Kalstein

Semi Automatic Microtome
Model YR416-1
Instruction Manual

Thank you very much for purchasing our Kalstein´s Semi-Automatic Microtome Model YR416-1.

Please read the “Operating Instructions” and “Warranty” before operating this unit to assure proper operation. After reading these documents, be sure to store them securely together with the “Warranty” at a hand place for future reference.

 Warning: Before operating the unit, be sure to read carefully and fully understand important warnings in the operating instructions.

OUR SERVICES

Benefits and Support

In Kalstein France, we take care of the full satisfaction of our customers, that is why we provide value-added services of the highest level based on our experience.

Online Inductions and Trainings

In any part of the world, receive your induction or training from our specialized team of engineers

Quick Response

Our work team is always available to response all your consults or questions, in order to support you in any situation.

#Letsgivemore 💚

Thanks to your purchase, a donation will be made to a non-profit foundation that fights against breast cancer and helps most vulnerable communities.

Technical Support

Enjoy of personalized advice for the correct preventive and corrective maintenance of your equipment, thanks to Kalstein's manuals and articles, special catalogues and video tutorials.

Delivery Logistics

We take care of all the necessary logistics for the dispatch of your goods, whether is by sea, land or.air.

Kalstein Worldwide

With more than 25 years growing with our customers, Kalstein's multiformat and modern content, is now present in more than 10 countries and increasing.

The information, numerical data, notes and value adjustments in this manual represent the current state of technological knowledge and the latest technology as we understand it following a thorough investigation in this field.

With the development of technology, we are under no obligation to update the present manual timely, nor to provide our customers with additional copies, updates and etc. of this manual.

In conflict with the national laws, we shall not be held liable for statements, drawings, technical requirement etc. contained in this manual. In particular, no liability whatsoever shall be accepted for any damage caused by or related to compliance with statements, instructions or other information in this manual.

Statements, drawings, technical requirement or other information in this manual are not to be considered warranted characteristics of our products. Only the matters agreed upon in the contract shall have legal effect.

Kalstein France reserves the right to change technical features, as well as processing techniques, without prior notice. Only in this way is it possible to continuously improve the technology and processing level.

For the instrument serial number and date of manufacture, please refer to the nameplate on the back of the instrument.

1. Table of Contents

1. Important Notes ..... Error! Bookmark not defined.
2. Table of Contents 4
3. Safety 5
4. Technical Data 5
5. General Overview 7
5.1. YR416-1 Overview 7
5.2. Main function 8
5.3. Standard Configuration 8
6. Unpacking and Setting up the Instrument 9
6.1. Unpacking 9
6.2. Instrument Setup location requirement 10
7. Installation 10
7.1. Install specimen clamp 10
7.2. Install the blade holder body and blade holder base 12
7.2.1. Install disposable blade holder 12
7.2.2. Install steel blade holder (Optional Part) 13
7.3. Install waste tray 13
8. Working with the Instrument 14
8.1. The function of control interface 13
8.2.1 Instruction of Control Interface Operation 14
8.4 After Sectioning 17
9. Malfunctions: Meaning and Troubleshooting 17
9.1. Possible Issues, Causes and Troubleshooting 17
10. Cleaning 19
11. Service and Maintenance 19
12. Appendix 19

2. Safety

2.1. Setting up

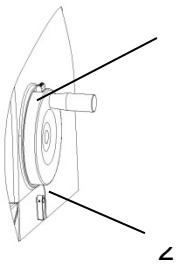
⚠Warning: Make sure the ground wire of the Three-line power cord is grounded before turning on the instrument. Conforms the GB9706.1 standard. Extremely sharp blades, always be exceptionally careful when handling the blades. Improper operation might lead to serious injury. At no time should one try to catch a dropping blade with bare hands.

- This instrument uses one separated power supply. Avoid moving Power cord.
- This instrument is equipped with an emergency button. In case of any emergency situation, pressing the emergency button will immediately cut off the working power.
- This instrument should be used in a place away from electromagnetic interference.
- All of the mechanical parts that surround the moveable components (e.g. fixed slide rail and etc.) should be lubricated regularly every 3-12 months with a fine instrument lubricant. Examining methods: Check if all clamp screws are tight. Check if all circuit boards and connectors are tight. Check if the power cord is correctly grounded. Check if there is a fuse.

