



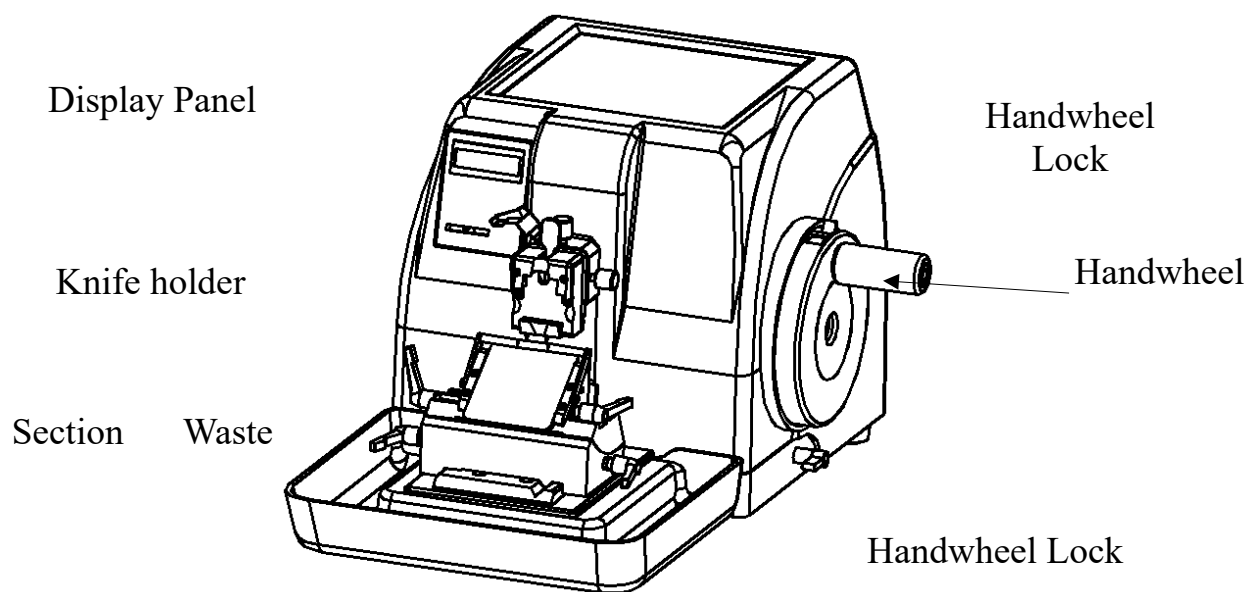
**AEM 450** (Version : AMOSAEM450OP20231205)

## **Semi-automatic Microtome**

### **Operation Manual**


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**This manual provides an overview of the instrument,**

**covering its components, key features, and usage guidelines. It's crucial to read and understand these instructions before operating the instrument.**



# Foreword

**The AEM450 Semi-automatic Microtome is designed to cater to users worldwide, meeting diverse requirements in standard sectioning for histology, medicine, and research.**

**It is necessary to read this operation manual to ensure the correct and safe usage of the equipment.**

**Our company is committed to providing exceptional service post-sale. Our trained agents are available globally to offer repair services. Clients can connect with our agents around the world to receive timely support.**

**Attention: Our products undergo continuous updates and refinements in line with evolving technology. As a result, the most current technical details of this instrument may not be included in this manual.**

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# 1. Safety Notes

## 1.1 Overview

The Operation Manual contains important safety instructions and information. The operation manual is an important part of the instrument, which the operator must read carefully prior to startup to ensure safe operation. It performs a critical role in maintaining personal safety and preventing equipment damage. Please keep the Manual near for timely access.

This instrument was built and tested in accordance with the safety regulations as specified below:

GB4793.1-2007 Medical Electrical Equipment First Part: Current Requirements for safety.

- ▲ **Notes** : Do not remove or modify safety marks and devices on the equipment and accessories to prevent harm to the user or the equipment itself.

## 1.2 Safety Warning

The following safety warnings concern aspects relating to transport, installation, calibration, operation, maintenance, cleaning, and others. It is crucial that all users carefully read and strictly follow these guidelines to ensure safe and efficient operation.

### 1.2.1 Warnings with Transport and Installation

- The instrument must always be transported or moved in an upright position, ensuring that the tilt angle does not exceed 45°C.
- After installation, it is crucial to remove the section waste tray and knife holder before any transportation or movement.
- The input voltage has been set at factory, please check if this setting complies with your local power requirement before connecting the equipment to the power supply.
- Please use the power cord provided. If in need of change, ensure that the replacement cord has an earth wire to maintain safe operation.



- Don't operate in room present with explosion hazards.
- The safety marks and devices on the equipment and its accessories should not be removed or modified. This is essential to prevent harm to the user or damage to the equipment itself.

### 1.2.2 Warnings with Operation

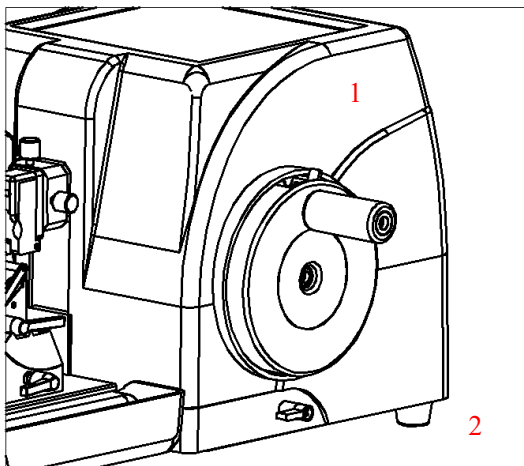
- Take special care when handling knife holder and the microtome blades, as the cutting edges are extremely sharp and can result in serious injury.
- Always remove the knife before detaching the knife holder from the equipment. When not in use, securely place the knife back into the storage box.
- Never position the knife with its cutting edge facing upwards, and never try to catch the knife with your hand.
- Always clamp the specimen block before securing the knife.
- Prior to changing the specimen and knife, always lock the handwheel first. If changing the specimen alone, always cover the cutting edge with the knife guard.
- Turn the handwheel in a clockwise direction to maintain the desired sectioning results. Incorrect rotation may affect the sectioning outcome.
- Always have the knife guard covering the blade edge when not sectioning.
- While sectioning, avoid frequent back-and-forth rotation of the handwheel when it is positioned at the top or bottom, as this may impact the thickness of the sections.
- Ensure that no liquid is to enter the equipment during work.

- Avoid touching the handwheel while it is in motion to prevent injury to the operator.

### 1.2.3 Warning with Cleaning and Maintenance

- Only authorized personnel may perform service and repair.
- Prior to cleaning, ensure the equipment is switched off, disconnected from power; remove the knife holder and clean it separately. You must remove the blade before cleaning the knife holder.
- Lock the handwheel before cleaning.
- Do not use cleaning solvents containing acetone or xylene on the equipment.
- Ensure no liquid enters the equipment's interior during cleaning.
- Do not activate the equipment until it is completely dry after cleaning.
- Before replacing the fuse, turn off the equipment using the mains switch, and disconnect the power. Only replace the fuse with one of the same specifications, following the instructions outlined in this manual.

## 1.3 Safety Devices



### Handwheel locking mechanism

As shown in the figure, lever (1) and (2) can be used to lock the handwheel.

Push lever (1) towards the back to lock the handwheel with the specimen locked at the topmost position.

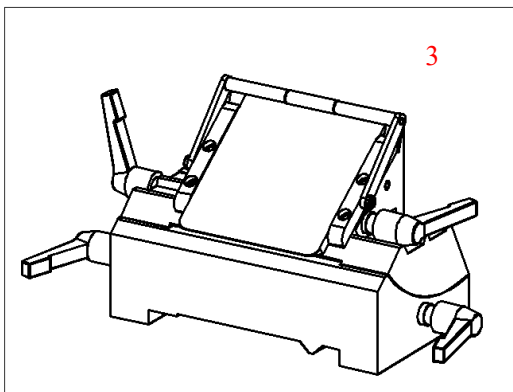
You could also rotate lever (2) clockwise 180° to lock the handwheel in any position.

