MICROTOMO ROTACIÓN MANUAL, BÁSICO
MANUAL ROTARY MICROTOME, BASIC
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Ref. ZFP010

Este manual es parte integrante del aparato y debe estar a disposición de todos los usuarios. Le recomendamos que lea atentamente este manual y siga todos los procedimientos de funcionamiento, para obtener el mejor rendimiento y una mayor vida útil del aparato.

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 fait partie intégrante de l'appareil, c'est pourquoi il doit être disponible pour tous les utilisateurs. Nous vous recommandons de lire attentivement ce manuel et de suivre toutes les procédures d'utilisation, afin d'obtenir les meilleures prestations et une plus grande durée de vie de l'appareil.

LANGUAGE INDEX

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1. Important hints

Thank you for choice of this basic microtome.

Basic model microtome is widely used in the normal biological, medical and industrial fields and the laboratories, slicing the specimen slices of the various hardnesses.

Before the operation please read this consumers´s handbook carefully in order to use the apparatus correctly and avoid the injury of the person and the damage of the apparatus.
The apparatus can only be operated by the professional men according to the consumers´s handbook.

The apparatus must not be allowed to use for the other purposes.

In order to develop and improve our products continuously, we may alter the technical parameters of the products without further notice.

2. Operating procedure of apparatus

2.1. Transportation and placement

- The microtome must be erectly transported.
- It is not allowed to cluth the handwheel, tool carrier, specimen clamp or adjusting knob of the slice thickness when moving the apparatus!.

2.2. Operation

- When you use the microtome knife it must be very careful, for its cutting edge is very sharp, if you misoperate it, it will lead to the serious injury and therefore you may not catch the falling microtome knife with your hands in any case.
- Don´t put the microtome knife anywhere carelessly, especially make the cutting edge of the microtome knife be upward put, the microtome knife which is not in use should always be preserved in the knife case.
- You should clamp the specimen tightly first, and then fix the knife.
- You must lock the handwheel first in operating the microtome knife and the specimen or in the work internal every time.

2.3. Cleaning

- Before cleaning the apparatus lock the handwheel first
- You must not use the solvent that contains acetone and benzene for cleaning the apparatus In using the cleaning the apparatus
- In using the cleanser you must observe the safe regulations of its manufacturer and the relevant rules and regulations of the laboratory!

2.4. Maintenance

- Only the professional maintenance workers are allowed to overhaul the apparatus

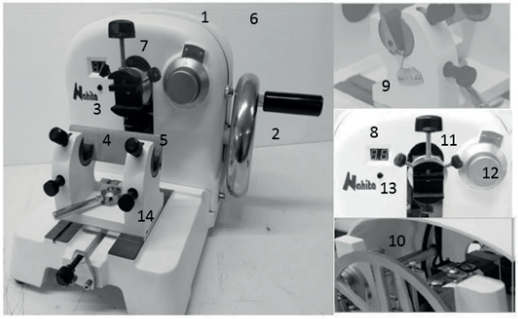
3. Summary

The basic model microtome is mainly used for the tissue slice and the pathological section of the animal and plant in the research institutes, universities and colleges, hospitals and laboratories. Provided with the semiconductor-refrigerating mains it can quickly refrigerate the slices. It has the advantages of the rational structures, high precision, long service life and being easy to operate.

4. Technical parameters

Code	ZFP010
Environmental temperature of using apparatus	+4 a +40ºC
Slice thickness	1 – 25 μm
Adjustment of slice thickness	1 μm
Blade orientation angle	0-10º
Accuracy	±10%
Horizontal feeding	35 mm
Vertical feeding	46 mm
Maximum cutting area	25x35 mm
Dimensions (LxWxH)	350x350x270 mm
Weight	26 Kg

5. Ilustrations of apparatus



1. Rear casing
2. Handwheel
3. Specimen
4. Knife
5. Knife adjustment
6. Sound of limit point
7. Specimen adjustmen
8. Number of slides counter
9. Angle of the knife
10. Internal lock handle
11. Screws of adjusting specimen
12. Thikness of the slide
13. Reset bottom

6. Usual operating of apparatus

6.1. Installation

Warning: it is not allowed to clutch the handwheel, tool carrier, wax-lump forceps or adjusting knob of the slice thickness when moving the apparatus

The place whice will be used for placing the apparatus must satisfy the following conditions

- The experiment table is firm and there is no vibrance
- There is no vibrance of the ground
- There should be capacious and comfortable space for operating the apparatus
- You should keep the room temperature between 5-40ºC

6.2. Fixing of specimen

Warning: you should clamp the specimen tightly first, then fix the knife

You must lock the handwheel first in operating the microtome knife and the specimen or in the work interval every time!

