Kalstein®

Model YR426-1

Cryostat Microtome

Instruction Manual

Thank you very much for purchasing our Model YR426-1 Cryostat Microtome.

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


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

CONTENT

1.Introduction ……...1

2.Safety Instructions……...2

3.Technical Parameter ……....3

4.Working Condition……...4

5.Assembling and parts adjustment…….....5

6.peration……10

7. Trouble shooting……15

8. Safety and maintenance……16

9.Cleaning……...17

1.Introduction

Kalstein Microtome. Used in conventional histology and Mohs surgery. It represents the high-end products worldwide. It is a highly cost-effective cryostat microtome. It produces high-quality tissue sections in a fast, simple, and efficient way. Our goal is to: To improve the precision of the cancer diagnosis, Improve the diagnosis speed and decrease the cost of diagnosis. Let more people can enjoy the fast and precise medical tests, thus promote the optimization of treatment.

This machine is a rapid pathological section instrument to human and animal body tissues. It can be widely used for pathological diagnosis, analysis and research in hospitals, medical colleges, legal medical experts and propagation institutes.

1.1 Scope of application

Used to Pathological section and study histology of plant, animal or human being.

1.2 Consists of parts

The instrument mainly consists of 4 parts:

- The computer-controlled panel is on the upper part to display the temperature and the working condition of the instrument.
- The center part is the constant low temperature room to rapidly freeze the vivid tissue and to conduct the cutting area.
- Behind is the mechanical transmission and motor drive.
- The lower part is the compressor unit for cooling.

1.3 Helpful suggestions

- The user should read this user manual carefully before first installation and operating the machine and put this manual beside the instrument to refer it when meet problems.
- Before operation, please carefully read operation instruction first to know operation steps and process.

2.Safety Instructions

2.1 Obligation to the operator

Only staff who are familiar with basic regulations on safety at work and accident prevention and are trained in the use and operation of this instrument should be allowed to handle this instrument.

2.2 Safety notes

- Unit must ship upright. If this unit was shipped lying down or stored lying down then it must stand upright for 36 hours before use.
- Do not put instrument under extreme temperature and high air humidity environment. Failure to follow this will cause instrument severe damage.
- Blade is sharp, beware when you change it.
- Do not place blade anywhere with the cutting edge facing upwards.
- Check your power socket is well grounded. Ensure that power supply is stable, constant and adequate. Compressor requires a start-up current between45 and 50A. Therefore, the professional electrical engineer must inspect the electric circuit before installation to meet smooth operation of the instrument requirement.
- Do not place instrument directly under sunshine or outlets of air condition.
- No other obstructs around the instrument in 30cm distance.
- Before changing specimens always lock the hand wheel.
- In case of malfunction, contact our company. Don't try to solve it by your own risk.

3.Technical Parameter

3.1 Technical Specification

- Voltage And Frequency： AC220V±10%, 50Hz (Standard)
- AC110V±10%, 60Hz
- Power：600W
- Refrigerant：R404a,300±10g
- Compressor Type：Double Danfoss Compressor
- Working noise: 47dB(A)

3.2 Feature

- Section thickness range： 0.5-100μm Adjustable

  0.5-5μm ， Increment：0.5μm

  5-20μm， Increment：1μm

  20-50μm， Increment：2μm

  50-100μm， Increment：5μm

- Trimming thickness range： 0-600μm Adjustable

  0-50μm ， Increment：5μm

  50-100μm ， Increment：10μm

  100-600μm ， Increment：50μm

- Specimen retraction：1-100μm Adjustable ，Increment：5μm
- Maximum specimen size：55mm*80mm
- Speed of fast-forward and back-forward: 0.9mm/s、0.45mm/s
- Horizontal stroke：22mm

  Vertical stroke：65mm

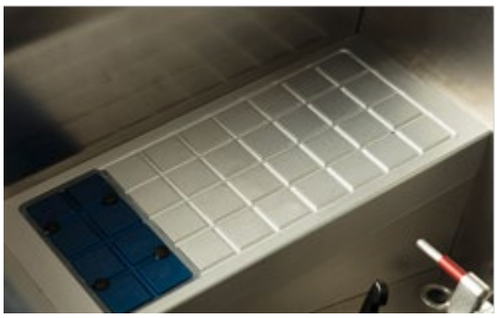
- Chamber temperature： 0℃～-60℃ Adjustable
- Specimen head temperature： 0℃～-60℃ Adjustable
- Freezing shelf ：Minimum Freezing shelf temperature：-55℃

