



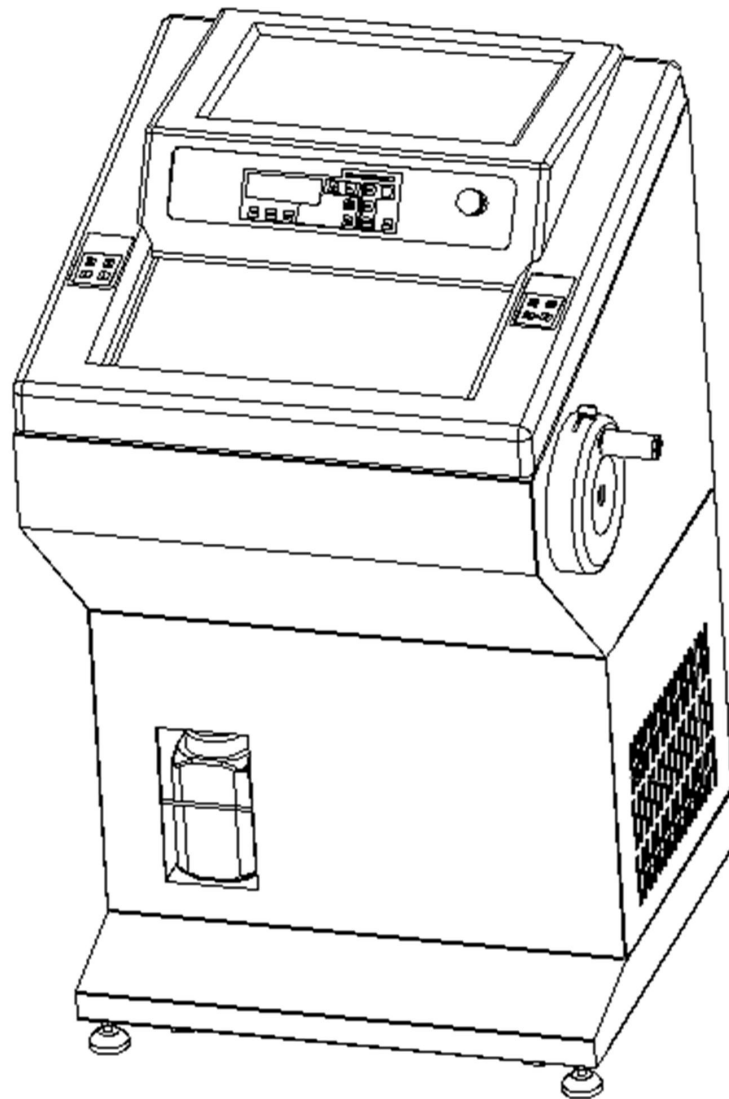
**AST 550** (Version: AMOSAST550OP20240204)

# **Fully-automatic Cryostat Microtome**

## **Operation Manual**

AMOS SCIENTIFIC PTY.LTD. ABN37 159 778 140

[www.amos-scientific.com](http://www.amos-scientific.com)



Presented in this Operation manual are the structure, performance and user's guideline. Read carefully prior to operating the equipment.

# Foreword

**AST550 Cryostat Microtome is a fully-automatic microtome designed with input from global customers, capable of meeting diverse requirements in routine sectioning.**

**To ensure the machine's smooth, durable, and safe functioning, it is essential to read this operational manual thoroughly.**

**Our company takes responsibility for the maintenance of the products sold. Additionally, we have provided relevant training to our authorized agents. To ensure smooth and timely repairs, customers can directly contact local authorized agents.**

**Note: Our products undergo continuous updates and refinements in line with evolving technology. Please note that any enhancements or modifications to the technical specifications and structure of this product may not be included in this manual.**

# Contents

<b>1. Safety Notes.....</b>	<b>1</b>
1.1 Overview.....	1
1.2 Safety Warning.....	1
1.3 Safety Device.....	2
<b>2. Performance &amp; Parameters.....</b>	<b>4</b>
2.1 Overview of Instrument Component.....	4
2.2 Performance Index.....	5
2.3 Technical Parameters.....	5
<b>3. Preparation before operating.....</b>	<b>7</b>
3.1 Requirement of Installation .....	7
3.2 Standard Delivery.....	7
3.3 Installation .....	8
3.4 Electrical Connection.....	10
<b>4. Operation .....</b>	<b>11</b>
4.1 Operate Panel Function &Control.....	11
4.2 Installation of Blade Holder.....	16
4.3 Clamping the Specimen & Inserting the Blade.....	18
4.4 Temperature Setting.....	19
4.5 Time Setting.....	20
4.6 Section/Trimming Setting.....	23
4.7 Retraction Setting.....	24
4.8 Section Reference.....	24
<b>5. Cleaning &amp; Maintenance.....</b>	<b>25</b>
5.1 Cleaning.....	25
5.2 Maintenance.....	26
<b>6. Trouble Shooting.....</b>	<b>27</b>

# 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

▲ **Note:** 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 Warning during 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 blade 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 Warning of Operation

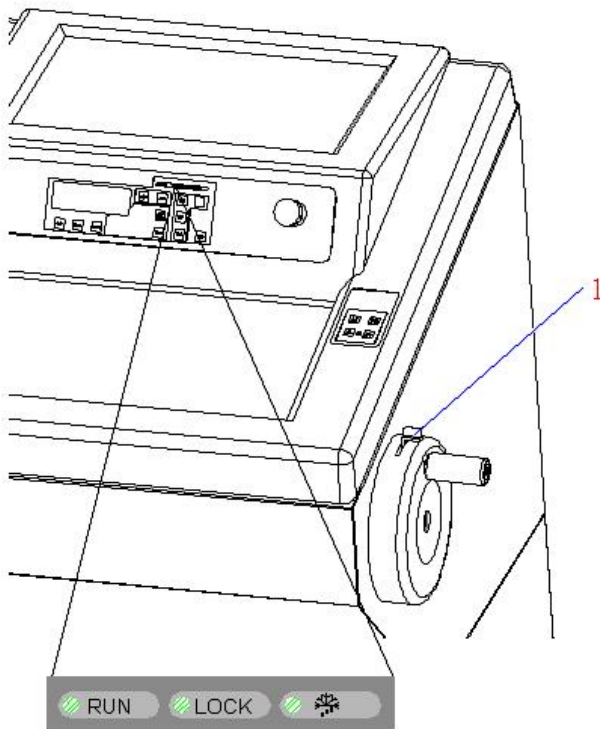
- Take special care when handling blade holder and the microtome blades, as the cutting edges are extremely sharp and can result in serious injury.
- Always remove the blade before detaching the blade holder from the equipment. When not in use, securely place the blade back into the storage box.
- Never position the knife with its cutting edge facing upwards, and avoid taking out the blade with bare hands.
- 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.
- 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.

### 1.2.3 Warning during 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 blade holder and clean it separately. You must remove the blade before cleaning the blade 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 Device



### Handwheel locking mechanism

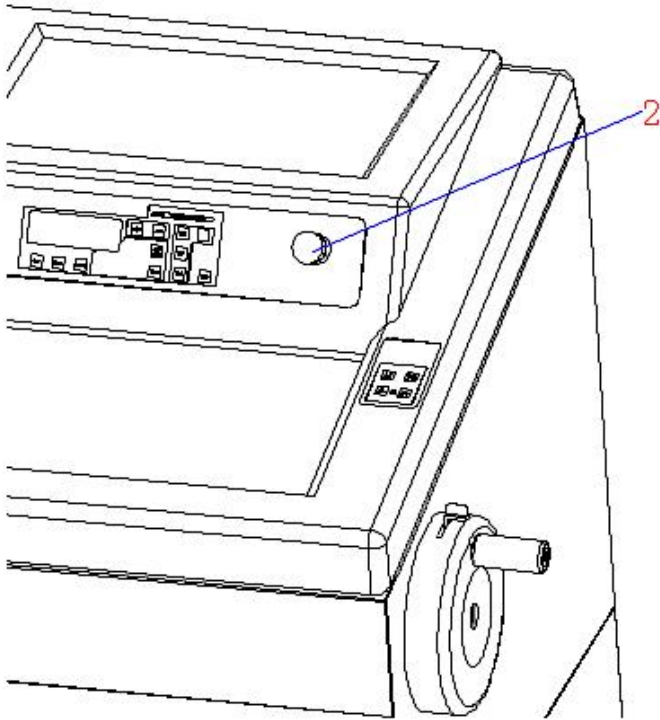
As shown in the diagram, (1) is the locking lever. Push the lever in clockwise direction to lock the sample at topmost position. To unlock, push the lever (1) in counterclockwise direction.

The diagram illustrates the handwheel in locked position.

When locked, the instrument's control panel will illuminate the LOCK indicator. In this state, sectioning is not possible, and the automatic run button is inactive.

- Don't lock the handwheel when the handwheel is rotating, otherwise it will damage the instrument.

▲ **Attention:** Before moving the instrument, changing specimen/blade or cleaning the instrument, the handwheel must be locked.



