

Thermo Scientific
CryoStar NX70 / NX50
Operator Guide
387928



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Print Date: June 22nd, 2011

Version: 1.0

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Standards

The Thermo Scientific CryoStar NX70 / NX50 meets the following CE Mark requirements:

In Vitro Diagnostic Directive 98/79/EC
IEC61010-1, IEC61010-2-101 and IEC61010-2-081

Important Note Regarding Instrument Variants

This document is designed for use with the Thermo Scientific CryoStar NX70 and NX50 cryostats.

A range of optional features is available on these instruments 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.

However, in cases where information only pertains to either the NX70 or NX50 models, this will be indicated by the presence of one of the following symbols:



Information only applies to CryoStar NX70 instruments



Information only applies to CryoStar NX50 instruments

Symbols

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



This symbol is used on the equipment, 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 equipment, or in a document, to indicate that there may be a biohazard associated with the instrument. Always act with common sense and be aware of the samples used. Take suitable precautions.



This symbol indicates that a surface is hot. If this symbol appears on the instrument, always refer to the operator guide. Take suitable precautions.



This symbol indicates that a surface is cold. If this symbol appears on the instrument, always refer to the operator guide. Take suitable precautions.



This symbol is shown in the manual and on the instrument to indicate that hand injuries are possible due to moving parts. Take suitable precautions.



This symbol is shown in the manual to indicate the risk of injury caused by sharp microtome blades and knives. Take suitable precautions.



This symbol is used on the equipment, or in a document, to indicate that harmful chemicals are used. Refer to the Material Safety Data Sheets for the chemicals used. Always act with common sense and be aware of local laboratory procedures. Take suitable precautions.

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

1 - Safety Information.....	1
2 - Introduction.....	5
Introduction to the CryoStar NX70 / NX50	5
Intended Use.....	5
Instrument Features	5
Technical Specifications	6
3 - Instrument Setup.....	9
Unpacking and Repacking	9
Location & Setup	11
Identification of Parts.....	12
Set Up.....	18
Fitting or Exchanging the Anti Roll Plate.....	18
Fitting or Exchanging Low Profile Blades	19
Removing Used Blades with the Magnetic Blade Tool	21
Blade Positioning and Orientation.....	22
Adjusting the Cutting Angle.....	23
Adjusting the Anti-Roll Plate.....	25
Specimen Setup	26
Specimen Orientation NX70.....	26
Specimen Orientation NX50.....	28
Filling with Disinfectant to Perform the Cold D Function.....	31
Filling the Cryostat with Disinfectant Solution (Sanosil®)	31
4 - Operation	33
Switching On.....	33
System Interfacing	34
Using the Touchscreen.....	34
Main Screen	34
Setting Preferences	36
Quick Freezing of the Specimen	36
Trimming and Fine Section Thickness.....	37
Temperature.....	39
Cutting Window	41
Select a Favorite.....	43
Vacutome and Cleaning Mode	43

Height Adjustment	48
Multi Function Bar.....	49
Time and Date	49
Cutting Mode Selection	49
Handwheel Brake.....	56
Multi-Function Button	57
Menu	59
Chamber Light	59
Standby.....	60
Display Lock	61
Favorites.....	62
User Guide.....	64
Settings Menu	65
Language.....	67
Time and Date	68
Start Time.....	72
Defrost.....	75
Immediate Defrosting.....	75
Programming the Daily Defrost Cycle	78
Screen	79
Retraction	81
Data Log.....	82
Default Settings.....	83
Service.....	85
Emergency Stop.....	86
Standard Emergency Stop Function.....	86
Optional Foot Pedal Emergency Stop	86
Cooling Processes	87
Specimen and blade holder cooling.....	87
Sectioning Procedures	88
Cutting Movement and Retraction	88
Trimming and First Cuts	88
Trimming	89
Sectioning and Taking Off Sections	89

