

# **AEM 480** (Version: AMOSAEM4800P20231205)

# **Fully-automatic Microtome**

# **Operation Manual**

AMOS SCIENTIFIC PTY.LTD. ABN37 159 778 140

www.amos-scientific.com



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

AEM480 Motorized 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 post-sale service. 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.

## Contents

1. Safety Notes	1
<ul><li>1.1 Overview</li><li>1.2 Safety Warning</li><li>1.3 Safety Devices</li></ul>	1 1 3
2. Performance & Parameters	4
<ul><li>2.1 Overview-Instrument Components</li><li>2.2 Performance Index</li><li>2.3 Technical Data</li></ul>	4 5 5
3. Preparation before use	7
<ul> <li>3.1 Installation Condition Requirements</li> <li>3.2 Standard Delivery Configuration</li> <li>3.3 Installation Instructions</li> <li>3.4 Electrical Connection Setup</li> </ul>	7 7 8 9
4. Operation	10
<ul> <li>4.1 Control Panel Functios</li></ul>	10 14 15 16 17 19
5. Cleaning & Maintenance	20
<ul><li>5.1 Cleaning</li><li>5.2 Maintenance</li></ul>	20 22
6. Trouble Shooting	23
7. Instrument Diagram	26



#### 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.

**1** 

**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 Warnings**

The following safety warnings concern aspects related 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-Transport and Installation

• The instrument must always be transported or moved in an upright position, ensuring that the tilt angle does not exceed  $45^{\circ}$ 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 you need to replace it, ensure that the replacement cord has an earth wire to maintain safe operation.

• Don't operate in rooms with present 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-Operation**

• Take special care when handling the 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- Maintenance and Cleaning

• 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 diagram shows: Lever (1) in locking position; lever (2) in open position.

When in the locked state, the LOCK indicator light on the instrument's display panel will be illuminated. In this state, sectioning operations cannot be performed.

• 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.

----3----





#### 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.

#### **Emergency Stop Function**

The Emergency Stop Switch (4) is designed for immediate cessation of the equipment's main power. Pressing this switch will cut off the power supply, bringing all operations to a halt. To release, rotate the switch in the direction indicated by the arrow until the button pops out.

• This function is essential for use in emergency situations. Follow the correct sequence: Activate



Emergency Stop Switch---Turn Off Power Switch---Release Emergency Stop Switch---Turn On Power Switch

#### 2. Performance & Parameters





#### **2.2** Performance Index

AEM480 is a motorized rotary microtome. The specimen's movement, feeding, and handwheel rotation for sectioning are automatically controlled by a stepper motor, ensuring high precision and user-friendly operation. This automated system guarantees consistent and accurate results, making the sectioning process efficient and reliable.

- The housing exterior is constructed from flame-retardant ABS engineering plastic, featuring a streamlined aesthetic design.
- $\odot$  Spacious, ingenious assembly section waste tray.
- $\odot$  Retraction function makes it easier to section. The retraction value can be set.

 $\odot$  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.
- The specimen coarse feed movement offers two speeds, providing greater convenience during specimen handling.
- $\odot$  Utilize the independent control panel for seamless and convenient operation.
- Three motorized sectioning modes (Cont, Single and Step) are available, for flexible user control.
- Benefit from the automatic coarse feed feature, boosting efficiency, especially during extensive sectioning processes.

#### 2.3 Technical Data

⊙ Surroundings requirements:

Working temperature:  $+10^{\circ}\text{C}$ — $40^{\circ}\text{C}$ Working humidity: <80%, defrosting Working pressure: (86~106) kPa.

