MRM-455
Fully-Automatic Microtome

Quick guide

USE THIS QUICK GUIDE TO OPERATE YOUR FULLY AUTOMATIC MICROTOME

FOR ANY FURTHER INFORMATION ASK YOUR LOCAL DEALER

SPECIAL TRAINNING UNDER REQUEST WITH LOCAL DEALER

LEIPZIG GmbH

Profitable Suggestions:

- The user should read this user manual carefully before installation and operating the machine.
- Check your power socket is well grounded.
- Blade is sharp, beware when you change it.
- Do not place blade anywhere with the cutting edge facing upwards.
- Before changing specimens always lock the hand wheel and cover the knife edge with the knife guard.
- Do not put instrument under extreme temperature and high air humidity environment. Failure to follow this will cause instrument severe damage.
- Please keep instrument far away from fire.
- In case of malfunction, contact our company. Don't try to solve it by your own risk.

1. Introduction

The microtome is the national regulated first class medical equipment. It is a device used for human and propagation tissues pathological section analysis. It is used to cut paraffin embedding specimens, thin section mounted specimens. It can be widely used for pathological diagnosis analysis and research in hospitals, medical colleges, legal medical experts and propagation institutes.

The instrument mainly consists of the following:

Box type specimen clamp

Direction movable support for the specimen clamp

Fore-and-aft movable knife holder and locking device

Removable waste tray

Microtome hand wheel and locking device

Seat and driven mechanism on it

Cover

Electronic control system

Chromatic LCD touch screen

Cassette Clamp

General overview:

Fig 1

2. Scope of Application

Used to cut paraffin embedded specimen and make thin section mounted specimens

3. Technical Parameter

3.1 Section thickness: 0μm -100μm, adjustable. (Set 3-5μm may get the best shape)

Setting values: From0μm -20μm; in 1μm increment

From 20μm -60μm; in 5μm increments

From 60μm -100μm; in 10μm increments

3.2 Trimming thickness: 0μm - 600μm adjustable

Setting values: From 0μm -10μm; in 1μm increments

From 10μm -20μm; in 2μm increments

From 20μm -50μm; in 5μm increments

From 50μm -100μm; in 10μm increments

From 100μm -600μm; in 50μm increments

3.3 Retraction value: 10-150μm

3.4 Specimen horizontal travel distance: 25mm

3.5 Specimen vertical travel distance: 60 mm

3.6 Number of languages: 2 (Chinese English)

3.7 Power supply: AC 100-240V; 50Hz or 60Hz

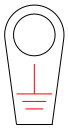
3.8 Input power: 75W

3.9 Dimension: (L × W × H) 620 × 410×310 (mm)

3.10 Total weight: about 40kg

3.11 Working noise: less than 65dB (A)

3.12 Remind:



Protective grounding (earth)

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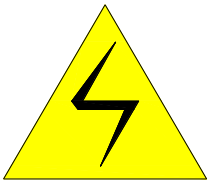


Prevent electric shock

4. Working Conditions

4.1 This instrument is a movable desk top type which can be placed on the experiment stable working table to prevent it receiving quakes from the ground, and don't install other vibrating equipments round it.

4.2 Place the instrument with appropriate space around it to ventilate and smoothly rotate the handle.

4.3 After confirming power with grounding wire (three holes socket), connect the instrument and power socket by attaching wires. Turn on the switch on the back of instrument and it is under state of working.

4.4 This instrument uses single-phase voltage 220V±10% and 50Hz AC power supply. If does not meet requirement, it needs to externally connect AC voltage stabilizer.

4.5 The instrument should be used at ambient temperature +10℃~+40℃.

4.6 Environmental relative humidity shall not be more than 80%.

5. Operation

5.1 Turning on

The instrument should be connected to a grounded main power outlet socket. To connect the instrument only by using one of the main cables supplied together with the instrument.

Turn on switch at the rear of instrument, after instrument start, LCD screen is showing as Fig 2.