Handwheel Brakes	91
Electronic Handwheel Brake.....	91
Mechanical Handwheel Brake.....	92
Cold D	94
Starting the Disinfection (Cold D) Function	94
Aborting the Disinfection.....	95
Programming Cold D	96
5 - Troubleshooting.....	99
Troubleshooting Tables	99
Tips for Successful Sectioning.....	101
Optimum Temperature Ranges for Sectioning Different Types of Fresh Specimen.....	102
6 - Cleaning and Maintenance.....	103
Cleaning the Touch Screen Display	103
Shutting Off for Cleaning	103
Cleaning and care of the Blade Holder	103
Emptying the Defrosting and Cold D Liquids	104
Exchange the Vacutome Filter Bag.....	105
Adjustment of the Movable Specimen Head Jaw.....	107
Transportation of the Instrument	108
Appendices.....	110
Appendix A - Spares and Accessories.....	111
Appendix B - Recommended Disinfection Procedure.....	113
Recommended Disinfection Procedure	113
Index	114

1 - Safety Information

Introduction

Thermo Fisher Scientific products are designed for convenient and reliable service; however, incorrect actions by a user may damage the equipment, or cause a hazard to health.

The following sections contain important information for the safe setup and use of the instrument.



All users must read and understand the following sections before using the instrument.

General Safety

This instrument, as supplied, conforms with IEC61010-1, IEC61010-2-101 and IEC61010-2-081; however, the addition of chemical introduces potential hazards.

This IVD equipment complies with the emissions and immunity requirements of IEC 61326-2-6:2006 and DIN EN 61326-2-6:2008.

Do not use this device 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.

As with all scientific equipment, due care and good laboratory practice must be employed when dealing with these chemicals, and consideration must be given to the potential for hazard when dealing with particular chemicals.

Be aware that many of the reagents used with this instrument may be flammable. 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 covers. The instrument does not have any user serviceable parts.

The instrument must be properly connected to a good earth (ground) via the Mains input supply.

Position the instrument such that it is possible to interrupt the Mains supply at the source by removing the plug from the socket.

If the equipment is used in a manner not specified by Thermo Fisher Scientific, the protection offered by the equipment may be impaired.

Make sure that there is enough room for the adjustable height of the CryoStar and at least 100mm (4in) clearance around any fan inlets on the instrument.

In compliance with statutory requirements all our equipment is designed to accepted standards of safety. Its use does not entail any hazard if operated in accordance with the instructions given in the documentation. However, the following safety precautions must be obeyed:

- All users must have read and understood the Operator Guide and these safety instructions; and only operate the unit in accordance with the instructions.
- Potentially lethal voltages are present inside the instrument. Do not remove any access covers unless specifically instructed to do so.

- It is important that normal standards of safety and good laboratory practices are employed. Always use common sense when operating the instrument.
- Any problems and queries should be referred to your Thermo Fisher Scientific supplier.
- Correct maintenance procedures are essential for consistent performance. It is recommended that a Maintenance Contract is taken out with our Service Department.
- Use only factory approved accessories or replacement parts with this instrument.
- Only use reagents recommended in the Operator Guide.

Chemical Safety

THE INTRODUCTION OF CHEMICALS CREATES POTENTIAL HAZARDS AND THERMO FISHER SCIENTIFIC HAS ADOPTED THE FOLLOWING POSITION WITH REGARD TO THE SUBJECT OF VOLATILE CHEMICALS USED IN MEDICAL LABORATORIES:

- Non-specified chemicals are used in the instrument at the customers own risk.
- All the chemicals recommended by Thermo Fisher Scientific have auto-ignition temperatures considerably above any surface temperature 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 are 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.



Some chemicals which may be used during operation are flammable - do not use sources of ignition in the vicinity of the instrument when it is loaded with reagents.



Harmful chemical vapours such as xylene and toluene may be emitted during the normal operation of some instruments, and the operator should be aware of suitable precautions and safety measures.

Environment

This product is required to comply 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 has contracted with one or more recycling / disposal companies in each EU Member State, and this product should be disposed of or recycled through them.

Further information on Thermo Fisher Scientific's compliance with these Directives, the recyclers in your country, and information on Thermo Fisher Scientific products which may assist the detection of substances subject to the RoHS Directive are available at:

www.thermo.com/WEEERoHS

Warranty Statement

We at Thermo Fisher Scientific are proud of our 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 keep your purchase in peak condition for many years to come.

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.
- Accessories and reagents which have not been approved by Thermo Fisher Scientific are used.
- The instrument is not operated or maintained in accordance with the instructions in the Operator Guide.

Product Return Safety Declaration



PRODUCT RETURN SAFETY DECLARATION

Part 1 Decontamination Certificate

Any instrument or part of any instrument must be clean before being returned, and where necessary accompanied by a completed Decontamination Certificate. Should the instrument or any part of it be received in an unclean condition, or Thermo Fisher Scientific consider it to be a hazard, the instrument or part will be returned unrepaired at the expense of the customer.