- $\odot$  Power supply: 100-240 V AC±10 %
- ⊙ Frequency: 50/60 Hz
- $\odot$  Power: <60 VA
- $\odot$  Fuse: 3 A
- $\odot$  Safe classify: Classify I type B
- $\odot$  Section thickness: : 0 to 600 $\mu$ m



0 to  $2\mu m$ , 0.5 $\mu m$  increments 2 to 10µm, 1µm increment 10 to 20µm, 2µm increments 20 to 100µm, 5µm increments 100 to 600µm, 50µm increments  $\odot$  Trimming thickness: 0 to 600 $\mu$ m 0 to  $2\mu m$ , 0.5 $\mu m$  increments 2 to 10µm, 1µm increment 10 to 20µm, 2µm increments 20 to 100µm, 5µm increments 100 to 600µm, 50µm increments • Retraction thickness: 5-100μm. 5μm increments (can deactivate) • Specimen horizontal feed: 28mm ⊙ Specimen vertical feed: 70mm • Maximum specimen: 40x50x30mm, or standard cassette  $\odot$  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: 300µm/s (Slow) and 900µm/s (Quick)  $\odot$  cutting speed: 100-420mm/s $\pm$ 10% ⊙ Dimension: Length: 550mm Width: 405mm (without handwheel, 310mm) Height: 325mm • Net Weight: about 37kgs



#### 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.
- $\odot$  Ensure there is ample space for the handwheel to rotate.

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

#### **3.2** Standard Delivery Configuration

$\odot$ Microtome (with quick release cassette clamp)	1 unit
⊙ Knife holder	1 set
⊙ C-type Specimen clamp	1 pc
$\odot$ Waste tray	1 pc
$\odot$ Separate Control Panel with connection cable	1 pc
$\odot$ Foot switch with cable	1 pc
$\odot$ 2.5 Allen wrench (M3)	1 pc
$\odot$ 3 Allen wrench (M4)	1 pc
$\odot$ Dust Cover	1 pc
$\odot$ Disposable blade	1 box
$\odot$ Power Cord	1 pc
$\odot$ Fuse	2 pcs
$\odot$ Operation Manual	1 pc

• Please carefully check out the supply with the packing list after open the carton. If you have any doubt, immediately contact the seller. If the client has any special requirement, please illuminate it before order.

---7---

**3.3 Installation Instructions** 



# 





#### 3.3.1 Unpacking

As Figure shows:

- $\odot$  Box Cover (1)
- $\odot$  Microtome (2)
- $\odot$  Rear support (3)
- $\odot$  Waste Tray (4)
- $\odot$  Knife holder (5)
- $\odot$  Front support (6)
- $\odot$  Specimen Clamp (7)
- $\odot$  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

#### Ver:AMOSAEM480OP20231205

AEM480 F



shown in the left diagram.





#### **3.4 Electrical Connection Setup**

#### **3.4 Separate Control Panel**

Remove the control handle (12) and communication cable (13) from the packaging box. As illustrated in the diagram, insert the plug at the end of the communication cable into the socket (14) at the rear of the instrument. Securely fasten the two screws on the plug to ensure a stable connection.

• Note: Ensure secure connection of Control Panel to the equipment for normal functioning.

#### 3.3.5 Foot Switch installation

Take out the foot switch (16)from box. As diagram shows, insert the cable plug into socket (15) located at the rear. Secure the connection firmly by tightening the screw on the plug.

•The foot switch is an accessory part.

• 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 (17) into installation part (16) and then place the entire installation part (16) into the socket (15).





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

- The power switch is illustrated in the diagram below. The left image represents the off state, while the right image indicates the on state.
- 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 display panel and the separate control panel, used to control the operation after switching on, and the keys on it are described as follows:

#### 4.1.1 Display Panel



T=168

Sect=3um

POWER

Num=56



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

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.

#### **Indicator Light**

- The Power indicator illuminates to signify that the power supply is functioning properly.

- The False indicator lights up in the event of a false operation of coarse feed, accompanied by an audible alarm.

- The Lock indicator illuminates to indicate that the rotary wheel is in a locked state. During this time, sectioning actions will not elicit a response.

#### Sectioning Mode indicator light

Continuous (Cont) Mode:

When the indicator light is on, the system is in automatic continuous mode, allowing continuous operation.

Single Section (Single) Mode:

An illuminated indicator light signifies automatic single-section mode, enabling precise control for individual sections.

Manual (Rock) Mode:

The illuminated light indicates manual mode, providing users with hands-on control for manual operations.

#### Sectioning Mode selection button

Press this button to choose desired operating sectioning mode (CON, SINGLE or ROCK)



FALSE

LOCK



----11----





#### **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.

#### 4.1.2 Separate Control Panel





#### **Display Area**

Display the section/trimming/retraction setting value.



