MICROTOMO DE ROTACIÓN AUTOMÁTICO
AUTOMATIC ROTATING MICROTOME
MICROTOME ROTATIF AUTOMATIQUE

Ref.| Code | Réf. ZFP015

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.

LANGUAGE INDEX

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1. GENERAL DESCRIPTION

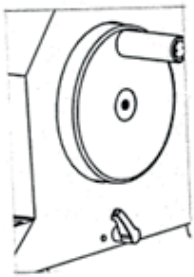
Nahita's automatic rotating microtome is a high-precision device designed for cutting samples in histology, pathology and various areas of scientific research laboratories.
It is equipped with a fully automated or manual cutting system, allowing tissue sections of different thicknesses to be cut efficiently and accurately. Its ergonomic design and advanced specimen clamping system optimise workflow and ensure high quality cuts.
Thanks to its advanced technology, this microtome facilitates sample processing with a high level of reproducibility and safety.

2. MAIN TECHNICAL PARAMETERS

Code	ZFP015
Modes for section	Manual and automatic
Cutting speed	0-300 mm/s
Section thickness range	0.5-100 μm
Setting value	From 0.5-5 μm in increments of 0.5 μm From 5-20 μm in increments of 1 μm From 20-60 μm in increments of 5 μm From 60-100 μm in increments of 10 μm
Trimming section thickness range	5-600 μm
Setting value	From 5-10 μm in increments of 5 μm From 10-100 μm in increments of 10 μm From 100-200 μm in increments of 20 μm From 200-600 μm in increments of 50 μm
Horizontal sample stroke	20 mm
Vertical sample stroke	60 mm
Sample retraction	1250 μm/s
Accuracy	± 5 %
Maximum specimen size	50x45 mm
Blade orientation angle	0-14º
Sample orientation	8º (X-Y axes); rotatable 360º
Dimensions (LxWxH)	500x320x500 mm
Weight	32 kg
Power supply	220 V 50/60 Hz

3. SAFETY INSTRUCTION FOR OPERATING THE INSTRUMENT

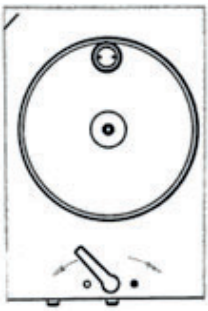
Warning:



The safety devices on the instrument and accessory equipment must not be removed or revised!

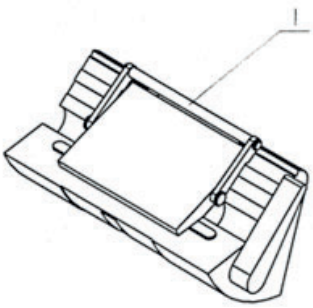
Safety device of the handwheel: the locking system: the spanner controls the handwheel, lock the handwheel at any position of rotation.

Warning:



Do lock the handwheel prior to manipulating or changing the specimen or knife(blade).

The handwheel can be locked in any direction with the locking spanner. The locking spanner can be set on the locked or released position on the right side of the base.
Inspection: Push the locking spanner backside until the handwheel be locked and can't rotate.
Release action: Push the locking spanner to the front side, and the handwheel can rotate again.

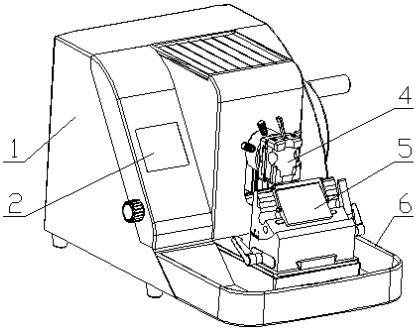


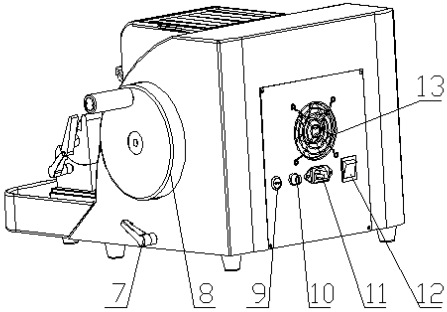
Every knife(blade) carrier has a knife guard (1) that allows to cover the cutting edge completely.

Warning:
Prior to manipulating or changing the specimen or knife, and during breaks, it must always cover the cutting edge with the knife guard!