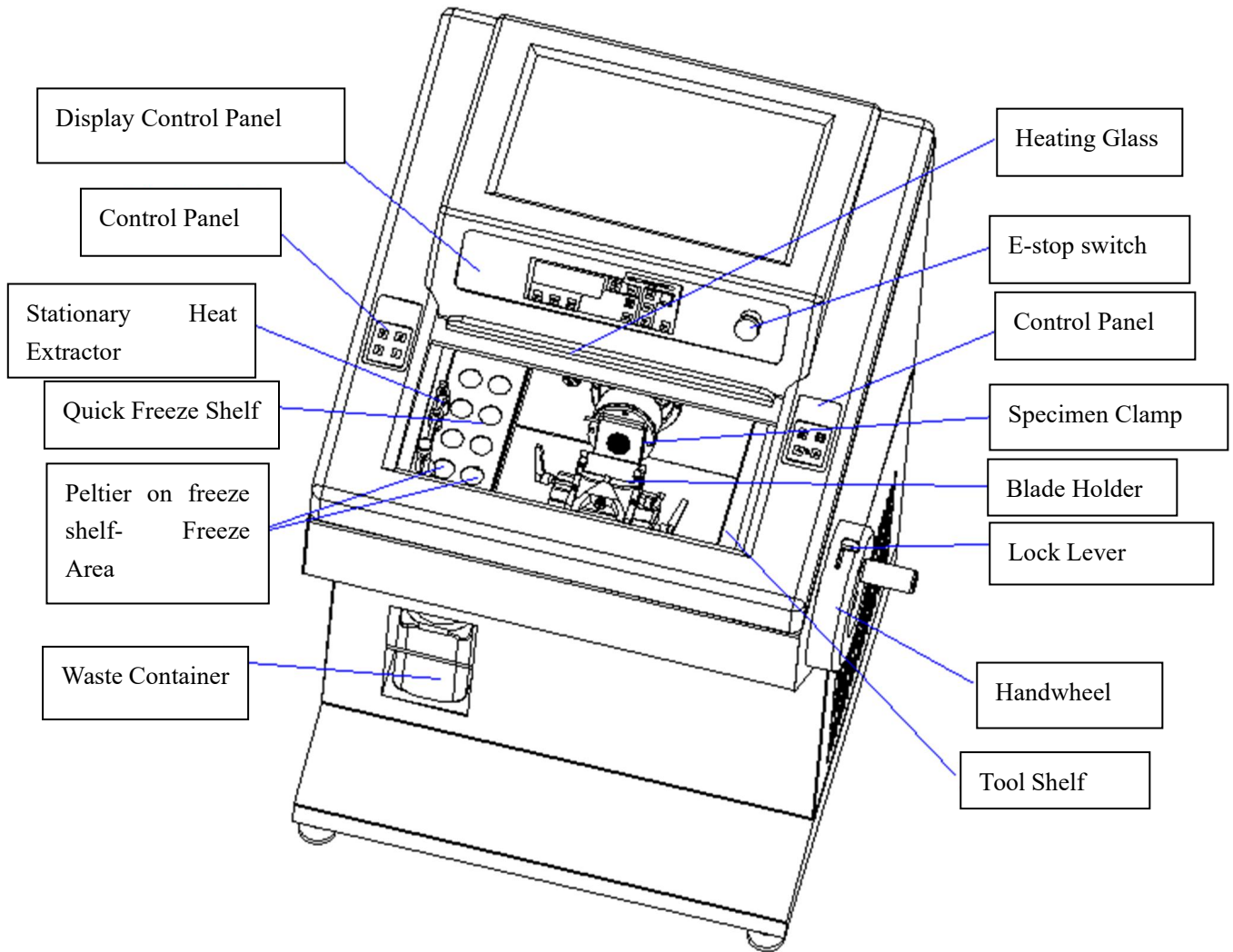
### Emergency Stop Function

As shown in the diagram (2), the emergency stop switch is used to immediately cut off the main power of the instrument and stop all activity when pressed. To release it, rotate the switch in the direction indicated by the arrow until the button pops out.

- This function must be used in emergency situations. The correct sequence of use is: Activate the emergency stop switch—Turn off the power switch — Release the emergency stop switch—Turn on the power switch.

## 2. Performance & Parameters

### 2.1 Instrument Components Overview





## 2.2 Performance Index

AST550 is a fully automatic cryostat microtome, the movement and feed of the sample are automatically controlled by a stepper motor, ensuring higher sectioning precision and simplified operation. Below are some performance features of the device:

- ⊙ The instrument adheres to ergonomic design principles for a more aesthetically pleasing appearance, crafted through CNC for precision.
- ⊙ Retraction function makes it easier to section.
- ⊙ Includes a counter function to display the total number of sections.
- ⊙ It equips calculator function to display the total thickness .
- ⊙ Touchscreen interface, convenient, user-friendly operation, and is easy to learn.
- ⊙ Adopt UV and O<sub>3</sub> to sterilize, with each cycle lasting 30 minutes.
- ⊙ The specimen clamp semiconductor refrigerating function can be toggled on/off.
- ⊙ Defrosting options include both timed defrost and manual defrost.
- ⊙ Large freezing shelf could load 8 samples simultaneously .
- ⊙ Two running modes: manual and automatic
- ⊙ Emergency stop function: Press the red button to stop in emergency.

## 2.3 Technical Parameter

- ⊙ Environment requirements:    Temperature Range: +15°C—+30°C,  
   Air Humidity:                             ≤60%  
   Working pressure:    (86~106) kPa.
  
- ⊙ Nominal Voltage: AC 220V /AC 110V
  
- ⊙ Normal Frequency: 50/60 Hz
  
- ⊙ Power:                    ≤1000VA
  
- ⊙ Fuse:                    8A/15A
  
- ⊙ Safe Classify: Classify I - Type B
  
- ⊙ Lowest freeze chamber Temperature : -35±2°C
  
- ⊙ Lowest freeze shelf Temperature: -45±5°C
  
- ⊙ Lowest temperature of peltier unit on freeze shelf: -55±5°C
  
- ⊙ Lowest temperature of peltier unit on specimen clamp : -50±5°C (Working time of peltier :15 minutes)

- ⊙ Electric coarse feed: Slow     $300\mu\text{m/s} \pm 30\mu\text{m/s}$   
   Rapid    $900\mu\text{m/s} \pm 30\mu\text{m/s}$
- ⊙ Section thickness range: 0 to  $100\mu\text{m}$   
   0 to  $3\mu\text{m}$ ,    in  $0.5\mu\text{m}$  increments  
   3 to  $10\mu\text{m}$ ,    in  $1\mu\text{m}$  increments  
   10 to  $20\mu\text{m}$ ,    in  $2\mu\text{m}$  increments  
   20 to  $100\mu\text{m}$ ,    in  $5\mu\text{m}$  increments
- ⊙ Trimming thickness range: 10 to  $600\mu\text{m}$   
   10 to  $50\mu\text{m}$ ,    in  $5\mu\text{m}$  increments  
   50 to  $100\mu\text{m}$ ,    in  $10\mu\text{m}$  increments  
   100 to  $600\mu\text{m}$ ,    in  $50\mu\text{m}$  increments
- ⊙ Retraction : 0~ $80\mu\text{m}$ , in  $5\mu\text{m}$  increments
- ⊙ Specimen feed:  $15\text{mm} \pm 0.2\text{mm}$
- ⊙ Vertical stroke:  $48\text{mm} \pm 1\text{mm}$
- ⊙ Specimen Max:  $35 \times 35\text{mm}$
- ⊙ Repositioning of blade holder base(left-right) :  $50 \pm 1\text{mm}$
- ⊙ Motorize cutting speed :  $75\text{-}230\text{mm/s} \pm 10\%$  .
- ⊙ Dimension:    Length:  $805\text{mm}$ ,  
   Width:  $715\text{mm}$ ,  
   Height:  $1210\text{mm}$ ,
- ⊙ Weight:    About  $130\text{kgs}$

### 3. Preparation before operating

#### 3.1 Installation site requirement

- ⊙ This machine is a mobile floor-standing unit equipped with four caster wheels at the bottom and two fixed support feet. The front two casters are used when movement is required. After removing the packaging, move the machine to the desired location. Once in position, adjust the two fixed support feet to deactivate the front casters.
- ⊙ Start the instrument after let it rest for at least 2 hours .
- ⊙ Do not place any objects on either side of the machine, leaving a minimum clearance of 300mm to ensure proper ventilation and heat dissipation.
- ⊙ Ensure that the ambient temperature and humidity in the environment where the instrument is placed comply with the specifications outlined in the technical parameters.
- ⊙ Due to the movable nature of the rotating handwheel, sufficient space must be provided to allow for its movement.

▲ **Notice:** Do not operate the instrument in the room with explosion hazard .

