

# Operation Manual



**BHTP-202**

## Semi Automatic Microtome

Thank you for Choosing Biolab products. Please read the "Operating Instructions" and "Warranty" before operating this unit to assure proper operation.

## Important illustration

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Please refer to the nameplate on the back of the instrument for the serial number and manufacturing date of the instrument.

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# 1. General description:

Thank you for your choice of BHTP-202 Computerized Microtome.

The BHTP-202 Computerized Microtome is used widely for routine and laboratory section in hospitals, medical colleges, Animal and Plant Quarantine, medical jurisprudence inspection departments and Scientific research units. It is used for slicing different thickness specimen section for pathological diagnosis..

The microtome integrates the distillate of technology of our company, adopts advanced design idea in the world. Its main components are imported from reputed manufacturers in the world. No matter setting program is easy or the rotation of the handwheel is light, which greatly reduces the labor's intensity in the section job.

Our unique design of the specimen clamp that can be adjust the angle arbitrarily. Precision Roller Cross Guide and Step Mechanism System are available with sustained lubricating and automatic adjustment. There is not need of adding oil and maintenance, etc.

The microtome lives up to that standard in a unique manner: stable performance, easy operation and exemplary comfort and safety standards characterize as much as the comfortable level of the working surface and the ergonomic design.

Its main functions: " fast FWD", " fast BWD", section and trimming thickness adjustable freely between 1~100um, auto sleep protection, etc.

LCD screen : Section and trimming thickness  
Section counter  
Position

**Indication** : The lengthen model of the instrument which is equipment with our rapid thermostatic freezing power supply, cryo-knife, and cryo-plate together can both carry out the rapid thermostatic freezing section and routine paraffin section. (see the chapter.10)

## 2. Main technical parameters :

Section thickness range :	0-100 $\mu$ m
Trimming thickness range :	0-100 $\mu$ m
Specimen retraction	20 $\mu$ m
Max. Horizontal dislocation of specimen stroke:	20mm
Max. Vertical displacement of specimen stroke:	60mm
Min. section thickness gradual value:	1 $\mu$ m
Min. trimming thickness gradual value:	1 $\mu$ m
Section precision:	$\pm 10\%$
Max. slice section	50 $\times$ 45mm
Overall dimension:	( L ) 500 $\times$ ( W ) 420 $\times$ ( H ) 310mm
Wet weight:	32kg
Gross weight:	38kg
Environmental temperature:	10 $^{\circ}$ C $\sim$ 40 $^{\circ}$ C

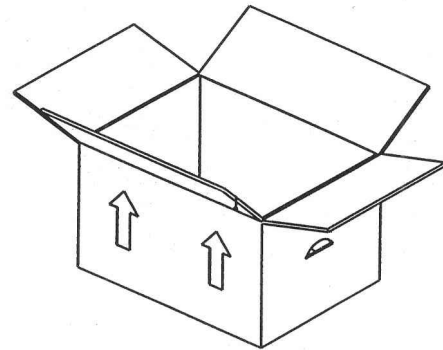
## 3. Unpacking and Installation :

Please check the weather Tip-n-Tell box is upon or not . Make sure it is upon.  
Cut off the plastic bands on the outside of carton.  
Take out the accessory box and the instruction manual.  
Remove the around foam packing.



indicators on the outside of the carton

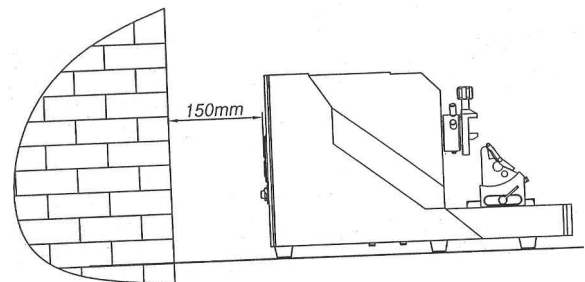
carton.