It is important that the certificate is forwarded by post or fax, and a copy attached to the exterior of the container. Containers will not be opened until the company is in possession of the required certificate.

This form MUST be completed by the customer and NOT by a Thermo Fisher or distributor employee.

If an instrument or part is to be returned to Thermo Fisher Scientific, please note the following:

- 1 If the instrument or any part of it has been exposed to, or been in contact with potential pathogenic or radioactive material, it is essential that it is decontaminated.
2 Set procedures are laid down in the European Health and Safety Directives for decontamination. To avoid any misunderstanding, we request that all instruments or parts returned to us must be accompanied by a certificate stating the following:

We certify that this (Model)..... Serial No.....

- has not been exposed to pathogenic, radioactive or other hazardous material and has been cleaned
OR
• has been decontaminated and cleaned (if exposed to the above) according to approved procedures following exposure to:

• Has the instrument been used for work with human or animal Transmissible Spongiform Encephalopathies, e.g. Creutzfeld-Jacob disease, Scrapie or BSE?
YES / NO
If yes, please contact Thermo Fisher Service before taking any further action.

Signed Position
Name (Block Capitals)
Company or Organisation
Full Address

Part 2 Guidelines for Returning Instruments

Please use the checklist below to ensure that the instrument being returned is ready for collection.

- All reagents / wax removed from instrument, including vapour traps (if applicable).....
• Accessories are secured / itemised
• Instrument has had transit clamps fitted as per Operator Guide (if applicable).....
• Instrument is packed in original packaging..... YES / NO

RMA NUMBER
CARRIER
FOR ATTENTION OF

2 - Introduction

Introduction to the CryoStar NX70 / NX50

Intended Use

The Thermo Scientific CryoStar NX70 and NX50 are high-performance cryostats designed to prepare tissue sections of frozen samples in medical, pharmaceutical and research laboratories. Only trained laboratory personnel may operate the CryoStar NX70 / NX50.

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 / NX50 are precision-engineered, ergonomically-designed, high-performance cryostats 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.

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%
	220-240V, 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: <i>Performance may deteriorate when operated outside of this range.</i>
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/m ² (660 lb/ft ²)
Safety 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)
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% H ₂ O ₂)

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

3 - Instrument Setup

Unpacking and Repacking

Safety Precautions



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



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



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



After moving the CryoStar, 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 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 from 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.
- Important Safety Precaution: 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 these instructions in reverse order.

Location & Setup

When deciding where to locate the CryoStar NX70 / NX50, 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 15 cm (6 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