#### 3.2 Standard Delivery

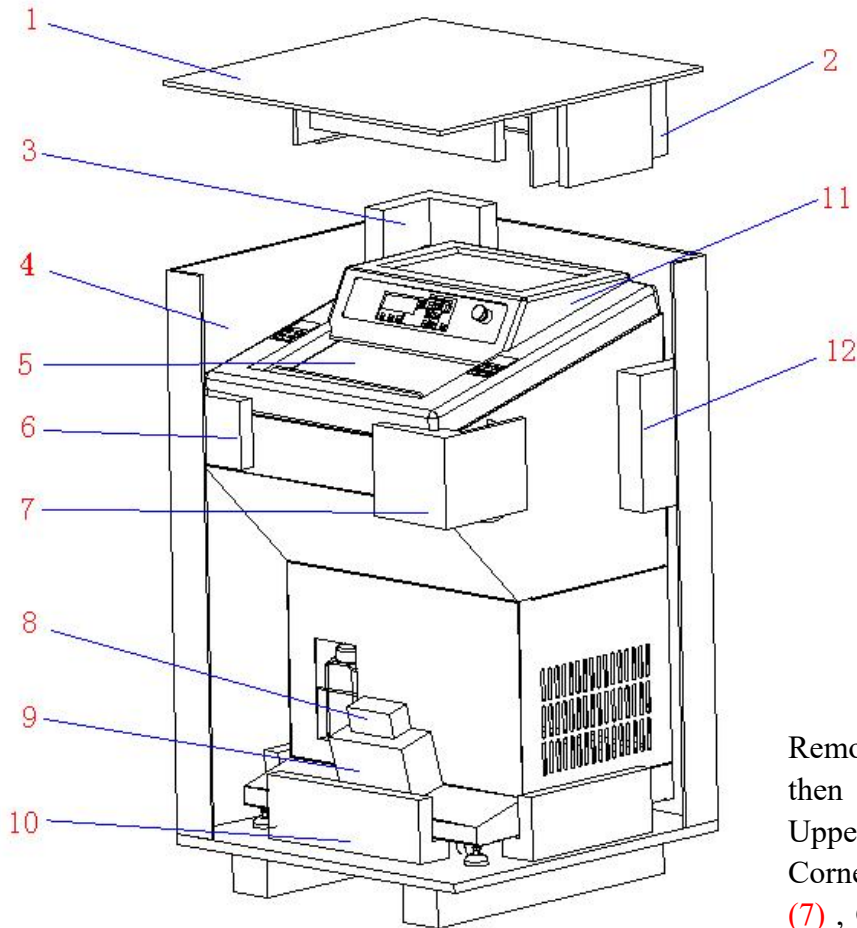
⊙ Cryostat Microtome	1 set
⊙ Blade Holder	1 set
⊙ Handwheel	1 pc
⊙ Specimen Clamp	10 pcs
⊙ M5 Allen Key	1 pc
⊙ M3 Allen Key	1 pc
⊙ 7mm Wrench	1 pc
⊙ Disposable Blade	1 box
⊙ Power Cord	1 pc
⊙ Fuse	2 pcs
⊙ Brush	1 pc
⊙ Operate Manual	1 pc

● 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 conFig.uration or requirements, please specify before ordering.

### 3.3 Installation

#### 3.3.1 Unpacking

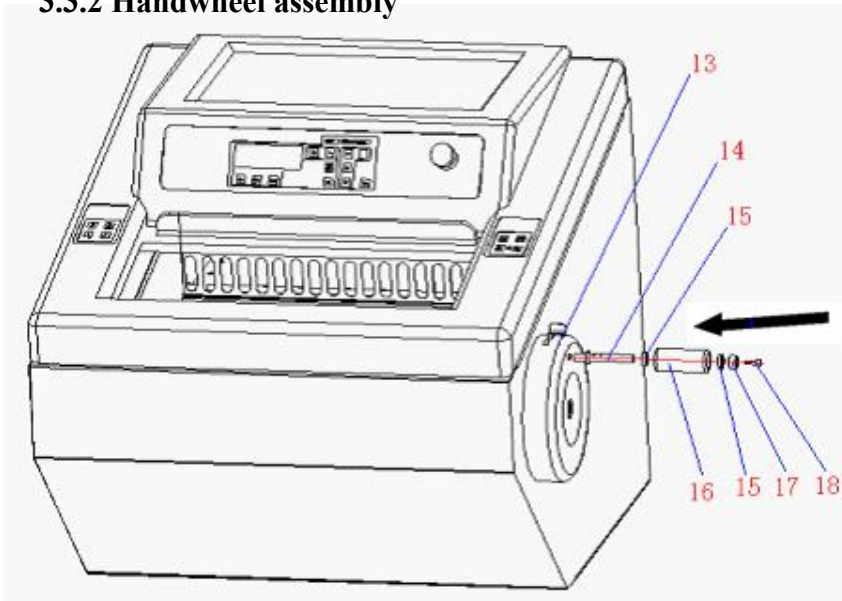
As showed in the diagram, the following is the instrument accessories:



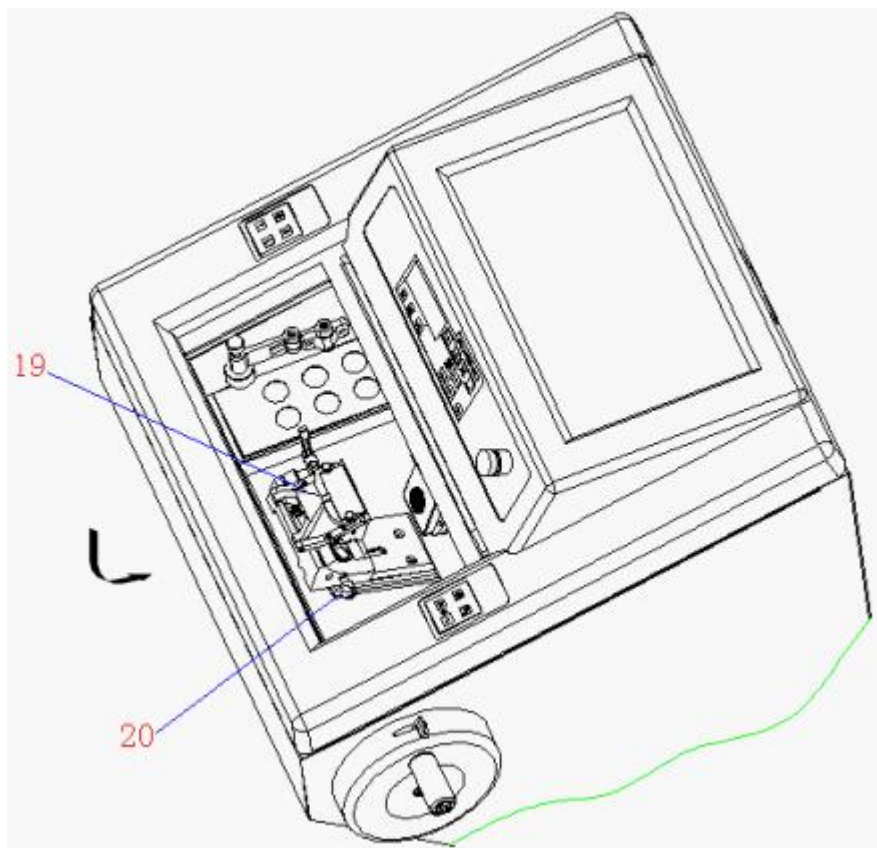
- ⊙ Carton Cover (1)
- ⊙ Upper Support (2)
- ⊙ Corner Support \*1 (3)
- ⊙ Carton body (4)
- ⊙ Glass Support (5)
- ⊙ Corner Support \*2 (6)
- ⊙ Corner Support \*3 (7)
- ⊙ Handwheel (8)
- ⊙ Blade holder (9)
- ⊙ Carton Base (10)
- ⊙ Cryostat Microtome (11)
- ⊙ Corner Support \*4 (12)

Remove the cover (1) and carton body (4), then take the following things in order: Upper support (2), Corner Support \*1 (3), Corner Support \*2(6), Corner Support \*3 (7) , Corner Support \*4 (12), Handwheel (8), Blade Holder (9), Cryostat Microtome (11), Glass Support (5). Finally, carefully unwrap all packages for installation.

### 3.3.2 Handwheel assembly



- Take out the handwheel accessories from handwheel box (8) .
- Tighten the handwheel shaft (14) into handwheel (13) with 7mm wrench .
- In the following order, insert bearing (15) , handwheel sleeve (16) , and handle pad (17).
- Tighten them with M5 × 16 hexagon socket screw (18).

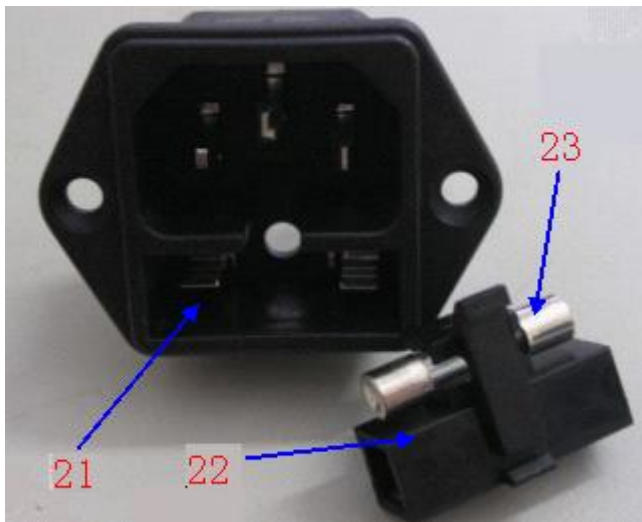


### 3.3.3 Blade holder

Take out the blade holder (19) from the box, push it along the track as it is shown in the diagram, and then rotate the blade holder lock lever (20) to lock in position.

