

User Manual
TN5000 Titan
Manual Rotary Microtome



Read Prior to Operation!
Always keep this manual near the unit!

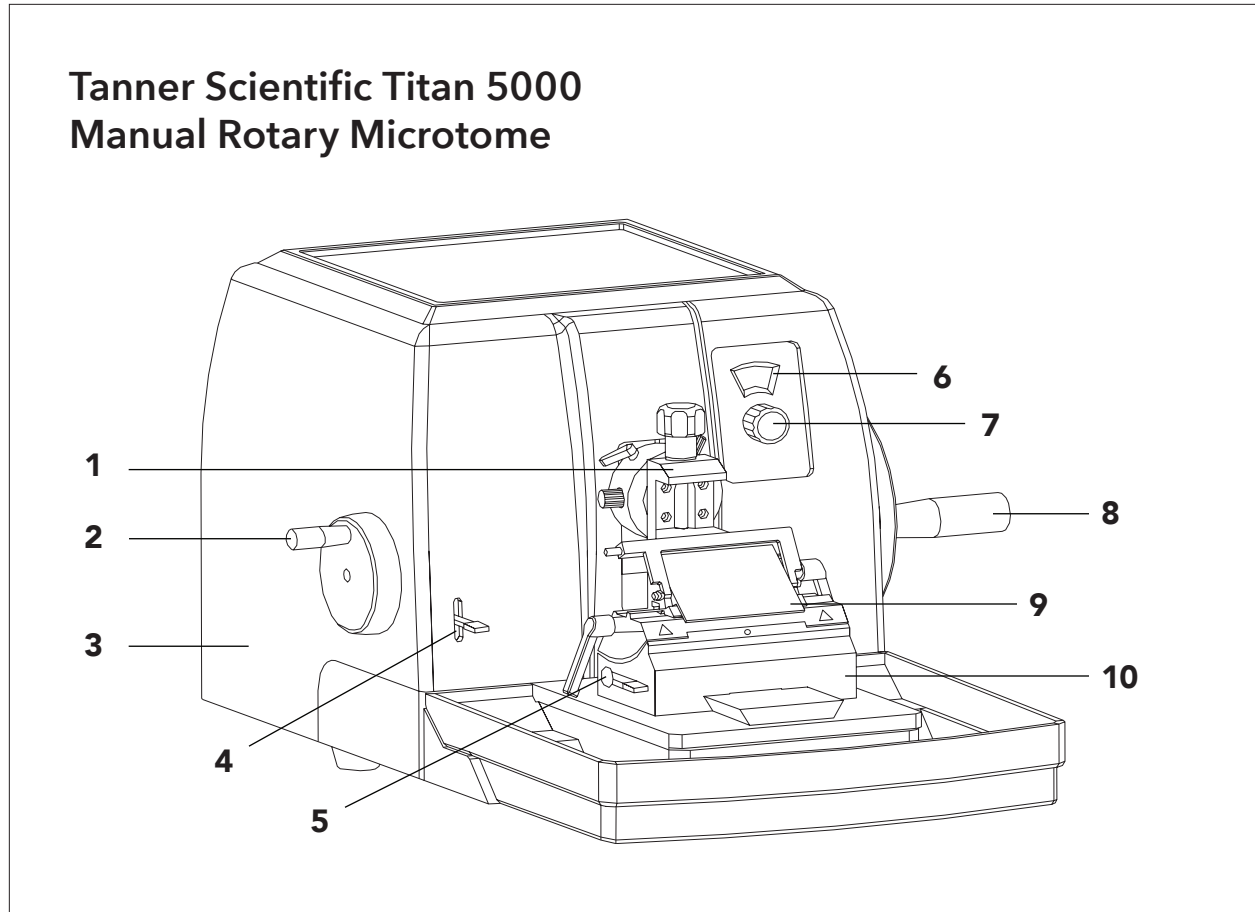
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1 | General Summary

Tanner Scientific Titan 5000 Manual Rotary Microtome



1 - Standard Specimen Clamp

2 - Course Feed

3 - Enclosure

4 - Trimming Lever

5 - Lock Lever

6 - Display Window

7 - Section Thickness Knob

8 - Hand Wheel

9 - Pressure Plate

10 - Blade Holder Assembly

The **Model Titan 5000** is a manually operated microtome powered by rotating the hand wheel. The guidelines for the vertical and horizontal movement of the specimen are seamless and maintenance free. The specimen advances when the hand wheel is turned.