#### **Action Display LED**

<u>RIM</u>: If lit up, the system is in the section trimming mode and thickness adjustment state.

SECT: If lit up, the system is in the sectioning mode and

AEM480 ]

ficrotome

----12----



thickness adjustment state.

- <u>RETRA</u>: If lit up, the system is in the retraction mode and thickness adjustment state.
- <u>RUN</u>: If lit up, sectioning or trimming is in progress, speed adjustment buttons can be activated, while all other buttons will be non-responsive.

Buttons for setting the section thickness / trimming section thickness/ retraction value

Section thickness setting range: 0µm to 600µm

Setting values:From 0µm to 2µm, in 0.5µm incrementsFrom 2µm to10µm, in 1µm incrementsFrom 10µm to 20µm, in 2µm incrementsFrom 20µm to 100µm, in 5µm incrementsFrom 100µm to600µm, in 50µm incrementsRetraction value:From 5µm to 100µm, in 5µm increments.





These two buttons are exclusive to the automatic mode and are designed to adjust the speed of specimen movement during vertical sectioning. The adjustable range is 100-420mm/s with a precision of  $\pm 10\%$ .

**Buttons for coarse feed backward/forward FAST.** Fast adjustment for coarse feed, speed at 900μm/s. **Buttons for coarse feed backward/forward SLOW.** Slow adjustment for coarse feed, speed at 300μm/s.

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



Pressing this button illuminates the sectioning status indicator, during this time, you can perform sectioning as well as make adjustments.



#### Button for sectioning

**Button for trimming** 

Pressing this button illuminates the sectioning status indicator, during this time, both sectioning and adjustment procedures can be performed.



#### **Button for retraction**

Press the button to toggle the retraction function—illuminating or extinguishing the indicator light accordingly. Hold the button for three seconds to enter retraction value setting mode, indicated by a flashing light. Exit the mode by pressing any other button.





#### **Button for run**

This button is intended for use in automatic mode. Press and hold for three seconds to initiate operation, indicated by the illumination of the corresponding operational light. A short press will stop the operation. During operation, all keys except the speed adjustment key will be non-responsive.

• In manual mode, avoid pressing this button to maintain responsiveness of other keys. Unintended presses will deactivate other keys.



#### Memorized coarse feed position

Memo: Pressing this button will store the current specimen position in memory.

Feed: Pressing this button will initiate automatic specimen movement to the last memorized position when pressed.

#### 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.
- $\odot$  Rotate Lever 1(10) to lock clamp 2 (4) and clamp 1 (5).
- $\odot$  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.

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.

---15----



#### 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



Ver:AMOSAEM480OP20231205



joint (4) and 2 clamps (5&6).

There are two types of clamps: 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.

Refer to left figure for screw-fastened components. To replace the clamp, loosen the screws connecting it to the joint and substitute it 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:	±8°

## 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)



#### 4.4 Specimen Clamps/Blade Installation





Ver:AMOSAEM480OP20231205



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 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



#### $\odot$ Operation Mode selection

Use MODE key to choose the desired trimming mode: CONT/SINGLE/ROCK

If in CONT mode, the light lit up, the system is in continuous mode, allowing seamless, automated operation.

If in SINGLE mode, the light lit up, the system is in single section mode, facilitating automated single-section processing.

If in ROCK mode, the light lit up, the system is in manual mode, offering hands-on control for specific operations.

















#### $\odot$ Retraction setting

Active retraction function and set retraction thickness via the following buttons.

Press to activate retraction function. Corresponding LED indicator will be lit. Press again to deactivate, the LED indicator will turn off.

To enter the retraction value adjustment mode, press and hold for three seconds. During this time, the retraction RETRA indicator ----will illuminate and flash, while all other indicators will be off. Adjustme **+ •** n be made using , and the numerical values will be layed on the screen .

Press any other key (such as TRIM or SECT) to exit the setting mode and resume normal operation.

#### **O**Trimming setting

Press to activate retraction function. Corresponding LED indicator will be lit. Use • • to adjust the trimming value and it will be displayed on screen .