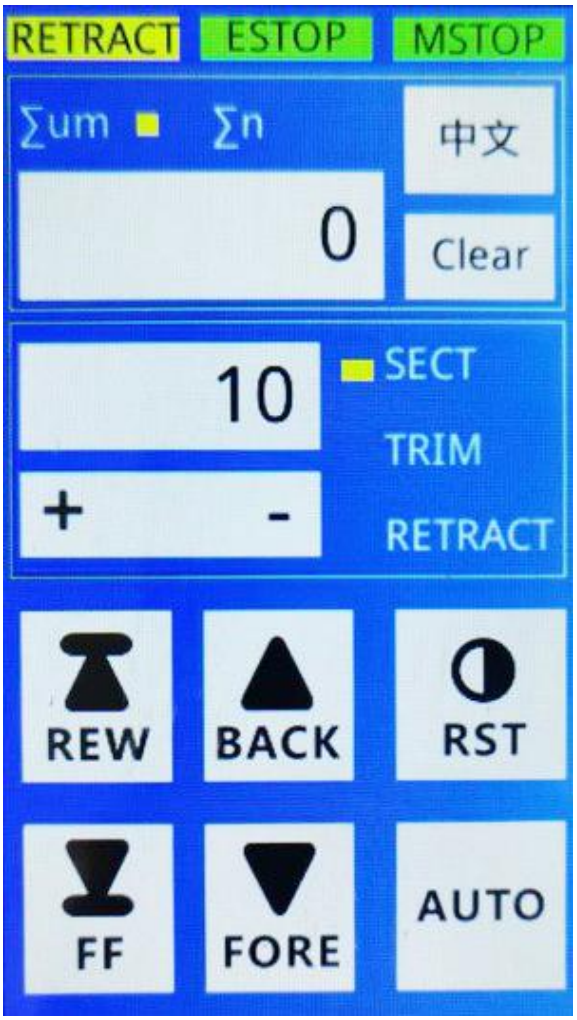
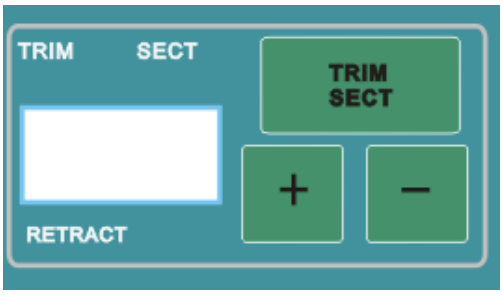


Fig 2

5.2 Description and operation for LCD touch screen:

5.2.1 Total amount of cutting times and thickness



Press “Menu Mode” to switch displayed number between the total amount of cutting times (∑n) and the total amount of thickness (∑um). It shows the present mode you choose by turning on the blue light after it

Press “clear” to reset.

5.2.2 How to set the section/trimming thickness

“TRIM SECT”——Switch mode between trim and section

“SECT” ——Section thickness;

“TRIM” ——Trimming thickness

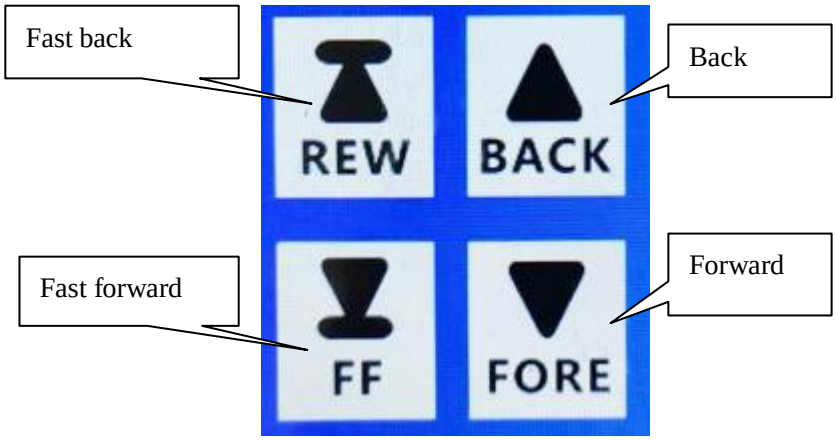
Press”+” and “-” to increase or decrease the setting thickness.

5.2.3 Settings for retraction

Unit enables retraction function, retracting value is from 0 to 150um adjustable.

