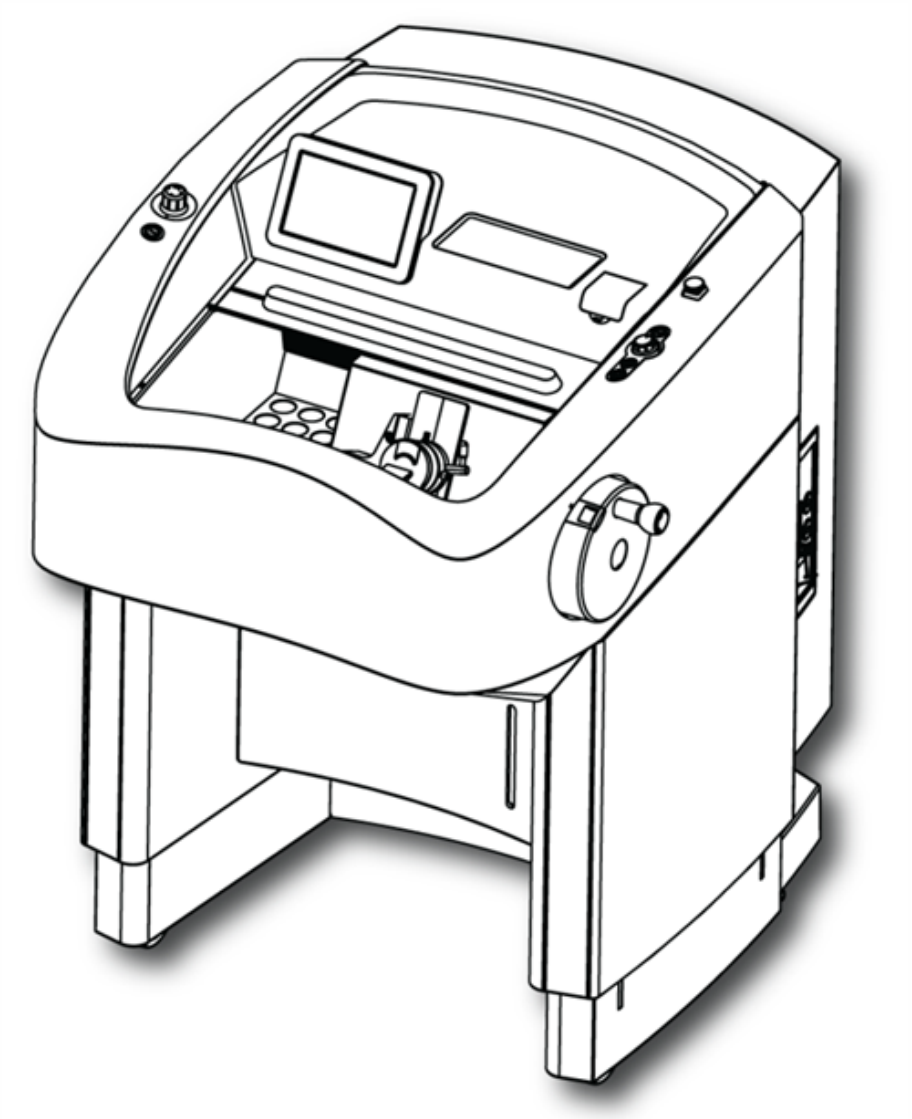
Thermo Scientific CryoStar NX70

Product Code 956960, 956970, 956980, 956990, 957000, 957010, 957020, 957030, 957040, 957050, 957060, 957070

Operator Guide

387928 Issue 10



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This instrument conforms to the essential requirements of:

IVD Directive 98/79/EC

and its harmonized standards under Union harmonization legislation

NX70 110V

EC Regulation No 517/2014 – Fluorinated Greenhouse Gas Regulations

Contains fluorinated greenhouse gases
Refrigerant: R404A
R404A GWP value = 3992
System charge weight = 0.400 Kg
System CO2 equivalent charge weight = 1.597 tonnes

NX70 230V

EC Regulation No 517/2014 – Fluorinated Greenhouse Gas Regulations

Contains fluorinated greenhouse gases
Refrigerant: R404A
R404A GWP value = 3992
System charge weight = 0.400 Kg
System CO2 equivalent charge weight = 1.597 tonnes

EMC Statement

This IVD equipment complies with the emissions and immunity requirements of IEC 61326-2-6:2012 and IEC 61326-1:2012.

This equipment has been designed and tested to CISPR 11:2009+A1:2010 Class A.

It is intended for use in a laboratory environment by a trained and qualified professional. In a domestic environment it may cause radio interference, in which case it may be necessary to take measures to mitigate the interference.

Important Note Regarding Instrument Variants

This document is designed for use with all variants of the Thermo Scientific CryoStar NX70 cryostat.

A range of optional features are available on this instrument and the instructions contained in this manual are not specific to any one variant. Thus some features described may not be available on your instrument.

This IFU is valid for the variants listed below:

Product Code	Product	Variant
956960	CryoStar NX70 HOMP	100V 60 Hz
956970	CryoStar NX70 HOMPD	100V 60 Hz
956980	CryoStar NX70 HOMPV	100V 60 Hz
956990	CryoStar NX70 HOMPDV	100V 60 Hz
957000	CryoStar NX70 HOMP	110-120V 60 Hz
957010	CryoStar NX70 HOMPD	110-120V 60 Hz
957020	CryoStar NX70 HOMPV	110-120V 60 Hz
957030	CryoStar NX70 HOMPDV	110-120V 60 Hz
957040	CryoStar NX70 HOMP	220-230V 50/60Hz
957050	CryoStar NX70 HOMPD	220-230V 50/60Hz
957060	CryoStar NX70 HOMPV	220-230V 50/60Hz
957070	CryoStar NX70 HOMPDV	220-230V 50/60Hz

Symbols

The following symbols and conventions may be used throughout this document and on the instrument:

This symbol is used on the instrument, or in a document, to indicate that instructions must be followed for safe and correct operation. If this symbol appears on the instrument, always refer to the operator guide.

This symbol is used on the instrument, or in a document, to indicate that there are potential biological risks associated with the instrument and / or instrument use. Always use Good Laboratory Practice.

Cold surface, if necessary, use gloves

Cutting hazard, sharp edges, watch your fingers.

This symbol is used on the instrument, or in a document, to indicate that irritants or potentially harmful chemicals are present. Refer to the Material Safety Data Sheets for the products, and always use Good Laboratory Practice.

Separate taking back of electrical and electronic instruments in the countries of the European Union:
This is to be applied in the countries of the European Union and other European countries with a separate collecting system within the waste management. This product, being an electro and/or electronic instrument, must be treated separately within the waste management process (WEEE).

Manufacturer.

Serial number
It is stated on the product label sticker.
It is built up as follows: SYYMMXXXX
S=Production site, Y=year of production, M=Month of production, X= Counter
So the serial number states the production date of the device

A warning is given in the documentation if there is a danger of personal injury or damage to the equipment or samples.

Note

Notes give additional information about a job or instruction, but do not form part of the instruction.

Table of Contents

Chapter 1 - Safety Information

Thermo Scientific instruments are designed for convenient and reliable service; however, improper use or handling by a user may damage the instrument. Protection might be impaired if the equipment is used in a manner not specified by the manufacturer. Correct maintenance procedures are essential for consistent performance. It is recommended that users secure a maintenance contract with our service department acting on behalf of Thermo Shandon Limited.

Any problems and queries should be referred to your Thermo Fisher Scientific service department.

The following sections contain important information for the safe setup and use of the instrument, and should be read and understood by the user before using the instrument.

General Safety

This instrument, as supplied, conforms to IEC 61010-1 and IEC 61010-2-101; however, the addition of chemicals introduces potential hazards. Good Laboratory Practice must be employed and consideration must be given to the potential for hazard when dealing with these chemicals.

Do not use the instrument in close proximity to strong electromagnetic radiation, as these may interfere with the proper operation. The electromagnetic environment should be evaluated prior to operation of the device.

Good Laboratory Practice must be used when handling tissue samples to prevent cross contamination and infection. The user should complete a risk assessment to determine any potential hazards related to tissue handling.

Do not introduce any source of ignition into, or near, the instrument once it has been loaded with reagents.

Do not remove any panels or access covers, unless specifically instructed to do so. The instrument does not have any user serviceable parts. Potentially lethal voltages are present inside the instrument.

The instrument must be properly connected to a good earth (ground) via the Mains input supply and positioned such that it is possible to interrupt the Mains supply at the source by removing the plug from the socket.

Use only factory approved accessories or replacement parts within the instrument.

Only use reagents recommended in the operator guide.

Chemical Safety

The introduction of chemicals creates potential hazards. Thermo Fisher Scientific has adopted the following position with regard to the subject of volatile chemicals used in laboratories:

- Customers using non-specified chemicals in the instrument, do so at their own risk.
- All chemicals recommended by Thermo Fisher Scientific have auto-ignition temperatures considerably above any surface temperatures that can be reached during a single fault failure on the instrument.
- The instrument contains no source of ignition in any areas of the instrument where chemicals are stored, or likely to leak into, in a single fault condition.
- The operator is fully aware of the contents of the specification documents detailing the properties of the chemicals they are using.
- The operator has carried out any legally required assessment of chemicals used and is using Good Laboratory Practice.

Environment

This instrument complies with the European Union's Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC. It is marked with the following symbol:

Thermo Fisher Scientific on behalf of Thermo Shandon Limited has contracts with one or more recycling / disposal companies in each EU Member State, and this product and packaging should be disposed of or recycled through them. For further information contact your Thermo Fisher Scientific service representative.

Warranty Statement

Thermo Shandon Limited as part of Thermo Fisher Scientific is proud of their quality, reliability and of our after-sales service. We continuously strive to improve our service to our customers.

Please ask your distributor or Thermo Fisher Scientific representative about service contracts which can help maintain your instrument in an optimal operating condition.

Warranty provisions necessarily vary to comply with differences in national and regional legislation. Specific details can be found in the delivery documentation or from your dealer or representative.

Please note that your warranty may be invalidated if:

- This instrument is modified in any way, or not used as intended by Thermo Shandon Limited.
- Accessories and reagents which have not been approved by Thermo Fisher Scientific are used.
- The instrument is not operated or maintained in accordance with instructions.

Chapter 2 - Introduction

Intended Use

IVD

The Thermo Scientific cryostat NX70 is an in vitro diagnostic device, designed to take precision sections of tissue specimens including the sectioning of paraffin embedded samples in medical, pharmaceutical laboratories as necessary preparation for their examination. Only qualified and trained laboratory personnel may operate the NX70.

The instrument may only be operated within the scope of its intended use as described above and as per the instructions given in this manual.

Any other use of this instrument is considered as improper operation.

Instrument Features

The CryoStar NX70 is a precision-engineered, ergonomically-designed, high-performance cryostat in modular design with a stainless steel cooling chamber. Some of its features are:

- Knife / Blade Holder cooling.
- Specimen cooling.
- Ergonomic height adjustment with integrated ergonomic casing.
- Colour touch-screen user interface and joystick control.
- Motorized cutting with variable speed control (from 0 to 256 mm/s).
- Optional Cold D function consisting of an internal fumigation unit that applies Sanosil® (disinfection medium) into the user-accessible, operating areas of the cryochamber.
- Optional Vacutome function.

Technical Specifications

Mechanical Specifications

Depth	100 cm (39.4 in)
Width	75.5 cm (29.7 in)
Height Range	Adjustable range 82 - 112 cm (32.3 - 44.0 in)
Maximum Weight	200 kg (440 lb)

Electrical Specifications

Power Requirements	Dedicated line recommended.
	100V, 50/60Hz, 10A, +/-10%, 110-120V, 60Hz, 10A, +/-10%
	220-230V, 50/60Hz, 5A, +/-10%

Environmental Specifications

For Indoor Use Only	
Temperature (Operating Limits)	+5°C to +35°C (+41°F to +95°F)
Temperature (Recommended Operation)	+15°C to +30°C (+59°F to +86°F) **Note:** Performance may deteriorate when operated outside of this range.
Temperature (Transport and Storage)	-20°C to +40°C (-4°F to 122°F) +70°C (158°F) for short exposure
Relative Humidity	Max. 80% RH up to 31°C Decreasing linearly to 50% RH at 40°C
Altitude	Up to 2000 m (6,500 ft)
Pollution Degree	2
Over Voltage Category	II
Floor Loading Requirements	300 kg/m² (660 lb/ft²)
Protection Class	I
Sound Emission	<45 dB (A) - measured with 1m distance to the instrument.
Refrigerant	R404a, filling amount 400g

Cooling Specifications

Specimen Temperature Control	-50°C to +10°C (-58°F to +50°F) at +20°C room Temp. (decrease 0,7°C/1°C room temp. increase)
Blade Temperature Control	-35°C to -5°C (-31°F to +23°F) at 20°C room Temp (decrease 0.5°C 71°C room temp. increase)
Cryobar Cooling	Max. -60°C (-76°F) at -35°C blade temperature
Defrosting Options	Programmed / Immediate

Microtome and Sectioning Specifications

Section Thickness Range	0.5 – 500 µm
Fine Section Thickness Range	0.5 - 100 µm
Fine Section Thickness Resolution	0.5 – 2 µm in 0.5 µm steps
	2 µm – 10 µm in 1 µm steps
	10 µm – 20 µm in 2 µm steps
	20 µm – 50 µm in 5 µm steps
	50 µm – 100 µm in 10 µm steps
Trimming Thickness Range	5 - 500 µm
Trimming Thickness Resolution	5 – 10 µm in 5 µm steps
	10 µm – 100 µm in 10 µm steps
	100 µm – 200 µm in 20 µm steps
	200 µm – 500 µm in 50 µm steps
Specimen Retraction (Return Travel)	20 µm
Vertical Specimen Stroke	64 mm
Horizontal Specimen Movement	48 mm
Specimen Approach	Manual (variable speed by joystick control), maximum speed: 3mm/s
Chuck Size	30, 40 mm (additional special sizes are available)
Specimen Orientation	x - and y - axes universal 7° with zero positioning; z - axis up to 360°

Coarse Feed	Motorized
Cutting Drive	Motorized, electronically controlled and manual via handwheel
Cutting Window	Manually adjusted to specimen size
Operating Modes	Interval, single, multi- and continuous-stroke
Cutting Speed	0 - 256 mm/s (0-120 1/min)
Clearance Angle Adjustment	Disposable blade carrier 8- 16°
Vacutome Filter	approximately 500 ml

Cold D Specification

Reservoir Volume	1000 ml
Recommended Medium	Sanosil® S010 (5% H2O2)

Default Settings

Counter Mode	Speed V = 0
Multi Counter	2
Operating Mode	Continuous
Retraction	ON
Language	English
Fine	0.5 µm
Trim	5 µm
Joystick Calibration	Calibrated
Chamber Light	100%
Screen Brightness	100%
Brake	ON
Stepper Motor Initialization	Yes
Blade Temperature	-15°C
Specimen Temperature	-15°C
Cutting Window	0 mm (OFF)
Favorites (Program 1, Program 2, Program 3)	(-15°C/-15°C), (-20°C/-20°C), (-25°C/-25°C)
Cryobar	OFF
Vacutome	OFF
Disinfection	OFF

Disinfection, Cycle (Automatic)	ON (03:00 Night)
Defrost Cycle (Automatic)	ON (00:00 Night)
Standby Mode	1h (After 1 hour, the Cryostat enters the Standby Mode automatically). Kept temperature: -15°C.
Sleep Mode	3h (After 3 hours, the Cryostat enters the Sleep Mode automatically). Kept temperature: -10°C. Power savings: Approximately 30%.
Start Time	06:00 a.m.
Section Counter	0
Section Sum	0

Chapter 3 - Instrument Setup

Unpacking and Repacking

Safety Precautions

The CryoStar NX70 is heavy and requires a minimum of two people to safely unpack and manoeuvre it.

The CryoStar NX70 has a high centre of gravity and care should be taken when moving.

Do not tip the CryoStar NX70more than 30° from the upright position.

After moving the CryoStar NX70, wait at least 8 hours before switching on to allow the refrigerant to settle - failure to do so may cause damage to the unit.

Note

The packing materials should be carefully stored for use in any future instrument shipment.

Unpacking Procedure

General Information:

- Ensure that these Instructions are retained for future use.
- The CryoStar NX70 is delivered on a pallet. The sides of the instrument are encased in cardboard and cushioned with foam spacers inside the container. A wooden cover protects the top of the instrument.
- In unpacking be aware of the weight (200 Kg/440 lbs) of the instrument.

Safe handling of the installation requires the involvement of two people

Handling:

- Place the crate on a flat surface while ensuring that there are no objects underneath the pallet.
- Remove the wooden cover form the crate but retain it for later use as a ramp.
- Remove the top foam spacer from the crate.
- Remove the exterior cardboard container by opening the clips.
- Remove the remaining foam spacers and the accessories carton. Place all the accessories carefully to one side.
- Remove the plastic cover from the instrument.
- Two wing-nuts are now visible at the front edges of the wooden pallet.

- Using the wing-nuts affix the wooden top of the crate to the pallet to serve as an unloading ramp for the instrument.
- The instrument can be moved on its castors. However, ensure that it does not roll off the pallet inadvertently.
- Screw in the two bails (part of the standard accessories) into the respective holes in the foot of the cryostat.
- Mount the transport belts (part of the standard accessories) with the bails.

To move the instrument from the pallet stand BEHIND (NOT in front) of the instrument.

- Carefully roll the instrument off the pallet and on to the floor.
- Move the instrument to the desired location while leaving space on the left- and right-hand.
- Keep all packing and transportation materials together in case of future need.
- In the future, if the instrument is transported by forklift, truck, train, ship or aircraft it must be packed in the original shipping container with all transportation locks in place.

Repacking the Instrument

- To repack the instrument, follow the above instructions in reverse order.

Location & Setup

When deciding where to locate the CryoStar NX70, the following items must be taken into consideration:

- Approximately 10 cm (4 in) must be allowed around the cooling system to allow free air flow.
- Approximately 10 cm (4 in) must be allowed between the wall and the rear panel.
- The vents on the sides of the rear panel must be unobstructed at all times.
- The mains power socket must be accessible at all times.
- The location must be free from draughts, open doors or air conditioning systems.
- The location must not expose the cryochamber to direct sunlight.
- Enough room for height adjustment.

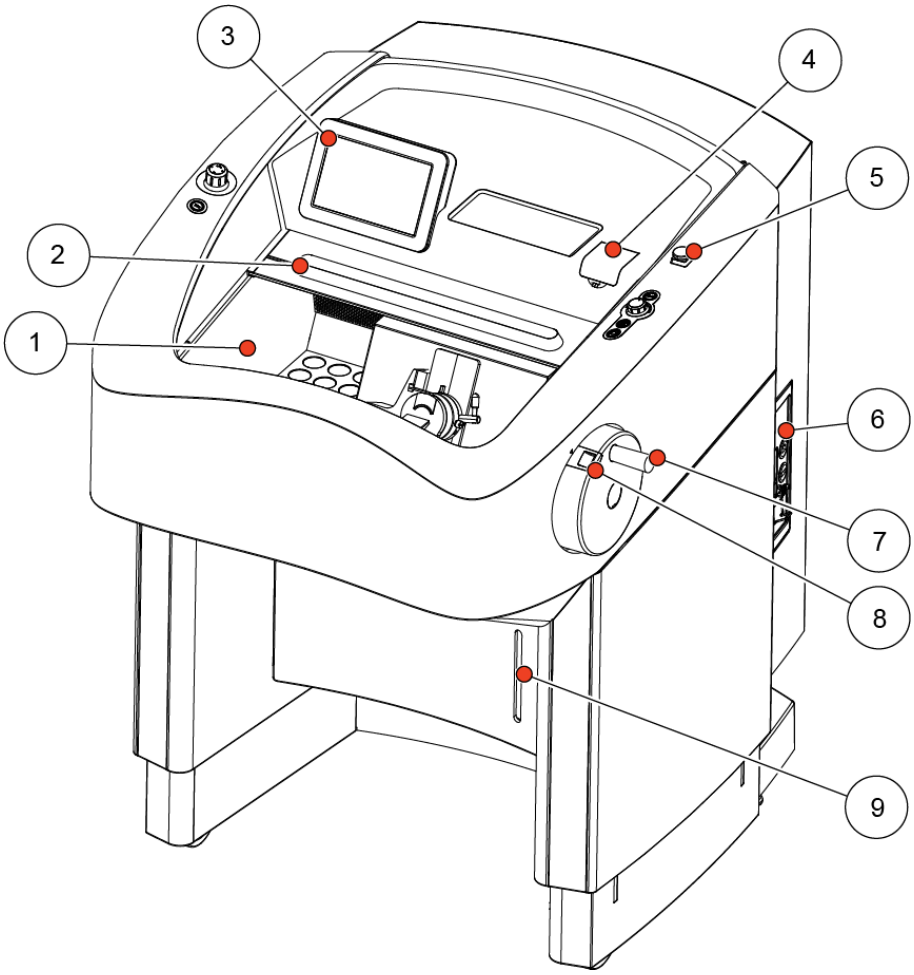
Note

These measures are intended to reduce the build-up of frost and maintain consistent cooling temperatures resulting in more favourable working conditions. Locations which have high humidity and / or high ambient temperatures can reduce the performance of the instrument.

Once the CryoStar NX70 has been located, ensure the fixing bolts shown are tightened to prevent the unit from moving during operation.