2 | Safety

Attention! Remember to lock the hand wheel and attach the blade protector before operating or changing the blade and at any time when the microtome is not in use. The blade protector will cover the blade and protect against cuts.

Transportation and Installation

- Always transport in an upright position.
- Never pick up by the handles of the hand wheel, or the knob used for adjusting the section thickness.
- Do **NOT** remove or change the protecting devices equipped on the instrument and its components.
- Pay careful attention to the technical parameters!

Operation

- Be very careful when using blades or disposable blades. The sharp edges can cause serious injury.
- Firmly clamp the specimen before installing the blade.
- Remember to lock the hand wheel and cover the blade with the protection guard before changing the specimen and at any time that the unit is not being used.
- Be careful when using any liquids around the instrument as spillage can cause serious damage and void the warranty.

3 | Technical Parameters

Section Thickness Setting Range: 0-60 μ m

Setting Values:

0-20 μ m, in 1 μ m increments

20-60 μ m, in 5 μ m increments

Precision Error: \pm 5%

Trim Setting Mode: 15 μ m or 35 μ m

Specimen Retraction Range: 90 μ m, this function can be shut off

Object Feed: 30mm

Vertical Stroke: 70mm

Specimen Orientation System: 8° X/Y, moving range of Holder Base

Front/Back: 2.56"

Left/Right: 1.57"

Dimensions: 19.69" x 22.45" x 11.80"

Height of Blade Edge: 4.13"

Net Weight: 73lbs

4 | Installation

1 - Unpacking

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

Important: The Titan 5000 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 head hex screw from the base before attempting to remove the unit from the crate. Hold the base of the instrument and remove. Do not try lifting the unit by any part of the enclosure at any time.

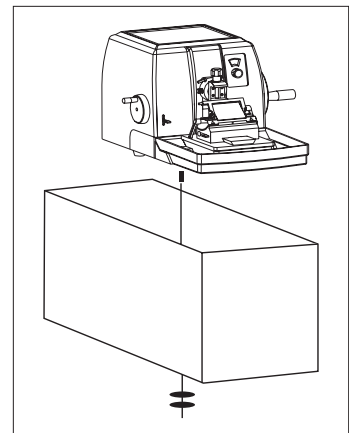
Attention! Avoid grasping the handle of the hand wheel, the wheel itself, or any part of the section adjustment knob in the course of moving the instrument.

2 - Instrument Setting

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

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 convenient operation of the hand wheel and the wheel's rotation.



Installation of Specimen Clamp

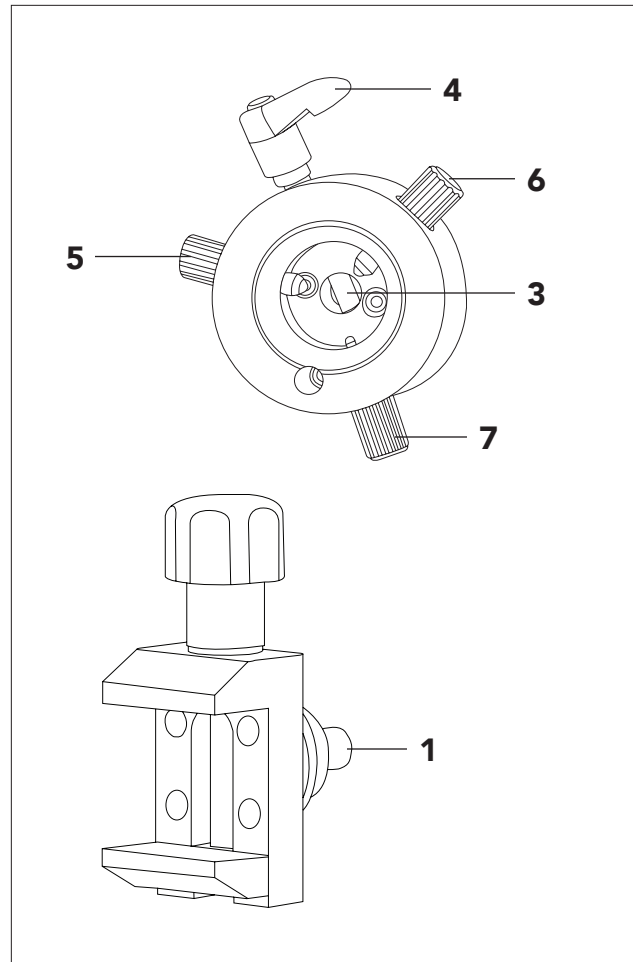
The adjustment mechanism of the specimen clamp has been installed onto the mainframe, and the component setting has **NOT** been preset. The mechanism requires installation and adjustment at the time of unit setup.