4.ILLUSTRATION OF MICROTOME

1.Cover
2. Touch screen
4. Specimen clamp
5.Balde carrier
6.Waste tray
7.Safety lock spanner
8. Handwheel
9.Foot pedal port
10. Fuse
11. Power port
12.Power switch
13.Fan



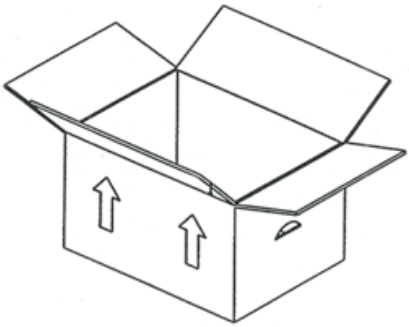


5. UNPACKING AND INSTALLATION

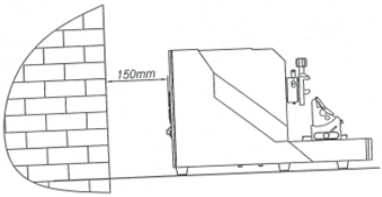
Please check whether the Tip-n-Tell indicators on the outside of the box is upon or not. Make sure it is upon.
Take out the accessory box and the instruction manual.
Remove the around foam packing.

Warning:

Do not transport the machine with the hand wheel or with the blade holder fitted.



5.1 Installing the instrument

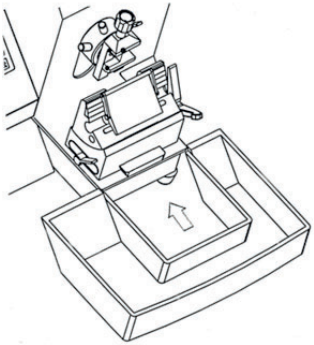


Place the instrument on a stable laboratory table, with back away from the wall about 150mm.

5.2 Site requirement

The installation site must meet the following requirements:
-Stable, vibration-free laboratory table
-Vibration-free floor
-room temperature always between+10 ºC~+40 ºC.

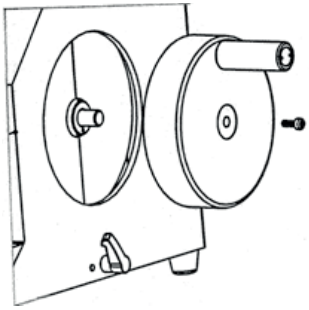
5.3 Waste tray

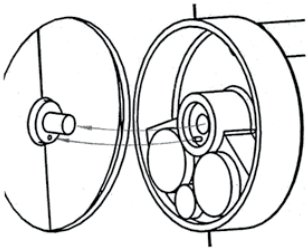


Insert the section waste tray as the figure indicates.

5.4 Installment of the hand wheel

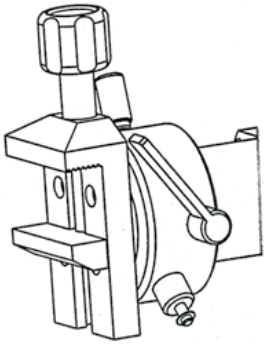
Make sure the axis of hand wheel is in the axis hole of the hand wheel and secure the screw with the inner hexagon spanner .

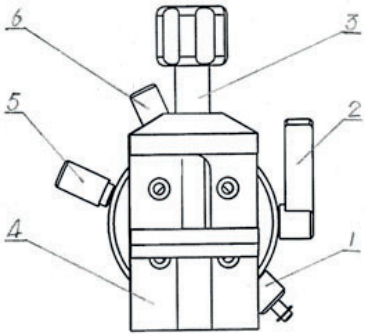




6. ORIENTING SYSTEM

The specimen orienting system consists of specimen clamp and angle adjusting device. The specimen clamp can be adjusted right and left or up and down to obtain the best slicing angle.