Note: Lock the handwheel before cleaning the instrument!

2.1.1.Hand wheel Fast Locking System

Note: Before each operation of blade and specimen or changing specimen, the handwheel must be locked and using the blade protection frame(bar) to cover the blade edge.



On the right side of the Instrument base, using the lock handle (2) can lock the handwheel at any position. Lock handle (2) (Lever rotated up = Lock; Lever rotated down = unlock). These two positions are marked on the base of the instrument.

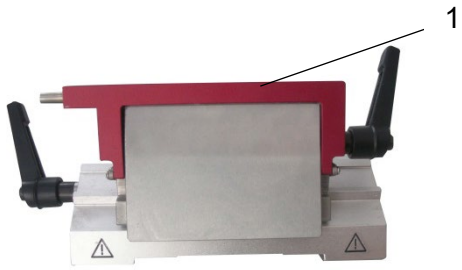
Checking Method:

- Locking push button (1): When the handle is in the top position, press the push button (1) to lock handwheel, and the handwheel will be locked at the highest position and no longer rotatable. Release the push button (1) to unlock the handwheel.
- Locking handle (2): pulling the locking handle (2) up to lock the handwheel at any position, and as a result, no more rotations can be made. Pulling the locking handle (2) down to the release position will unlock handwheel and allows it to rotate.

2.1.2. Blade protection frame(bar) on the Blade holder

Note: If suspending operation during the operation of blade or before changing the specimen, the handwheel must be locked, and using the blade protection frame(bar) to cover the blade edge.

Each blade holder is equipped with a movable protection frame(bar) (1). The protection frame(bar)(1) can completely cover the blade edge.



Transportation and Setting up

- Please note the "Technical Data" in Chapter four!
- The instrument must be vertically transported!
- Do not hold the handwheel handle while transporting the instrument!
- Removing or changing the protective device on the instrument and accessories should be avoided!

Operation

- Always be exceptionally careful when handling disposable blades. The blade is extremely sharp. Improper operation might lead to serious injury.
- Blade and blade holder should be correctly placed! Used blades should always be kept in the blade box!
- Fix the specimen first, then install the blade!
- Before each operation of blade and specimen or changing specimen, the handwheel must be locked and using the blade protection frame(bar) to cover the blade edge.
- Avoid spilling any liquid into the instrument from surrounding operations!

Cleaning

- *Lock the handwheel before cleaning the instrument!*
- *Do not use solvents that contain acetone or benzene to clean the instrument!*
- *Avoid the spilling of the cleaning agents or detergents into the inside of the instrument.*
- *Detergent should be used in compliance with the manufacturer safety regulations and corresponding laboratory rules!*

Service

- *The instrument should be opened only when company authorized personnel consider it necessary!*

3. Technical Data

Model: YR416-1 Semi-automatic Microtome

●Section thickness range： 0.25—100μm

0.25—2.5μm increments 0.25μm

2.5—5.0μm increments 0.5μm

5.0—10μm increments 1μm

10—30μm increments 2μm

30—6 0μm increments 5μm

60—100μm increments 10μm

●Adjust section thickness range:0—600μm

1—10μm increments 1μm

10—20μm increments 2μm

20—50μm increments 5μm

50—150μm increments 10μm

150—600μm increments 50μm

Sectioning retraction range:0—100μm

0 means off the retraction

0—5—10—15———100μm (optional)

Whole layer clearance distance Range: 10 – 6000μm

10-12-15-20-25~5000~6000μm

Small handwheel feed adjust： 100-1000um per circle

100-200-300-400-500-600-800-1000um

- ●horizontal feed range: 25 mm
- ●vertical moving range: 70mm
- ●power voltage: AC220V/110V
- ●frequency: 50Hz
- ●power: 100W
- ●fuse: F1A L 250V
- ●operating temperature: +18 to 25℃
- ●relative humidity max 80%
- ●atmospheric pressure: 860hpa -1060hpa

