remember that mains voltage in most European countries is 220-240V. If you want to use your device in a country with a different mains voltage standard, remember that use of a converter is absolutely necessary.
- (CZ) **Upozornění:** Mějte na paměti, že síťové napětí ve většině evropských zemí je 220-240 V. Chcete-li svůj přístroj používat v zemi s odlišnou normou síťového napětí, nepameneňte, že je naprosto nezbytné použít napěťový měnič.
- (DE) **Vorsicht:** In den meisten europäischen Ländern beträgt die Netzspannung 220-240 V. Soll das Gerät in einem Land mit abweichender Netzspannung eingesetzt werden, ist unbedingt ein Spannungswandler zu verwenden.
- (ES) **Advertencia:** Tenga en cuenta que la tensión de red en la mayor parte de los países europeos es 220-240 V. Si va a utilizar este aparato en un país con una tensión de red diferente, recuerde que es absolutamente necesario utilizar un convertidor.
- (PL) **Uwaga:** Prosimy pamiętać, że napięcie sieciowe w większości państw europejskich wynosi 220-240 V. Jeśli urządzenie ma być używane w państwie, w którym napięcie sieciowe ma inną wartość, należy koniecznie pamiętać o stosowaniu przetwornika.
- (RU) **Внимание!** Помните, что напряжение сети в России и большинстве европейских стран составляет 220-240 В. Если вы хотите использовать устройство в стране с другим стандартом сетевого напряжения, необходимо включать его в розетку только через соответствующий конвертер (преобразователь напряжения).

- (EN) **Caution:** Children should use the microscope under an adult's supervision only.
- (CZ) **Pozor:** Děti by měly mikroskop používat pouze pod dohledem dospělé osoby.
- (DE) **Vorsicht:** Kinder dürfen das Mikroskop nur unter Aufsicht Erwachsener verwenden.
- (ES) **Atención:** Los niños únicamente deben utilizar este microscopio bajo la supervisión de un adulto.
- (PL) **Ostrożnie!** Używanie mikroskopu przez dzieci może odbywać się tylko pod nadzorem osób dorosłych.
- (RU) **Внимание:** дети должны пользоваться микроскопом только под присмотром взрослых.



General Information

Levenhuk 700 Series biological microscopes are modern state-of-the-art optical instruments made with great attention to detail. They are a perfect choice for specialists in all scientific areas. Levenhuk 700 Series microscopes are mainly used for observing and testing biological samples. They perform well during clinical research and tests; teaching demonstrations; in medical and health establishments, laboratories, universities and schools; and may be used for scientific research in agriculture and microbiology.

Package

- microscope body
- eyepiece head: monocular (700M), binocular (720B) or trinocular (740T, D740T)
- achromatic objectives: 4x, 10x, 40xs, 100xs (oil)
- eyepieces: WF10x and WFH20x (wide field)
- filters: blue, green, yellow
- vial of immersion oil
- dust cover
- user manual and warranty

The Levenhuk D740T kit additionally includes: 5Mpx digital camera, a USB cable and a CD with LevenhukLite software & drivers.

Microscope parts

Base. It supports the weight of the microscope, and houses the illumination source, electronics and control mechanisms.

Arm. This piece holds the base, the stage and the head of the microscope together. Coarse and fine focus systems provide for smooth vertical movements of the stage.

Rack-and-pinion mechanism. The stage with the condenser are mounted on the arm and are moving vertically along it. For additional precision, a condenser may be adjusted separately.

Head. A monocular (Levenhuk 700M), binocular (Levenhuk 720B) or a trinocular (Levenhuk 740T and D740T) head is mounted at a 45° angle at the upper end of the arm and is 360° rotatable.

Eyepieces and objectives. Consist of lenses that allow magnifying the image. High-quality achromatic objectives with 4x, 10x, 40x and 100x magnifications provide for sharp and bright images. The total magnification is calculated by multiplying the eyepiece magnification to the objective magnification. Thus, the available magnifications are 40x, 100x, 400x and 1000x with the WF10x eyepiece, and 80x, 200x, 800x and 2000x with the WFH20x eyepiece.

Revolving nosepiece. The quadruple revolving nosepiece allows you to change objectives smoothly and easily.

Stage. Sturdy and reliable stage with a specimen holder can be used to move your slides while observing them. The lower illumination light passes through the opening in the middle of the stage.