- Turn over backward and open the rear cover.
- Turn the handwheel till the big pulling plate is hoisted to the highsted position, then screw the gripper of stopping slicing to lock the handwheel and the wax-lump forceps in order to prevent its falling.
- Turn the gripping handle on the wax-lump forceps to adjust the mouth size of the wax-lump forceps. place the specimen at expected position
- Turn the gripping handle on the wax-lump forceps grip the specimen.
- Loose the locking bolt of the wax-lump forceps, adjust the surface of the griped specimen. Tight the locking bolt of the wax-lump forces, adjust the surface of the griped specimen. Tight the locking bolt of the wax-lump forceps to lock the specimen clamp.

6.3. Installation of microtome knife

Warning: when you use the microtome knife it is must be very careful, for its cutting edge is very sharp, if you misoperate it, it will lead to the serious injury.

- Turn the two left and right tightening screws of the microtome knife counter-clockwise to withdraw it from
- Turn and loose the two locking bolts of the left and right of the rear angle.
- Hold the back of the microtome knife, making the cutting edge up, carefully inserting it into the tool carrier from the side direction.
- Turn the tightening screw of the microtome knife clockwise, evenly support the microtome knife and be not tight-ened first.

- Forwards and backwards move and turn the tightening screw of the microtome knife, and adjust the rear angle of the microtome till the expected position (between 0-10 degrees of the tool carrier angles).
- Clockwise turn the tightening screw of the microtome knife and evenly tighten the microtome knife
- Clockwise turn the locking bolt to tighten to the rear angle

6.4. Rough slicing pieces

1. Screw the gripper of stopping slices and loose the wax-lump forceps, turn the handwheel to fall the specimen till the corresponding position with the microtome knife.
2. Loose the handle of fixing the tool carrier, move the tool carrier and make the cutting edge close to the specimen and then lock the handle of fixing the tool carrier.
3. Turn the clutch of bracing tooth and make the bracing tooth be out the ratchet.
4. Turn the ratchet round to move the specimen, carefully adjust the specimen till it meets with the microtome knife exactly. At the same time turn the handwheel to make the specimen move up and down, and watch the distance of the specimen to the cutting edge, simultaneously trim the specimen wax-lump levelly.
5. Turn the handwheel to make the specimen move to the highest position turn the clutch of bracing tooth to make the bracing tooth coincide with the ratchet.
6. Turn the adjuster of thickness till the thicker degree turn the handwheel round to try slicing the specimen till the expected specimen surface carrier the tool carrier can simultaneously move on all sides. The forward and backward moving can move the tool carrier to the right slicing position, and the moving towards the left and right can make the whole length of the cutting edge of the blade be fully utilized and unnecessary to adjust the other positions of the blade.

6.5. Slicing

Through turning the adjuster of thickness, adjust the slice thickness to the expected value. Evenly turn the handwheel to slice

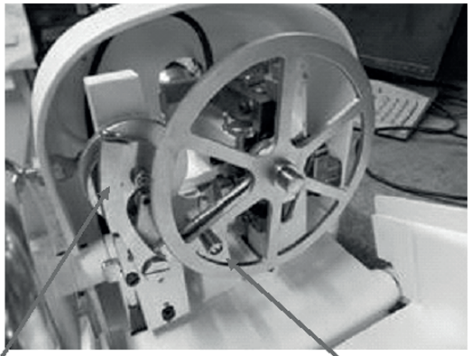
Take the slices to produce the specimens.

Attention; you should turn the handwheel evenly, and the velocity of the turning must fit in with the hardness of the specimen when you slice the harder specimen, it should be slower.

When the sample block has reached the end of its travel, the microtome will emit an audible alert to indicate this.

Steps to follow:

1. Open the rear casing.
2. Release the wedge of the toothed wheel (1).
3. Turn the toothed wheel so that the sample block moves back to its initial position (2).
4. The alarm sound will stop.
5. Re-position the cutting wedge on the toothed wheel.



6.6. Ending of daily works

- Turn the handwheel till the wax-lump forceps is hoisted to the highest position, screw the gripper of stopping slicing to lock the handwheel and the wax-lump forceps.
- Take the microtome knife form the tool carrier and place it into the knife case. Take the specimen from the wax-lump forceps.
- Clear up the scraps of the slices. Clean the apparatus
- Cover the rear cover.

Warning: when you use the microtome knife it must be very careful, for its cutting edge is very sharp, if you misoperate it, it will lead to the serious injury and therefore you may not catch the falling microtome knife with your hands in any case.

Don´t put the microtome knife anywhere carelessly, especially make the cutting edge of the microtome knife be upward put, the microtome knife which is not in use should always be preserved in the knife case. You must lock the handwheel first in operating the microtome knife and the specimen or in the work interval every time.