**DO Do not carry the instrument with the handle of the handwheel, or knife carrier device.**

### 3.1 Installing the instrument :

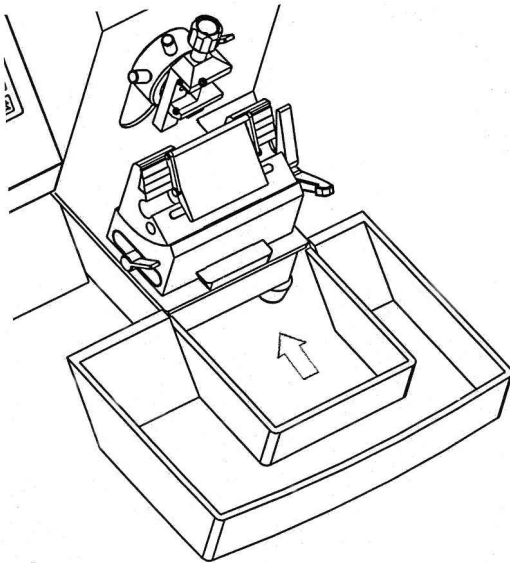
Place the instrument on a stable laboratory table, with back away from the wall about 150m



### 3.2 Site requirement :

The installation site must meet the following requirements:

- Stable, vibration-free laboratory table
- Vibration-free floor
- room temperature always between +10°C~+40°C

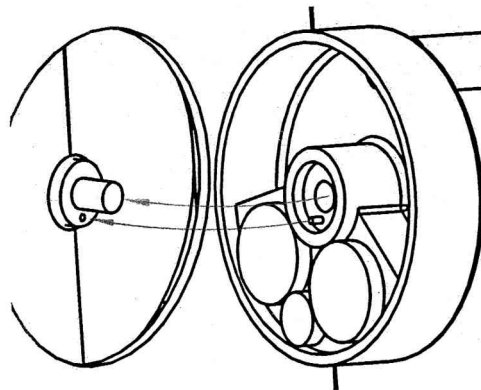
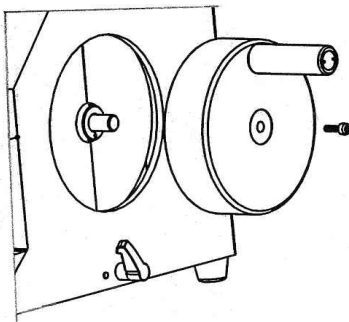


Insert the section waste tray as the figure indicates.

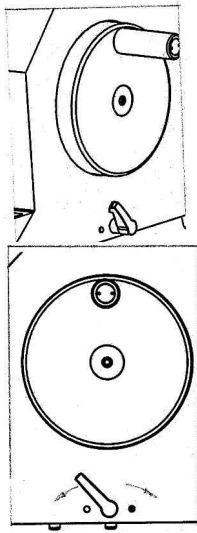
The spindle in the handwheel should be inserted into the hole in the machine. **Especially the small bolt must be inserted into the small hole.** Then tighten the screw with an inner hexagon spanner in the tool box.

### 3.4 Installment of the hand wheel

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



## 4. Safety instruction for operating the instrument :



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

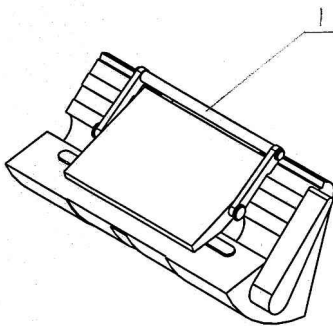
Safety device of the handwheel: the locking system: the spanner controls the handwheel, lock the handwheel at any position of rotation.

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

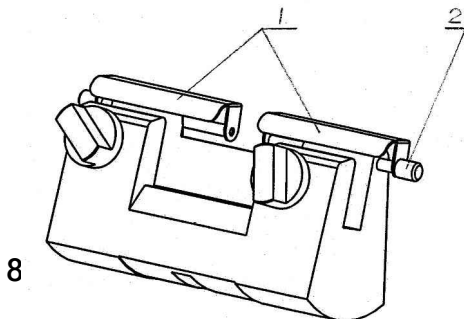
The handwheel can be locked in any direction with the locking spanner . The locking spanner can be set on the locked or released position on the right side of the base.