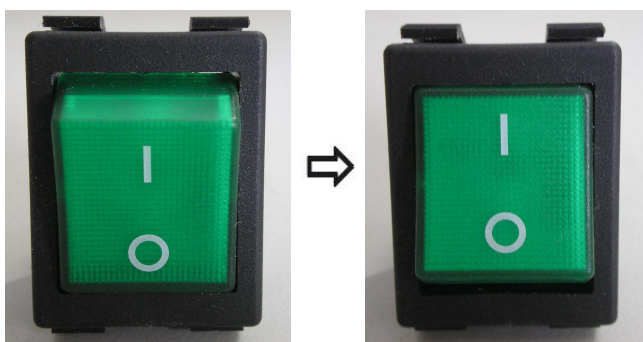
### 3.4 Electrical Connection

- 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 the fuse (23) into installation part (22) as shown and insert the whole into the socket (21) .

- 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.

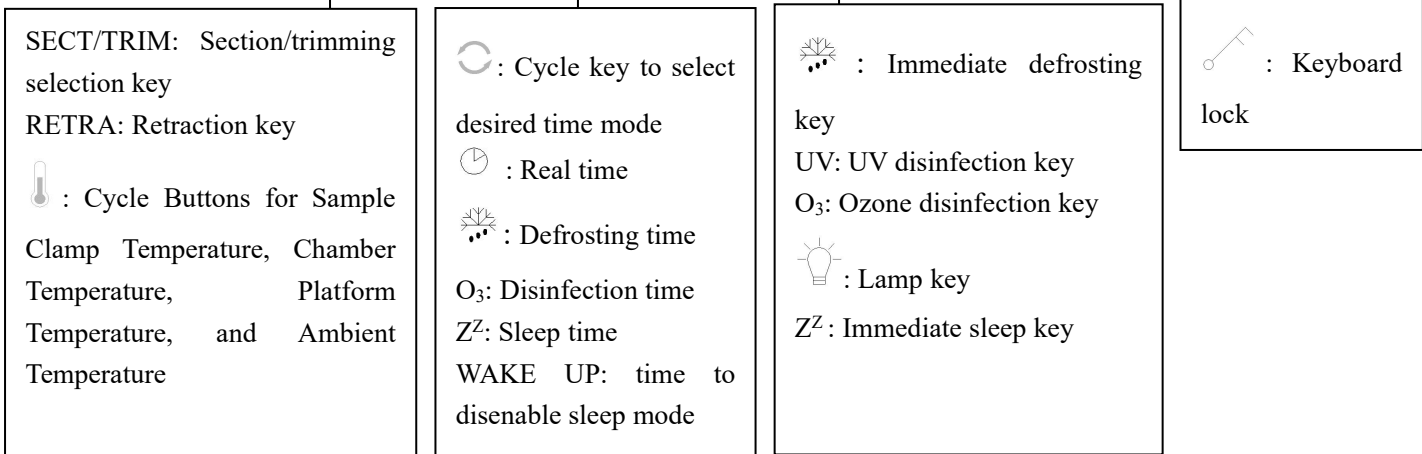
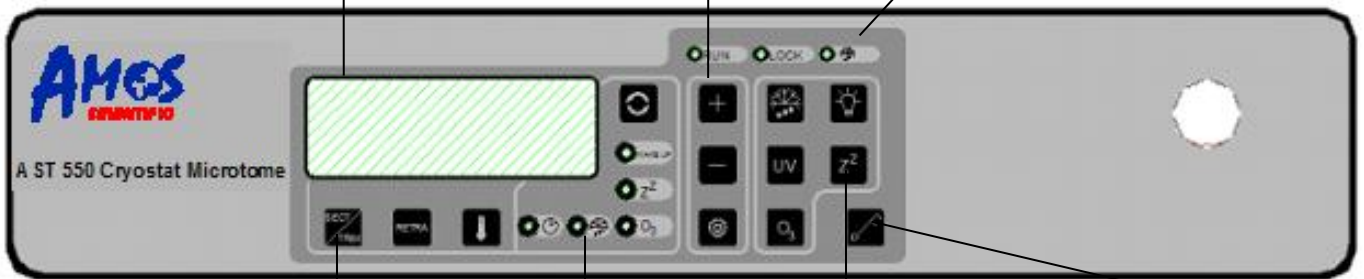
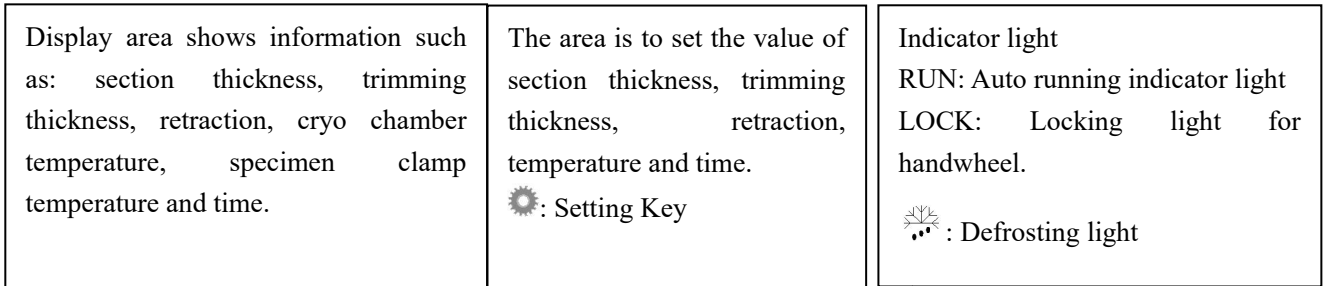
- Upon turning on the power switch, the LCD screen on the panel will initiate display. Simultaneously, the specimen clamp will automatically perform a zeroing action. A single beeping sound will signal the process's conclusion.

## 4. Operation

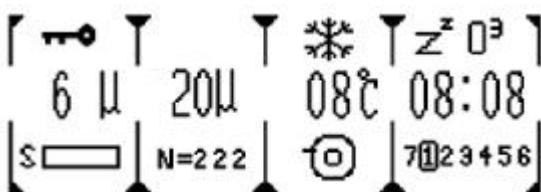
### 4.1 Control panel function & Control

All the parameters are set and displayed via control panel. After power on, use the control panel to operate:

#### 4.1.1 Display Panel



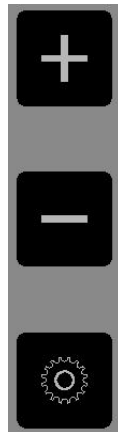
#### Three indication lines in white on LCD



The first line displays status (Keyboard lock, defrosting, sleep and disinfection icons in order)

The second line displays section thickness, retraction, cryo chamber temperature and time etc.

The third line displays section/trimming status, specimen clamp progress, section count, temperature and day of the week.



“ + ” , “ - ” **The two keys are used for setting section/trimming thickness , time and temperature.**

Section thickness value: 0 to 100µm

- 0 to 3µm, in 0.5µm increments
- 3 to 10µm, in 1µm increments
- 10 to 20µm, in 2µm increments
- 20 to 100µm, in 5µm increments

Trimming thickness value: 10 to 600µm

- 10 to 50µm, in 5µm increments
- 50 to 100µm, in 10µm increments
- 100 to 600µm, in 50µm increments

Retraction value: 0 to 80µm, in 50µm increments


 **is the Setting key.**

This key is used for setting of the section/trimming thickness, retraction value, temperature, and time.



**Indicator light on Section mode**

**LOCK** : The illuminated light indicates that the right turning wheel is in a locked state, during which the sectioning action will not respond.

 : Deforesting indicator, if lit, shows defrosting is in progress.



**SECT/TRIM is the key for switching between sectioning and trimming modes.**

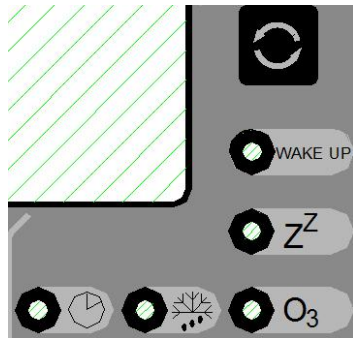
**RETRA is the retraction key.**

This key is used to enter a retraction function.

 **is the temperature setting key.**

Used to switch between sample clamp temperature, chamber temperature, platform temperature, and ambient temperature.





☺ is a cycle key to select desired time mode

Short press to toggle between real-time, real-time clock setting, defrost time setting, disinfection time setting, sleep time setting, wake-up time setting, and day setting.

🕒 is the real-time indicator light

When in real-time setting, the real-time clock indicator is illuminated.

❄️ is defrosting time indicator light

When in deforesting time setting, the deforesting time indicator is illuminated.

O<sub>3</sub> is disinfection time indicator light

When in disinfection time setting, the disinfection time indicator is illuminated.



ZZ is the sleep time indicator light

When in sleep time setting, the sleep time indicator is illuminated.

WAKE UP is the wake up time indicator light

When in Wake-up time setting, the WAKE UP time indicator is illuminated.

❄️ is the key to start defrosting

Long press this button for about 5 seconds to start defrosting immediately, Meanwhile the  defrosting indicator light will be lit. The process lasts about 30 minutes , and goes back to work status automatically,  light turns off.



UV is the key to turn on/off UV disinfection light

Short press this key to turn on UV disinfection light and turn it off by pressing it again .

O<sub>3</sub> is the key to turn on/off O<sub>3</sub> disinfection

Short press this key to turn on O<sub>3</sub> disinfection and turn it off by pushing it again.


