TANNER scientific

Users Manual

Tanner Manual Rotary Microtome
TITAN 5000

phone 919.309.0188 www.TannerSci.com
4122 Bennett Memorial Drive, 201 Durham, North Carolina 27705

Contents

Section		Page
1	Overview	1
2	Handwheel operation	1
3	Technical parameters	3
4	Brief introduction	3
4.1	Sketch of the Titan microtome	3
4.2	Description	4
5	Unpacking and installation	4
5.1	Unpacking	4
5.2	Requirements for handling	4
6	Installation	5
6.1	Installation of specimen clamp	6
6.2	Installation of accessories	6
6.3	Installation of Blade Holder and its Base	6
6.4	Installation of Waste Tray	6
7	Operation	7
7.1	Section Thickness	7
7.2	Handwheel	7
7.3	Trimming	7
7.4	Sectioning	8
7.5	Retraction	8
8	Regular Operation	8
9	Error Checking and Solutions	9
10	Cleaning	9
11	Maintenance	10
12	Appendix	11

TANNER scientific

1. Overview

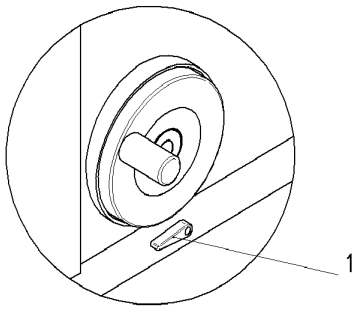
The serial number and date of production are attached on the nameplate at the back of the instrument.

2. Handwheel Operation

Safety Devices
Attention: Always Lock the Handwheel before cleaning!

Quick locking lever for Handwheel
Attention: Remember to lock the handwheel and cover the blade with the protective fitting before changing the blade or specimen block.

The handwheel can be locked at any position with the locking lever (1) located at the right side of the microtome pedestal. The two positions (Up=lock; Down=loosen) of the locking handle are marked on the pedestal.



Operation:
- Pull the locking lever (1) "Up" to mechanically lock the handwheel, the handwheel can then not be turned.
- Pull the locking lever (1) to "Down" to loosen the handwheel, and the handwheel can then rotate.

Blade-protecting lever on the blade holder

Attention: Remember to lock the handwheel and cover the blade with the protection lever before operating the blade or changing the blade and at any time when not operating the microtome.

There is a protecting lever on each blade holder, with which the blade edge can be fully covered.

Transportation and Installation

- Pay careful attention to the "Technical Parameters" in Chapter 4.
- The instrument can only be placed upright in the course of transportation.
- Avoid grasping the handles of the handwheel, or the knob used for adjusting the section thickness in the course of moving the instrument.
- Do not remove or change the protecting devices equipped on the instrument and its component parts.

Operation

- Be very careful when using blades or disposable blades. The sharp edges may cause serious injury.
- No blade or blade-holder with blade inside should be randomly placed. The blades should always be kept in blade cases except when in use.
- The blade is should never be placed with its edge upward.
- Never try to catch a blade if dropped!
- Firmly clamp the specimen before installing the blade.
- Remember to lock the handwheel and cover the blade with the protection fitting before operating the microtome or when changing the specimen, and also at any time that the unit is not being used.
- Be careful when using any liquids around the instrument, any spilling of liquid on the instrument will cause serious damage and void the warranty.

Cleaning

- Always lock the handwheel before cleaning the instrument.
- Do not clean the instrument with detergent containing acetone and benzene.
- Make sure that no cleaning fluids flow into the instrument, this will cause serious damage and void the warranty.
- Please follow any cleaning regulations and rules stipulated by the manufacturer and any laboratory rules concerning safety.