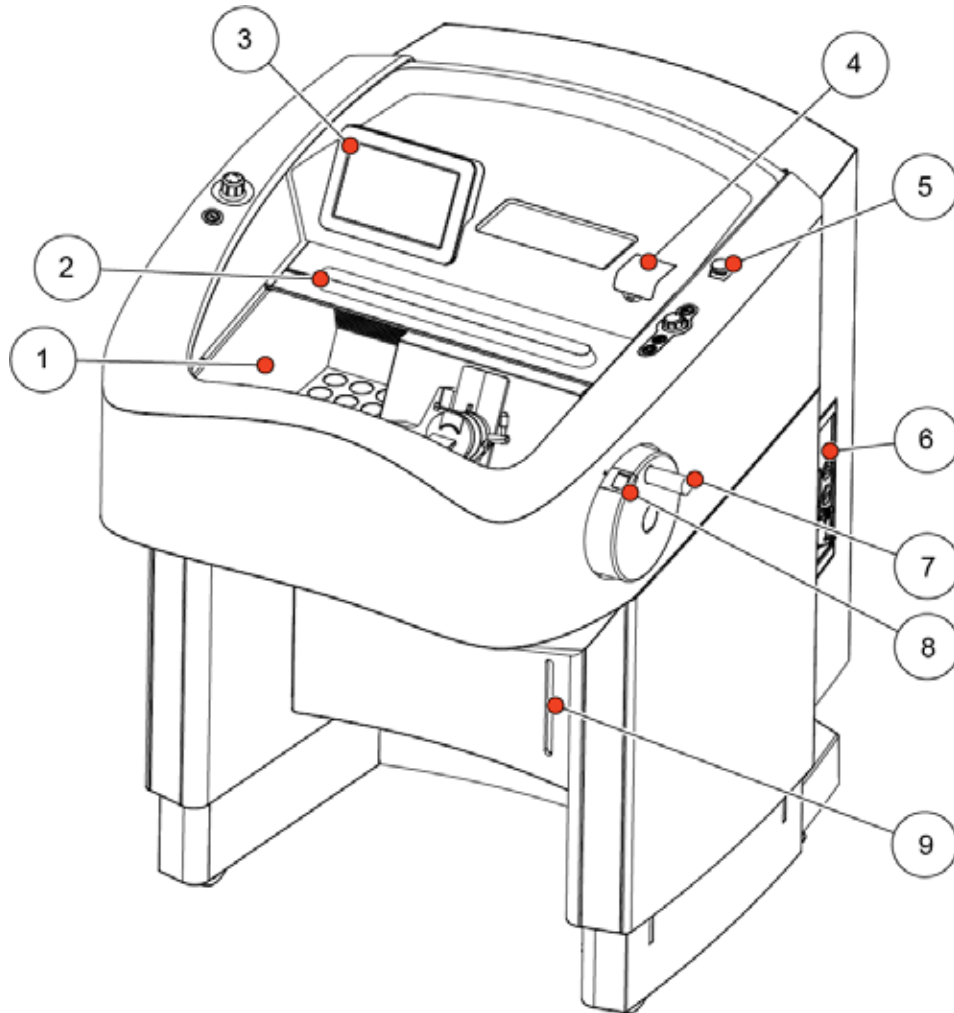
These measures are intended to reduce the build-up of frost and maintain consistent cooling temperatures resulting in more favorable working conditions. Locations which have high humidity and / or high ambient temperatures can reduce the performance of the instrument.



Once the CryoStar NX70 / NX50 has been located, ensure the fixing bolts shown are tightened to prevent the unit from moving during operation.