**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.

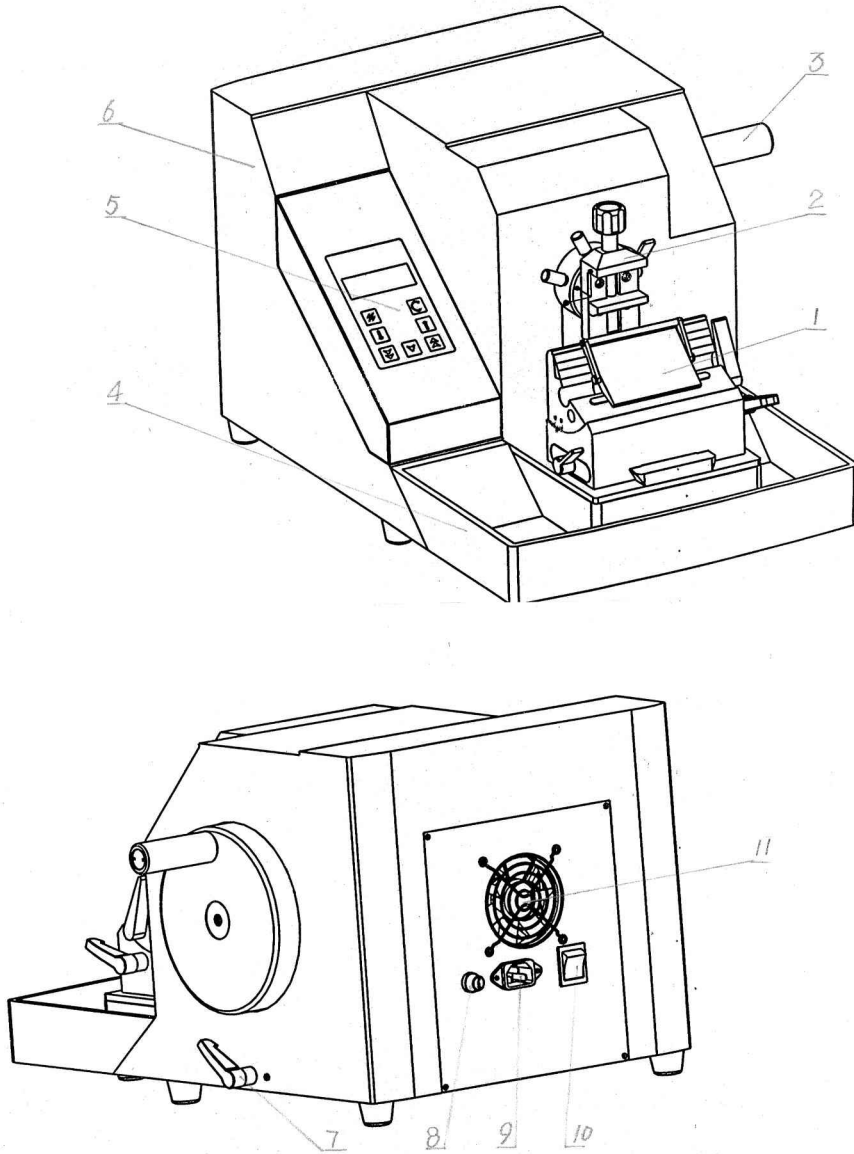


Every knife carrier has different shape knife guard (1) that allows to cover the cutting edge completely. Turn over the knife guard handle (2) to cover the knife edge.



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





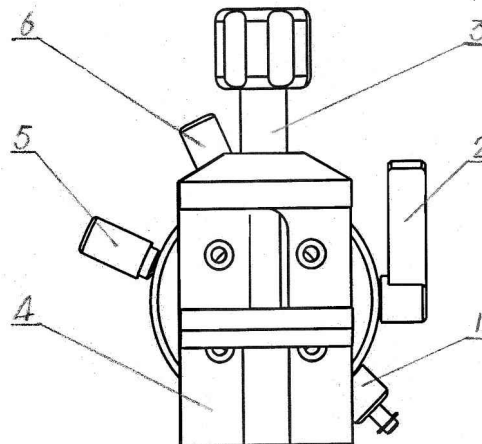
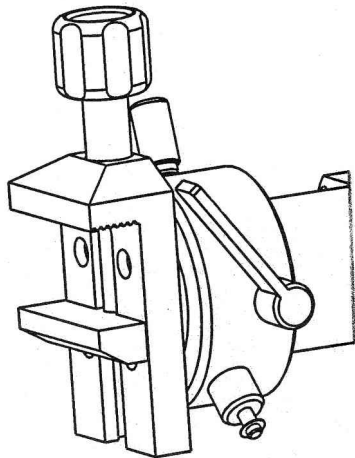
## 5. Illustration of Microtome

