OTF6000 Cryostat Manual

MADE IN BRITAIN

Bright Instruments

Contents

Contents Cont.

SAFETY WARNING

Low temperatures are present in this equipment. Extreme care should be taken.

DO NOT let bare skin come into contact with metal surfaces.

SAFETY WARNING

Extremely sharp knives/blades.
Use knife/blade guards at all times.
Use correct tools for removal and insertion of knives/blades.

DO NOT leave knives/blades laying around.
Place knives/blades not in use, into box/wallet provided.

Safety Information

CONSUMER PROTECTION
The Consumer Protection Act 1987 Part 1, refers to Product Liability. This legislation was issued as a direct result of an EC Directive to all member states and has been in force with effect from 01 March 1988.

Bright Instrument Company Limited, ever mindful of the need to ensure that their products are not subject to misuse and/or incorrect handling, have made it their aim to communicate any possible dangers to their customers.

Whilst Bright Instrument Company Limited markets products manufactured to the highest safety standards, it is in the interest of the purchaser that he is aware of the resultant dangers of misuse and/or incorrect handling of these products.

Your attention is therefore drawn to the following precautions:

Electrical

a. Warnings - A warning notice is fixed to the instrument stating that it should be disconnected from the power supply before removing the panels. This warning should be strictly observed. This cryostat is fitted with an in line mains filter which may affect portable appliance test results.

b. Fuses - Fuse ratings are clearly indicated on all fuse panels adjacent to the fuse holder. If and when replacement is necessary, the correct fuse rating must be adhered to.

c. Earthing (Grounding) - A protective earth terminal is fitted, and must be used in all two wire installations.

NB. It is recommended the OTF6000 is plugged in via an electrical surge protection unit.

Microtome Knives & Blades

Microtome knives can be hazardous in the laboratory. Personnel should be made aware of the dangers and observe the following warnings:

a. Do not leave the microtome unattended with an exposed knife in position. Remove the knife, or cover it with the guards provided.

b. Do not leave knives lying around. Place knives that are not in use in their boxes.

c. Do not carry knives unless secure in the box provided.

d. Do not clean the knife along its length. Wipe from the back edge of the cutting edge.

e. Remember that even used knives are dangerous – they are still sharp and may have been used to cut potentially infectious specimens.

f. Dispose of used knives with the same care as other sharp objects. **On no account** should used knives be placed in waste bins.

Operation

When placing object holders in the microtome, when orientating, manipulating or in any way placing fingers in a position above the knife edge - ensure that the handwheel is locked and knife guards are in position.

Low Temperatures

Parts of this instrument may attain temperatures as low as -50°C. It is important to avoid bare skin touching things such as cold surfaces. When in doubt, wear gloves. Avoid touching the knife, it is cold as well as sharp! Always use knife guards.

Accessories

Fluids supplied as accessories with Bright instruments, such as Cryospray 134, Cryo-M-Bed and microtome oil, are strictly for laboratory use only. They should not be taken by mouth and precautions afforded to other laboratory chemicals should be adhered to.

Product Safety Suggestions

All Bright Instrument Company Limited personnel are encouraged to make suggestions regarding product safety. We also welcome such suggestions from our Customers. They may be submitted by completing the appropriate (Safety) section of the Quality Survey Report Form supplied with all Bright instruments, or alternatively by letter, telephone or email: sales@brightinstruments.com.

All communications should be direct to our Warranty Assurance Department and will be acknowledged.

Decontamination Certificates

IMPORTANT

If the instrument or any part of it is to be returned to Bright Instrument Company Limited, a decontamination certificate must accompany it, and please note the following:

a. If the instrument or any part of it has been exposed to or been in contact with potential pathogenic or radioactive material, it is essential that it be decontaminated.

Set procedures are laid down by the Health and Safety Executive for decontamination. For the avoidance of doubt, we ask that instruments or parts returned to us should be accompanied by a completed decontamination certificate. A copy of this can be found at the back of this instruction manual and we suggest you use a photocopy of this when returning parts.

b. Alternatively you can download a decontamination certificate from our website.

c. Should the instrument or any part of it be received in a condition that Bright Instrument Company Limited, consider to be a potential biological hazard, the instrument or part will be returned un-repaired at the expense of the customer.

d. Overseas customers declarations must indicate that the package contains 'British Returned Goods'. Failure to do so will involve customs duty payable by us, which will be invoiced to the sender.

Warranty

1. The Seller 's products are carefully inspected and submitted to its standard tests.

2. The Seller warrants all its products to be free from defects in workmanship and materials under normal conditions of use and service provided always:

a. That if any of the goods so manufactured is alleged to be defective in workmanship and material and is returned carriage paid, and protected against damage in transit to the Seller's works at Luton within 12 months from the date of despatch and if after examination by the Seller that goods or part of them are found to be so defective then the Seller will repair or replace them free of charge and will return them to the Buyer, carriage paid.

b. Where any part of the goods manufactured by the Seller is repaired or replaced under the terms of the foregoing warranty, such warranty shall thereafter be limited to a period of six months from the date when the goods shall have been re-delivered to the Buyer.

c. This warranty does not apply to any defects caused by wear and tear, incorrect installation abnormal conditions of working, accident, misuse or neglect.

d. That save as in this clause herein before expressed, the Seller shall not be under any liability for negligence or otherwise in respect of defects in goods delivered or for any injury, damage or loss resulting from such defects and the Seller's liability under this clause shall be in lieu of any warranty or condition implied by law as to the quality or fitness for any particular purpose of such goods.

e. This warranty is expressly in lieu of all other warranties, guarantees or liabilities expressed or implied by any of the Seller's Representatives or Agents.

Please see our separate Product Warranty sheet for deliveries to the mainland UK.

WARNING: Before proceeding to Operating Instructions, ensure you are familiar with the contents of the pages marked 'Safety Information'. This instrument must only be used by competent persons.

1. Introduction

Based on the long-established and reliable OTF cryostat range, the new OTF6000 brings Bright cryostats completely up to date. New styling with improved user ergonomics, the latest blade systems in the ever-reliable and powerful 5050 microtome, a huge choice of options plus money-saving package deals make these cryostats absolutely unique.

They are suitable for an endless range of applications and in the correct configuration are capable of cutting a wide diversity of specimens from undecalcified bone to brain, resins, plastics and plant tissue as well as more usual soft tissue. Allowing full anti-roll plate adjustment for perfect results coupled with long lasting temperature stability, the OTF6000 can truly be described as complete.

1.1 RECEIPT OF PRODUCT

1.1.1 RECEIPT AND UNPACKING

This instrument received a final test and inspection prior to despatch from the factory. The following instructions are given for the re-assembly of the instrument, adjustments and its correct use. If the instrument is received before preparations for installation are completed. It should be stored in a clean, dry place and not exposed to dirty or damp conditions.

1.1.2 RECEIPT

Immediately upon receipt of the instrument, make a careful examination for evidence of damage encountered in transit. If any damage is found or suspected, notify both the carrier and Bright Instrument Company Limited immediately.

1.1.3 UNPACKING

All packing must be carefully removed and parts checked against the enclosed packing list. If any damage or discrepancy is noted, please inform our agent/distributor or Bright Instrument Company Limited immediately.

1.1.4 UNPACKING PROCEDURE

The following should be followed when the instrument is received:

a. At least two people are required during the unpacking.

b. Check that the outer packing is in good order and does not show signs of serious damage.

c. Remove the microtome from the case and unpack it.

d. Remove and unpack the accessories.

1. Introduction

1.2 ASSEMBLY AND INSTALLATION

1.2.1 FITTING THE HANDWHEEL

Push the handwheel over the shaft on the right side of the cabinet. Ensure the pin on the shaft engages the slot in the centre of the handwheel. Press firmly home, then fit and tighten the centre screw. Using the special tool provided (212-053).

1.2.2 DRAIN TUBE AND PLUG

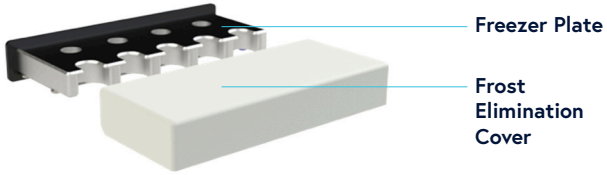
A small drain plug is fitted to the bottom right corner of the chamber, and a drain tube takes defrost water to the waste liquid bottle on the right hand side of the cabinet.

Pour approximately 100ml of water down the drain hole and place the tapered plug into position. The purpose of the water is to act as a vapour lock to prevent the ingress of moist laboratory air.

The drain plug should be left in position except when cleaning is carried out.

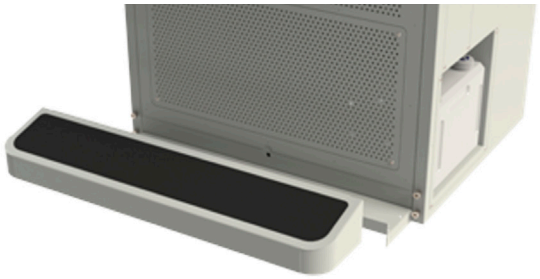
1.2.3 FROST ELIMINATION COVER

Place the provided Frost Elimination cover onto the Freezer Plate. The cover stops the build up of frost on the Freezer Plate.



1.2.4 POSITIONING

The instrument should be positioned on a level floor. To ensure adequate ventilation, leave a gap of 100mm minimum at the rear of the cabinet. Ensure that the instrument has been positioned away from direct, hot sunlight and is in a location completely free from draughts, e.g. fans, air conditioning units, air inlets and air outlets etc. The instrument is mounted on castors, two of which are lockable, to give easy movement. To access the lockable castors, the footrest cover must be removed. To do this, lift then pull the footrest towards you.



NOTE: Instrument should be placed on a level floor.

1. Introduction

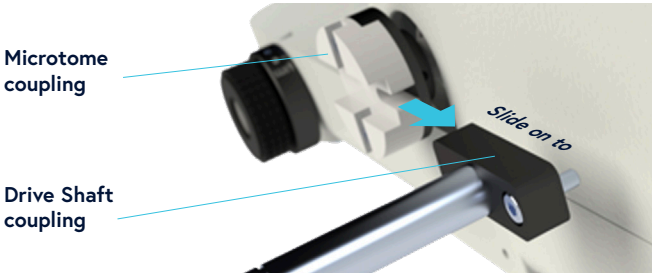
1.2 ASSEMBLY AND INSTALLATION CONT.

1.2.5 INSTALLATION AND REMOVAL OF THE MICROTOME

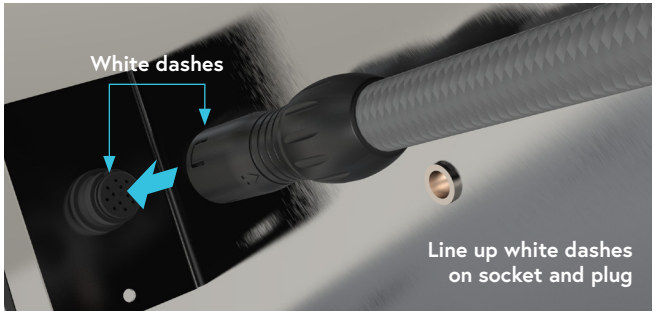
a. Fit the left hand shelf into position, press down to ensure shelf is completely down.

WARNING: The microtome weighs approximately 15kg. Ensure that adequate precautions are taken to prevent injury, i.e. back strain, when lifting and moving. The use of an industrial, personal lifting belt is highly recommended.

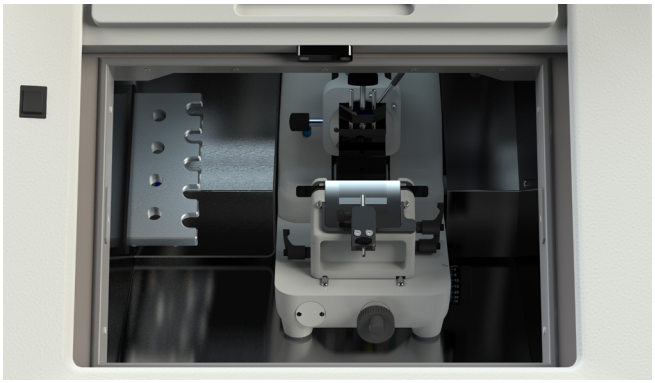
b. To fit the microtome, firstly ensure the one-way coupling is in the correct orientation (as pictured) so the microtome can slide into position. Carefully push the microtome back aim the back feet between the guides that will guide the foot to the pin, push until it won't go back any further, it should fit snugly into position.



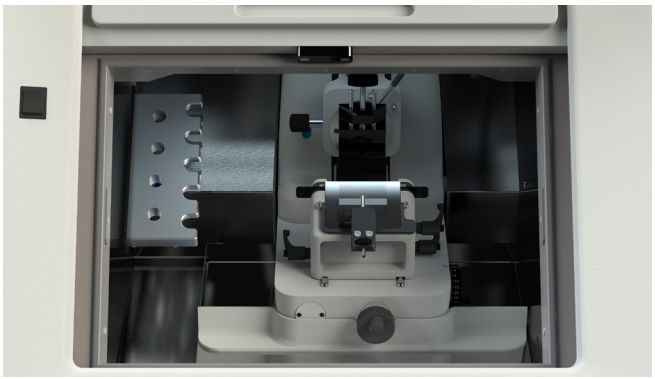
c. Plug the microtome into the socket located on the right hand side of the chamber.



d. Fit the right hand shelf into position, press down to ensure shelf is completely down.



e. Position the left and right debris trays before sliding the front cover into position.



To remove the microtome and shelves repeat all these steps in reverse.

1. Introduction Cont.

1.3 ELECTRICAL

1.3.1 SETTLING

During transit the oil in the compressor will have been subject to movement, so it is important to let the cryostat settle before switching on. We recommend the instrument is left standing for at least eight hours, and preferably overnight, before switching on.

Moving the instrument around on its castors, e.g. from one laboratory to another, will not affect the compressor oil.

1.3.2 ELECTRICAL REQUIREMENTS

The supply cord of the instrument should be connected to any ordinary electrical outlet (minimum 13 amps for 220/240V), a 13 amp fuse should be incorporated in the line. (minimum 20 amps for 110/115V) Check the voltage stamped on the nameplate, located on the back of the cabinet, with your supply.

The connections are:
Brown - Positive (live)
Blue - Negative (neutral)
Yellow/Green - Earth (ground)

NB. It is recommended the OTF6000 is plugged in via an electrical surge protection unit.

1.3.3 ELECTRICAL SAFETY

Where earth cables may have to be removed from panels for servicing or repair purposes, care should be taken to replace them when replacing the panel. Earth points are identified by a yellow and green striped circular sticker.

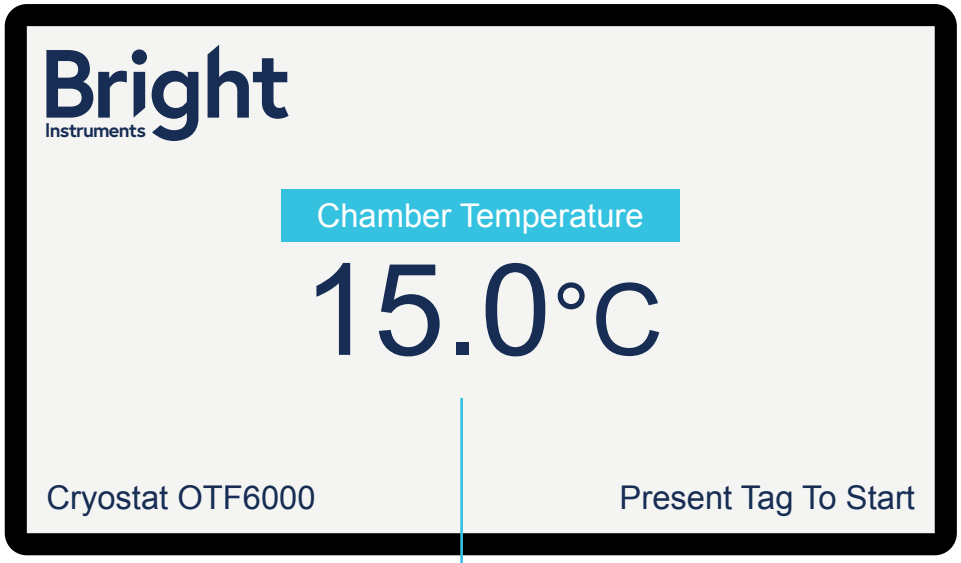
Where earth connections are taken through connectors, then the connector must be rated to take the maximum fault current. The machine should be disconnected before such connectors are separated for servicing purposes.

This cryostat is fitted with an in-line mains filter which may affect portable appliance test results.

2. Operation Instructions

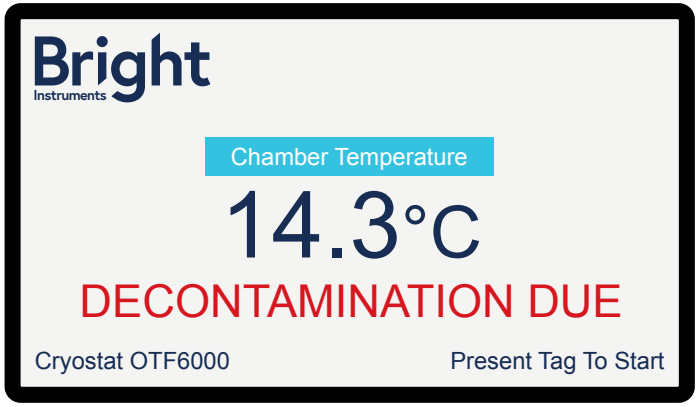
2.1 TOUCHSCREEN

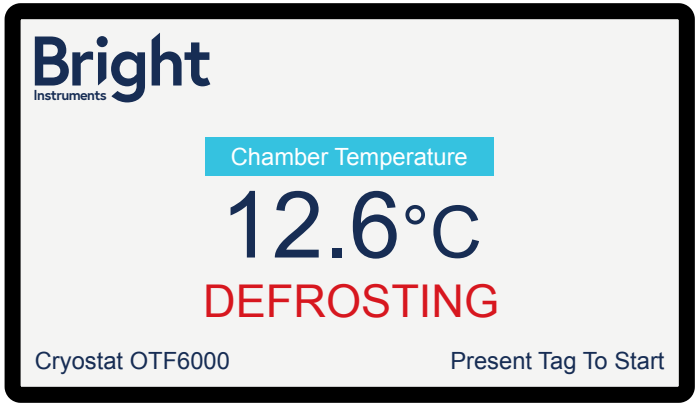
2.1.1 LOCK SCREEN.

