

MICROSCOPIO METALGRÁFICO ZUZI 505MT
ZUZI 505MT METALLOGRAPHIC MICROSCOPE
MICROSCOPE MÉTALLOGRAPHIQUE ZUZI 505MT

REF. - CODE - RÉF. HBH012



Este manual es parte inseparable del aparato por lo que debe estar disponible a todos los usuarios del equipo. Le recomendamos leer atentamente el presente manual y seguir rigurosamente los procedimientos de uso para obtener las máximas prestaciones y una mayor duración del mismo.

This manual should be available for all users of these equipments. To get the best results and a higher duration of this equipment it is advisable to read carefully this manual and follow the processes of use.

Ce manuel est une partie indissociable de l'appareil et doit être mis à la disposition de tous les utilisateurs de l'équipement. Nous vous recommandons de lire attentivement ce manuel et de suivre scrupuleusement les procédures d'utilisation afin d'obtenir des performances maximales et une plus longue durée de vie de l'appareil.

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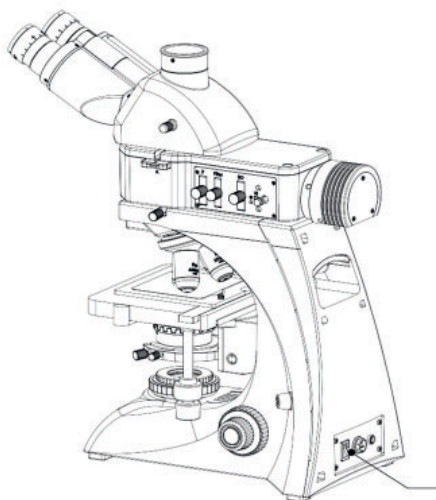
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1. ATTENTION

- This microscope is designed exclusively for microscopic observation. It must not be used for any other purpose, as this may damage the equipment.
- The microscope must only be handled or disassembled by qualified personnel.
- Do not connect the microscope to a power supply outside the range of 100–240 V (50/60 Hz).
- During operation, the illumination system may reach high temperatures. Avoid direct contact to prevent burns and keep flammable materials such as alcohol, gasoline, or paper away from the equipment.
- Before replacing the lamp, always disconnect the equipment from the power supply and ensure it has cooled down completely. Use only replacement parts with the same specifications.
- The equipment must be transported with care and always disconnected from the power supply. Avoid impacts or drops, as it is a precision instrument.
- The microscope must be installed indoors at temperatures between 0°C and 40°C, with a maximum relative humidity of 85%. Inadequate environmental conditions may affect the optical components.
- Packaging materials must be disposed of responsibly at authorized recycling facilities.

2. MICROSCOPE APPEARANCE



3. TECHNICAL SPECIFICATIONS

Code	HBH012
Model	505MT
Head	Trinocular (third tube 23 mm)
Eyepieces	10WF 22mm (Ø30mm)
Nosepiece	Quintuple
Objectives	Plan achromatic: 5X, 10X, 20X, 50X
Stage	Double-layer mechanical stage 175x145mm (without clip) Glass plate 95x85 mm
Condenser	Abbe N.A. 1.25
Precondenser	Köhler type
Focusing	Coaxial coarse and fine adjustment
Illumination	5W- LED x2
Power supply	100-240VAC 50/60Hz
Weight	10.5 kg
Dim. (Length x Width x Height)	400x210x555 mm

4. INSTALLATION

- Before installation, ensure that the work surface and surrounding environment are clean and free from any objects or residues such as paper, cotton, alcohol, or packaging materials, to avoid interference during assembly.
- Check that the power switch is in the 'O' (OFF) position. Verify that the input voltage matches the value indicated near the power socket. If it does not match, use a suitable power supply.

5. OPERATING PROCEDURE

(1) Powering on the instrument

Connect the instrument to the power supply. Set the light intensity control to the minimum level before switching on the device. Turn on the main power switch and set it to the ON position.