Maintenance

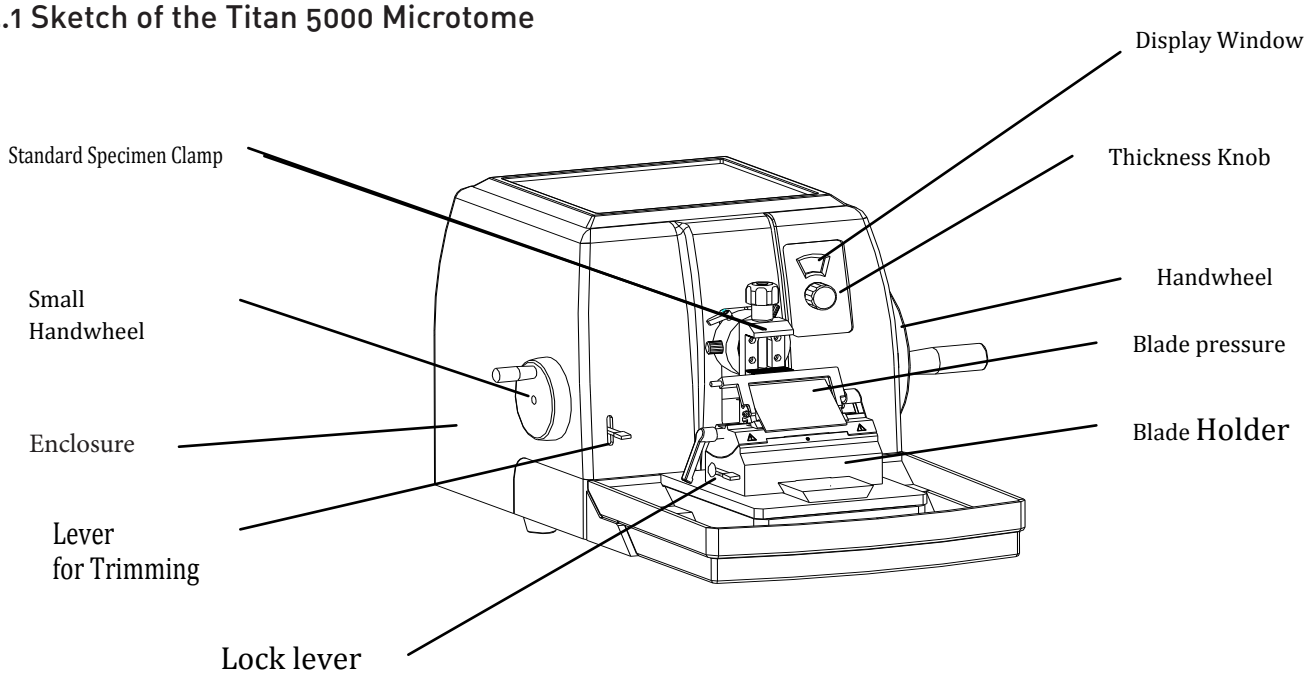
- Opening the instrument cover should not be necessary except by authorized technicians of our company in the course of maintenance.

3. Technical Specifications

- Section thickness setting range: 0-60µm
- Setting values : 0µm-20µm in 1µm increments
  20µm-60µm in 5µm increments
- Precision Error: ±5%
- Trim Setting Mode: 15µm or 35µm
- Specimen Retraction Range: 90µm, this function can be shut off
- Object Feed: 30mm
- Vertical Stoke: 70mm
- Specimen orientation System: 8°X/Y, moving Range of Holder Base:
- Front / Back: 65mm
- Left / Right: 40mm
- Dimension: 500 x 570 x 300(L x W x H)
- Height of Blade edge: 105mm
- Net Weight: 33kgs

4. Brief

4.1 Sketch of the Titan 5000 Microtome



4.2 Description

Model Titan 5000 is a manually operated microtome powered by the turning handwheel. The guide-lines for the vertical and horizontal movement of the specimen are seamless and maintenance free. The specimen advances by the turning of the handwheel. All of the important the parts of the instrument are covered by a sturdy enclosure. The handwheel should turn smoothly during cutting. Selection of the section thickness can be adjusted by the thickness adjustment knob.