  Number of freezing stations：27

- Peltier：Minimum Peltier shelf temperature：-60℃

Peltier number: 6

Working time to reach -60℃： 15min



3.3 Dimension

- Size：700*760*1160mm 210KG
- Packing size：790mm*810mm*1336mm 225KG

4.Working Condition

4.1 Advanced set

- The instrument is movable floor type with 4 caster wheels. Two front wheels can be up and down adjusted by turning knobs on the foot. These front wheels only function when the instrument needs to move. After remove the package, put the front wheels on the ground and move it to the working position and secure it, then disable the front wheels.
- The instrument can only be used after 2 hours standing still.
- Confirm the power supply is grounded (triple socket), then connect the instrument with the main power socket, turn on the power switch at the back of the instrument, the machine is in operation mode.
- Other materials are not allowed to put on both sides of the instrument. At least to leave a 300mm space to facilitate ventilation and heat dispersion.

4.2 Ambient temperature and environment

- The instrument working ambient temperature is +5℃～+28℃. If

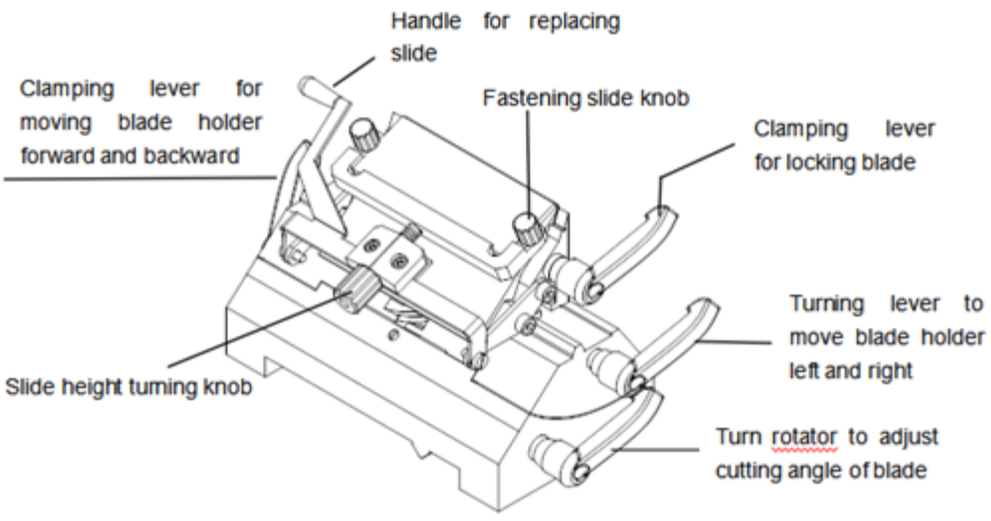
the temperature is above 26℃, air conditioning must be installed. Otherwise, the lifetime of the cooling compressor will be shortened.

- Environment relative humidity is no more than 80%.

High temperature or humidity will influence freezing effect.

5.Assembling and parts adjustment

5.1 Specimen head



- Release（anti clockwise）clamping lever on the left，manually move the holder back and lock it at the desired position. When the holder moves to the terminal point the whole blade holder can be taken out and put it back by reverse procedures. Release（anti clockwise）lever on the right, manually move the holder left and right and lock it at the desired position.

Note: Remember to lock well the blade holder to right position when doing forward or backward specimen adjustment.

5.2.1 Replace blade

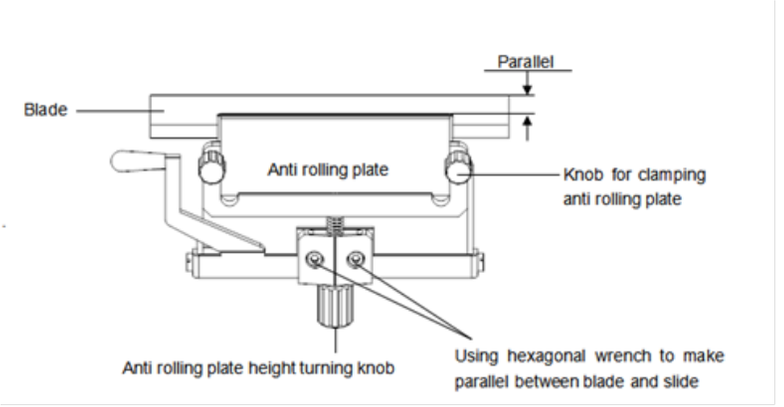
- Release clamping lever on the upper right to open blade clearance; insert blade from left to right; then lock well the clamp lever.

Note：Blade is sharp, beware when you change it.

5.2.2 Adjust the angle of the blade

- Use hexagon spanner to lose the rotator. Knife folder can be turned and in the selected location can be tight. Slice half-way when necessary change blade, only need to release clamping lever for locking blade, then replace the blade.