Follow the following steps to set this function: (1)press “TRIM SECT”on the screen for 2 seconds until the yellow cursor goes to “RETRACT”.(2) Press “+”、“-” to set the retracting value. (3)when done settings, press “TRIM SECT” until the yellow cursor goes back to “TRIM SECT”.

5.2.4 Movement of the specimen clamp



Lower half for the LCD screen is the trouching area：

“↑↑” —— Fast back: Press it once and the cassette clamp moves back at a speed of 60mm/min and will stop at the limit while the blue light stay lit. Press the button again to stop moving.

“↑” —— Back: Press on it and the cassette clamp moves back at a speed of 30mm/min and stops when the pressure is gone. The blue light on the left top of the button flickers during movement and stays lit when move to the limit.

“↓↓” —— Fast forward：Press it once and the cassette clamp moves forward at a speed of 60mm/min and will stop at the limit while the blue light stay lit. Press the button again to stop moving.

“↓” —— Forward：Press on it and the cassette clamp moves forward at a speed of 30mm/min and stops when the pressure is gone. The blue light on the left top of the button flickers during movement and stays lit when move to the limit.

5.2.5 How to choose a language

Unit enables to display by Chinese English

Press “English” Or “中文” for 2 seconds until language changes

5.3 Operating instructions for sectiong and trimming.

(1) Put the paraffin-embedded specimen into the specimen holder of the microtome. Then rotate to fix it to the lock lever. The specimen fix the clamping properly.

(2) Put the disposable blade into the knife holder（Please lock the handwheel first），

face the cutting point to the specimen.

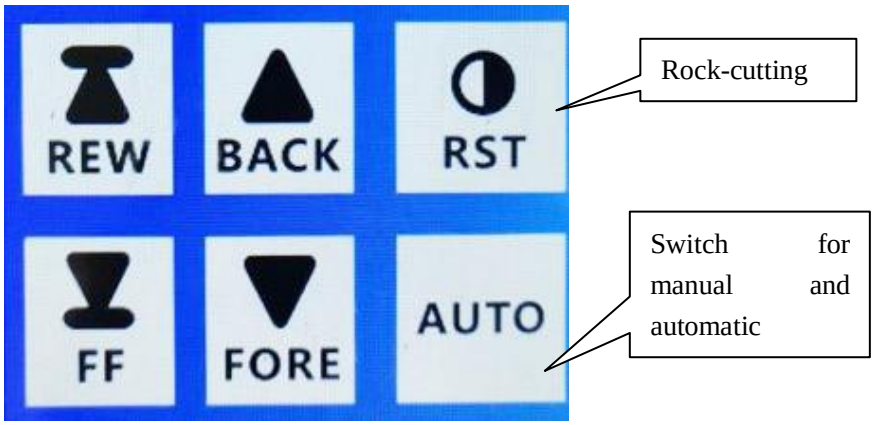
(3) Adjust the section thickness and trimming thickness according to the needing.

(4) Rotate the handwheel. Rotate a circle for cutting one piece; continuous rotation for getting continuous pieces. On LCD screen ∑n、∑um (press “Menu Mode” to switch) can show you the total section thickness and total numbers.

(5) Stop shaking the handwheel and lock the lever. Put the sections into the tray carefully with the forcep.

(6) After section, clean up the microtome promptly. Keep the knife and holder tidily.

5.4 Rock-cutting operation



Press”ROCK”button,it would be rock-cutting state when there is yellow light on the button. On the position of 12 o’clock and 6 o’clock of handwheel, it is forwarding by clockwise,and backforwarding by anticlockwise.

5.5 Switch of manual and automatic

The button “Manual Auto” is for switch of manual and automatic.

5.6 Automatic operation

5.6.1 Selection of automatic operation models.

Press” CUT MODE” button to select operation models before automatic operation, there is yellow light showing model state.

CONT: continuous operation after microtome switched on, press”RUN STOP” to stop it;

SINGLE: single operation, one press of “RUN STOP” one time of operation. Then stoped.