Standard Specimen Clamp

Lock the hand wheel. 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 (7)** downward to loosen. The position of the specimen clamp can be adjusted by **screws (5) and (6)**.

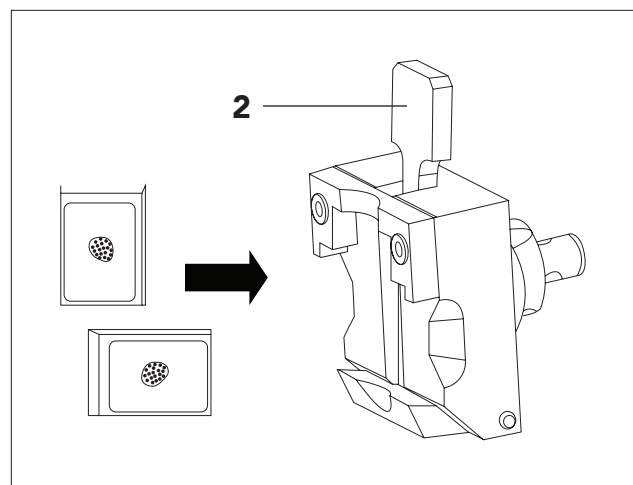
Attention: The **screws (5) and (6)** should be adjusted simultaneously within their range of movement.

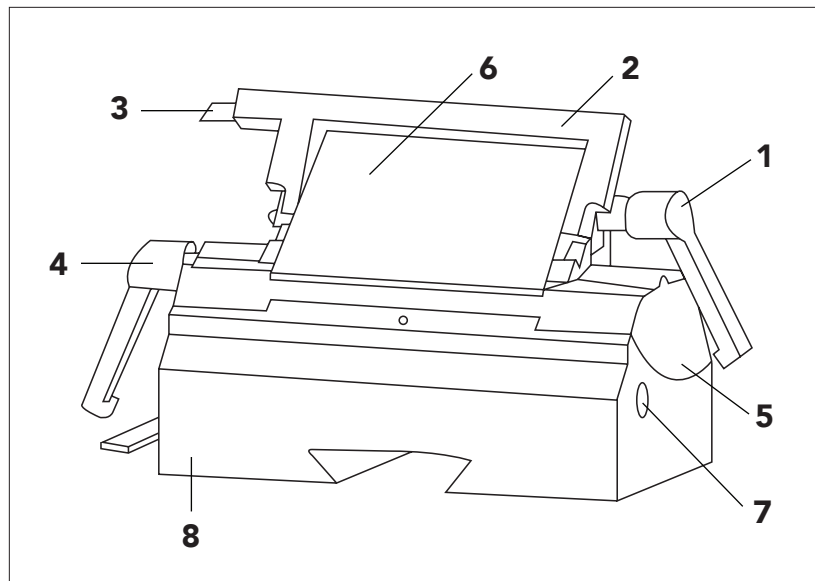
Screw (5) is for Up/Down. **Screw (6)** is for Right/Left. In the course of adjustment, the **locking handle (7)** should be loosened. Once the position of the specimen clamp is fixed, turn the locking handle upward (**7**) to lock it down. To change the Specimen Clamp, loosen the **locking handle (4)** to take out the specimen clamp from the coattail slot and install new one by reversing the procedure.



Universal Cassette Clamp

- Lock the hand wheel.
- Installation and adjustment is the same as the standard clamp above.
- The general specimen should 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 cassette.
- Allow spring to retract back to lock cassette in place.





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 must be removed before dismantling the blade holder for any reason.

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)**, and 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 move **part (6)** to the 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 edgewise, and lock the locking **lever (4)** after putting the blade into place.

The protection lever on the disposable blade holder includes 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)**, and press **pin (3)** to take out the blade.