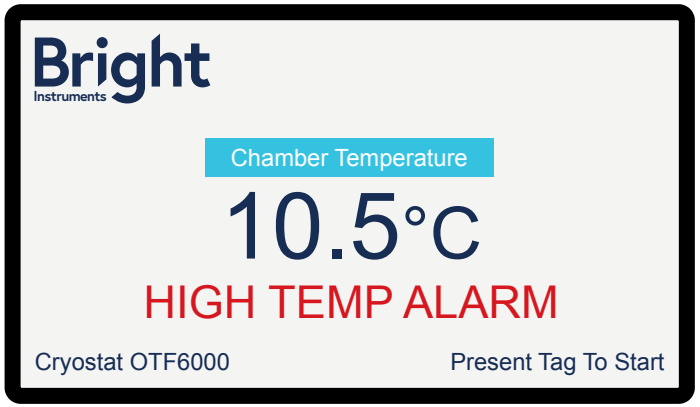


Live chamber temperature readings

Relevant task / warning messages





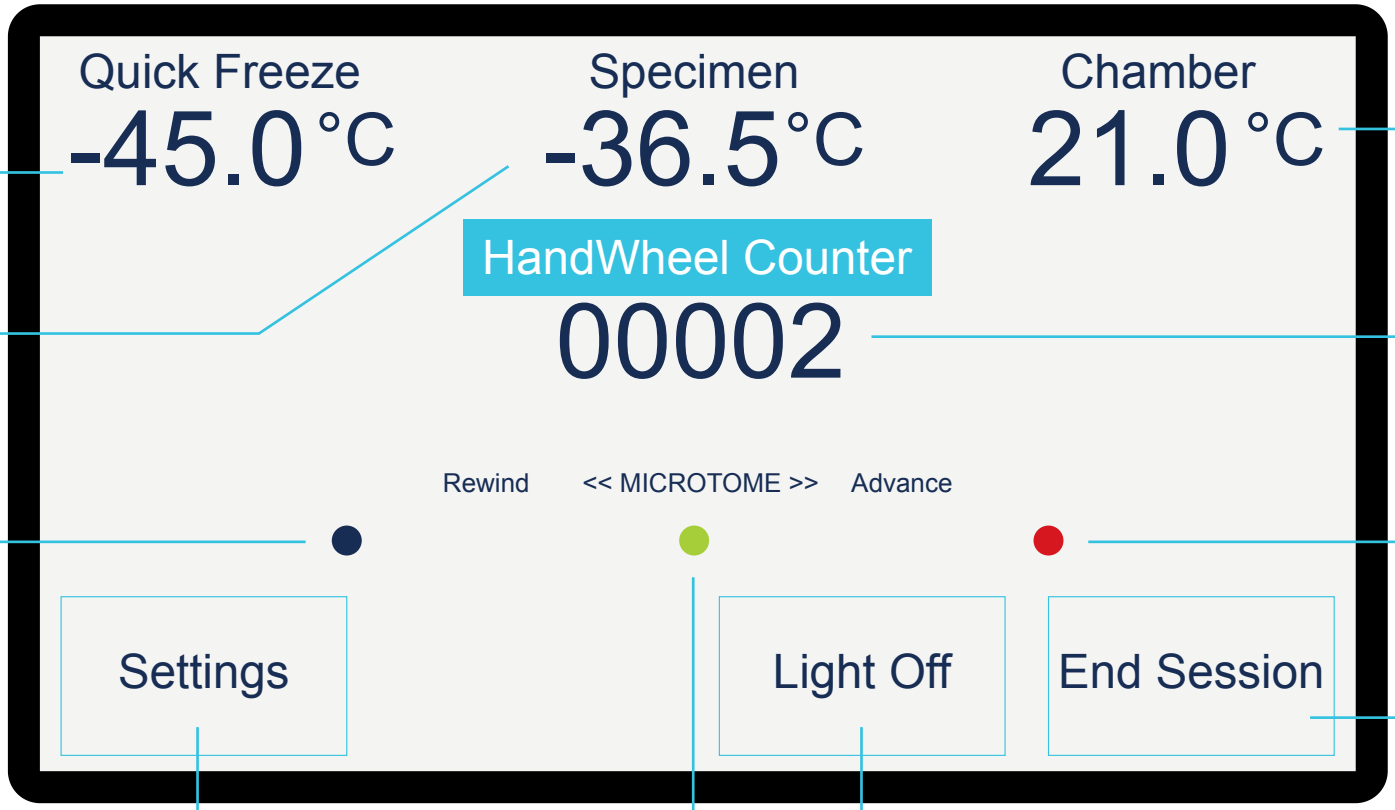


NOTE: Window lock is active when this screen is displayed. To unlock either present RFID key fob, or tap anywhere on touch screen to enter passcode.

2. Operation Instructions Cont.

2.1 TOUCHSCREEN CONT.

2.1.2 HOME SCREEN (LOW SPEC ONLY)



Live reading of Quick Freezer bar temperature

Live reading of Specimen Temperature. (Touch to set target)

Rewind position indicator. Turns red when furthest back.

Live reading of Chamber Temperature. (Touch to set target)

Cut Counter. Touch to reset.

Advance position indicator. Turns red when furthest forward.

Sign out

Turn light on/off

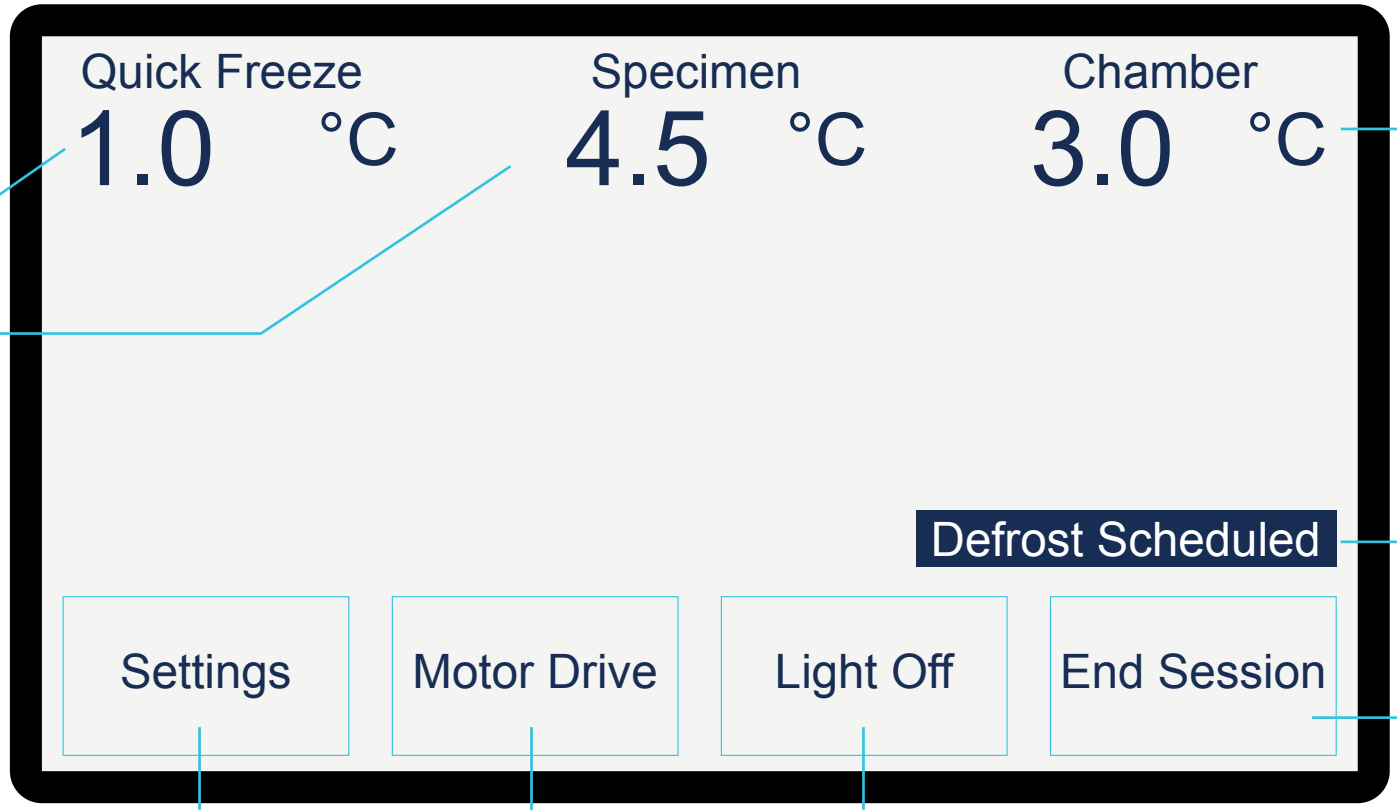
Settings Menu

Goes green when the microtome head is at start of retraction.

2. Operation Instructions Cont.

2.1 TOUCHSCREEN CONT.

2.1.3 HOME SCREEN (HIGH SPEC ONLY)



Live reading of Quick Freezer bar temperature

Live reading of Specimen Temperature. (Touch to set target)

Live reading of Chamber Temperature. (Touch to set target)

Defrost Schedule Confirmed

Sign out

Turn light on/off

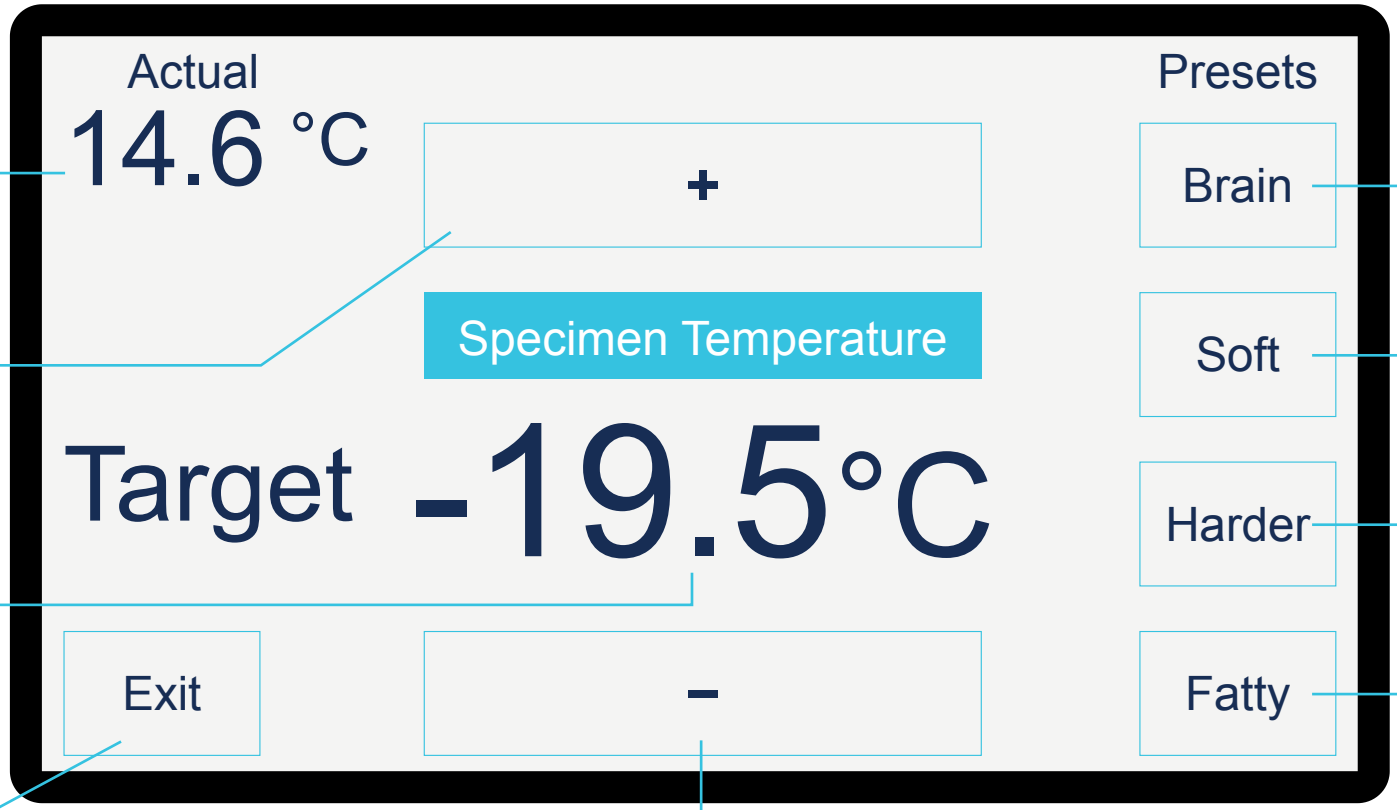
Settings Menu

Press to enter Cutting Zone controls

2. Operation Instructions Cont.

2.1 TOUCHSCREEN CONT.

2.1.4 TEMPERATURE SETTINGS: SPECIMEN



Live reading Current Specimen Temperature

Increase Target Specimen Temperature

Target Specimen Temperature

Return to Home Screen

Decrease Target Specimen Temperature

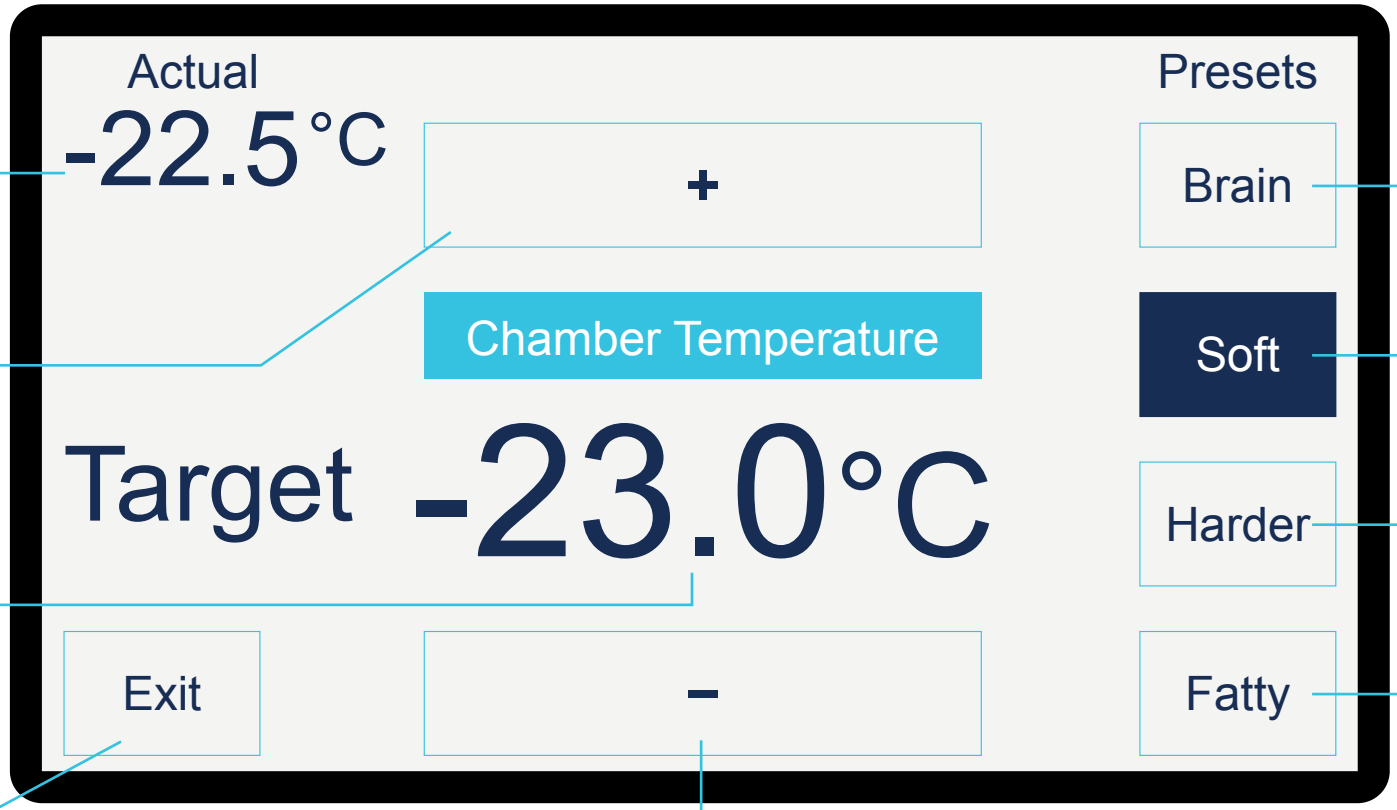
Recommended Preset Cutting Temperatures

(Selecting will change both specimen and chamber temperatures to the preset parameters)

2. Operation Instructions Cont.

2.1 TOUCHSCREEN CONT.

2.1.5 TEMPERATURE SETTINGS: CHAMBER



Live reading Current Chamber Temperature

Increase Target Chamber Temperature

Target Chamber Temperature

Return to Home Screen

Decrease Target Chamber Temperature

Recommended Preset Cutting Temperatures

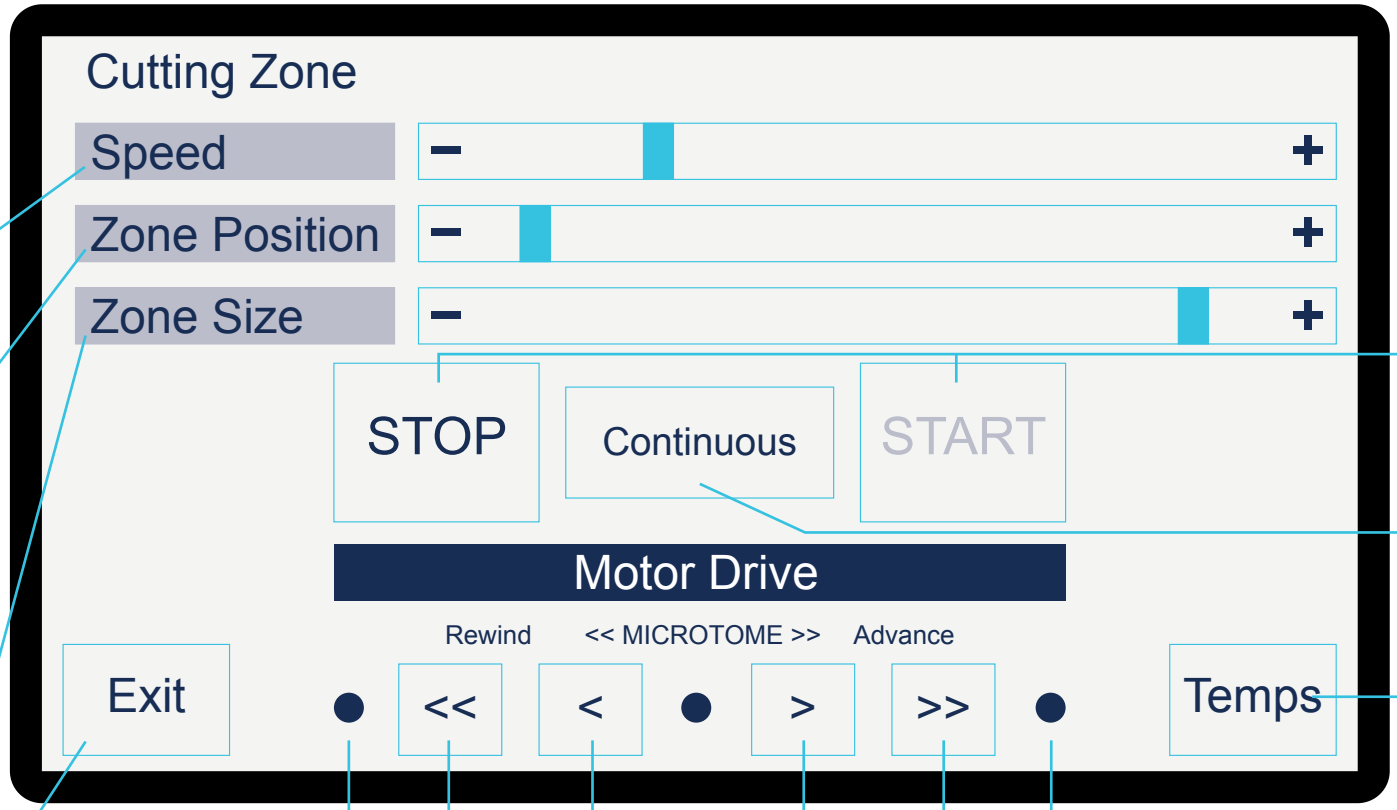
(Selecting will change both chamber and specimen temperatures to the preset parameters)

2. Operation Instructions Cont.

2.1 TOUCHSCREEN CONT.

2.1.6 MOTOR DRIVE (HIGH SPEC ONLY)

CAUTION: To avoid mechanical damage, before using the advance/ rewind feature set either the thickness to zero microns or move the microtome head to the bottom of its cutting stroke.



Adjusts speed of cutting stroke.

Adjusts the starting point of the cutting zone

− Top of cutting stroke

+ Bottom of cutting stroke

Adjusts size of cutting zone

Return to Home Screen

Rewind position indicator. Turns red when furthest back.

Fast Speed Rewind

Slow Speed Rewind

Slow Speed Advance

Fast Speed Advance

Advance position indicator. Turns red when furthest forward.