1 knife carrier 2 specimen clamp 3 handwheel 4 waste tray 5 control panel and LCD 6 shell  
7 the lock spanner of handwheel  
8 fuse 9 power connection 10 power switch 11 fan

## 6. The specimen Orienting system :

5. Illustration of Microtome 1 knife carrier 2 specimen clamp 3 handwheel 4 waste tray  
5 control panel and LCD 6 shell 7 the lock spanner of handwheel  
8 fuse 9 power connection 10 power switch 11 fan

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.



6. The specimen Orienting system : 5. Illustration of Microtome 1 knife carrier 2 specimen clamp 3 handwheel 4 waste tray 5 control panel and LCD 6 shell 7 the lock spanner of handwheel

8 fuse 9 power connection 10 power switch 11 fan

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

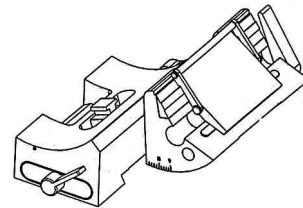
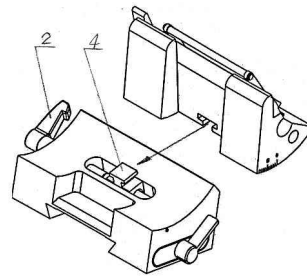
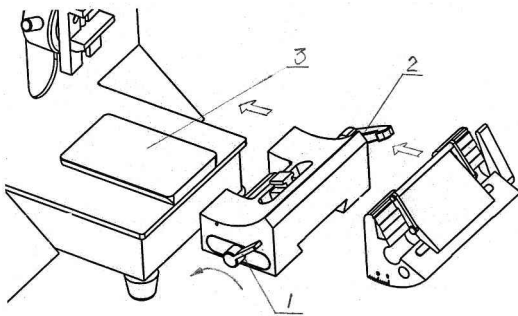
4. specimen clamp 5 screw for left and right 6 screw for up and down

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

## 7. Knife carrier's Fixing System

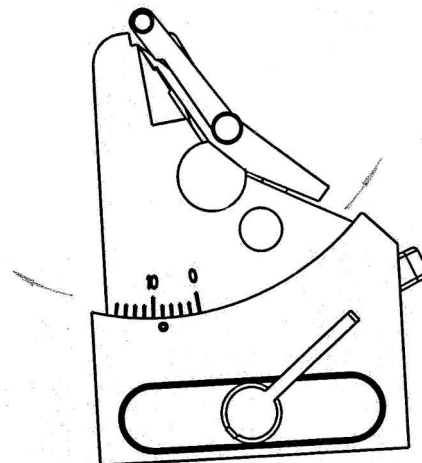
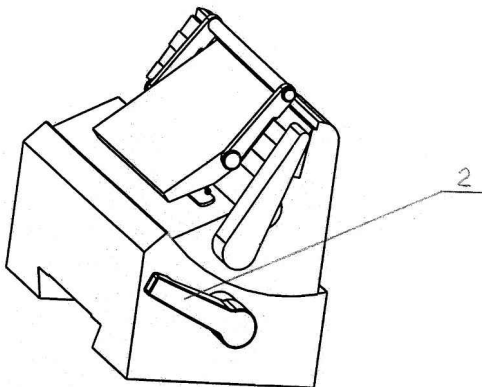
### 7.1 Installment of the knife carrier :