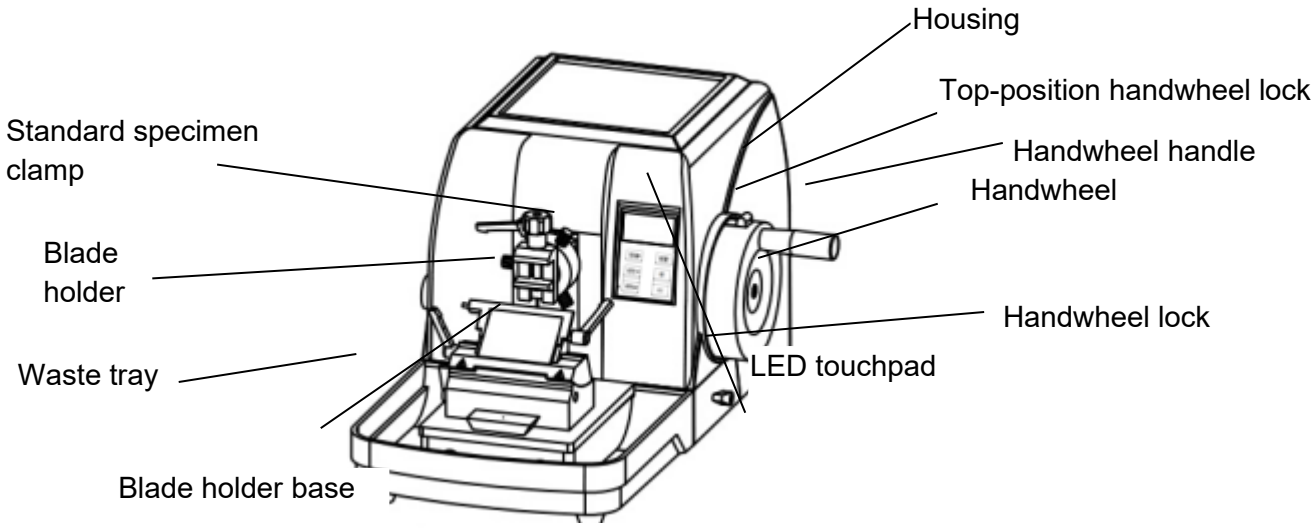
Accessories

- ●specimen orientation adjustment: left right/up down, arbitrary angle
- ●blade holder body moving range
- ●front/back: 65mm
- ●blade pressing plate moving range left/right: ±20mm

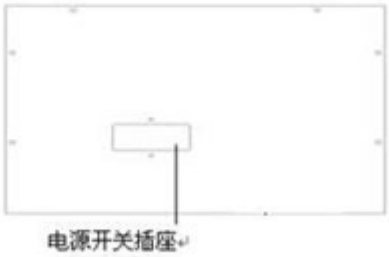
Dimensions and Weight

- Length：578 mm
- Width： 424 mm
- Height：330 mm
- Operating blade height：99mm
- Net weight：35kg

YR416-1 Semi-automatic Microtome



Rearview



Power switch

4. General Overview

4.1. YR416-1 Overview

This microtome product represents the best technology from our company from both quality and design perspective. Main components all supplied by world famous suppliers to ensure the quality. There are three modes: SMART MODE, ENTIRE MODE and NORMAL MODE, it also has intelligent fast trimming function. The world's leading design concepts have been adopted to produce a more user friendly ergonomic design. User can use single hand to switch between cutting and trimming. The retraction function reduces blade wear and produces a more precise section. Our uniquely designed specimen clamp can be adjusted to any angle; the cross roller guide and the micro-feeding mechanism are designed to be permanently lubricated, with no need for special service. This product features a good design, strong structure, and high stability, and it is convenient to use.

5.2 Main function

Main function： Main controller panel and Adjust knob on the left

Main controller panel: MODE SET (SMART MODE, STANDARD MODE and FULL MODE); slicing/trimming switching; memory point position 1 and memory point position 2; increase and decrease in value

Adjust knob on left: fast forward button, fast backward button, and switch for Sectioning and Adjust Sectioning

Sectioning thickness:0.25～100μm, trimming thickness:1～600μm. The unit automatically saves the previous setting of section thickness (trimming thickness), automatically stops operating and sends warning when beyond the stroke range, and has the function of automatic sleep protection.