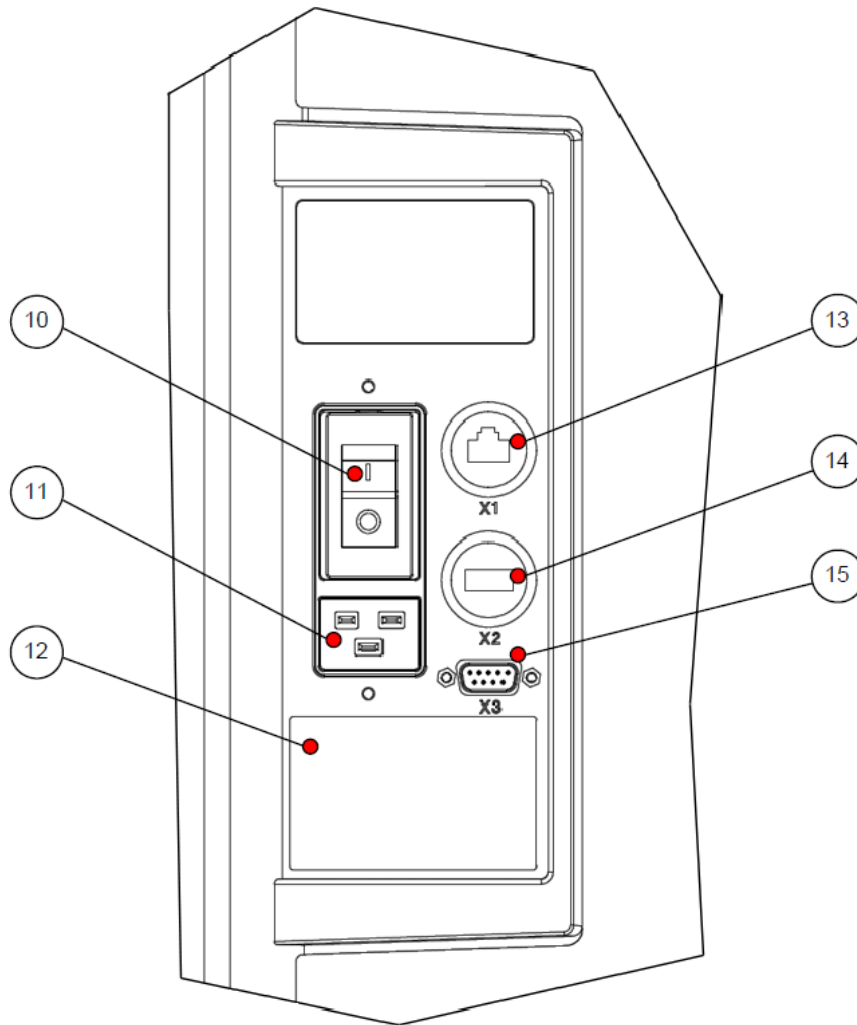
Identification of Parts

Overview



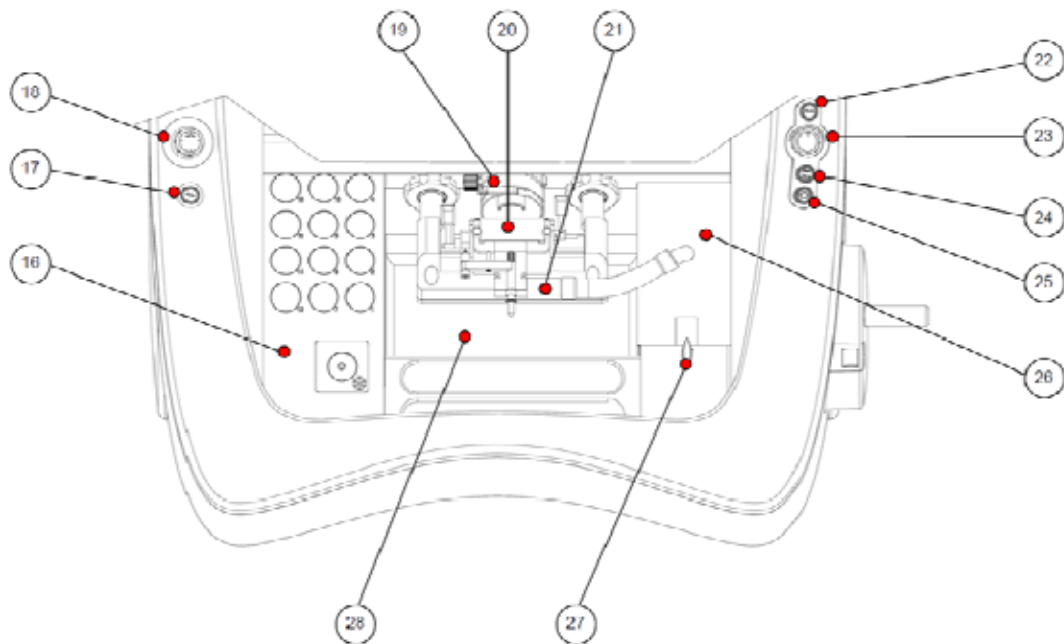
1	Cryochamber	6	Connections Panel
2	Cryochamber Window	7	Handwheel
3	Touch Screen	8	Handwheel Mechanical Brake
4	Cold D Reservoir Cover	9	Water Drain Reservoir Cover
5	Emergency Stop Button		