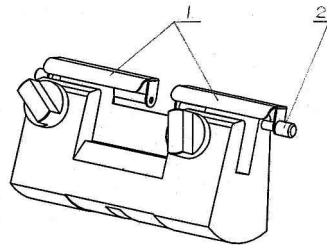
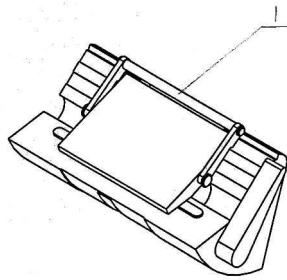
- 1) Rotate and release the fixing spanner ( 1 ) of the knife carrier base, push the carrier base forward along with Rail ( 3 ) in the machine .Then lock the fixing spanner and fix knife carrier base.
- 2) Rotate and release the fixing spanner ( 2 ) of knife carrier .
- 3) The locking block ( 4 ) of the knife carrier base enter the T shape tray of the knife carrier.
- 4) Rotary and lock the fixing spanner ( 2 ) of knife carrier to lock the knife carrier .



### 7.2 Adjusting the cutting angle:

1. Release the fixing spanner ( 2 ) of the knife carrier.
2. Turn the knife carrier, adjust the knife carrier angle according to different specimen hardness and section thickness
3. Lock the fixing spanner ( 2 ), and fix the knife carrier on the knife carrier base.





### 7.3 Knife guard on the knife carrier

A safety device for moving the knife or revising the instrument.

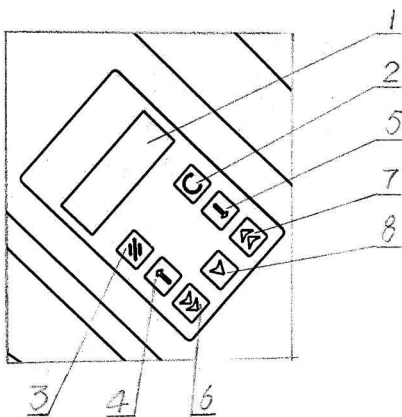


Prior to manipulating or changing the specimen, knife and disposable blade, even during breaks, it must always cover the cutting edge with the knife guard!

### Knife and disposable knife holder

Be careful during adjusting knife or disposable knife holder, because the cutting edge is extremely sharp, any mal-operation may cause injury to hands.

## 8. Functions induction of the LCD and control panel



- a、 LCD display
- b、 Select
- c、 Confirm
- d、 Increment
- e、 Reduction
- f、 Fast FWD
- g、 Fast BWD
- h、 Trimming / Section

LCD: Show menu and selected contents in Chinese and English version.

“Select” button : Press at a time, the LCD screen will subsequently display section thickness, trimming thickness, section accounting and position of specimen clamp..

“Confirm” button: press this button, you can confirm and store the set program.

“Increment” button : Press this button to increase the thickness of the section or trimming.

“Reduction” button : Press this button to reduce the thickness of the section or trimming.

“ Fast FWD” button : Press this button to let the specimen clamp to move forward fast

“ Fast BWD” button : Press this button to let the specimen clamp to move backward fast

“Trimming” button: Though press this button , you change section into trimming or trimming to section . then you can trim or slice while rotary the hand wheel.

## 9.Operation

### **9.1 opening**

Ensure that the instrument is laid steadily on a firm and solid testing table.

Insert the power cord plug in the input socket on the rear cover board, and then connect through the 220V main power supply.

Turn on the general power switch, the power switch and LCD screen light up, and the specimen forceps resets fast.

### **9.2 Fixing the specimen**

Rotate the handwheel till the specimen forceps is hoisted to the highest position, and lock the handwheel. Loose the specimen forceps and mounting the specimen tissue and fix it.

### **9.3 Fixing the knife or disposal blade**

Insert the blade into the knife carrier and fix.

Adjust the appropriate knife angle.

Release the fixing spanner of the knife carrier base.

Approach the knife holder to the specimen as close as possible.

Lock the fixing spanner, and the knife carrier.

Rotate the handwheel to make the specimen and knife edge on the same height

Be careful when changing the knife or disposable blades, the cutting edge is extremely sharp, or will cause injury to hands! Be extremely careful when manipulating the knife, because the cutting edge is extremely sharp, any mal-operation may cause severe injury. In any case, do not touch the falling knife with your naked hand!