Stop and Start the microtome cutting

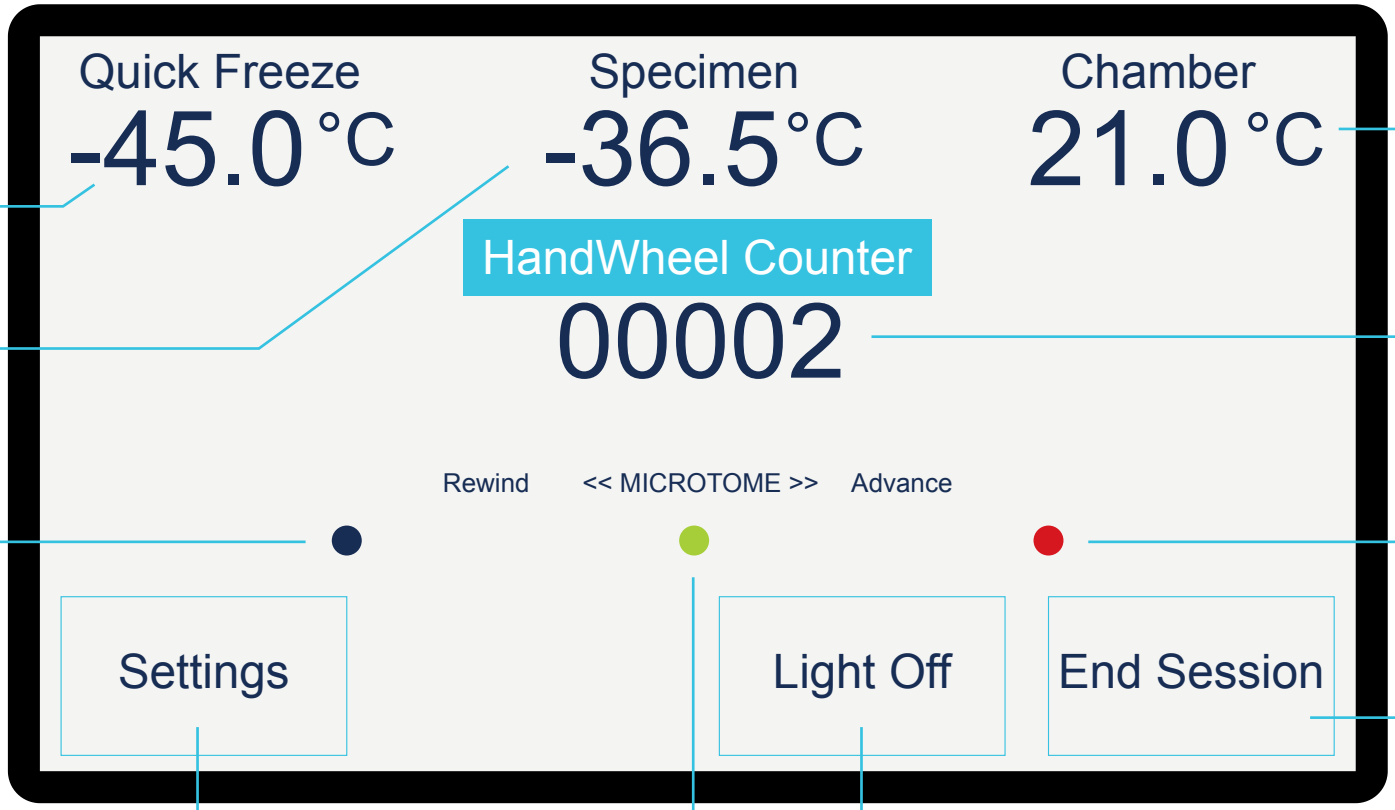
Switch between 'Continuous' and 'Single' cutting

Shows Temps Screen readings (See next page)

2. Operation Instructions Cont.

2.1 TOUCHSCREEN CONT.

2.1.7 MOTOR DRIVE: TEMPS SCREEN (HIGH SPEC ONLY)



Live reading of Quick Freezer bar temperature

Live reading of Specimen Temperature.

Rewind position indicator. Turns red when furthest back.

Live reading of Chamber Temperature.

Cut Counter. Touch to reset.

Advance position indicator. Turns red when furthest forward.

Sign out

Turn light on/off

Settings Menu

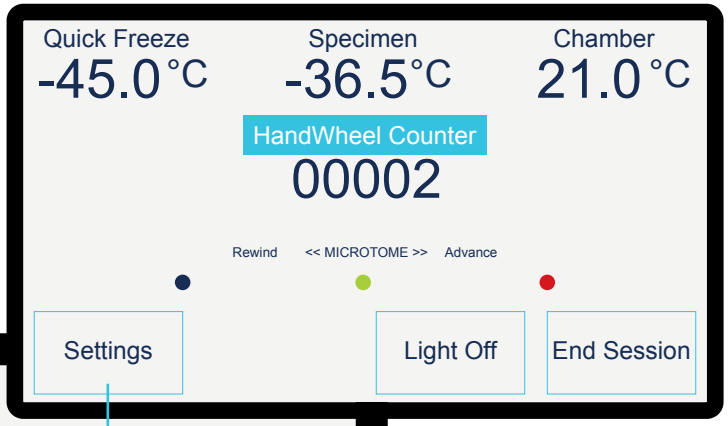
Goes green when the microtome head is at start of retraction.

2. Operation Instructions Cont.

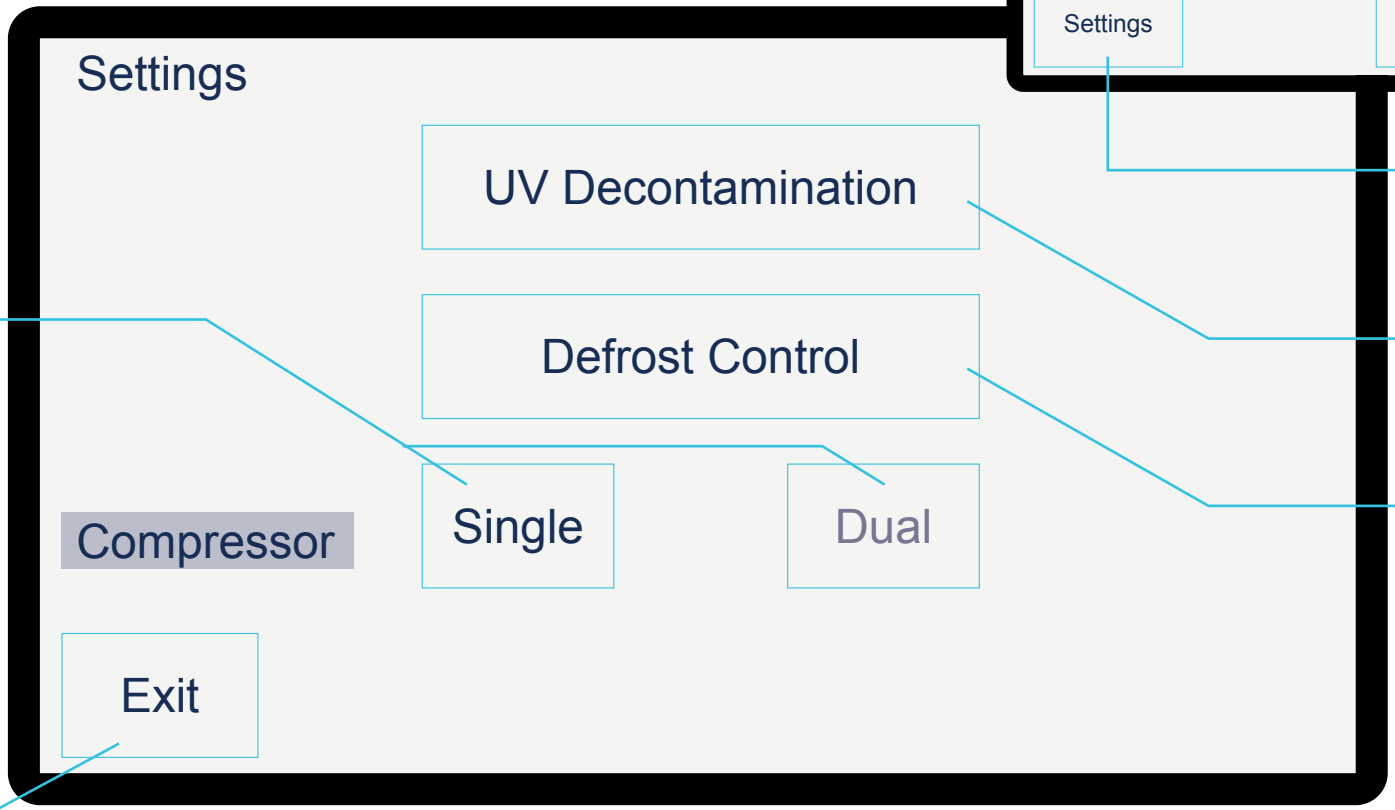
2.1 TOUCHSCREEN CONT.

2.1.8 SETTINGS (USER ACCOUNT)

HIGH SPEC ONLY
Select machine to run in either single or dual compressor mode.



Settings Button on Home Screen comes to this screen



UV Decontamination duration settings

Defrost duration and time settings

Return to Home Screen

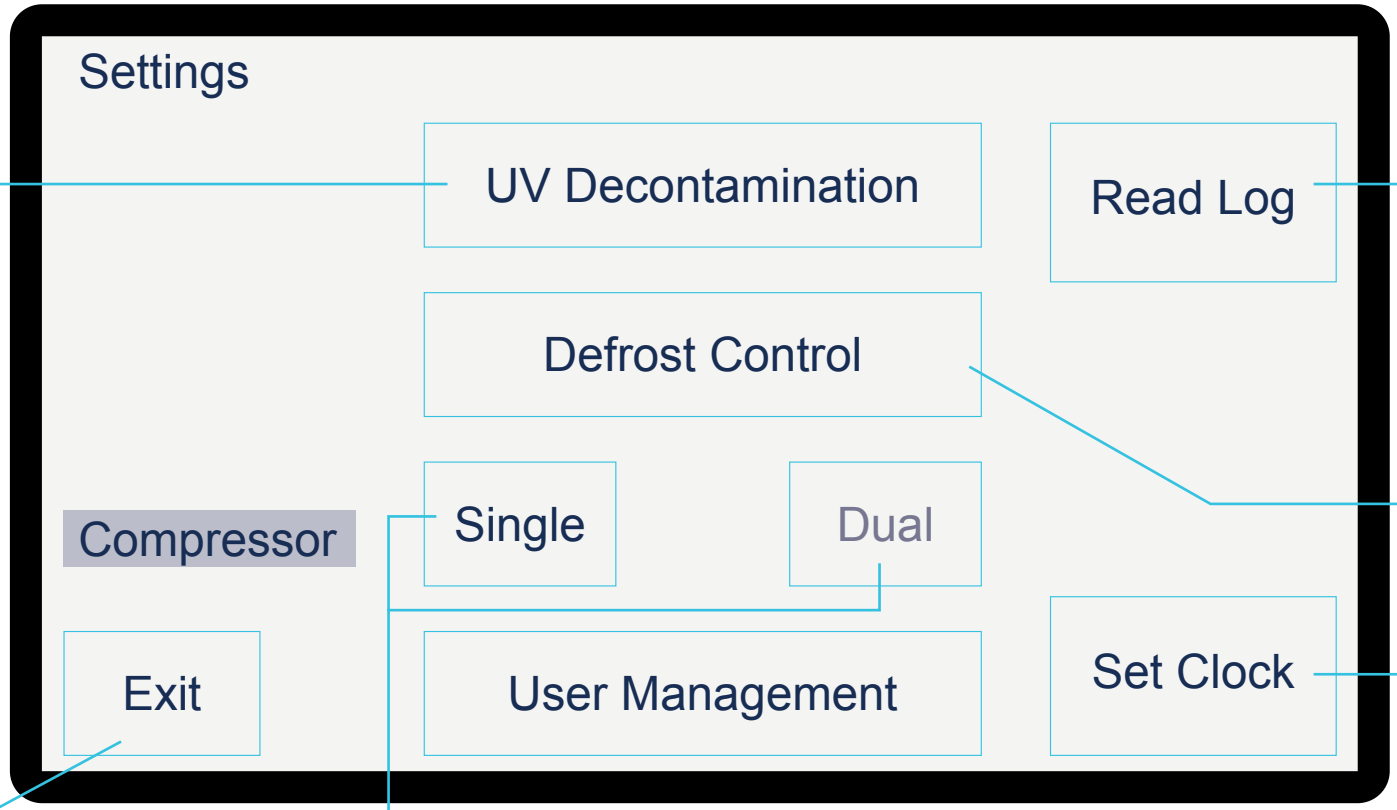
When running in Single mode the cryostat will automatically switch between one compressor and the other in order to reduce wear on the compressors. Please note that there will be a pause of 40 to 70 seconds between the compressors starting in order to reduce current surges.

In the Dual mode, full advantage can be taken of the extra refrigeration power available, with faster cool down times and an extra 5°C can be achieved in the cryostats freezing performance.

2. Operation Instructions Cont.

2.1 TOUCHSCREEN CONT.

2.1.9 SETTINGS (ADMIN ACCOUNT)



UV Decontamination duration settings

Contains directory of 'log in' data

Defrost duration and time settings

Set time and date

Return to Home Screen

HIGH SPEC ONLY
Select machine to run in either single or dual compressor mode.

2. Operation Instructions Cont.

2.1 TOUCHSCREEN CONT.

2.1.10 SETTINGS: UV DECONTAMINATION

CAUTION: UV-C radiation is dangerous and excess exposure can cause skin and eye damage. For safety purposes the UV Decontamination process will only start when the chamber window is closed.

This button only appears once a duration has been selected. Press to cancel selected duration.

Select a decontamination duration

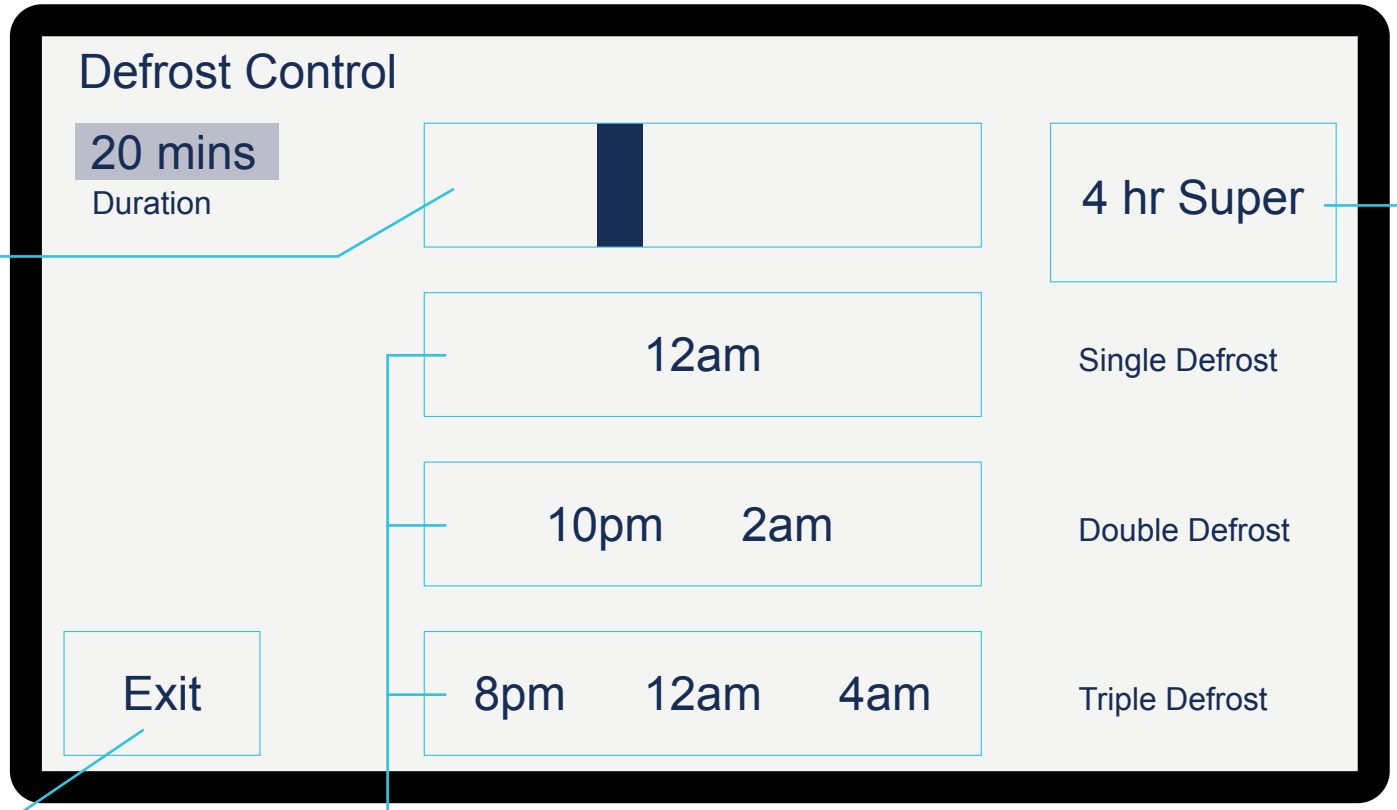
Return to Home Screen

Once a duration is selected a 'Decontamination Scheduled' message will appear on Home Screen. It won't begin until the Users session has ended and the window is closed.

2. Operation Instructions Cont.

2.1 TOUCHSCREEN CONT.

2.1.11 SETTINGS: DEFROST CONTROL



Slide to adjust duration

Goes on straight away. 4 hour process for total defrost of chamber from frozen.

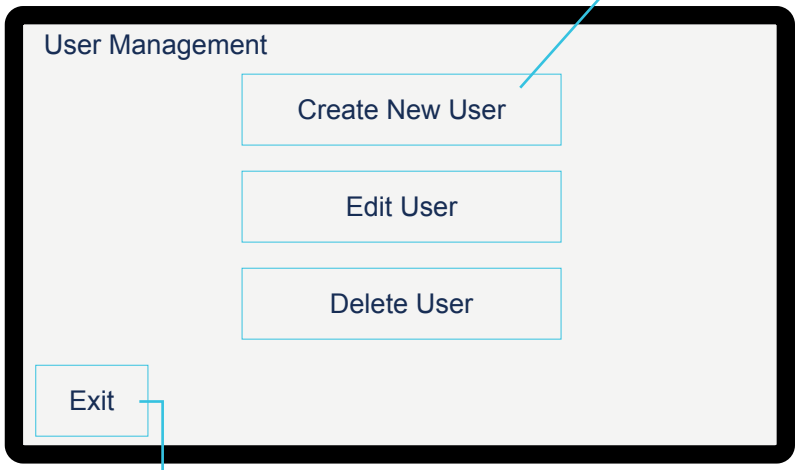
Return to Home Screen

Once duration is set. Select single, double or triple defrost by touching one of the fixed time buttons. Once selected a 'Cancel' button will appear in the top left corner of the screen.

2. Operation Instructions Cont.

2.1 TOUCHSCREEN CONT.

2.1.12 SETTINGS: USER MANAGEMENT: CREATE NEW USER (ADMIN ONLY)

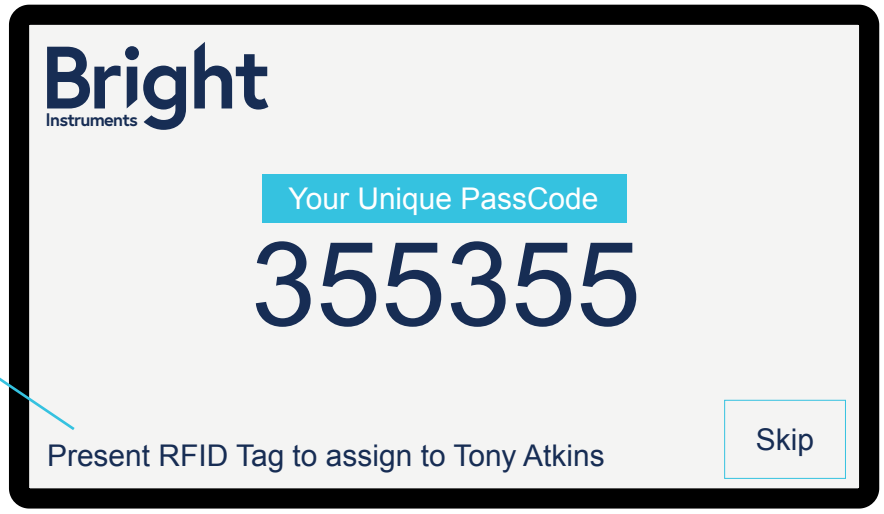


Select 'Create New User' and type in a new user name.

To confirm name press the 'return' button.