Operate the lever in the opposite direction to unlock the handwheel.

The Left drawing shows Lever (1) locked, and lever (2) unlocked.

- DON'T operate the handwheel locks during rotation to prevent potential equipment damage.

▲ **Attention** : When moving the instrument, replacing specimens and blades, or performing maintenance, ensure that the handwheel is in the locked position.



### Knife Guard on the knife holder

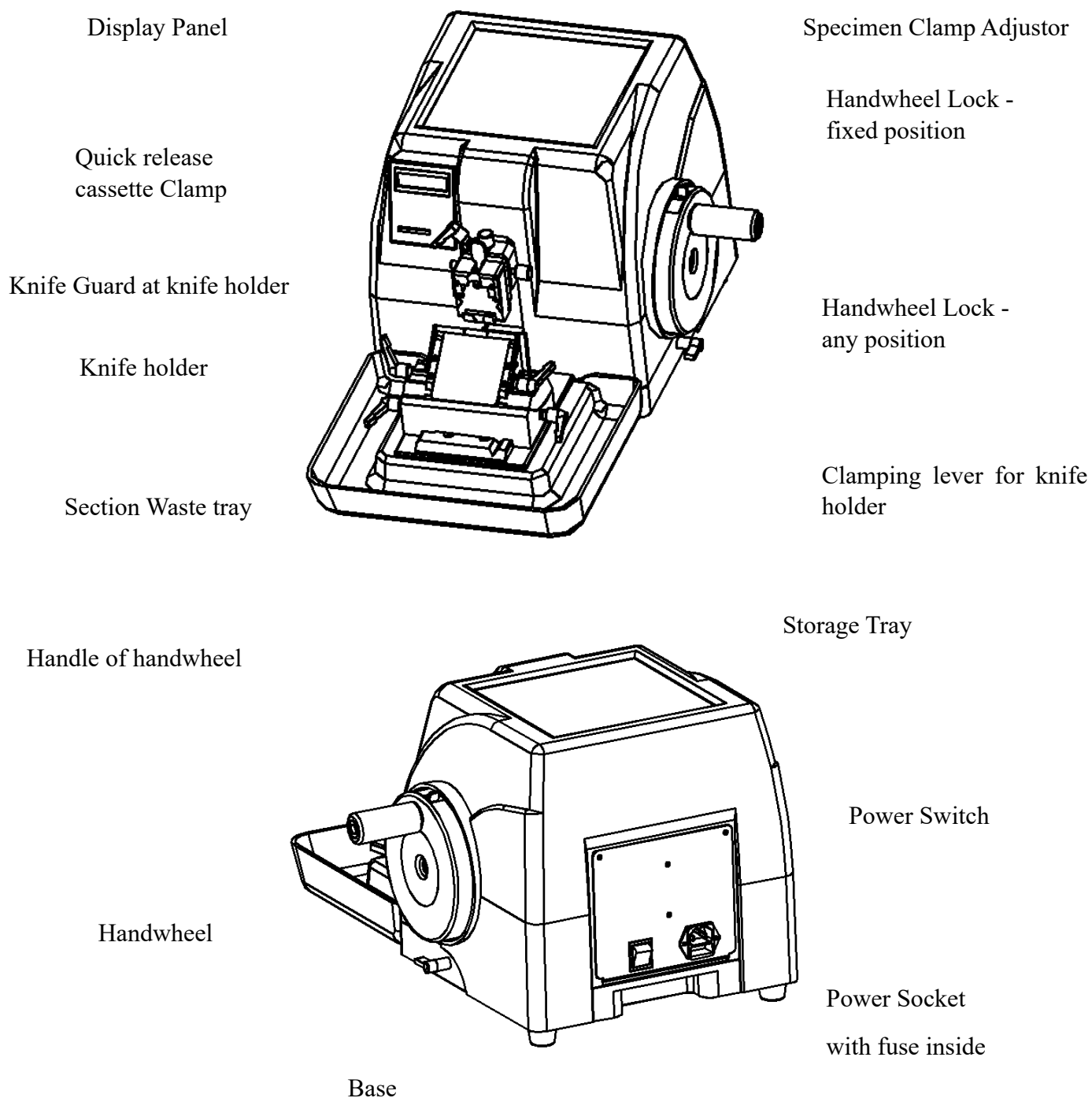
Lift the knife guard (3) upwards to cover the blade's cutting edge, an attempt to avoid personal injury and damage to the blade.

The Left drawing shows knife guard (3) in up-right position, guarding the blade.

- Note: Only authorized and qualified service personnel may remove this safety device. Please keep it in place and always have it in up-right position when not sectioning.

## 2. Performance & Parameters

### 2.1 Overview- Equipment Components



## 2.2 Performance Index

The AEM 450 semiautomatic microtome is an apparatus used for routine histological sectioning. The forward and backward movement of the specimen and the feed are

automatically controlled by the stepper motor, which makes sectioning more accurate and easier to operate, the following are some of its performances:

- ⊙ The housing exterior is constructed from flame-retardant ABS engineering plastic, featuring a streamlined aesthetic design.
- ⊙ Spacious, ingenious assembly section waste tray.
- ⊙ Retraction function makes it easier to section.
- ⊙ Quick release cassette clamp and C-type specimen clamp fit for standard embedding cassette.
- ⊙ Locking may be activated at any position by handwheel locks to ensure safety during cassette change over.

## 2.3 Technical Data

- ⊙ Surroundings requirements:

Working temperature: +10°C—40°C

Working humidity: <80% , defrosting

Working pressure: ( 86 ~ 106 ) KPa

- ⊙ Power supply: 100-240 V AC±10 %

- ⊙ Frequency: 50/60 Hz

- ⊙ Power: <60 VA

⊙ Fuse: 2A

⊙ Safe classify: ClassifyI- type B

⊙ Section thickness: 0 to 600μm

0 to 2μm , 0.5μm increments

2 to 10μm , 1μm increment

10 to 20μm , 2μm increments

20 to 100μm , 5μm increments

100 to 600μm , 50μm increments

⊙ Trimming thickness: 0 to 600μm

0 to 2μm , 0.5μm increments

2 to 10μm , 1μm increment

10 to 20μm , 2μm increments

20 to 100μm , 5μm increments

100 to 600μm , 50μm increments

⊙ Retraction thickness: 20μm

⊙ Specimen horizontal feed: 28mm

⊙ Specimen vertical feed: 70mm

⊙ Maximum specimen: 40x50x30mm, or standard cassette

⊙ Specimen holder adjusted system: Horizontal orientation:  $\pm 8^\circ$

Vertical orientation :  $\pm 8^\circ$

⊙ Repositioning of knife holder base(left-right):50mm

⊙ Electric Coarse Feed Speed: 750 $\mu$ m/s

⊙ Dimension: Length: 550mm

Width: 405mm (without handwheel , 310mm)

Height: 325mm

⊙ Net Weight: about 34kgs

### 3. Preparation before use

#### 3.1 Installation Condition Requirements

- ⊙ Place the equipment on a stable table to ensure that the instrument base remains level while the equipment is in operation.
- ⊙ Maintain a clear workspace around the equipment to prevent potential obstructions that may hinder operation.
- ⊙ The working temperature and humidity must be in accordance with provided technical parameters.
- ⊙ Ensure there is ample space for the handwheel to rotate.

▲ **Attention** : Do not operate in rooms with explosion hazard.

