

# OPERATING INSTRUCTIONS

**TANNER**  
scientific®

## Cryostat TN50



**CE**

INS2000GB  
2018-10-003.00



# CONTENTS

|                                      |           |
|--------------------------------------|-----------|
| <b>1. INTENDED USE</b>               | <b>4</b>  |
| <b>2. SYMBOLS</b>                    | <b>4</b>  |
| <b>3. SAFETY NOTES</b>               | <b>4</b>  |
| <b>4. COMPONENTS</b>                 | <b>8</b>  |
| <b>5. SPECIFICATIONS</b>             | <b>9</b>  |
| <b>6. UNPACKING AND INSTALLATION</b> | <b>11</b> |
| <b>7. INITIAL OPERATION</b>          | <b>14</b> |
| <b>8. OPERATION OF MICROTOME</b>     | <b>20</b> |
| <b>9. OPERATION OF CRYOSTAT</b>      | <b>28</b> |
| <b>10. CLEANING AND MAINTENANCE</b>  | <b>33</b> |
| <b>11. SERVICE</b>                   | <b>37</b> |
| <b>12. OPTIONAL ACCESSORIES</b>      | <b>38</b> |
| <b>13. WARRANTY</b>                  | <b>39</b> |
| <b>14. DISPOSAL</b>                  | <b>39</b> |

## 1. INTENDED USE

The floor standing open top cryostat TN50 is intended for rapid freezing and cutting thin sections of frozen specimens for professional use in routine and research laboratories in the fields of biology, medicine and industry.

The system of knife advance operates very reliable from 0.5 to 100  $\mu\text{m}$  with trimming function up to 750  $\mu\text{m}$ . The quality of cutting of this microtome is increased by the automatic retraction during the upstroke of the specimen, which avoids rubbing on the disposable blades or microtome knives. This stops rapid deterioration of the disposable blade.

## 2. SYMBOLS



Dangers, warnings and cautions are marked by this symbol



Special instructions regarding the operation of the instrument are marked by this symbol



Mechanical components that can lead to injuries during operation are marked with this symbol.

## 3. SAFETY NOTES

The Tanner Scientific open top cryostat TN50 is provided with the following safety features:

**Hand wheel stop**

**Finger protection for Blade-holder**

|      |
|------|
| TN50 |
| ●    |
| ●    |

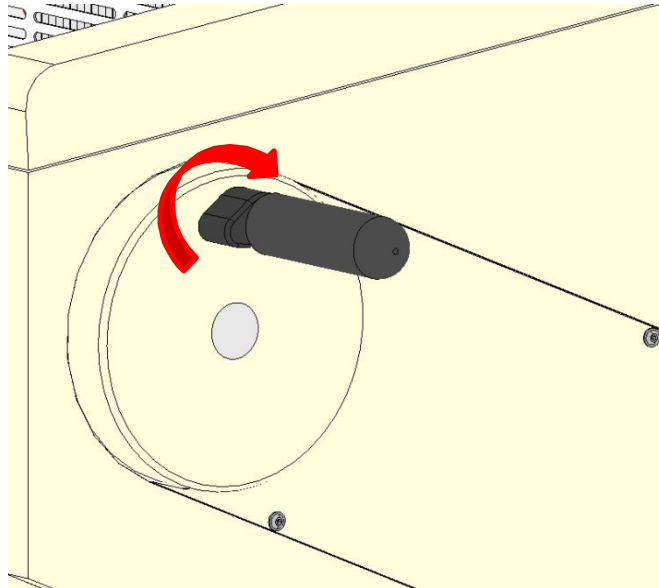
The institution which owns the unit and the persons working with the unit, servicing or repairing it are responsible for a hazard-free use.

### 3.1 Hand wheel stop

Always use the finger protection with the blade holder and put hand wheel in stop position

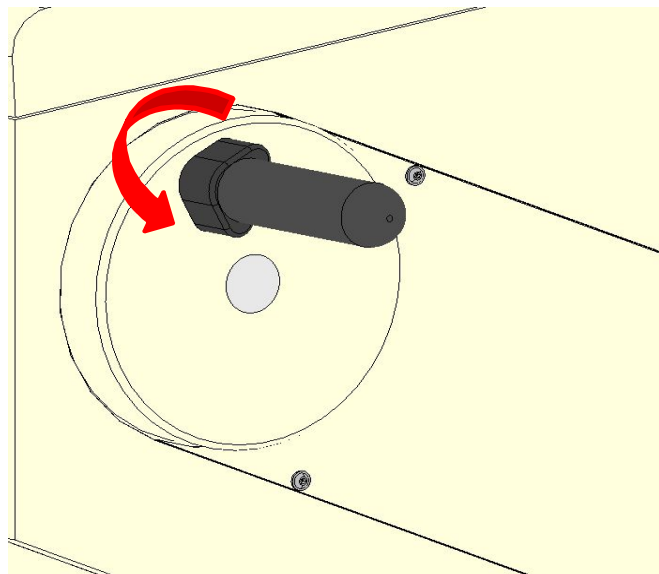
- before working with the blade or specimen
- before changing the specimen
- during break time

The hand wheel can be stopped in any position. For this purpose move the stop lever towards the centre.



Hand wheel stop released. Movement.

To release the stop please turn the lever towards the outside again.

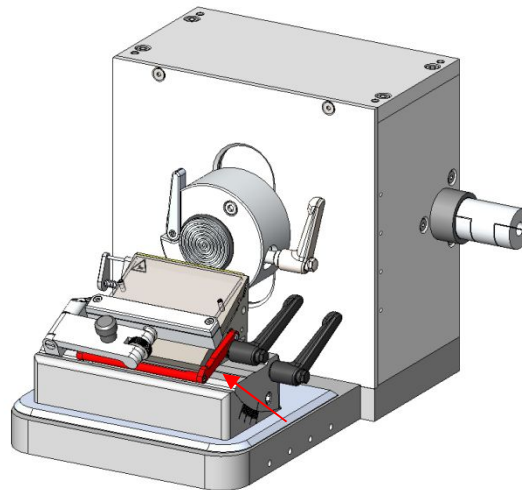


Hand wheel stop activated. No movement.

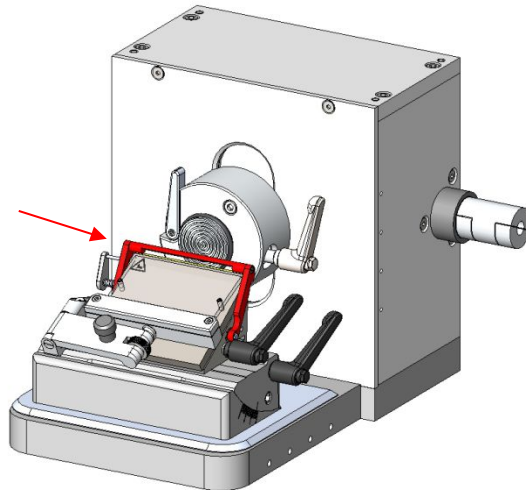
### 3.2 FINGER PROTECTION

**Always** use the finger protection (red lever)

- Before you start any work with the blade or specimen
- Before changing the specimen
- During work break



Finger protection released.