Return to Home Screen

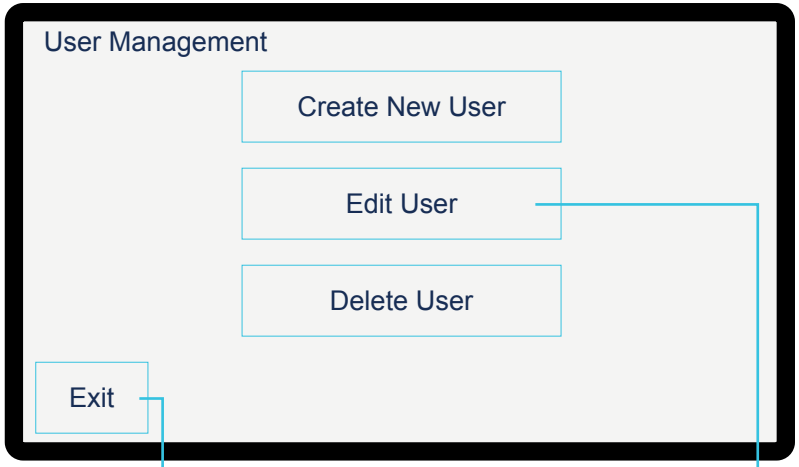
When user name is entered, a unique user code is generated. At this stage a blank RFID key fob can be placed on the RFID key fob scanner (to the right of the screen) to program the fob for this user. If you are not using a key fob simply press 'skip'.



2. Operation Instructions Cont.

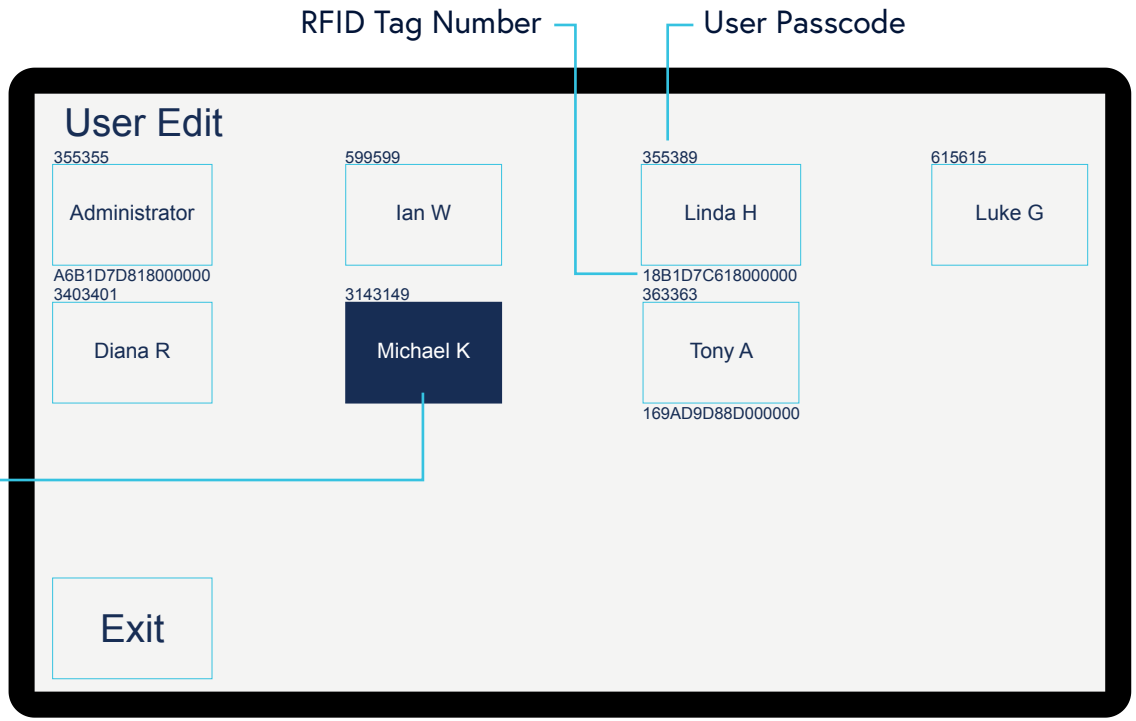
2.1 TOUCHSCREEN CONT.

2.1.12 SETTINGS: USER MANAGEMENT: EDIT USER (ADMIN ONLY)

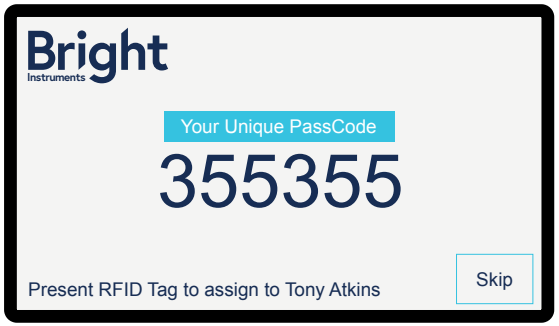


Return to Home Screen

Select 'Edit User' and then select the user you would like to edit.



Type in a new user name. To confirm name press the 'return' button.

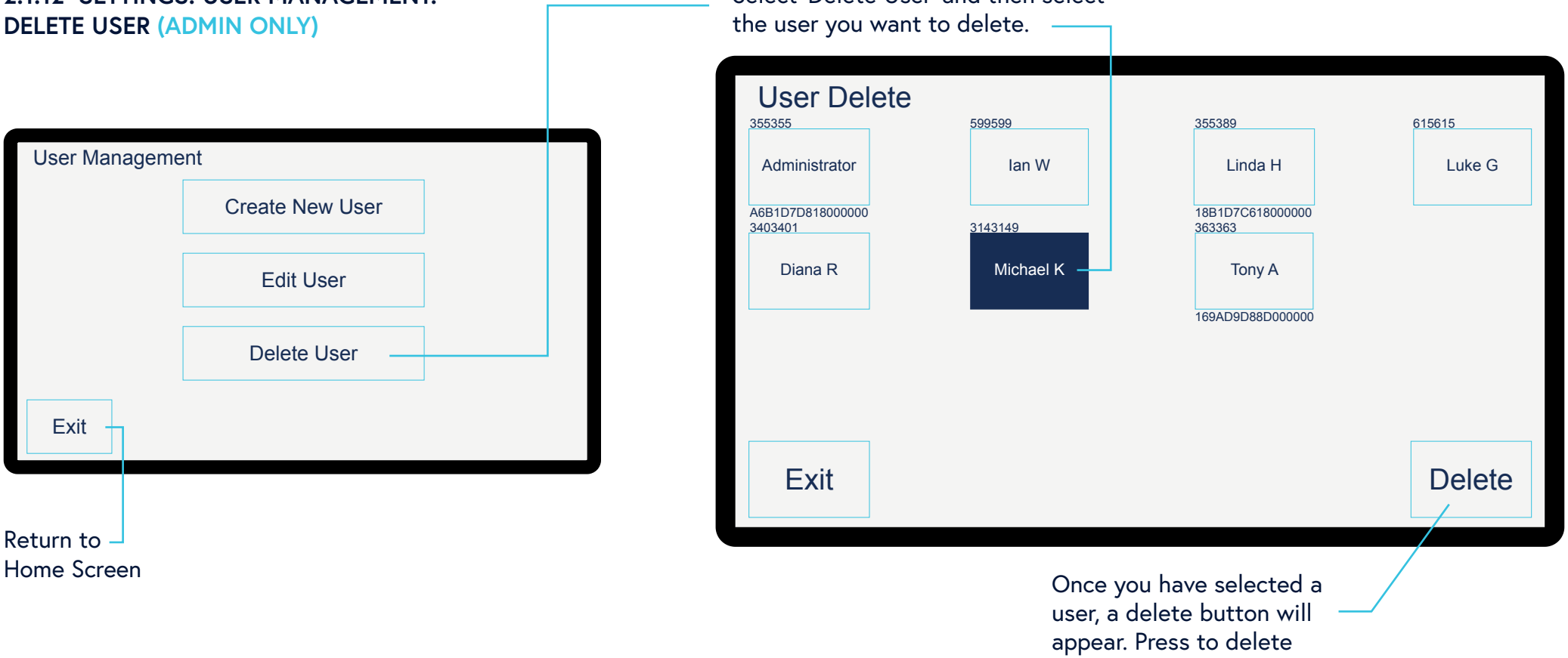


A new unique passcode is then generated. At this stage a blank RFID key fob can be placed on the RFID key fob scanner (to the right of the screen) to program the fob for this user. If you are not using a key fob simply press 'skip'.

2. Operation Instructions Cont.

2.1 TOUCHSCREEN CONT.

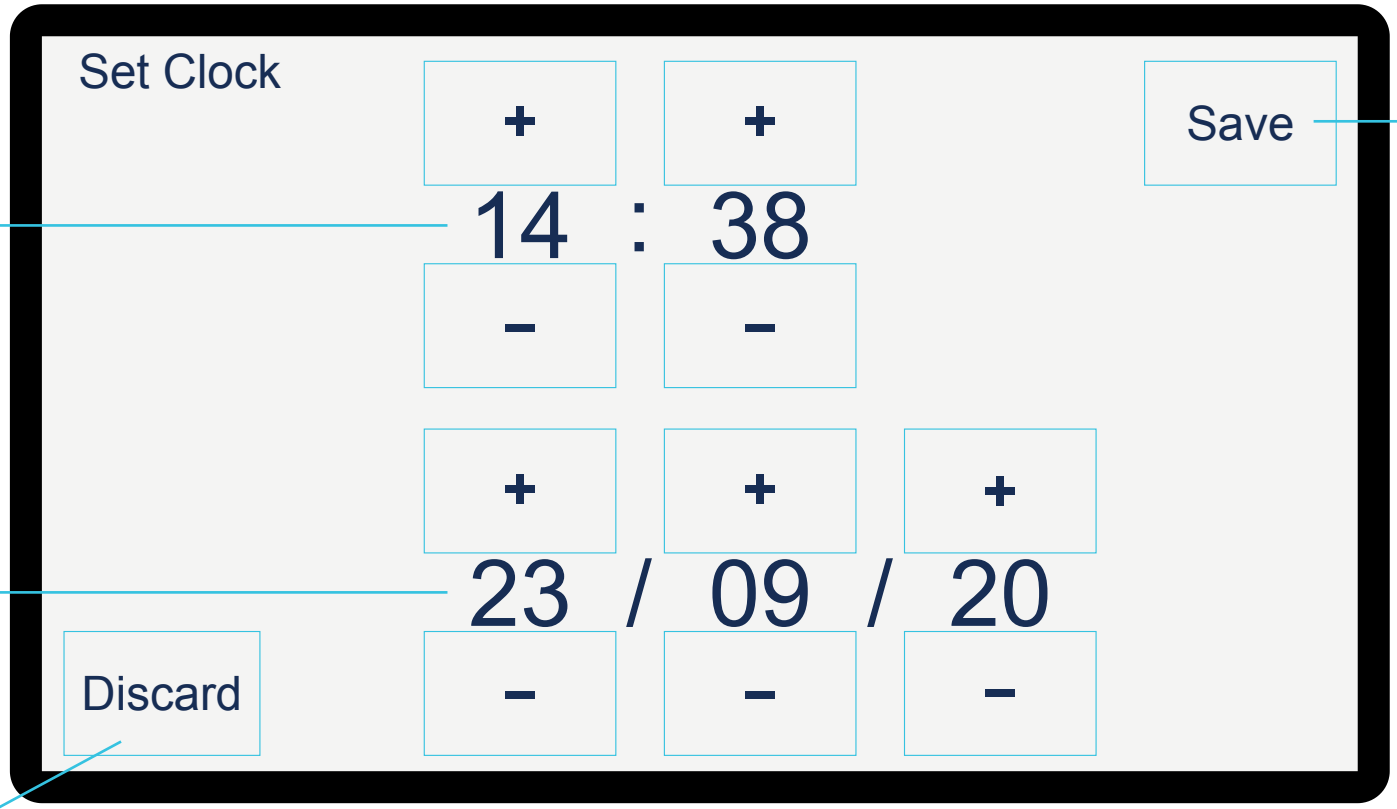
2.1.12 SETTINGS: USER MANAGEMENT: DELETE USER (ADMIN ONLY)



2. Operation Instructions Cont.

2.1 TOUCHSCREEN CONT.

2.1.13 SETTINGS SET CLOCK (ADMIN ONLY)



Time

Date

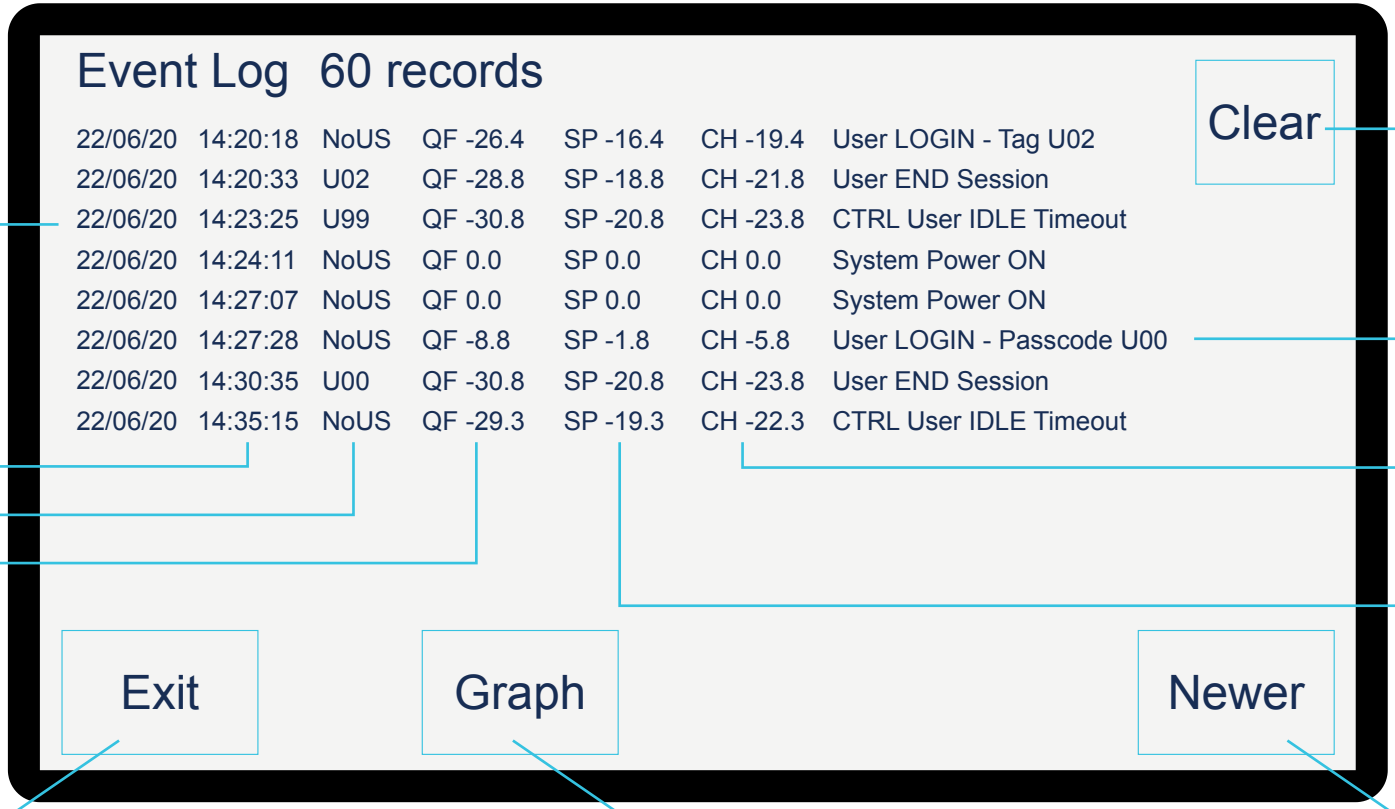
Return to Home Screen

Save changes to date and time

2. Operation Instructions Cont.

2.1 TOUCHSCREEN CONT.

2.1.14 SETTINGS: EVENT LOG (ADMIN ONLY)



Time

Date

User No.

Quick Freeze Temperature

Clear records in Event Log

Event description

Chamber Temperature

Specimen Temperature

Return to Home Screen

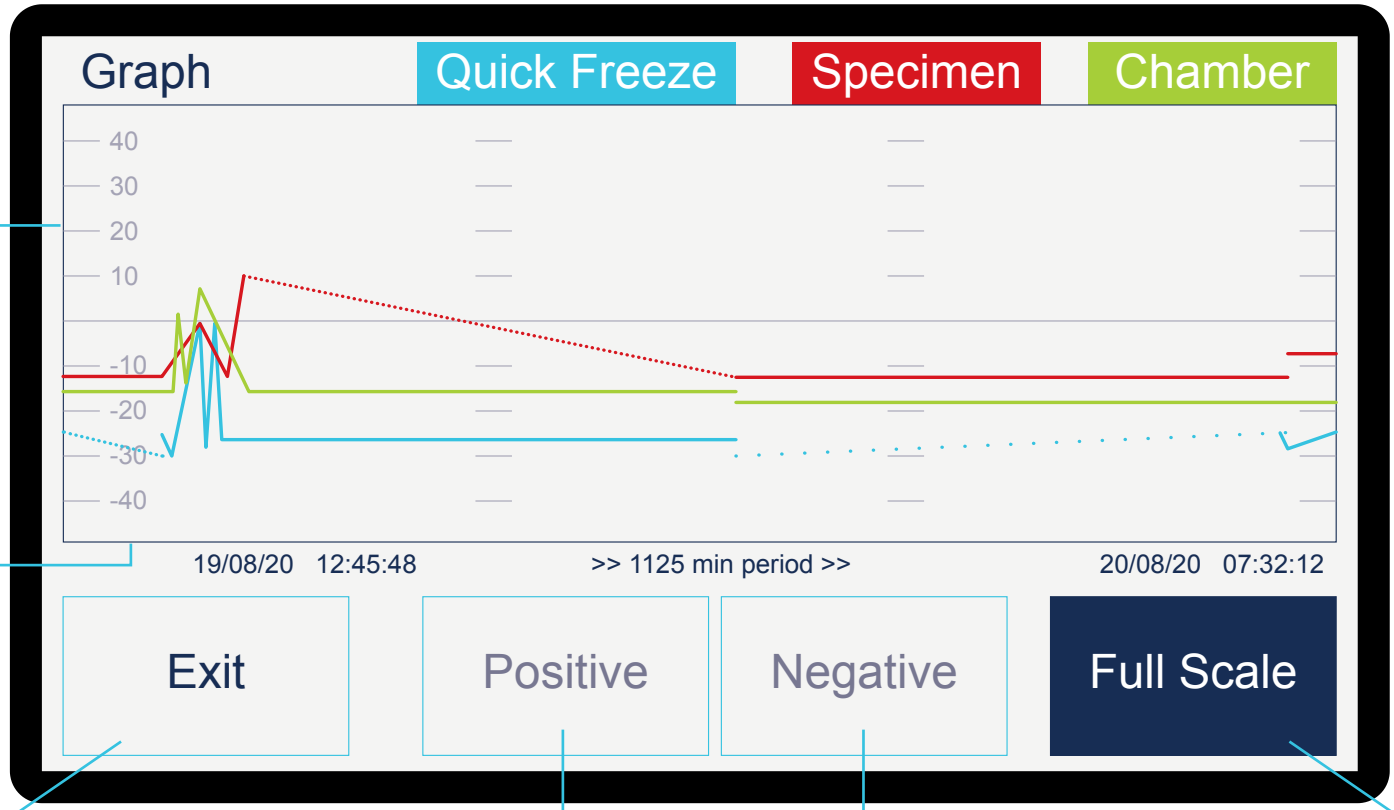
Temperatures and time of event log shown in a graph.

Scrolls to more records

2. Operation Instructions Cont.

2.1 TOUCHSCREEN CONT.

2.1.14 SETTINGS: EVENT LOG: GRAPH (ADMIN ONLY)



Y Axis
Temperature

X Axis
Time

Return to
Home Screen

Zooms in.
Only shows
temperatures
above zero

Zooms in.
Only shows
temperatures
below zero

Reverts to full
screen showing
positive and
negative
temperatures

2. Operation Instructions Cont.

2.2 CABINET CONTROLS

2.2.1 AROUND TOUCHSCREEN

Refer to Figure 1.

USB

Emergency Stop
(High Spec Models Only)

RFID Key Fob Scanning: Hover key fob over area

2. Operation Instructions Cont.

2.2 CABINET CONTROLS CONT.

Refer to Figure 1.

2.2.2 MAINS SWITCH

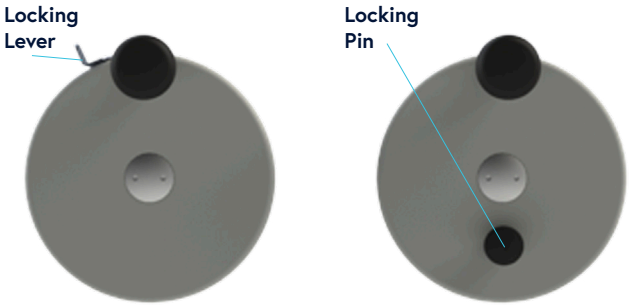
The Mains switch is located at the back of the instrument, it is used to connect the power supply to the cryostat. Operate this switch to switch the instrument on and off.