### 3.2 Standard Delivery Configuration

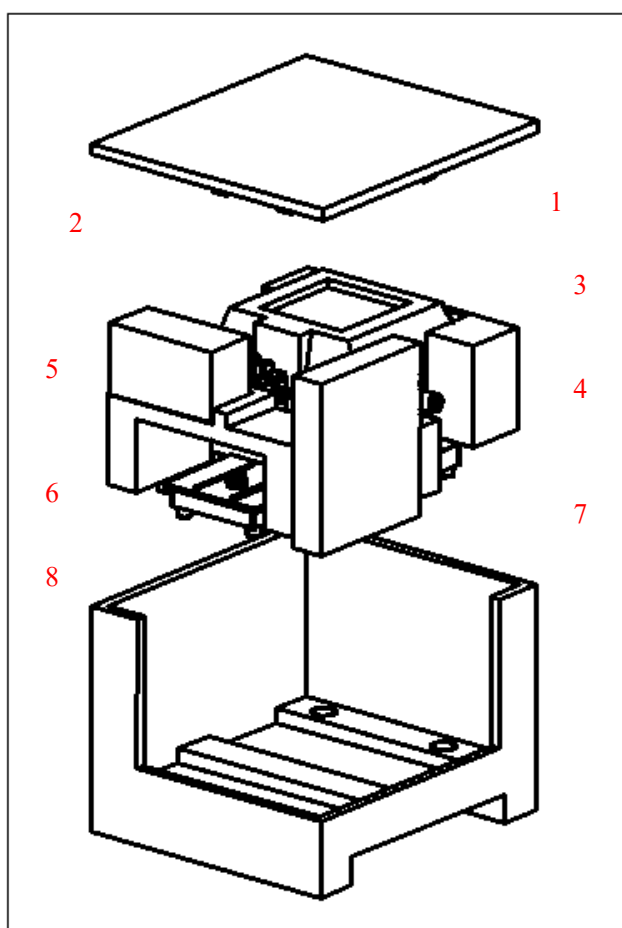
⊙ Microtome (with quick release cassette clamp)	1 unit
⊙ Knife holder	1 set
⊙ C-type Specimen clamp	1 pc
⊙ Waste tray	1 pc
⊙ 2.5 Allen wrench (M3)	1 pc
⊙ 3 Allen wrench (M4)	1 pc
⊙ Dust Cover	1 pc
⊙ Disposable blade	1 box



⊙ Power Cord	1 pc
⊙ Fuse	2 pcs
⊙ Operation Manual	1 pc

● Upon unboxing, please verify the completeness of the standard listing provided above. In the event of any discrepancies or issues, please contact the supplier in time. If you need special configuration or requirements, please specify before ordering.

### 3.3 Installation instructions

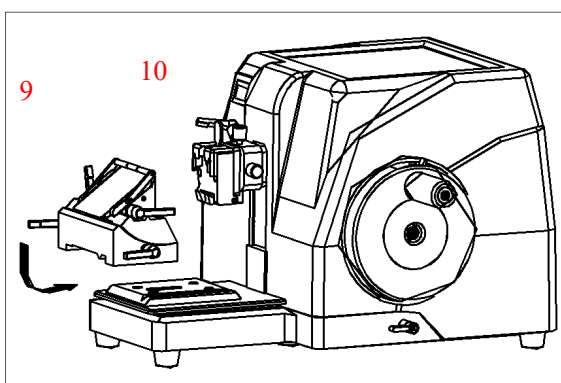


#### 3.3.1 Unpacking

As Figure shows :

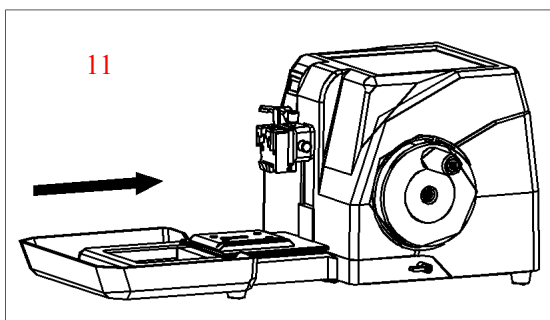
- ⊙ Box Cover ( 1 )
- ⊙ Microtome ( 2 )
- ⊙ Rear support ( 3 )
- ⊙ Waste Tray ( 4 )
- ⊙ Knife holder ( 5 )
- ⊙ Front support ( 6 )
- ⊙ Specimen Clamp ( 7 )
- ⊙ Box Base ( 8 )

Remove the box cover (1), then take parts out in the following order, the knife holder (5), the waste tray (4), standard cassette clamp (7), the front support (6), the rear support (3), and the microtome the last (2). Finally, carefully unwrap all packages for installation.



### 3.3.2 Knife holder

Take the knife holder (9) out from the box, push it along the track as it is shown in the left diagram, then rotate the knife holder locking lever (10) to lock the knife holder.



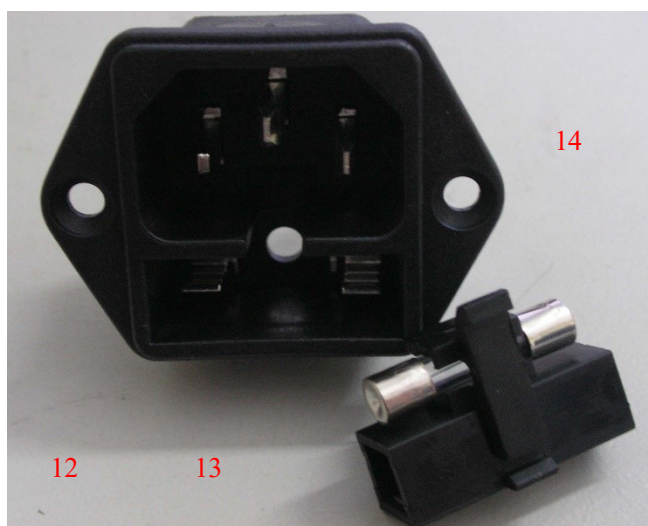
### 3.3.3 Section Waste Tray

Take the waste tray (11) out from the box and push it along the track as it is shown in the left diagram.

## 3.4 Electrical Connection Setup

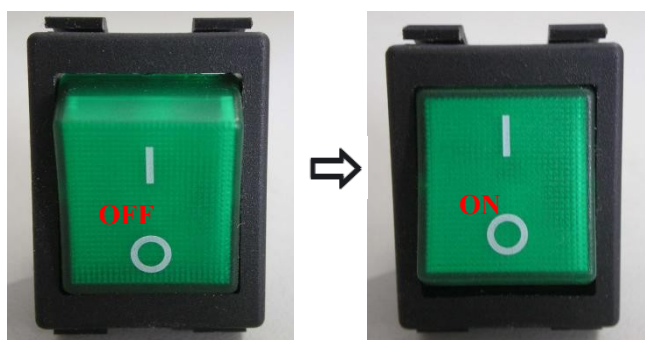
- The input voltage is set before exiting factory. Prior to installation, please check that this setting complies with the local power requirements of your laboratory, as incompatible voltage may cause damage to the equipment.

- For safety during instrument operation, the power supply must be equipped with a grounding wire, adhering to safety standards.
- Please use supplied power cord; in the event of replacement, must use power cord equipped with a grounding wire.



- Insert fuse (14) into installation part (13) and then place the entire installation part (13) into the socket (12).

• **Attention:** Ensure power is off before replacing the fuse. To ensure trouble-free operation, please comply with the instructions outlined in the operation manual.