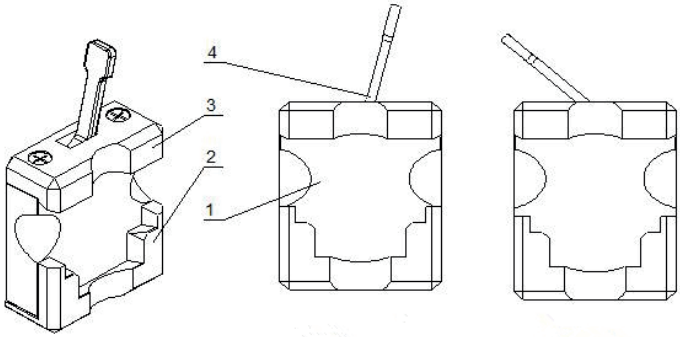




1.Springs screw
2.Lock spanner for clamp
3.Screw for controlling size of clamp
4.Specimen clamp
5.Screw for left and right
6.Screw for up and down

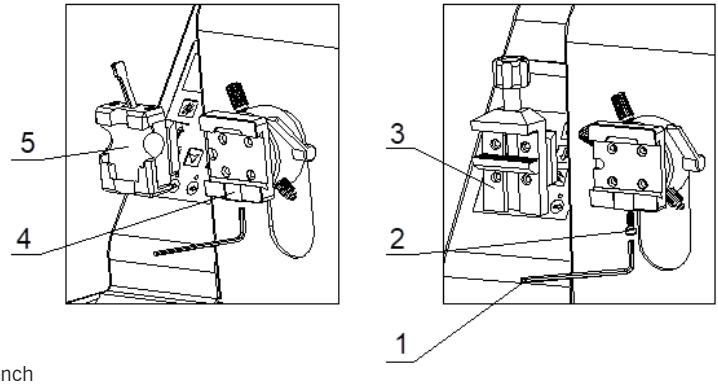
Attention: The specimen clamping system has been installed and adjusted appropriately. Users don't need to dismount and adjust by himself.

6.1 Embedding cassettes clamp



Structural representation:
1.Foundation plate
2.Movable vice jaw
3.Regular jaw
4.Wrench to open and close

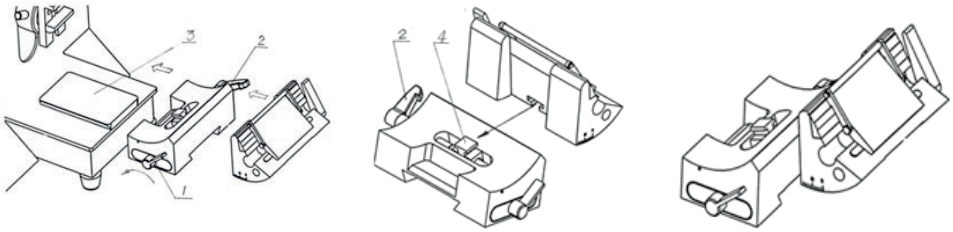
6.2 Clamp exchange



1.Allen wrench
2.Socket head screw
3.Paraffin clamp
4.Bayonetlock
5.Embedding cassettes clamp
If you want to change the clamp, first shift out the blade carrier. Then, loosen the socket head screw with an Allen wrench and remove the embedding cassette clamper or paraffin clamper.

7. KNIFE CARRIER'S FIXING SYSTEM

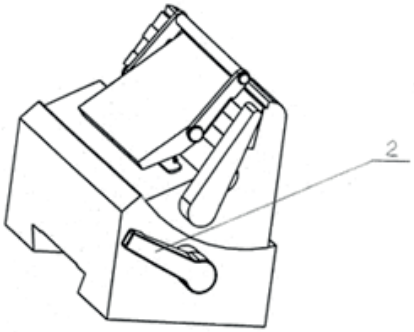
7.1 Installment of the knife(blade) carrier

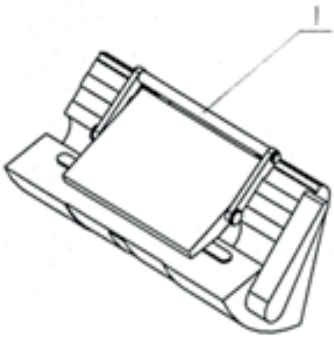


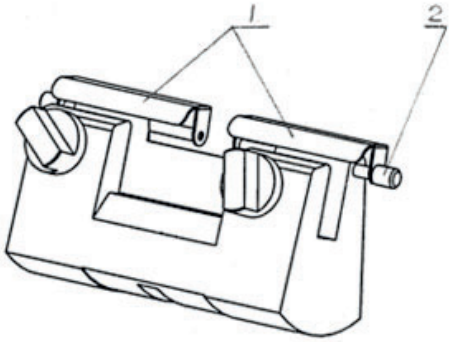
1) Rotate and release the fixing spanner (1) of the knife carrier base. Push the carrier base forward along the rail (3) inside the machine. Then, lock the fixing spanner and secure the knife (blade) carrier base.
2) Rotate and release the fixing spanner (2) of the knife (blade) carrier.
3) The locking block (4) of the knife carrier base enters the T-shaped slot of the knife (blade) carrier.
4) Rotate and lock the fixing spanner (2) of the knife (blade) carrier to secure it in place.