2.2.3 HANDWHEEL

For safety, the handwheel must be locked whenever a specimen is being fitted, manipulated or removed.

Depending on which model you have, there are two types of handwheel locking mechanism, for Base spec units the handwheel is fitted with a locking lever which locks the wheel (and therefore the specimen arm) in a variety of positions.

On the High spec unit, the handwheel has a locking pin to lock the handwheel position.



2.2.4 QUICK FREEZER PLATE

Remove the frost elimination cover before using the quick freezer plate. This plate runs at or below the set chamber temperature (typically 10°C below chamber temperature) and is useful for storage or pre-cooling of knives etc. Although it is possible to freeze fresh tissue on the quick freezer plate, it is generally preferable to use a much colder medium.

The temperature of the quick freezer plate is displayed constantly on the main control panel. Do not forget to replace the frost elimination cover after using the quick freezer plate, this helps prevent a build up of frost.

2.2.5 MOTORISED ADVANCE/REWIND

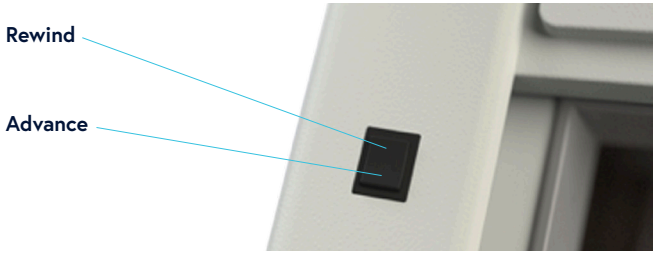
CAUTION: To avoid mechanical damage, before using the advance/rewind feature set either the thickness to zero microns or move the microtome head to the bottom of its cutting stroke.

Move the head to its furthest back position whenever is appropriate. The advance / rewind control can also be used for fine advance of the specimen. The feed indicator on the front cover of the microtome shows how much forward travel is available, blue at the start position transitioning the red at the end of travel.

2. Operation Instructions Cont.

2.2 CABINET CONTROLS CONT.

2.2.5 MOTORISED ADVANCE/REWIND CONT.



Ways to use the switch:

a. If the Advance/Rewind switch is pressed for more than 1.5 seconds, the specimen travels faster.

b. To fully advance/rewind the head press and hold the switch.

c. To move small rewind increments, quickly press the switch in the intended direction.

2.2.6 FOOT SWITCH

The Foot switch is only available on High Spec models and is used to control the Motor drive. The Motor drive has two different modes of operation they are; single cut and continuous cutting mode, the mode being selected through on the touchscreen. On single cut mode, pressing the foot switch commences a single cut. While on continuous cutting mode, a press of the foot switch commences cutting then a secondary press stops the cutting.

2. Operation Instructions Cont.

2.3 MICROTOME CONTROLS SOLID KNIFE

Refer to Figure 2.

2.3.1 KNIFE GUARD

The knife guard is fitted to the knife block with a retaining wire to ensure it cannot be misplaced. When a knife is installed, the guard should be in position over the knife only being removed when access is required.

2.3.2 KNIFE HOLDER

To ensure optimum sectioning performance the knife must be kept clean from grease and dirt. To clean the knife, carefully apply a small amount of methylated spirits or ethanol to the surface of the knife using a clean, dry, soft paper towel. Always move the towel away from the edge of the knife - never towards it.

To install a knife, loosen the knife clamp screws and slide the knife in from the left.

Before re-tightening the knife clamp screws, set the knife tilt angle scale and lock into position. The correct setting of the knife angle is essential for obtaining good results see table below.

To remove a knife, loosen the knife clamp screws, remove the knife guard and slide the knife out through to the left.

See the table below for a list of recommended knife angles.

Part No.	Description	Angle (+/- 2.5)
50230	Standard knife	15°
50232-1	Hardened steel knife	12°
50207	Steel knife	15°
50234	Tungsten carbide tipped knife	25°

2.3.3 ANTI-ROLL ASSEMBLY

Refer to Figure 3.

The Anti-Roll plate is a device for ensuring that tissue sections pass down the blade face without curling, so that they can be collected flat on to microscope slides.

The setting up of the Anti-Roll plate is second only in importance to the quality of the blade edge in obtaining ribbons of high quality sections.

Step 1: Preparation

a. Install a sharp Bright microtome knife, setting the appropriate clearance angle for that particular knife.

b. Clamp a frozen specimen (or embedding compound alone) into the microtome (refer to section 3.2)

c. Release the knife block clamp locking lever and turn the knife carriage feed control clockwise to bring the knife towards the specimen.

d. Trim the specimen or embedding medium until a suitable block face is made (refer to section 3.3).

e. Lock the knife carriage clamp firmly and proceed to cut sections at the chosen thickness. Once it can be seen that regular, good quality sections are cut (albeit curled up) go on to step 2.

2. Operation Instructions Cont.

2.3.3 ANTI-ROLL ASSEMBLY CONT.

Step 2: Setting the Anti-Roll Plate

To ensure optimum sectioning performance the anti-roll plate must be kept clean from grease and dirt. To clean the anti-roll plate carefully apply a small amount of methylated spirits or ethanol to both the upper and lower surfaces using a clean, dry, soft paper towel.

a. Place the Roll plate against the knife to see where the Roll plate edge is positioned in relation to the blade edge, the edge of the Roll plate should be positioned slightly below the knife edge, if this not the case, use the adjustment knob to reposition.

> **NOTE:** if the edge of the Roll plate is above the edge of the knife lift it from the knife to adjust, dragging the Roll plate downwards while on the knife could result in damage to the Roll plate and knife).

b. Lightly tighten the Anti-Roll adjustment lock so that the Anti-Roll adjustment knob can still be turned.

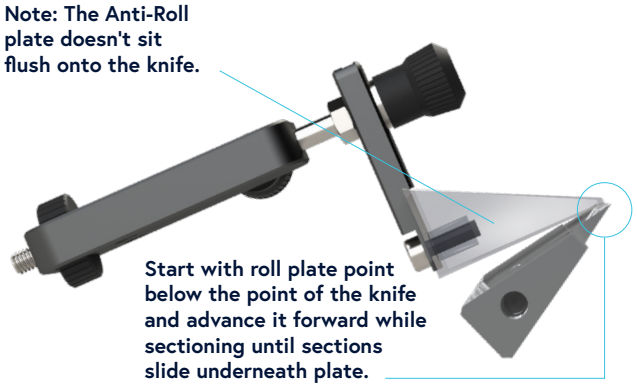
c. Place the Roll plate back against the knife and start to cut sections again. If the plate is too low they will curl up on the tip of the knife.

d. Loosen the Anti-roll adjustment knob and adjust the angle between the bottom face of the plate and the blade, set the angle somewhere between 10°-15°.

e. Slowly turn the anti-roll adjusting knob clockwise while cutting sections. When the plate reaches the correct height, the sections will start to slide under the plate.

f. Tighten the Anti-roll adjustment lock then flip the plate away from the knife. Now flip the plate back into position. When cutting is resumed, sections should go under the plate as before, i.e. the plate has aligned itself. If not, repeat the setting up process.

Your anti-roll plate may vary from the design shown, but the set-up procedure remains the same. Please refer to section 3.6, Frozen Sectioning: A Problem Solving Guide, for further assistance.



2.4 MICROTOME CONTROLS QUICK RELEASE FEATHER BLADE HOLDER (QRFBH)

Refer to Figure 4.

2.4.1 BLADE GUARD

When access to the blade is required, the blade guard can be opened. Flip it downwards to open and flip it upwards to close.

During sectioning, the wire blade guard is in the open position. At all other times when a blade is fitted, the guard should be in the closed position for operator safety.

2. Operation Instructions Cont.

2.4.2 ANTI-ROLL ASSEMBLY

Refer to Figure 5.

The Anti-Roll plate is a device for ensuring that tissue sections pass down the blade face without curling, so that they can be collected flat on to microscope slides. The setting up of the Anti-Roll plate is second only in importance to the quality of the blade edge in obtaining ribbons of high quality sections.

Step 1: Preparation
a. Install a sharp Bright microtome knife, setting the appropriate clearance angle for that particular knife.

b. Clamp a frozen specimen (or embedding compound alone) into the microtome (refer to section 3.2)

c. Release the knife block clamp locking lever and turn the knife carriage feed control clockwise to bring the knife towards the specimen.

d. Trim the specimen or embedding medium until a suitable block face is made (refer to section 3.3).

e. Lock the knife carriage clamp firmly and proceed to cut sections at the chosen thickness. Once it can be seen that regular, good quality sections are cut (albeit curled up) go on to step 2.

Step 2: Setting the Anti-Roll Plate
To ensure optimum sectioning performance the anti-roll plate must be kept clean from grease and dirt. To clean the anti-roll plate carefully apply a small amount of methylated spirits or ethanol to both the upper and lower surfaces using a clean, dry, soft paper towel.

a. Place the Roll plate against the knife to see where the Roll plate edge is positioned in relation to the blade edge, the edge of the Roll plate should be positioned slightly below the knife edge, if this not the case, use the adjustment knob to reposition.

> **NB:** if the edge of the Roll plate is above the edge of the knife lift it from the knife to adjust, dragging the Roll plate downwards while on the knife could result in damage to the Roll plate and knife).

b. Lightly tighten the Anti-Roll adjustment lock so that the Anti-Roll adjustment knob can still be turned.

c. Place the Roll plate back against the knife and start to cut sections again. If the plate is too low they will curl up on the tip of the knife.

d. Slowly turn the anti-roll adjusting knob clockwise while cutting sections. When the plate reaches the correct height, the sections will start to slide under the plate.

e. Tighten the Anti-roll adjustment lock then flip the plate away from the knife. Now flip the plate back into position. When cutting is resumed, sections should go under the plate as before, i.e. the plate has aligned itself. If not, repeat the setting up process.

Your anti-roll plate may vary from the design shown, but the set-up procedure remains the same. Please refer to section 3.6, Frozen Sectioning: A Problem Solving Guide, for further assistance.

2. Operation Instructions Cont.

2.5 COMMON MICROTOME CONTROLS

2.5.1 KNIFE BLOCK ADJUSTMENT

For large movements of the knife holder or rapid advance (e.g. specimen trimming) first raise the knife block clamp locking lever on the right-hand side of the knife holder then turn the knife carriage feed control on the front of the microtome base. To turn clockwise will move the knife towards the specimen and to turn anticlockwise will move the knife away from the specimen.

When set in the desired position lower the knife block clamp lever to lock in position.

2.5.2 SECTION THICKNESS CONTROL

To select section thickness, set the thickness control at zero and rotate anticlockwise until desired thickness is level with the indicator. To reset the section thickness at any time, ensure that the thickness control is always reset back to zero before selecting the new section thickness.

NB: If feed screws other than the standard 0.5 - 30µm are fitted, a conversion factor is needed.

3. Cutting & Collecting Sections

3.1 BASIC FREEZING TECHNIQUES

As a general rule, the quicker tissues are frozen the better the results will be. The aim is to minimise the damage caused by ice crystal artefact, and the more rapid the transition from liquid phase to solid phase, the smaller the ice crystals will be. The susceptibility to damage varies between tissue types, with certain tissues (e.g. muscle) being very easily damaged. Furthermore, the nature of the work may dictate the level of tissue disruption which is acceptable. In all cases it is important to keep the specimen size minimal, i.e. at least one dimension should be no more than a few millimetres.

3.1.1 LIQUID NITROGEN

With a boiling point of -196°C, LN2 is an ideal freezing agent. Tissues may be immersed directly, or more frequently a solvent, such as hexane, is pre-cooled in LN2 then specimens are immersed in the solvent.

3.1.2 CARBON DIOXIDE - GAS

The traditional method of freezing. A blast of gas from a CO_2 cylinder will achieve temperatures around -60°C. Care must be taken with pressurised gas, and the risk of creating an aerosol of potentially infectious tissue particles must be borne in mind.

3.1.3 CARBON DIOXIDE - SOLID

This can be used in a bath of solvent, such as hexane, to achieve temperatures around -60°C. Safer than CO_2 gas, solid CO_2 (cardice) remains one of the most popular methods of freezing.

3.1.4 FREEZER PLATES

Some cryostats incorporate special cold plates for rapid freezing, covering the temperature range -45°C to -60°C. The OTF cryostat has a standard quick freezer plate that operates at approximately 10°C below chamber temperature.

3.2 FITTING THE SPECIMEN

For setting up tissue, proceed as follows:

a. Remove the frost elimination cover from the quick freezer plate.

b. Make sure that the object holder is above 0°C, if it is at room temperature that is fine and it just takes a little longer. It is important to note that embedding compound does not stick to a surface that is below 0°C.

c. Place a small amount of embedding compound on the top surface of the object holder and make sure that it covers all of it in order to get the maximum area for adhesion. Try to avoid spilling embedding compound over the side.

d. Place the object holder in one of the semi-circular recesses of the quick freezer plate so that the machined slot fits with the top of the object holder a few mm above the level of the plate. Alternatively, if the quick freezer plate has frosted over too much then object holders may be stood on the top of it.

3. Cutting & Collecting Sections Cont.

3.2 FITTING THE SPECIMEN CONT.

e. Before the embedding compound starts to freeze place the tissue in the correct orientation, holding it with a pair of forceps. Take care that the forceps do not freeze to your tissue. If your tissue is fresh you will see the freezing isotherm gradually rise through the tissue, as a white line.

f. Remove the object holder from the quick freezer and place it in the V block or cryomatic block and tighten the screw firmly to hold it in position. Wait a few minutes for temperatures to equalise before trimming.

It is often best to set up a new blade, knife or anti-roll plate using some embedding compound first. Proceed as follows:

a. Follow steps 1 to 4 above.

b. Watch the embedding compound and suddenly it will be seen to freeze as it turns from transparent to a dense white colour.

Watch the freezing isotherm until just before it reaches the top surface of the embedding compound and while it is still liquid, carefully apply some more embedding compound until it forms a mound on the top. Then let it continue to freeze until it is completely solid.

c. Remove the object holder from the quick freezer and place it in the microtome.

NOTE 1: If you are unlucky enough to have your object holder freeze solidly into ice on the quick freezer plate, a little 90% ethanol solution around the base or neck of the chuck will act as an antifreeze to release it. Be careful if you do this because the ethanol will also lower the melting point of your specimen.

NOTE 2: If you are using pre-frozen tissue then it will be much colder than its optimum cutting temperature and therefore plenty of time must be allowed for temperature to equalise in the specimen before cutting.

NOTE 3: It is important that after use the frost elimination cover should be replaced on the quick freezer plate.

3. Cutting & Collecting Sections Cont.

3.3 TRIMMING THE SPECIMEN

a. Fit a sharp knife in position. Allow the knife to equilibrate to chamber temperature.

b. Lock the handwheel with the specimen holder in the top position.

c. Fit the specimen into the microtome.

d. Release the knife block clamp locking lever and turn the coarse advance control to bring the knife towards the specimen.

e. Either rotate or rock the handwheel while using the knife carriage feed control or use the section thickness mechanism (at 10-20µm) and rotate the handwheel to trim the tissue.

NB: If rocking the handwheel, ensure trimming is done on the downstroke (handwheel knob in 1 o'clock round to 5 o'clock position). Trimming on the upward (retraction) stroke will result in a subsequent very thick section and may damage the specimen.

3.4 SECTION CUTTING AND COLLECTION

a. After trimming, lock the knife block clamp locking lever firmly downwards. Set the section thickness control to the desired position.

b. It may be necessary to cut a few sections off first to clear trimming marks.

c. Once sections are seen to be cut, place the anti-roll plate against the knife and proceed to cut sections. if adjustments to the anti-roll plate are required, see section 2.3.3.

d. To collect sections, have a clean microscope slide ready at ambient temperature. Bring the slide towards the knife, swing the anti-roll plate out of the way, and move the slide very close to the section(s). The section(s) should jump across the gap and stick to the slide.

NB: Keep the knife clear of debris and frost by brushing upwards with the knife cleaning brush. Never brush along or down the knife, always brush upwards.

- Beware of debris build-up on the back of the knife.
- Cut with a slow, steady movement.
- Sometimes, especially with soft tissue such as brain, the best results can be obtained with a very slow approach to the knife and then accelerating through the cut.

3.5 HINTS ON SECTIONING

a. Always start by turning the hand wheel slowly to cut the first sections. Later it may be found that the best sections are obtained by varying the speed of cut.

b. Don't trim too thickly as it might damage the tissue internally.

c. If the anti-roll plate seems to be giving problems, first make sure that you can cut good sections of embedding compound without the anti-roll plate by teasing off sections using a fine brush.

3. Cutting & Collecting Sections Cont.

3.5 HINTS ON SECTIONING CONT.

d. Make sure that the knife and the anti-roll plate are suitably cold. It can often help to use a short blast of Cryospray 134 if this is in doubt. If Cryospray 134 is used, make sure that there is not an accumulation of rime present on the underside and leading edge of the anti-roll plate. Care must be taken when using Cryospray 134. The risk of creating an aerosol of potentially infectious tissue particles must be borne in mind.

e. If the section is skewing, this is a sign that the anti-roll plate is not parallel to the edge of the knife. Remember also that the angle of the underside of the anti-roll plate must be parallel to the facet of the knife (but just a little larger for the best results). If the angle is too large, then the section will curl. If the angle is too small, then the section will crumple.

f. If there is any doubt that the temperature of the microtome or cryostat chamber is not at the right temperature, be patient and wait for a while until the temperatures equalise.

g. For other problems follow the advice in section 3.6 below.

3.6 FROZEN SECTIONING: A PROBLEM SOLVING GUIDE

Cutting good frozen sections requires skill and practice, and some tissues are particularly difficult. In all cases the quality of the result depends on a number of factors.

The notes which follow deal with the more commonly encountered difficulties, and suggest a systematic approach to problem solving.

3.6.1 SOLUTION CHECKLIST

First check all the basic factors:

Specimen

- Was it frozen badly?
- Has it equilibrated to chamber temperature?
- Has it become loose on the specimen holder?
- Is the specimen holder tightly clamped?
- Is the orientation lever locked? (Orientating head microtomes only)
- Has the specimen dehydrated?

Knife

- Has it become dull?
- Is it nicked or chipped?
- Is the knife tilt angle incorrect?
- Is the knife loose?
- Is there a build-up of frost or debris on the knife?

Anti-Roll Plate

- Is it set too high/low?
- Is the angle to the knife too wide/narrow?
- Is it parallel to the knife?
- Is it frosted/too warm?
- Is it damaged?.

General Factors

- Is the chamber temperature appropriate to the specimen (or specimen temperature control, where fitted)?
- Is the cutting motion too fast/slow/uneven?
- Has the microtome reached the end of its travel?
- Is the section thickness setting appropriate?

3. Cutting & Collecting Sections Cont.

3.6.2 SPECIFIC PROBLEMS

Thick/thin sections, intermittent failure to cut:

Specimen
- Knife not sharp enough
- Knife tilt angle too high/low
- Clamping screws too loose
- Specimen loose on holder
- Cutting temperatures too warm/cold
- Anti-roll plate adjusted too high
- Tissue expansion due to block warming up

Sections crumbling or not forming:
- Freezing technique too slow
- Cutting temperatures too warm/cold
- Specimen not equilibrated to chamber temperature
- Specimen dehydrated
- Knife not sharp enough
- Cutting motion too fast or uneven
- Knife tilt angle too high/low

Excessive compression of sections:
- Knife not sharp enough
- Knife tilt angle too high
- Knife surfaces frosted or debris built up
- Anti-roll plate frosted, too warm or incorrectly adjusted
- Freezing technique too slow
- Cutting temperature too warm

Uneven thickness across section:
- clamping screws too loose
- specimen loose in holder
- specimen was not trimmed correctly
- knife not sharp enough
- knife edge too thin
- cutting motion uneven

Vertical score marks on sections:
- Knife edge nicked or chipped
- Knife faces have built up debris or frost
- Anti-roll plate edge damaged
- Anti-roll plate surface has debris or frost built up
- Tissue contains hard, fine particles (e.g. bone fragments)

NB: When removing frost and debris always brush up the knife, never down or along.