5.3 Adjust the anti-rolling plate

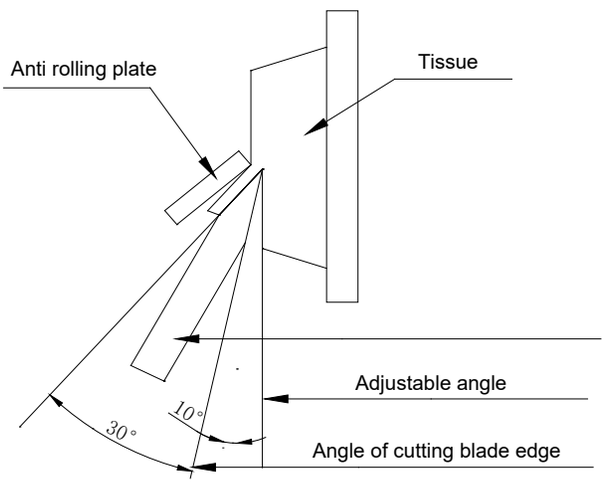


The anti-rolling plate is made of Plexiglas. Adjustment includes：

5.3.1 Make the edge of the anti-rolling plate parallel to the edge of the blade

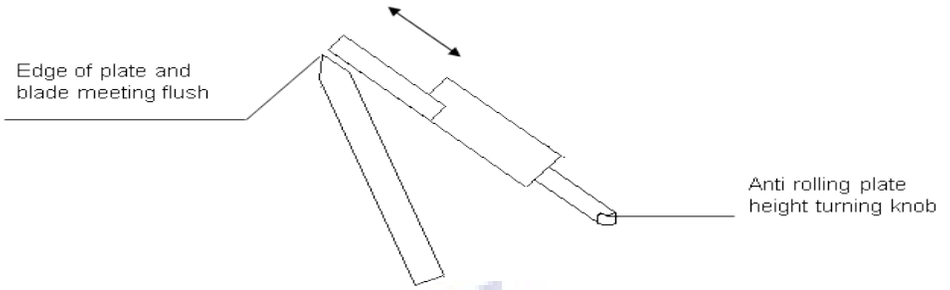
- Insert blade and lock the clamping lever
- Lock two knobs.
- Using hexagonal wrench to make parallel between blade and anti-rolling plate
- Fastening hexagonal screw
- Turing height turning knob to adjust height of anti-rolling plate

5.3.2 Adjust the anti-rolling plate angle with the blade



The angle shall be no more than 10°

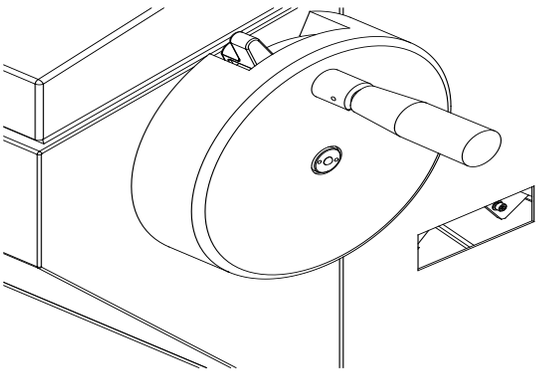
5.3.3 Make the edge of plate and edge of blade meet flush



- To protect the upper part of the anti-rolling plate connecting with tissue specimen without any damage.
- When the quality of the tissue section is not good, should view the cutting edge, anti-coil whether organized debris, grease and other foreign matter.
- Avoid to touching the front of the plate, because high temperature will stick the tissue section.

5.4 Hand wheel locking

To give operator more convenience and safety, we increase locking position from 8 to 16. The first locking position is at the top while gearing handle is facing to operator.



6.Operation

6.1 Turning the Instrument on

First connect power line on the rear of cryostat, then turn on switch on the rear of cryostat. Cryostat is under working condition and feeding arm go back original position. Compressor starts to work after turning on power switch and freezing chamber begins to cool down. (It depends the interval of turning off and on, if within 3 minutes, the instrument needs to wait another 3 minutes, otherwise machine easy to damage). There has logo of two fans, it is used to indicate the working state of the compressor. first one is for main compressor and second is small compress. Green is the working state, blue is the standby state, and black is the stopped state.

6.2 Operation panel

The main panel is divided into two pages. The first page is the Immediate defrost setting, the section / trimming mode setting, Peltier freezing module control and the standby control, the temperature control; the second page, the timing defrost setting, the time display and setting area, left small operation panel is used for the rapid movement of the specimen head, the lighting lamp and the UV sterilize control.