Finger protection activated.

### 3.3 ELECTRICAL POWER CONNECTION

Do not use any extension lead.



Make sure that electric power is constant. Make sure that electric power is constant. Please note that the compressor requires a start-up current between 25 and 35 A. The electric circuit at the installation site must be inspected by an electrical engineer to ensure that it meets the requirements for a smooth operation of the instrument.

- This should be examined during installation of the unit by a competent person
- Use a dedicated fuse for the unit
- Do not connect another unit to the same power circuit.
- Before turning on the instrument, check if the voltage of the mains supply is identical with the name plate of the unit

### 3.4 WORKING WITH DISPOSABLE BLADES

Disposable blades have extremely sharp edges and this can lead to injuries. Please be extremely careful when handling disposable blades.



Do not place disposable blades at unsecured areas.

Never position disposable blades with the sharp edge pointing upwards.

Use a container that has guides to hold the blades rigid.

Never try to catch a falling disposable blade.

Always insert the specimen first and then the disposable blade.

To avoid compression or knife marks, ensure that the blade is clean.

## 4. COMPONENTS

The Tanner Scientific open top cryostat TN50 is provided with the following standard components:

|   | TN50 |
|---|------|
| <b>Basic unit with refrigeration system</b>   | ●    |
| <b>Semi-automatic rotary microtome</b>        | ●    |
| <b>Operation manual</b>                       | ●    |
| <i>clear-cut</i> <b>Brush</b>                 | ●    |
| <b>Anti-roll plate</b><br>Ready to use        | ●    |
| <b>1x Bottle cryostat low temperature oil</b> | ●    |
| <b>4x 125 ml CryoGlue embedding medium</b>    | ●    |
| <b>1 Box of disposable blades (50 pcs.)</b>   | ●    |
| <b>Set of Allen keys</b>                      | ●    |



## 5. SPECIFICATIONS TN50

### General

|                                    |                          |
|------------------------------------|--------------------------|
| Nominal power                      | 115 V AC +-10%           |
| Nominal frequency                  | 60 Hz                    |
| Power                              | 860 VA                   |
| Max. current for 5 sec             | 35 A                     |
| Protective class                   | I                        |
| Fuses                              | 2 * T 20 A               |
| Pollution class                    | 2                        |
| Overcurrent protective class       | II                       |
| Max. heat energy                   | 860 J/s                  |
| Temperature range during operation | +10 to +25 °C            |
| Temperature during storage         | +5 to +55 °C             |
| Relative humidity                  | max. 60%, non condensing |
| Humidity during storage            | < 60%                    |

### Cryochamber

|                     |   |
|---------------------|---|
| Temperature range   | 0°C to -35°C, selectable in 1 K steps,<br>Environment: 20°C |
| Cooling power       | 514 W   |
| Switch off pressure | 25 bar  |
| Current             | 6,45 A  |
| Cooling gas         | R 449 A, 320 g  |

### Chamber defrost

|                   |   |
|-------------------|---|
| Automatic defrost | hot gas defrost, time selectable, 1-3 times per<br>day or manual defrost on request |
| Automatic stop    | at -5 °C chamber temperature  |

### Freezing bar

|                        |  |
|------------------------|--|
| Minimal temperature    | 10 K lower than chamber temperature                                      |
| Number of positions    | 24 (standard version) resp. 21 + 2 (version<br>with quick freeze places) |
| Quick freeze positions | 2 (optional), to -55 °C (Peltier cooling)                                |

## **Microtome**

|                                 |  |
|---------------------------------|--|
| Type                            | rotary microtome, encapsulated   |
| Thickness range                 | 0.5 – 100 $\mu\text{m}$  |
| Thickness settings              | 0 – 2 $\mu\text{m}$ in 0.5 $\mu\text{m}$ steps<br>2 – 20 $\mu\text{m}$ in 1 $\mu\text{m}$ steps<br>20 – 50 $\mu\text{m}$ in 2 $\mu\text{m}$ steps<br>50 – 100 $\mu\text{m}$ in 5 $\mu\text{m}$ steps |
| Horizontal movement             | 28 mm  |
| Vertical movement               | 58 mm  |
| Retraction during upward stroke | 0 – 200 $\mu\text{m}$ , free selectable (defined steps)  |
| Trimming                        | 0 – 750 $\mu\text{m}$ , free selectable (defined steps)  |
| Specimen orientation            | 8° (x and y axes), 360° (z axes)   |

## **Cryostat**

|                              |  |
|------------------------------|--|
| Dimensions (L x W x H)       | 680 mm x 760 mm x 1110 mm<br>27" x 30" x 44" |
| Weight (without accessories) | 127 kg / 280 lbs                             |

## 6. UNPACKING AND INSTALLATION

### 6.1 UNPACKING THE INSTRUMENT

In standard design you will receive the unit in a cardboard box standing on a wooden pallet. The unit is equipped with four castors and two feet, adjustable in height in the front.



When the instrument is delivered, check the tilt indicators and shock watches on the packaging. If tilt indicators are activated, the shipment was transported laying flat, was tilted at too great an angle or fell over during transport. If the shock watches are activated, the instrument fell over during transport. Note this on the shipping documents and check the shipment for possible damage.

Open the cardboard box from the top and remove the accessories together with the supporting foams. Then remove the cardboard box.

Remove the screws on the two fixation brackets that hold the instrument on the wooden pallet.

Swing out the ramp on which the instrument can be rolled down off the transport pallet. To ensure a safe transport two (2) people are required.

Carefully roll the instrument backwards over the ramp from the pallet and push the instrument to the installation location on the castors

Extend the two front feet to stabilize the cryostat in its position by turning the supporting screws counter clockwise.

For repacking use the original cases. Keep the packing material.

## 6.2 INSTALLATION SITE REQUIREMENTS

The site for installation for TN50 should meet the following requirements:

- A maximum ambient temperature of 22°C
- No direct sunlight into the cooling chamber
- Mains power supply within 3 m
- No air circulation (for example by air conditioning)
- Instrument may only be used indoor
- Main switch / fuses must be reached easily
- Hand wheel must be reached easily
- Relative humidity lower than 60%
- A minimum distance between wall and rear of the instrument of 10-20 cm (8 – 10 " inches) should be guaranteed



High room temperatures and high humidity influence the cooling capacity of the instrument and will lead to ice forming inside the instrument.

## 6.2 INSTALLATION

For opening the chamber push the window to the top.