5.3 Standard Configuration

YR416-1 Accessories

Power cable	1	Dust cover	1
Fuse	1	User manual	1
Certificate of quality	1	Warranty card	1

The accessories above and the additional accessories ordered are all packed along with the instrument in a sturdy wooden box. Compare the parts received with the parts ordered. If the parts received do not match your order, contact Kalstein France or the

sales company immediately.

6 Unpacking and Setting up the Instrument

6.2 Unpacking

- ●Open the wooden packing and unscrew the bottom
- ●Take out all of the accessories and user manual
- ●Hold the base of the instrument to move it out from the wooden box carefully

Notice: do not grip the handwheel handle, speed-controlling knobs, or emergency button!

Placement of the instrument

- ●The instrument should be placed on stable work surface.

6.3 Instrument Setup location requirement

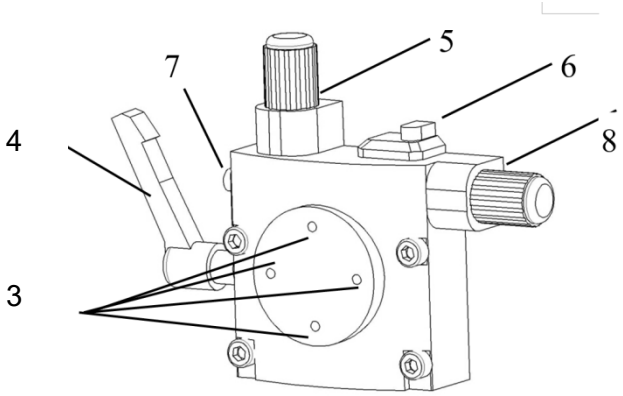
- ●Stable, vibration free work surface
- ●Vibration free
- ●This instrument should be used in a place away from electromagnetic interference

7 Installation

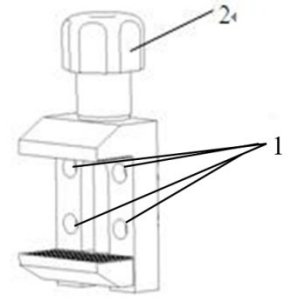
7.1 Install specimen clamp

If the specimen clamp has already been installed on the instrument, it needs adjustment. If the specimen clamp is purchased as optional accessory, then it needs to be installed and adjusted.

Wax block clamp



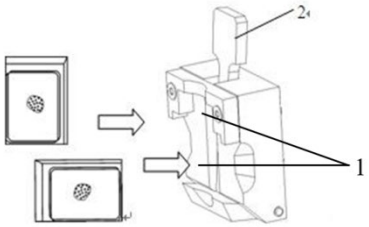
- This instrument should be placed in a place away from electromagnetic interference.
- Lock handwheel
- Standardized specimen clamp: First, lock the specimen clamp handle (4), and align the specimen screw hole



(1) with (3). Then lock the screws.

- Release the specimen clamp handle (4) and rotate the adjustment knob (5). When the colored head (7) is at its highest position, the specimen is at its vertical median position; turn the knob (5) in a CCW or CW direction to finely adjust the specimen up or down. Using the knob (8)to move the specimen left or right: when the colored head (6) is at its highest position, the specimen is at its horizontal median position; turn CCW or turn CW (8) will finely adjust the specimen to move left or right. Note: while adjusting, the specimen clamp angle adjustment knob (5) and (8) can only be adjusted within its rotary range. Don't use extra force to rotate the knob.
- Specimen clamp angle adjustment knobs (5) and (8) are for adjusting the vertical position and horizontal position. When adjusting these positions, the specimen clamp handle (4) must be released. Once the specimen is adjusted to its desired position, the specimen clamp handle needs to be locked.
- Replacing the specimen clamp: lock the clamp handle (4), loosen screw (1), remove the specimen clamp that needs to be replaced.

Embedding cassette clamp **(Optional Part)**



- Lock handwheel
- Installation and adjust method is the same as above.
- The cassette can be fixed horizontally or vertically using the cassette clamp.

For all common cassettes

- Pull the lever (2) forward
- Insert the cassette horizontally or vertically
- Release lever (2), the cassette will be clamped

7.2 Install the blade holder body and blade holder base

Note: Before blade holder is installed on the Microtome, don't insert disposable blade! For safety issue, remove the disposable blade before replacing the blade holder.