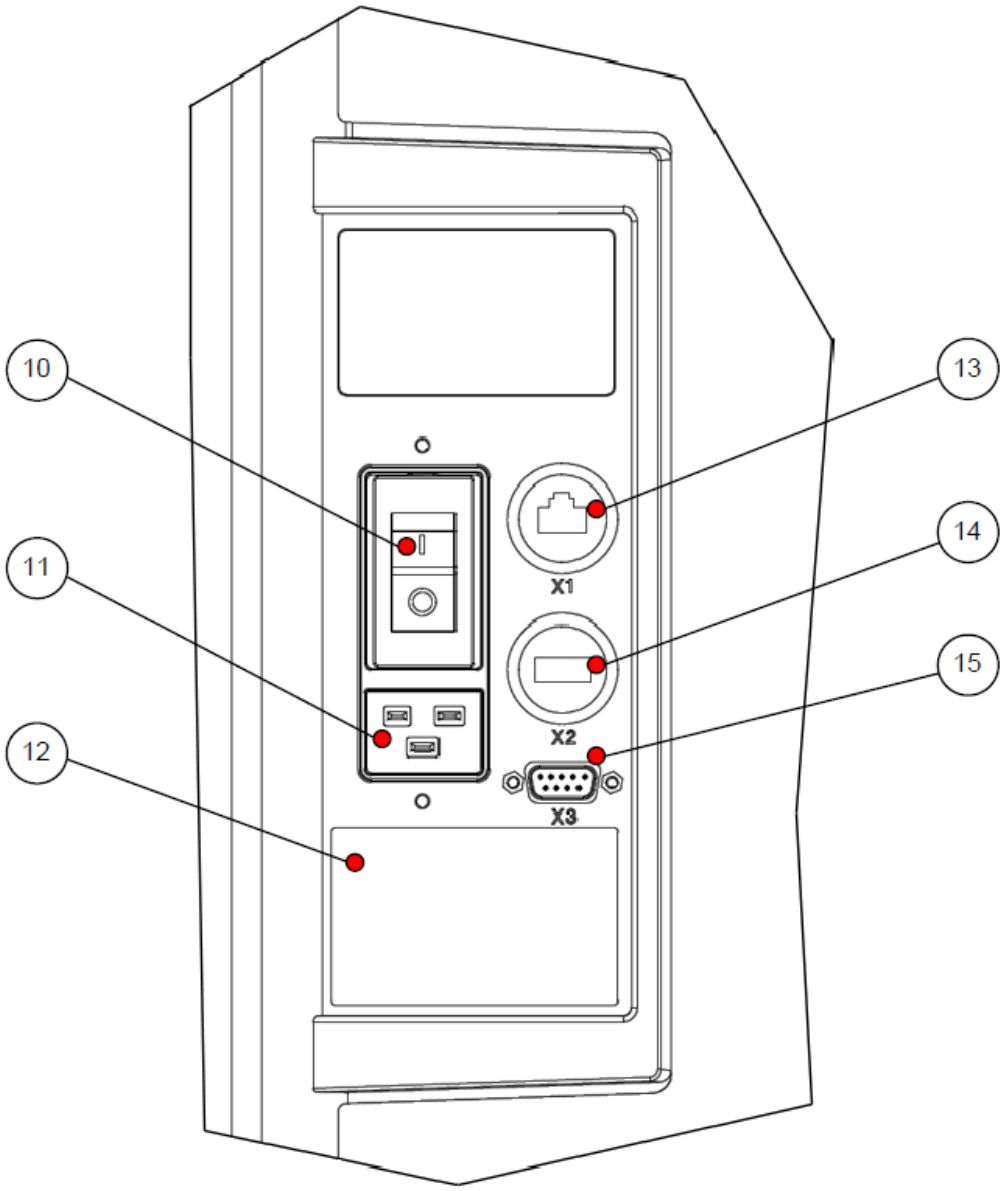
Identification of Parts

Overview



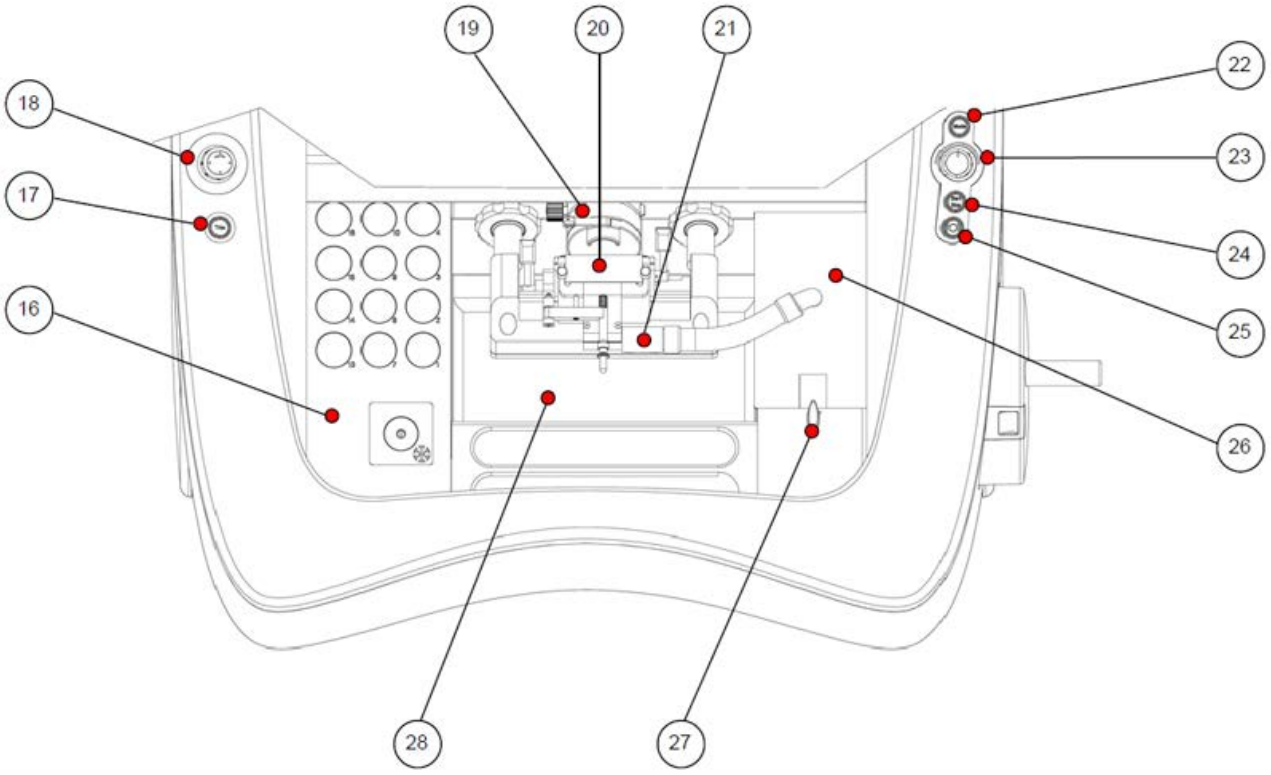
1	Cryochamber	6	Connections Panel
2	Cryochamber Window	7	Handwheel
3	Touch Screen	8	Handwheel Mechanical Brake
4	Cold D Reservoir Cover	9	Water Drain Reservoir Cover
5	Emergency Stop Button		

Connections Panel



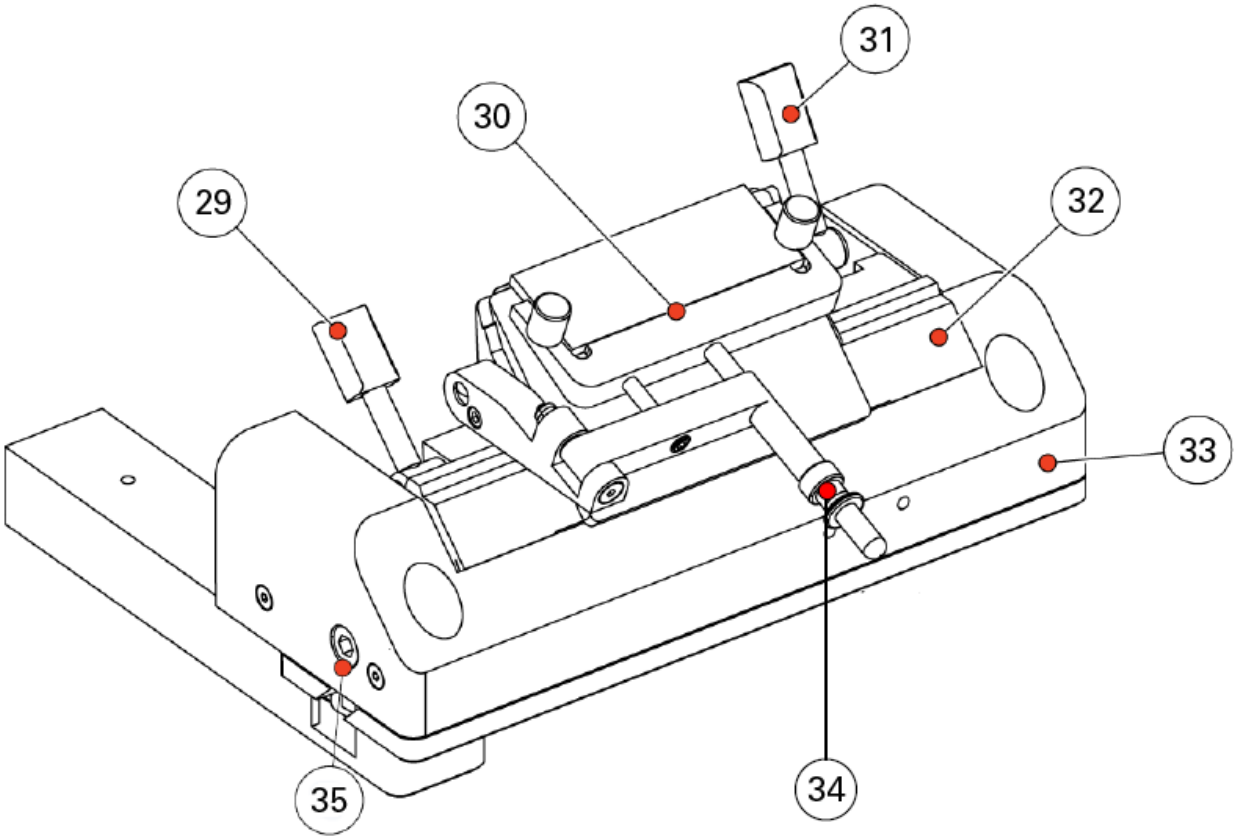
10	Power Switch	13	X1 – RJ45 port (for Service purposes only)
11	Power Socket	14	X2 – USB port (for service purposes only)
12	Rating and Serial Number Label	15	X3 – Foot Pedal Connector

Cryochamber



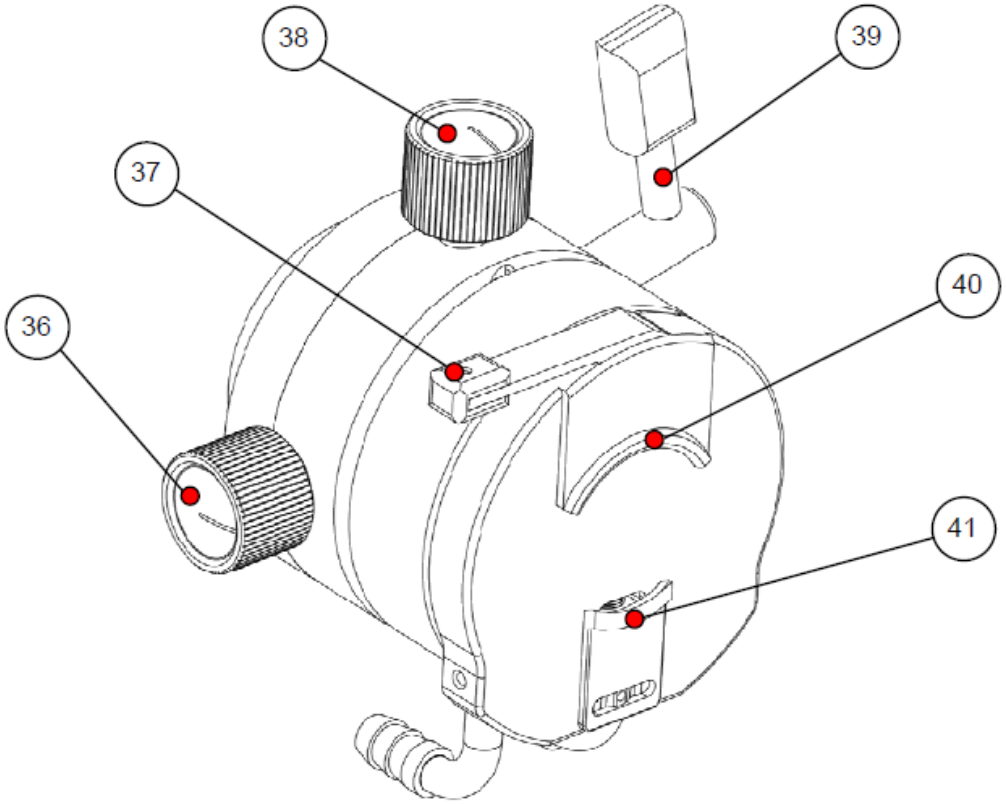
16	Cryobar and Cooled Storage Area	23	Cutting Speed Control
17	Trim Button	24	Motorized Cutting Start / Stop Button
18	Joystick	25	Handwheel Electronic Brake Button
19	Specimen Head	26	Vacutome Filter Cover
20	Blade Holder with Anti-Roll Plate	27	Vacutome Filter Cover Release Knob
21	Vacutome	28	Section Waste Tray
22	Mode Selection Button		

Blade Holder



29	Lateral Adjustment Lever	33	Blade Holder Base
30	Anti-Roll Plate	34	Anti-Roll Plate Adjustment
31	Blade Clamping Lever	35	Clearance Angle Adjusting Screw
32	Top Stage (Angle Adjustment)		

Specimen Head NX70



36	Y-axis Fine Adjustment Knob	39	Specimen Head Clamping Lever
37	Specimen Chuck Release Lever	40	Upper Specimen Chuck Jaw (Static)
38	X-Axis Fine Adjustment Knob	41	Lower Specimen Chuck Jaw (Moving)

Set Up

Before sectioning, the blade holder and the Cryochamber should be at a stable temperature close to the desired cutting temperature. These temperatures should be selected to suit the consistency of the specimen.

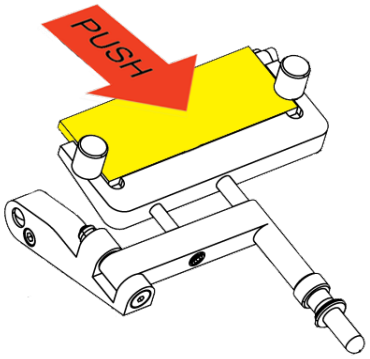
All tools which come into contact with the sections or which are used to manipulate the specimen must also be cooled to prevent the tissue from sticking to them. Therefore all accessories should be stored on the shelves or in the brush tray in the Cryochamber. The exceptions to this rule are the specimen chucks which should be kept at room temperature.

The heated sliding window should be closed during periods of inactivity and while preparing specimens to avoid warm air getting into the chamber. This will result in more favourable working conditions and a lower frost build-up.

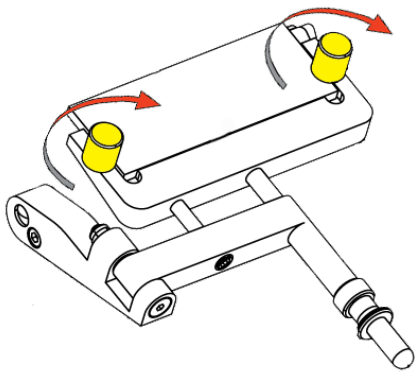
Ensure that the Vacutome filter is properly inserted in the filter unit and is suitably maintained - see Cleaning and Maintenance.

Fitting or Exchanging the Anti Roll Plate

- The Anti Roll Plate is held in place by two black screws.
- Ensure that the gap clearance side of the Anti-Roll Plate is facing inwards.
- Position the Anti Roll Plate in the holder, gently pushing the glass to the bottom of the holder.



- Tighten the black screws.



Note

There are two usable edges on the Anti Roll Plate.

Fitting or Exchanging Low Profile Blades

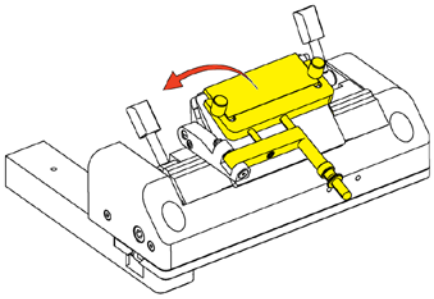
Microtome blades are extremely sharp and can cause severe injuries- always use good laboratory practice when handling them.

Always cover the blade with the knife / blade guard and activate the electronic and mechanical brakes prior to making modifications to the blade/knife and specimen or changing the specimen.

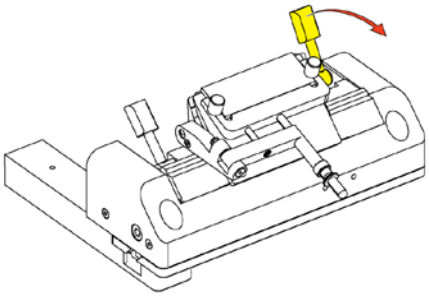
The blade holder should be fitted with low profile blades (80mm x 8mm; 35° facet angle) as standard.

To fit or exchange low profile blades:

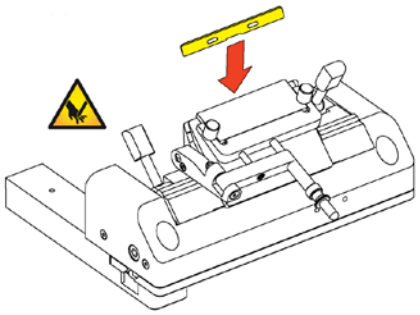
- Use only the front handle to move the anti-roll plate to the side.



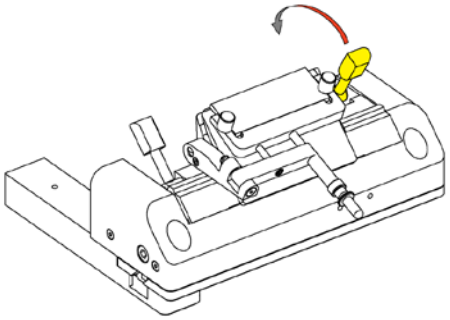
- Pull the blade clamping lever towards the front of the instrument to release the clamping plate.



- Carefully slide a low profile blade into the middle of the slot, ensuring that the blade is equidistant from the ends of the slot.



- Push the blade clamping lever towards the back of the instrument to clamp the blade in position.

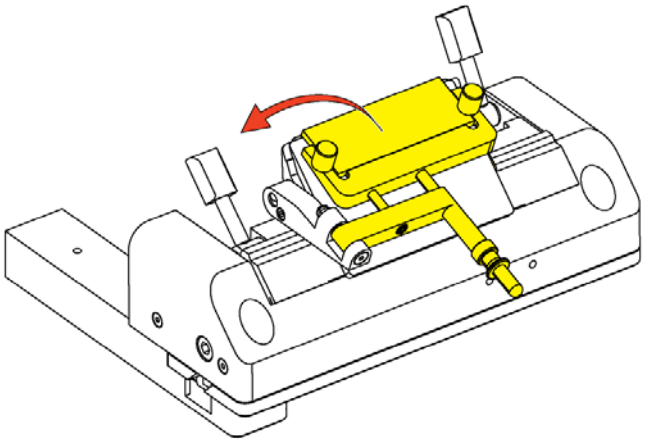


Removing Used Blades with the Magnetic Blade Tool

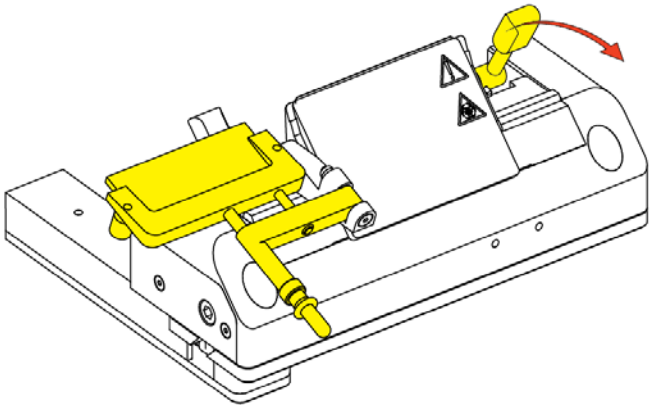
The magnetic blade tool allows the user to remove used blades from the blade holder in a safe way.

Remove the used blade with the magnetic blade tool:

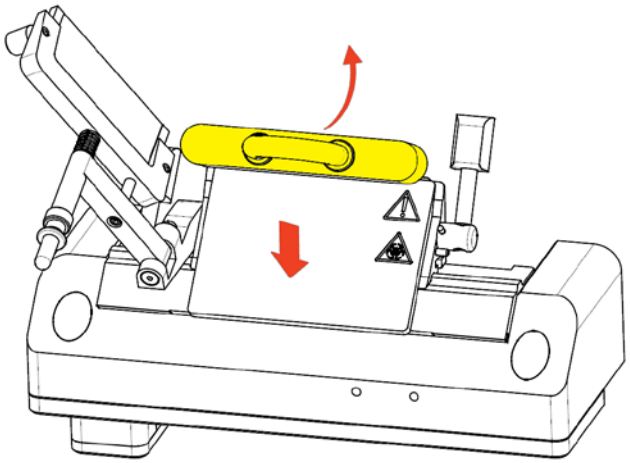
- Use only the front handle to move the anti-roll plate to the side.