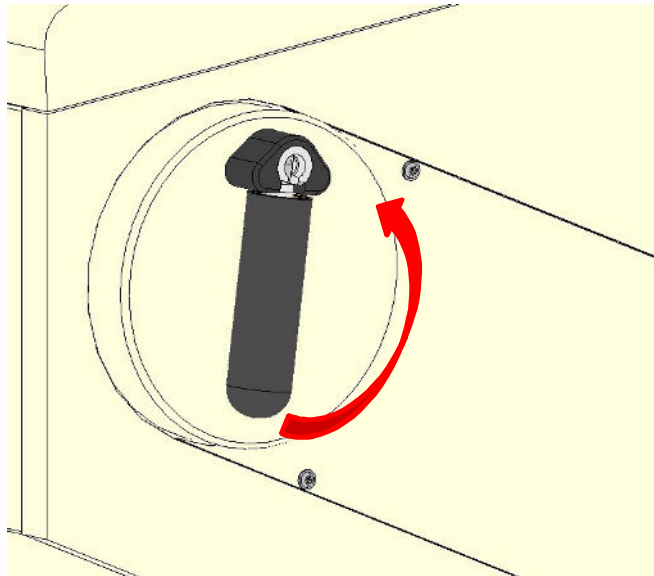
Remove the transport security underneath the specimen holder and position the waste tray.

After installation, wait at least 4 hours before switching on the instrument. Failure to comply may result in severe damage to the instrument.

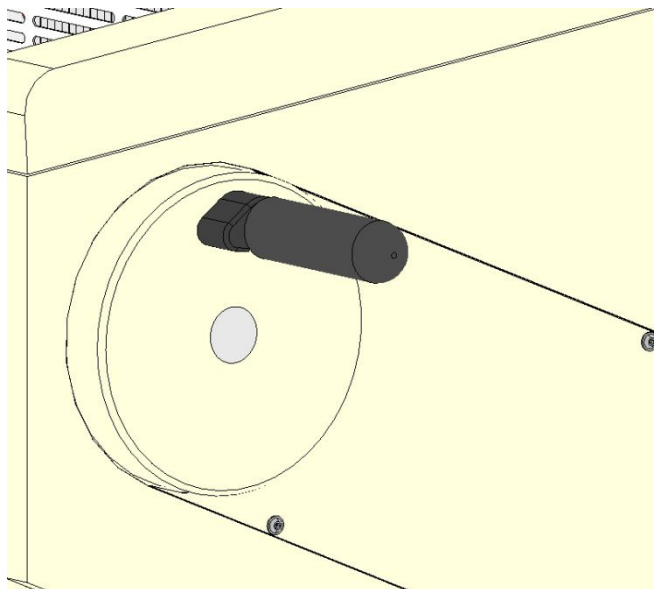
### 6.3 COLLAPSIBLE HANDWHEEL LEVER

The instrument is delivered with a ready to use hand wheel lever that is folded away for transport reasons.

- Before you start any work, unfold the hand wheel lever by simply pulling the lever into a horizontal position.
- For folding the lever back, pull the horizontally orientated lever and fold it away.



Hand wheel lever in folded position.



Hand wheel lever unfolded.

## 7. INITIAL OPERATION

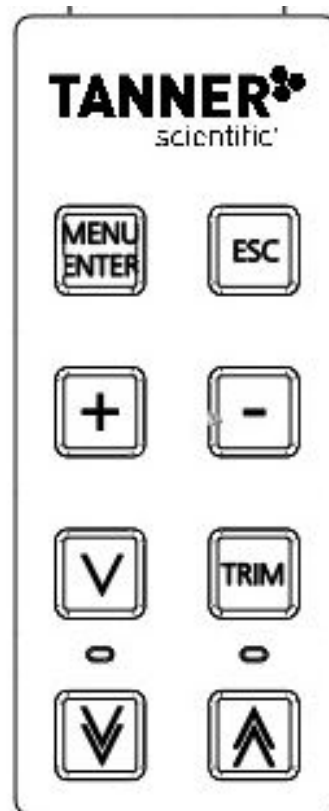
### 7.1 MAIN DISPLAY

The main display will show the cutting thickness, the trimming thickness, the current chamber temperature, the target chamber temperature, the status of the quick-freeze unit (optional).

|                      |                        |
|----------------------|------------------------|
| CUT: 7 $\mu\text{m}$ | Trim: 19 $\mu\text{m}$ |
| Cha: -20 °C (-22)    | QF: 0                  |


### 7.2 CONTROL PANEL

Software settings and motor operation can be operated with the control panel on the left to side of the instrument.




TN50 Control Panel.


### 7.3 SOFTWARE SETTINGS

Press  to open the Settings menu.

|   |                 |        |
|---|-----------------|--------|
| > | Chamber temp    | -20 °C |
|   | Quickfreeze     | Off    |
|   | UV disinfection |        |
|   | Light           | Auto   |

To move further down in the main menu list, press .



|   |               |              |
|---|---------------|--------------|
|   | Retraction    | 5 µm         |
|   | Start defrost |              |
|   | Contrast      |              |
| > | TIME          | TUE 13:05:05 |

To move further up in the main menu list, Press .

|   |                |        |
|---|----------------|--------|
| > | Light          | Auto   |
|   | Light duration | 10 m   |
|   | Chamber incr   | -15 °C |
|   | Retraction     | 5 µm   |


To change values, select a setting.

Press  to open the setting.

Change entries by pressing  or .


Store new settings by pressing .

|   |                |        |
|---|----------------|--------|
|   | Light duration | 10 m   |
| > | Chamber incr   | -15 °C |
|   | Retraction     | 5 µm   |
|   | Start defrost  |        |


Press  to return to the main menu.

|      |            |       |      |
|------|------------|-------|------|
| CUT: | 7 µm       | Trim: | 19µm |
| Cha: | 22 °C (25) | QF:   | 0    |

## 7.4 AUTOMATIC DEFROST, DISINFECTION AND POWER SAVING SETTINGS

Press  to open the Settings menu.

|   |                 |        |
|---|-----------------|--------|
| > | Chamber temp    | -20 °C |
|   | Quickfreeze     | Off    |
|   | UV disinfection |        |
|   | Light           | Auto   |

Select Program settings and press  to open the menu for setting automatic defrost and power saving times.

|   |                  |     |          |
|---|------------------|-----|----------|
|   | TIME             | TUE | 13:05:05 |
|   | Language         |     | English  |
|   | Display version  |     |          |
| > | Program settings |     | 5 µm     |

Enter PIN Code 5792.