💡 is the button to turn on/off lamp.

Short press this key to turn on/off lamp.

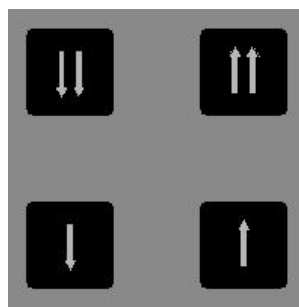
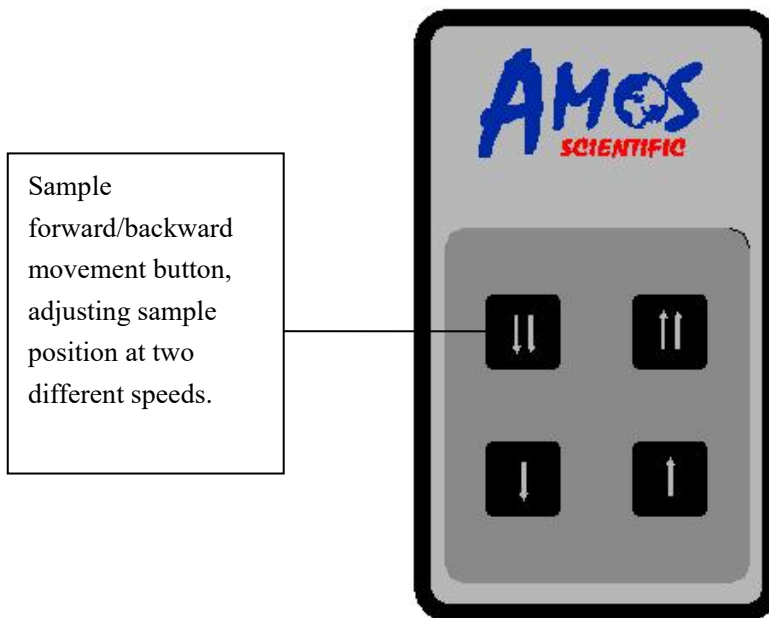
ZZ: press to enter sleep mode, press again to terminate sleep mode.



 **Keyboard locking key**

This key is used to lock the keyboard.  
 Hold on this button until the icon "  " shows up on display panel (As shown in left diagram), the keyboard has been locked. All other keys (other than itself and the lamp key) are disabled at this moment and release the lock by long press the locking key again.

**4.1.2 Left control panel**



**Fast movement**

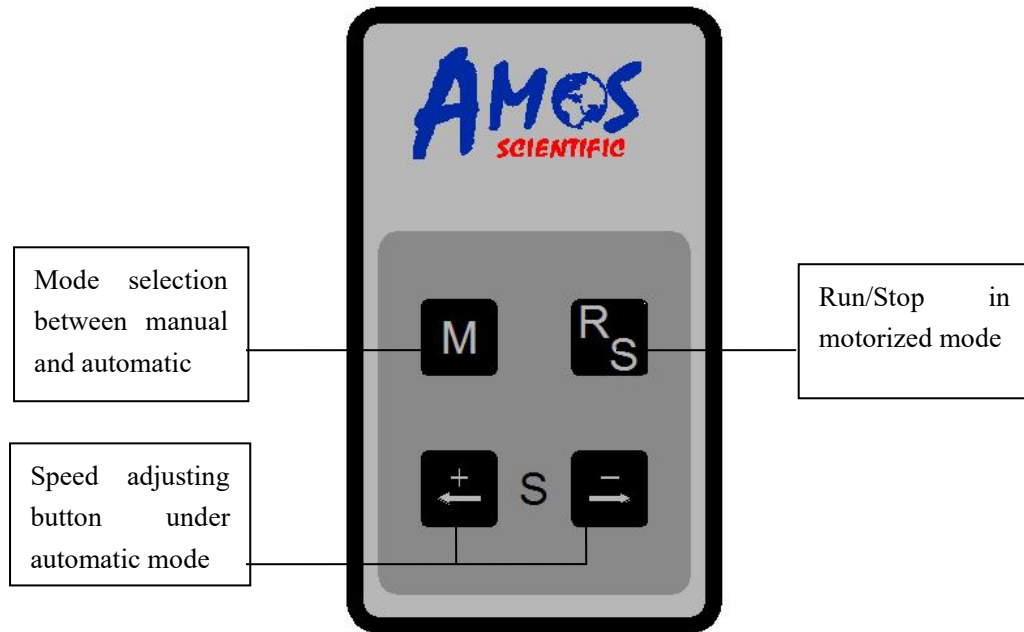
Adjust the specimen position in fast mode, with speed at  $900 \pm 30 \mu\text{m/s}$ .

**Slow movement**

Adjust the specimen position in slow mode, with speed at  $300 \pm 30 \mu\text{m/s}$ .

- The sample has a forward/backward displacement range of 15mm. If this range is exceeded, the buzzer will sound an alarm, and the sample's forward/backward movement will stop.

### 4.1.3 Right control panel

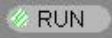


#### Mode selection between manual and automatic

Select the mode by pressing this button.



#### Auto-run/ Stop button in automatic mode

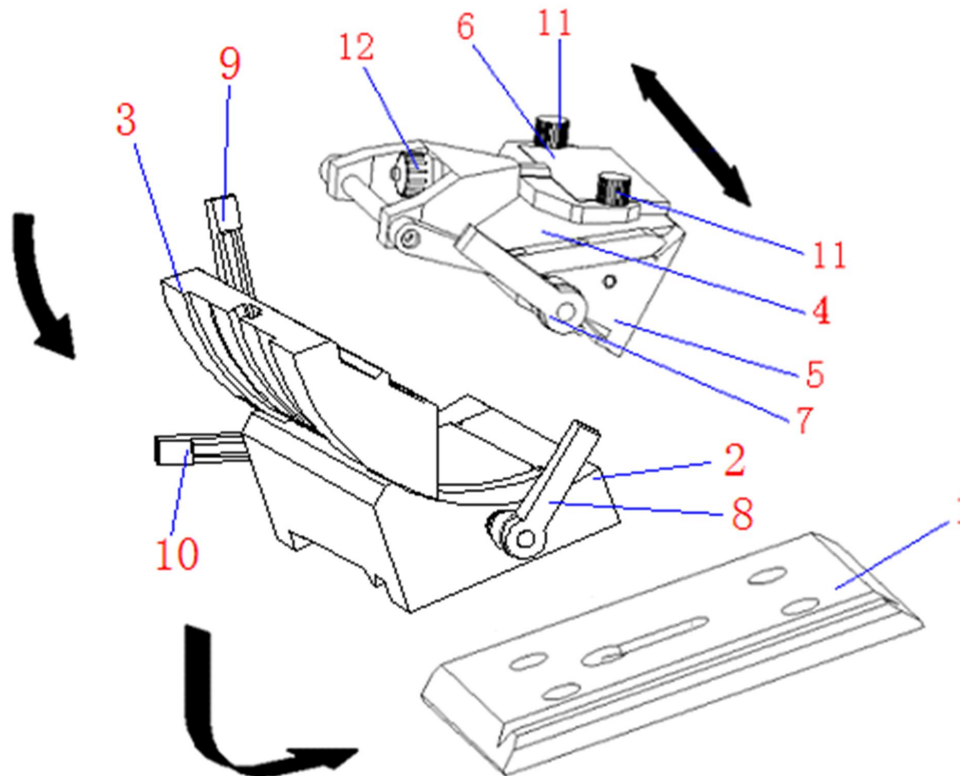
Long press this button to activate the automatic function. During automatic sectioning operation, a short press of this button will stop the automatic motion. The automatic sectioning starts at the lowest speed by default. When the automatic sectioning is running, the operation indicator light is on. After stopping the automatic sectioning, the operation indicator light  goes off.



#### Speed adjusting button

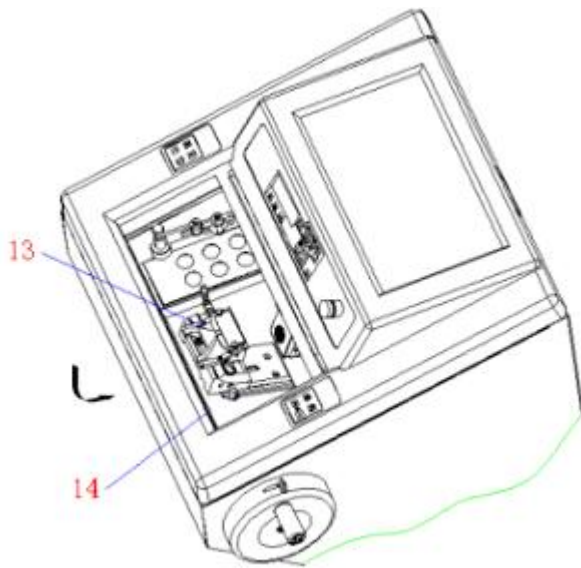
These two buttons are only applicable in automatic mode and are used to adjust the speed. The speed range is 75-230mm/s  $\pm 10\%$ .

## 4.2 Installation of blade holder



As shown in the diagram, the blade holder consists of the following components: base (1), vertical slider (2), rotating slider (3), movable knife clamp (4), fixed knife clamp (5), anti-curling plate (6), lever 1 (7), lever 2 (8), lever 3 (9), lever 4 (10), anti-curling plate locking knob (11), anti-curling plate height adjustment knob (12).