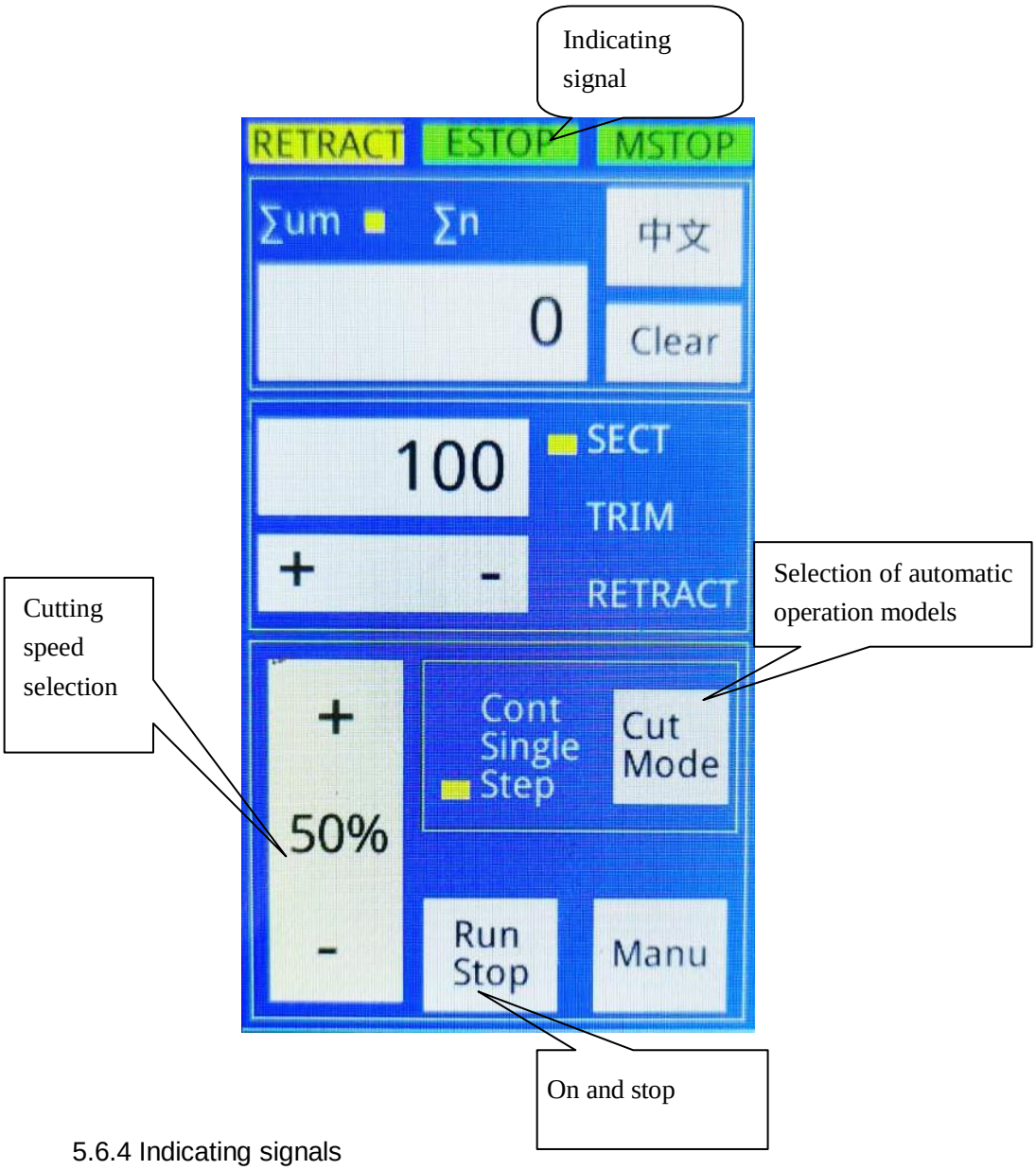
STEP: “RUN STOP” for operation for one time, then stopped.the light flicking in “STEP”.press”CUT MODE” of step the step switch once, the microtome cutting once more.”RUN STOP” for quit.

5.6.2 RUN AND STOP

Press” RUN STOP” button for 3 seconds(all the three yellow indicator was on), the machine operate automatically. Repress “RUN STOP”to stop it.