PIN Code is usually restricted to service technicians or instrument administrators

|           |  |
|-----------|--|
| Enter PIN |  |
| 0000      |  |

Select defrosting programs 1 to 3 and set a time for the automatic defrosting programme.  
(e.g. each day at 12:00 h and at 23:00 h in this example)

|   |               |       |
|---|---------------|-------|
| > | Defr. Start 1 | 12:00 |
|   | Defr. Start 2 | 23:00 |
|   | Defr. Start 3 | __:__ |
|   | Disinf. Req.  | __:__ |

Select temperature increase start and set a starting time for the automatic power saving mode.  
(e.g. start at 21:00 h in this example)

|   |               |         |
|---|---------------|---------|
|   | Disinf. delay | 10 h    |
| > | Incr. start   | 21:00   |
|   | Incr. end     | 04:00   |
|   | Incr. days    | _____ 5 |

Select temperature increase end and set a ending time for the automatic power saving mode.  
(e.g. end at 04:00 h in this example)

|   |               |           |
|---|---------------|-----------|
|   | Disinf. delay | 10 h      |
|   | Incr. start   | 21:00     |
| > | Incr. end     | 04:00     |
|   | Incr. days    | _____ 5 6 |





Select temperature increase days and set the days at that the automatic power saving mode will be active for 24 hours.  
(e.g. Fridays and Saturdays in this example)

|               |               |
|---------------|---------------|
| Disinf. delay | 1 2 _ _ _ _ _ |
| Incr. start   | 21:00         |
| Incr. end     | 04:00         |
| > Incr. days  | _ _ _ _ 5 6 _ |

1-Monday 2-Tuesday 3-Wednesday 4-Thursday 5-Friday 6-Saturday 7-Sunday

## 7.5 List of available software settings

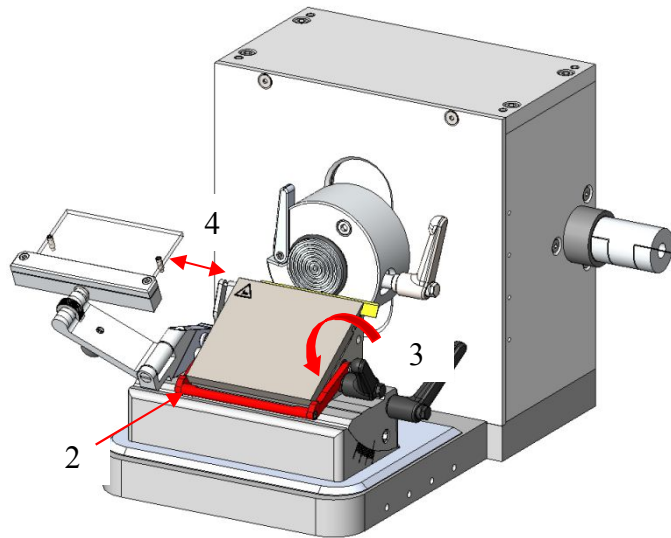
|                            |   |
|----------------------------|---|
| <b>Chamber temperature</b> | -35 °C to ambient<br>The recommended working temperature is -15 °C to -25 °C  |
| <b>Object cooling</b>      | ON / OFF<br><br>If the instrument is equipped with the optional object cooling system, its function can be activated or deactivated.  |
| <b>Object temperature</b>  | -50 °C to 0 °C<br><br>If the instrument is equipped with the optional object cooling system, its function can be activated or deactivated.  |
| <b>Quick-freeze</b>        | ON / OFF<br><br>If the instrument is equipped with the optional fast cooling peltier system, its function can be activated or deactivated.<br><br>The default setting for automatic deactivation of the quick freeze is set to 30 minutes. The timer for automatic deactivation can be set by an authorized service technician. |
| <b>UV disinfection</b>     | ON /OFF<br><br>If the instrument is equipped with the optional UV-C disinfection system, its function can be activated or deactivated.<br><br>The default setting for automatic deactivation is set to 30 minutes. The timer can be set by an authorized service technician.  |
| <b>Light</b>               | ON / OFF / AUTO<br><br>The light can be set on or off. If AUTO has been selected, the light will switch off after the time being set under Light duration.  |
| <b>Light duration</b>      | 0 - 99 minutes  |

|                         |   |
|-------------------------|---|
| <b>Chamber Increase</b> | <p>For power saving, a higher temperature can be set for defined times and/or days.</p> <p>The selected temperature should be below 0 °C to avoid damage to the microtome by freezing moisture.</p>   |
| <b>Retraction</b>       | 0 - 200 µm  |
| <b>Start defrost</b>    | <p>Activate</p> <p>A manual defrost procedure is activated.</p>   |
| <b>Trim latching</b>    | <p>ON/OFF</p> <p>If Trim latching mode is activated, trimming function is activated and deactivated by pressing  once.</p> <p>If Trim latching mode is deactivated, trimming function is activated by continuously pressing .</p> |
| <b>Contrast</b>         | Display contrast  |
| <b>Time</b>             | Day and Time  |
| <b>Language</b>         | A language can be selected out of a list of available languages.  |
| <b>Display version</b>  | Display of software version.  |
| <b>Program settings</b> | Upon selecting Program settings the automatic defrost and power saving settings can be changed.   |

## 8. OPERATION OF MICROTOME

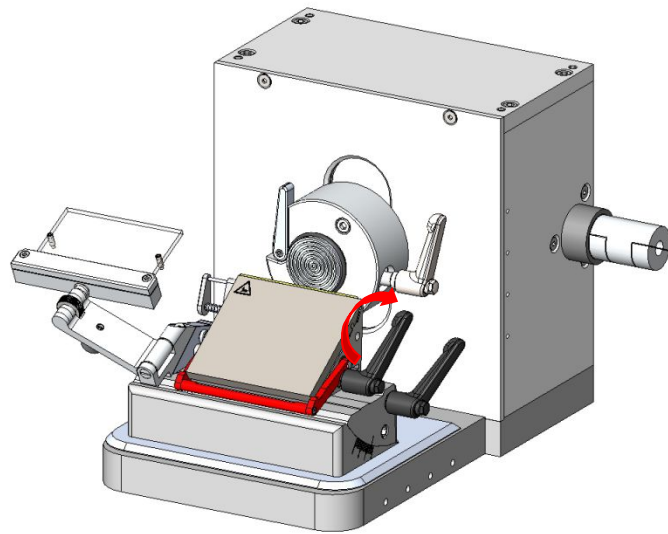
### 8.1 INSERTION AND ORIENTATION OF DISPOSABLE BLADE

- 1 Activate hand wheel lock.
- 2 Remove finger protection.
- 3 Loosen the blade fixation by turning the right lever counter clockwise.
- 4 Remove/Insert blade from one side.



Loosening of blade fixation and insertion of new blade.

Tighten the blade fixation by turning the right lever clockwise.



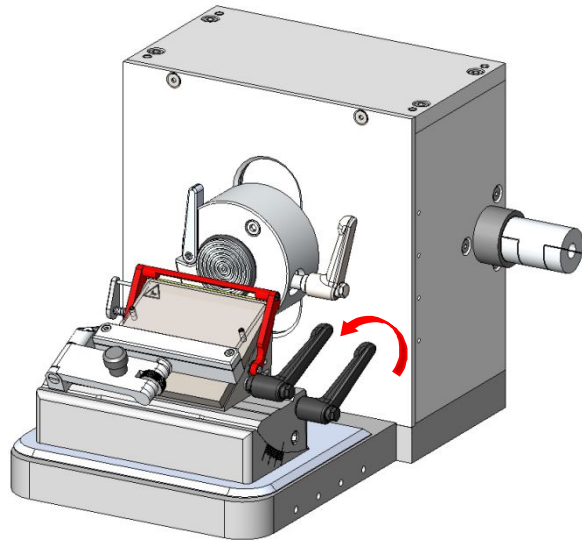
Fixation of blade.