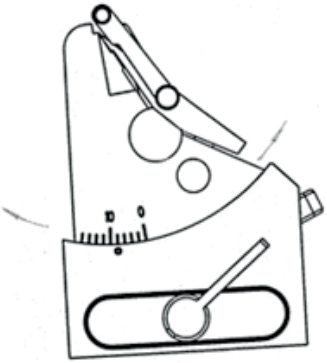
7.2 Adjusting the cutting angle

1) Release the fixing spanner (2) of the knife (blade) carrier.
2) Rotate the knife (blade) carrier and adjust its angle according to the specimen's hardness and section thickness.
3) Lock the fixing spanner (2) to secure the knife (blade) carrier to the knife (blade) carrier base.









Before manipulating or changing the specimen, knife, or disposable blade—even during breaks—the cutting edge must always be covered with the knife guard!

Be careful when adjusting the knife or disposable blade holder, as the cutting edge is extremely sharp. Any improper operation may result in hand injuries.

8. TOUCH SCREEN PANEL

Displays **Counter, Handwheel Rotation Speed, Trimming Thickness, and Section Thickness.**

"START/STOP" button: Press to start or stop automatic trimming or sectioning.
button: Press to move the specimen clamp rapidly forward. In Section or Trimming mode, press this button to increase the thickness when the cursor is blinking * in the thickness value field.
button: Press to move the specimen clamp rapidly backward. In Section or Trimming mode, press this button to decrease the thickness when the cursor is blinking * in the thickness value field.
- **" SPEED" button:** Press to adjust the fully automatic section feed range.
- **"TRIM " button:** Press to enter Trimming mode.
- **"SECT" button:** Press to enter Section mode.
- **"OPTION" button:** Press to enter Retraction and Specimen Clamp Feed Speed mode. The user can:
  - Turn retraction **on/off.**
  - Adjust the retraction thickness range (0–220 μm).
  - Set different specimen feed speeds by inputting **1, 2, or 3.**

9. OPERATION

9.1 Switch on

- Ensure that the instrument is placed steadily on a firm and solid testing table.
- Insert the power cord plug into the input socket on the rear cover panel, then connect it to the 220V main power supply.
- Turn on the main power switch. The power indicator and screen will light up, and the specimen forceps will reset quickly.

9.2 Fixing the specimen

- Rotate the handwheel till the specimen forceps are raised to the highest position, then lock the handwheel. Loose the specimen forceps, mount the specimen tissue and fix it.

9.3 Fixing the knife or disposable blade

- Insert the blade into the knife(blade) carrier and secure it.
- Adjust the knife to the appropriate angle.
- Release the fixing spanner of the knife (blade) carrier base.
- Move the knife holder as close to the specimen as possible.
- Lock the fixing spanner and secure the knife (blade) carrier.
- Rotate the handwheel to make the specimen and knife edge on the same height.

Be careful when changing the knife or disposable blades, as the cutting edge is extremely sharp and can cause injury to your hands!
Exercise extreme caution when handling the knife, as any improper operation can result in severe injury.
Under no circumstances should you touch a falling knife with your bare hands!
Do not place the knife with the cutting edge facing up. When not in use, store the knife in the knife box.
Always lock the handwheel before manipulating or changing the specimen or knife, even during breaks.
Indication: We provide a variety of permanent knife (blade) carriers and disposable blade holders for your selection.

9.4 Fast forward or backward

Press the “  ” or “  ” button to move the specimen clamp forward or backward. Once it reaches the desired position, release the specimen clamp spanner.
Rotate the angle adjustment handle to adjust the parallelism between the specimen and the knife, either left to right or up and down.
Simultaneously, rotate the handwheel slowly to achieve the optimal angle.
Lock the specimen clamp spanner to secure the specimen clamp in place.
Indication: An alarm will sound, like the hum of bees, when the movement reaches the forward or backward limit.