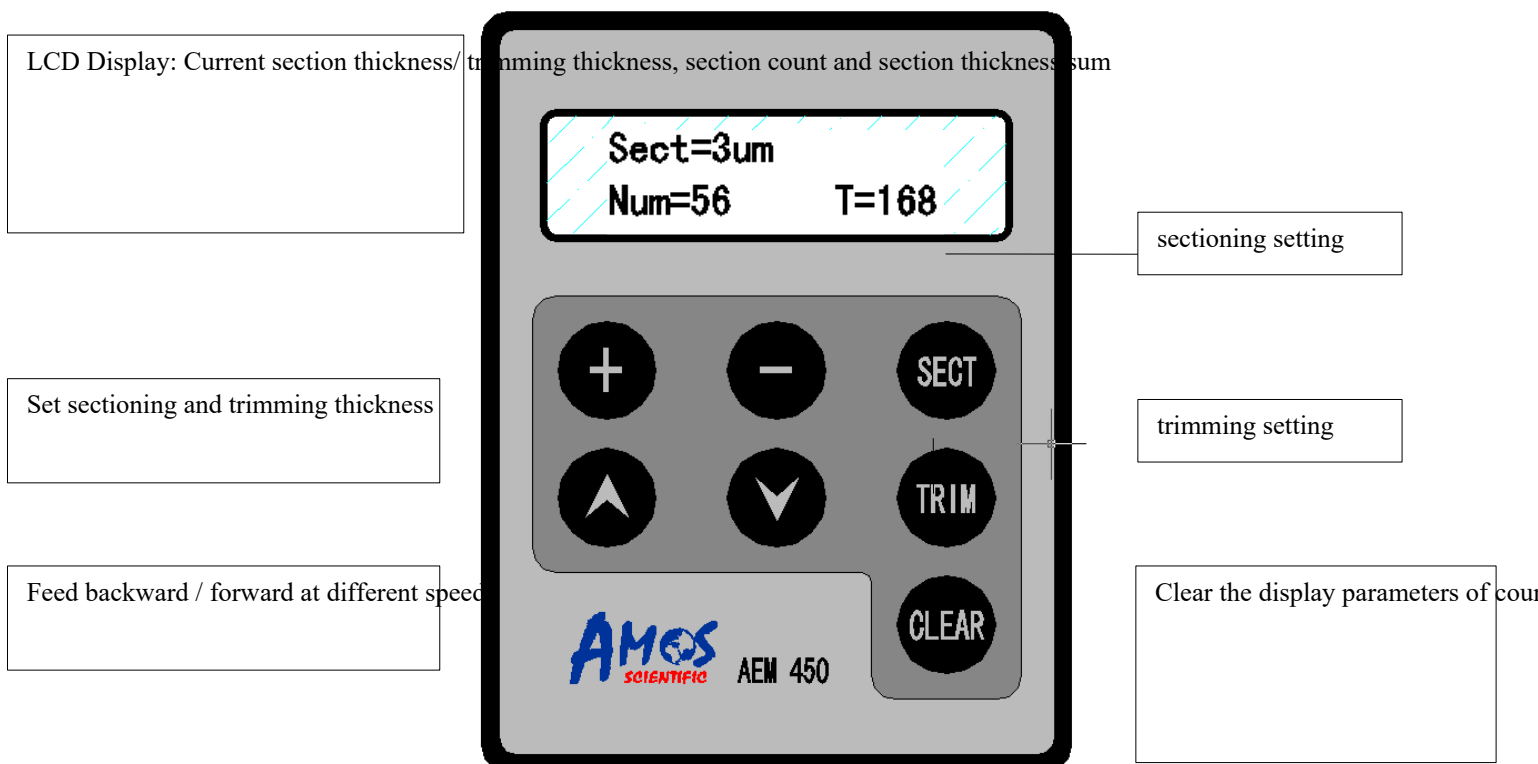
- Left image shows power off and the right image shows power on.

- Upon turning on the power switch, the LCD screen on the panel will initiate display. Simultaneously, the specimen clamp will automatically perform a zeroing action. Upon completion, a single beep from the buzzer will signal the process's conclusion.

## 4. Operation

### 4.1 Control Panel Functions

All the operating parameters are set and displayed through the operating panel, which can be used to control the operation after switching on, and the keys on it are described as follows:



The LCD window shows two lines of white text on blue background.

**Sect=3um**  
**Num=56      T=168**

The first line displays: *Current set value of section Thickness/Trimming section thickness setting*

The second line displays: *Section/Trimming count and section thickness sum.*

- When switched on, the system shows trimming status by

default.



**SECT:** Activate the sectioning mode to set the sectioning value.

**TRIM:** Activate the trimming mode to set the trimming value.

- Upon startup, the displayed sectioning and trimming values represent the settings from the machine's last shutdown.



### **CLEAR button**

Clear the display (section count or section thickness sum) to 0.

- Upon start up, the system will automatically clear section count and sum thickness value.

### **Buttons for setting the section thickness / trimming thickness**



Section thickness setting range : 0 $\mu$ m to 600 $\mu$ m

Setting values: From 0 $\mu$ m to 2 $\mu$ m , in 0.5 $\mu$ m increments

From 2 $\mu$ m to 10 $\mu$ m , in 1 $\mu$ m increments

From 10 $\mu$ m to 20 $\mu$ m , in 2 $\mu$ m increments

From 20 $\mu$ m to 100 $\mu$ m , in 5 $\mu$ m increments

From 100 $\mu$ m to 600 $\mu$ m , in 50 $\mu$ m increments

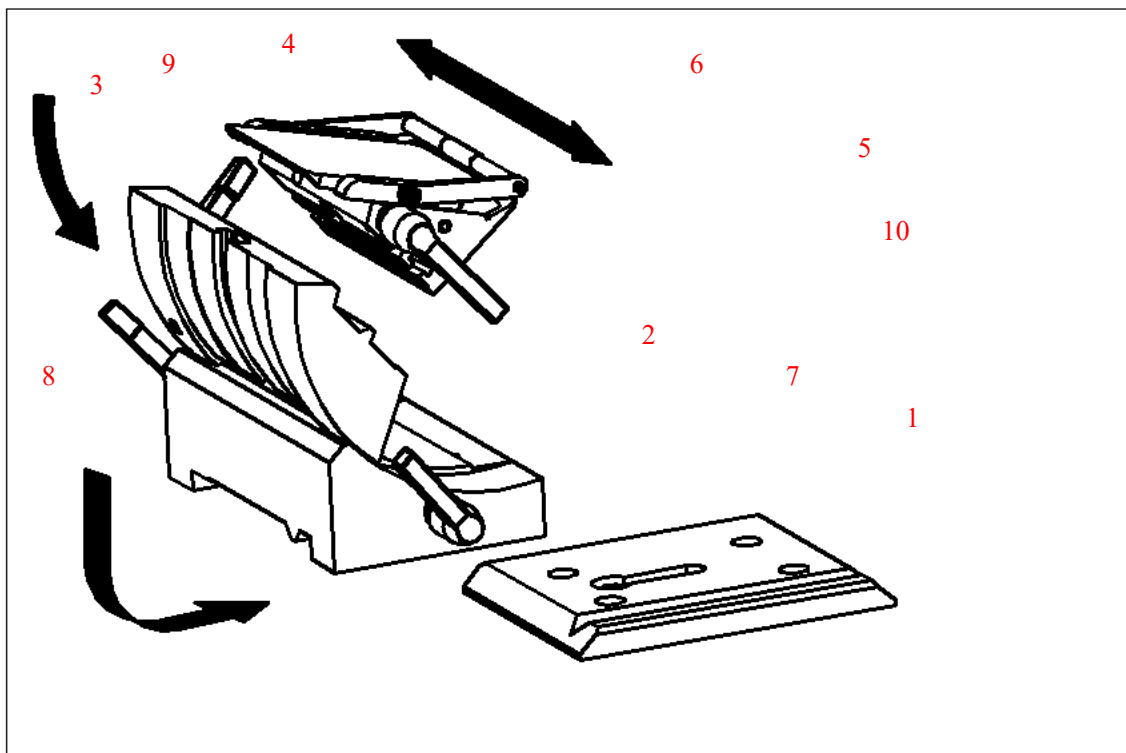


### **Buttons for backward/forward feed**

With backwards and forward feed, quickly adjusts the position of the specimen for coarse feed, with speed at  $750\mu\text{m/s}$ .

- If the specimen displacement exceeds 28mm, the buzzer will sound an alarm and the feed movement will stop.