For adjusting the cutting angle of the blade, loosen the blade holder fixation by turning the right lever on the blade holder base counter clockwise.

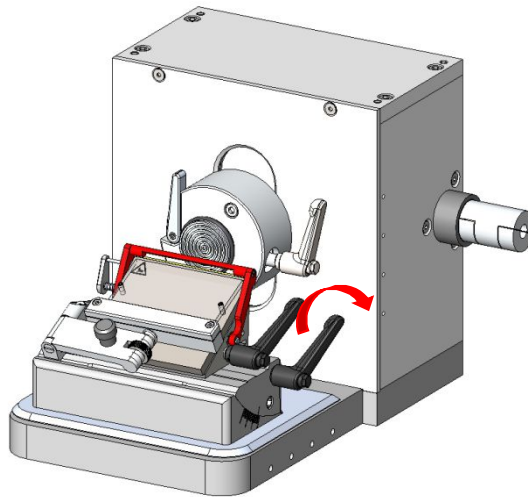
Set new angle for cutting by turning the knob in the front of the blade holder or by manual tilting the blade holder. A tilt towards the object holder increases the cutting angle (clockwise turn of the knob), a tilt away from the object holder decreases the cutting angle (counter clockwise turn of the knob).

Tighten the blade holder fixation by turning the right lever on the blade holder base clockwise.

Release hand wheel lock for cutting.



Loosening of blade holder fixation and adjusting new cutting angle (increased cutting angle).

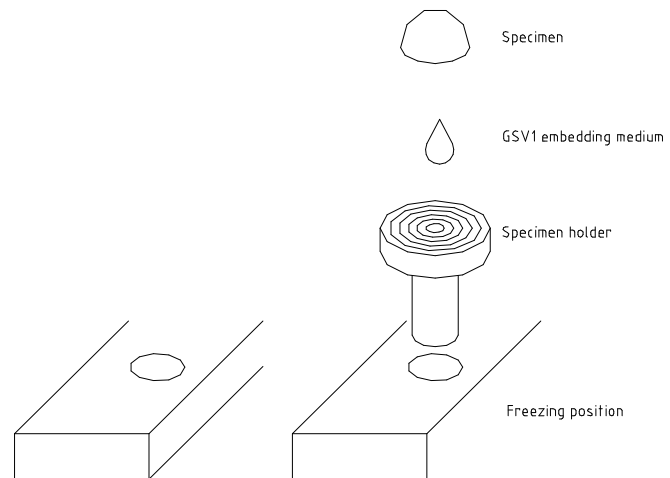


Fixation of blade holder with increased cutting angle.

## 8.2 SPECIMEN MOUNTING

The instrument is equipped with 24 freezing positions. The temperature is approx. 10 °C lower than the actual cryochamber temperature.

In order to prepare a specimen for sectioning, place the specimen holder on a freeze point, add some drops of embedding medium (e.g. GSV1) on the holder and carefully press the object on top.



Wait until the object is frozen (mat surface or pressure).

## 8.3 INSERTION OF OBJECT HOLDER

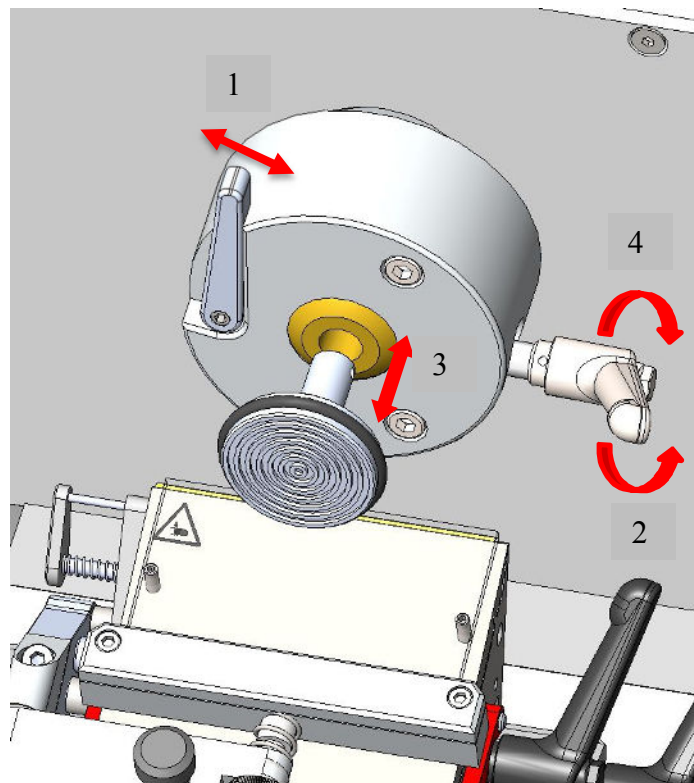
1 Turn hand wheel and move object holder to its highest position and activate the hand wheel stop.

2 Release the object holder fixation by turning the fixation lever counter clockwise.

3 Remove/Insert object holder.

4 Tighten the object holder by turning the fixation lever clockwise.

Please pay attention, that under all circumstances during operation, the fixation lever must not point downward, otherwise there is a risk of collision and damage.

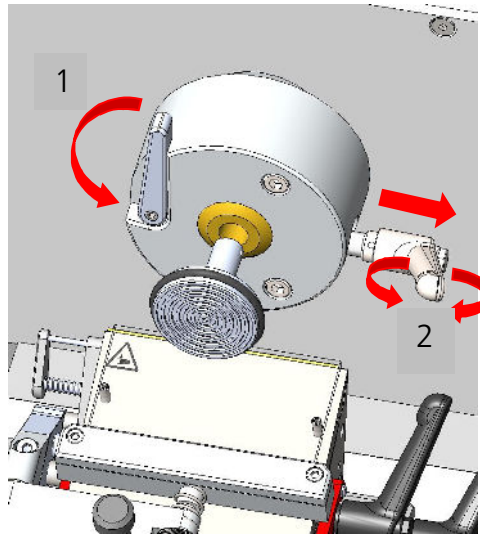


Release of object holder fixation; removal and/or insertion of object holder.

## 8.4 SPECIMEN ORIENTATION ADJUSTMENT

Turn hand wheel to its highest position and activate the hand wheel stop.