7. Maintenance and cleaning

- Warning; before the cleaning of the apparatus lock the handwheel first
- You must not use the solvent that contains acetone and benzene to clean the apparatus
- Lock the handwheel.
- Brush off the scraps of the slices with a dry brush
- Clean the apparatus with a damp rag (slightly moist with cleanser)

8. Most common problems

Problem	Causes	Solutions
The thicknesses of the slices are not even. The slices are sometimes thin, when serious even the slices can not be produced at all	The inclination angle of the microtome knife is not right, namely the rear angle is too small. The firmness of the locking of the waxlump forceps and tool carrier is not enough. The knife is blunt	Make the rear angle bigger. Try slicing enlarging the rear angle step by step. Check up on all of the screws of the system of gripping the specimen and the tool carrier whether or not they screw home. Use another section of the cutting edge or change the microtome knife.
The slices are compressed. The slices are seriously compressed, crumpled or pressed each other	The knife is blunt. The specimen is too hot. The rear angle is too big. The velocity of slicing it too big	Use another section of the cutting edge or change the microtome knife. Cool the specimen on the cold table. Try slicing reducing the rear angle step by step till the right angle is found. Slowerly turn the handwheel.
When slicing the hard specimen the microtome knife squeaks. There are the scars of vibration marks on the slices	The velocity of slicing is too big. The rear angle is too big. The firmness of locking of the wax- lump forceps or tool carrier is not enough.	Solowarly turn the handwheel. Try slicing reducing the rear angle step by step till the right rear angle is found. Check up on all of the screws of the system and the tool carrier whether or not they screw home.
The specimen can not be fed, naturally there are no slices to be produced	The specimen has got to the limit position at the front end.	Turn the ratchet to make the specimen draw back

9. Maintenance

Before the first operation of this microtome you must wipe down the rust-proof oil outside on the microtome.

Any parts of the microtome must not be disassembled at will.

When the microtome is not in use, you should keep the microtome in the wooden case.

- Clean the microtome on time every day.
- Lubricate the various mobile parts with the lubricating oil appropriate for the precision instrument every month.
- Screw rod and its nut Ratchet, bracing tooth

- Various mobile slides
- Various adjusting parts on the tool carrier

Warning: only the professional maintenance workers are allowed to overhaul the apparatus

10. Sharpening of the cutting edge of the microtome knife

The quality of the slices is closely linked with the sharpness of the microtome knife. If the microtome knife is blunt or with the notches on it, it will lead to slices broken, incomplete, and wrinkled or unevenness.

10.1. Ways of the sharpening

Generally there are two sharpening, that is to sharpen it on a sharpener. The other is hand sharpening to make it keen on a sharpening stone by hands. There are some sorts of sharpening stones-natural oil stone, artificial oil stone, fine blue stone, inkstone fineness, adequate hardness, with no grain of sand, or any other solid grain.

Steps to sharpen the blade

1. As showed in illustration: fasten the screw on one end of handle into a screw hole of the blade, it is for the worker to choose the hole he prefers.
2. Insert the back part of the slicing blade into the blade shell. Clean dust, direct and other stuffs off the blade.
3. Coat over the sharpening stone with spindle oil or pararrin oil, then put the blade on the sharpening stone with an angle a between the blade edge and the stone. To guarantee that the angle a for the first sharpening equals to any angle a for its later sharpening, a definite blade shell should be used for a definite blade only.

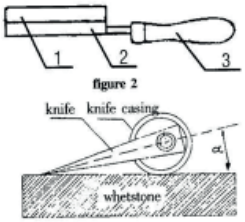


figure 2

figure 3

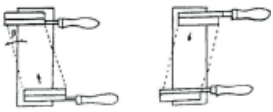


figure 4

4. With your right hand holding the handle, your left hand holds the blade shell and moves the blade edge to and fro on the stone. Make it a point that all parts on the edge are sharpened. When your

push the blade on one of the two sides, you should pull it back on its other side so that both sides of the blade get fair chances for sharpening. Go on working this way until the edge is well adapted to cut. To test that your finger is on a line of very small needle points, it hints that the edge is keen enough for slicing.

5. In the course of sharpening, rough sharpening as well as fine sharpening may be done on two different stones. If the stone is not big enough, you may put the blade against the stone to form an angle B, as on fig, and sharpening can be done along angle B. when you push the blade forward then pull it back ward, not only you should turn the blade over, but should move the blade crosswise, so that the edge as a whole is sharpened.
6. Examine the edge of sharpened blade under a one hudered-fold microscope it is in good quantity if is bright and smooth along the edge without any notch or rough spot.
7. When the slicing blade is not very keen after some cutting you may sharpen it on a piece of fine leather. However, there is no other way to sharpen a dull blade except on a sharpening stone.
8. Take off the blade shell and handle and make them clean for further use.
9. After sharpening, coat over the slicing blade with antirust grease, then Put into the blade box for further use.

11. Accesories of the microtome

Microtome knife: 1

Knife case: 1

Knife handle: 1

User´s manual: 1