7.2.1Install disposable blade holder

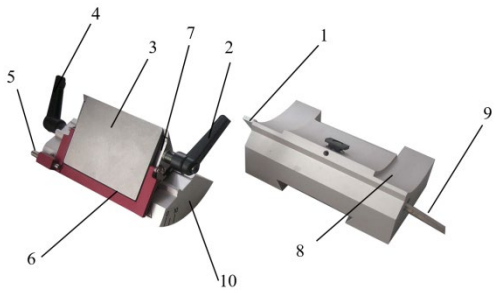
- Rotate the clamp handle (1) CCW
- Install the blade holder body on the V shape block on the Instrument base.
- Rotate the clamp handle (1) CW, lock the blade holder body (8)
- Use an Allen wrench to loosen the angle adjustment screw (9) on the blade holder base. Install blade holder (10) on the blade holder body (8), at the same time the cutting angle can be adjusted. After adjusting to a proper cutting angle, lock the angle adjust screw for the blade holder base.
- A proper clamp position is about 8° ~ 10°
- When installing a disposable blade holder, release clamp handle (4) on the blade holder base, install the disposable blade holder (7) to a proper position on the blade holder base (10). Lock the clamp handle(4) on the blade holder base, and disposable blade holder(7) can be moved horizontally on the blade holder base(10).

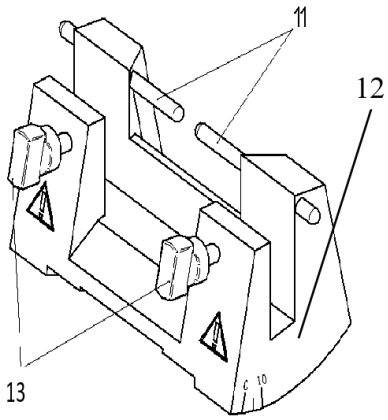
Install disposable blade

- When installing blade, release the clamp handle (2) for the disposable blade, insert the blade into the slot, lock the clamp handle(2) to fix the blade at the position by the press plate(3).

- When Replacing the blade, release the clamp handle(2) first, pull up the blade protect bar(6), then push the push-rod(5) will remove the blade.

Note: For the use of high-profile blades, the disposable blade holder needs to be customized.





7.2.2Install steel blade holder (Optional Part)

- Use an Allen wrench to loosen the angle adjustment screw (9) on the blade holder base. Remove the disposable blade holder (7) and blade holder base (10) from the blade holder body (8).
- Insert the steel blade holder (12) to the blade holder base (8), move the steel blade holder until the index aligns with the angle positioning line, then lock it. The cutting angle can be adjusted; a suggested angle would be 8 ~ 10°.
- When installing the steel blade, insert the steel blade into the slot from side to its position, then fasten the two rotary knobs (13) to fix the steel blade at its position.
- Loosen the two rotary knobs (10) to move steel blade to its desired position. The steel blade can be adjusted to the left or right.
- When taking a break before changing the specimen or during the operation, please remember to use the blade protection bar(10) to cover the blade edge!

Note: If suspending operation during operation or before changing the specimen, the handwheel must be locked, using the blade protection bar to cover the blade edge

7.3 Install waste tray

Align the waste tray with the instrument base, then push the waste tray in horizontally.