Note: This model, equipped with LED illumination and dual observation modes, allows selection between reflected and transmitted illumination depending on the sample type and required observation. Set the switch to position 'I' for metallographic mode (reflected light) and to position 'II' for biological mode (transmitted light).

(2) Placing the specimen

Rotate the coarse focusing knob to lower the stage to an appropriate height. Place the specimen on the stage. Use the horizontal and vertical movement controls to position the sample in the optical path and centre it within the observation area.

(3) Initial focusing with the 10X objective

It is recommended to start observation using the 10X objective, as it provides a wide field of view and greater depth of focus, facilitating sample location.

Rotate the nosepiece to place the 10X objective into the optical path. Observe through the right eyepiece. Slowly turn the coarse focusing knob until a preliminary image of the specimen appears. Then use the fine focusing knob to achieve a sharp and clear image.

■ Coarse focus tension adjustment

The resistance of the coarse focusing knob can be adjusted according to user preference:

- Turn clockwise to increase tension
- Turn counterclockwise to decrease tension

If the stage descends by itself or the specimen moves out of focus, increase the tension of the mechanism.

■ Stage height adjustment

If the specimen height exceeds the normal focusing range:

- Hold the stage with one hand
- Loosen the stage height adjustment screw using an Allen key
- Adjust the stage to the appropriate position
- Retighten the adjustment screw

(4) Interpupillary distance adjustment

To obtain a clear and comfortable binocular image, hold both eyepiece tubes and slowly adjust the distance between them until both fields of view merge into a single circular image.

(5) Dioptre adjustment

This adjustment compensates for differences between both eyes.

- First, focus using the right eyepiece with the dioptre ring set to zero
- Observe through the left eyepiece
- Adjust the dioptre ring until both images appear equally sharp

After this adjustment, both eyes should perceive the same level of sharpness.

(6) Aperture diaphragm adjustment

The aperture diaphragm controls image contrast, depth of field, and resolution.

- Reflected light observation: Adjust the aperture diaphragm lever to modify the aperture size and optimize specimen contrast.
- Transmitted light observation: (1) Adjust the condenser height to optimize illumination uniformity and (2) adjust the aperture diaphragm opening until the desired level of contrast and brightness is achieved

Important:

- A smaller aperture increases contrast and depth of field but reduces brightness and resolution
- A larger aperture increases brightness and resolution but reduces depth of field
- For optimal optical performance, the illumination aperture should match the numerical aperture of the objective used

(7) Field diaphragm adjustment

The field diaphragm limits the illuminated area of the specimen and helps optimise contrast and image centring.

- Reflected light observation: Adjust the field diaphragm control to regulate the illuminated area.
- Transmitted light observation:
 - Select the 10X objective
 - Slightly reduce the illuminated field
 - Adjust the condenser height until the edge of the illuminated field is clearly focused
 - Centre the field using the condenser centring controls
 - Switch to a higher magnification objective (20X or 40X) and slightly open the field diaphragm until it just exceeds the visible field

Note: If the illumination field is not centred, the specimen is also not correctly aligned. Repeat the centring procedure if necessary.

(8) Filter installation

Filters are used to modify illumination characteristics during observation.

- Reflected light observation: Insert the filter holder into the optical path until it clicks into the correct position
- Transmitted light observation: Place the filter in the corresponding field diaphragm holder

(9) Polarisation unit installation

The polarisation unit consists of a polariser and an analyser, which must be used together for the qualitative identification of isotropic and anisotropic materials.