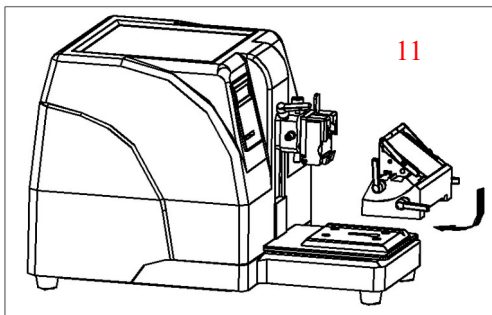
## 4.2 Knife Holder installation



As the diagram shows , the knife holder is composed of the following parts : Z axis slider ( 1 ) , Y axis slider ( 2 ) , X axis slider ( 3 ) , clamp 2 ( 4 ) , clamp 1 ( 5 ) , knife guard ( 6 ) , lever 2 ( 7 ) , lever 2 ( 8 ) , lever 2 ( 9 ) , lever 1 ( 10 ) .

⊙ Insert Y axis slider ( 2 ) into the track of Z axis slider ( 1 ) , and then rotate lever 2

- (7) until the slider is securely clamped, rotate the adjustable handle of lever 2 ( 7 ) to horizontal position.
- ⊙ Rotate X axis slider (3) to slide into Y axis slider (2), and then rotate lever 2 (8) until slider is securely clamped, rotate the adjustable handle of lever 2 (8) to horizontal position.
  - ⊙ Place clamp (4) and clamp (5) on X axis slider (3), and then rotate lever 2 (9) to lock , rotate the adjustable handle of the lever 2 ( 9 ) to the vertical position.
  - ⊙ Rotate Lever 1(10) to lock clamp 2 ( 4 ) and clamp 1 ( 5 ) .
  - ⊙ Turn the knife guard (6) up to cover the cutting edge for safety consideration.

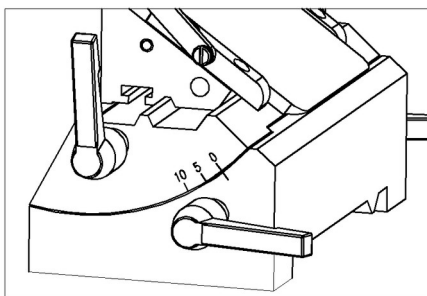


#### Knife holder and the equipment base

Insert the knife holder (11) along the track of the base (12), and then rotate lever 2 (7) to lock, then adjust the adjustable handle of lever 2 (7) to horizontal position.

▲ **Attention:** Always remove the knife before detaching the knife holder from the instrument. Always put the knife back into the knife case when not in use.

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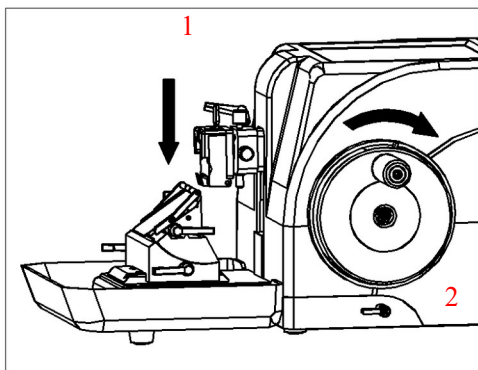


Tighten the knife holder and the base holder using the four levers and adjust the rotating angle as requirement before tightening it.

The rotating angle is from 0 to 10 degrees (as shown in left diagram), the user can adjust the angle in this range according to requirement.

▲ **Caution :** Take care when operating the knife holder and the blade. The cutting edge is extremely sharp and can cause serious injury.

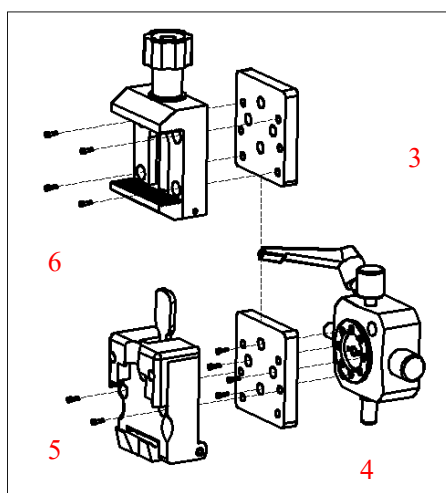
### 4.3 Specimen Clamp System



As shown in the left diagram, the handwheel (2) is linked to the specimen clamping system (1), and the specimen clamping system moves vertically up and down when the handwheel is rotated.

- Always turn the handwheel in clockwise direction to obtain best sectioning results.

As the drawing shows, the specimen clamping system is made up of an adjustor (3), a connecting joint (4) and 2 clamps (5&6).



There are two types of clamps: C-type specimen clamp (6) and Quick release cassette clamp (5).

**C-type Specimen clamp is fit for :**

Dimension of specimen: 40\*50\*30mm or  
the standard cassette.

**Quick release cassette clamp is fit for:**

Standard cassette.

As shown in the left figure, the components are fastened by screw connections. Replace the clamp by loosening the screws between the clamp and the joint,



then replace with another specimen clamp.

### The specimen clamp adjustor

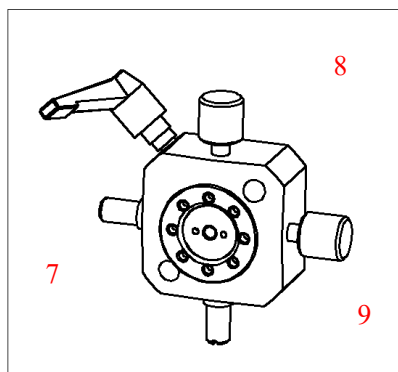
Loosen lever 1 (7) and adjust the vertical knob (8) to calibrate the vertical angle of the specimen; and the horizontal adjusting knob (9) can be used to adjust the horizontal angle of the specimen.

After adjustment, rotate lever 1 (7) to tighten it.

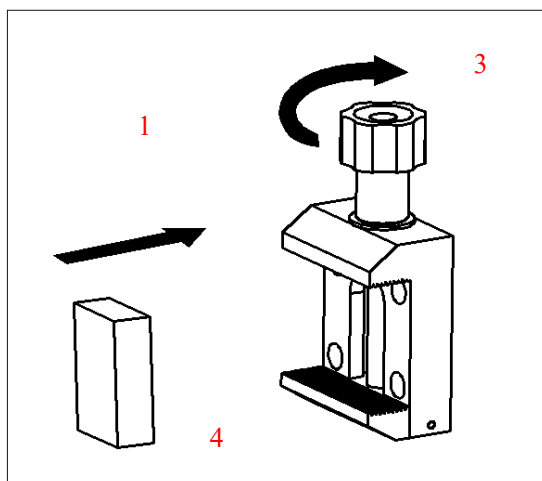
Specimen adjusting system:

horizontal orientation:  $\pm 8^\circ$

vertical orientation :  $\pm 8^\circ$



## 4.4 Specimen Clamp/Blade Installation



### Specimen Clamp

Specimen Clamp is available in two types : C-type specimen clamp ( 1 ) and Quick release cassette clamp ( 2 ) .

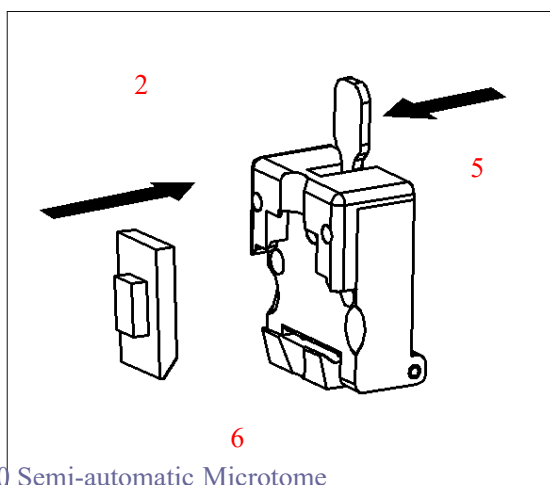
#### C-type specimen clamp :

Put the specimen (4) into the clamp (1) as shown in the diagram. Rotate the knurled screw (3) in clockwise direction to tighten the clamp. Take down the specimen by rotating the knurled screw in counterclockwise direction.