8 Working with the Instrument

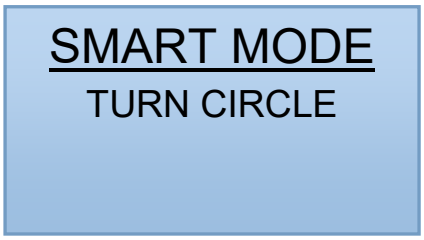
8.1. The function of control Interface

1、Interface　　2、Set Key　　3、 Cut/Trim Key

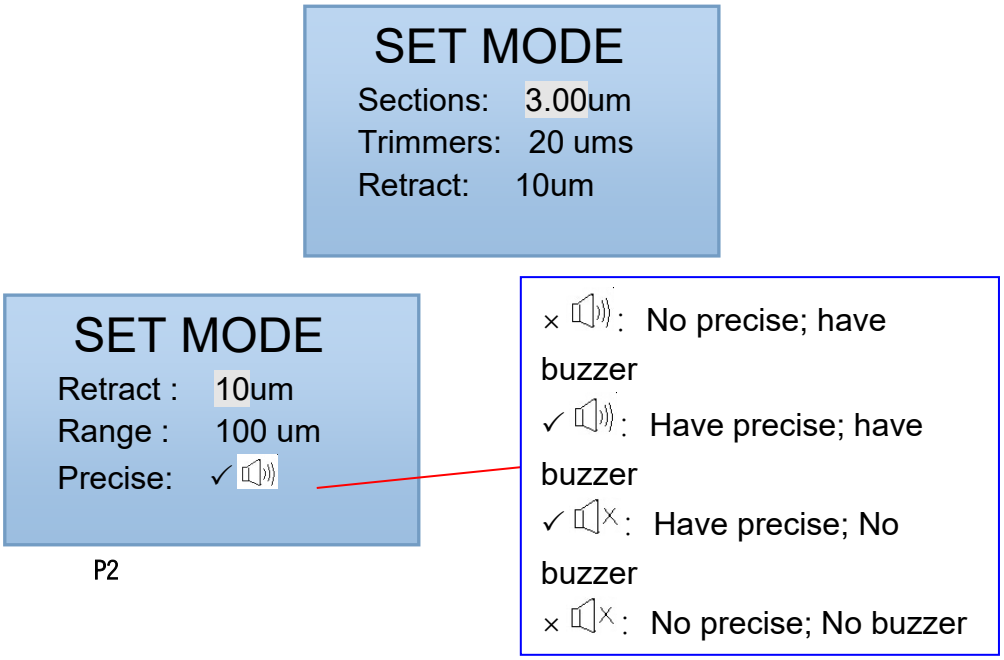
4、Resting Light　　5、Increase Key　　6、Decrease Key

8.2.1 Instruction of Control Interface Operation

Start the Power of unit, then go to the SMART MODE, TURN CIRCLE. So, just turn the handwheel for a circle the unit will into the SMART MODE.

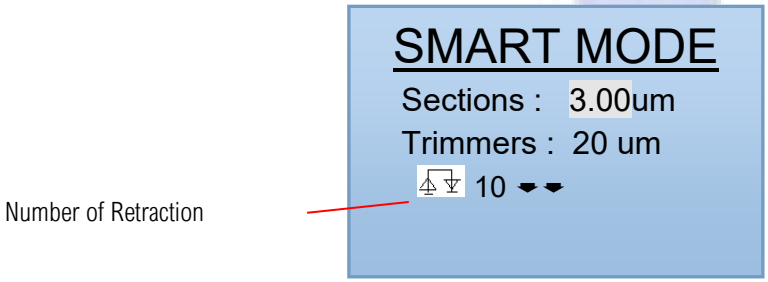


8.2.2 Press and hold Key 2 （⚙） , it will show the following features, then press the Key 3 （↻） , you can adjust to choose sections, trimmers, retract, range and precise. After choosing each of them, press Key 5 （🡅） or Key 6 （🡇） to adjust the feature as you want. After all the operation set, you need to press Key 2 （⚙） to confirm and log off the SET MODE.



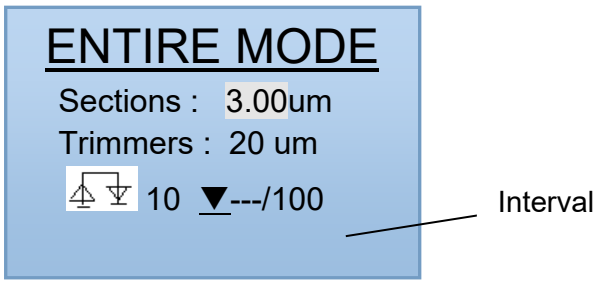
8.3 Press Key 2 （☼） into the three modes as you want: SMART MODE、 ENTIRE MODE and NORMAL MODE.