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

Installation of Waste Tray

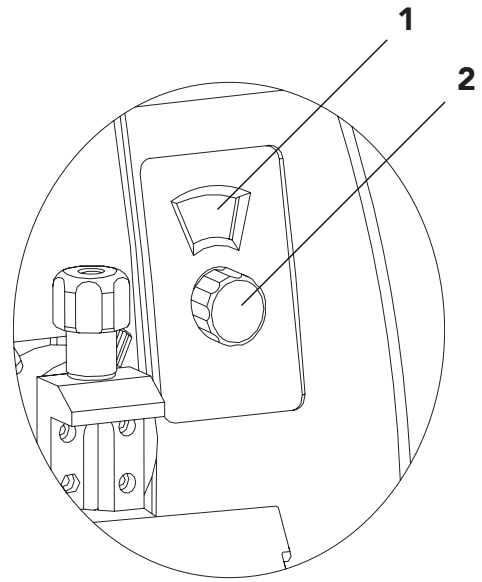
- Position waste tray parallel at the bottom of base of machine until the tray stops against the base of the microtome.

5 | Operation

Section Thickness

Section thickness range can be adjusted by turning the knob located on the right upper side on the front of the microtome. The thickness can easily be adjusted using the **knob (2)**.

- **Section Thickness Range:** 0–60µm
- **Setting Value:**
 - 0–20µm, increment 1µm
 - 20–60µm, increment 5µm
- **Display Window (1)** shows section thickness range.



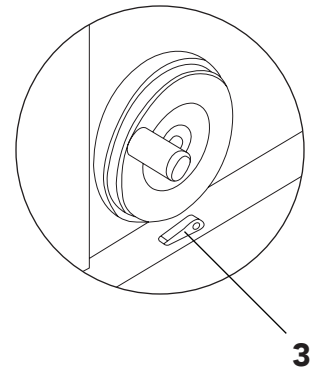
Hand Wheel Operation

Attention! Always lock the hand wheel before cleaning!

Quick Locking Lever for Hand Wheel

The hand wheel can be locked at any position with the **locking lever (3)** 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.

- Pull the **locking lever (3) "Up"** to mechanically lock the hand wheel; the hand wheel can then not be turned.
- Pull the **locking lever (3) "Down"** to loosen the hand wheel; the hand wheel can then rotate.



Small Hand Wheel

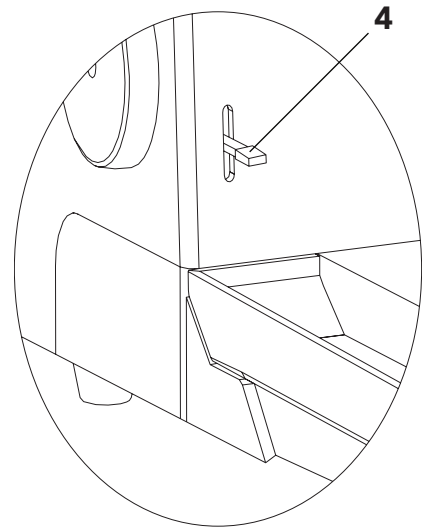
The small hand wheel on the left is used to move the specimen clamp forward or backward quickly.

Turn the hand wheel clockwise to make the specimen move toward blade. The hand wheel is designed to move the specimen horizontally and to quickly move the block toward or away from the blade. When the hand wheel moves to the foremost and backmost position, it will become harder to rotate.

Attention! Be careful to ensure that the specimen is mounted securely on the specimen clamp. Damage will be done to the blade if the blade contacts the metal specimen clamp.

Trimming

- **Trimming lever (4)** located at the left side of the machine.
When in the middle position, trimming thickness is 15 μ m.
When in the bottom position, trimming thickness is 30 μ m.
- First move the blade holder and 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.
- When specimen is in the upper position, press the trimming lever to accomplish trimming or until the surface of the specimen is in a suitable position to start sectioning.



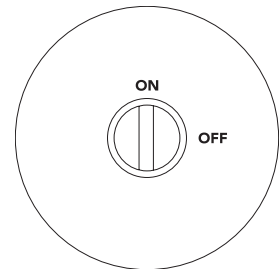
Sectioning

Attention! Be sure to turn the hand wheel evenly. The speed of hand wheel rotation should match the rigidity of the specimen. The section thickness value can be adjusted using the knob on the right of the machine.

- Choose the best cutting angle. If the specimen is too hard to cut, the cutting angle should be increased until a desired ribbon is achieved.
- The scale to the right side of blade holder is used to adjust cutting angle.
- Rotate section hand wheel smoothly and evenly to get an ideal section.