- Pull the blade clamping lever towards the front of the instrument to release the clamping plate.



- Move the magnetic blade tool over the blade.



- Carefully lift the blade out of the blade holder and dispose of it in accordance with laboratory regulations.

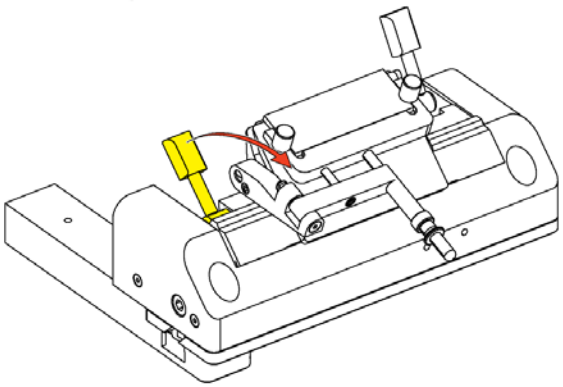
Blade Positioning and Orientation

Always cover the blade with the knife/blade guard and activate the electronic and mechanical brakes prior to making modifications to the blade/knife!

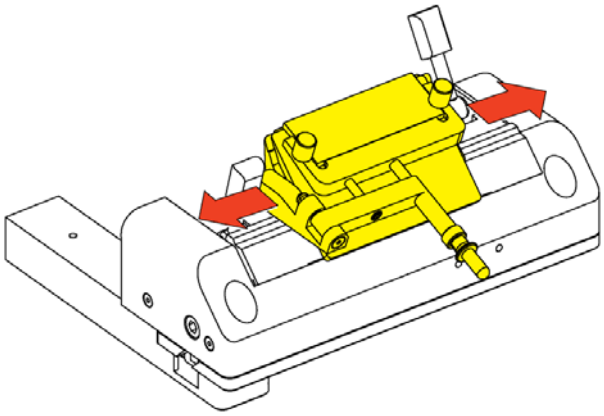
If the cutting area of the blade is no longer usable, the upper part of the blade holder can be moved without removing the blade.

To move the upper part of the blade holder:

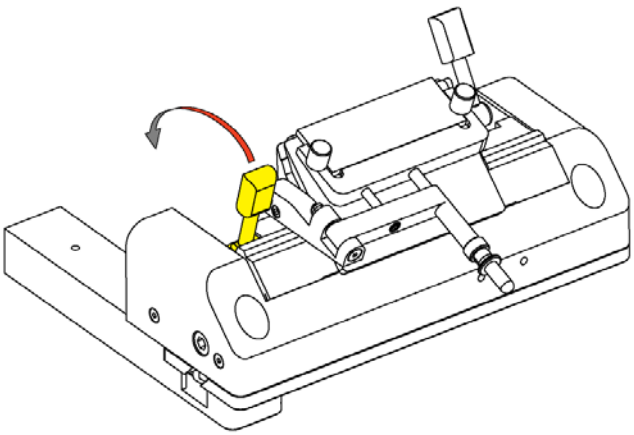
- Loosen the lateral adjustment lever.



- The upper part of the blade holder should now be free to move left and right.
- Move it either to the left or to the right until the desired area of the blade is directly below the specimen head.



- Move the lateral adjustment lever forward to secure the upper part of the blade holder in the new position.



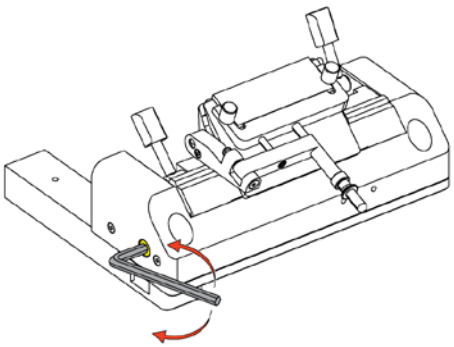
Adjusting the Cutting Angle

The cutting angle can be adjusted. The recommended cutting angle is approximately 10° for Thermo Scientific low profile blades.

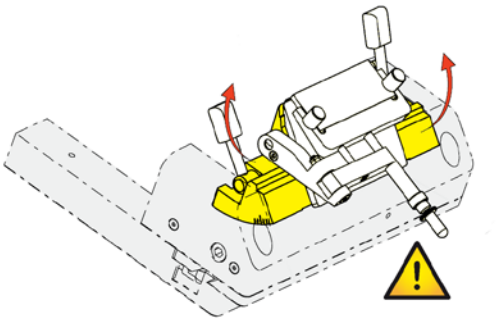
Note

The factory pre-set cutting angle is 10°.

- Loosen the clearance angle adjustment screw on the lower left site of the blade holder.



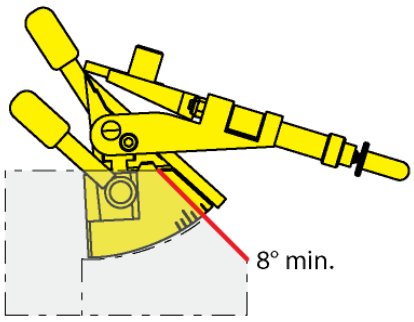
- Gently push both sides of the blade holder base to select the desired angle.

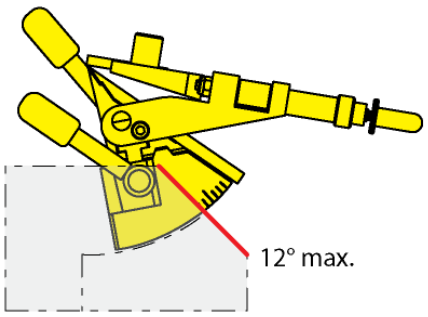


The surface of the blade holder base might be cold. Use gloves if necessary

Note

The clearance angle can be read on the scale on the left side on the upper part of the blade holder.

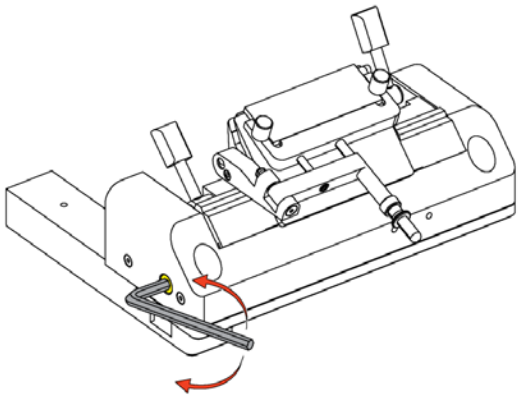




Note

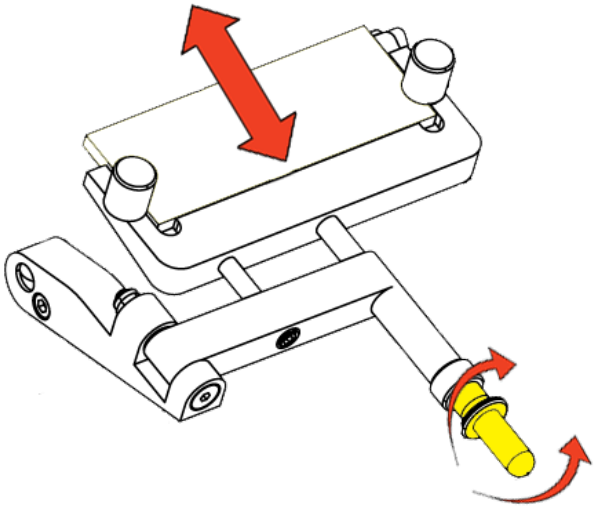
10° is indicated by the longer increment in the middle of the scale.

- Re-tighten the clearance angle adjusting screw to fix the selected clearance angle.



Adjusting the Anti-Roll Plate

The fine adjustment of the anti-roll plate is carried out using the knurled screw.



- To raise the height of the Anti-Roll Plate, turn the screw anti clockwise.
- To lower the height of the Anti-Roll Plate, turn the screw clockwise.

Note

Always adjust the height of the Anti-Roll Plate in small increments.

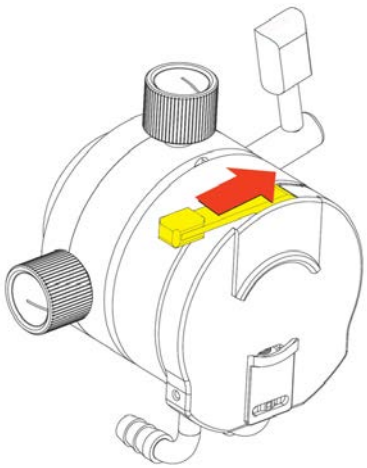
Specimen Setup

Specimen Orientation

Before sectioning can begin, the specimen must be correctly clamped and oriented in the specimen head.

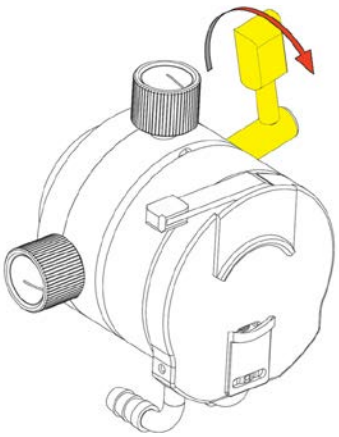
To clamp and orient the specimen:

- Loosen the specimen chuck release lever and insert the specimen chuck into the jaws of the specimen head.

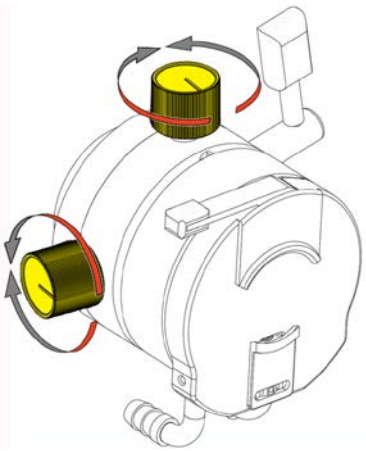


- Release the specimen chuck release lever again to allow the jaws to grip the chuck.

- Loosen the specimen head clamping lever to allow adjustment of the specimen parallel to the cutting edge.



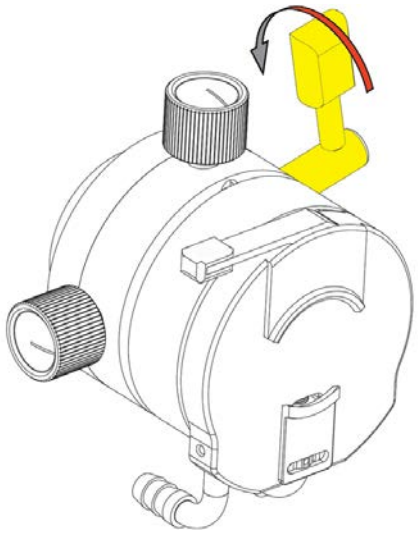
- Use the fine adjusting knobs to orient the specimen on the x- and y-axes.



Note

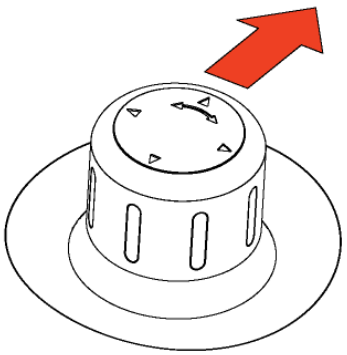
The fine adjustment knobs will click into place when the centre position has been reached.

- Tighten the specimen head clamping lever again.



For further specimen orientation, the specimen chuck can also be rotated by 360° as described below:

- Loosen the specimen head clamping lever slightly.
- Rotate the chuck as required.
- Move the specimen head clamping lever back to its original position.
- After the specimen is adjusted, set the cutting window limits - see Setting the Cutting Window.
- Use the motorized coarse feed to position the blade close to the specimen.
- Tilt the joystick forwards to move the blade holder towards the specimen.



Filling with Disinfectant to Perform the Cold D Function

The Cold D function is an integrated system for the delivery of disinfectant (Sanosil®) into the cold cryostat chamber. This method of disinfection ensures an even distribution of the disinfectant throughout the Cryochamber.

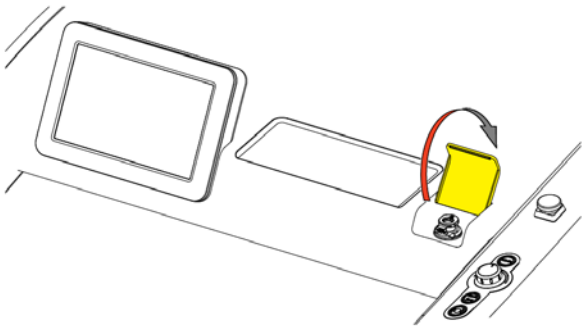
The Cold D cycle takes 50 minutes to complete and the instrument cannot be used during this time; however, as soon as the Cold D cycle is complete, the cryostat can be used safely.

To avoid frosting of the chamber, Cold D should not be used more than 2 times per day plus one cycle overnight.

Filling the Cryostat with Disinfectant Solution (Sanosil®)

To load the cryostat with disinfectant:

- Open the Cold D reservoir cover to access the filling inlet of the disinfectant tank.

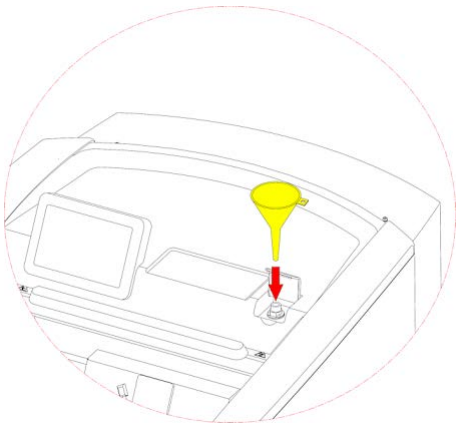


Before filling the tank, check the shelf life and the hazardous substance warnings on the disinfectant.

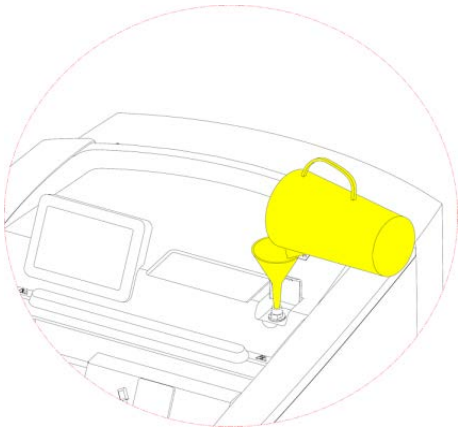
Note

Always follow the manufacturer's instructions for handling, storage and disposal of the disinfectant as well as the information provided by the manufacturer concerning any precautionary measures to be taken in the event of an accidental release or spillage of the disinfectant.

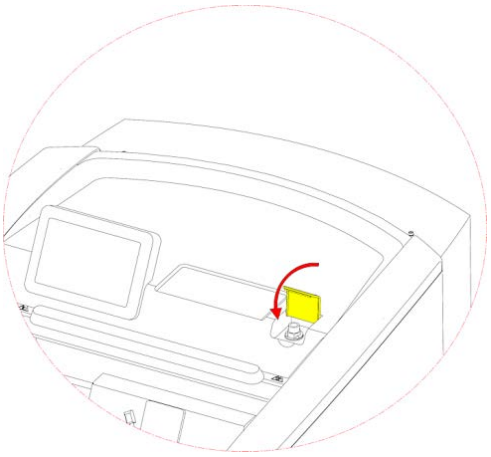
- Place the funnel into the inlet.



- Empty the contents of one litre Sanosil into the tank.



- Close the reservoir cover.



Chapter 4 – Operation

Switching On

Before switching on the instrument for the first time, ensure that the power requirements indicated on the rating label correspond to the power supply voltage being used.

Note

No other instruments should be connected to the circuit used for the cryostat, as the compressor needs high surge currents when started.

Do not use multi-socket power outlets with small wire sizes for the supply of the instrument.

- Insert the supplied power cord into the power socket and then connect the power cord to the mains supply.
- Install the blade holder if necessary.
- Close the heated window.
- Turn on the power switch.

Note

The default setting of the blade holder and specimen head temperature are -15°C.

The cooling phase will take approximately 2 to 3.5 hours depending on the set chamber temperature.

System Interfacing

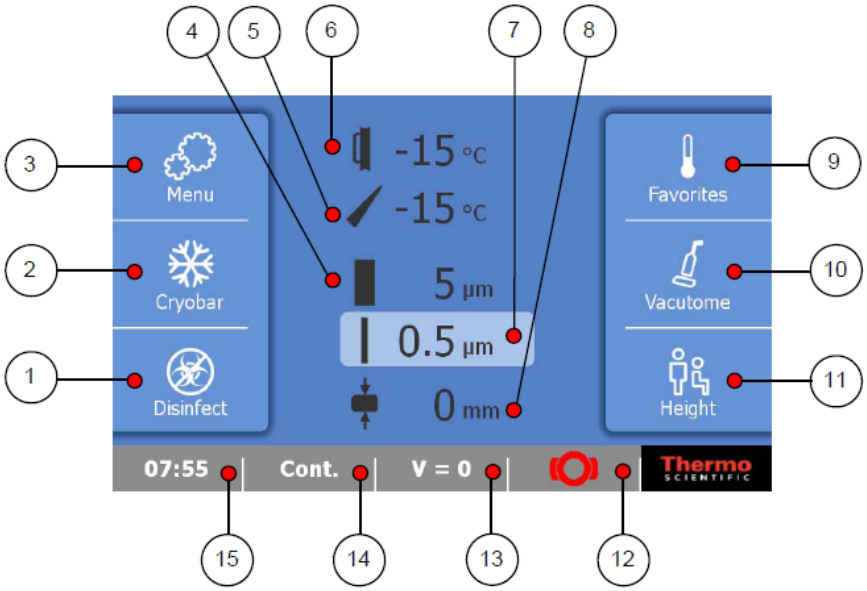
Using the Touchscreen

The CryoStar NX70 has an embedded touchscreen user interface which is used to set all preferences.

Avoid using sharp or pointed objects to press buttons on the touchscreen

Main Screen

The Main screen appears after the instrument has been switched on.



1	Disinfection (Cold D Function)	9	Favourite Temperatures
2	Cryobar	10	Vacutome Settings
3	Menu	11	Height Adjustment
4	Trimming Thickness	12	Handwheel Brake On/Off
5	Blade Temperature	13	Multi-Function Button
6	Specimen Head Temperature	14	Cutting Mode
7	Fine Section Thickness	15	Time or Date / Service Message (Wrench symbol)
8	Cutting Window		

- Press the required key to activate / deactivate the function or to display the options screen for the selected function - See Setting Preferences.

"OK" Button

- Press the “OK” button to save any changes to specific settings.

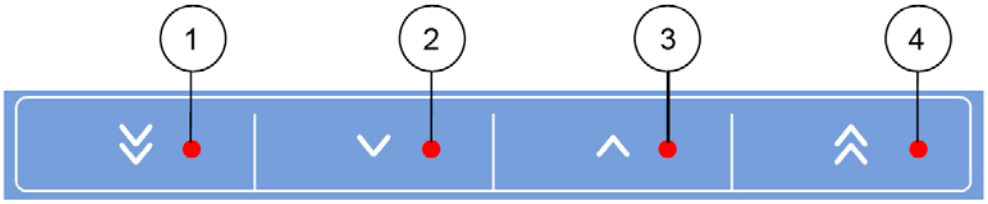
"Back" Button

- Press the “Back” button to return to the previous menu without saving any changes.

"Arrow" keys

The “Arrow” keys are used in several menus to increase or decrease values.

- Use the arrow keys to adjust the value to the required setting.



1	Decreases the selected value by multiple steps	3	Increases the selected value by 1 step
2	Decreases the selected value by 1 step	4	Increases the selected value by multiple steps

Note

The number of steps by which the 'multiple step' increase / decrease buttons alter the selected value by will vary depending on the function

Setting Preferences

Quick Freezing of the Specimen

The Cryobar provides on-demand, quick freezing of specimens.

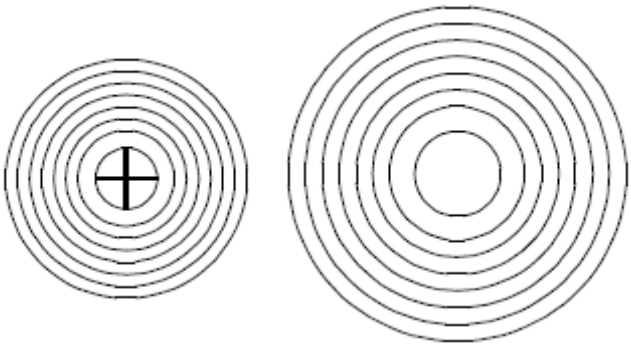
Note

When the Cryobar is activated, it will take approximately 2 - 3 minutes for the Cryobar to reach a temperature of -60°C.

The Cryobar remains active for approximately 10 minutes.

The specimen is frozen onto the specimen chuck using a freezing compound and the Cryobar.

To ensure optimal adhesion of the specimen to the chuck, store the chucks at room temperature prior to use.