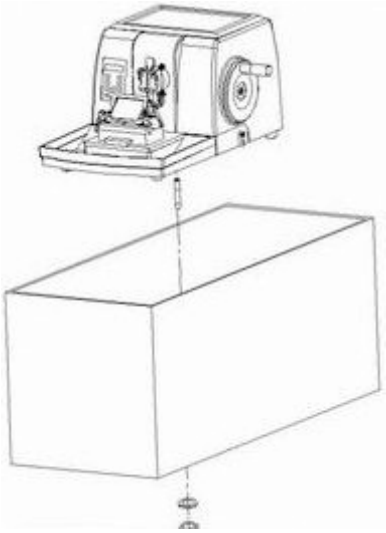
5. Unpacking and Installation

5.1 Unpacking

• Unpack the wood crate to take out all components and the instruction sheets.

IMPORTANT – The Titan microtome is packed in a safe crate designed to limit any movement of the unit during shipping.

WARNING- A hex screw is used to secure the unit to the base of the wooden crate. Care must be taken to remove the hex head screw from the base before attempting to remove the unit from the crate.
Hold the base of instrument and take it out.
DO NOT try lifting the unit by any part of the enclosure at any time.



Attention

Avoid grasping the handle of the handwheel, the wheel itself, or any part of the section adjustment knob in the course of moving of the instrument.

Instrument setting

• The instrument should be set up on a very stable platform in the lab.

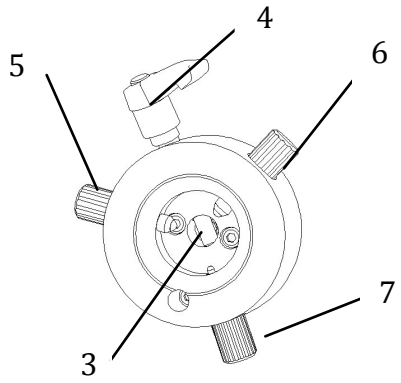
5.2 Requirements for Handling

• The unit should always be stable and not allowed to rock on the surface.
• There should be no vibration coming from the floor.
• Leave enough room for the convenient operation of the handwheel and the wheel's rotation

6. Installation

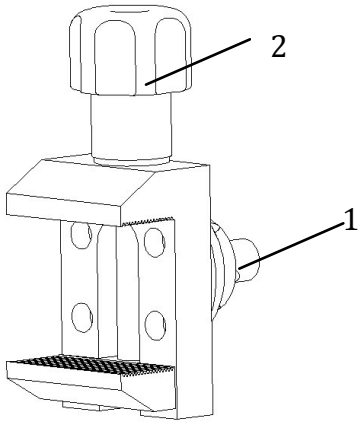
6.1 Installation of Specimen clamp

The adjustment mechanism of the specimen clamp has been installed onto the mainframe, and as ordered, the component setting hasn't been pre adjusted, The mechanism requires installation and adjustment at the time of unit setup.



Standard specimen clamp

- Lock the handwheel
- There is a coattail holder on the standard specimen clamp (1)
- loosen the clamp handle (4)
- Insert the coattail holder-leading into the coattail slot (3) when completed
- Lock "up" the handle (4).
- Turn the locking handle downward to loosen (7)
- The position of the specimen clamp can be adjusted by the large screw (5) and (6).



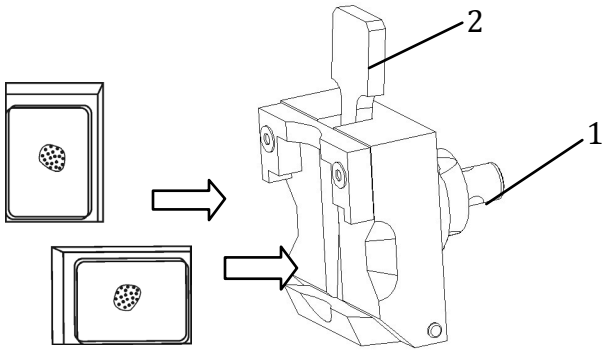
Attention

The screw (5) and (6) should be adjusted simultaneously within their range of movement.