8.3.1 SMART MODE: This mode can working between cutting and trimming switch without any operation. When you turn the handwheel as lower half circle, it will trimming and you can see the screen shows trimmer. When you turn the handwheel as full circle, it will goes to cutting and also shows on the screen. At this time the 【▼▼】 mark means it is in the precise, after precise the 【▼▼】 mark will disappear. (If you set the Precise as ✓ : Have precise; have buzzer, after the precise finished, the unit will make a buzzer sound.) The cutting tissue after precise has high quality, and you can take this slide.

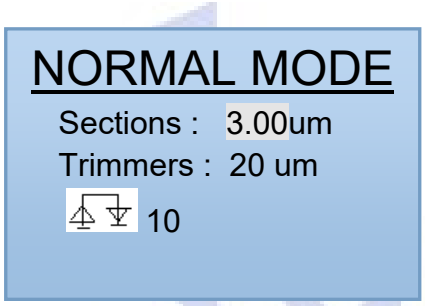


8.3.2 ENTIRE MODE: This mode is for entire interval cutting, it means you can set many intervals for any thickness of the tissue and choose which thickness you need to cut (also means you can choose any part for thickness of the tissue for cutting.) There is a knob at the left of unit, turn this knob you can do the fast forward and backward operation. And press the knob you can switch for cutting or trimming. At meantime, you can also press Key 3 （↻） to switch the cutting or trimming.

When the trimmer goes to the set number (you can set how much thickness you need to be the interval), the unit will goes to cutting itself and has the buzzer for notice. This mode usually use for cutting the tissue which need to check in different thickness, and we can call this mode as “CT slide under the microscope”.



8.3.3 NORMAL MODE: The same mode with other Microtome, there is a knob at the left of unit, turn this knob you can do the fast forward and backward operation. And press the knob you can switch for cutting or trimming. At meantime, you can also press Key 3 （↻） to switch the cutting or trimming. You need to turn a full circle of handwheel to cutting or trimming.



⚠ *Warning: When exceeding the stroke range, motor will automatically stop running and alert, press exit button to reset.*

Note: Handwheel should be evenly rotated, and the rotation speed has to be accommodated to the hardness of the specimen, slow down for harder specimens.

If the instrument sits idle for several minutes after being turned on, it will automatically enter sleep state. Sleep state indicator on. Swing the handwheel or press any button to wake the instrument from sleep state and enter working state.

Reminder: After completing the cutting with the instrument, the power should be turned off. Otherwise, being in the sleep state for a long period will accelerate instrument aging and affect the overall useful life of the instrument.

8.4 After Sectioning

- Shut the power switch down, unplug the power supply cord, rotate handwheel specimen clamp to its highest position, lock the handwheel.
- Remove blade from the blade holder, put the blade into the blade box.
- Remove the specimen from the specimen clamp.
- Clean the section debris on the instrument, remove the debris slot, clean up the debris.
- Instrument cleaning (see Section 10 “Cleaning”)

9 Malfunctions: Meaning and Troubleshooting

9.1 Possible Issues, Causes and Troubleshooting

Issues	Causes	Troubleshooting
Section thickness is not even. Section thickness is sometimes thick and sometimes thin, or even cannot produce the section	1. The tilt angle of the blade is not properly set, i.e., too small rear angle. 2. Specimen clamp or blade holder fastener is not tightly fastened. 3. The blade is blunt.	1. Apply a bigger rear angle for the blade. Increase the rear angle step by step and experiment with trial cut until find out the proper rear angle. 2. Check if all the screws for the specimen clamp system and blade holder are fastened well. 3. Try with the other section of the blade edge or replace the blade with a new one. Decrease the rear angle step by step and experiment with trial cut until find out the proper rear angle.
Section compressed. Section is severely compressed, section is wrinkled or mutually compressed.	1. The blade is blunt. 2. The temperature of the specimen is too high. 3. The rear angle of the blade is too big. 4. The cutting speed is too high.	1. Try with the other section of the blade edge or replace the blade with a new one. 2. Freeze the specimen for several minutes. 3. Slow down the rotation speed for the handwheel
Noise from blade when sectioning hard specimen. Scratches or chatter marks shows on the blade	1. The cutting speed is too high. 2. The rear angle of the blade is too large.	1. Slow down the rotation speed for the handwheel. 2. Decrease the rear angle step by step and

	3. The specimen clamp or blade holder is not fastened tight enough.	experiment with trial cut until find out the proper rear angle. 3. Check if all the screws for the specimen clamp system and blade holder are fastened well. If needed, apply more force on the screws and the specimen clamp.
Specimen cannot be fed, and cannot produce the section.	The specimen has already reach the front limit position	Press the button to retract the specimen, a system warning will be informed.
Display window is off after turning on the power.	1. The display connector is loose. 2. Safety fuse burned	1. Check and connect the display connector. 2. Replace the burned fuse with a new one.