9.5 Trimming

Press the “**TRIM**” button to display the trimming thickness (“TRIM: 00μm”).
Press “  ” or “  ” to adjust the thickness until a satisfactory value is reached. Wait for a few seconds until the cursor stops flickering, then rotate the handwheel to begin trimming.
After trimming, the surface of the specimen should be clean and smooth.
Rotate the handwheel clockwise until the specimen clamp reaches the highest position. At this point, the specimen is ready for sectioning.

9.6 Section

Press the “**SECT**” button to display the section thickness (“Section thickness 00μm”).
Press “  ” or “  ” to adjust the thickness until the desired value is reached. For example, the screen will display “SECT 03μm, COUNT 00.”
Wait a few seconds until the cursor stops flickering, then rotate the handwheel to begin sectioning and auto-counting simultaneously.
If trimming is needed during sectioning, simply press the “TRIM” button to switch modes.
Rotate the handwheel a full circle for each section. The best technique is to rotate the handwheel evenly clockwise from the starting point back to the starting point.
If the handwheel is rotated too quickly, it may compress the specimen and cause tissue sticking.
After sectioning, rotate the handwheel back to the starting position and lock the handwheel.
Indication: The section thickness and count number will be automatically stored, so you do not need to reset the program.

9.7 Position of specimen clamp

The “FEED mm” and the schematic on the screen remind the operator to be aware of the distance limit of the specimen clamp’s movement.
If the specimen clamp reaches the distance limit, the knife cannot feed further. Press the “ ” button to reset.
Attention: The handwheel rotation should be smooth and the rotation speed should be adjusted according to the specimen’s hardness. When slicing hard specimens, the speed should be slower.

9.8 Specimen retraction function

The specimen clamp has an automatic retraction function when it reaches the highest position, which helps prevent damage caused by friction between the specimen and the knife. This feature ensures smoother sectioning and extends the knife’s lifespan.

9.9 “Auto-sleep” protection function

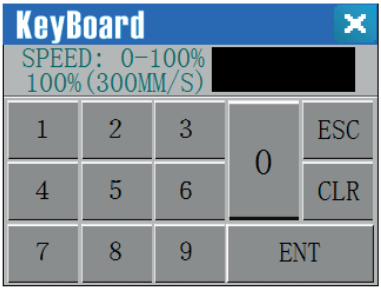
After booting, if the instrument is not in use for a long period, it will enter “auto-sleep” mode. The display screen will darken, but you can touch the screen to resume operation when needed.
Indication: After use, the power supply should be turned off. Otherwise, the instrument will remain in protection mode for an extended period, which can accelerate its aging and shorten its lifespan.

9.10 Remote Control Panel

“TRIM/SECT” button: Press this button to switch between Trimming and Section cutting modes.
“START/STOP” button: Press this button to start or stop Fully Automatic Sectioning.
“ - ” button: Press this button to decrease the thickness.
“ + ” button: Press this button to increase the thickness.
“ ” button: Press this button to move the specimen clamp quickly forward.
“ ” button: Press this button to move the specimen clamp quickly backward.

10. FULLY AUTOMATIC SECTION

10.1 Speed control introduction



SPEED button: Activates the speed adjustment mode.
ESC button: Exits the current speed adjustment mode.
CLR button: Clears the data.
ENT button: Confirms the action.

10.2 Method of operation

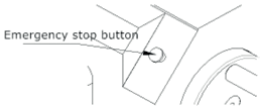
Install the specimen clamp and blade, then set the section parameters.
Open the handwheel lock wrench and start working if the manual sectioning mode is selected.
If the fully automatic sectioning mode is selected, simply press the “START” button, and the microtome will begin slicing the specimen automatically.
Adjust the section speed by pressing the “ + ” or “ - ” buttons on the remote-control panel, or the “SPEED” button on the touchscreen panel.
Foot Switch Inching Control: Press the foot switch to inch the specimen clamp into position.
Stop: After the fully automatic sectioning operation, press the “STOP” button on the touchscreen or remote-control panel to stop the section rotation. The microtome will return to manual sectioning mode.

10.3 Motor surcharge protection

When running in fully automatic slicing mode, the microtome is equipped with motor overload protection. If the slicing resistance increases to an abnormal level, the protection system will cut off the motor’s torque transmission to prevent damage to the operator or the microtome. The operator should then stop the automatic mode and check for the cause of the malfunction.