Condenser. Abbe condenser, 1.25 N.A. iris diaphragm is a system of lenses located below the stage that allows gathering and directing the light rays.

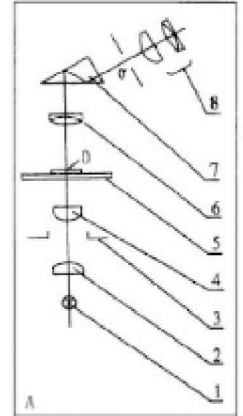
Focusing knob. A coarse and fine focusing system allows moving the stage up and down adjusting the image sharpness.

Lower illumination. LED illumination with adjustable brightness allows observing transparent objects. The illumination system can be powered by A/C.

Operating principle and illumination

Image creation system: objective (6), prism (7) and eyepiece (9). The objective lens (6) magnifies a specimen (0), light rays pass through the prism (7), refract at a 45° angle and create an image in the eyepiece. Total magnification may be calculated by multiplying magnifications of the eyepiece and the objective used.

Illumination system: lamp (1), collector lens (2), diaphragm (3) and condenser (4). Light emitted from the lamp (1) passes through the collector lens (2) and illuminates the diaphragm (3). Then, the light is focused by the condenser (4). This illumination system is used for observations of a specimen (0) in transmitted light. You can also use a different type of illumination (e.g. a reflector) for observations in reflected light.



Using the microscope

Getting started

- Unpack the microscope and make sure all parts are available.
- Move the stage to the lowermost position using the focusing knob and turn on the illumination or adjust the reflector to evenly illuminate the specimen within the field of view.
- Connect the microscope to A/C power using the A/C adapter.
- Insert the eyepiece into the eyepiece tube.
- Slowly adjust the illumination brightness, from dark to light. When you finish your observations, always dim the illumination before unplugging the power cable.
- If you need to change the light bulb, unplug your microscope first.

Focusing

- Place a specimen on the stage and fix it with the holders.
- Select the 4x objective rotating the revolving nosepiece.
- Center the observed specimen in the field of view.
- Rotate the focusing knob to slowly raise the stage until the objective is close to the specimen; keep checking the distance between the objective and the object to avoid their contact.
CAUTION: The objective should not touch the specimen, otherwise the objective or/and the specimen might be damaged.
- Look through the installed eyepiece and lower the stage slowly rotating the focusing knob until you see the sharp image of the observed specimen.
- Such adjustment protects the frontal lens from contacting the object when you use objectives of other magnifications; though, slight refocusing might be required.
- If the image is too bright, adjust the diaphragm disk until the passing light ray is reduced to a comfortable brightness level. If the image is too dark, increase the light ray.

Selecting the objective

- Start your observations with the lowest magnification objective (4x) and select a specimen segment for detailed research. Then move the specimen to center the selected segment in the field of view, to make sure it keeps centered when the objective is changed to a more powerful one. Once the segment is selected, you should center its image in the microscope's field of view as precisely as possible. Otherwise, the desired segment might fail to center in the field of view of the higher power objective.
- Now you can switch to a more powerful objective by rotating the revolving nosepiece. Adjust the image focus, the iris diaphragm and the illumination brightness if required.
- When using a 100x objective lens, you have to fill the space between the lens and the specimen with immersion oil. There should be no air bubbles in the oil, as they might reduce the resulting quality of the image. You must wipe the 100x objective clear after using it.

Digital camera

Levenhuk D740T comes with a 5Mpx digital camera. The digital camera is installed in the eyepiece tube in place of the eyepiece. It camera allows you to observe specimens in fine detail and true colors on your PC monitor and save images on the hard drive. Connect the camera to your PC via a USB cable that also acts as a power cable.

Digital camera specifications:

Max. resolution (still images)	2592x1944
Megapixels	5.1
Sensor	1/2.5° CMOS
Mounting location	eyepiece tube (replaces the eyepiece)
Pixel size, µm	2.2x2.2
Sensitivity, V/lux.sec@550 nm	0.53
Spectral range	380–650nm
Image format	*.bmp, *.jpg, *.jpeg, *.png, *.tif, *.tiff, *.gif, *.psd, *.ico, *.emf, *.wmf, etc.
Video format	*.wmv, *.h264, *.avi, etc.
Exposure	ERS (Electronic Rolling Shutter)
White balance	auto/manual
Exposure control	auto/manual
Software features	image size, brightness, exposure control
Port	USB 2.0, 480Mb/s
System requirements	Windows XP/Vista/7/8/10 (32 and 64 bit), processor up to 2.8GHz Intel Core 2 or higher, USB 2.0 port; also compatible with Mac OS and Linux
Software	USB 2.0 driver, LevenhukLite software (image editor)
Camera power supply	USB 2.0 cable