- Press the "**Cryobar**" button on the Main screen to activate it.

- The "**Cryobar**" button is highlighted in blue when the function is activated.

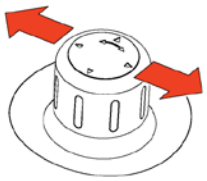
- To turn off the Cryobar function, press the highlighted "**Cryobar**" button again.

Trimming and Fine Section Thickness

The trimming and fine section thickness can be set in two ways:

Using the joystick

- Tilt the joystick either to the left or to the right to toggle between "**Fine**" and "**Trimming**" thickness settings.



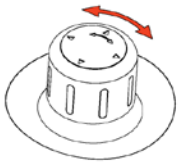
Fine Section Thickness

Trim Section Thickness

Note

The selected function is displayed highlighted on the Main screen.

- Turn the joystick knob left to decrease the selected thickness.
- Turn the joystick knob right to increase the selected thickness.



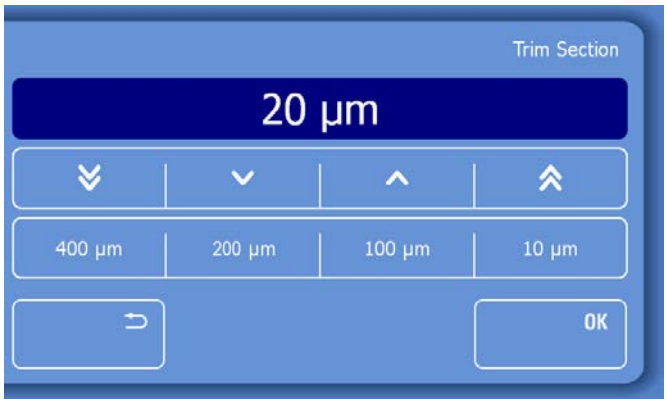
- For details of the thickness steps, refer to the Technical Specifications section.

Using the touch screen display

To set the trimming section thickness:

- Press the "**Trimming Thickness**" button on the Main screen.

- The Trim Section screen will be displayed.

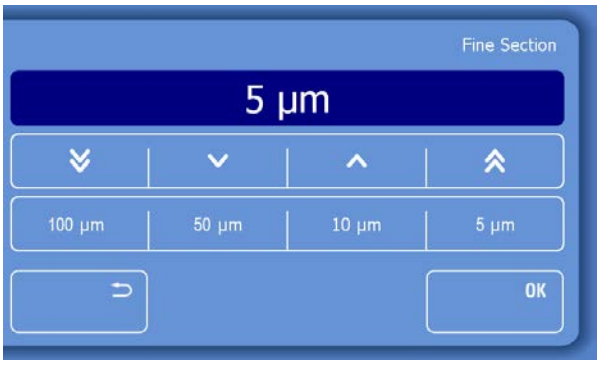


- Either select one of the pre-set values (400µm, 200µm, 100µm or 10µm) or adjust the value using the arrow keys.
- For details of the thickness steps, refer to the Technical Specifications section.
- Press "**OK**" to confirm the setting and to return to the Main screen.
- Press the "**Back**" button to exit back to the Main screen without saving the changes.

To set the fine section thickness:

Press the "**Fine Section Thickness**" button on the Main screen.

The Fine Section screen will be displayed.



- Either select one of the pre-set values (100µm, 50µm, 10µm or 5µm) or adjust the value using the arrow keys.
- For details of the thickness steps, refer to the Technical Specifications section.
- Press "**OK**" to confirm the setting and to return to the Main screen.
- Press the "**Back**" button to exit back to the Main screen without saving the changes.

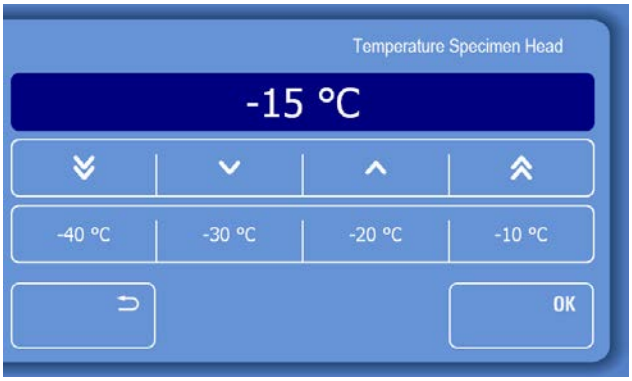
Temperature

Both the specimen head and the blade holder are actively cooled and the user can adjust either temperature independently.

Setting the temperature of the specimen head

- Press the "**Specimen Head Temperature**" button on the Main screen.

- The Temperature Specimen Head screen will be displayed.



- Either select one of the pre-set temperatures (-40°C, -30°C, -20°C or -10°C) or adjust the temperature using the arrow keys.
- Press "**OK**" to confirm the setting and to return to the Main screen.
- Press the "**Back**" button to exit back to the Main screen without saving the changes.

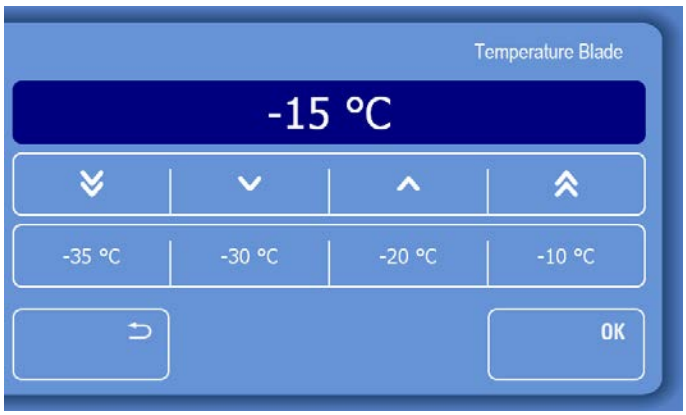
Note

The new set temperature is displayed in white on the Main screen until the temperature is reached.

Set the Blade Temperature

- Press the "**Blade Temperature**" button on the Main screen.

- The Temperature Blade screen will be displayed.



- Either select one of the pre-set temperatures (-35°C, -30°C, -20°C or -10°C) or adjust the temperature using the arrow keys.
- Press "**OK**" to confirm the setting and to return to the Main screen.
- Press the "**Back**" button to exit back to the Main screen without saving the changes.

Note

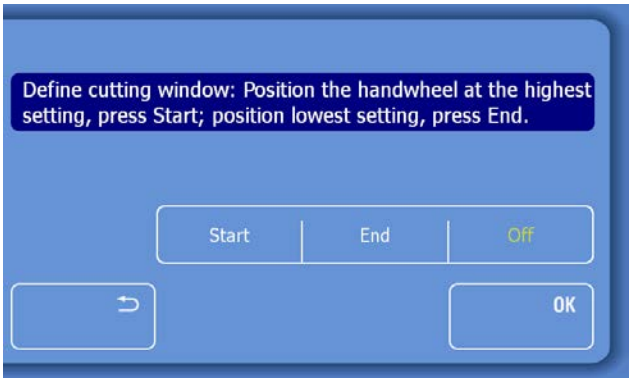
The new set temperature is displayed in white on the Main screen until the temperature is reached.

Cutting Window

The cutting window allows the user to customise this setting for each specimen.

- On the Main screen press the "**Cutting Window**" button.

- The Set Cutting Window screen will be displayed.



To set the lower limit of the cutting window

- Turn the handwheel so that the lower edge of the specimen is positioned slightly above the blade edge.
- Press the “Start" button.
- The lower limit should now be set and the "Start" button is highlighted in yellow.

To set the upper limit of the cutting window

- Continue turning the handwheel clockwise so that the upper edge of the specimen is positioned just below the blade edge.
- Press the “End" button.
- The "End" button is highlighted in yellow.

Next Steps

- Press "OK" to confirm the setting and to return to the Main screen.
- Press the "Back" button to exit back to the Main screen without saving the changes.
- Press the “Start/Stop” button on the right control panel twice to start sectioning.

Note

A cutting window should only be set during the downward stroke.

Select a Favourite

Favourites are user-definable, pre-selectable temperature settings for the specimen head and the blade holder.

To select one of the pre-set Favourites:

- Press the "**Favourites**" button on the Main screen.
- The Favourites sliding menu will appear.

- Press the desired favourite to select it.
- The sliding window disappears and the selected Favourite is highlighted in yellow.
- To program favourites, refer to the Setting Preferences – Favourites section.

Note

The sliding menu disappears after approximately 3 seconds if no Favourite is selected.

Vacutome and Cleaning Mode

The Vacutome system provides an active vacuum that aids in chamber cleaning and stretching of sections.

Note

The user sets the desired value depending upon the intended function (stretching or suction process), section thickness and the size of the specimen.

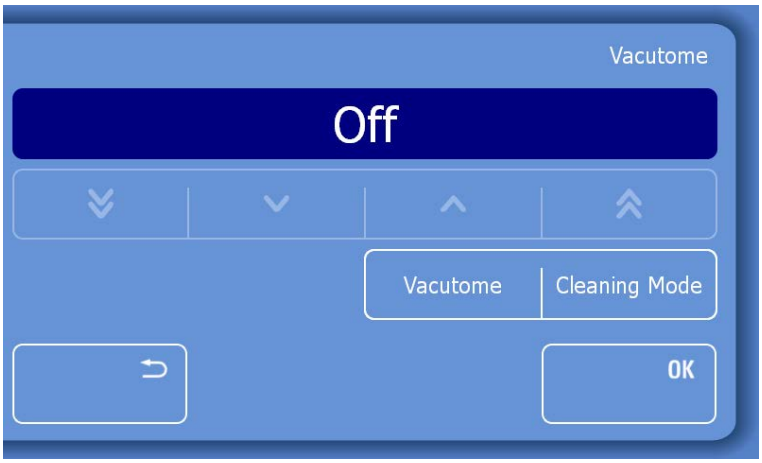
The vacuum applied for stretching sections and/or disposing of section waste is only active when within the cutting window. Outside of the cutting window, the selected vacuum is turned off by means of a valve.

After 10 minutes of inactivity the vacuum will automatically switch off. When activity resumes the vacuum will automatically switch on. The vacuum takes approximately 2 seconds to reach full efficiency.

The Vacutome system is provided with two different-length nozzles. The longer nozzle is optimized for use in specimen trimming and aids in keeping the Cryochamber clean. The shorter nozzle is optimized for use with the anti-roll plate in appropriately stretching specimens.

- Press the "**Vacutome**" button on the Main screen.

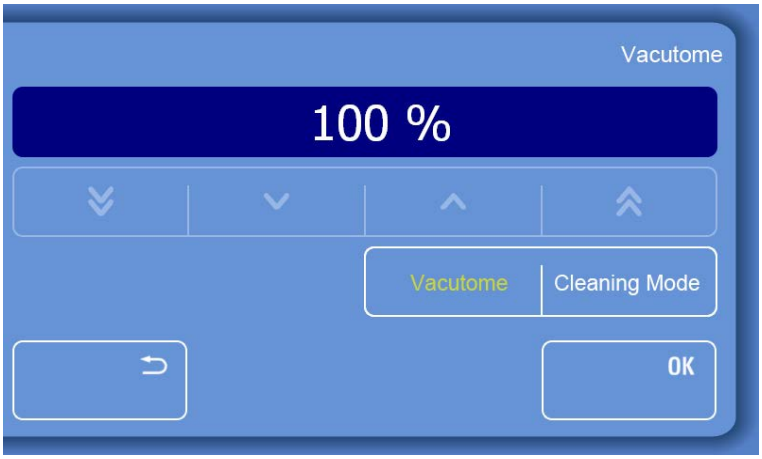
- The Vacutome screen will be displayed.



Activate the Vacutome

To activate the Vacutome:

- Press "**Vacutome**" to display the Vacutome settings screen.

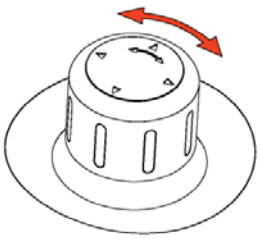


- Use the arrow keys to increase or decrease the Vacutome suction value - the default setting is 100%.
- Press "**OK**" to confirm the setting and to return to the Main screen.
- Press the "**Back**" button to exit back to the Main screen without saving the changes.

Note

The Vacutome suction setting can also be adjusted by turning the Joystick as long as the Vacutome screen is displayed.

- Turn the Joystick to the left to decrease the suction value in 1% increments.
- Turn the Joystick to the right to increase the suction value in 1% increments.



Note

When the Vacutome is activated the "Vacutome" button on the Main screen will appear yellow.

Turning off the Vacutome function

- Press the yellow "**Vacutome**" button on the Main screen.
- Press the yellow "**Vacutome**" button on the Vacutome screen - the button will now appear white.

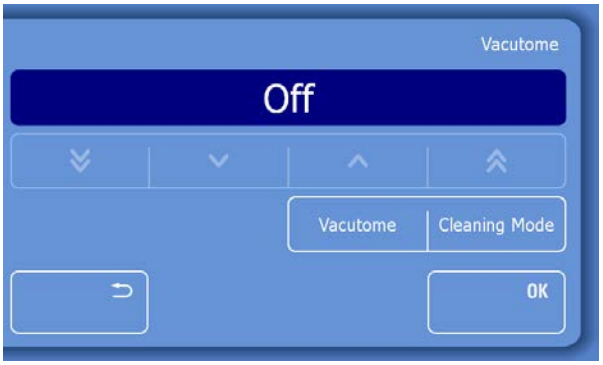
- Press "**OK**" to confirm the setting and to return to the Main screen.
- Press the "**Back**" button to exit back to the Main screen without saving the changes.

Turning On the cleaning mode

To activate the cleaning mode:

- Press the "**Vacutome**" button on the Main screen.

- The Vacutome screen will be displayed.



- Press "**Cleaning Mode**" to activate this mode.

Note

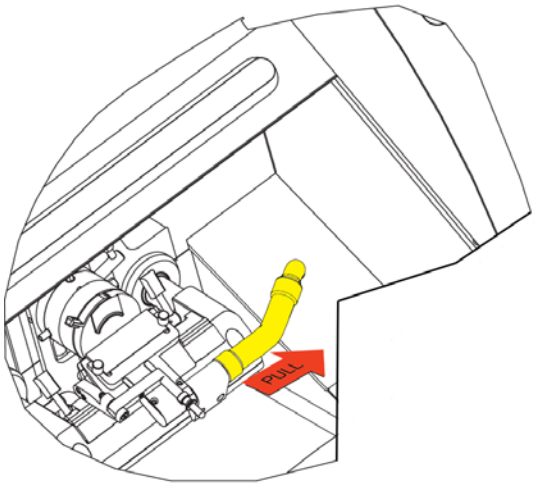
The "Cleaning Mode" button turns yellow to indicate that this function is now activated.

The cleaning mode will switch of automatically after 10 minutes.

- Press "**OK**" to confirm the setting and to return to the Main screen.
- Press the "**Back**" button to exit back to the Main screen without saving the changes.
- To clean the cooling chamber, remove the Vacutome hose from the nozzle plug and then:

I. Wash and dry the cooling chamber using a cloth or paper towel, and appropriate cleaning agents.

II. Attach the hose extension (standard accessory 435560) to the Vacutome hose and vacuum clean the small parts. The hose extension provides enough length to reach all parts of the cooling chamber.



Turning Off the cleaning mode

To deactivate the cleaning mode:

- Press the yellow "**Vacutome**" button on the Main screen.
- Press the yellow "**Cleaning Mode**" button on the Vacutome settings screen - the button will now appear white.
- Press "**OK**" to confirm the setting and to return to the Main screen.
- Press the "**Back**" button to exit back to the Main screen without saving the changes.
- Re-attach the Vacutome hose to the blade holder.

Height Adjustment

The CryoStar NX70 cryostat has an electronic height adjustment which enables the user to raise or lower the cryostat to a convenient working height.

Ensure that the area to the rear of the CryoStar is free of obstructions to avoid damaging the instrument when the height adjustment is in use.

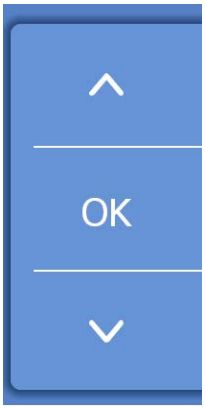
Do not lean on the instrument when the height adjustment is carried out to avoid damage to the instrument.

Ensure that the power cord is free to move.

To adjust the height of the cryostat:

- Press the "**Height**" button on the touch screen.

- An adjustment menu will appear.



- Use the arrow buttons to raise or lower the cryostat to the required level.
- Press "**OK**" to confirm the adjustment. The sliding menu disappears after approximately 3 seconds if "**OK**" is not pressed.

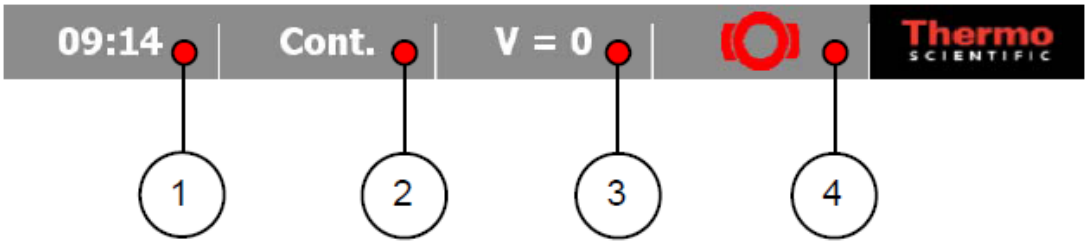
Note

Continuous use of the height adjustment for longer than 1 minute will result in a pause of 9 minutes before the function can be used again.

Multi-Function Bar

The multi-function bar provides the user access to useful information and functions.

The Multi-Function Bar is located at bottom of the Main screen.



1	Time / Date / Service Message	3	Multifunction Button
2	Cutting Mode	4	Brake

Time and Date

To toggle between Time or Date indication:

Press the "Time / Date" button.

Note

When there is an outstanding service message, a wrench symbol is show instead of the Date / Time button.

- Press the Wrench symbol to see the service message.

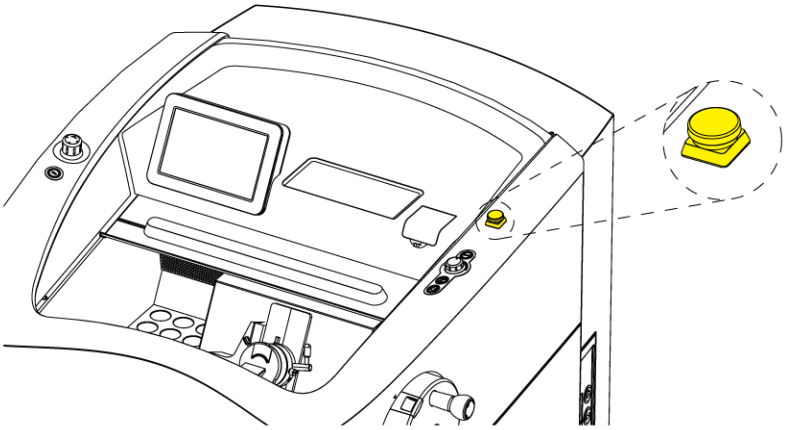
Cutting Mode Selection

The cutting mode selection aids in utilizing the motorized cutting function. Four cutting modes for the motorized cutting drive are available.

- Single
- Interval
- Multi-Stroke
- Continuous-Stroke

Note

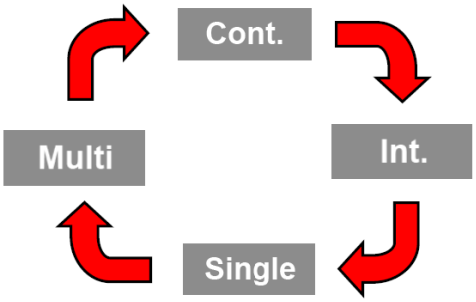
In case of emergency, the motor drive can be stopped in every operating mode by pressing the emergency stop button or the emergency stop in the (optional) foot pedal. To continue sectioning pull out the emergency stop button or unlock the emergency stop in the foot pedal.



The cutting mode can be changed in three ways. Via the Main screen, in the cutting mode submenu or via the mode button on the right touch panel.

To switch between the cutting modes using the Main screen:

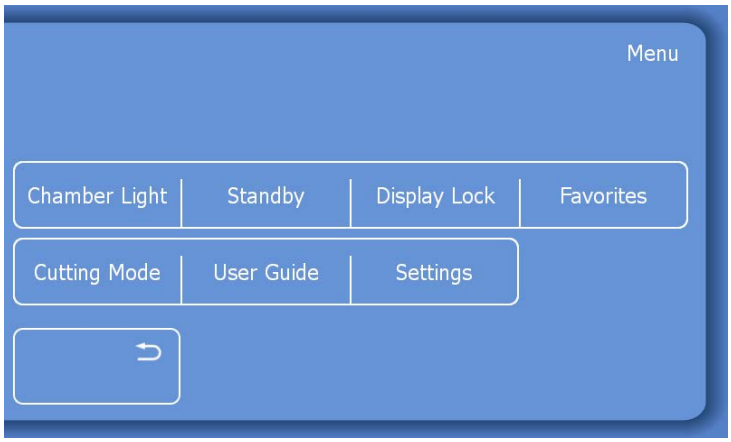
- Press the "**Multi-Function**" button on the Main screen to switch between the cutting modes.