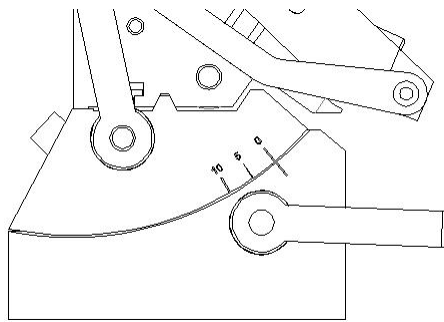
- ⊙ Place the vertical slider (2) on the guide rail of the base (1), rotate and tighten lever 2 (8) to secure it, adjust the adjustable handle on lever 2 (8) to a horizontal position.
- ⊙ Rotate the rotating slider (3) as shown in the diagram, sliding it into the vertical slider (2), and tighten lever 4 (10) to secure it.
- ⊙ Place the movable knife clamp (4) and fixed knife clamp (5) on the rotating slider (3), tighten lever 3 (9) to secure them, and adjust the adjustable handle on lever 3 (9) to a vertical position.
- ⊙ Rotate lever 1 (7) to lock the movable knife clamp (4) and fixed knife clamp (5) in place.



### Installation of blade holder and base

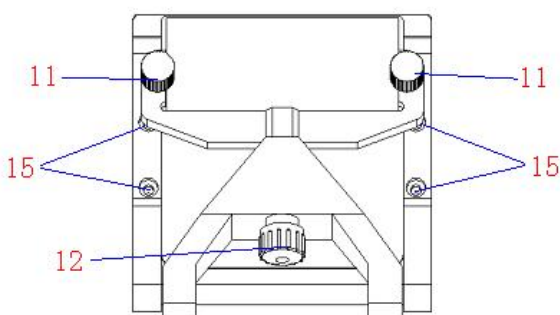
As shown in the diagram, slide the blade holder (13) horizontally along the track on the cryostat microtome (14), rotate lever 2 (8) to secure it, and adjust the adjustable handle on lever 2 (8) to a horizontal position.

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



At this point, the blade holder itself and its attachment to the machine base can be secured by using the four fixed rods. Before tightening, you can adjust the positions, such as front-back, left-right, and rotational angles, as needed.

For angle adjustment, as illustrated in the left diagram, the range is from 0 to 10 degrees, and users can adjust it as necessary at any time.



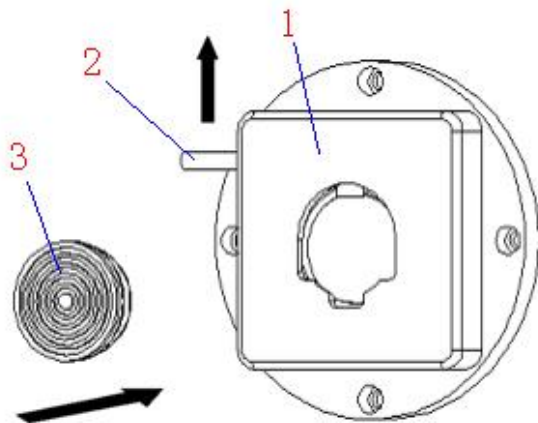
### Anti roll plate adjustment

The anti-curling plate is a rectangular, transparent organic glass. The adjustment process includes:

- ⊙ Insert the blade and rotate lever (7) to vertically clamp the blade.
- ⊙ Lock the two anti-curling plate locking knobs (11).
- ⊙ Use a 3mm hex wrench to adjust bolt (15), aligning the blade parallel to the anti-curling plate. Tighten bolt (15).
- ⊙ Turn the anti-curling plate height adjustment knob (12) to adjust the height of the plate.

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

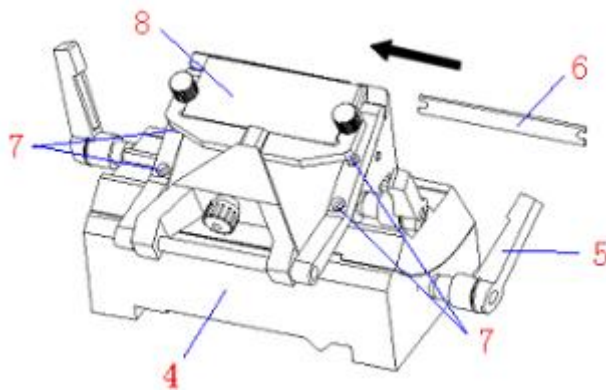
### 4.3 Clamping the Specimen & Inserting the Blade



#### Clamping the specimen

Lift the sample clamp lever (2) upwards as shown in the diagram, place the sample (3) into the sample clamp (1), and release the sample clamp lever (2).

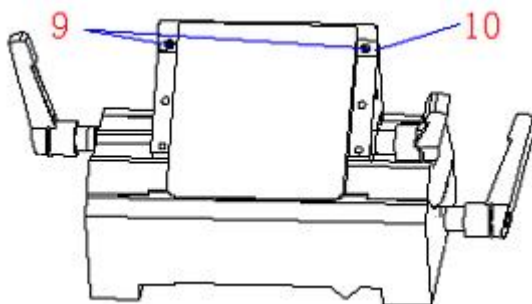
● Always clamp the specimen before installing the blade to avoid injury .



#### Blade inserting

as shown in the diagram, first rotate and loosen the lever (5). Then, insert the blade (6) into the blade holder (4) following the indicated direction, and rotate the lever (5) vertically to secure the blade.

Two types of disposable blades are available: low & high-profile.

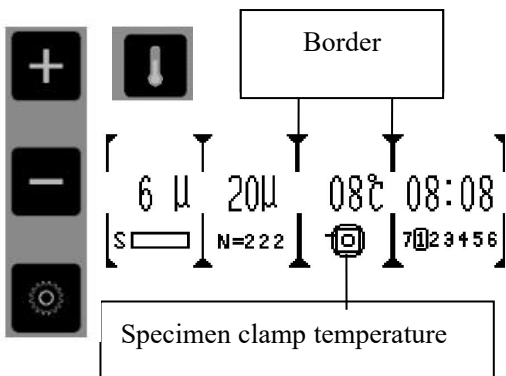




If a high-profile blade is needed, use a 3mm hex wrench to remove the four bolts (7), detach the anti-curling plate (8), and then unscrew the two screws (9) on the spacer (10) and remove the spacer (10). After installing the blade, reattach the anti-curling plate (8) and secure it with the four bolts (7).


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

## 4.4 Temperature setting


### 4.4.1 Specimen clamp temperature setting



-After pressing , as shown in the left diagram, the border of the temperature area will be bolded. When the display shows , it entered specimen clamp temperature display mode.

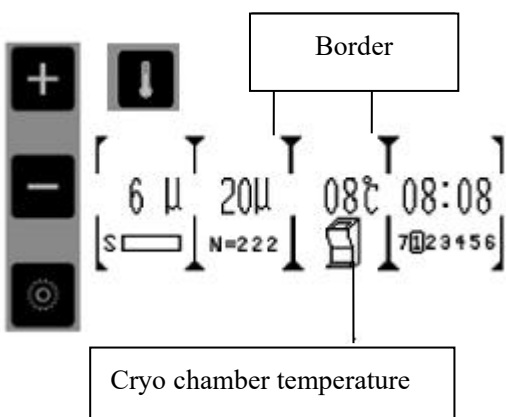
-Press  to enter temperature setting.



-The value can be adjusted by  as shown on the left.



-After setting up, press  again to exit or it will automatically exit after 5 seconds of no activity.


The temperature adjustment range is between -50°C and 50°C.

### 4.4.2 Cryo chamber temperature setting



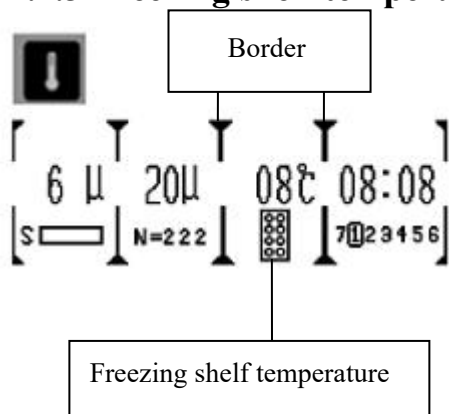
-After pressing , as shown in the left diagram, the border of the temperature area will be bolded. When the display shows , it entered cryo chamber temperature display mode.



-Press  to enter temperature setting. The value can be adjusted by  as shown on the left.

- After setting up, press  again to exit or it will automatically exit after 5 seconds of no activity.

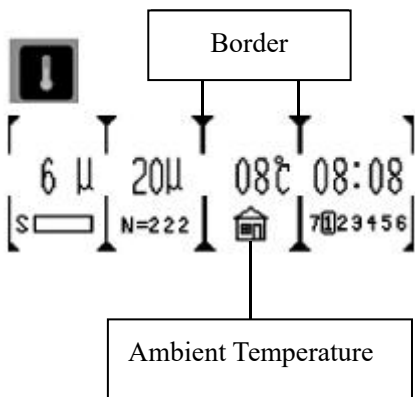
The temperature adjustment range is between -50°C and 50°C.