- Reflected light observation:
 - Insert the polariser into the optical path
 - Insert the analyser
 - Fully open the aperture diaphragm
 - Temporarily remove the specimen from the field of view
 - Gradually adjust the analyser until the darkest possible field is obtained
 - Reposition the specimen and perform crossed-polarised light observation

■ Transmitted light observation:

- Place the polariser in the corresponding holder
- Insert the analyser
- Follow the same procedure as for reflected light observation

6. MAINTENANCE

Cleaning

- Do not touch the lenses with your hands. Dust deposited on optical surfaces should be removed using a soft brush or clean gauze. If necessary, use absorbent cotton or lens paper lightly moistened with a mixture of ethyl alcohol and ether in a 1:4 ratio.
- Warning: alcohol and ethyl ether are highly flammable substances. Keep them away from heat sources or open flames and exercise extreme caution when connecting or disconnecting the equipment from the power supply.
- Do not clean painted or plated metal surfaces with organic solvents, as they may damage the surface finish. Use a soft cloth or an appropriate mild cleaning product instead.
- Plastic surfaces should only be cleaned with a soft cloth slightly moistened with clean water.

Operating and storage conditions

- The microscope must be used and stored in a cool, dry, dust-free environment, free from vibrations and corrosive gases.
- The equipment must be operated under environmental conditions with a temperature range of 0°C to 40°C and a maximum relative humidity of 85%.
- In areas with high humidity, the use of dehumidifiers or desiccants is recommended to prevent mould growth and condensation.
- During use and transport, avoid impacts, strong vibrations, or sudden movements. Do not drag the instrument across the work surface to prevent damage to both the microscope and the laboratory bench.
- When the microscope is not in use, disconnect it from the power supply and store it in a cool, dry place, protected with a dust cover.
- Eyepieces and objectives should be stored in a dry container with desiccant material to prevent moisture and optical degradation.

7. TROUBLESHOOTING

During the use of the microscope, occasional issues may occur. The following table lists the most common problems, their possible causes, and the recommended corrective actions.

Problem	Possible cause	Solution
The lamps do not switch on or shows very low brightness when the instrument is powered on	The plug or electrical connection is loose	Check and reconnect the plug properly
	The fuse is blown	Replace the fuse
	The bulb is damaged	Replace the bulb
The illumination flickers or brightness is unstable	The bulb is damaged	Replace the bulb
	The lamp holder is loose	Check and secure the connection properly
The field of view has low or uneven illumination	The installed bulb does not meet specifications	Use a compatible bulb
	Brightness is not correctly adjusted	Adjust the light intensity control
	The objective is not correctly positioned	Position the objective correctly in the optical path
	The aperture diaphragm is too closed	Readjust the aperture diaphragm
	Dirt or dust on the lenses	Clean the optical surfaces
	The condenser is positioned too low	Raise the condenser position
The image is not clear (insufficient contrast or resolution)	The cover glass does not meet specifications	Use a 0.17 mm thick cover
	The cover glass is incorrectly positioned	Position the specimen correctly
	The objective lens is dirty	Carefully clean the objective
	Immersion oil is not used with the 100X objective	Use immersion oil
	The aperture diaphragm is not correctly adjusted	Readjust the aperture diaphragm
	The condenser is too low	Adjust the condenser position

Problem	Possible cause	Solution
One side of the image is dark or the image shifts during focusing	The objective is not correctly positioned	Position the objective correctly
	The specimen is not correctly placed	Place the specimen flat on the stage
Dust or stains are visible in the field of view	The lamp glass is dirty	Clean the component
	The specimen is dirty	Clean the specimen
	The front lens of the condenser is dirty	Clean the lens
	The eyepiece, objective or collector is dirty	Clean the optical components
The objective touches the specimen when switching from low to high magnification	The cover glass is incorrectly positioned	Position the specimen correctly
	The cover glass does not meet specifications	Use a 0.17 mm cover glass
The image observed with both eyes is not fully aligned	Interpupillary distance is not correctly adjusted	Adjust the interpupillary distance for the user
	Dioptre adjustment is incorrect	Readjust the dioptres
	Left and right eyepieces are not identical	Replace the eyepiece
Eye fatigue during observation	Interpupillary distance is uncomfortable	Readjust the interpupillary distance
	Dioptre adjustment is incorrect	Readjust the dioptres
	Illumination intensity is uncomfortable	Adjust the brightness level