Sections curl over anti-roll plate:
- Anti-roll plate too low

Section curl under anti-roll plate:
- Anti-roll plate at too large an angle to knife

Sections curl under and stick to anti-roll plate:
- Anti-roll plate too warm, greasy

Sections curl after lifting anti-roll plate:
- Anti-roll plate at too large an angle to knife
- Movement too quick
- Delay in collecting sections
- Static electricity present

Sections fail to flatten and pass down knife:
- Anti-roll plate too warm, greasy or misaligned
- Knife surface has built up frost or debris or is too warm

NB: To remove static electricity use an anti-static brush or gun. The main area of static electricity build-up is on the anti-roll plate.

3. Cutting & Collecting Sections Cont.

3.7 CUTTING TEMPERATURES

Standard textbooks on histological technique give tables of recommended cutting temperatures for different tissues. However, in most cases, the following guidelines will prove adequate.

3.7.1 FRESH UNFIXED TISSUE

Most soft tissues will cut at -18°C to -20°C. Fatty tissue, such as breast lumps, will need lower temperatures, -25°C or colder. Brain and spinal cord cut best at warmer temperatures, e.g. minus 12°C. Below is a table extracted from IMVS Division of Pathology, The Queen Elizabeth Hospital.

Sectioning temperature guidelines for fresh unfixed tissue:
(Add 5°C to 10°C for fixed tissue.)

Tissue Type:	Temp. (°C.)
Uterine curettings	-7
Brain	-10
Liver	-10
Spleen	-10
Testis	-10
Thyroid	-10
Lip	-13
Lymph Node	-15
Kidney	-15
Lung	-16
Muscle	-16
Connective Tissue	-16
Skin	-16
Heart	-18
Pancreas	-20
Uterus	-20
Cervix	-20
Ovary	-20
Prostate	-20
Gut	-20
Bone Marrow	-20
Skin with fat	-25
Breast	-30
Omentum	-35

3.7.2 FIXED TISSUE

Differences between tissues are much reduced after fixation. Cutting temperatures around -10°C to -15°C are recommended, but some experimenting may be required. Ensure fixative is rinsed off tissue before freezing.

4. Care & Maintenance

4.1 DAILY CARE

Routine daily care consists of removing sectioning debris from the working area and brushing debris & frost from the knife.

4.2 AUTOMATIC DEFROST CYCLE

Refer to section 2.1.11. The function of the automatic defrost cycle is to clear the evaporator cooling fins of frost but without allowing the chamber or microtome temperature to rise above 0°C. This ensures efficient refrigeration.

4.3 TOTAL DEFROSTING

It will be necessary to periodically defrost the entire cryostat to carry out cleaning and/or other procedures. The frequency of this total defrosting will depend on how heavily the cryostat is used; it may be as often as daily but is commonly once a month.

To initiate a total defrost:

a. Place a suitable container under the drain tube.

b. Turn off the cryostat.

> **IMPORTANT:** If decontamination of the cryostat is required carry out the standard procedures as practised in your laboratory at this point. Refer to section 4.8 for further details. Anti-roll plate.

c. Remove the microtome knife (refer to section 2.3.2) and clean it (see section 4.4).

d. Remove the microtome from the chamber, the reverse of the installation procedure (see section 1.2.5). Remove drain plug from base of chamber.

e. Place the microtome on the laboratory bench and clean it. Refit the rewind knob and rewind the feed mechanism until the pointer is at the bottom on the indicator. Undo the two knurled screws on the specimen arm and lift off the upper debris screen. Now remove the two small screws which hold the microtome cover, using the Allen key provided. The cover can now be lifted off. Allow the microtome to warm up completely and dry it off carefully.

f. The chamber interior can now be cleaned once it has thawed. Replace the drain plug.

g. Once the chamber and microtome have been cleaned and dried off, apply a little low temperature oil to the threads of the knife clamp screws and feed screw, replace the cover and re-install in the chamber (see section 1.2.5).

Make sure that the inside of the cryostat is perfectly dry before switching the refrigeration on. Use a hair dryer if necessary. Note that the microtome requires no other routine maintenance.

4. Care & Maintenance Cont.

4.4 MICROTOME KNIVES

Great care must be exercised when handling knives:

• Knives must be stored in their boxes when not in use

• Knives fitted to the microtome must be properly guarded

• Particular care must be taken during cleaning and knife sharpening

Conventional microtome knives are usually made from carbon steel and will corrode in moist conditions.

Whenever the cryostat chamber is allowed to warm up above freezing point (e.g. during a full defrost) the knife should be removed, warmed up, cleaned and/or decontaminated, oiled and then stored in its box in a dry place.

The Bright 50230 cryostat knife normally supplied with the cryostat can be sharpened on a conventional knife sharpening machine. Alternatively, Bright Instrument Co Ltd offer a knife sharpening service.

4.5 OPERATING IN EXTREME CONDITIONS

The refrigeration system used in Bright cryostats is highly efficient and will cope well with high ambient temperatures. However, where conditions of high humidity exist, it may be necessary to adjust the automatic defrost cycle in order to ensure that the evaporator cooling fins remain frost free.

It is recommended that additional defrost cycles are initiated (refer to section 2.1.11).

Do not exceed the defrost cycle time beyond thirty minutes as this could cause the entire chamber to warm up above 0°C.

4.6 SERVICING AND REPAIRS

In the event of a breakdown a qualified person should be called.

If a service visit is required, the cryostat should be defrosted, decontaminated (refer to section 4.8), cleaned thoroughly and left switched off in preparation for that visit, unless otherwise advised by the engineer. Please remember that the cleaning procedure should also include removing the microtome and cleaning underneath where it sits in the chamber - the microtome should be left out of the chamber until the arrival of the engineer. Failure to carry out this action will result in the service visit being cancelled and could incur further call-out charges. A completed decontamination certificate must be left with the cryostat and work will not commence until the engineer has seen sight of that certificate (refer to details regarding decontamination certificates on the page marked Safety Information towards the front of this instruction manual).

4. Care & Maintenance Cont.

4.6 SERVICING AND REPAIRS CONT.

If the cryostat or any part of it is returned to the distributor or manufacturer, it must be decontaminated (refer to section 4.8) and cleaned thoroughly. Please remember that the cleaning procedure should also include removing the microtome and cleaning underneath where it sits in the chamber. A completed decontamination certificate must be either sent in advance or attached to the outside of the packaging of the returned goods.

Work on the returned goods will not proceed until the decontamination certificate has been received (refer to details regarding decontamination certificates on the page marked Safety Information towards the front of this instruction manual). Should no decontamination certificate be received, or the cryostat or any part of it be received in a condition that Bright Instrument Co Ltd consider to be a potential biological hazard, the cryostat or part will be retuned, un-repaired, at the expense of the customer.

4.6.1 UK

For customers in the UK, Bright Instrument Co Ltd offer a comprehensive range of after sales services that include extended warranties and a full range of service contracts. For further information or for any refrigeration, electrical or mechanical problems contact Bright Instrument Co Ltd direct providing the following information:

- Cabinet Number (see ID plate on rear panel)
- Microtome Number (see ID plate on rear panel)
- Date of installation
- Nature of fault

4.6.2 REST OF THE WORLD

Refrigeration problems are likely to be rare and will normally be dealt with by a local refrigeration specialist. For electrical and mechanical problems contact your local distributor of Bright products providing the following information:

- Cabinet Number (see ID plate on rear panel)
- Microtome Number (see ID plate on rear panel)
- Date of installation
- Nature of fault

4.7 SIMPLE SERVICING/REPAIR PROCEDURES

All servicing must be carried out by a qualified engineer. Any replacement parts must be ordered from Bright Instrument Co Ltd - no liability can be accepted if non-Bright supplied parts are installed.

If there are any further problems contact your local distributor or Bright Instrument Co Ltd direct.

4.8 DECONTAMINATION

If decontamination is required carry out the standard procedures as practised in your laboratory. It is the responsibility of the customer to use a decontamination procedure appropriate to his/her work.

4. Care & Maintenance Cont.

4.8 DECONTAMINATION CONT.

The following decontamination method is as recommended in the 'Code of Practise for the Prevention of Infection in Clinical Laboratories and Post-mortem Rooms', ISBN 0 11 320464 7.

a. Bring the cryostat to room temperature.

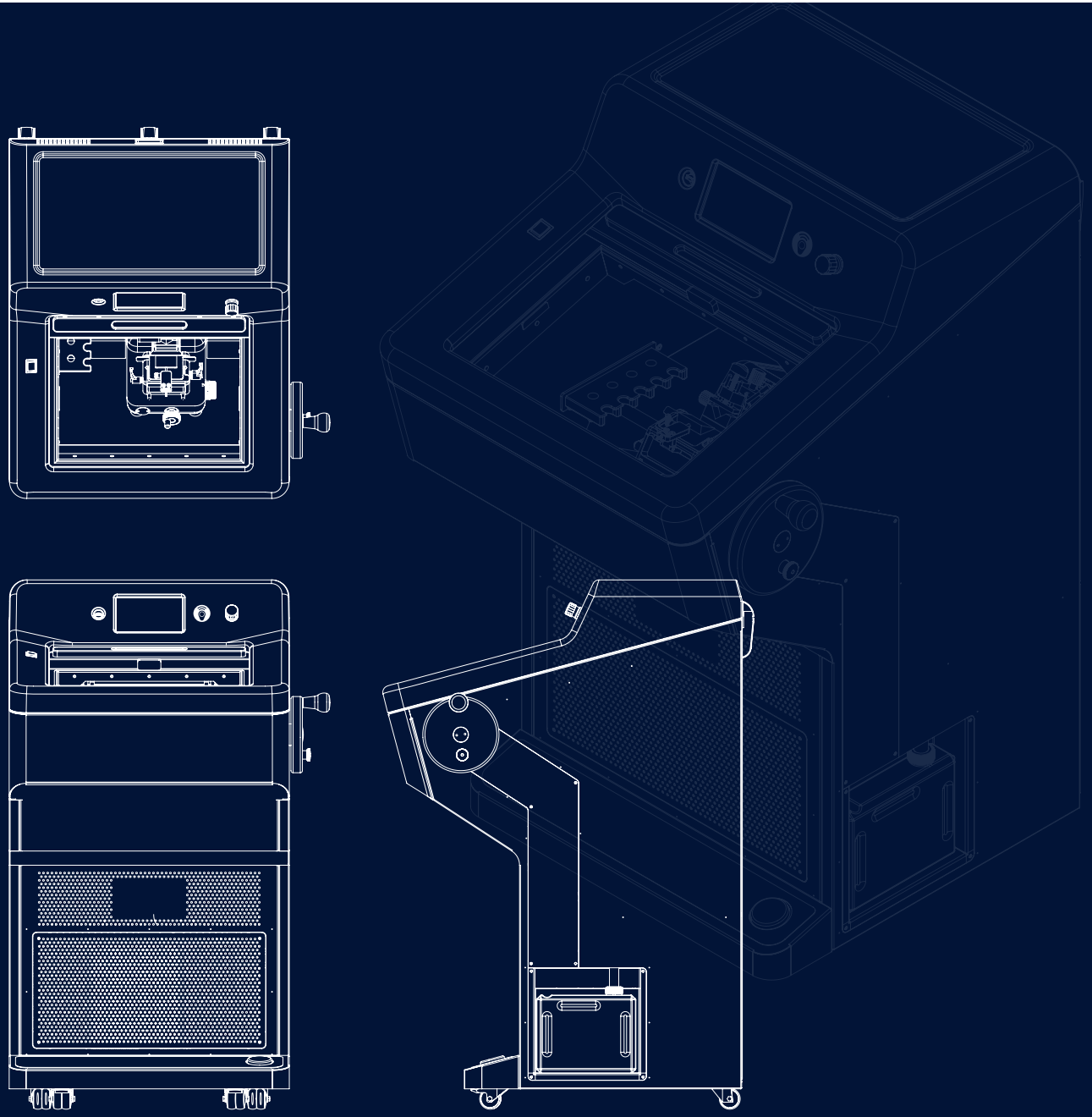
b. Place 50-100ml of formalin BP in a flat dish inside the chamber. Close the window.

c. Leave for at least 24 hours, preferably 48 hours.

d. Open the window and place a beaker containing 10ml of ammonia SG.880 in the chamber. Close the window.

e. Leave for one hour. The cryostat is now decontaminated.

For further information regarding alternative decontamination procedures please refer to 'Safe Working and the Prevention of Infection in Clinical Laboratories', ISBN 0 11 885446 1.



5.1 Cryostat Specification

Feature	Low Spec	Hi Spec
Powder Coated Welded Steel Chassis	Yes	Yes
Colour Touchscreen Display	Yes	Yes
Physical Specimen Advance/Rewind Switch	Yes	Yes
Manual Handwheel Drive	Yes	Yes
Motorised Handwheel Drive	No	Yes
Emergency Stop	No	Yes
Built In Footswitch	No	Yes
Refrigeration	-35 (Single Compressor)	-40 (Dual Compressor)
Quick Freeze Block	Yes	Yes
Anti Fog Window	Yes	Yes
Window Lock RFID Access	Yes	Yes
Built In Waste Collection Bottle	Yes	Yes
Heated Specimen Block	Yes	Yes
UV Decontamination	Yes	Yes
Refrigeration Alarm	Yes	Yes
Recent User Log Records	Yes	Yes

Dimensions H1300 x W890 x D900mm

Packing

Net weight (Manual): 146kg

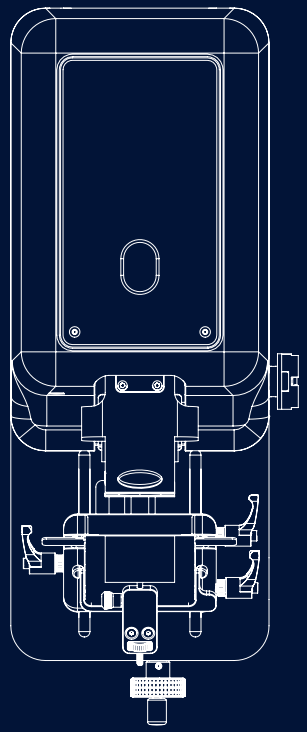
Gross weight (Manual): 186kg

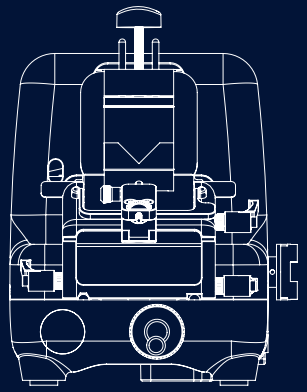
Packing dimensions:
H1540 x W900 x D1060mm

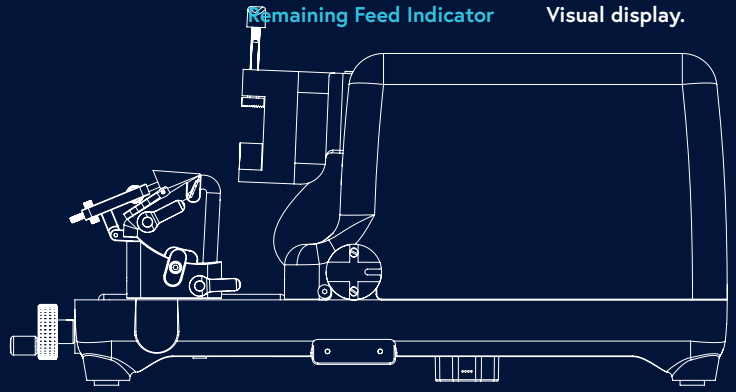
Shipping volume: 1.632m^3

Weights vary according to specification of instrument

5.2 5050 Microtome Specification







Construction	Rotary rocking design of cast alloys, with detergent and solvent resistant epoxy-polyester finish.
Section Thickness Range	1-60µm in 1µm steps.
Specimen Advance	5600µm (Total).
Knife Block Movement	44mm (Total).
Retraction	Approximately 50µm.
Cutting Stroke	56mm.
Specimen Orientation	None (Fixed Head). ± 8° horizontal and vertical (Orientating Head).
Maximum Specimen	Size 70mm x 50mm
Remaining Feed Indicator	Visual display.

Knife Holders	New interchangeable solid and QRFBH knifeblocks can take conventional steel knives; tungsten carbide tipped knives, glass knives and disposable blade holders. Sliding knife carriage with central lock. Alternatively, the quick release Feather blade holder is available as an optional feature either in addition to or in place of the standard knife holder block.
Motorised Section Cutting	(Hi Spec Only) With variable speed, variable cutting zone, single or continuous modes, hands off foot switch and emergency stop.
Safety Features	• Counter-balance handwheel with safety lock. • Built in knife guards. • Locking window. • Requires RFID tag or password to access the touch screen controls.
Dimensions	H300 x W300 x D500mm
Weight	Net weight (Manual): 20kg Gross weight (Manual): 25kg

Weights vary according to specification of instrument

Accessories

OTF6000 Cryostat

Order List 2021

PRODUCT	
Code	**Description**
OTF6000	Complete with: • Cryochamber - polished stainless steel construction • Quick freezer - 9 position, running at 10°C below chamber • Minimum chamber temperature: Single compressor -35°C • Shelves: 2 internal, 1 external (Top • Touch Screen with HMI • Evaporator defrost: Automatic • Cutting system: Manual with balanced handwheel • Microtome: 5050 rotary microtome with beryllium hinges • Section range: 1 to 60µm in 1µm increments • Maximum head advance: 5.6mm • Maximum knife block adjustment: 44mm (Coarse control) • Knife angle adjustment: 25° Solid Blad • Knife angle adjustment: 0-10° Feather Blad • Window surround: heated • Heated glass window • Built in UV decomtatination • Waste water bottle with level alarm • Surface fi nishes: easy clean, scratch and solvent resistant Standard accessories include: • 50230 Solid Knife or Feather Blad • Easi-set anti-roll plates (50mm) • Circular object holders (2 x 22mm, 1 x 37mm) • Set of Allen keys • Bottle of Cryo-M-Bed 113ml • Brush and debris tray • Debris brush • Instruction manual

PRODUCT

LOW SPECIFICATION **

OTF6000/LS-001 - 220V/240V AC, 50/60Hz Solid blade
OTF6000/LS-002 - 110/115V AC, 50/60Hz Solid blade
OTF6000/LS-003 for 220V/240V AC, 50/60Hz Quick Release Feather blade
OTF6000/LS-004 for 110/115V AC, 50/60Hz Quick Release Feather blade

Specification

- Powder Coated Welded Steel Chassis.
- Colour Touchscreen Display.
- Physical Specimen Advance Rewind Switch.
- Manual Handwheel Drive.
- Refrigeration:-35 °C (Single Compressor).
- Quick Freeze Block.
- Anti Fog Window.
- Window Lock RFID Access.
- Built in Waste Collection Bottle.
- Heated Specimen Block.
- UV Decontamination.
- Refrigeration Alarm.
- Recent User Log Records.

HIGH SPECIFICATION **

OTF6000/HS-001 for 220V/240V AC, 50/60Hz Solid blade
OTF6000/HS-002 for 110/115V AC, 50/60Hz Solid blade
OTF6000/HS-003 for 220V/240V AC, 50/60Hz Feather Blade
OTF6000/HS-004 for 110/115V AC, 50/60HzFeather Blade

***As above specification plus the below**

- Motorised Handwheel Drive.
- Emergency Stop.
- Built in Footswitch.
- Refrigeration: -40 °C (Dual Compressor)

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*Included in standard order | **Not included in overseas orders. VAT not included - E & OE

Bright Instruments

OTF6000 Cryostat

Order List 2021

EQUIPMENT OPTIONS

Code	Description	Low Spec	High Spec
/V	Footswitch for motor drive Leaves hands free to collect sections. (P/Nbr: 138026).	Optional	Standard

FEED SCREWS FOR / MAR OPTION

Code	Description
50255-1	0.5 - 30µm feed screw.
50257-1	1 - 60µm feed screw.
50258-1	2 - 120µm feed screw.

ORIENTATION

Code	Description
50539	Orientating head assembly. With fine object orientation +/-8° in horizontal and vertical axes, 360° rotation.
50627	Orientating head assembly. Without fine adjustment screws
51695	Universal head assembly for orientating object holders. Used on instruments without the factory fitted orientation system. This fits into the standard specimen clamp in place of the V-block and permits a range of orientating object holders to be used. NB Not compatible with /D cryomatic specimen temperature control.