### 4.4.3 Freezing shelf temperature



After pressing , as shown in the left diagram, the border of the temperature area will be bolded. When the display shows , it entered freezing shelf temperature display mode. The temperature on the display reflects the actual temperature of the freezing shelf.

#### 4.4.4 Ambient temperature



Press and the border of the temperature area will be bolded.

When the display shows , it entered ambient temperature display mode. The temperature on display reflects the actual ambient temperature.

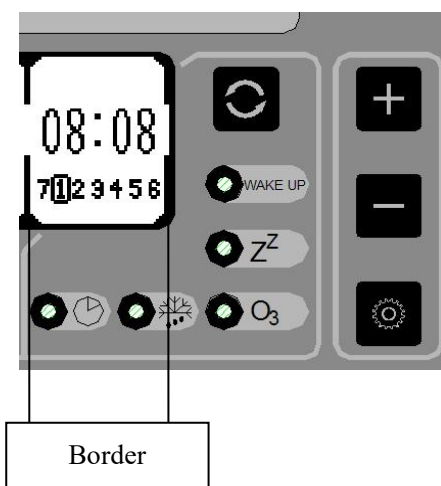
#### 4.4.5 Enable specimen clamp peltier function



Press and hold for a few seconds to turn on/off specimen clamp peltier function. When the function is activated, “❄️” icon will appear above the displayed temperature value (as shown in the left diagram). It operates for a duration of 15 minutes; the specimen clamp peltier function can be activated when the cryo chamber temperature drops below minus 8 degrees Celsius.

### 4.5 Time setting

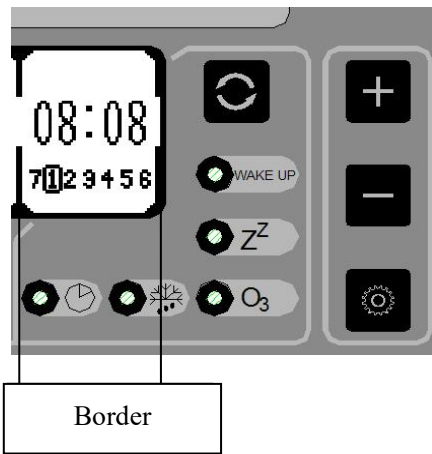
#### 4.5.1 Real time setting



Press , and the border of the time display area will be bolded. When the light is on, it enters real-time mode as the left diagram illustrates. Press to enter real-time clock setting. The value can be set through ; Press to switch to minute setting, then press again to switch to day setting. After completion, press to enter defrost time setting or it will automatically exit after 5 seconds of inactivity.

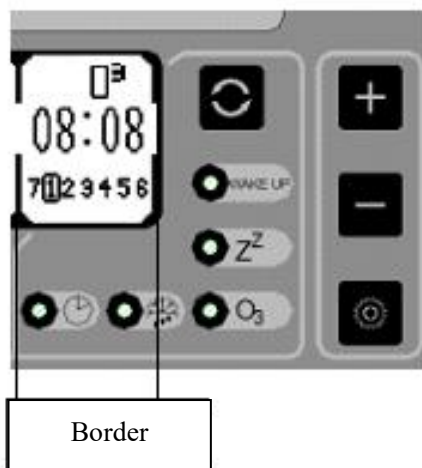


### 4.5.2 Defrosting time setting



Press and the border of the time display area will be bolded. When the light is on, it enters defrost time mode as the left diagram illustrates. Press to enter defrost time setting. The value can be set through ; Press to switch to minute setting, then press again to switch to day setting. After completion, press to enter disinfection time setting or it will automatically exit after 5 seconds of inactivity.

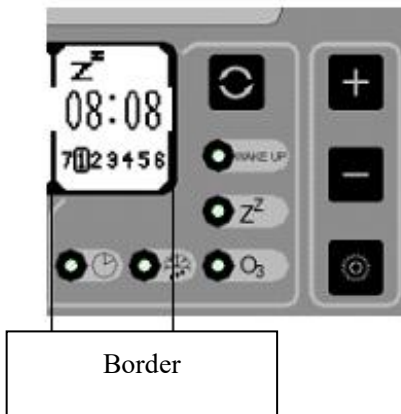
### 4.5.3 Disinfection time



Press and the border of the time display area will be bolded. When the light is on, it enters disinfection time mode as the left diagram illustrates. Press to enter disinfection time setting. The value can be set through ; Press to switch to minute setting, then press again to switch to day setting. After completion, press to enter sleep time setting or it will automatically exit after 5 seconds of inactivity.

When the disinfection function is activated, an O3 icon (as shown in the left diagram) will be displayed above the time display. The disinfection function activates both UV ultraviolet sterilization and O3 simultaneously.

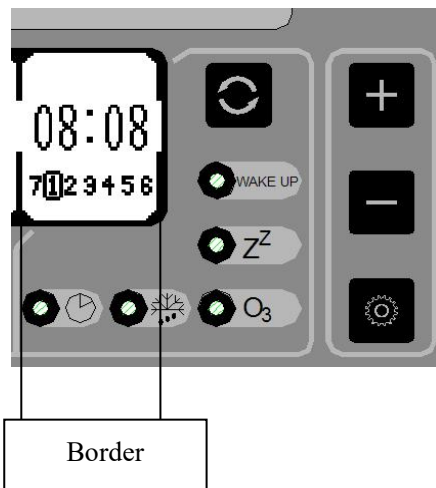
### 4.5.4 Sleep time setting



Press and the border of the time display area will be bolded. When the light is on, it enters sleep time mode as the left diagram illustrates. Press to enter sleep time setting. The value can be set through ; Press to switch to minute setting, then press again to switch to day setting. After completion, press to enter wake up time setting, or it will automatically exit after 5 seconds of inactivity.

When the sleep function is activated, a "Z<sup>2</sup>" icon (as shown in the left diagram) will be displayed above the time area. Users can individually set the sleep time for Monday through Sunday.

### 4.5.5 Wake up time setting



Press and the border of the time display area will be bolded. When the light is on, It enters sleep time mode as the left diagram illustrates. Press to enter wakeup time setting. The value can be set through ; Press to switch to minute setting, then press again to switch to day setting. Users can individually set the wake-up time for Monday through Sunday.

If the user does not need to use this machine on a certain day, please set the hour value as 00 and the minute value as 60 (minute value of 60 is an invalid time, and it will not automatically wake up). After completing the settings, press the cycle button to exit, or it will automatically exit after 5 seconds of inactivity.

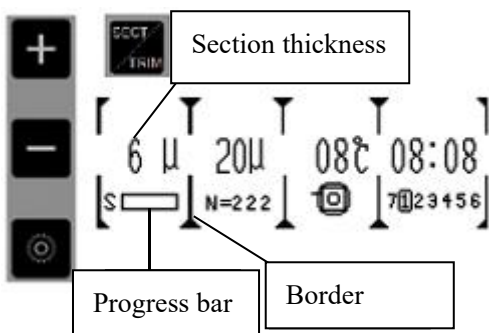
### 4.6 Section/Trimming setting



#### ⊙ Mode selection

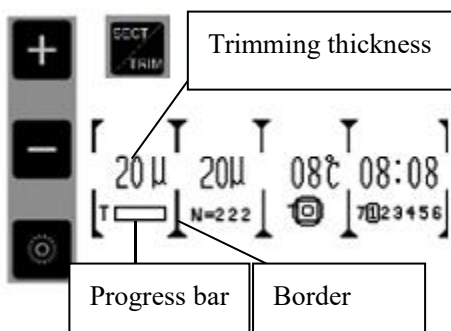
Select the desired mode between manual and automatic mode.

When in manual mode, the icon "" appears on the top of the retraction value display (as left diagram shows) , In this mode, pressing the button for automatic sectioning will not work, and automatic mode cannot be initiated. When the machine is in automatic sectioning mode, only automatic operations are possible. Attempting manual operations forcefully may lead to machine damage.



#### ⊙ Section setting

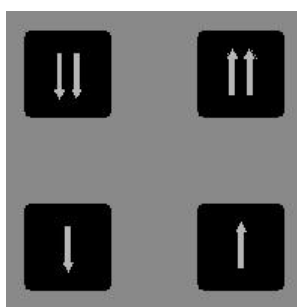
Press **SECT/TRIM**, and the border of the section display area will be bolded. When the letter on the left side of the progress bar becomes "S", it enters sectioning mode. Press to enter section setting. The section value can be set by . After completion, press again to exit or it will automatically exit after 5 seconds of inactivity.



#### ⊙ Trimming setting

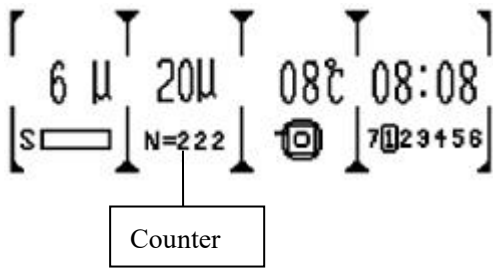
Press **SECT/TRIM**, and the border of section display will be bolded. When the letter on the left side of the progress bar becomes "T", it enters trimming mode, press to enter trimming setting.

The section value can be set by . After completion, press again to exit or it will automatically exit after 5 seconds of inactivity.