⚠ *Warning: A well-grounded power socket is required before plug in the power cord. This instrument is only designed for sectioning specimen, must not be used for other purpose. The rear of the instrument should be at least 15mm away from the wall to allow a better cooling, otherwise it would shorten the instrument life.*

10 Cleaning

Note: Lock the handwheel before cleaning the instrument!

Remove section debris with dry brush.

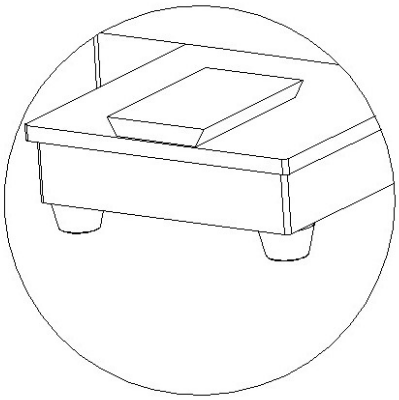
Disassemble the blade holder body and blade holder for cleaning.

Note: Only gentle household detergent and soap can be used for cleaning the instrument!

Painted surfaces are not resistant to acetone and benzene!

Do not let the detergent spill into the inside of the instrument!

Use soft cloth to clean the instrument. Clean all components each time after using the instrument. Apply cleaning lubricant on moveable components such as the blade holder movement base and slide rail. Good maintenance of the instrument will extend its life.



11 Service and Maintenance

Routine maintenance

This microtome has a long work life without any special maintenance. To ensure its best performance for a long period of time, we offer the following suggestions:

1.The instrument should be inspected by the company authorized customer service technicians once a year.

2.Maintenance contracts should be signed after the warranty period. Contact your Kalstein France customer service for more details.

3.Clean the instrument every day.

4.Do not repair the instrument by yourself, or you may lose the warranty. Only the company authorized technicians can repair the instrument.

12 Appendix

Product change

Kalstein France reserves the right to change technical data without prior notice. As technology advances, every product should be changed and improved.

Warranty period

Kalstein France guarantees that every product delivered has passed a comprehensive and strict quality inspection to ensure that the instrument meets the required technical standards.

Warranty terms is decided by your Kalstein France sales organization.

Only when the instrument operates in accordance with agreed terms, as well as terms in this manual, the warranty period is valid.

The company is not responsible for any damage caused by misuse of instrument or improper operation.

Scrap disposition

The instrument or parts of the instrument must be disposed according to the existing corresponding laws and regulations.

We are glad to offer you an environmentally friendly scrap disposition method.

Customer service information

If you are in need of customer service or spare parts in warranty period, please contact your Kalstein France representative or the dealer where you purchased the instrument. Please provide the model's name, serial number of the instrument and delivery date. Kalstein France do not receive any returns without formal return authorization.

Attention must be paid to the followings if you return the instrument or parts of the instrument:

1. Disinfection or radioactive decontamination must have been done before returned if the instrument or parts of the instrument may expose to virus or radioactive substance. It must be proved that disinfection or radioactive decontamination have been done. The authorized technicians will be ordered to check it.

2. If you are sure that the instrument with no radioactive substance or dangerous virus and germs, please inform Kalstein France about the disinfection and radioactive decontamination methods. The instrument or parts of the instrument will be sent back to you without any change if there is a risk of infection of the returned instrument or parts

Please provide the following information if you need technical service:

- Model name and serial number of the instrument
- Location of the instrument and name of the person to contact
- Reason for the service call

Accessories of the instrument:

disposable blade holder 1 piece

Specimen holder 1 piece

Waste tray 1 piece

Blade holder body 1 piece