OBJECT HOLDERS

Code	Description
50734-1*	Object holder, 22mm diameter, solid.
50734-2	Object holder, 22mm diameter, solid, as 50734-1 but long type.
50734-4	Object holder Brass 22 diameter.
50735-1*	Object holder, 37mm diameter, solid.
50735-2	Object holder, 37mm diameter, solid, as 50735-1 but long type.
50744	Object holder, 5mm diameter, solid.
50721	Object holder, 50mm diameter.
50741	Object holder, 50 x 50mm.
50743	Object holder, 50 x 70mm.
54229	Object Holder Stepped 16mm short.
50720	Orientating object holder, 22mm diameter, for use with item 51695.
50719	Orientating object holder, 37mm diameter, for use with item 51695.
50718	Orientating object holder, 50mm diameter, for use with item 51695.
50712	Orientating object holder, 50 x 50mm, for use with item 51695.
50745	Orientating object holder, 5mm diameter, for use with item 51695.
50221	Quick release object holder clamp, complete with 50 metal object discs.
50727	Hollow object holde 22mm.
50690	Metal object holder discs, 22mm, pack of 50.
50204	Cork object holder discs, 22mm, pack of 50.
50204-1	Cork object holder discs, 50 x 50mm, pack of 50.
54168	Prostate Cryomould Former L22 x W6 x D4mm
54170	Quick release object holder strip clamp, complete with 10 of part number 54171
52658	Vertical vice clamp.
52632	Vertical vice clamp, 45°.

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OTF6000 Cryostat

Order List 2021

KNIVES & BLADES

Code	Description
50241	Pack of 50 disposable Feather blades
50232-1	Hardened steel knife with box C-profile, 160 x 35 x 9mm 15° angle suitable for large area sections.
50207	Hardened steel knife with box C-profile, 160 x 32 x 13mm 23° angle suitable for large area sections.
50230*	Standard knife with box C-profile 189 x 27 x 10mm 22° angle tapped to accept holder for Shandon knife sharpener, safety cut-outs at each end B1009DR.
50234	Tungsten carbide tipped knife with box, 228 x 38 x 6mm. Suitable for cutting bone and hard plastics.NB Needs to be resharpened at our factory.

ANTI-ROLL PLATES

Code	Description
52485*	Easi-Set anti roll plate 50mm.

ANCILLARY ITEMS

Code	Description
57808	Anti static brush 12mm.
57344*	Knife cleaning brush.
53581	Bright Cryo- M-Bed 120ml carton of 6 bottles.
53581-1*	Bright Cryo-M-Bed 120ml bottle.
57713-1*	Bright Cryospray 134 300ml areosol can.
57713	Bright Cryospray 134 300ml areosol can, carton of 12 cans.

ANCILLARY ITEMS CONT.

Code	Description
57491*	Low temperature oil, 200ml bottle.
57491-1	Low temperature oil, 4.54 litre bottle.
56561	Suction cups for 50138, pack of 12.
56560	Rubber teats for 50138 pack of 12.
57151/2/3	Allen keys, set of three.
52518*	Brush and debris tray.
139301-01	LED light tube. (Must be ordered with 139301-02.)
139301-02	LED light tube power supply.
52284*	Frost elimination cover.
50530	Hand wheel trigger spring.
51895*	Large storage tray, left hand.
51896*	Large storage tray, right hand.
50029	Long shelf.
52439	Pawl.
50414	Pawl Spring.
50277	Ratchet Wheel.
52591	Ratchet Wheel (/MAR).
52518-1	5030 Tray.

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Valid from 1 January 2019

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Material Safety Data Sheets

Cryo-M-Bed 53581

MATERIAL SAFETY DATA SHEET

1. Cryo-M-Bed 53581 Product Information	
Trade/Type:	Embedding Compound.
Container:	Disposable plastic bottles.
Uses:	Embedding compound for frozen tissue specimens.
Description:	Colourless viscous liquid.

2. Cryo-M-Bed 53581 Product Information		
Information on Ingredients:	Blend of polyviol alcohol 217, thymol and water.	
Physical and Chemical Properties:	Colourless viscous liquid.	
Stability and Reactivity:	May react with oxidising materials.	
Toxicological Information:	No harmful effects if handled correctly. May give off toxic fumes in the case of fire.	
Ecological Information:	Degradable, miscible in all proportions.	
Transport Information:	No restrictions.	
Hazards Identification:	Skin:	Can cause skin irritation.
	Respiratory:	May cause difficulty in breathing if exposed to very high concentration.
	Ingest:	May be harmful by ingestion.
	Eyes:	Can cause Eye irritation.
First Aid Procedures:	Skin:	Wash thoroughly, with soap and water.
	Respiratory:	Move to fresh air.
	Ingest:	Rinse mouth out with water, in sever cases seek medical attention.
	Eyes:	Flush copiously for at least 15 minutes.
Fire Fighting Measures:	Hazards:	May cause toxic fumes.
	Equipment:	Water spray, foam, dry powder, CO_2.
Disposal Considerations:	Bag and dispose of waste in accordance with local authority requirements.	
Handling Storage:	No special requirements.	
Regulatory Information:	None.	
Accidental Release Measures:	Absorb spillage on an inert absorbent, bag and arrange disposal. Wash area in water and detergent.	
Exposure Controls:	Skin:	Avoid contact.
	Respiratory:	Avoid very high concentrations.
	Ingest:	Do not eat, drink or smoke.
	Eyes:	Goggles should be worn.
	OES:	Not assigned (long term, 8 hour TWA).

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Cryospray 1234ze

MATERIAL SAFETY DATA SHEET

1. Cryospray 1234ze Product Information

Trade/Type:	Bright Cryospray 1234ze Freezing Agent.
Container:	Aerosol.
Uses:	Rapid Freezing of tissue specimens to –52°C.
Description:	Gases under pressure, Liquefied gas.

2. Hazards Identification

Classification of the substance or mixture:	Classification according to Regulation (EC) No 1272/2008/EC (CLP/GHS):	Gases under pressure, Liquefied gas H280 Contains gas under pressure; may explode if heated.	
Label Elements:	Labelling Pictograms:		
	Signal Word:	Warning	
	Hazard Statements:	H280:	Contains gas under pressure; may explode if heated.
	Precautionary Statements:	P281:	Use personal protective equipment as required.
		P260:	Do not breathe dust/fumes/gas/mist/ vapours/spray.
		P308 + P313:	If exposed or concerned: Get medical advice/attention.
		P410 + P403:	Protect from sunlight. Store in a well-ventilated place.
	Potential Health Effects:	Skin:	Rapid evaporation of the liquid may cause frostbite.
		Eyes:	May irritate eyes.
		Ingestion:	Unlikely route of exposure.
		Inhalation:	Inhalation may cause central nervous system effects. Vapours may cause dizziness and drowsiness.
		Chronic:	None known.
		General:	Warning. Container under pressure.
	Potential Environmental Effects:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.	

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Cryospray 1234ze

MATERIAL SAFETY DATA SHEET

3. Composition / Information on ingredients

Substance or mixture:	**CAS number:**	29118-24-9
	EC Number (from EINECS):	471-480-0

4. First Aid Measures

General advice:	Show this safety data sheet to the doctor in attendance. Keep warm and in a quiet place.
Inhalation:	If inhaled, move to fresh air. Seek medical attention if irritation develops and persists.
Skin contact:	Rapid evaporation of the liquid may cause frostbite. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Call a physician if irritation develops or persists.
Eye contact:	If eye irritation persists, consult a specialist.

5. Fire-fighting measures

Extinguishing media:	Show this safety data sheet to the doctor in attendance. Keep warm and in a quiet place.
Special hazards arising from the substance or mixture:	If inhaled, move to fresh air. Seek medical attention if irritation develops and persists.
Advice for fire fighters:	**Special protective equipment** Rapid evaporation of the liquid may cause frostbite. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Call a physician if irritation develops or persists.
	Further information In the event of fire, cool tanks with water spray.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:	Provide adequate ventilation. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Avoid skin contact with leaking liquid (danger of frostbite). Use personal protective equipment. Keep people away from and upwind of spill/leak.
Environmental precautions:	Prevent further leakage or spillage if safe to do so. The product evaporates readily. Prevent spreading over a wide area e.g. by containment or oil barriers.
Methods for cleaning up:	Do not direct water spray at the point of leakage. Allow to evaporate.

7. Handling and Storage

Advice for safe handling:	Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C. Do not pierce or burn, even after use. Do not burn. Exhaust ventilation at the object is necessary.
Advice on protection against fire and explosion:	Do not spray on a naked flame or any incandescent material. Keep away from direct sunlight. Fire or intense heat may cause violent rupture of packages. Vapours may form explosive mixtures with air. The product is not easily combustible.
Hygiene measures:	Avoid breathing vapours, mist or gas. Keep working clothes separately. Do not smoke.
Further information on storage conditions:	Keep containers tightly closed in a cool, well-ventilated place. Keep only in the original container at temperatures not exceeding 50°C. Keep away from direct sunlight.
Advice on common storage:	Do not store together with Oxidising agents.

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8. Exposure controls / personal protection

Occupational exposure limits:	**Components:**	Trans-1,3,3,3-Tetrafluoroprop-1-ene		
	Basis:	Honeywell	**Exceeding factor:**	N/A
	Value type:	Time weighted average	**Form of exposure:**	N/A
	Control parameters:	800 ppm	**Remarks:**	We are not aware of any national exposure limit.
Occupational exposure controls:	The Personal Protective Equipment must be in accordance with EN standards: respirator EN 136, 140, 149; safety glasses EN 166; protective suit EN 340,463, 468, 943-1, 943-2; gloves EN 374; safety shoes EN-ISO 20345. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Avoid inhalation of vapour or mist.			
Environmental exposure controls:	Avoid breathing vapours, mist or gas. Keep working clothes separately. Do not smoke.			
Engineering measures:	Keep containers tightly closed in a cool, well-ventilated place. Keep only in the original container at temperatures not exceeding 50°C. Keep away from direct sunlight.			
Personal protective equipment:	**Respiratory protection:**	Remarks: In case of insufficient ventilation, wear suitable respiratory equipment. Wear a positive-pressure supplied-air respirator.		
	Hand protection:	Glove material: Vitron (R). Heat insulating gloves.		
	Eye protection:	Goggles.		
	Skin and body protection:	Wear suitable protective equipment. Protective footwear.		

9. Physical and Chemical Properties

Form:	Liquefied gas.
Appearance/colour:	Colourless.
Odour:	Slight, ether-like.
Boiling point:	-19°C.
Flash point:	Does not flash.
Auto-ignition temperature:	368°C.
Lower explosion limit:	No LEL and UEL was assigned at standard testing conditions, 20°C. Exhibits flame limits at temperatures in excess of 28°C.
Upper explosion limit:	No LEL and UEL was assigned at standard testing conditions, 20°C. Exhibits flame limits at temperatures in excess of 28°C.
Vapour pressure:	4.271 hPa at 20°C.
Vapour pressure:	11.152 hPa at 54.4°C.
Density:	1.17 g/cm^3 at 21.1°C.
Ph:	Neutral.
Solubility in water:	0,373 g/l.
Partition coefficient (n-octanol/water):	log Pow 1.6.
Relative vapour density:	4 (Air = 1.0).

10. Stability and Reactivity

Conditions to avoid:	Some risk may be expected of corrosive and toxic decomposition products. Avoid heat, flames and sparks.
Materials to avoid:	Reactions with alkali metals.
Hazardous decomposition products:	Pyrolysis products containing fluoride. Fluorocarbons. Hydrogen fluoride.
Stability and reactivity:	Stable under normal conditions. Hazardous decomposition products formed under fire conditions. To avoid thermal decomposition, do not over heat.

11. Toxicological Information

Acute oral toxicity:	Not applicable.
Acute dermal toxicity:	No data available.
Acute inhalation toxicity:	LC50/rat, value: >207000 ppm, >965 mg/l. Exposure time: 4 h.
Skin irritation:	Species: rabbit, result: no skin irritation. Method: OECD Test guideline 404.
Eye irritation:	No data available.
Sensitisation:	Species: human, classification: non-sensitizing.
Further information:	Not mutagenic in Ames Test. May cause headache and dizziness. No experimental indications on genotoxicity in vivo found. Detailed toxicological data and examinations, exceeding the data set in the MSDS are available for professional users on request.

12. Ecological Information

Persistence and degradability

Biodegradability:	Aerobic. Result: Not readily biodegradable.

Ecotoxicity effects:

Effects:		**Species:**	**Value:**	**Exposure time:**	**Comments:**
Toxicity to fish.	NOEC	Cyprinus Carpio (Carp)	>117 mg/l	96 h	
Toxicity to aquatic plants.	NOEC	Algae	>170 mg/l	96 h	Growth inhibition
Acute toxicity to aquatic invertebrates.	EC50	Daphnia magna (Water Flea)	>160 mg/l	96 h	

13. Disposal Considerations

Product:	Dispose according to legal requirements. Contact manufacturer.
Packaging:	Legal requirements are to be considered in regard of reuse or disposal of used packaging materials.
Further information:	Provisions relating to waste: EC Directive 2006/12/EC; 91/689/EEC Regulation No. 1013/2006.

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14. Transport Information

ADR/RID:	**Class:**	2.
	Classification code:	2A.
	Un number:	3163.
	Hazard labels:	2.2.
	Proper shipping name:	Liquified Gas, N.O.S. (Trans-1,3,3,3-Tetrafluoroprop-1-ene).
	Hazard number:	20.
	Environmentally hazardous:	No.
IATA:	**Class:**	2.2.
	Un number:	3163.
	Hazard labels:	2.2.
	Proper shipping name:	Liquified Gas, N.O.S. (Trans-1,3,3,3-Tetrafluoroprop-1-ene).
IMDG:	**Class**	2.2
	Un number	3163
	Hazard labels	2.2
	Proper shipping name	Liquified Gas, N.O.S. (Trans-1,3,3,3-Tetrafluoroprop-1-ene)
	Ems number	F-C,S-V
	Marine pollutant	No

15. Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture.

Other inventory information:

Country	Legislation	Information
US	Toxic Substances Control Act.	On TSCA inventory.
Australia	Industrial Chemical (Notification & Assessment) Act.	Not in compliance with inventory.
Canada	Canadian Environmental Protection Act (CEPA).	Not in compliance with inventory.
	Domestic Substances List (DSL).	
Japan	Kashin-Hou Law List.	On the inventory or in compliance with the inventory.
Korea	Existing Chemicals Inventory (KECI).	Not in compliance with inventory.
Philippines	The Toxic Substances and Hazardous and Nuclear Waste Control Act.	Not in compliance with inventory.
China	Inventory of Existing Chemical Substances.	On the inventory or in compliance with the inventory.
New Zealand	Inventory of Chemicals (NZIoC), as published by ERMA New Zealand.	Not in compliance with inventory.

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16. Other Information

Abbreviations:	**EC:**	European Community.
	CAS:	Chemical Abstract Service.
	WEL:	Workplace Exposure Limit.
	MAK:	Maximale Arbeitsplatz-Konzentration.
	AGW:	Arbeitsplatzgrenzwert.
	STEL:	Short Term Exposure Limit.

Other inventory information:

When using this document care should be taken as the decimal sign and its position complies with rules for the structure and drafting of international standards and is a comma on the line. As an example 2,000 is two (to three decimal places) and not two thousand, whilst 1.000 is one thousand and not one (to three decimal places).

This data sheet contains changes from the previous version, CLP03 dated January 2018. Sections 1 and 9 have been updated.

This datasheet was prepared in accordance with Regulation (EC) No. 1907/2006.

Information given is, to the best of the Company's knowledge and belief, accurate and reliable. However, no warranty, guarantee or representation is made to it's accuracy, reliability of completeness. An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

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Bright Instruments

Low Temperature Oil 57491

MATERIAL SAFETY DATA SHEET

1. Low Temp Oil 57491 Product Information	
Trade/Type:	Clavus Oil 15.
Container:	Plastic Bottle.
Uses:	For lubrication of microtomes and remote control spindles.
Description:	Low Temperature Oil.

2. Low Temp Oil 57491 Product Information		
Information on ingredients:	Mineral oil	
Physical and chemical properties:	Form:	Liquid
	Density:	@15°C, Kg/1 0.878
	Odour:	Mineral oil odour
	Colour:	Pale amber
	Flashpoint:	153°C (IP 34PM closed cup)
Stability and reactivity:	Stable:	Yes
	Conditions to avoid:	Extreme temperatures store between 0 – 50°C
	Materials to avoid:	Strong oxidising agents
	Hazardous Decomposition/Combustion Products: Dependant of conditions bringing about decomposition the following substance may be expected from normal combustion: carbon dioxide – polyeyelic Aromatic Hydrocarbons, carbon monoxide – Unburnt hydrocarbons, water – unidentified organic and inorganic compounds, particulate matter – nitrogen oxides.	
Ecological information:	Soil:	Will biodegrade
	Water:	Will not evaporate or dissolve
	Air:	Nil
	DO NOT allow to enter drainage systems, rivers or waterways.	

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2. Low Temp Oil 57491 Product Information (Cont.)		
Hazards identification:	Skin:	Unlikely to irritate on brief or occasional exposure.
	Respiratory:	Low volatility make inhalation unlikely at ambient temperatures.
	Ingest:	Possible aspiration into the lungs with possible resultant chemically induced neumonia.
	Eyes:	May cause transient irritation.
First aid procedures:	Skin:	Wash thoroughly, with soap and water..
	Respiratory:	Remove from exposure.
	Ingest:	DO NOT induce vomiting. Wash out mouth with water. SEEK MEDICAL ATTENTION URGENTLY.
	Eyes:	Flush copiously for at least 15 minutes. If irritation persists SEEK MEDICAL ADVICE.
Fire fighting measures:	Extinguish fires with foam, dry powder, CO2 or water fog - do not use water jets.	
Toxicological information:	This product is NOT classified as dangerous for supply or conveyance.	
Accidental release measures:	Let spillages evaporate and ventilate area well.	
Disposal considerations:	Dispose waste in accordance with local authority requirements.	
Handling storage:	No special requirements. Store away from direct heat and avoid extremes of temperature. DO NOT leave container unsealed.	
Transport information:	Not classified as dangerous to transport.	
Exposure controls:	5mg/m3 (8hour TWA) and 10mg/m£ (15 minute reference period) (Ref: EH40/1999).	
Regulatory information:	This product is a preparation and is NOT classified according to EEC Guideline.	