To switch between the cutting modes using the cutting mode submenu:

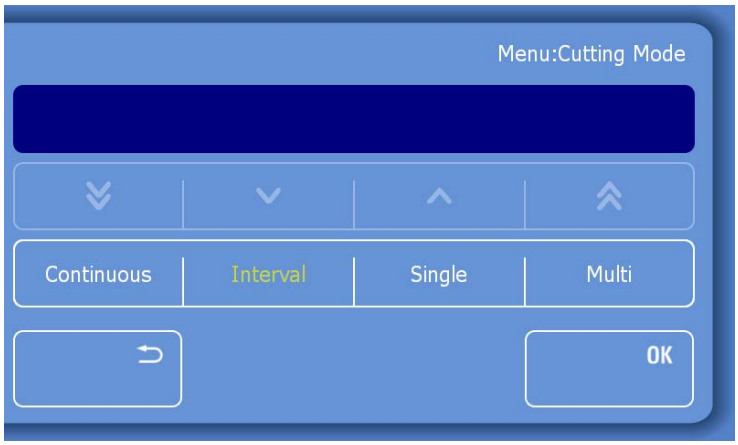
- Press the "**Menu**" button on the Main screen.

- The Menu screen will be displayed.



- Press the "**Cutting Mode**" button.

- The Menu: Cutting Mode screen will be displayed.



- Press on the desired cutting mode (Continuous, Interval, Single or Multi).
- Press "**OK**" to confirm the setting and to return to the Main screen.
- Press the "**Back**" button to exit back to the Main screen without saving the changes.

To switch between the cutting modes using the "Mode Selection" button on the right touch panel:

- Press the mode selection button on the left touch panel.

- The actual cutting mode is displayed on the multi function bar on the Main screen.

Mode: Single

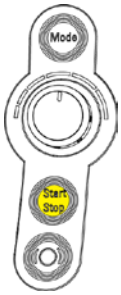
By using this mode, a single full cutting movement is carried out with the specimen head stopping in the down position.

- Press either the "Start/Stop" button twice or press the foot pedal twice to carry out a single cutting stroke.

Mode: Interval

The cutting movement is carried out as long as the Start/Stop button or the foot pedal is pressed. The movement can be stopped in any position.

- Press either the "Start/Stop" button twice or press the foot pedal twice.
- Hold the "Start/Stop" button or the foot pedal on the second press.
- Release either the "Start/Stop" button or the foot pedal to stop cutting immediately.



Mode: Multi-Stroke

A pre-set number of strokes will be carried out.

Note

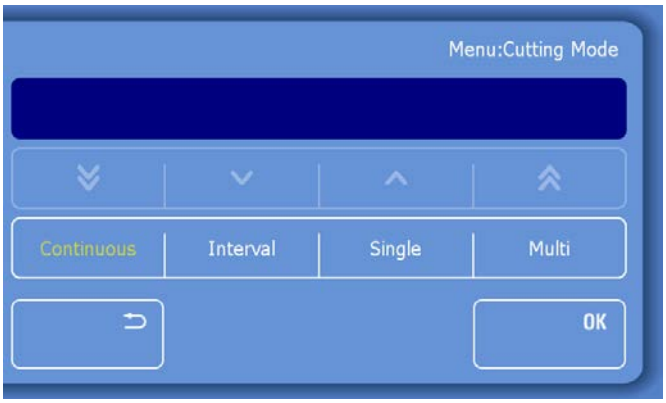
When "Multi-Stroke" is first selected, the default number of strokes is two.

To set the number of strokes for the Multi-Stroke Mode:

- Press the "Menu" button on the Main screen.

- The Menu screen will be displayed.
- Press the "Cutting Mode" button.

- The Menu: Cutting Mode screen will be displayed.



- Press the "Multi" button to highlight it.

Use the arrow keys to select the number of strokes.

Note

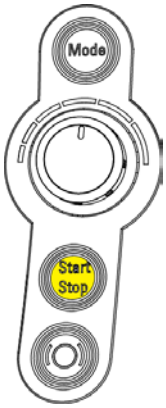
The default number of cutting strokes is 2.

The minimum number of strokes is 2, the maximum number is 99.

- Press "OK" to confirm the setting and to return to the Main screen.
- Press the "Back" button twice to exit back to the Main screen without saving the changes.

To carry out Multi-Stroke sectioning:

- Set the number of strokes as described above.
- Press either the "Start/Stop" button twice or press the foot pedal twice to start sectioning.



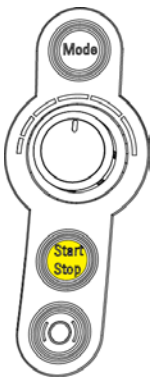
- The cutting movement stops automatically after the pre-set number of strokes have been carried out.

Mode: Continuous-Stroke

An unlimited number of strokes will be performed when this mode is selected.

To start the continuous-stroke mode:

- Press either the "Start/Stop" button twice or press the foot pedal twice.



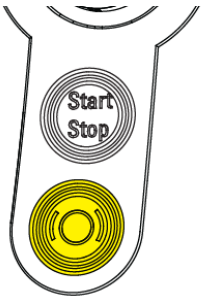
- To stop the continuous-stroke, press the "Start/Stop" button or the foot pedal again.
- The cutting drive will stop after the next full downward stroke

Handwheel Brake

Always activate the brake when manipulating the blade/knife and specimen. For your personal safety, also activate the handwheel mechanical brake.

To activate the Handwheel Brake:

Press the "Brake" button on the Main screen or press the "Brake" button on the right touch pad.

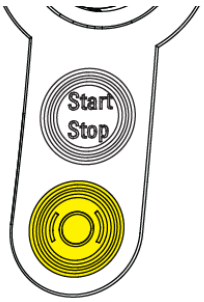


Note

The "Brake" button is highlighted if the handwheel brake is activated.

To deactivate the Handwheel Brake:

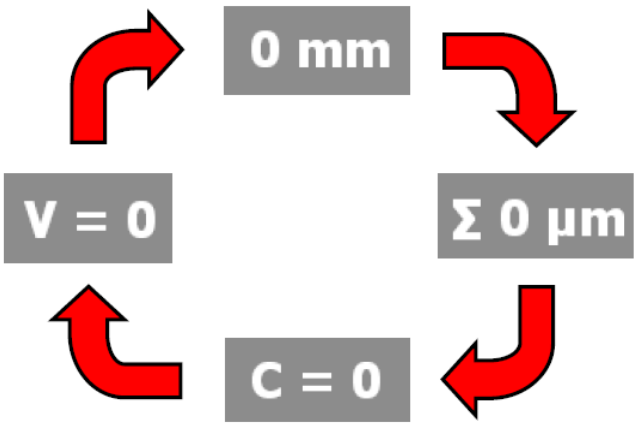
Press the red highlighted "Brake" button on the Main screen or the "Brake" button on the right touch pad.



Multi-Function Button

The Multi-Function button provides to the user additional information on the sectioning process.

- Four different indications can be displayed by pressing this button.



Remaining Distance to the Front End Position

This button indicates the remaining distance to front end position of the blade holder.

Section Thickness Sum

This button indicates the total section thickness sum of the actual mounted specimen.

- To reset this value, press this button and keep it pressed for approximately 3 seconds.

Note

It is recommended to reset the section thickness sum if a new specimen is mounted in the specimen head for sectioning.

Motorized Cutting Drive

The motorized cutting drive facilitates routine work and ensures a steady cutting speed even for hard specimens.

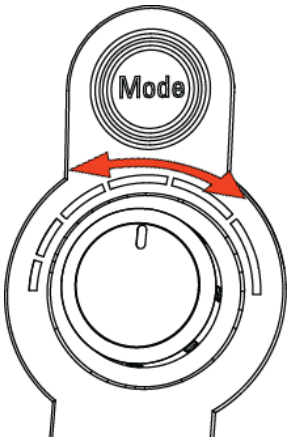
When using the motorized cutting drive the hand wheel is controlled automatically.

Setting the Cutting Speed

To set the speed at which motorized cutting drive will operate:

- Select the Speed settings on the multi-function bar on the Main screen.

- The speed can be varied from 0 to 100 using the knob on the right hand site of the instrument.
- Turning the knob to the left decreases the speed; turning to the right increases the speed.



Note

The selected speed will be used in the cutting window. Outside of the cutting window a higher return speed determined by the system is used.

- Use either the operating controls or the foot pedal (if fitted) to turn on/off the drive.
- The cutting speed can be varied to allow it to better suit to the properties of the specimen.

Setting a cutting speed too high in combination with a high section thickness, may result in a warning screen.

Section Counter

The section counter adds up the number of the produced sections. After each downward movement of the specimen head, the number on the section counter increases by 1.

To reset the section counter:

- Press the Section Counter button for approximately 3 seconds to reset it to zero.

Menu

The "Menu" button provides access to submenus for adjustments, settings and the user guide.

To enter the Menu screen:

- Press the "**Menu**" button.

- The Menu screen will be displayed.

- Press the "**Back**" button to return to the Main screen.
- Press the desired function button to access the respective submenu.

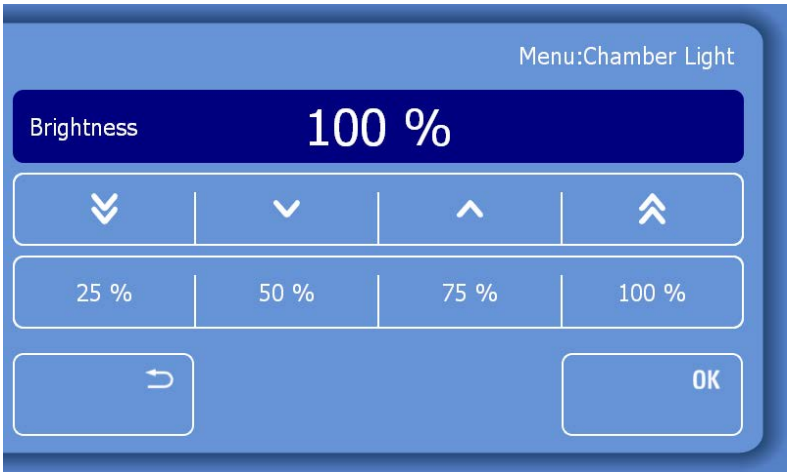
Chamber Light

To adjust the brightness of the chamber light:

- Press the "**Menu**" button on the Main screen.

- The Menu screen will appear.
- Press the "**Chamber Light**" button.

- The Menu: Chamber Light screen will appear.



- Select one of the pre-set values (25%, 50%, 75% or 100%) or adjust the brightness using the arrow keys.
- Press "**OK**" to confirm the setting and to return to the Main screen.
- Press the "**Back**" button twice to exit back to the Main screen without saving the changes.

Note

The chamber illumination can be adjusted; from the lowest (1%) to the highest (100%) level.

Standby

When the CryoStar is switched on but has been inactive for 1 hour, it will automatically enter the Standby mode. After 3 more hours, the instrument enters the sleep mode. The cryostat maintains the user adjusted temperatures for both blade holder and specimen head during Standby. When the cryostat enters the sleep mode, the temperature for the blade holder is set to -10°C and for the specimen head to -10°C.

In Standby mode the chamber light switches off and the touchscreen display will dim.

To enter the Standby-mode:

- Press the "**Menu**" button on the Main screen.

- The Menu screen will appear.
- Press the "**Standby**" button to switch the instrument immediately into the Standby mode.

- Press the touchscreen to exit the Standby or Sleep mode.

Display Lock

Note

The display lock is used to avoid unwanted changes to the settings of the cryostat.

To activate the Display Lock:

- Press the "Menu" button on the Main screen.

- The Menu screen will appear.
- Press “Display Lock” to activate the display lock immediately.

To deactivate the Display Lock:

- Press the "Lock" Symbol three times.

Note

The symbol changes its colour (red - yellow - green) each time it is pressed.

Favourites

Favourites are a set of pre-set values for the specimen head and blade temperature.

The user can program three favourites to allow quick selection of the set of temperatures most often used.

Note

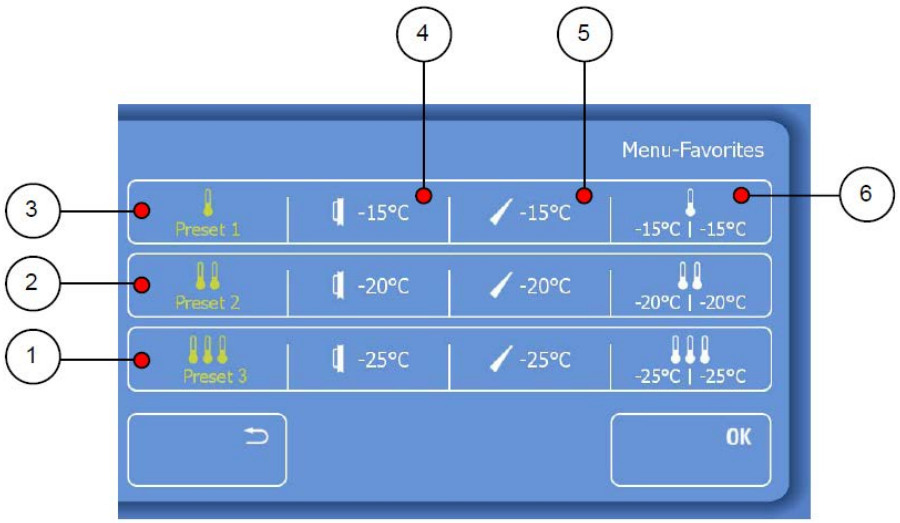
Whenever a temperature setting is altered the cryostat will require a period of time to reach the set temperature. Observe the readings on the display and begin sectioning when the pre-set value is reached.

To program Favourites:

- Press the "Menu" button on the Main screen.

- The Menu screen will appear.
- Press “Favourites” to enter the menu.

- The Menu: Favourites screen will appear.



1	Pre-set 3 Title Box	4	Specimen Head Temperature
2	Pre-set 2 Title Box	5	Blade Temperature
3	Pre-set 1 Title Box	6	Alternative Indication

Each favourite setting is divided into four sections (from left to right):

- Favourite name (displayed on the main screen if highlighted).
- Specimen head temperature.
- Blade temperature.
- Alternative indication (displayed on the main screen if highlighted).

To change the Favourite name:

- Press the name of the pre-set to be altered.
- The Keyboard screen will appear.

- Use the upper left button to toggle between capital letters, small letters and numbers.

- Erase letters or numbers by pressing the "Delete" button.

- Type in the new name for the favourite (for example “Muscle” / “Fat” / “Bone”).
- Press "OK" to confirm the setting and to return to the Favourites menu.
- Press the "Back" button to exit back to the Favourites menu without saving the changes.

Note

If the value for either the specimen head temperature or blade temperature is changed on the Main Screen, the favourite is no longer displayed but settings are still stored in memory.

User Guide

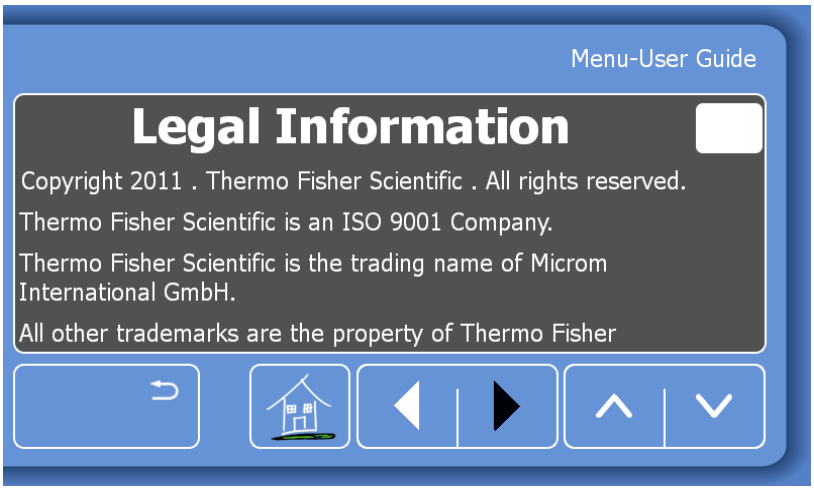
This function contains an electronic version of this user guide.

To activate the User Guide:

- Press the "Menu" button on the Main screen.

- The menu screen will appear.
- Press the “User Guide” button.

- The Menu: User Guide screen will appear.



- Use the scroll bar on the right side or the two arrow keys to scroll through the manual.

- Press the "Home" button to return to the first page of the User Guide.

- Use the arrow keys to browse forward or backwards through the User Guide.

- Press the "Back" button to return to the settings menu screen.
- Press the "Back" button twice to return to the Main screen.

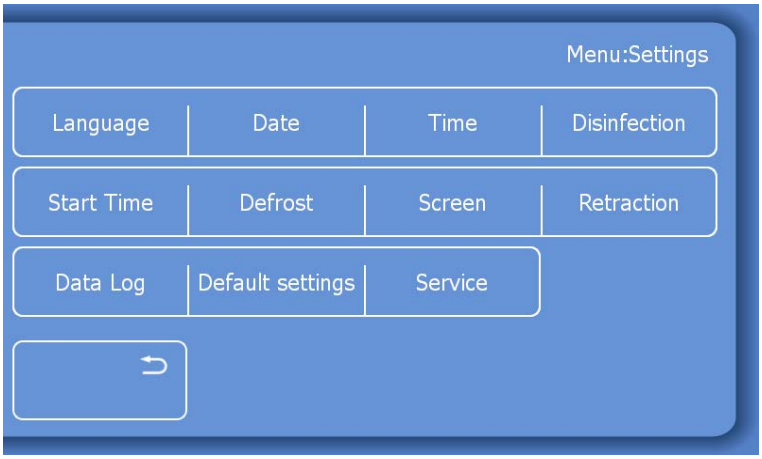
Settings Menu

To enter the Settings menu:

- Press the "Menu" button on the Main screen.

- The menu screen will appear.
- Press the "Settings" button.

- The Menu: Settings screen will appear.



- Press the "Back" button to return to the Menu screen.
- Press the "Back" button twice to return to the Main screen.

Language

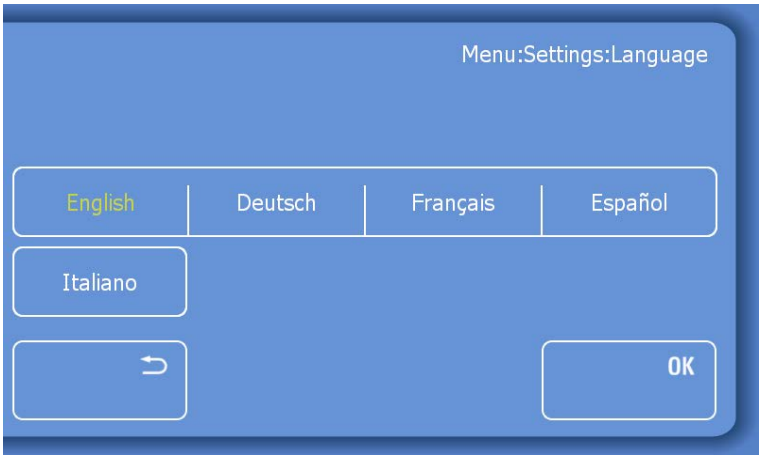
To set the Language:

- Press the "Menu" button on the Main screen.

- The menu screen will appear.
- Press the "Settings" button.

- The Menu: Settings screen will appear.
- Press the "Language" button.

- The Menu: Settings: Language screen will appear.



- Select the desired language by pressing the respective button.
- Press "OK" to save the changes and to return to the Main screen.
- Press the "Back" button three times to return to the Main screen without saving the changes.

Time and Date

Note

If a Defrost or Cold D cycle is running, the cycle must finish before the time or date can be adjusted.

- Press the "Menu" button on the Main screen.

- The Menu screen will be displayed.
- Press the "Settings" button.

- The Settings Menu screen will be displayed.

Set the Date

- Press the "Date" button.

- The Menu: Settings: Date screen will appear.

Set the Day

- Press the "Day" button to highlight it.

- Use the arrow keys to select the desired day and date.

Set the Month

- Press the "Month" button to highlight it.

- Use the arrow keys to select the desired month.

Set the Year

Press the "Year" button to highlight it.

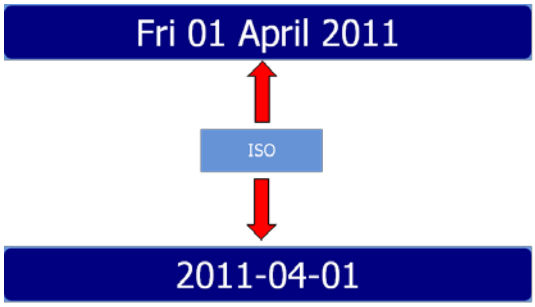
Use the arrow keys to select the desired year.

Press "OK" to confirm the setting and to return to the Main screen.

Press the "Back" button three times to exit back to the Main screen without saving the changes.

Change to ISO format

Press the "ISO" button to toggle between the full date format and the ISO format.



- Press "OK" to confirm the setting and to return to the Main screen.
- Press the "Back" button three times to exit back to the Main screen without saving the changes.