- The screw (5) for Up/Down, and screw (6) for Right/Left. In the course of adjustment, the locking handle (7) should be loosened.
- Once the position of the specimen clamp is fixed, turn the locking handle upward (7) to lock it down.
- Changing the specimen clamp: Loosen the locking handle (4) to take out the specimen clamp from the coattail slot and install new one by reversing the procedure.

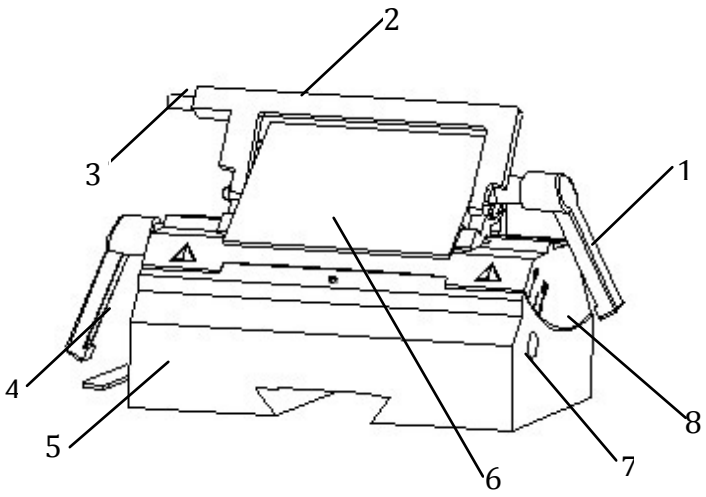
Universal Cassette Clamp

- Lock the handwheel
- Installation and adjustment is the same as the standard clamp above.
- The general specimen be positioned horizontally or vertically as shown above.
- Pull the locking lever 2 toward you to loosen mechanism.
- Horizontally or vertically put in the specimen cassett
- Allow spring to retract back to lock cassette in place.



6.2 Installation of Accessories

Attention: please don't insert the disposable blade before the blade holder is securely and properly installed on the Microtome! The disposable blade should be taken out before dismantling the blade holder for any reason.



6.3 Installation of Blade Holder and its Base

- Loosen Lever (9), move the blade holder base (5) backward to V block on the pedestal, then lock lever (9)
- Loosen the screw (7), install part (8) onto part (5), adjust the angle of part (8). The appropriate angle is 8°
- The screw (7) should be loosened before adjusting the cutting angle
- Loosen the locking lever (4) and mover part (6) to left or right to adjust blade position. The blade holder can be used for both low and high profile disposable blades.
- Turn and loosen the locking lever (1), and insert the blade into the groove edgeways, and lock the locking lever (4) after putting the blade into place.

The protection lever on disposable blade holder consists of a red adjustable handle (2) and pin (3). Cover the blade with the protection lever at any time when not operating the microtome. When changing the blade. Loosen lever (1), press pin (3) to take out the blade.

Attention

Remember to lock the handwheel and cover the blade with the protection fitting before changing the specimen and during times when microtome is not operating.

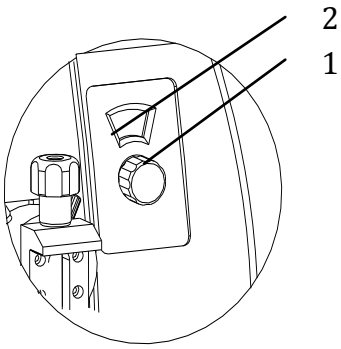
6.4 Installation of Waste Tray

Push waste tray parallel to bottom of base of machine until the tray stops against the base of the microtome.

7. Operation

7.1 Section Thickness

Section thickness range can be accomplished by adjusting the knob located on the right upside of the front part of the microtome. Each grade of the selection of the slice thickness can be easily be positioned by knob (1)



- Section Thickness Range: 0—60μm
- Setting value:
  0—20μm increment 1μm
  20—60μm Increment 5μm
- Display Window (2) shows section thickness range

7.2 Small Handwheel

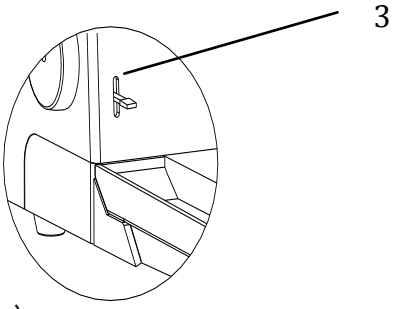
The small handwheel on the left is used to move the specimen clamp forward or backward quickly.