Specifications

	Levenhuk 700M	Levenhuk 720B	Levenhuk 740T	Levenhuk D740T
Type		biological		digital, biological
Head	monocular, 360° rotatable, inclined at 45°	binocular, 360° rotatable, inclined at 45°	trinocular, 360° rotatable, inclined at 45°	
Revolving nosepiece		quadruple		
Magnification		40x–2000x		
Objectives		achromatic 4x, 10x, 40xs, 100xs (oil)		
Eyepieces		WF10x/18mm, WFH20x		
Optics material		glass		
Body material		aluminum		
Eyepiece tube (length x Ø)		160mm (6.3in) x 23.2mm (0.9in)		
Stage		double layer mechanical stage, 140x130mm (5.5x5.1in)		
Stage movement range		24mm vertical, 75mm horizontal		
Condenser		Abbe N.A. 1.25 iris diaphragm and filters		
Focus system		coaxial, coarse (22mm) and fine (0.002mm)		
Illumination		lower (3W LED, brightness adjustment)		
Camera		no		5Mpx
Power source		AC adapter 220V / 110V 50Hz		

Levenhuk reserves the right to modify or discontinue any product without prior notice.

Care and maintenance

- **Never, under any circumstances, look directly at the Sun, another bright source of light or at a laser through this device, as this may cause PERMANENT RETINAL DAMAGE and may lead to BLINDNESS.**
- Take necessary precautions when using the device with children or others who have not read or who do not fully understand these instructions. After unpacking your microscope and before using it for the first time check for integrity and durability of every component and connection. Do not try to disassemble the device on your own for any reason. For repairs and cleaning of any kind, please contact your local specialized service center.
- Protect the device from sudden impact and excessive mechanical force. Do not apply excessive pressure when adjusting focus. Do not overtighten the locking screws. Do not touch the optical surfaces with your fingers. To clean the device exterior, use only special cleaning wipes and special optics cleaning tools from Levenhuk. Do not use any corrosive or acetone-based fluids to clean the optics. Abrasive particles, such as sand, should not be wiped off lenses, but instead blown off or brushed away with a soft brush. Do not use the device for lengthy periods of time, or leave it unattended in direct sunlight. Keep the device away from water and high humidity. Be careful during your observations, always replace the dust cover after you are finished with observations to protect the device from dust and stains. If you are not using your microscope for extended periods of time, store the objectives and eyepieces separately from the microscope.
- Store the device in a dry, cool place away from hazardous acids and other chemicals, away from heaters, open fire and other sources of high temperatures. When using the microscope, try not to use it near flammable materials or substances (benzene, paper, cardboard, plastic, etc.), as the base may heat up during use, and might become a fire hazard. Always unplug the microscope from a power source before opening the base or changing the illumination lamp. Regardless of the lamp type (halogen or incandescent), give it some time to cool down before trying to change it, and always change it to a lamp of the same type. Always use the power supply with the proper voltage, i.e. indicated in the specifications of your new microscope. Plugging the instrument into a different power outlet may damage the electric circuitry of the microscope, burn out the lamp, or even cause a short circuit.
- **Seek medical advice immediately if a small part or a battery is swallowed.**

Levenhuk International Lifetime Warranty

All Levenhuk telescopes, microscopes, binoculars and other optical products, except for accessories, carry a **lifetime warranty** against defects in materials and workmanship.

Lifetime warranty is a guarantee on the lifetime of the product on the market.

All Levenhuk accessories are warranted to be free of defects in materials and workmanship for **six months** from date of retail purchase.

Levenhuk will repair or replace such product or part thereof which, upon inspection by Levenhuk, is found to be defective in materials or workmanship.

As a condition to the obligation of Levenhuk to repair or replace such product, the product must be returned to Levenhuk together with proof of purchase satisfactory to Levenhuk.

This warranty does not cover consumable parts, such as bulbs (electrical, LED, halogen, energy-saving and other types of lamps), batteries (rechargeable and non-rechargeable), electrical consumables etc.

For further details, please visit our web site: <https://www.levenhuk.com/warranty>

If warranty problems arise, or if you need assistance in using your product, contact the local Levenhuk branch.