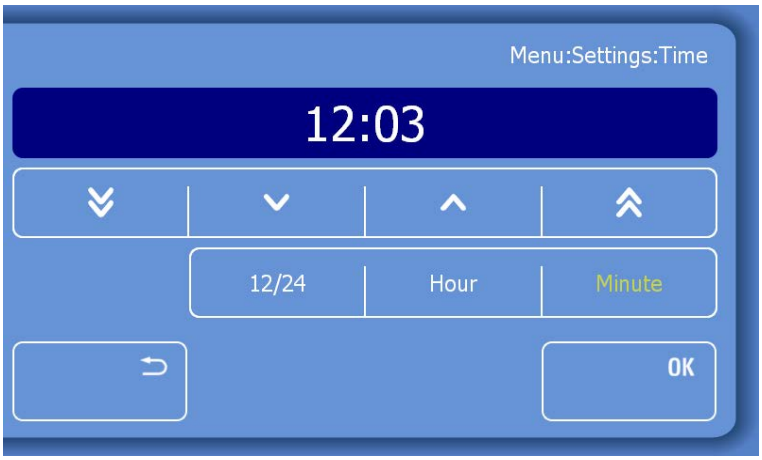
Setting the Time

- Press the "Menu" button on the Main screen.

- The Menu screen will be displayed.
- Press the "Settings" button.

- The Menu: Settings screen will appear.
- Press the "Time" button.

- The Menu: Settings: Time screen will be displayed.



Set the minutes

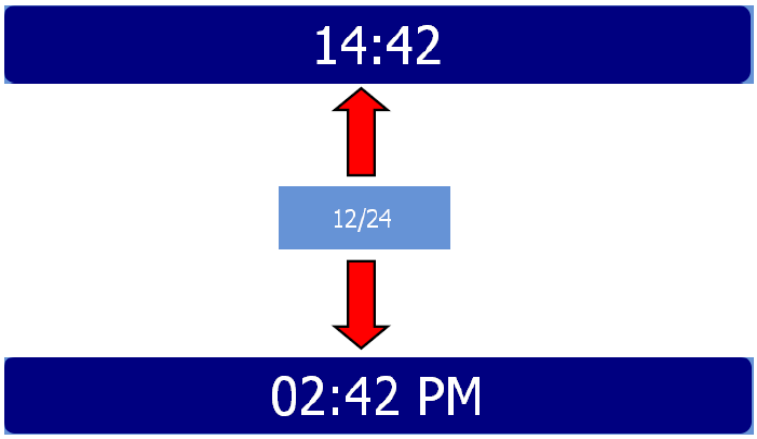
- Press the "Minute" button to highlight it.
- Use the arrow keys to select the desired minute.

Set the hour

- Press the "Hour" button to highlight it.
- Use the arrow keys to select the desired hour.

Set the time format

- Press the "12/24" button to toggle between the 12 and 24 hour modes.



Note

The 12/24 button is highlighted in yellow if the 12h mode is active.

- Press "OK" to confirm the setting and to return to the Main screen.
- Press the "Back" button three times to exit back to the Main screen without saving the changes.

Start Time

The Start Time is the time were the cryostat switches from the sleep mode to the Active mode on every programmed day.

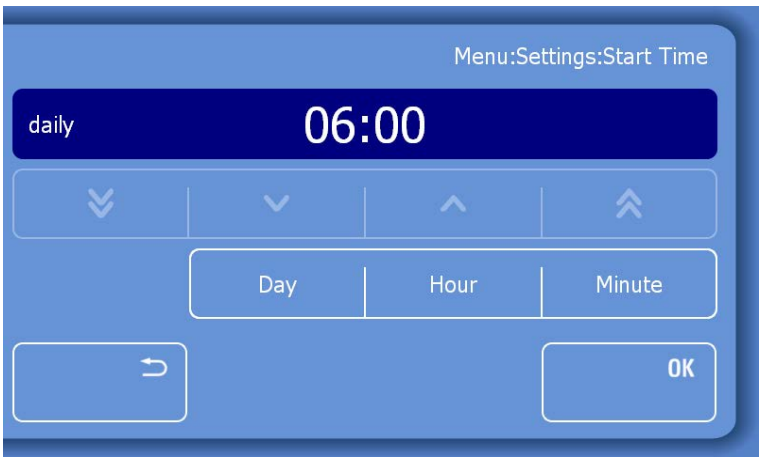
To set the Start Time:

- Press the "Menu" button on the Main screen.

- Press the "Settings" button.

- The Menu: Settings screen will appear.
- Press the "Start Time" button.

- The Menu: Settings: Start Time screen will appear.



- In this menu, the user can specify the day(s) and the exact time when the cryostat should start automatically.

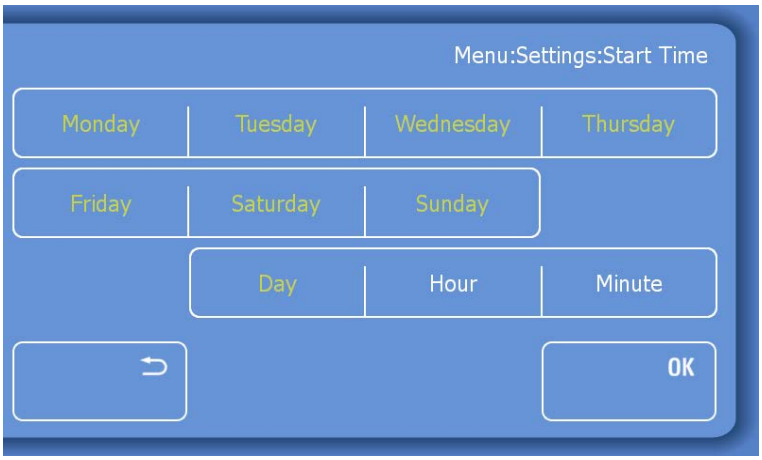
Note

The pre-set start time is from Monday to Sunday at 06:00 a.m.

To set the Day:

- Press the “Day” button.

- The Menu: Settings: Start Time screen will appear.



Note

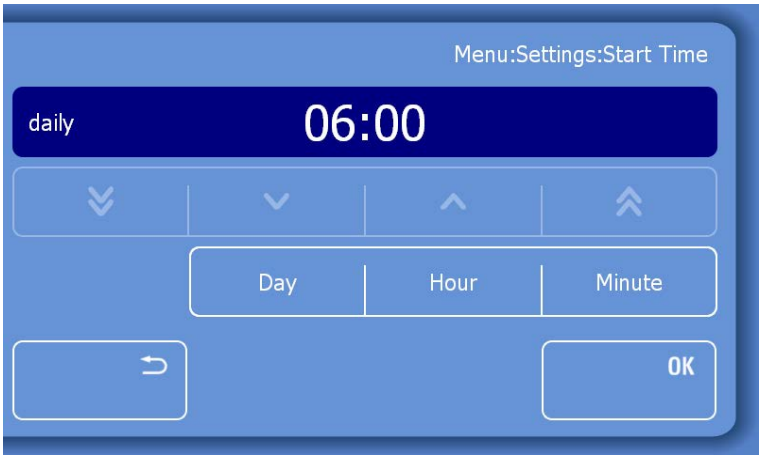
The default setting is every day, from Monday to Sunday.

- Press the weekdays on which the cryostat should not start automatically.

Note

Deactivated weekdays will turn white.

- Press the "Hour" and "Minute" button and use the arrow keys to adjust the time at which the cryostat should start.



- When all settings have been done, press “OK” to save the settings and to return to the Main screen or press the "Back" button three times to return to the Main screen.

Defrost

Inevitably, when working on the microtome the dry cold air of the Cryochamber mixes with the warm humid air outside the chamber. Frost forms on the finned evaporator. The increasing thickness of the frost reduces the efficiency of the evaporator. For this reason, the daily defrosting is necessary.

During defrosting, remove the specimens from the Cryochamber, as the temperature inside the chamber will increase. Do not leave or store specimens inside the cryostat over a long period of time. Due to a power failure or other unexpected malfunctions of the instrument, the specimen might be damage.

Note

Set the time of the daily defrosting on the control panel. The period of the defrosting takes approximately 1 hour and varies according to the thickness of the frost.

Possible frost build-up on the microtome or on the knife carrier is not removed by defrosting the instrument. However, the frost recedes after defrosting as now the evaporator is fully efficient again.

In addition, the instrument is equipped with an immediate defrosting function. The immediate defrosting takes approximately 90 minutes.

Immediate Defrosting

To start the defrosting immediately:

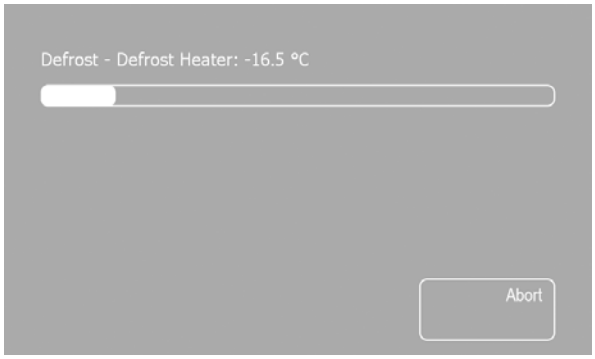
- Press the "Menu" button on the Main screen.

- The Menu screen will be displayed.
- Press the "Settings" button.

- The Menu: Settings screen will appear.
- Press the "Defrost" button.

- The Menu: Settings: Defrost screen will be displayed.

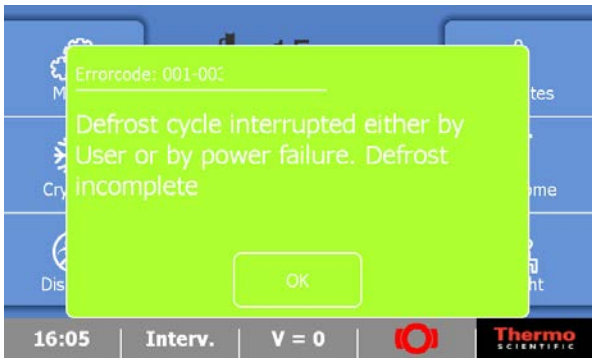
- Press the "Back" button three times to return to the Main screen without starting the defrosting.
- Press the "Now" button to start the defrosting immediately.
- The Defrosting screen will appear, showing the progress of the defrosting and the actual temperature of the evaporator.



To abort the defrosting

- Press the "Abort" button on the Defrosting progress screen.

- The Main screen will appear, displaying an error message.



Press the "OK" button to remove the error message.

Note

The Defrosting cycle can be aborted at any time.

Programming the Daily Defrost Cycle

Note

The time for the daily defrost cycle should be programmed outside of the normal working hours to avoid delays in the workflow.

To program the Daily Defrost Cycle:

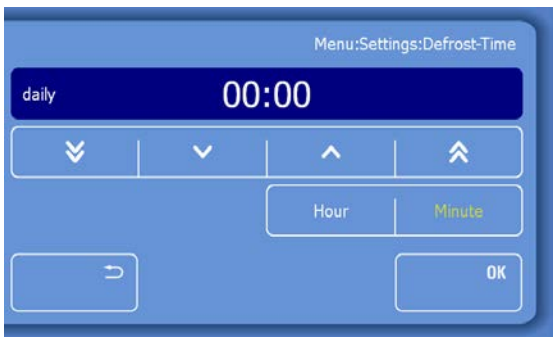
- Press the "Menu" button on the Main screen.

- The Menu screen will be displayed.
- Press the "Settings" button.

- The Menu: Settings screen will appear.
- Press the "Defrost" button.

- The Menu: Settings: Defrost screen will be displayed.

- Press the "Time" button twice.
- The Menu: Settings: Defrost-Time screen will appear.



Note

The standard setting for the daily defrost cycle is daily at 00:00 a.m.

- To change the standard setting, press the "Hour" and / or the "Minute" button.

- Adjust the time by using the arrow keys.
- Press the "OK" button to confirm your settings.
- Press the "Back" button three times to return to the Main screen.

Screen

The brightness of the Screen can be adjusted.

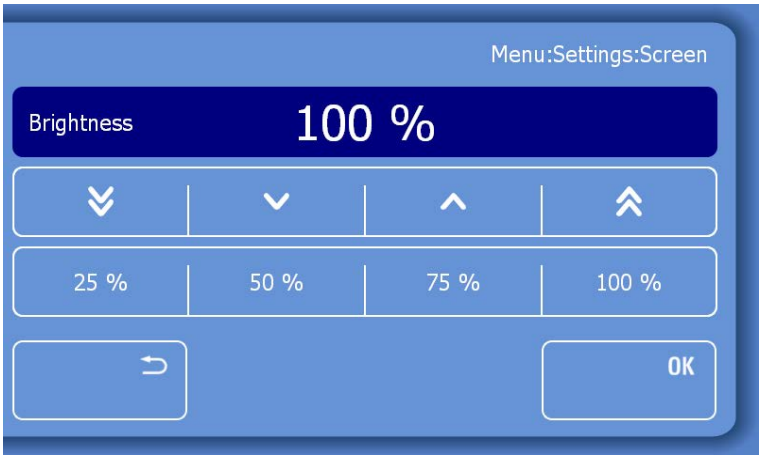
To set the Screen brightness:

- Press the "Menu" button on the Main screen.

- The Menu screen will be displayed.
- Press the "Settings" button.

- The Menu: Settings screen will appear.
- Press the "Screen" button.

- The Menu: Settings: Screen will be displayed.



- Select one of the pre-set values (25%, 50%, 75% or 100%) or adjust the brightness using the arrow keys.
- Press "OK" to confirm the setting.
- Press the "Back" button three times to return to the Main screen without saving the changes.

Note

The chamber illumination can be adjusted; from the lowest (1%) to the highest (100%) levels.

Retraction

If required, the Retraction function can be turned off.

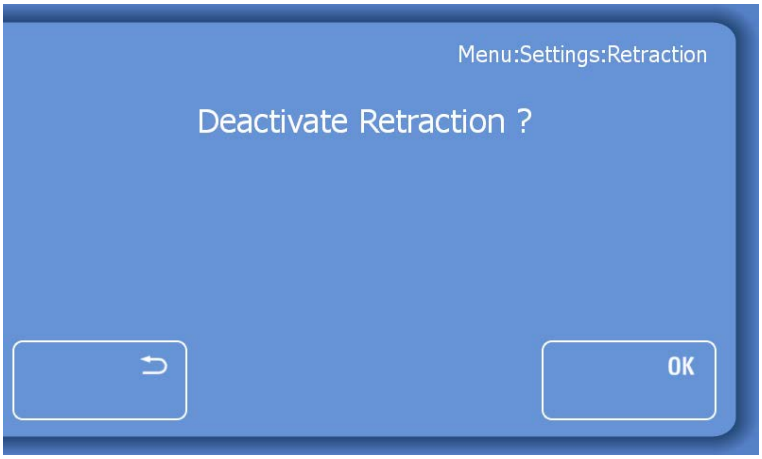
To toggle the retraction on or off:

- Press the "Menu" button on the Main screen.

- The Menu screen will be displayed.
- Press the "Settings" button.

- The Menu: Settings screen will appear.
- Press the "Retraction" button.

- The Menu: Settings: Retraction screen will be displayed.



- Press the "OK" button to turn off the Retraction and to return to the Main screen.
- Press the "Back" button three times to return to the Main screen without saving the changes.

To turn on the Retraction:

- Enter the Retraction menu screen as described above.
- Press the OK" button on the Menu: Settings: Retraction screen to turn on the Retraction and to return to the Main screen.

- Press the "Back" button three times to return to the Main screen without saving the changes.

Data Log

The Data Log records all events and error messages on the cryostat. The Data Log file can be exported to a USB-Stick for Service purposes in case of a malfunction.

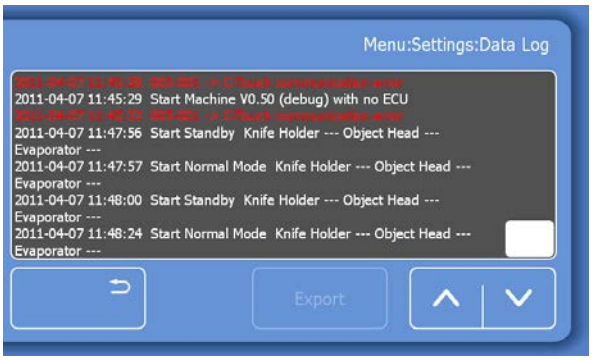
To enter the Data Log

- Press the "Menu" button on the Main screen.

- The Menu screen will be displayed.
- Press the "Settings" button.

- The Menu: Settings screen will appear.
- Press the "Data Log" button.

- The Menu: Settings: Data Log screen will be displayed.



- Use the scroll bar on the right side to scroll through the Data Log.
- Insert the USB-Stick.

Note

The "Export" button is now highlighted in white.

- Press the "Export" button to transfer the log data to the USB-Stick.
- Press the "Back" button three times to return to the Main screen.

Note

The Data Log file can only be exported to the USB-Stick supplied with the instrument.

Default Settings

If required, the instrument can be reset to the default settings.

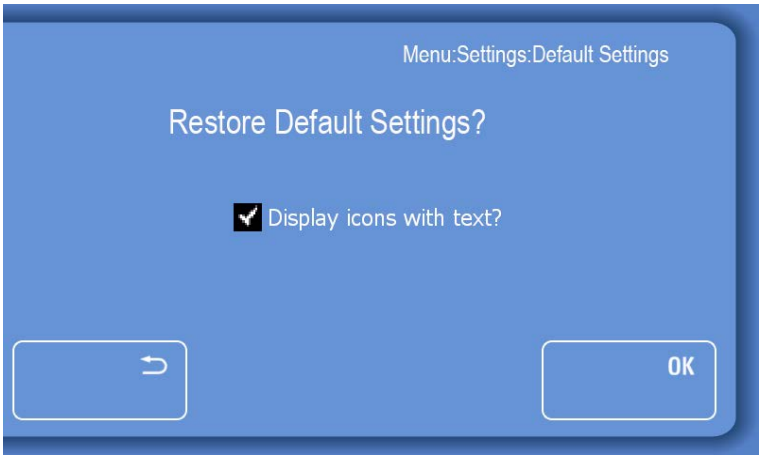
To restore the Default Settings:

- Press the "Menu" button on the Main screen.

- The Menu screen will be displayed.
- Press the "Settings" button.

- The Menu: Settings screen will appear.
- Press the "Default Settings" button.

- The Menu: Settings: Default Settings screen will be displayed.



- Press the "OK" button to restore the default settings and to return the Main screen.
- Press the "Back" button three times to return to the Main screen without restoring the default settings.

Note

A message appears on the Main screen to inform the user that the default settings have been restored. The message disappears after approximately 3 seconds.

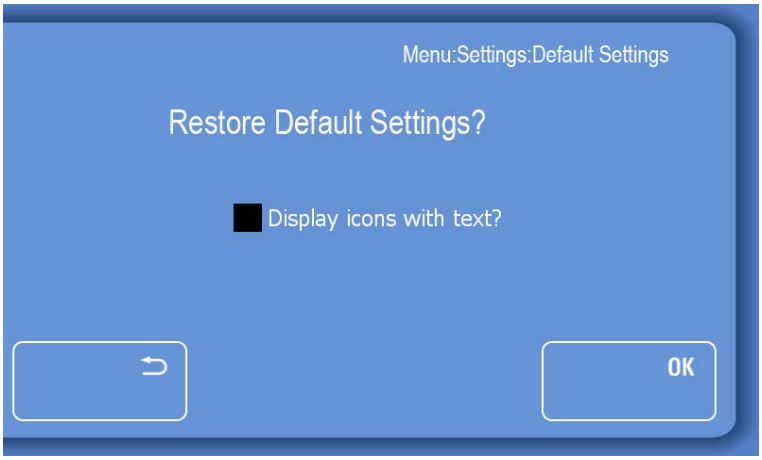
Display icons with text

The text underneath the Main screen icons can be switched off if required.

To switch the text off:

- Enter the Menu: Settings: Default Settings screen as described above.
- Uncheck the box and press the "Back" button three times to save the changes and to return to the Main screen.

Pressing "OK" will reset the instrument to the default settings.



Service

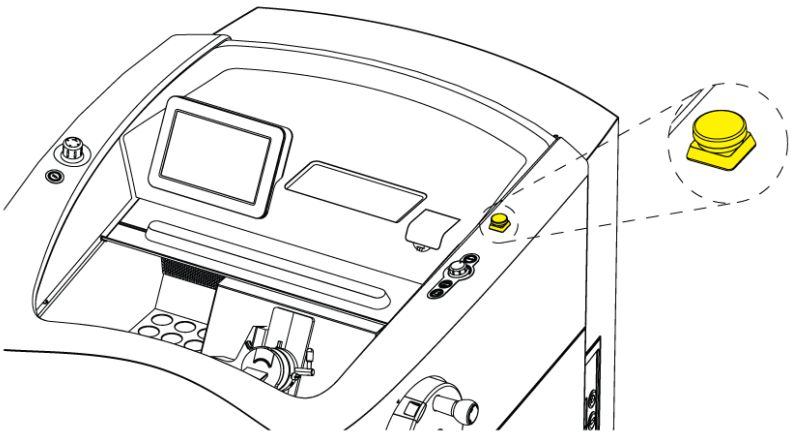
This submenu is only for service purposes. A password is required to enter the Service menu.

Emergency Stop

Standard Emergency Stop Function

To activate the emergency stop:

Press the red emergency stop button to immediately stop the motorized cutting drive.



Note

When the emergency stop is activated, the handwheel brake button in the display and the handwheel brake button on the right keypad light up and a red button are shown on the display.

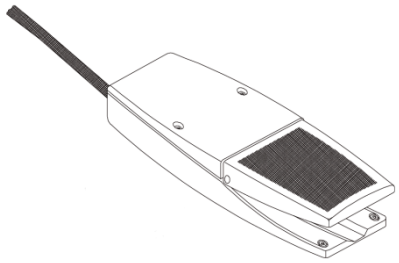
- To reset the emergency stop function pull out the red emergency stop button.
- The motorized cutting drive can then be started again.