Retraction

- The button for the retraction function is located on the back of the machine.
- Use a screwdriver to turn the button to **ON**, meaning retraction function is activated. If turned to **OFF**, retraction function is shut off.



Paraffin Sectioning

Attention! Be sure to lock the hand wheel and cover the edge of the blade with the blade protector when not in use.

- Firmly clamp in the specimen before installing the blade.
- Put the pre-frozen paraffin block onto the specimen clamp.

Attention! Be sure to carefully avoid the edge of the blade, it is very sharp.

- Turn the hand wheel to move the specimen to the back, utmost position.
- Insert the blade into the blade holder and firmly clamp it in.
- Adjust the cutting angle (start at 0°-3°).
- Move the blade holder toward the specimen.
- Adjust the specimen's surface position so it is parallel to the blade's edge.
- Loosen the hand wheel.

Attention! Be sure to turn the hand wheel evenly in the course of cutting.

- Turn the hand wheel to start trimming.
- Select the ideal thickness.
- Evenly turn the hand wheel clockwise to cut.

6 | Cleaning & Maintenance

Cleaning

Attention! *REMOVE THE BLADE.

- Be sure to lock the hand wheel before cleaning.
- Brush off any residue with a dry brush.
- Remove the blade base and the blade holder for cleaning.
- Do **NOT** use detergent containing acetone and benzene to clean the instrument; it will damage the paint on the surface of the instrument.
- Only mild cleaners or gentle lye should be used for cleaning the instrument.

Maintenance

Preventive maintenance is needed to ensure a long working life. For regular maintenance, follow the advice listed below:

- Have an authorized microtome technician service the instrument at least once a year.
- After the warranty period ends, a successive maintenance contract should be made to ensure the service continues. Details can be obtained by contacting the Tanner Scientific® Service Department.
- Clean the microtome daily.
- Lubricate the moving parts monthly with lubricating oil (one or two drops is enough).
- Maintenance should be done by the authorized technicians. Self-repair could void the warranty and can cause extra expense later.

7 | Warranty & Service

Tanner Scientific® warrants this product for a period of one year from the date of purchase, provided that the customer complies with the rules of this manual. Extended warranties are available. Contact Tanner Scientific® at 888.708.5233 for more information. Tanner Scientific® will not be responsible for the damage and other problems caused by abuse and misuse of the instrument.

Service Information

If you require any service or parts during the warranty period, please contact **Tanner Scientific® at 888.708.5233** or the sales agent who sold you the unit. Prior to calling, please have the instrument model and serial number ready.

Amendment

Tanner Scientific® reserves the right to change the technical parameters of any model for improving the function of our instruments.

Quality Guarantee

- Tanner Scientific® will ensure that every instrument sold has been strictly examined to ensure it meets our stringent quality and technical standards.
- Service terms are only provided for those who regularly use the instrument and operate the instrument according to its instructions.

Disposal of Unwanted Instruments

Discarding the instrument and its parts should be done according to current laws and regulations.

8 | Troubleshooting

Manual Rotary Microtome		
PROBLEMS	CAUSES	ELIMINATION
+ Uneven slices/inconsistent cuts.	+ Wrong blade angle. + Specimen not firmly locked in the specimen clamp and/or the blade holder. + Blunt blade.	+ Adjust the angle of cutting until the appropriate angle is acquired. + Check and firmly lock the screw of the specimen lock and the blade holder. + Use another section of the blade or change blade for a new one.
+ Slices are compressed or corrugated or extruded. + "Chatter."	+ Blunt blade. + Specimen too hot. + Cutting angle too big. + Cutting too fast.	+ Use another section of the blade or change blade for a new one. + Freeze the specimen on the freezing platform. + Adjust the cutting angle. + Turn the hand wheel slowly.
+ Nicks or chatter marks are left on the slice.	+ Cutting too fast. + Cutting angle too big. + Specimen holder or clamp not locked tightly.	+ Turn the hand wheel slowly. + Adjust the cutting angle. + Check and firmly lock the screw of the specimen locking device and blade holder or tighten the locking handle.



Information

The information, notes, and figures that appear in this user manual represent the present state of knowledge as we comprehend it. Due to continuous improvements in technology and manufacturing techniques, specifications/manufacturing procedures may change.

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Refer to the name plate on the back of the unit for the serial number and manufacturing date of this instrument.

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