Do not lay the knife with the edge upside. If not in use, keep the knife in the knife box!

Always lock the handwheel prior to manipulating or changing the specimen or knife, even during breaks.

Indication : We provide various permanent knife carriers and disposable blade holder for your option.

#### **9.4 Fast forward or backward:**

Press the Fast FWD button or BWD button; the specimen clamp can fast forward or backward. After it reached the appropriate distance, release the specimen clamp spanner. Rotating the Angle adjusting handle accordingly, can adjust the parallel between the specimen and knife right and left or up and down. At the same time, rotate the handwheel slowly to reach a better angle. Lock the specimen clamp spanner to fix the specimen clamp.

Indication : It will alarm as bees hum when it forward or backward to the limit.

#### **9.5 Section trimming:**

Press twice the "selection" button twice to trimming thickness "trimming thickness 00 $\mu$ m".

Press "increment" and "reduction" to adjust the thickness until a satisfactory thickness. Press "trimming" button, and rotate the handwheel to trimming section.

After section trimming, the surface of the specimen should be clean and smooth

Rotate the handwheel clockwise till dispose the specimen clamp in the highest position, and at this time, the specimen is in a status for slicing.

#### **9.6 Slicing:**

Press "selection" button to display the section thickness "section thickness 00 $\mu$ m", press "increment" and "reduction" to adjust the thickness until reaching the needed thickness, press "confirm" button, the LCD screen displays "section thickness 03 $\mu$ m section counting00", rotate the handwheel for slicing, and auto-counting at the same time.

if need to trim the specimen when section, just to press "selection" to change

Rotate the handwheel for a complete circle for each slicing. The best slicing way is to rotate the handwheel clockwise from the starting point to the starting point evenly. If the handwheel is rotated too fast, it will compress the specimen, and cause tissue sticking.

After slicing, rotate the handwheel to the starting position, and lock the handwheel. The LCD screen will display the counted number of the sectioning (0~999).

Indication : it will auto-store the section thickness and account number, so you donot need to

set the program again.

### **9.7 Position of specimen clamp**

"Position 0000mm" remind the operator to notice the distance limit of the specimen clamp movement. If the specimen clamp moves to the distance limit, it can't feed the knife. Press the "fast BWD" button to reset.

Attention : handwheel rotation should be even, and the rotation speed should be compatible with the specimen hardness. When slicing hard specimen, the speed should be more slowly

Attention : During the slicing, if manipulated fast forward, fast BWD, section trimming, or section thickness alteration, etc, should press the "confirm" button, otherwise, the handwheel can't feed the knife automatically.

### **9.8 Specimen retraction function**

The specimen clamp have the automatic retraction function when it reach the highest place ,, so it avoid the damage which caused by attrition between specimen and knife . so it can make the section more smoothly and lengthen the life-span of knife .

### **9.9 "Auto-sleep" protection function**

After booting, if don't work for a long time, the instrument will enter "auto-sleep" protection status. The display screen darkens. Press, confirm button when needed, and resume to work.

Indication :

After termination, the power supply should be closed, otherwise, the instrument will in protection status for a lone time, which will speed the aging of the instrument, and shorten its life-span.

## 10 Cleaning and Maintenance

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

### 10.1 Closing section :

Shut off the general power supply switch, remove the power supply plug

Turn the handwheel to make the specimen clamp to the highest position, turn the spanner, and lock the handwheel.

Loose the knife-protection board and knife, lock the spanner, put the knife in knife box.

Loose the specimen-clamping bolt, and remove the specimen.

### 12.2 Cleaning

Remove all debris in the machine;

Remove the section waste tray for emptying

Lock the hand wheel before cleaning the instrument!

Clean the instrument like family daily life; pay especial attention to remove the waste wax around the knife holder.

Only use mild commercial detergents or soap solution for cleaning! Do not use solvent that contains acetone and benzene!

Use dry cloth and bedew a little detergent to clean the surface of the instrument.