10.4 Emergency Stop Button

Press the red Emergency Stop Button in case of an emergency during fully automatic sectioning. The microtome will stop working immediately. Turn the button clockwise to resume operation. **Warning**: During the automatically slicing process, it’s strictly prohibited to touch specimen clamps or blades, otherwise it will cause a serious injury. **Note**: Select the automatic slice model ,please open Hand wheel lock wrench, otherwise the automatic slice model will be locked and can’t run.



11 CLEANING AND MAINTENANCE

Warning: Remove the knife, knife carrier and knife carrier base before any cleaning and maintenance.

11.1 Shut down the microtome

- Shut off the main power supply switch and unplug the power cord.
- Turn the handwheel to raise the specimen clamp to the highest position, then use the spanner to lock the handwheel.
- Loosen the knife protection board and remove the knife. Lock the spanner and store the knife in the knife box.
- Loosen the specimen clamping bolt and remove the specimen.

11.2 Cleaning

- Remove all debris from the machine
- Remove the section waste tray and empty it
- Lock the handwheel before cleaning the instrument
- Clean the instrument as you would clean household items, paying special attention to remove any waste wax around the knife holder
- Only use mild commercial detergents or soap solutions for cleaning. Do not use solvents containing acetone or benzene
- Use a dry cloth and a small amount of detergent to clean the surface of the instrument
- Ensure that no detergent liquid enters the instrument during cleaning. After cleaning, wipe the surface of the instrument with a soft cloth

- Continue cleaning all parts of the instrument after use. Move the knife carrier along the sliding rail and apply detergent lubricant. Proper maintenance of the instrument will extend its lifespan.

Warning: Be extremely careful when using the knife, as its edge is very sharp. Any mishandling can result in serious injury. In any case, do not touch the falling knife with your hand!

Do not leave the knife in random places.

Do not lay the knife with the edge facing up. If not in use, store the knife in the knife box!

Always lock the handwheel when operating the knife and specimen, or during work breaks.

12. PROBLEMAS Y SOLUCIONES

Problema	Posibles causas	Acción correctiva
No uniformidad de las secciones. El grosor de la sección varía de una sección a otra.	-Insuficiente inclinación de la cuchilla; en consecuencia, el ángulo es demasiado pequeño. -Sujeción insuficiente de la muestra y/o de la cuchilla. -Cuchilla sin filo	-Probar sistemáticamente varios ajustes del ángulo de despeje hasta encontrar el ángulo óptimo. -Compruebe si todas las abrazaderas están bloqueadas y los tornillos están apretados en los sistemas portamuestras y portacuchillas. Vuelva a apretar las abrazaderas y los tornillos si es necesario. -Utilizar una cuchilla nueva
Secciones comprimidas. Las secciones están muy comprimidas, arrugadas o atascadas.	-Cuchilla sin filo -Espécimen demasiado caliente. -Ángulo de despeje demasiado grande. -Velocidad de seccionado demasiado alta.	- Utilizar una cuchilla nueva -Enfriar la probeta sobre una superficie fría. - Ajuste del ángulo de despeje; disminuya sistemáticamente el ángulo hasta obtener el ajuste óptimo. -Girar el volante a una velocidad inferior.
El cuchillo “suena” en la muestra cuando se rebanan muestras duras. Las secciones presentan arañazos y marcas de vibración.	-Velocidad de seccionado demasiado alta. -Ángulo de despeje demasiado grande. -Sujeción insuficiente de las pinzas de parafina o del porta cuchillas.	-Girar el volante a una velocidad inferior. -Ajuste del ángulo de despeje; disminuya sistemáticamente el ángulo hasta obtener el ajuste óptimo. -Compruebe si todas las palancas están bloqueadas y los tornillos están apretados en los sistemas portamuestras y portacuchillas. Vuelva a apretar las abrazaderas y los tornillos si es necesario.
No avanza el espécimen y, por consiguiente, no se produce ninguna sección.	-La muestra ha alcanzado el límite de avance frontal. -La rueda de avance grueso no puede girar libremente.	- Gire la rueda de avance grueso en la dirección adecuada para desplazar la muestra hacia el límite de separación. - Retire la obstrucción.
No se enciende y no se visualiza al conectar el interruptor de alimentación.	-Fusible quemado	-Sustituir el fusible