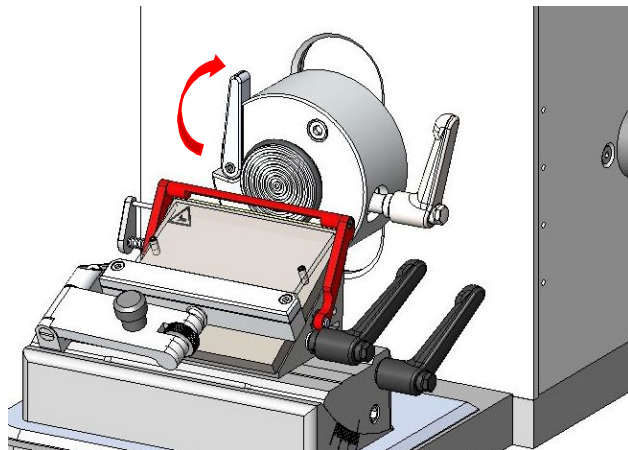
1. For a new sample orientation, loosen the fixation lever on the left side of the sample holder counterclockwise.
2. To adjust the orientation, swing the right orientation screw.



Release the sample orientation and orientation of the sample.

Fix the sample orientation by turning the fixation lever on the left side of the sample holder clockwise.

Release the handwheel lock to cut the samples.




Fix the sample orientation.




Levers must be up!

## 8.5 FAST APPROACH TO SPECIMEN

Press  to move the knife holder base towards the sample.

Press  to move the knife holder away from the sample.



## 8.6 SLOW APPROACH TO SPECIMEN

Press  to move the knife holder base slowly towards the sample.

## 8.7 THICKNESS ADJUSTMENT FOR TRIMMING

To change the trimming settings, press  continuously and press  or  to increase or decrease the value.

## 8.8 THICKNESS ADJUSTMENT FOR CUT

To change the cutting thickness, press  or  to increase or decrease the value.


## 8.9 TRIMMING OF SPECIMEN

Insert object holder.


Orientate specimen as desired.

Deactivate the hand wheel stop.

Release finger protection.

If Trim latching mode is activated, trimming function is activated and deactivated by pressing  once. Activation of trimming function is displayed as illustrated.

|                   |            |
|-------------------|------------|
| --TRIM--          | Trim: 19µm |
| Cha: -20 °C (-22) | QF: 0      |

If Trim latching mode is deactivated, trimming function is activated by continuously pressing .

Activation of trimming function is displayed as illustrated above.

Turn hand wheel evenly clockwise



## 8.10 MANUAL CUTTING

Deactivate the hand wheel stop.

Release the finger protection.

Turn hand wheel evenly clockwise.

A counter clockwise movement will also result in cutting and incremental advance of the specimen.

Approach specimen either by trimming or slow approach.

Set the required section thickness. Change entries by pressing  or . The selected section thickness is indicated in the display.(e.g. 7  $\mu\text{m}$  in this example)

|                                   |                        |
|-----------------------------------|------------------------|
| CUT: 7 $\mu\text{m}$              | Trim: 19 $\mu\text{m}$ |
| Cha: -20 $^{\circ}\text{C}$ (-22) | QF: 0                  |

Turn hand wheel until some even sections have been obtained.

Clean the disposable blade (always away from the cutting edge) with a cold brush.

Position anti-roll plate onto the disposable blade and cut. If necessary readjust the height of the guide plate.

Leave hand wheel with handle at its lowest point (specimen holder underneath the disposable blade).

Transfer the section onto a slide.



Leave brush always in the chamber to keep it cold.

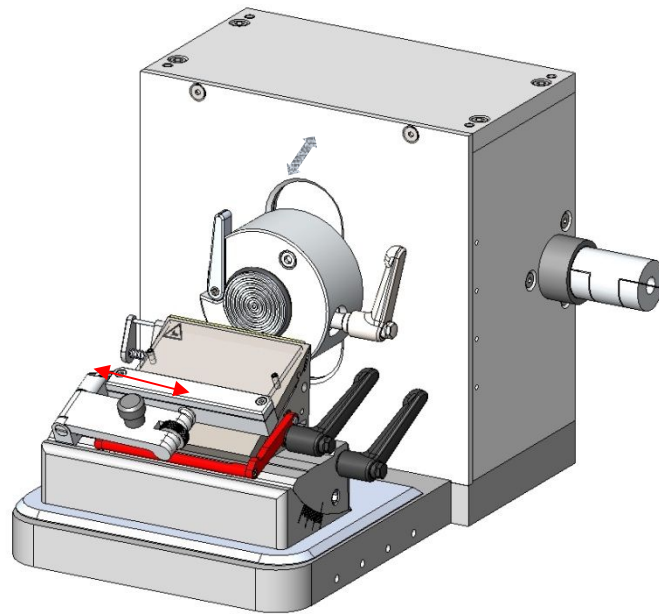
## 8.11 ANTI-ROLL PLATE

Each instrument is equipped with an anti-roll plate.

To adjust the horizontal position of the anti-roll plate, turn the wheel to the left (towards blade) or right (away from blade).

For pick up of the samples, turn the anti-roll plate sideways with the help of the knob.

In this case, make sure that the anti-roll-plate is folded into the horizontal position when it is unfolded in order to prevent a one-sided warm-up.



Horizontal adjustment of anti-roll plate



For height adjustment of the anti-roll-plate, it is recommended to adjust the correct height during cutting.

## 8.12 TIPS AND TRICKS

It is common knowledge that the temperature of the cryostat plays an important role in the quality of the tissue sections obtained. Each type of tissue needs a different temperature as shown in the following list. The temperature ranges indicated in the table below are approximate values and may require adjustments for individual tissues.

| Type of Tissue     | Recommended temperature range at the blade edge [°C] |
|--------------------|--|
| Bone marrow        | -16 to -25   |
| Brain              | -7 to -10  |
| Breast with fat    | -25 to -30   |
| Breast without fat | -16 to -20   |
| Cartilage          | -13 to -20   |
| Fat                | -30 to -40   |
| Heart              | -20 to -25   |
| Intestinal         | -13 to -20   |
| Kidney             | -13 to -20   |
| Larynx             | -13 to -16   |
| Lip                | -10 to -20   |
| Liver              | -7 to -13  |
| Lung               | -13 to -20   |
| Lymph-Node         | -13 to -20   |
| Lymphatic          | -13 to -20   |
| Lymphoid           | -13 to -20   |
| Muscle             | -13 to -20   |
| Nose               | -13 to -20   |
| Rectal             | -13 to -20   |
| Scrapings          | -16 to -25   |
| Skin with fat      | -16 to -25   |
| Skin without fat   | -10 to -16   |
| Spleen             | -7 to -10  |
| Testicle           | -10 to -13   |
| Tongue             | -13 to -20   |
| Uterine-           | -7 to -10  |

■ For tissue which has to be cut considerably below normal chamber temperature (e.g. fatty tissues) and in order to avoid cooling artefacts, an additional bench top CO<sub>2</sub> freezer is available.

Exceptionally freezing spray can be used.