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References & Drawings

Figure 1. OTF6000 Cabinet

1. Advance/Rewind Switch
2. Automatic Demist Window
3. USB
4. Storage
5. Touchscreen
6. RFID Key Fob Scanning
7. Emergency Stop (High Spec Models Only)
8. Handwheel
9. Waste Liquid Collection
10. Foot Switch (High Spec Models Only)

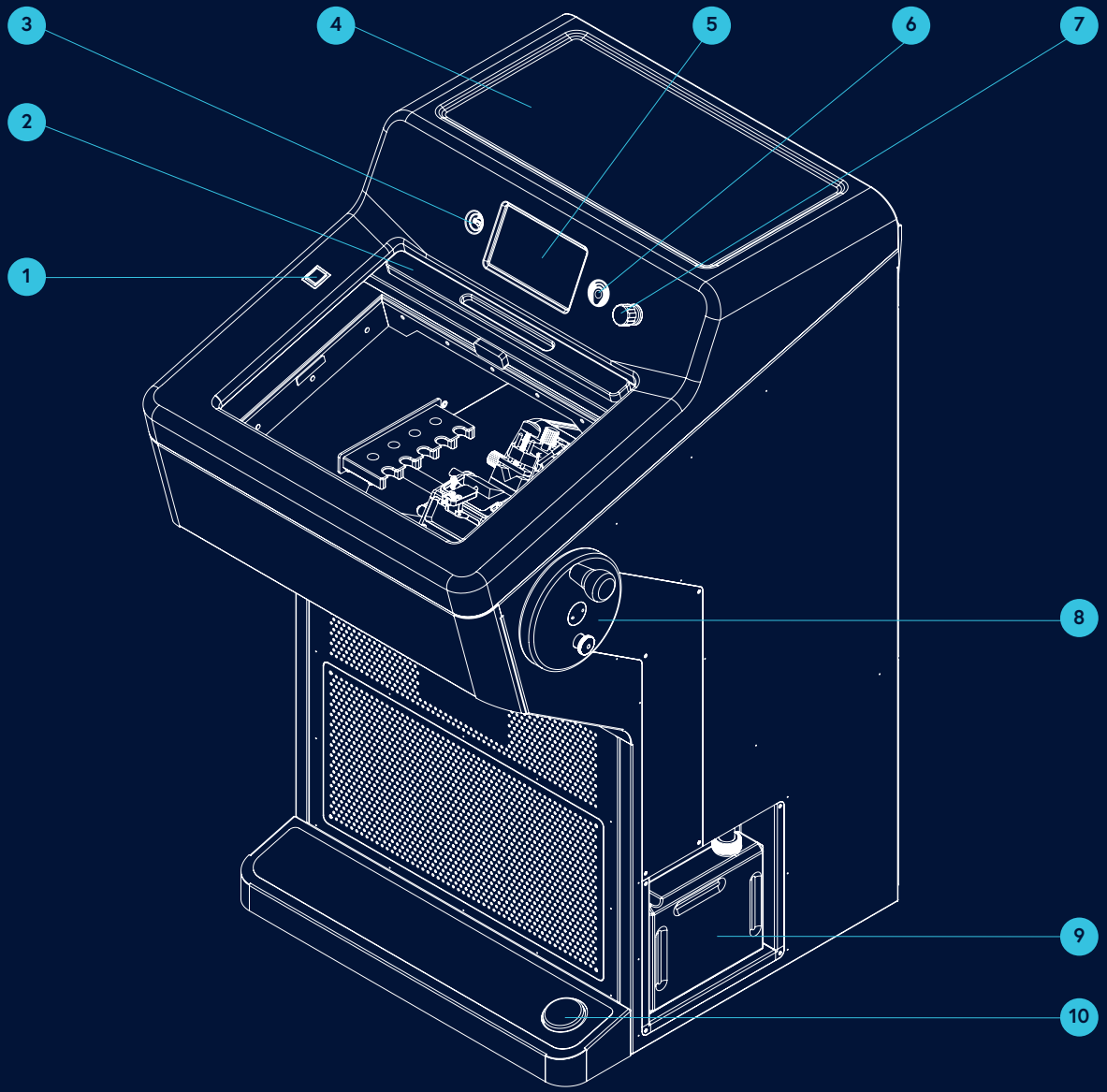


Figure 2. 5050 Microtome Solid Knife

1. Blade Angle Locking Lever
2. Anti-Roll Adjustment Knob
3. Anti-Roll Adjustment Lock
4. Anti-Roll Angle Adjustment Bracket
5. Anti-Roll Angle Adjustment Knob
6. Feed Indicator
7. Knife Guard
8. Manual Advance/Rewind Plug
9. Anti-Roll plate
10. Solid Knife
11. Knife Locking Knob
12. Knife Block Clamp Locking Lever
13. Section Thickness Control
14. Coarse Advance Control

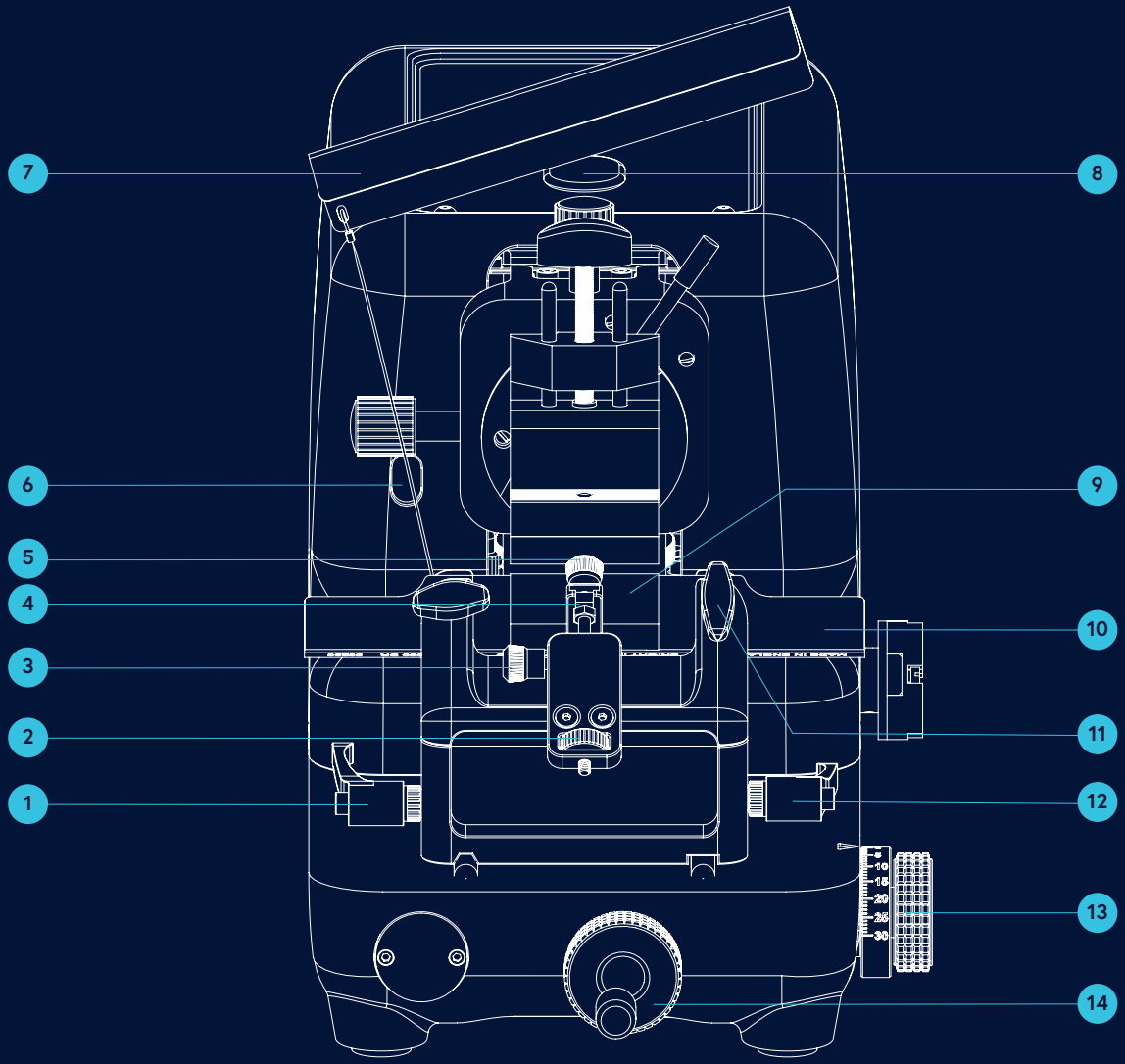


Figure 3. 5050 Microtome Solid Knife Anti-Roll Assembly

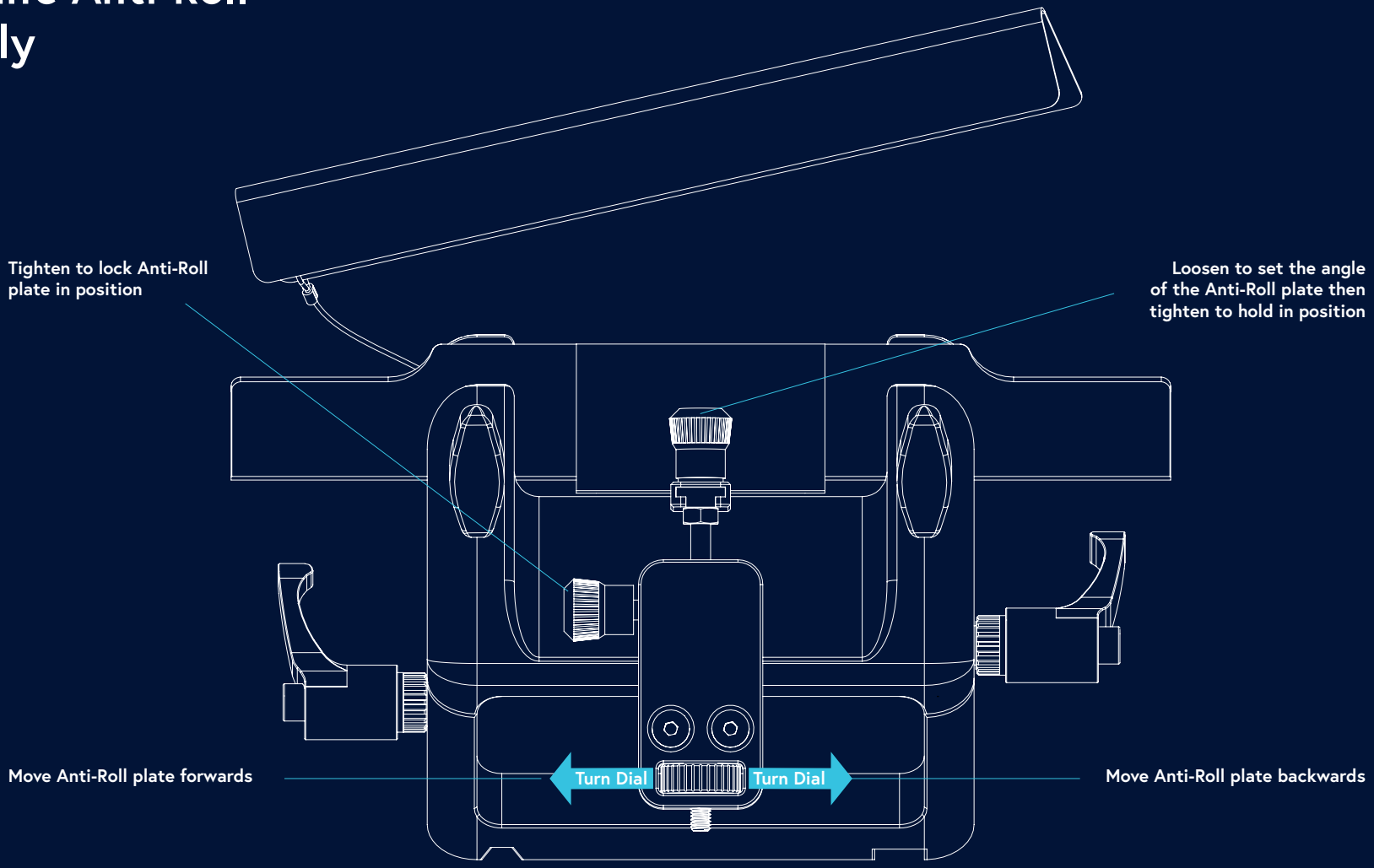


Figure 4. 5050 Microtome Quick Release Feather Blade Holder (QRFBH)

1. Blade Angle Locking Lever
2. Anti-Roll Adjustment Knob
3. Anti-Roll Adjustment Lock
4. Blade Clamping Plate
5. Feed Indicator
6. Manual Advance/Rewind Plug
7. Anti-Roll Plate
8. Blade Loading Plate
9. Blade Guard
10. Blade Clamping Lever
11. Knife Block Clamp Locking Lever
12. Section Thickness Control
13. Coarse Advance Control

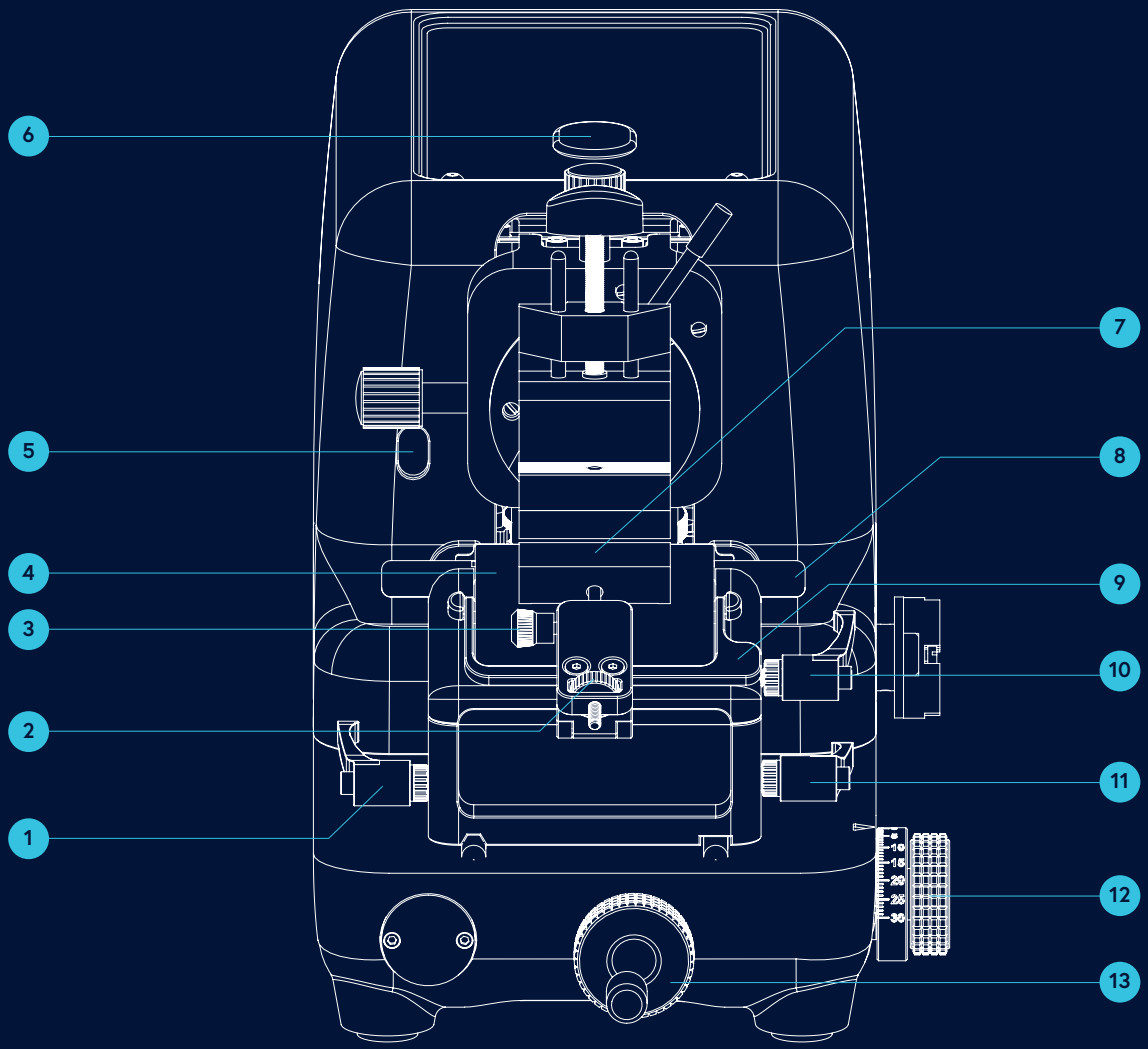
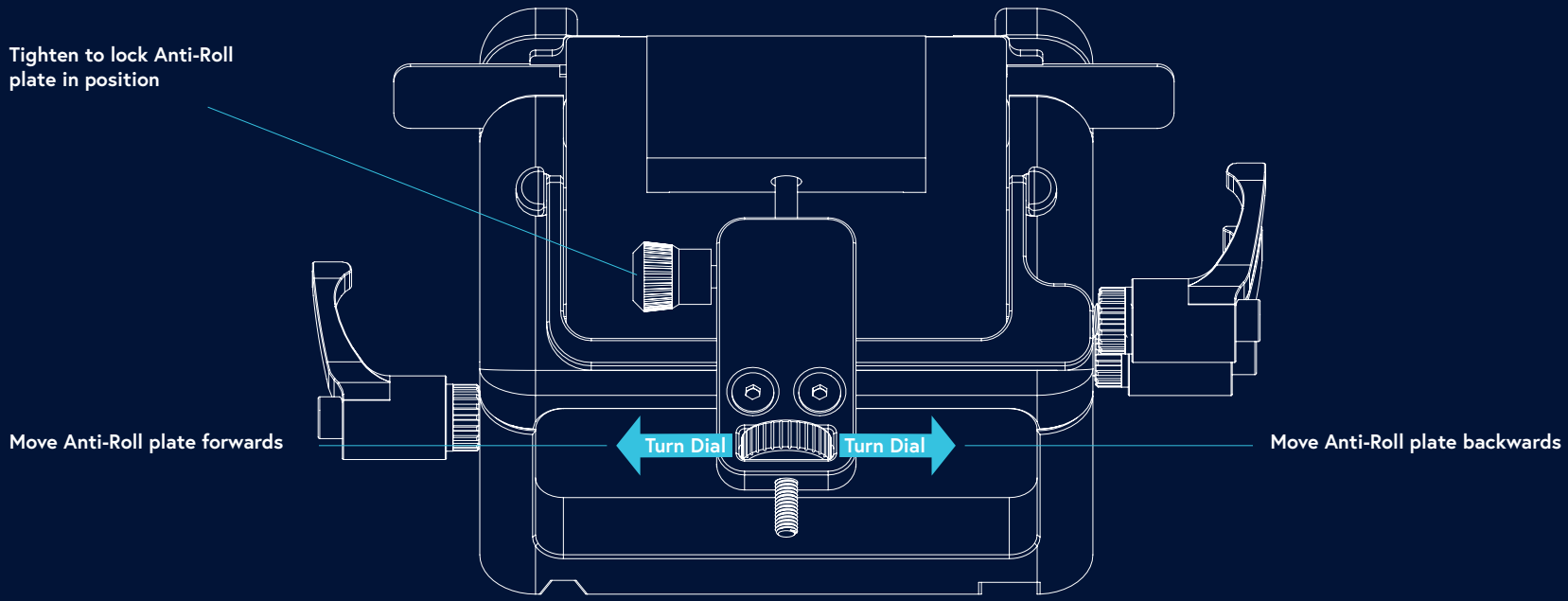


Figure 5. 5050 Microtome Quick Release Feather Blade Holder (QRFBH) Anti-Roll Assembly



HEALTH AND SAFETY AT WORK ACT

DECONTAMINATION CERTIFICATE

Customer input

Any product which is to be returned to Bright Instrument Company Limited or serviced on site, must be cleaned and decontaminated in the appropriate manner. This certificate, duly completed, must be either sent in advance (fixed to the outer packing containing the product), or handed to the service engineer.

Packages will not be opened nor servicing commenced until the Company or service engineer have received a satisfactory certificate. Should returned goods be considered a hazard by the Company, they will be returned immediately to the customer at his/her expense.

NB: Microtome knives must be in boxes.

Name:

Date:

Signed:

* Such equipment must not be returned without the written agreement of Bright Instrument Company Limited.

Name:		**Address:**	
Position:			
Department:		**Postcode:**	
Company:		**Telephone:**	
Serial No.		**Email:**	
Product No.		**Order No.**	
Description:			

Mark Box **A** if applicable. Otherwise complete all parts of **B**, providing further information as requested or appropriate.	**A.** This equipment has not been in contact with unfixed biological samples.	**A:**
	B. This equipment has been exposed internally or externally to hazardous materials as indicated below:	**B:**

Blood, body fluids, pathological samples?	Yes/No:	Other biohazards?	Yes/No:
Chemicals/substances hazardous to health?	Yes/No:	Other hazards?	Yes/No:
Further Details:			

This equipment has been cleaned and decontaminated:	Yes/No:
If Yes, what method?	If No*, why not?
Further Details:	

The equipment has been prepared to ensure safe handling/transportation.	Yes/No:

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QUALITY SURVEY REPORT

Customer input

Our watchword is QUALITY. In our continuing endeavour to improve the quality and performance of our processes and products, we would welcome any initial comments on the following aspects of our service and products. As you have only just received the product we do not feel that you could asses the actual workings of the instrument accurately, so we will follow up in approximately six months with a Customer Feedback – Voice of the Customer questionnaire. If, of course, you have any comments to make prior to receiving the questionnaire, please feel free to contact us.

Please return this form for the attention of the QA Manager.

Name:		**Address:**	
Company:			
Department:		**Postcode:**	
Serial No.		**Telephone:**	

PURCHASING: Did the purchasing process run smoothly with respect to our involvement? e.g. correct advice, lead times, payment arrangements etc.	
DELIVERY: Was the instrument in a satisfactory condition on arrival?	
INSTALLATION: Did we install the instrument? If so was adequate pre-use instruction given?	
PURCHASING: Did you receive an operating manual? Do you believe it is comprehensive enough for your use?	
SAFETY: Any comments?	
MISCELLANEOUS: Any other aspect you would like to comment on, e.g. appearance, first impressions etc.	

Date: Name: Signed.

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