#### Quick release cassette clamp:

As shown in the figure, push the handle (5) in the illustrated direction, the clamp (2) opens, to put in the specimen (6). Loosen the handle (5), the specimen (6) will be securely fixed. Remove the specimen in the same way.

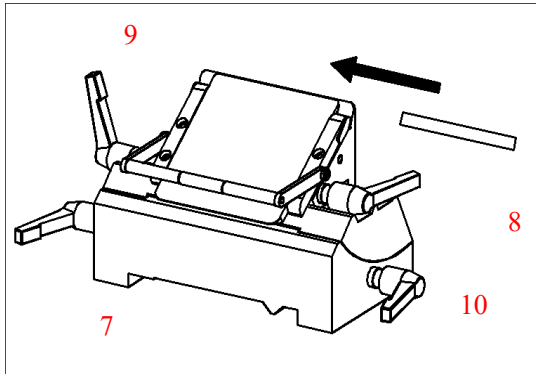
You can change the specimen with one hand, quick and easy operation with the quick release



cassette clamp.

- Always clamp the specimen before installing the knife to avoid injury.

### Blade Installation



Install the blade as shown in the figure, first rotate lever 1 (10) to loosen it, then slide the blade (8) into the knife holder (7) in the illustrated direction. Rotate lever 1 (10) vertically to clamp the blade.

There are two types of blade profiles applicable: the Low disposable blade as the figure illustrates and the High disposable blade.

To use the high disposable blade, unscrew the two screws on the blade plate (9) and remove the plate (9).

- Take care when operating the knife holder and the blade. The cutting edge is extremely sharp and can cause serious injury.

### 4.5 Trimming



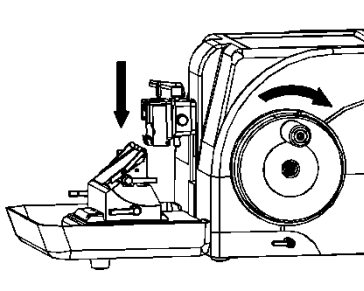
- ⊙ Press TRIM key, the LCD screen will display the trimming setting.



- ⊙ Set the trimming thickness using the plus and minus buttons.



- ⊙ Press these buttons to adjust the specimen position back and forth to align with the blade edge.



- ⊙ Once the above steps have been completed, check and ensure that all locking levers on the knife holder, on the base and on the specimen clamping system have been tightened. Lastly, unlock the right handwheel to trim.

- Before changing the specimen and the blade, the specimen clamp must be placed on top and locked in place.

## 4.6 Sectioning



- ⊙ Press SECT key, the LCD screen will display the sectioning setting.



- ⊙ Set the sectioning thickness using the plus and minus keys.
- ⊙ After finishing the above two steps, begin sectioning.

A high-quality microtome and a good microtome knife are prerequisites for obtaining good quality sectioning. Factors affecting the quality of sections are:

- a. The hardness of the specimen
- b. The angle of the cutting blade
- c. Whether the blade is clamped tight
- d. Whether the specimen is clamped tight

### **Operational Manual for Sectioning Knife Angle Adjustment:**

Begin by selecting the angle of the sectioning knife relative to the specimen; a smaller angle results in less compression, while the hardness of the specimen determines the ideal angle, the harder the specimen, the greater the knife angle. If sectioning results are unsatisfactory, gradually increase the angle from 0° and assess the sections at each adjustment.

There is no universal rule for determining the proper angle for different specimens; the key is experimentation. Iterate the angle until achieving high-quality sections, making this trial-and-error process integral to obtaining consistent sectioning excellence. Always adhere to safety protocols and equipment specifications during the sectioning process, following the manufacturer's guidelines for the equipment in use.

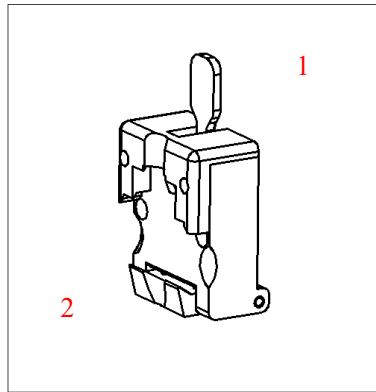
- After sectioning, place the specimen clamping system on the top position and lock it. Take out the blade and store it in the blade storage box when not in use.

## **5. Cleaning & Maintenance**

### **5.1 Cleaning the equipment**

#### **⊙ External cleaning**

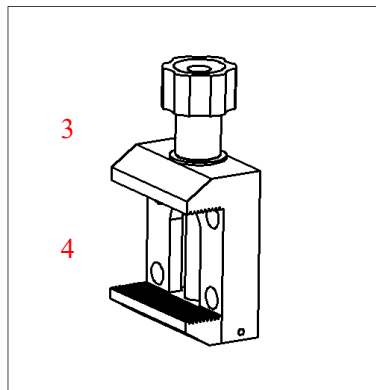
Clean the instrument's exterior with a dry cloth, ensuring effective removal of dust. In areas that require more thorough cleaning, a damp cloth may be necessary, focusing on frequently touched components, such as the right-hand wheel handle, machine base locking lever, and storage platform on the housing.



### ☉ Cleaning the Clamp

#### Quick release cassette clamp

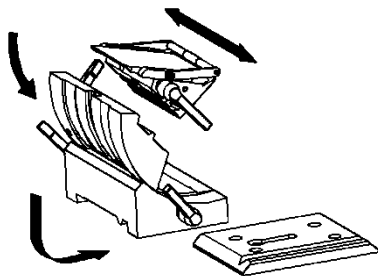
The depicted quick specimen clamp head (1) and the constant contact point for specimens (2) require regular cleaning to prevent potential contamination and maintain optimal functionality, with a particular emphasis on keeping position (2) clean.



#### C-type specimen clamp

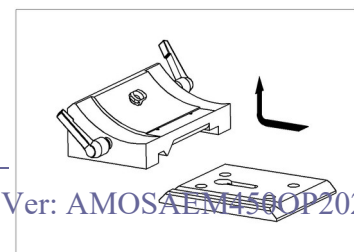
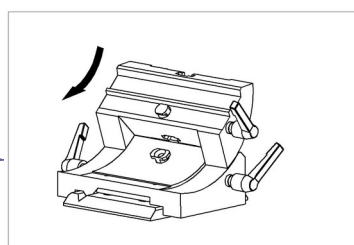
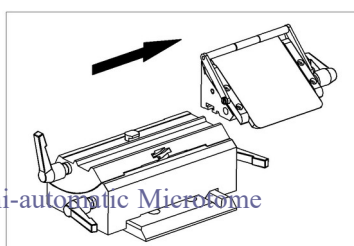
The depicted C-type specimen clamp head is often touched at position (3) during operation, while specimens consistently contact position (4). Regular cleaning is essential to prevent contamination and ensuring smooth functioning. Emphasis on maintaining cleanliness at position (4) is particularly crucial.

### ☉ Cleaning the knife holder



As shown, each knife holder component is detachable for separate cleaning. The slide rails, locking lever, blade clamp, and connecting parts are susceptible to contamination. It's particularly crucial to clean the blade clamp before each installation to prevent compromised blade tightness and ensure high-quality sections.

Follow the illustration, rotate the corresponding levers to disassemble into: Clamp, X-axis slider, Y-axis slider and Z-axis slider.

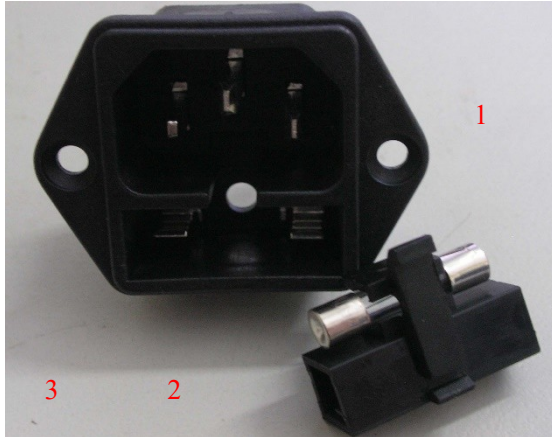


The cleaning and maintenance of the equipment is a prerequisite for obtaining high-quality sections. Therefore, users can perform regular or occasional cleaning of the instrument based on the volume of their respective sectioning needs. This ensures the attainment of superior-quality sections.