Do ensure that during the cleaning, no detergent liquid enter the instrument. After cleaning, wipe off the surface of the instrument with a soft cloth.

Keep on cleaning all positions of the instrument after use. Use the knife carrier to move on the sliding rail, infuse the detergent lubricant. Good maintenance to the instrument will prolong the life span of the instrument.

Warning : Be extremely careful when using the knife, because its edge is very sharp, any mal-operation will cause serious injury. In any case, do not touch the falling knife with your hand!

Do not leave about the knife in other places.

Do not lay the knife with the edge upside. If not in use, keep the knife in the knife box!

Lock the handwheel for each operating of the knife and specimen, or during the working intermission.



## 11. Problem and solution

Problems, possible causes and corrective action

Problems	Possible causes	Corrective action
Non-even of sections: The section thickness varies from one section to another. In extreme cases, sections are skipped meaning that a section is not obtained.	<ul style="list-style-type: none"> <li>-Insufficient knife/blade inclination; consequently the Clearance angle is too small.</li> <li>-Insufficient clamping of specimen and/or knife.</li> <li>-Blunt knife/blade.</li> </ul>	<ul style="list-style-type: none"> <li>-Systematically try several Clearance angle adjustments until the optimum angle is found.</li> <li>-Check if all clamps are locked and screws are tightened on the specimen and knife carrier systems. Retighten the clamps and screws if necessary.]</li> <li>-Use a different part of the cutting edge or use a new knife/blade.</li> </ul>
Compressed sections The sections are extremely compressed, wrinkled or jammed together.	<ul style="list-style-type: none"> <li>-Blunt knife/blade.</li> <li>-Specimen too warm.</li> <li>-Clearance angle too big.</li> <li>-Sectioning speed too high.</li> </ul>	<ul style="list-style-type: none"> <li>-Use a different part of the cutting edge or use a new knife/blade.</li> <li>-Cool the specimen on a cold plate.</li> <li>- Clearance angle adjustment; systematically decrease the Clearance angle until the optimum adjustment is obtained.</li> <li>-Rotate the handwheel at a lower speed.</li> </ul>
The knife "rings" on the cutting specimen when	<ul style="list-style-type: none"> <li>-Sectioning speed too high.</li> </ul>	<ul style="list-style-type: none"> <li>-Rotate the handwheel at a lower speed.</li> </ul>

slicing hard specimens. Sections exhibit scratches and chatter marks.	-Clearance angle too big.  -Insufficient clamping of paraffin forceps or knife carrier.	-Clearance angle adjustment; systematically decrease the clearance angle until the optimum adjustment is obtained. -Check if all levers are locked and screws are tightened on the specimen and knife carrier systems. Retighten the clamps and screws if necessary.
No more specimen advance and consequently no section produced.	(4) Specimen reached the front feed limit.  (5) The coarse feed wheel cannot rotate freely.	1. Turn the coarse feed wheel in the appropriate direction to move the specimen towards the clearance limit. 2. Remove and obstruction.
Not lighting-up and no display when turn-on the power supply switch.	Fuse is burned	Replace the fuse

Warning : It should use well-earthed plug and turn on the power supply.

This machine should be used only to section specimen it should not be used for other purpose.

The machine should be 15cm away from the wall to keep good heat-scattering effect; otherwise it will shorten the span-life of the machine.

## 12. Storage and transportation

This machine should be stored in a room with temperature 5°~ 40°C, relative humidity <= 80%.

Before transportation of this machine, please check if it's locked and if marks are complete. The microtome must be erectly transported!

## 13. Packing list

1, main unit	1
2, consumers' handbook	1
3, power supply cord	1
4, 3A fuse	1
5, Disposable blade holder	1

## 14. Maintenance and after-sales service

If any damage, please do not carry out any repairs on your own, as this will invalidate the warranty.

Qualified service engineers authorized by our company may only carry out repairs.

If the user operate strictly in accord with this manual, and obey the instruction, we will provide one-year warranty from the date of delivery. Within one year, all damages caused by quality defects, we will be responsible for repairs or replacement free of charge. Besides, we will provide long time maintenance service.

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



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