5.6.3 selection of cutting speed

Pree”+” and “-“ to select cutting speed. Selection range is 100%-10%.When speed was 100%, it is about 60 pcs/s. There is speed percent index above the button



5.6.4 Indicating signals

On top of the working menu, there are 3 indicating signals:

(1) RETRACT: retracting signal and indicates retracting when becomes orange;

(2) ESTOP: emergency signal and indicates functions disabled when becomes red.

Clockwise rotate the “emergency stop button” to shut ESTOP down, then the unit can be turn on normally.

(3) M_STOP: locking signal for handwheel, and indicates the handwheel is locked and functions are disabled when becomes jacinth. Unlock the handwheel to back to normal.

6 Parts adjustment

6.1 Specimen holder and orientation system

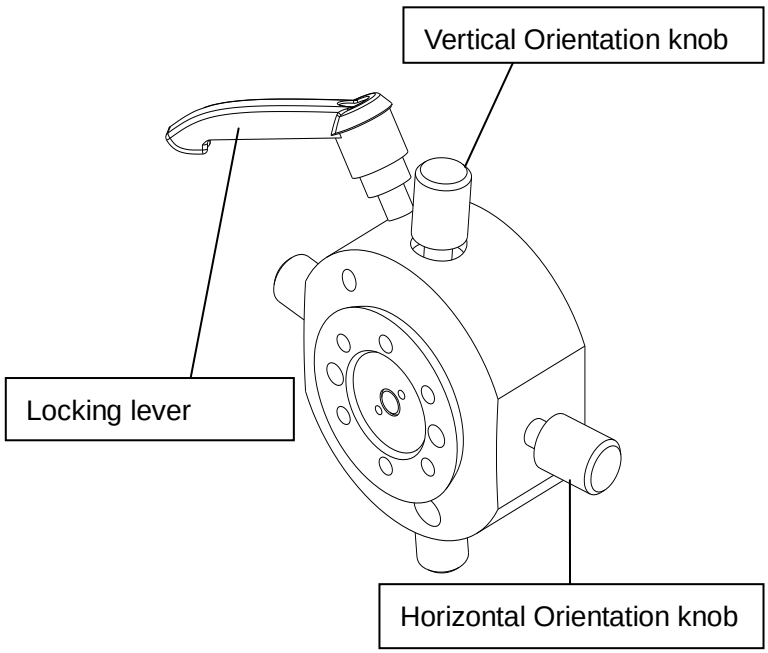


Fig 3

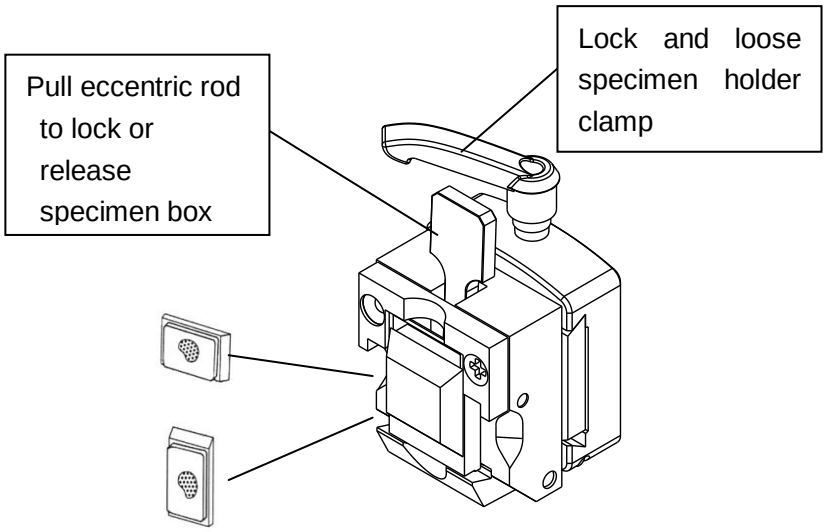


Fig 4

- Turning the locking lever (Fig 3) to set the specimen holder to the adjustable release condition and section lock status.
- Turning the two orientation knobs under release condition make specimen holder clamp plane defluxion by pass horizontal axis and vertical axis for ensuring required tangent plane location to decide the required plane cutting location.
- Turning the adjustable lever to lock and loose specimen holder clamp

6.2 Box shaped specimen clamp.

- Turning the spanner (Fig 4) on the specimen clamp can make the jaw in the state of braced and locked.
- The specimen can be put in or take off in the state of braced.
- Specimen box may be placed horizontally or vertically.