#### $\odot$ Adjust the specimen position

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

Press for faster adjustment when the specimen is far away from the blade.

Press  $\land$   $\checkmark$  to adjust when the specimen is near the cutting 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.

#### $\odot$ Trimming operation (Automatic mode)

---18----

In CONT and SINGLE modes, the film trimming operation requires the use of the RUN button.

Long press and hold this button for three seconds; when the corresponding indicator light illuminates **Short press** RUN to stop the operation.

During operation, only the speed adjustment button is responsive, and all other buttons remain inactive. Adjust trimming speed with



• Don't touch this key on manual operation, otherwise the others key have no response.

#### $\odot$ Memorized coarse feed position for fast reload

This function is designed for efficiently producing a large number of specimens in a single operation, saving time on slide preparation and enhancing overall workflow. Follow the steps below for precise operation:

Secure a new specimen in the clamp and tighten the blade holder. Utilize the position adjustment keys to position the specimen. Press when the specimen just contacts the blade. The buzzer will sound, indicating the current position has been memorized.

Upon completing the processing of the current specimen and moving on to the next one,  $p \bigoplus$  . At this point, the specimen returns to the zero position and automatically reaches the memorized position.

**Note:** During specimen positioning, it is crucial to elevate the specimen above the blade to prevent erroneous operations. Failure to do so will trigger the specimen positioning error indicator **Figure**, accompanied by audible warnings.

Attention: 1.Ensure the use of standard embedding cassettes and clamps. Avoid any excess paraffin. 2. Don't move the knife holder during the operation.

#### 4.6 Sectioning



#### $\odot$ Operation Mode selection

Use MODE key to choose the desired sectioning mode: CONT/SINGLE/ROCK

If in CONT mode, the light lit up, the system is in continuous mode, allowing seamless, automated operation.

If in SINGLE mode, the light lit up, the system is in single section mode, facilitating automated single-section processing.

If in ROCK mode, the light lit up, the system is in manual mode, offering hands-on control for specific operations.

#### **⊙** Sectioning setting

Press to activate retraction function. Corresponding LED indicator will be lit. + • to adjust the trimming value and it will be displayed een .

#### • Sectioning operation (Automatic mode)

In CONT and SINGLE modes, the film trimming operation requires the use of the RUN button.





AEM480 Fully-automatic Microtome





Long press and hold this button for three seconds; when the corresponding indicator light illuminates **Short** press RUN to stop the operation.

During operation, only the speed adjustment button is responsive, and all other buttons remain inactive. Adjust trimming speed with



• Don't touch this key on manual operation, otherwise the others key have no response.



#### ⊙ Sectioning operation (Manual Mode)

The ROCK indicator light will be lit, turn the right handwheel to start 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  $0^{\circ}$  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.





#### $\odot$ 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 functioning. ensuring smooth Emphasis on maintaining cleanliness position at (4) is particularly crucial.

#### $\odot$ 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.

Clamp and its corresponding lever	X-axis Slider and its corresponding lever	Y-axis Slider and its corresponding lever

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

#### **O**Replacing the Fuse



⊙ Maintenance for the knife holder

• 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.

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

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





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
	• The mains cable is not securely plugged in or the mains cable is disconnected.	• Re-connect the mains plug or replace the mains cable.
• No response after	• The fuse is not installed or has blown.	• Re-install referring to the Operation Manuel section 5.2; or replace the fuse.
switching on	• The input voltage marked on the instrument does not correspond to the ambient voltage.	• Check the ambient voltage if it does not match, request a service professional.
	• The Emergency Stop button is pressed.	• Check the Emergency Stop button and resume the equipment.
• Alarm is activated after turning on	• The control panel is not well connected.	Reconnect the control panel.