## 9. OPERATION OF CRYOSTAT

### 9.1 UVC DISINFECTION [only applicable to instruments equipped with this feature]

UV-C radiation at 254 nm has an intense germicidal effect. Microorganisms, such as viruses, bacteria, fungi and yeasts are effectively destroyed in the area accessible to UV light without the addition of chemicals.

The cryostat TN50 can be equipped with a UVC light source that can either request activation in defined periods (see section 7.3) or is manually activated.

The default setting for the UVC light duration and the automatic deactivation is set to 30 minutes. The timer can be set by an authorized service technician.



For safety reasons UVC light will be deactivated upon opening of the lid of the cryochamber. The UVC disinfection will be aborted and has to be activated again for surface disinfection.

The default setting for automatic deactivation is set to 30 minutes. The timer can be set by an authorized service technician.

#### 9.1.1 INSTALLATION INSTRUCTION FOR UV LAMP - CRYOSTAT

Please follow the respective steps and pay attention to the relevant instructions.

**Never** directly touch the UV lamp's glass, since this reduces its durability.

Picture 1:



Picture 2:



Picture 3:



Slide the UV lamp as shown into the glass bulb. Keep 2 cm space before the endposition will be reached, this place will be needed to connect the UV-lamp with the connecting plug. (Pic. 2 & 3)

Picture 4:



Picture 5:



The connector can be plugged into two directions of polarity, a switch is excluded.

Picture 6:



Picture 7:



Once the plug is connected to the UV-lamp, the final step can be done now and the UV-lamp unit can clip into the retaining clips.

## 9.2 QUICK FREEZE POSITION [only applicable to instruments equipped with this feature]

For convenience of the user, the cryostat TN50 can be equipped with a quick freeze shelf with two positions located in the object freezing shelf. Upon activation the installed peltier element will cool down the two quick freeze position to approximately -55 °C.

The quick freeze shelf can be activated as described in section 7.2.



The default setting for automatic deactivation of the quick freeze is set to 30 minutes. The timer for automatic deactivation can be set by an authorized service technician.

## 9.3 HEAT EXTRACTOR

For a more rapid freezing process with improved structural preservation of tissues and a flattened block surface, the instrument is equipped with a heat extractor.

Apply the heat extractor on top of the specimen during the freezing process.



Heat extractor



Use of the heat extractor can lead to changed orientation of the specimen in the frozen block, especially for smaller samples. If precise orientation of the specimen is required, the freezing procedure should be performed without the heat extractor.

## 9.4 AUTOMATIC/MANUAL DEFROST

For an optimal effect of the cooling machine, a low thermal resistance at the cooling ribs is necessary. Frequent use of the cooling machine condenses moisture on these cooling ribs and increases the thermal resistance. Therefore, the device, in particular the cooling ribs, is automatically defrosted.

During an automatic defrost (programmed for every midnight) or an manual activated defrost (possible at every time) hot gas from the cooling system is pressed through the evaporator. All ice which has been built up is melted, the water drops into the condensate bottle.

The defrosting process ends at a temperature of 20 °C on the evaporator. The chamber temperature remains in the minus range, so that samples which are stored there do not thaw.



The defrost process starts automatically at midnight every day. To change this time, please refer to section 7.3.



Before starting a complete defrost of the instrument, assure that all samples have been removed from the cryochamber.

Before switching on the instrument ensure that the instrument is completely dry, otherwise ice built up can damage mechanical parts



During defrosting (automatic or manual) always leave front window open.

## 9.5 COMPLETE DEFROST OF THE INSTRUMENT

It is highly recommended to defrost the instrument at least every 6 months. If the instrument is used regularly in warm tropical climate a more frequent complete defrost might be necessary. The unit should be defrost for a minimum period of 48 h, better over the weekend.

Turn hand wheel to its highest position and activate the hand wheel stop.

Remove samples and tools from the cryochamber.

Switch off the instrument. Be sure to open the front window and leave it open until it is switched back on.

Before restarting, the microtome and the cooling chamber must be completely dry in order to avoid a decision.

Switch on the instrument.



Before starting a complete defrost of the instrument, assure that all samples have been removed from the cryochamber.

Before switching on the instrument ensure that the instrument is completely dry, otherwise ice built up can damage mechanical parts.

## 9.6 EMPTYING THE CONDENSATE BOTTLE

The unit is equipped with a condensate bottle for defrosting water. The filling level of the collecting container is checked with a fill level sensor. As soon as "full container" is displayed in the display, the collecting container must be emptied in order to avoid overfilling.



The contents of the condensate bottle should be disposed according to laboratory regulations.



To reduce the risk of contamination and infection, after emptying, is recommended to fill a disinfectant concentrate into the condensate bottle..



## 10. CLEANING AND MAINTENANCE

### 10.1 CLEANING

The recommended frequency of cleaning of the cryostat chamber depends on how frequently the instrument is used.



Wear protective clothing and disposable gloves according to Good Laboratory Practices.

Please take note of the safety aspects of the instrument.

Do not use acetone or xylene for cleaning the unit. Only use alcoholic media.

Never spray or use cleaning medium directly onto the touch panels.

### 10.2 DISINFECTION

Spray disinfection with alcohol-based disinfectants is applicable without removing the microtome from the cryochamber. When disinfecting the instrument, take appropriate protective measures (gloves, mask, protective clothing, etc.).



Wear protective clothing and disposable gloves according to Good Laboratory Practices.

When using detergents and disinfectants please comply with the safety precautions of the disinfectant manufacturer!

The integrated anti-roll plate of the blade holder can be cleaned with alcohol.

Dispose of waste liquid according to the waste disposal regulations!

Do not turn the instrument on before the cryochamber and the microtome are completely dry otherwise ice built up can damage mechanical parts.

All components removed from the cryostat must be carefully dried before returning them to the cryochamber!

### 10.3 RECOMMENDED MAINTENANCE AND SERVICE SCHEDULE

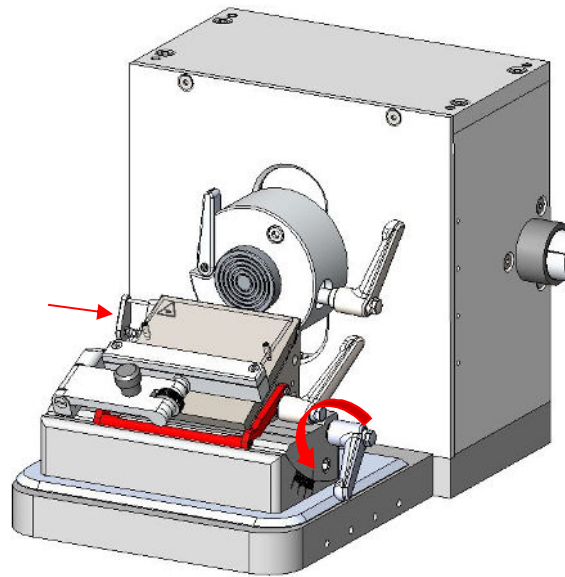
- Daily** Remove frozen section waste from the cryostat chamber after every day of usage.  
Disinfection if necessary.
- Weekly** Cleaning of blade holder (see section 10.3).  
Cleaning of window.
- Monthly** Check of temperature sensor in cryochamber.  
Cleaning of cryostat ventilation (see section 10.4).
- Yearly** Complete Service (performed by authorized Tanner Scientific service technician)
- check of all functions
  - complete defrost
  - removing of microtome
  - oiling of movable parts
  - check of cooling system
  - check of driving system
  - complete disinfection / cleaning / drying

## 10.4 CLEANING OF DISPOSABLE BLADE HOLDER

Turn the handwheel to the highest position and operate the handwheel lock.