- The cleaning and maintenance of the equipment must be carried out by authorized and qualified service personnel.
- Prior to cleaning and maintenance, the equipment must be turned off, the power cord unplugged, and the knife holder removed for separate cleaning. It is also essential to remove the blade from the knife holder before cleaning.
- The handwheel must be locked before initiating the cleaning and maintenance procedure.
- Do not use corrosive liquids to clean the instrument.
- Ensure that no liquids enter equipment during the cleaning and maintenance process.
- Following cleaning and maintenance, the instrument must stay power off until completely dry.

## 5.2 Maintenance

### ⊙ Replacing the Fuse



- Insert fuse (1) into installation part (2) and then place the entire installation part (2) into the socket (3).

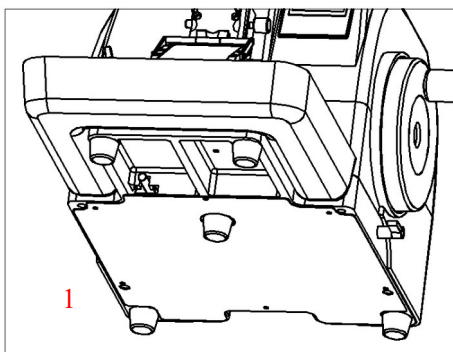
- Ensure power is unplugged before replacing the fuse.

**Attention:** Before changing the fuse, please refer to the operation manual. Make sure the specified fuse type is used.

### ⊙ Maintenance for the knife holder

Regular maintenance is required for levers, the fixed device of the knife holder, and other frequently used and susceptible-to-wear parts. Remove the lever and apply lubricant to prolong their service life.

### ⊙ Balance



The equipment's balance, regulated by an internal spring connected to the wheel, can be affected by changes in temperature, humidity, and long-term stress on the spring, leading to an imbalance in rotation. To address this issue, lift the bottom of the equipment and rotate the nut (1) as shown in the diagram.

- Please note that it is essential to lock the right-hand wheel and remove the knife holder before performing this operation.

## 6. Trouble Shooting

The following are some common problems as well as the causes and solutions. These faults are mostly caused by improper use by the operator, please be sure to read the operation manual carefully before use.

Problem	Possible cause	Solution
<ul style="list-style-type: none"> <li>• No response after switching on</li> </ul>	<ul style="list-style-type: none"> <li>• The mains cable is not securely plugged in or the mains cable is disconnected.</li> </ul>	<ul style="list-style-type: none"> <li>• Re-connect the mains plug or replace the mains cable.</li> </ul>
	<ul style="list-style-type: none"> <li>• The fuse is not installed or has blown.</li> </ul>	<ul style="list-style-type: none"> <li>• Re-install referring to the Operation Manuel section 5.2; or replace the fuse.</li> </ul>
	<ul style="list-style-type: none"> <li>• The input voltage marked on the instrument does not correspond to the ambient voltage.</li> </ul>	<ul style="list-style-type: none"> <li>• Check the ambient voltage if it does not match, request a service professional.</li> </ul>
<ul style="list-style-type: none"> <li>• Uneven sectioning (from the second section)</li> </ul>	<ul style="list-style-type: none"> <li>• The sectioning angle is too small.</li> </ul>	<ul style="list-style-type: none"> <li>• With missed cut, undue pressure may be exerted on the specimen, resulting in thicker sections in subsequent cutting cycles. Optimal sectioning angles can be determined through experimental exploration of various angles.</li> </ul>
	<ul style="list-style-type: none"> <li>• The clamp is unstable.</li> </ul>	<ul style="list-style-type: none"> <li>• inspect all screw connections and clamping mechanisms. If necessary, readjust to ensure proper functioning. This will maintain the precision of the sectioning process.</li> </ul>
<ul style="list-style-type: none"> <li>• Sections are not continuous</li> </ul>	<ul style="list-style-type: none"> <li>• The paraffin wax is too hard.</li> </ul>	<ul style="list-style-type: none"> <li>• Re-embedding Specimens in Low Melting Point Paraffin: Immerse the specimen in low melting point paraffin or submerge the entire embedding block into the paraffin. Trim the embedding block to ensure a thin "adhesive" layer remains on both the top and bottom surfaces of the block.</li> </ul>



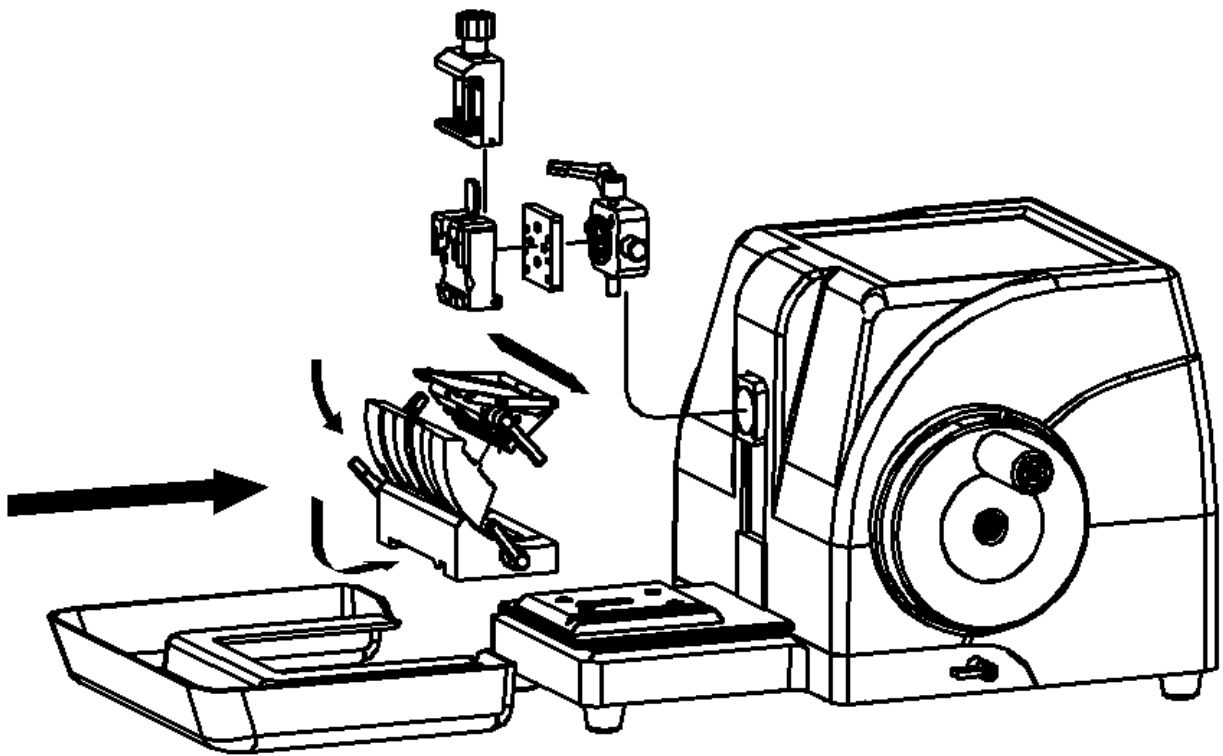
	<ul style="list-style-type: none"> <li>The sectioning angle is too large.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize tilt of the blade for embedded blocks.</li> </ul>
	<ul style="list-style-type: none"> <li>The sectioning thickness is too large.</li> </ul>	<ul style="list-style-type: none"> <li>Adjust the thickness of the sectioned material.</li> </ul>
	<ul style="list-style-type: none"> <li>The blade is blunt.</li> </ul>	<ul style="list-style-type: none"> <li>Replace and rearrange blade.</li> </ul>
	<ul style="list-style-type: none"> <li>Other reasons.</li> </ul>	<ul style="list-style-type: none"> <li>Smooth section using a soft brush.</li> </ul>
<ul style="list-style-type: none"> <li>Sections are bent or damaged</li> </ul>	<ul style="list-style-type: none"> <li>Wax blocks shaped as wedges.</li> </ul>	<ul style="list-style-type: none"> <li>Alignment of Embedded Blocks: Adjust the embedded block to ensure that its top and bottom surfaces are parallel to each other, with equal width.</li> </ul>
	<ul style="list-style-type: none"> <li>Embedding blocks not parallel to the blade.</li> </ul>	<ul style="list-style-type: none"> <li>Parallel Alignment with Sectioning Blade: Utilize the specimen holder adjustment to align the top and bottom surfaces of the embedded block parallel to the cutting edge of the sectioning blade.</li> </ul>
	<ul style="list-style-type: none"> <li>Irregular cutting blade edge.</li> </ul>	<ul style="list-style-type: none"> <li>Lateral Movement of Sectioning Blade: Move the sectioning blade laterally until there are no irregular blade edges remaining for sectioning.</li> </ul>
	<ul style="list-style-type: none"> <li>Varying viscosity in embedded paraffin.</li> </ul>	<ul style="list-style-type: none"> <li>Removal of Uneven Paraffin.</li> </ul>
	<ul style="list-style-type: none"> <li>External factors causing temperature discrepancies. (Be mindful of external factors such as light sources, heaters, or ventilation systems)</li> </ul>	<ul style="list-style-type: none"> <li>Avoiding Unfavorable Conditions: Exercise caution to prevent placement under adverse conditions. Ensure the sectioning machine is positioned in a uniformly heated area, allowing both the embedded block and the sectioning machine to reach the specified temperature.</li> </ul>
<ul style="list-style-type: none"> <li>Sections</li> </ul>	<ul style="list-style-type: none"> <li>Blunt blade.</li> </ul>	<ul style="list-style-type: none"> <li>Sharpening the Blade: To enhance cutting</li> </ul>