• Uneven sectioning (from the second	• The sectioning angle is too small.	• 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.
section)	• The clamp is unstable.	• Inspect all screw connections and clamping mechanisms. If necessary, readjust to ensure proper functioning. This will maintain the precision of the sectioning process.
	• The paraffin wax is too hard.	<ul> <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>
Sections are not continuous	• The sectioning angle is too large.	• Minimize tilt of the blade for embedded blocks.
	• The sectioning thickness is too large.	• Adjust the thickness of the sectiond material.
	• The blade is blunt.	• Replace and rearrange blade.
	• Other reasons.	• Smooth section using a soft brush.
	• Wax blocks shaped as wedges.	• Alignment of Embedded Blocks: Adjust the embedded block to ensure that its top and bottom surfaces are parallel to each other, with equal width.
• Sections are bent or damaged	• Embedding blocks not parallel to the blade.	• 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.
	• Irregular cutting blade edge.	• Lateral Movement of Sectioning Blade: Move the sectioning blade laterally until there are no irregular blade edges remaining for sectioning.
	• Varying viscosity in embedded paraffin.	• Removal of Uneven Paraffin.



	• External factors causing temperature discrepancies. (Be mindful of external factors such as light sources, heaters, or ventilation systems)	• 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.
	• Blunt blade.	• Sharpening the Blade: To enhance cutting performance, either re-sharpen the blade, replace the sectioning blade, or adjust its position laterally.
• Sections excessively compressed and wrinkled – jammed together	• Excessive room temperature.	<ul> <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>
	• Inadequate tile angle of the knife.	Increasing Angle by Grinding the Embedding Block's Inclined Surface
	• Contamination from paraffin residue on the knife.	• 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.
	• Damage to sections due to repeated paraffin usage.	• Re-embedding with New Paraffin: Replace the existing paraffin and re-embed the specimen.
	• Incomplete dehydration or improper cleaning.	• Dehydration or Cleaning Procedure: Before proceeding, ensure thorough dehydration or cleaning of the specimen.
<ul> <li>Fragmented sections and/or Specimen Tear</li> </ul>	• Soft and paste-like specimen appearance indicating incomplete paraffin infiltration.	<ul> <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>



	• Residual alcohol before paraffin infiltration.	• Alcohol Removal: Remove any traces of alcohol from the specimen.
	• Prolonged exposure or excessive heat in paraffin bath.	• Difficulty in Salvaging Irreversibly Damaged Tissues: Multiple instances of irreversible damage to tissues may pose challenges in salvaging them.
	• Excessive hardness of tissue for paraffin.	• Re-embedding in Plastic (Histo Resin) or "Soft-Hard" Paraffin: Consider re-embedding the specimen (tissue) in plastic (Histo Resin) or "soft-hard" paraffin.
	• Blade has notches.	• Blade Maintenance: Utilize the alternative section of the sectioning blade or replace the sectioning blade as needed.
• Splitting or scratches along the length of the section	• Contamination of the blade.	• Cleaning: Ensure proper cleaning of equipment.
	• Scratches caused by hard particles, especially wax contaminants.	• Filtration and Gradual Pouring of Paraffin: Filter the paraffin and pour it slowly to prevent impurities.
	• Presence of calcium or silica particles on embedded blocks.	Calcium or Silica Removal: Remove calcium deposits or eliminate silica content as necessary.
• Section sticking to the blade	• Possible contamination with the blade.	• Cleaning: Ensure proper cleaning of equipment.
• Noise and sections are being scratched, displaying noticeable traces of vibration.	• Improper inclination of the sectioning blade.	• Re-install the blade and adjust its tilting angle.
• Wavy sectioning surface	• Improper inclination of the sectioning blade.	• Readjust the tilt.
<ul> <li>Sections detaching and sticking either to or nearby objects.</li> </ul>	electrostatic influence	• Air humidity must be increased to remove static electricity.

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

#### 7. Instrument Diagram





## Standard accessories list

## **AEM480**

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	Separate control panel	1 set	With connection cable
6	Foot switch with	1 pc	
	connection cable		
7	M3 Allen Wrench	1 pc	
8	M4 Allen Wrench	1 pc	
9	Disposable blade	1 box	
10	Dust Cover	1 pc	
11	Power cord	1 pc	
12	Fuse	2 pcs	
13	Operation Manual	1 pc	

Published by:



# **AMOS SCIENTIFIC PTY.LTD.**

24/632-643 Clayton Road, Clayton South, VIC 3169 Melbourne, Australia Tel: +61-4-10190188 ABN 37 159 778 140

www.amos-scientific.com

Email: info@amos-scientific.com