Turn the handwheel clockwise to make the specimen move toward blade. Handwheel is designed to move the specimen horizontally and quickly move the block toward or away from the blade. When the handwheel moves to the forward and backward utmost position, it will become harder to rotate.

Attention

Be careful enough to ensure the specimen is mounted securely on the specimen clamp. Damage will be done to the blade if the blade meets the metal specimen clamp.

7.3 Trimming



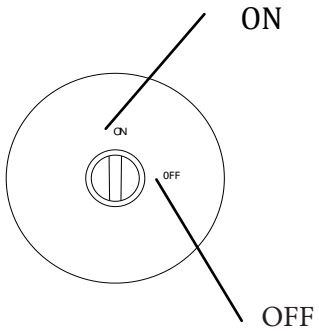
- Trimming lever (3) located at left side of the machine.
  Pressed to the middle position,trimming thickness is 15μm.
  Press it to bottom, trimming thickness is 30μm.
- First move the blade holder & base close to specimen, but don't touch or allow them to touch. Then, fasten the blade holder to begin the trimming and sectioning process.
- You can also Press lever (1) to the largest range, for example(50μm) to make trimming.
- When specimen is at upper position, press trimming lever to accomplish trimming or until the surface of the specimen is in a suitable position to start sectioning.

7.4 Sectioning

Attention

Be sure to turn the handwheel evenly, the speed of handwheel rotation should match the rigidity of the specimen. The harder the specimen, the slower Section thickness value can be accomplished by adjusting section knob at right upright of the machine.

- Choose best cutting angle, from the small to big scale. Once the specimen is too hard to cut, Cutting angle should be increased until ultimate desired ribbon is achieved.
- The Scale Value at right side of the blade holder is used to adjust cutting angle
- Rotate Section Handwheel smoothly and evenly to get ideal, good sample



7.5 Retraction

- Button for the retraction function is located on the back of the Machine. "ON" for retraction.
- Use "Single" Screwdriver to turn the button to "ON", it means retraction function is activated, If turned to "OFF", it means retraction function is shut off.

8. Regular Operations

Instructions for paraffin Sectioning

Attention

Be sure to lock the handwheel and cover the edge of the blade with the blade protection fitting in the course of operating the blade and specimen or before changing the specimen.

- Lock the handwheel
  Attention: Firmly clamp the specimen before installing the blade.
- Put the pre-frozen paraffin onto the specimen clamp.
  Attention: Be sure to be careful to avoid the edge of the blade, it is very sharp.
- Turn the handwheel to move the specimen to the backward utmost position.
- Insert the blade into the blade holder and firmly clamp it.
- Adjust the cutting angle (try first from 0°to 3°)
- Try to move the blade holder approaching the specimen.
- Adjust the surface position of the specimen to make it parallel to the edge of the blade.
- Loosen the handwheel.
  Attention: Be sure to turn the handwheel evenly in the course of cutting.
- Turn the handwheel to start trimming for the ideal surface of the specimen.
- Select the ideal thickness of the slice or take the former ones as reference.
- Evenly turn the handwheel clockwise to cut slice.
- Change the specimen or stop the operation.

Attention: Be sure to lock the handwheel and cover the edge of the blade with the blade protecting fitting in the course of operating of the blade and specimen or before changing the specimen or during the break.

• Lock the handwheel.
• Cover the edge of the blade with the blade protecting fitting.
• Take out the specimen from the specimen-clamp for another operation. End the operation.
• Lock the handwheel.
• Take out the blade from the holder and put it into the blade-case.
• Take out the specimen from the specimen-clamp.
• Brush away the waste and clean up the instrument.