6.2.1 first page control button introduction

6.2.1.1 Immediate defrost

This is fast defrosted button. Is used to open or close. Press this button, the machine enters the instant defrosting state, the indicator light on the right is on, the machine enters the defrosting state, and the defrost time is 60 minutes each time. Pressing this key during

defrosting will immediately stop defrosting. The indicator light goes out, Cooling system re-start to work after 25 seconds.

6.2.1.2 Peltier freezing (It is invalid understand by mode)

This is Peltier switch button. Is used to open or close. Press it, indicator light is on, and Peltier element begins to work. Peltier cooling is started for 15 minutes. As time increases, the Peltier operating time will gradually decrease until the Peltier refrigeration unit stops working and the indicator light goes out. User also can press this button to stop Peltier when it is activated.

If Peltier shelf temperature is higher than -15℃when Peltier working, Peltier will self-close. On the same principle, if freezing shelf temperature is higher than -150℃, Peltier cannot be activated.

6.2.1.3 Standby

We call the instrument into "Standby" mode by keeping the freezing chamber at a temperature of -5℃ to -10℃. This time the operational time of the compressor is less than the stop time with average power consumption decreased, more prolongs the lifetime of the compressor. When long time do not use the instrument for slicing, then let it go into "Standby" mode.

This is standby button. Press it one time, system goes into standby mode or transfer to work state.

6.2.1.4 Adjust value (section /trimming thickness)

After switch on cryostat, the screen will display data.

The display information on the lower part of the touch screen shows the section model and its value on the right, the retraction value and total thickness value on the left.

This is mode selection button. Press it may select Section (Sect) or Trimming (Trim) working mode.

"+" button is to increase value. Push it to add on section (trimming) value.

"-" button is to decrease value. Function is same as above.

6.2.1.5 Temperature adjust

After the machine is turned on, it automatically runs at the current time. We call this mode after the machine is powered on and reset, called the initial mode.

The upper right side of the screen is the current time and week; the left side is the temperature of the freezer chamber, specimen head temperature and the freezing shelf temperature. The screen displays the actual temperature value, and the number in the white box shows the set temperature value. "+" "-" Used to adjust the temperature.

6.2.2 second page control button introduction

6.2.2.1 Time setting

click the setting button at the bottom right of the screen to enter the second page of the setting button, time, standby and automatic defrost settings.

Time and week settings, as shown below, press the up and down buttons to adjust the number and day of the week.

Set the standby model time, as shown in the figure below, click to select the day of the week, and then set the standby time. The first time is the standby start time, and the second is the time to release the standby. Click to Save or set according to the actual application.

Automatic standby model setting, as shown in the below, click to select the day of the week, then select the defrost time, and click Save.

6.2.3 Usage of small operation panel (left)

6.2.3.1 UV sterilize

This is UV sterilize button. Press it to activate UV lamp and Indicator light is on, UV lamp in the freezing chamber is on and begins to sterilize. It is automatic timing after activating, and it will self-close in 15 minutes. User may press button once more to stop it at any time.

Note： Keep quartz tube cleaning is the key point for sterilizing, we suggest user to regularly clean it to maintain sterilizing ability. Because UV sterilizing is unfit for low temperature, it is better to start to sterilize understand by situation.

Note: When doing UV sterilize, please close glass window and do not let UV light goes out of chamber.

6.2.3.2 Lamp

This button is the light on / off button. Press this button to turn on the light. To stop, press this key again, the light goes out.

6.2.3.3 Specimen head slow feeding

Specimen position is adjustable by this button. Press it to move slowly to adjust the specimen head. backward.

6.2.3.4 Specimen head fast feeding

Press double arrow buttons to fast move clamp forward or backward. The specimen head moves quickly by pressing any of these two keys. If the back button is pressed, an operation to return to the end point will be generated. If you do not want the specimen head to return to the end point, you need to touch the fast forward button You can stop the sample head in motion.

When user press backward button, clamp will go back to backward limitation, if need to stop on the midway, please lightly touch forward double arrow button, then clamp will stop moving Alarm will warn while specimen is moving to front or end limitation.

Note：When adjust specimen forward or backwards movements, the hand wheel must lock at the right position.