6.3 Knife holder

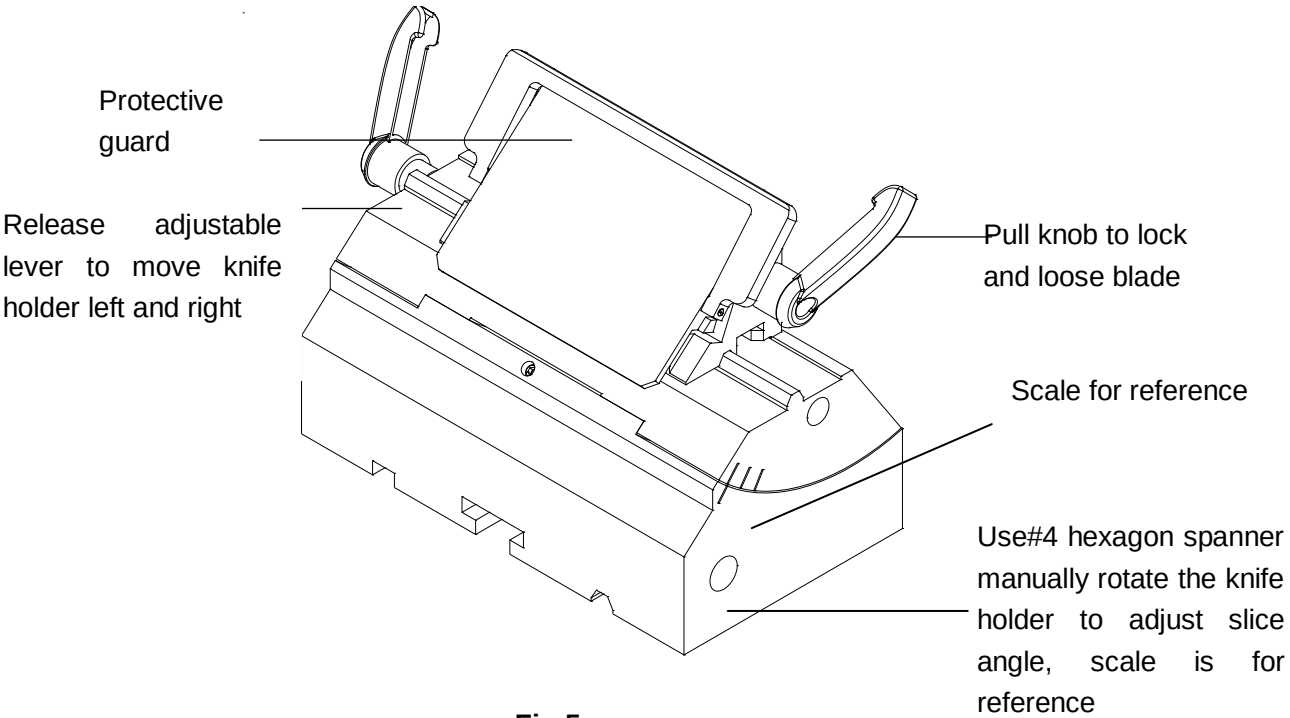
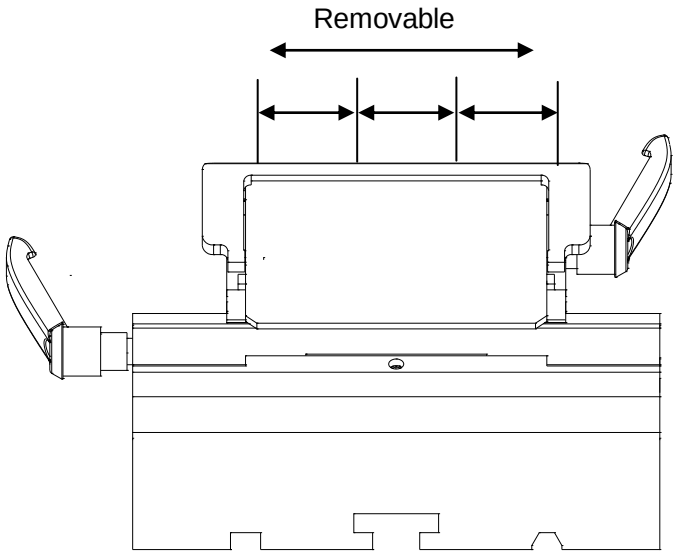


Fig 5

- To turn the adjustable lever under knife holder to release and lock knife holder base.
- In release conditions you can make the knife holder base do the back and forth movement by hand to choose latched position needed. There is a scale under knife holder for reference by location.