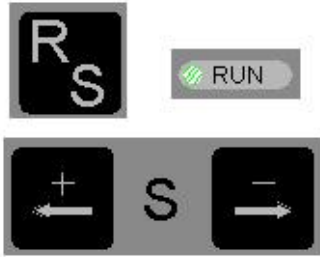
#### ⊙ Feed

Press these buttons to adjust the specimen position back and forth to align with the blade edge. When the blade is far away from specimen, press to move the specimen clamp forward or backward quickly; When the blade is close to the blade, press to adjust the position slowly.



⊙ Section (in motorized mode)

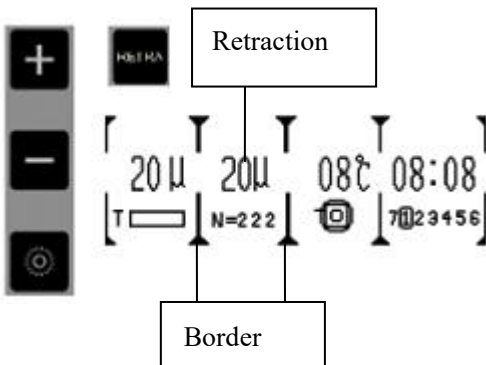
Long press the button **RS** corresponds to the operation indicator light turning on, indicating the start of the operation. A short press of this button will stop the operation. During operation, all other buttons, except the speed adjustment button **+ S -**, are non-responsive.



In manual mode, rotating the right-hand wheel will initiate sectioning or trimming.

Section counting function: The counter display is zero in trimming mode. It starts counting when transitioning from trimming to sectioning.

#### 4.7 Retraction setting



Press **RETRA**, the border will be bolded, then press to enter retraction setting. The value can be set by **+ -**.

After completion, press again to exit or it will automatically exit after 5 seconds of inactivity.

#### 4.8 Section Reference

1. When using the cryostat microtome, mastering the appropriate sectioning speed and correctly adjusting the anti-curling plate are the most crucial factors for cutting ideal tissue sections. The suitable sectioning speed is acquired through practical experience. The adjustment of the anti-curling plate involves multiple components that may interact with each other. It requires meticulous calibration and should not be randomly placed on the blade.
2. During cryosectioning of live tissues, the moisture within the tissue condenses into ice, causing the tissue to harden. The hardness varies with temperature; the lower the temperature, the harder the tissue becomes. To determine the optimal sectioning temperature for obtaining high-quality tissue sections, one needs to experiment and explore. For most tissues without fat and not fixed with formalin, the recommended sectioning temperature is between -13°C and -23°C.
3. To obtain high quality section, please pay attention to the following aspects:

- 1) Selecting the appropriate working temperature for the cryochamber.
- 2) Executing precise sectioning operations.
- 3) Fine-tuning the anti-curling plate.
- 4) Using a sharp sectioning knife with an appropriate cutting angle.
- 5) Ensuring the blade is securely clamped.
- 6) Ensuring the sample is properly secured.

Choosing the angle between the sectioning knife and the sample is crucial. A smaller angle results in less compression of the section. For harder samples, a larger angle is recommended. If the sectioning results are unsatisfactory, try gradually increasing the angle from 0°. There is currently no universal rule to determine the optimal angle for different samples. Experimenting to find the suitable angle for various samples is a method to achieve high-quality sections.

4. In contrast to general paraffin sections, frozen sections do not cut along the long edge of the tissue; it is preferable to cut along the short edge, ensuring a shorter contact line between the tissue and the sectioning knife.

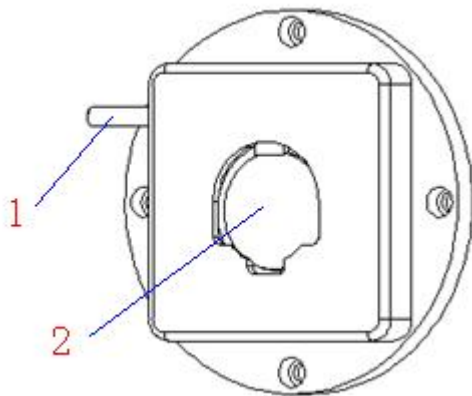
● After completing the sectioning process, place the sample clamping system at the top and secure it. Once the instrument is no longer in use, remove the blade and store it in the blade box.

## 5. Cleaning & Maintenance

### 5.1 Cleaning

#### ⊙ Cleaning the instrument

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.



#### ⊙ Cleaning the clamp

##### Specimen clamp

Position (1) which is often touched when operation, and position (2) which always contacts with the specimens. These two positions, especially position (2) is very easy to be polluted, so it need to be cleaned frequently to ensure normal operation.

⊙ **Cleaning the blade holder**



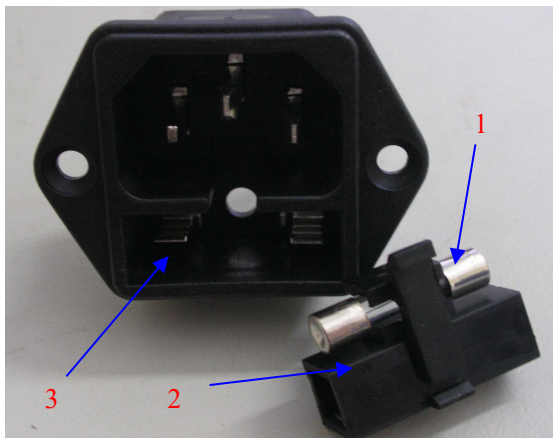
Detach all the parts of blade holder as it is shown in the picture and clean all the parts separately, especially the following easily polluted parts: the sliding rail, lever, blade clamp and the joint of the parts. And remember to clean the blade clamp every time before installing a new blade to ensure good sectioning.

To obtain a high-quality section, it is important to keep the instrument's cleanliness. Therefore, the user must clean the instrument periodically or irregularly according to the total sectioning quantity to obtain the best sectioning result.

- 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 blade holder removed for separate cleaning. It is also essential to remove the blade from the blade holder before cleaning.
- The handwheel must be locked before initiating the cleaning and maintenance procedure.
- Open the glass after turning off the instrument to keep the chamber dry
- Do not use corrosive liquids to clean the instrument.
- Ensure that no liquids enter equipment during the cleaning and maintenance.
- Keep cleaning the cryo chamber frequently
- Do not turn on the instrument before it is completely dry .

## 5.2 Maintenance

⊙ **Fuse replacement**



● Put the fuse (1) in the installation part (2) and then insert the installation part into the socket (3) .

● Cut off the power supply and pull out the plug before changing the fuse .

Attention: Before changing the fuse, please read the operation manual carefully. And make sure to use the specified fuse.

## 6. Trouble Shooting

Below you find a list of the problems that most frequently occur. And they are mostly caused by operation, so please read the operation manual carefully before using it.

Problem	Possible causes	Corrective action
<ul style="list-style-type: none"> <li>No display, no reaction to buttons pressed after the instrument is switched 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> <li>The fuse is not installed or has blown.</li> <li>The input voltage marked on the instrument does not correspond to the ambient voltage.</li> </ul>	<ul style="list-style-type: none"> <li>Reconnected the main cable or replace it.</li> <li>Replace the fuse .</li> <li>Check the ambient voltage if it does not match, request a service professional.</li> </ul>
<ul style="list-style-type: none"> <li>The section is uneven from the second section</li> </ul>	<ul style="list-style-type: none"> <li>The sectioning angle of the blade is too small.</li> <li>The clamp is not steady.</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> <li>Check if all the screw are tightened.</li> </ul>
<ul style="list-style-type: none"> <li>Section curl</li> <li>Section soften</li> </ul>	<ul style="list-style-type: none"> <li>The clamp is unstable.</li> <li>The space between anti-curl plate and blade is too small or anti-curl plate is lower than the blade</li> </ul>	<ul style="list-style-type: none"> <li>Adjust the anti-curl plate .</li> <li>Extend the cooling time of blade or anti-curl plate .</li> </ul>
<ul style="list-style-type: none"> <li>The section sticks to the blade or anti-curl plate</li> <li>Section splinter</li> </ul>	<ul style="list-style-type: none"> <li>The temperature of blade or anti-curl plate is too high</li> <li>The blade or anti roll plate is polluted</li> <li>Temperature too low for tissue cut</li> </ul>	<ul style="list-style-type: none"> <li>Clean the blade or anti-curl plate</li> <li>Reduce the cooling time and adjust cryo chamber temperature</li> </ul>

Problem	Possible causes	Corrective action
<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 tilting gradient.</li> </ul>
<ul style="list-style-type: none"> <li>• The section flies away and sticks to the microtome or other near objects</li> </ul>	<ul style="list-style-type: none"> <li>• It is effected by static.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase the surrounding humidity to get rid of the static.</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>• Reinstall the blade and adjust the gradient of the blade.</li> </ul>

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



## Standard accessories list

### AST550

No	Accessory Name	Qty	Notes
1	Cryostat Microtome	1 set	
2	Blade Holder	1 set	
3	Handling wheel	1 pc	
4	Specimen clamp	10 pcs	
5	M5 Allen Wrench	1 pc	
6	M3Allen Wrench	1 pc	
7	7mm Wrench	1 pc	
8	Disposable blade	1 box	
9	Power cord	1 pc	
10	Brush	1 pc	
11	Fuse	2 pcs	220V/8A 110V/15A
12	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](http://www.amos-scientific.com)

Email: [info@amos-scientific.com](mailto:info@amos-scientific.com)