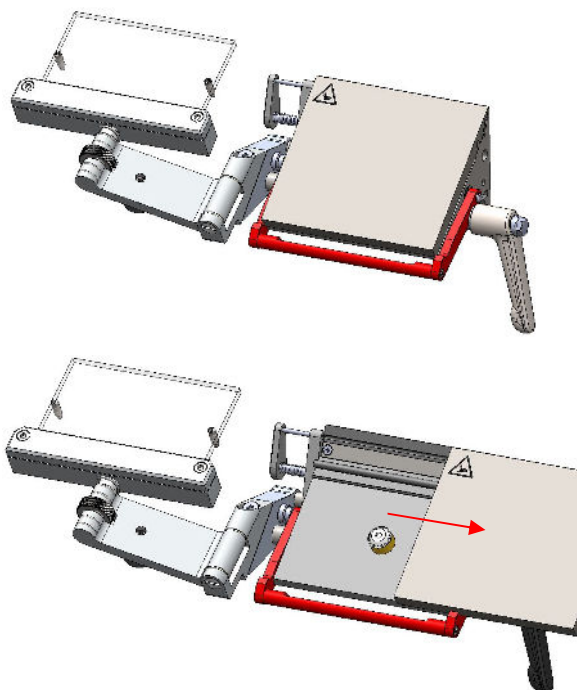
Loosen the blade by turning the lever counterclockwise.

Remove the blade from the blade holder using the ejection mechanism. Loosen the upper part of the blade holder by turning the upper lever counterclockwise. Slide the top of the blade holder to the right.



Pull out the lever and release the upper blade holder.

Remove the pressure plate and clean the blade holder with a brush or cloth



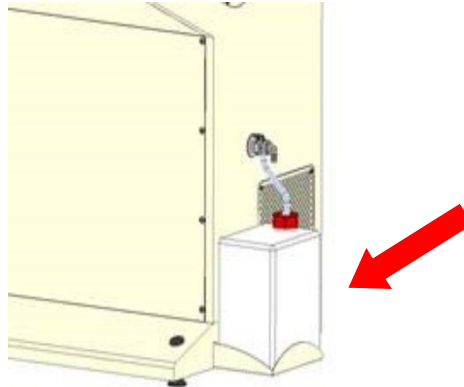
Remove the pressure plate

Reassemble the pressure plate and the lever in reverse order and release the handwheel lock for cutting.

## 10.5 CLEANING OF CRYOSTAT VENTILATION

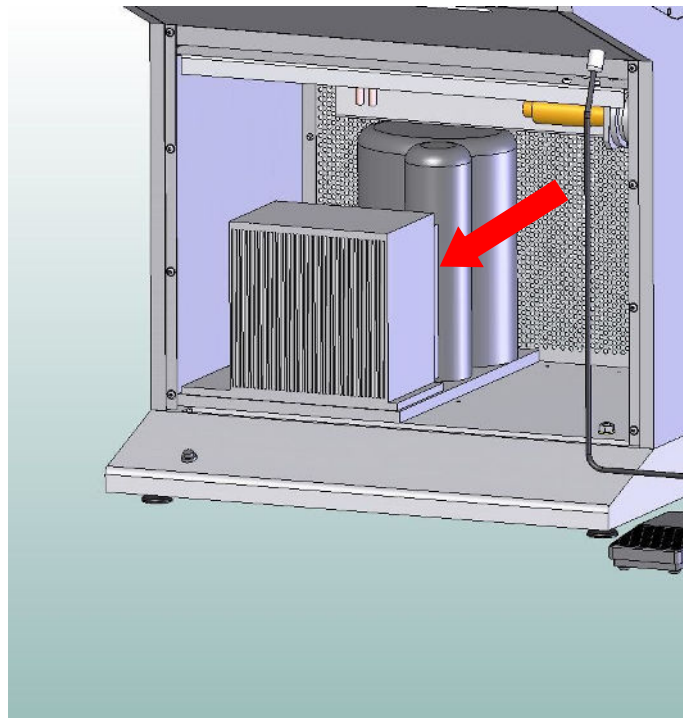
During usage of the instrument, dust will deposit on the ventilation of the cooling unit. This can negatively affect the cooling performance of the instrument.

A cleaning of the cryostat ventilation is recommended monthly.



Remove the front panel of the unit by unscrewing the 8 screws (four on each side). Remove the dust with a vacuum cleaner.

A cleaning of the cryostat ventilation is recommended monthly. We suggest using a vacuum cleaner and a brush for cleaning.



## 11. SERVICE

Internal components should only be serviced by technicians authorized by Tanner Scientific.

If technical service or spare parts are necessary, please contact your local Tanner Scientific distributor. Please have the following information available:

- Complete contact details
- Type of instrument and serial number
- Place of instrument and name of user
- Purpose of service call
- Delivery date of the unit

If it is necessary to return the instrument, it must be cleaned and disinfected before delivery. It must be returned in its original packing.

If the instrument or parts thereof are sent back in a dirty or non-disinfected condition, Tanner Scientific reserves the right to return the parts to the debit of the customer.

## 12. OPTIONAL ACCESSORIES

**Disposable Blade Holder (low profile)**

**Disposable Blade Holder (high profile)**

**2x Quick freezing positions**

**UV disinfection**

**Heat extractor block**

**Cork plate (100 pcs.; Ø 20 mm)**

*clear-cut* **Brush**

**Anti-roll plate (disposable blade holder)**

### **13. WARRANTY**

Tanner Scientific guarantees that the product delivered has been subjected to a comprehensive quality control procedure, and that the product is faultless and complies with all technical specifications and/or agreed characteristics warranted.

Tanner Scientific guarantees that the instrument is manufactured under an ISO 9001 quality management system.

Unauthorized modification or repair by third party persons will void the warranty.

Only original Tanner Scientific spare parts must be used.

Guarantee claims can be put forward only if the instrument is used according to this manual and for the purpose described.

Mistakes and errors which occur because of improper use cannot be accepted.

### **14. DISPOSAL**

The instrument or parts of the instrument must be disposed of according to existing local applicable regulations.







**Tanner Scientific**

12210 Rangeland Parkway

34211 Bradenton FL / US

Tel. (888) 708-5233

[sales@tannerscientific.com](mailto:sales@tannerscientific.com)

<http://www.tannerscientific.com>