- Use hexagon spanner to turn the eccentric rod in the hole on the right side of the knife holder to release and lock the rotator of the knife holder.
- In release condition you can move the rotator by hand to choose locked cutting angle needed. There is a scale on the right side for reference by location.
- Turn adjustable lever on the rotator to release and lock knife clamp.
- In release condition you can make the knife clamp do the left-and-right movement by hand to choose latched position needed.
- Turn adjustable lever on the knife clamp to release and lock knife flat.
- You can put in or take off the knife in release conditions. Take off the knife after finish the work.
- The protecting plate shall be on the installed position when the knife is on the knife clamp.

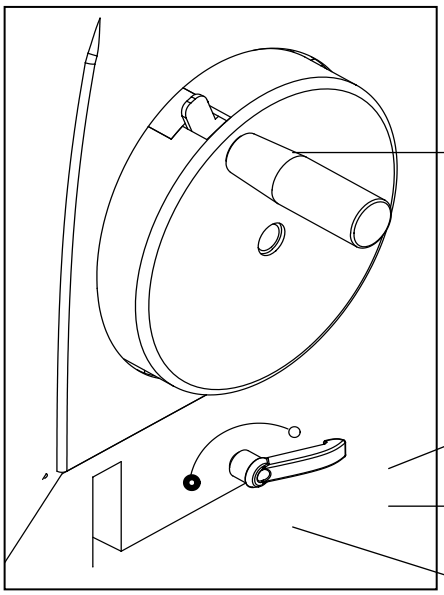


The knife holder can move freely. It can improve the efficiency for the disposable blade.

The user can divide the blade into three parts, A,B,C. It's more effective to use of the blade and save consumables cost.

Fig 6

6.4 Hand wheel.



- Hand wheel can be released or locked status.
- Hand wheel can be locked at a specific position when the spanner on the hand wheel is turned.
- Turn the eccentric rod handle under hand wheel to lock that at any position. Where there is a solid circle is locked, where there is hollow circle is rotatable.

7. Normal Troubles Solving Methods

There are normal problems in the following table which are likely to happen when the instrument is used. Besides, there are some possible causes that lead to these problems happened and solving methods.

Trouble	Reason	Solving Methods
7.1 Possible phenomena		
(1) The section is uneven. The thin and thick section is alternate, even if sometimes it doesn't cutaway.	● The knife centre gripping is improper. ● Knife is dull ● Pressure plate is broken or adjustment isn't right. ● The cutting angle of the knife is too less.	● fasten knife again ● Move the knife holder lateral or stick in new knife. ● Change new holder plate, or use new knife holder ● Readjust holder plate ● Increase the cutting angle gradually until find the optimum
(2) The section is congestion and compressive. The sections congestion. There is the phenomenon of crease and nip.	● Knife dull ● Specimen temperature is high ● Cutting speed so fast.	● Use the other part of the knife or a new one. ● Make the specimen cool before cutting. ● Reduce the cutting speed.
(3) There is fringe in the section.	● On the pressure plate is filling up paraffin on the back of the knife holder.	● Clear up this regional paraffin.
(4) There is noise when cutting. The knife will shake and sound when cutting some hard specimen. There is pull or slightly frictional make on	● Cutting speed too fast. ● The cutting angle is too big. ● Clip of specimen or knife not fixed.	● Turn hand wheel at a rather low speed. ● Decrease the cutting angle gradually until find the optimum one. ● Check all the screwed and jaw

the knife.		connection in the specimen rest and knife holder system. If necessary, fixture the control rod and screw.
Trouble	Reason	Solving Methods
7.2 Instrument failure		
(1) No section is cut when turn the hand wheel.	● The specimen has reached to the extreme position.	● Press “back” key to make the specimen backward and so the knife holder.
(2) Knife service time is short	● The power for section is too strong.	● Adjustment the cutting speed or the section thickness in the process of cutting. Choose smaller section thickness or slow down speed of turning hand wheel.