excessively compressed and wrinkled – jammed together		performance, either re-sharpen the blade, replace the sectioning blade, or adjust its position laterally.
	<ul style="list-style-type: none"> <li>Excessive room temperature.</li> </ul>	<ul style="list-style-type: none"> <li>Cooling Embedded Blocks and Sectioning Blade: Before sectioning, cool the prepared embedded blocks and the sectioning blade in very cold water or ice water. Alternatively, use "soft-hard" paraffin to re-embed the tissue.</li> </ul>
	<ul style="list-style-type: none"> <li>Inadequate tile angle of the knife.</li> </ul>	<ul style="list-style-type: none"> <li>Increasing Angle by Grinding the Embedding Block's Inclined Surface</li> </ul>
	<ul style="list-style-type: none"> <li>Contamination from paraffin residue on the knife.</li> </ul>	<ul style="list-style-type: none"> <li>Cleaning the Sectioning Blade: Wipe both sides of the sectioning blade with a wet cotton cloth and cleaning solution. When cleaning the blade, wipe from the base towards the blade edge; never wipe downward from the blade edge to avoid damaging the blade and posing a significant risk of injury.</li> </ul>
	<ul style="list-style-type: none"> <li>Damage to sections due to repeated paraffin usage.</li> </ul>	<ul style="list-style-type: none"> <li>Re-embedding with New Paraffin: Replace the existing paraffin and re-embed the specimen.</li> </ul>
<ul style="list-style-type: none"> <li>Fragmented sections and/or Specimen Tear</li> </ul>	<ul style="list-style-type: none"> <li>Incomplete dehydration or improper cleaning.</li> </ul>	<ul style="list-style-type: none"> <li>Dehydration or Cleaning Procedure: Before proceeding, ensure thorough dehydration or cleaning of the specimen.</li> </ul>
	<ul style="list-style-type: none"> <li>Soft and paste-like specimen appearance indicating incomplete paraffin infiltration.</li> </ul>	<ul style="list-style-type: none"> <li>Re-permeation of Paraffin and Re-embedding: In cases of incomplete dehydration (which is rarely recoverable), it is imperative to re-permeate the paraffin and re-embed the specimen.</li> </ul>
	<ul style="list-style-type: none"> <li>Residual alcohol before paraffin infiltration.</li> </ul>	<ul style="list-style-type: none"> <li>Alcohol Removal: Remove any traces of alcohol from the specimen.</li> </ul>
	<ul style="list-style-type: none"> <li>Prolonged exposure or</li> </ul>	<ul style="list-style-type: none"> <li>Difficulty in Salvaging Irreversibly</li> </ul>

	excessive heat in paraffin bath.	Damaged Tissues: Multiple instances of irreversible damage to tissues may pose challenges in salvaging them.
	<ul style="list-style-type: none"> <li>Excessive hardness of tissue for paraffin.</li> </ul>	<ul style="list-style-type: none"> <li>Re-embedding in Plastic (Histo Resin) or "Soft-Hard" Paraffin: Consider re-embedding the specimen (tissue) in plastic (Histo Resin) or "soft-hard" paraffin.</li> </ul>
<ul style="list-style-type: none"> <li>Splitting or scratches along the length of the section</li> </ul>	<ul style="list-style-type: none"> <li>Blade has notches.</li> </ul>	<ul style="list-style-type: none"> <li>Blade Maintenance: Utilize the alternative section of the sectioning blade or replace the sectioning blade as needed.</li> </ul>
	<ul style="list-style-type: none"> <li>Contamination of the blade.</li> </ul>	<ul style="list-style-type: none"> <li>Cleaning: Ensure proper cleaning of equipment.</li> </ul>
	<ul style="list-style-type: none"> <li>Scratches caused by hard particles, especially wax contaminants.</li> </ul>	<ul style="list-style-type: none"> <li>Filtration and Gradual Pouring of Paraffin: Filter the paraffin and pour it slowly to prevent impurities.</li> </ul>
	<ul style="list-style-type: none"> <li>Presence of calcium or silica particles on embedded blocks.</li> </ul>	<ul style="list-style-type: none"> <li>Calcium or Silica Removal: Remove calcium deposits or eliminate silica content as necessary.</li> </ul>
<ul style="list-style-type: none"> <li>Section sticking to the blade</li> </ul>	<ul style="list-style-type: none"> <li>Possible contamination with the blade.</li> </ul>	<ul style="list-style-type: none"> <li>Cleaning: Ensure proper cleaning of equipment.</li> </ul>
<ul style="list-style-type: none"> <li>Noise and sections are being scratched, displaying noticeable traces of vibration.</li> </ul>	<ul style="list-style-type: none"> <li>Improper inclination of the sectioning blade.</li> </ul>	<ul style="list-style-type: none"> <li>Re-install the blade and adjust its tilting angle.</li> </ul>
<ul style="list-style-type: none"> <li>Wavy sectioning surface</li> </ul>	<ul style="list-style-type: none"> <li>Improper inclination of the sectioning blade.</li> </ul>	<ul style="list-style-type: none"> <li>Readjust the tilt.</li> </ul>
<ul style="list-style-type: none"> <li>Sections detaching and sticking either to or nearby objects.</li> </ul>	<ul style="list-style-type: none"> <li>electrostatic influence</li> </ul>	<ul style="list-style-type: none"> <li>Air humidity must be increased to remove static electricity.</li> </ul>

**If other malfunctions persist or the above issues cannot be resolved, please contact the company for assistance.**

## 7. Instrument Diagram



## **Standard accessories list**

### **AEM450**

No	Accessory Name	Qty	Notes
1	Microtome	1 unit	
2	Blade Holder	1 set	
3	Specimen Clamp	1 set	
4	Waste Tray	1 pc	
5	M3 Allen Wrench	1 pc	
6	M4 Allen Wrench	1 pc	
7	Dust Cover	1 pc	
8	Disposable blade	1 box	
9	Power cord	1 pc	
10	Fuse	2 pcs	2A
11	Operation Manual	1 pc	

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