Optional Foot Pedal Emergency Stop

A second emergency stop device is integrated into the optional foot pedal.

To activate the emergency stop using this method:

- Firmly step on the foot pedal to immediately stop the motorized cutting drive.



Notes

The button for the handwheel brake does not light up when the foot pedal emergency stop is activated, however the display will show a red button as per the standard emergency stop method.

This emergency stop device will remain active as long as the foot pedal is engaged.

- The motorized cutting drive can then be started again.

Cooling Processes

Specimen and blade holder cooling

Integrated refrigeration systems allow the blade holder to be cooled to -35°C and the specimen head to be cooled to -50°C. Specimen stations are located on the left side inside the Cryochamber.

These specimen stations passively cool specimens to a temperature of -30°C and can be used as a staging area.

The temperature range of the specimen head is adjustable between +10°C and -50°C.

The instrument is also equipped with an active Cryobar.

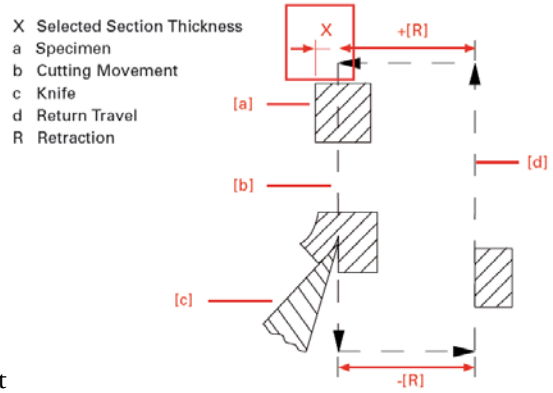
The Cryobar area actively cools down to -60°C.

Note

Use the heat extractor to accelerate the freezing of the specimen.

Sectioning Procedures

Cutting Movement and Retraction



Lateral view into instrument

Note

The retraction prevents the surface of the specimen being damaged during the return stroke of the specimen head.

The retraction can be switched off - see "Switching the Retraction On - Off".

The retraction distance required is 20 microns and cannot be changed.

Trimming and First Cuts

After the specimen orientation and the blade angle have been set, trimming can be carried out using the trimming function.

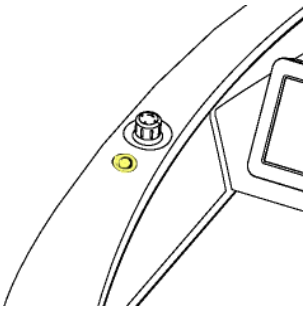
Trimming

- Make sure that the trimming thickness setting is selected by using the joystick.

Note

Trimming thickness is shown highlighted on the display.

- Turn the hand-wheel in a clockwise direction to begin trimming.
- Press the "Trim" button to move forward the blade holder by the pre-set trim value. The hand-wheel does not need to be turned for this function.

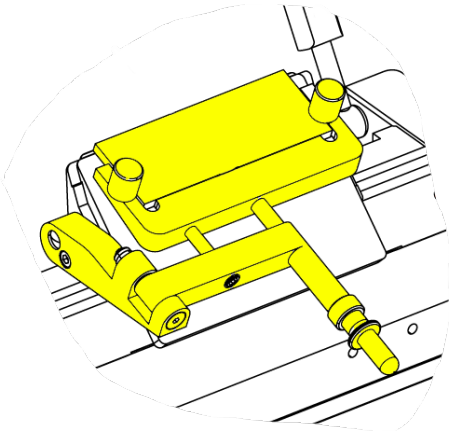


Note

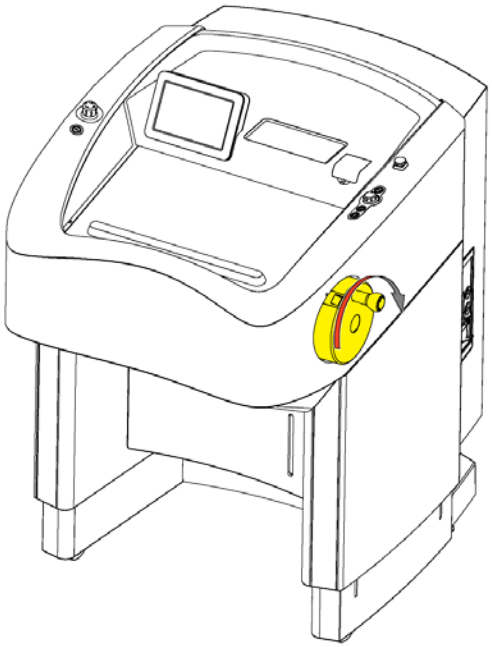
The blade holder will move forwards by the pre-set trim thickness value every cycle.

Sectioning and Taking Off Sections

- Set the desired section thickness - see Cutting Thickness
- Set the desired vacuum level - see Vacutome and Cleaning Mode.
- Place the anti-roll plate against the blade.



- Turn the hand wheel in a clockwise direction or use the motorized cutting drive to carry out sectioning.



Note

The section slides into the space between the blade and the anti-roll plate.

- Use the handle to move the anti-roll plate assembly away from the specimen.
- The section should remain on the clamping plate.
- Arrange specimen section gently with a brush.
- Transfer the specimen onto a glass microscope slide with help of adhesion forces.

Handwheel Brakes

Before placing or removing a specimen on the specimen head, or adjusting the orientation, always ensure that the mechanical handwheel brake is engaged. The cryostat is equipped with an electronic and a mechanical handwheel brake to prevent unintended movement of the specimen head.

Activating the brakes reduces the risk of being injured when adjusting the specimen head and/or the blade carrier.

When the instrument is turned off, the electronic hand wheel brake cannot be activated! Whenever the instrument is turned off, the mechanical hand wheel brake has to be activated.

For your personal safety, both electronic and mechanical hand wheel brakes must always be activated when working on the specimen head or blade carrier.

Electronic Handwheel Brake

To activate the electronic Handwheel Brake

- Press the "Brake" button on the Main screen.

- The "Brake" button is highlighted in red to indicate that the electronic brake is active.

Note

The motorized cutting drive cannot be started if the electronic Handwheel brake is activated.

To release the electronic Handwheel Brake

- Press the "Brake" button on the Main screen again.

- The "Brake" button is highlighted in white to indicate that the electronic Handwheel Brake is now deactivated.

Note

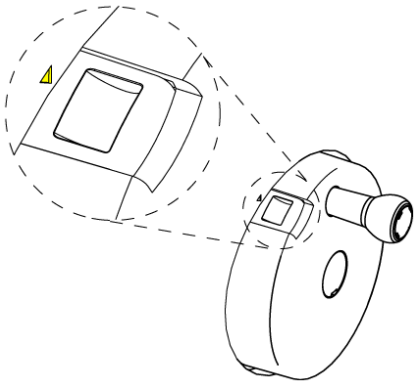
For safety reasons, the brake function is automatically activated after each stop of the motorized cutting drive.

Mechanical Handwheel Brake

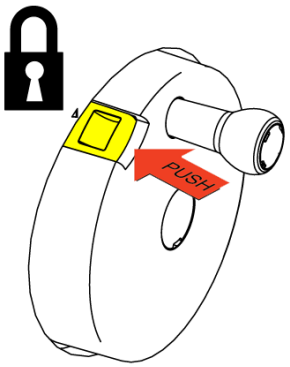
The mechanical handwheel brake acts as an additional safety device, especially when the instrument is turned off and the electronic handwheel brake is inoperable. The mechanical handwheel brake can be activated by a switch on the handwheel.

To activate the mechanical Handwheel Brake

- Bring the handwheel handle into a 12 o'clock position.



- The switch for the handwheel brake can now be pressed into the locked position.



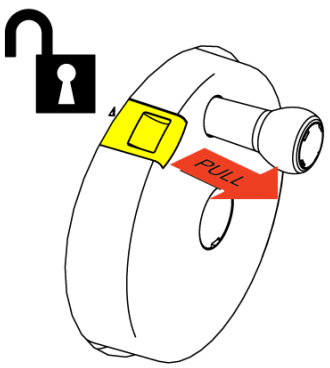
Note

If the switch is not in the correct position to lock, keep the switch pressed and move the handwheel slowly forward and backwards until the switch is locked.

Starting the cutting motor drive is not possible when the instrument is turned off or when the mechanical hand wheel brake is activated.

- To unlock the mechanical Handwheel Brake:

- Pull out the Handwheel Brake switch.



Cold D

Starting the Disinfection (Cold D) Function

The Cold D function allows the user to disinfect the Cryochamber with Sanosil®. Disinfection is either on-demand or pre-programmed.

The Cold D cycle takes 50 minutes to complete.

The window of the Cryochamber must always be closed before starting and during a Cold D cycle.

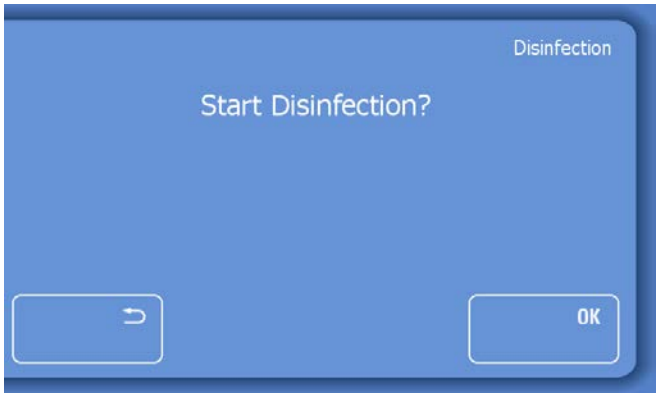
Note

If the window is not closed, the warning "Window not closed" will be displayed.

Before starting the Cold D function, remove all specimens from the Cryochamber

- Press the "Disinfect" button on the Main screen.

- The Disinfection screen will appear.

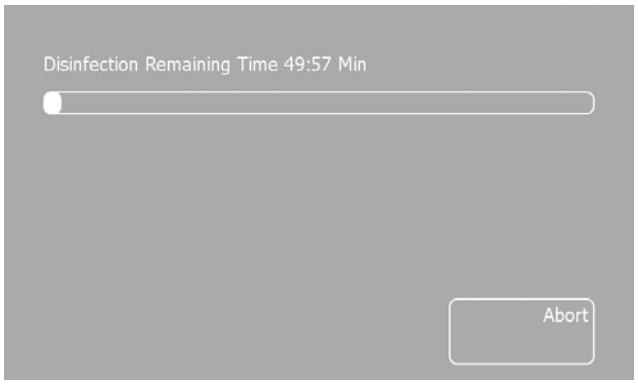


- Press "OK" to start the disinfection immediately.
- Press the "Back" button to return to the Main screen without starting the disinfection.

Note

Pressing the "OK" button starts immediate disinfection of the cryostat chamber, regardless of the programmed times.

- The Disinfection Remaining Time screen will appear.



Note

After the disinfection cycle is completed, the Disinfection Remaining Time screen will disappear and the Main screen will be displayed.

A small amount of liquid and, occasionally, a small amount of icing remain in the Cryochamber following completion of a Cold D cycle. These by-products of the Cold D cycle will normally evaporate from the Cryochamber within a period of three hours. The liquid droplets can be removed with a paper towel and, if necessary, any icing can be removed with an alcohol spray. Neither the liquid droplets nor the icing will prevent the use of the cryostat immediately after completion of a Cold D cycle.

Any occasional build-up of crystalline material in the Cryochamber can also be easily removed with an alcohol spray and paper towel.

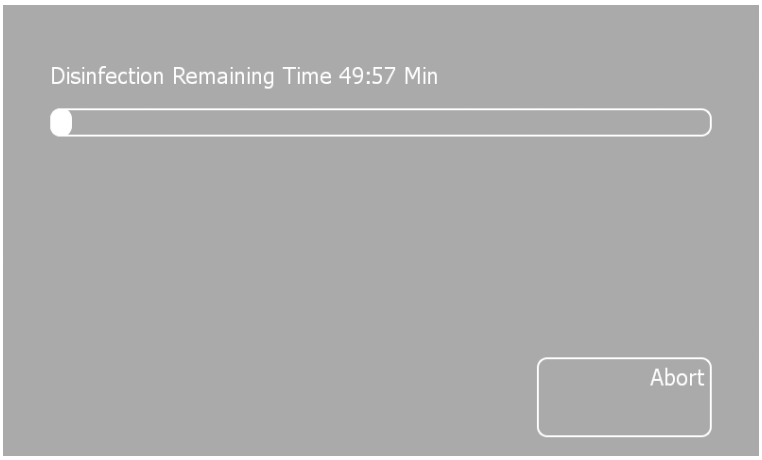
Aborting the Disinfection

Note

The disinfection process can be aborted at any time to facilitate an urgent frozen section.

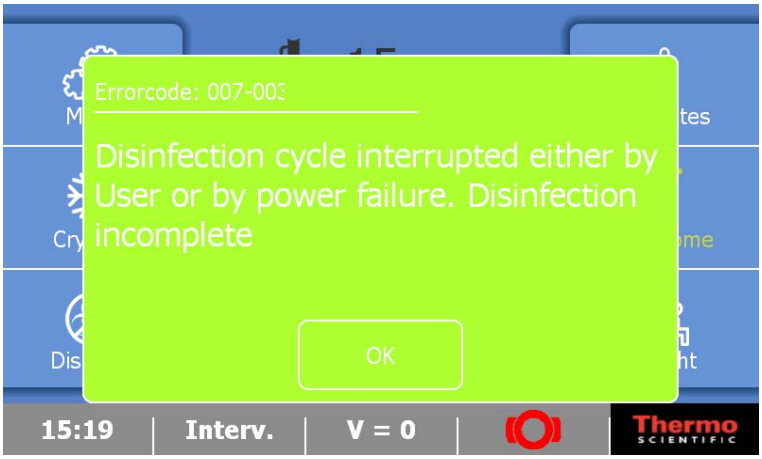
To abort the disinfection process:

- Press the "Abort" button on the Disinfection Remaining Time screen.



Note

If the Disinfection cycle was aborted, an error message appears on the Main screen.



- Press the "OK" button to remove the error message.

An interrupted Cold D cycle will not adequately disinfect the Cryochamber. However, the instrument can be used immediately afterwards.

Programming Cold D

In addition to the instant use, automatic Cold D cycles can be programmed.

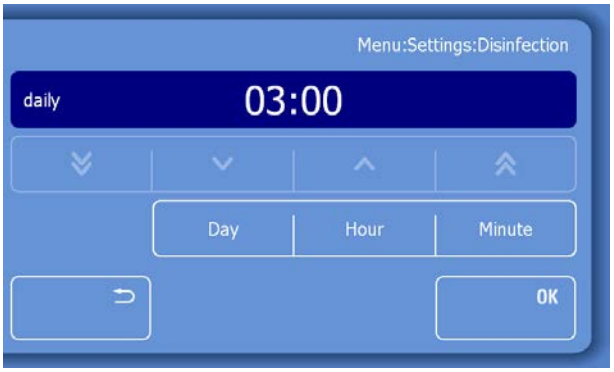
Follow the directions below to activate (or deactivate) the automatic Cold D feature.

- Press the "Menu" button on the Main screen.

- Press the "Settings" button.

- The Settings Menu screen will be displayed.
- Press the "Disinfection" button.

- The Menu: Settings: Disinfection screen will appear.

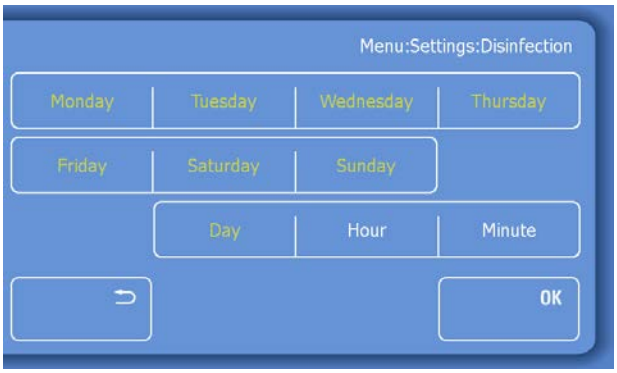


- In this menu, the user can specify the day(s) and the specific time when the Cold D process should automatically be carried out.

To set the Day:

- Press the “Day” button.

- The Menu: Settings: Disinfection day selection screen will appear.



Note

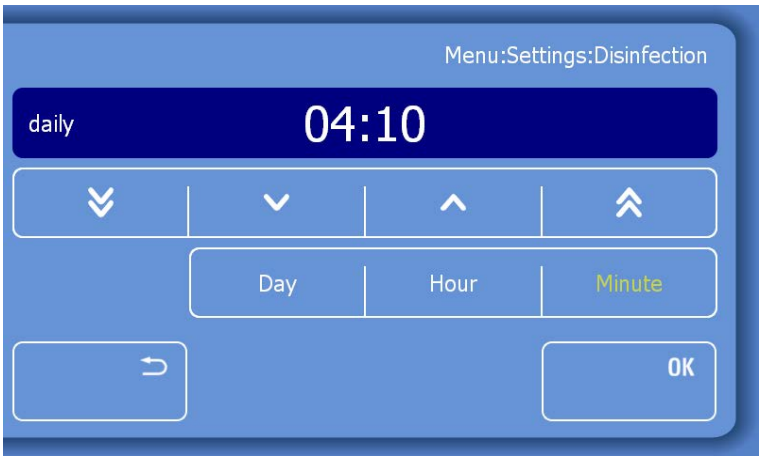
The default setting is every day, from Monday to Sunday at 3:00 am.

- Press the weekdays on which the automatic disinfection should not be carried out.

Note

Deactivated weekdays will turn white.

- Press the "Hour" and "Minute" button and use the arrow keys to adjust the time at which the Cold D cycle should start.



- When all settings have been done, press "OK" to save the settings and to return to the Main screen.
- Press the "Back" button to return to the Setting screen without saving the changes.

Chapter 5 - Troubleshooting

Troubleshooting Tables

Problem	Possible Reason	Advice
Sections fold or crumple	1. Specimen is too warm.	Lower specimen temperature
	2. Knife holder too warm.	Lower chamber temperature.
		Tip – use freezer spray on clamp plate and blade to confirm.
	3. Anti-Roll plate too low.	Raise Anti-Roll towards specimen.
	4. Anti-Roll plate and/or clamp plate dirty.	Clean with absolute alcohol & dry thoroughly.
Section rolls up under the Anti-Roll plate	1. Specimen is too cold.	Raise specimen temperature.
Specimen curls after lifting ARP	1. Anti-Roll plate & clamp plate too warm.	Lower chamber temperature
		Tip – use freezer spray on clamp plate and blade to confirm.
	2. Static electricity in chamber.	
	3. Blade blunt.	Change blade.
Sections tear or crack	1. Specimen too cold.	Raise temperature.
	2. Blade damaged or dirty.	Change blade.
	3. Specimen frozen too rapidly or specimen overly large.	
Specimen and section chatter	1. Knife holder not correctly clamped.	Check & tighten all stages of knife holder.
	2. Blade incorrectly clamped.	Blade clamping force can be increased by tightening clamp screw at the rear of the top stage.
	3. Specimen incorrectly clamped.	Check specimen is securely mounted and clamped in specimen head jaws. Check there is no debris or ice on the back of the chuck or on specimen head.

Problem	Possible Reason	Advice
	1. Check knife holder and specimen correctly clamped.	
	2. Ensure specimen is securely attached to the Cryocassette/chuck.	
	3. Temperature of specimen incorrect.	Raise or lower temperature.
	4. Blade not sharp.	Change blade.

Tips for Successful Sectioning

For optimal sectioning, the following points should be followed:

- Check the condition of the blade edge; move it horizontally to the left or right side to obtain a sharp cutting edge.
- Check adjustment of anti-roll plate and correct it, if necessary.
- Ensure that the edge of the anti-roll plate glass is clean and free of debris.
- Carefully remove frost from the front and the rear part of the blade, from the anti-roll plate and the clamping plate (i.e. with ethanol).
- Tighten all clamping screws and clamping levers on the blade holder and specimen head.
- Select the appropriate knife carrier and specimen temperature according to the specimen type - see Optimum Temperature Ranges for Sectioning Different Types of Fresh Specimens.
- Allow time for the temperatures within the chamber to stabilise.
- Select the appropriate freezing compound (Neg50).
- Avoid excessive use of freezing compound.

Note

If the specimen was frozen with liquid nitrogen or similar freezing techniques, the specimen must be allowed to adjust to the cutting temperature.

- Adjustment of proper clearance angle. Select a clearance angle of 8-12°. The preset clearance angle is 10°.
- Select an appropriate cutting speed: The harder the material, the slower the cutting speed!
- Take care when bringing knife and specimen together.

During defrosting, remove the specimens from the cryochamber, as the temperature inside the chamber will increase. Do not leave or store specimens inside the cryostat over a long period of time. Due to a power failure or other unexpected malfunctions of the instrument, the specimen might be damaged.

How to avoid malfunctions when working with the Vacutome

- Accurately adjust the cutting and suction window to the specimen size, to avoid inadvertent disposal of good sections.
- Adjust the suction vacuum setting according to the size of the specimen and the selected section thickness.
- Ensure that the specimens are cooled sufficiently to avoid that sectioning waste sticking and blocking the suction hose of the Vacutome.