9. Problems and Solutions

Problems	Causes	Solutions
Uneven slices produced and sometimes no slice can be cut	1. Inappropriate angle of the blade, the angle of cutting is too small 2. Specimen not firmly locked in the specimen clamp or/and the blade holder. 3. Blunt blade	1.Adjust the angle of cutting until the appropriate angle is acquired. 2. Check and firmly lock the screw of the specimen lock and the blade holder. 3. Use another section of the blade or change for a new one.
Slices are compressed or corrugated or extruded	1. Blunt blade. 2. The specimen is too hot. 3. The angle of cutting is too big. 4. The cutting is too fast.	1. Use another section of the blade or change to a new one. 2. Freeze the specimen on the freezing platform. 3. Adjust the cutting angle. 4. Turn the handwheel slowly.
When cutting hard specimens, the blade holder; nicks or chatter marks are left on the slice	1. The cutting is too fast. 2. The angle of cutting is too big. 3. Specimen holder or clamp not locked tightly	1. Turn the handwheel slowly. 2. Adjust the cutting angle. 3. Check and firmly lock the screw of the specimen locking device and blade holder or tigheten the locking handle.

10. Cleaning

Attention: Be sure to lock the handwheel before cleaning
Brush off the slice residue with a dry brush.
Take off the blade base and the blade holder for cleaning.

Attention: Only cleanser for domestic use or gentle lye can be used for cleaning the instrument.

ATTENTION! Acetone and benzene will damage the paint on the surface of the instrument.
• No leakage of cleaning liquid should be allowed into the instrument.
• A moist cloth should be used for cleaning.

11. Maintenance

Generally the microtome can work normally for a long time without any maintenance. But preventive maintenance is also needed to ensure that the instrument can work normally for a longer period. The regular maintenance should follow the advice listed below:

• Have a technician authorized by our company check the instrument at least once a year.

• After the free service period a successive maintenance contract should be made to ensure the service continues. The detail can be obtained by contacting the Tanner service department.

• Clean the microtome daily.

• Monthly lubricate the following parts with special Tanner lubricating oil which we offer (one or two drops is enough):
  - The "V" block on the base of the instrument.
  - The guiding rod on each disposable blade holder block

• The maintenance should be done by the authorized technicians.
Self-repair will void the warranty and can cause extra expense later

12. Appendix

Improvement of the instrument
Our company has the right to change any technical parameters of any Model for improving the function of the instruments. Do not assume the parameters are the same for all models produced.

Quality Guarantee
Every instrument we sell has been strictly examined and tested to ensure that every instrument is qualified and matches its technical standards.
Warranty service terms are only provided for those who regularly use the instrument and operate the instrument according to the Instructions.
We will not be responsible for the damage and other results caused by abuse and mis-operation of the instrument.

Discarding and disposition
Discarded microtomes and fittings should be disposed according to the current laws or regulations of the state and county of operation.
For the sake of environmental protection, we are willing to give you some advice on discarding the Titan 5000 microtome.

Service information for customers

If you need any service or fittings of the instrument in the warranty period, please consult our company or the sellers. You should provide them the specification, model, the serial number and the time of contact.

Attention:

If you mail the instrument or its fittings back to Tanner, please make sure the following procedures are followed:

- If the instrument or its fittings are free of any substance containing virus and bacteria or contacted with radiation resources, please disinfect them or eliminate the radioactivity before mailing back. Our technicians will examine and verify.
- If you are sure that the instrument or its fittings, that you want to send back to our company, is safe from any virus, bacteria or radiation, please tell our technician the possible ways you will disinfect or eliminate the radioactivity and possible contamination. Any possible infection of dangerous bacteria and virus or radiation will lead to us immediately sending back the instrument or its fittings without any maintenance or technical service, please inform us:

Model # _____

Serial # _____

The place where the instrument is located and the contact person.

Contact Name _____

Address _____

_____

Contact Phone/E-mail _____

_____

Reason for service _____

_____