7. Trouble shooting

Trouble	Solving Method/ Reason
Tissue crack	Select thinner tissue, The freezing time is not quick enough
Tissue specimen off	Apply more embedding material The cutting tissue is soft The temperature of the specimen disc is low
Tissue moves on, but without slicing	Ensure the fastening of the blade Fix the specimen clamp Ensure the fastening of the specimen disc on the clamp Increase the blade angle
Tissue section rolling	Check the gap between the anti-rolling plate and the blade Increase the height of the anti-rolling plate Check the angle of the anti-rolling plate and the blade
Tissue becomes soft when cutting	Prolong the refrigeration time of the anti-rolling plate and the blade
Tissue section stick to the anti-rolling plate	Use short hairbrush to clean the anti-rolling plate Prolong the refrigeration time
Tissue section overlapping	Clean the blade with hairbrush The clearance angle between the blade and the anti-rolling plate is too narrow
Vertical crack of tissue section	Edge of the blade has defection, need grinding Foreign matter on the blade
Tissue section narrowed	Adjust the clearance angle of anti-rolling plate and the blade evenly

Tissue section broken	Too low temperature of the tissue, too long time freezing, the tissue is affected
Vibration when slicing	Unfixed blade The angle of the blade is too big or too small The specimen disc is not fixed well Cutting speed is too fast
Uneven thickness of the tissue section	Dull blade Angle is too small The specimen disc is not fixed well

8. Safety and maintenance

- Make hand wheel in the lock position when the instrument stops.
- Open the glass door after the instrument stops, to let the steam vaporized and keep the working
- room dry.
- Change the broken light accordingly (220 V 15W），pay attention to safety when doing the
- exchange.
- The elements of the electric system, such as control panel, electric control box, only use expert
- for the maintenance, others no touch.
- The cooling system mainly consists of compressor, condenser, filter, and evaporator. The
- condenser (with fan) may accumulate dust after long time usage, which can affect the Cooling function. It is necessary to open the side ventilation board and use brush to clean the dust on the projecting vane of condenser or use high pressure air to blow it.
- Frequently clean the constant temperature chamber, to keep it clean. Pay special attention to not hurt by the blade.

9.Cleaning

9.1 Cleaning up the instruments

9.1.1 Conduct the following steps before cleaning each time

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

9.1.2 Instruments and external surface

- If necessary, the external painted surface can be cleaned with light-duty commercial housework cleaner or suds. And then use wet cloth rub it until dry. You may use the substitute of xylene,
- grease oil, grease scavenger to erase residual. The instruments must be dry when use again.

9.1.3 Blade holder

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

- Turn the eccentric rod handle in the lateral of the body of revolution and draw it out from side ward.
- Push the knife clamp back which have knife clip and shift it out from the rotary unit.
- Turn the eccentric rod handle in the lateral of the knife clap and draw it out from side ward.
- Dismount the knife clamp.
- Clean up all parts of the blade holder.
- Make the blade holder dry and assemble it together.
- Apply to thin layer of lubrication after cleaning up the parts which

had been taken off.

- When fix the knife clip, make sure that its upper part is parallel with the back edge of the knife
  clamp seat.

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

when clean up.

9.2 Lubricate instruments

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

9.2.1 Instruments and specimen holder

- Grip draws in the clamp.
- Lock in iron at the "T" knife clap back of the microtome bed plate.
- The blade holder slide way on the microtome bed plate.

9.2.2 Blade holder

- Lock in iron at the "T" body of the rotary units on the knife clamp seat.
- The knife control grip is shift to the eccentric rod handle.
- The iron locking heads on the knife clamp of the" T" body of rotary unit and the knife holder with
- slide way.
- The grasping joystick of the blade.

Notes ： Slice Reference

Note 1 ： When use the cryostat microtome, better to control the blade speed and correctly adjust the anti-rolling plate is an important factor to cut out high quality sections. The proper speed of the blade can only be acquired by practice experience, and the skillful control of the hand wheel. The adjust position of the anti-rolling plate is more. Sometimes they interfere with each other; it needs careful adjustment without random putting them on the blade edge.

Note 2 ： When freeze the living tissue, the water content in it will condensed into ice, the tissue will be hard. The hardness of it changes with the temperature, the lower temperature changes the harder the tissue becomes. Different tissue under different temperature, to have high quality sections, this skill can only be got through practice. Most cutting temperature of the specimen tissue without fat and formalin, better to select between -13℃～-23℃.

Note 3 ： In order to obtain high-quality pieces of tissue, pay attention to the following:

- Proper selection of working temperature in the chamber
- Correct slicing operation
- Fine adjustment of the anti-rolling plate
- Sharp slicing knife, correct cut angle

Note 4 ： The freezing section is just opposite to paraffin slicing，the freezing section is not cut the long edge, better to cut the shorter edge which means the line of contact is shorter.

The symbol on the product or on its packaging indicates that this product may not be treated as household waste. Instead, it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. For more detailed information about recycling of this product, please search http://www.hp.com/go/recyle.