Note

If the sectioning waste blocks the suction hoses of the Vacutome, it can be removed by using the attached hose cleaner. During this cleaning, the Vacutome should be operated with maximum power to guarantee that the released sectioning waste is removed.

Sectioning Temperature Guidelines for Fresh Tissues

Specimen Type	Knife/Blade Temp	Specimen Temp
Adipose Tissue	-35°C	-30°C or below
Bone Marrow	-25°C to -30°C	-20°C
Brain	-20°C	-12°C
Breast	-35°C	-25°C
Breast with Fat	-35°C	-30°C or below
Cervix	-25°C to -30°C	-20°C
Connective Tissue	-25°C	-16°C
Gut	-25°C	-20°C
Heart	-25°C	-18°C
Kidney	-25°C	-15°C
Lip	-25°C	-13°C
Liver	-25°C	-13°C
Lung	-25°C	-15°C
Lymph Node	-25°C	-13°C
Muscle	-25°C	-16°C
Omentum	-35°C	-35°C
Ovary	-25°C to -30°C	-20°C
Pancreas	-25°C to -30°C	-20°C
Prostate	-30°C	-20°C
Skin	-25°C	-16°C
Skin with fat	-30°C to -35°C	-25°C
Spleen	-25°C	-16°C
Testis	-25°C	-10°C
Thyroid	-25°C	-15°C
Uterine curetting	-25°C	-7°C
Uterus	-25°C to -30°C	-20°C

Chapter 6 - Cleaning and Maintenance

Cleaning the Touch Screen Display

Use commercially available cleaning tissues or use a soft and slightly wet towel to clean the Touch screen.

Do not use household cleaner or chemicals (i. e. Xylene) for cleaning of the Touch screen to avoid severe damage.

Shutting Off for Cleaning

The frequency of cleaning the cryostat depends on how often the instrument is used.

Preparations:

See Recommended Disinfection Procedure

Remove the blade out of the blade holder and store it in save place

- Remove the cold section waste by using the Vacutome cleaning mode.
- For this, remove the vacuum hose from the front side of the blade carrier.
- Attach the cleaning nozzle to the Vacutome hose.
- Remove the filter unit and dispose of the Vacutome filter together with the section waste and/or the micro filter according to the respective lab regulations.
- The warming up of the microtome chamber can actively be accelerated by softly using a hair dryer.
- Clean, wash and dry the cooling chamber with appropriate cleaning agents using a cloth or paper towel.

Cleaning and care of the Blade Holder

- Carefully clean and dry the dismounted blade holder.
- As there is condensate humidity inside the microtome, dry the microtome components inside the cooling chamber very carefully. For this, use a hair dryer.

Note

For the examination and readjustment of the microtome a routine maintenance should be performed by trained service technician once a year.

Emptying the Defrosting and Cold D Liquids

The liquids from the daily defrosting cycle as well as the liquid of a Cold D cycle is collected in a bottle, located in the base of the cryostat.

The liquids from the daily defrost and Cold D cycle might be hazardous! Wear protective clothing - see Recommended Disinfection Procedure.

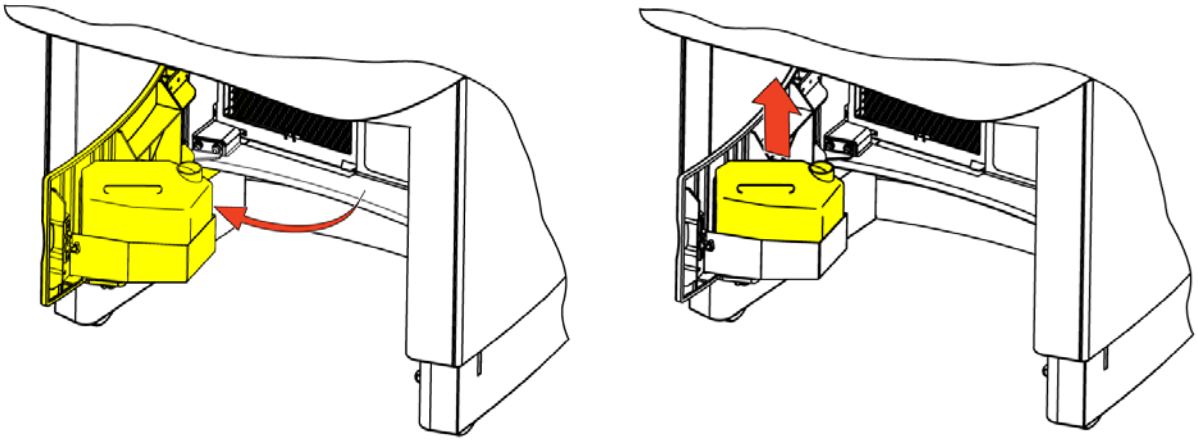
Note

The capacity of the bottle is 2.5 Litres (approximately 0.66 Gallons).

It is recommended to empty and disinfect the bottle once a week during the routine cleaning procedure.

To empty the Defrosting Liquid Bottle:

- Open the front door and pull out the bottle from the rack.

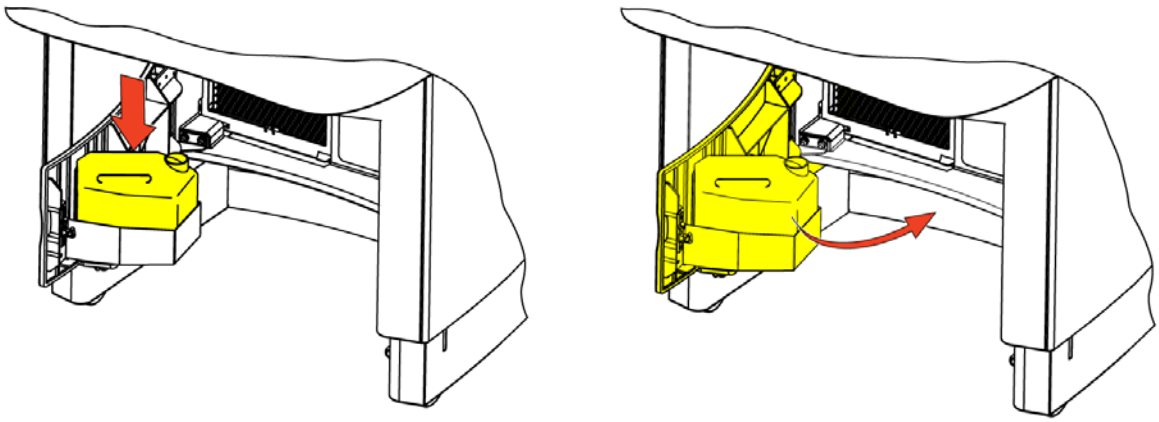


- Dispose of the liquid in accordance to the laboratory regulations and clean it.

Note

After cleaning the bottle, it is recommended that a small volume of Sanosil® is added.

- Wipe out any liquids from the rack.
- Put the bottle back into the rack and close the door.



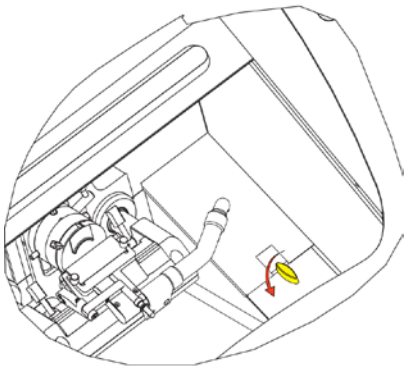
Exchange the Vacutome Filter Bag

The Vacutome Filter Bag collects all section waste which has been removed with the Vacutome function.

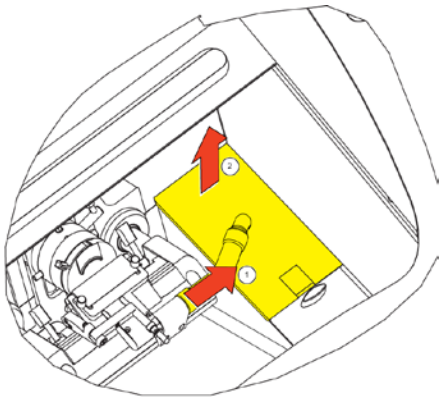
Section waste can be hazardous! Dispose of the used Vacutome filter bag in accordance to the laboratory regulations.

The Vacutome Filter Bag is placed under the cover on the right hand site of the Cryochamber.

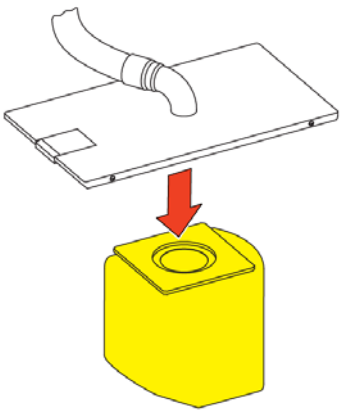
- Open the lever of the cover.

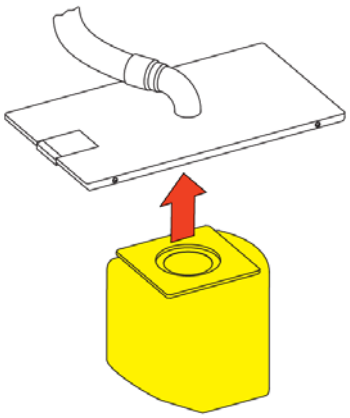


- Remove the Vacutome hose (1) and lift off the cover (2).

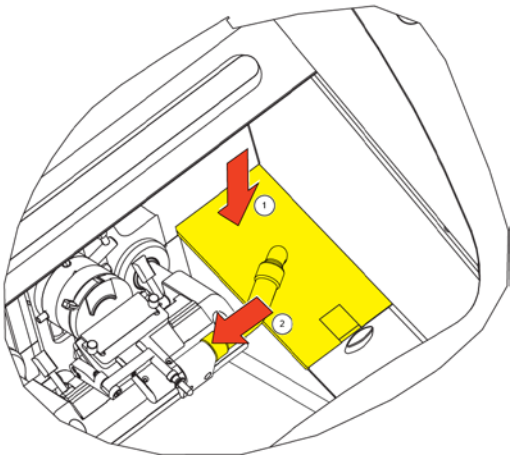


- Clean the Vacutome hose with a flexible brush.
- Slip off the old Vacutome filter and replace it by a new one.

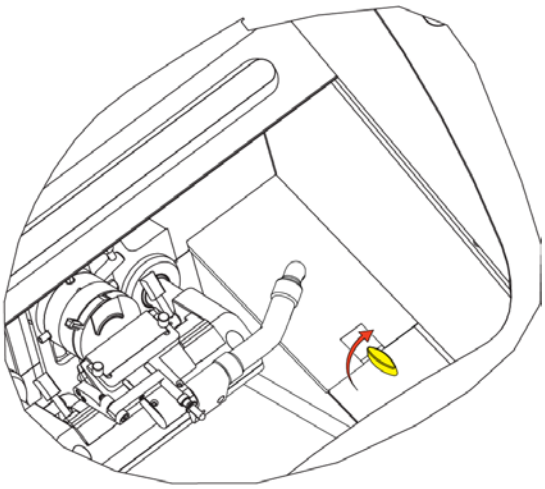




- Clean and disinfect the empty Vacutome filter chamber with disinfectant.
- Replace the cover, rear end first.



- Reattach the Vacutome hose.

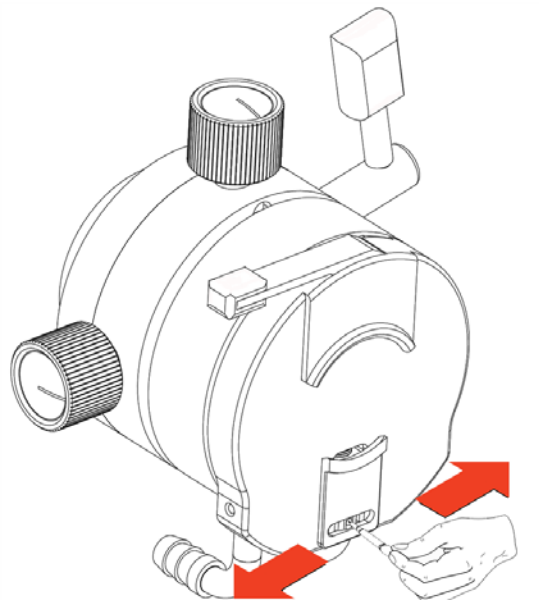


- Lock the cover with the lever.

Adjustment of the Movable Specimen Head Jaw

The clamping mechanism can be adjusted in case the chucks cannot be clamped properly.

- Lock both the electronic and mechanical handwheel brakes.
- Turn the adjusting ring by using the pin, provided with the standard accessories.



- Turn the pin counter clockwise to increase the tension of the moveable clamping jaw.
- By turning the pin counter clockwise, a click can be heard as a pin moves over the teeth on the ratchet wheel. After two clicks, stop turning and check the clamping tension with a specimen chuck. If the tension is not sufficient, increase the tension by a further click and re-test the clamping tension.
- Repeat this procedure until the right clamping tension is reached.
- After the final shutdown of the instrument, we recommend to contact a local recycling company for the disposal according to the national applicable regulations.
- To be applied in the countries of the European Union and other European countries with a separate collecting system within the waste management.
- The marking of the product and/or the respective literature indicates that, after its final shutdown, it must not be disposed of together with ordinary domestic waste.
- Please dispose of your instrument separately from other waste to not harm our environment and/or human health by uncontrolled waste disposal.
- Recycle your instrument to support the sustainable recycling of material resources.
- Industrial users should contact their suppliers and observe the conditions of the contract. This product must not be disposed of together with other commercial waste.

Transportation of the Instrument

Conditions for the Transportation of the Instrument

To guarantee trouble-free function of the instrument after transportation, please note the below-mentioned measures for the transportation preparation.

In addition, the conditions for storage and transportation must be observed during the entire transportation - see Technical Specifications.

Disinfect the instrument before the transportation and remove all section waste and tools out of the chamber - see Recommended Disinfection Procedure.

Shutting down the instrument for transportation:

- Turn off the instrument.
- Unplug the unit.
- Remove the blade from the blade holder.
- Remove the section waste tray, the brush shelf, the blade holder and all other accessories as well as tools from the Cryochamber.
- Dispose of the defrosting and Cold D liquids in accordance to the laboratory regulations and clean the bottle. - see Emptying the Defrosting and Cold D Liquids.
- Remove the defrosting liquid bottle.

Note

Clean and disinfect all accessories according to the respective applicable lab regulations and transport them in dry condition.

Any transportation of the instrument requires original packaging materials.

Note

If the original packaging is no longer available, please contact your local Thermo Scientific representation.

- Clean and disinfect the Cryochamber - see Recommended Disinfection Procedure.
- Unscrew the hand wheel handle for transportation if necessary.
- Keep the heated sliding window closed during transportation.

Note

If the new site of installation can be reached in less than half an hour, keep the sliding window closed so that the Cryochamber does not heat up. This avoids the formation of condensation water inside the chamber.

Two persons are necessary for the transport of the instrument.

Bringing the instrument back into service

After moving the CryoStar NX70, wait at least 8 hours before switching on to allow the refrigerant to settle - failure to do so may cause damage to the unit.

- Install the blade holder, the section waste tray and the brush shelf.
- Attach the hand wheel handle again, if necessary.
- Plug in the instrument.
- Turn On the instrument.
- After the instrument is turned on and it has reached the set temperatures, the instrument is ready of operation again.

Note

If the blade holder was heated up to ambient temperature, it needs approximately 1 h in the chamber at -25°C to be able to section specimens again.

Transportation of the instrument outside closed buildings

- Turn off the instrument.
- Unplug the unit.
- Remove the blade from the blade holder.
- Remove the section waste tray, the brush shelf, the blade holder and all other accessories as well as tools from the cryochamber.
- Dispose of the defrosting and Cold D liquids in accordance to the laboratory regulations and clean the bottle. - see Emptying the Defrosting and Cold D Liquids.
- Remove the defrosting liquid bottle.

Note

Clean and disinfect these accessories according to the respective applicable lab regulations and transport them in dry condition.

- Clean and disinfect the Cryochamber - see Recommended Disinfection Procedure.

Note

Let the Cryochamber dry out at least 48 h to avoid condensation water remaining in the chamber.

- For repacking of the instrument, refer to the Unpacking and Repacking section.

Taking back the instrument for the repair or routine maintenance

Repair or maintenance work is normally carried out at the site of installation. If this is not possible, the instrument can be returned to Thermo Shandon Limited. The contact address can be found at the beginning of this operation manual.

Appendices

Appendix A - Spares and Accessories

Description	Part Number
Knife and Blade Holder	
Standard Knife Holder	705950
Disposable Blade Holder for high profile blades	705940
Disposable Blade Holder for low profile blades	705840
Heat Extractor	524510
Specimen Chucks	
Ø 20 mm	715530
Ø 30 mm	715600
Ø 30 mm, red	715870
Ø 30 mm, green	715880
Ø 30 mm, blue	715890
Ø 30 mm, gold	715900
Ø 40 mm	715610
Ø 60 mm	715620
Cryo-Moulds	
10 mm	570400
15 mm	570380
22 mm	570390
Brushes	
Brush	334000
Small brush, bevelled	334180
Large brush	334170
Neg-50 Frozen Section Medium	
2 x 118 ml bottles	6502
6 x 118 ml bottles	6506
Cryomatrix embedding resin 4 x 120 ml bottles	6769006
Sanosil S010, 5L	175200
Cryostat Disinfectant Protect II	350270

Description	Part Number
Coarse filter for use with Vacutome (pk of 25)	281000
Nozzle (for trimming)	336090
Nozzle (for sectioning)	336080
Blade handling tool	419500
Foot pedal (optional)	640380
Paraffin repellent PARA GARD, 100ml	350170
Lubrication Oil	
1 x 100 ml bottle	350110
1 x 250 ml bottle	350120
Anti-Roll Plate	449980
Knife Guard	A78930078
Allen Key, 5 mm	362260
Allen Key, 6 mm	362120
Waste Tray	512990
Brush Shelf	410540
Hose Extension w/nozzle, Vacutome	435560
Adjusting pin	242530
UK power cord	313940
European power cord	313960
US power cord	313950
Operator guide English	387928
Operator guide German	388125
Operator guide Italian	388126
Operator guide French	388127
Operator guide Spanish	388128
Operator guide Japanese	388129

Appendix B - Recommended Disinfection Procedure

Cold D + Sanosil®

Disinfection of the cryostat chamber as per protection level 2 as per the Regulation of Biological Substances Act (BioStoffV; GBGI. I S. 50; 1999 S. 2059) and the Technical Regulations on Biological Substances (TRBA 10; 09/1999).

Universal Precautions

All specimens can be potentially infectious; because of this universal precautions should always be followed when handling cryotomy specimens and cryostats.

Definition of Disinfection

Disinfection is the destruction of pathogens by physical or chemical means. It is not as fully effective as sterilization. Disinfection destroys most recognized pathogens, but not necessarily all microbial forms, such as bacterial spores.

Disinfection Procedure for the CryoStar cryostat

- Wear appropriate protective clothing: double gloves, gown, mask and protective eye wear.

Remove all disposable blades and knives from the chamber and disinfect them separately.

- Using a paper towel remove all tissue trimmings and waste material from the cryostat chamber.
- Bring the cryostat chamber to room temperature before beginning the disinfection process.
- Use 5% Sanosil® as the disinfection agent. Spray the solution throughout the chamber, let sit for 20 minutes, drain, and then wipe with absorbent towels.
- Dilute bleach (5%) may be used as an alternative to 5% Sanosil®.
- Spray the chamber surfaces with 70% alcohol. Allow the solution to sit for 10 minutes, drain, and again wipe all surfaces with absorbent towels.

Sanosil® can be ordered by the manufacturer and/or the local dealers in the respective countries or by your respective Thermo Scientific contractual partner (cat. no. 350150).

www.sanosil.ch

Appendix C - Cold Disinfection Certificate

ecoscope

Labor für Mikrobiologie und Ökotoxikologie
Priv. Doz. Dr. Ingo Maier

CERTIFICATE

We certify that the

Cold Disinfection in CryoStar™ NX70/NX50 cryostats

manufactured by

Microm International GmbH
Otto-Hahn-Strasse 1a
69190 Walldorf, Germany

has been successfully evaluated for
antibacterial, antituberculous, antifungal and antiviral efficacy
and found to significantly improve instrument safety.

Tests on microbial inactivation were carried out in analogy to the standard methods of the German Society for Hygiene and Microbiology and the European norms DIN EN 13697:2002-01 and DIN EN 14563:2009-02 and on virus inactivation in analogy to the guideline of the German Association for the Control of Virus Diseases and the Robert Koch Institute as well as the European Norm DIN EN 14476:2007-02.

Using Sanosil® containing 5 % hydrogen peroxide or a solution of 5 % hydrogen peroxide as disinfectants the test bacterium *Staphylococcus aureus* was inactivated by > 99,996 (> $\log_{10}$ 4.5). *S. aureus* was used as a surrogate organism in a series of parallel studies. The combined results allow the conclusion that the bacteria *Enterococcus hirae*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Mycobacterium terrae and M. avium* are inactivated by 99.5 to 99.999 %, the yeast *Candida albicans* by 99.98 % and that the infectious titers of BVDV and BPV viruses are reduced by 90 % in the standard cold disinfection routine (20 min fogging/50 min total contact period) according to the test report of August 3, 2011.

Amtzell, 9 February 2012

Ingo Maier, PhD

Ulrike Hüppeler, PhD

Labor für Mikrobiologie und Ökotoxikologie ecoscope

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