8. Cleaning and Maintenance.

8.1 Cleaning up the instruments

8.1.1 Conduct the following steps before cleaning each time:

- Turn up the specimen grip to the top and lock the hand wheel.
- Release the specimen grip and pull it out.
- Pick off the knife from the knife holder and put it back to the knife box.
- Dismount the knife holder and its seat to clean up.
- Take down the specimen from the specimen nip. Clear away the section waste with dry brush.
- Take down the specimen grip to clear up separately.

8.1.2 Instruments and external surface:

If necessary, the external painted surface can be cleaned with light-duty commercial housework cleaner or suds. And then use wet cloth rub it until dry.

You may use the substitute of xylene, paraffin oil, paraffin scavenger to erase residual.

The instruments must be dry when use again.

8.1.3 Knife holder

Please according to following steps to clean up the knife holder if it had been dismounted.

- Downwardly turn over the cutting edge cover sheet.
- Turn the eccentric rod handle in the lateral of the body of revolution and draw it out from sideward.
- Push the knife clamp back which have knife clip and shift it out from the rotary unit.
- Turn the eccentric rod handle in the lateral of the knife clap and draw it out from sideward.
- Dismount the knife clamp.
- Clean up all parts of the knife holder.

Don't use xylene or alcoholic liquid (e.g.: glass cleaner) when clean up paraffin.

- Make the knife holder dry and assemble it together.
- Apply to thin layer of lubrication after clean up the parts which had been taken off.
- When fix the knife clip, make sure that its upper part is parallel with the back edge of the knife clamp seat.

8.1.4 Box shaped specimen grip

- Dismount the box shaped specimen grip to clear away the residual paraffin.
- Don't use xylene or alcoholic liquid to clean up. Use the substitute of xylene or paraffin scavenger.
- You can put the box shaped specimen grip into oven to heat it t**o** 65℃ until lipid paraffin bleeding off.
- Wipe off paraffin with dry cloth.
- Apply oil to the axis grasping joystick after using oven heating method.

8.2 Lubricate instruments.

Do oil lubrication for the following parts monthly. (1~2 drop is well enough

Instruments and specimen holder

- Grip draw in the clamp.
- Lock in iron at the "T" knife clap back of the microtome bedplate.
- The knife holder slide way on the microtome bedplate.

Knife holder

- Lock in iron at the "T" body of the rotary units on the knife clamp seat.

- The knife control grip is shift to the eccentric rod handle.
- The iron locking head on the knife clamp of the ”T” body of rotary unit and the knife holder with slide way.
- The grasping joystick of the knife.

Box shaped specimen grip

- The bearing of the grasping joystick.

9. Notices

- Must grasp the specimen before positioning the knife. During the operation locking hand wheel and cover the knife edge with its cover sheet.
- Be most careful when you take the section knife. It is possible to lead to bad hurt because of the sharp cutting edge.
- You should turn the hand wheel with the same speed during the cutting process. The hand wheel turning speed must suit with the hardness of the specimen. Harder specimen use slow speed.
- Locking hand wheel and covering the knife edge with its cover sheet when changing specimen piece.
- The instrument should be positioned on the experiment work table level and stable. Preventing it from quake from the ground, and don’t put other equipments which may produce vibration near the instrument.
- Holding the fore and end trough of the back when moving it and don’t hold the other parts like hand wheel handle.
- Periodically cleaning the instrument.
- Locking the hand wheel before cleaning.
- Don’t use acetone or xylene liquid to clean up the instrument.
- Make sure that no paraffin comes into the inside of machine during the cleaning.
- Please follow the safety warnings of the manufacture when using cleaning solvent.
- Put the hand wheel on the locking position when turn down the instrument.
- Electronic parts be repaired by professionals and other people do not touch them.

PLEASE CHECK YOUR LOCAL DEALER :

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