Connections Panel



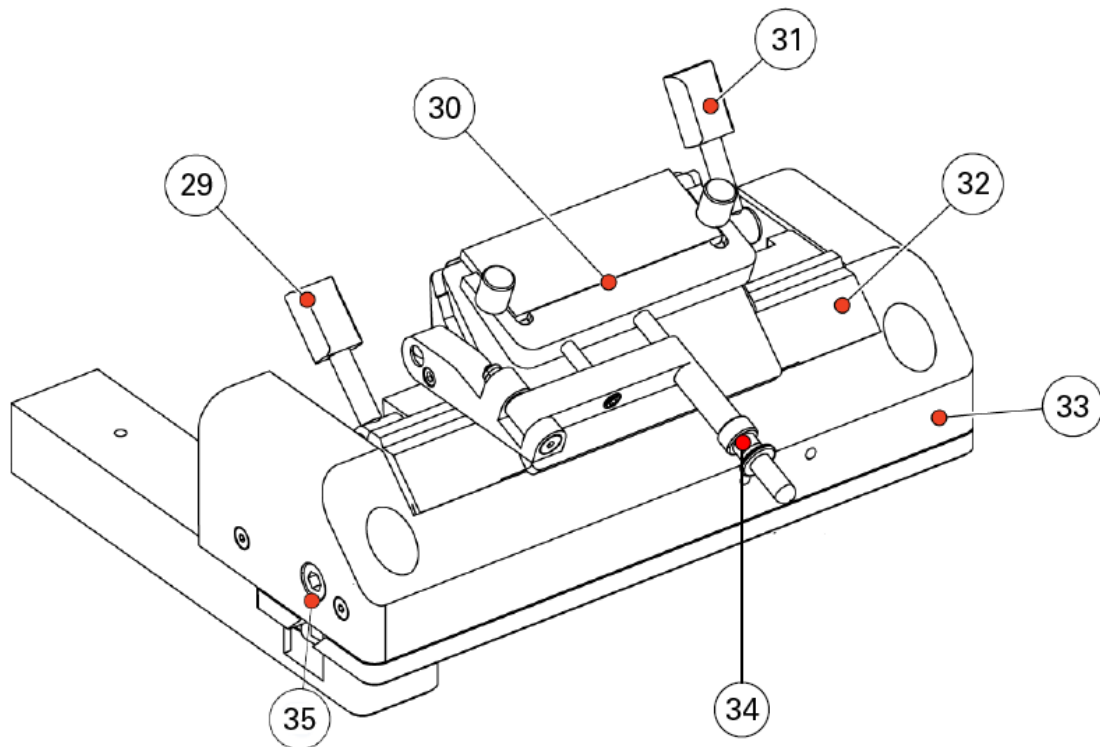
10	Power Switch	13	X1 – RJ45 port (for Service purposes only)
11	Power Socket	14	X2 – USB port
12	Rating and Serial Number Label	15	X3 – Foot Pedal Connector

Cryochamber



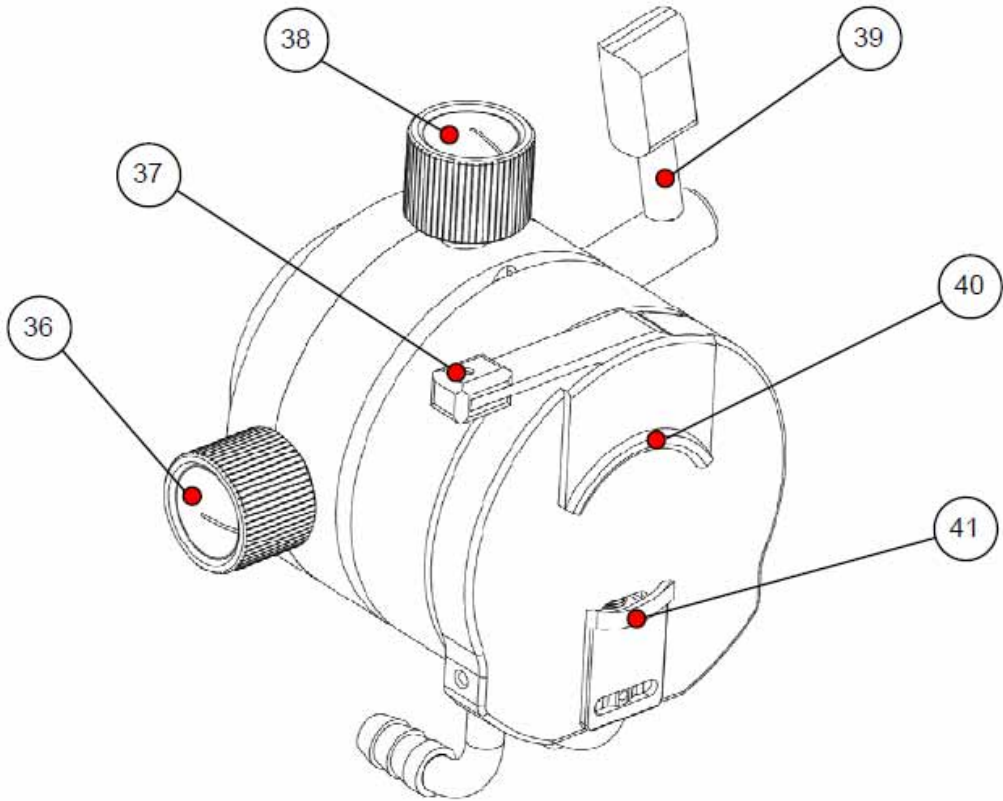
16	Cryobar and Cooled Storage Area	23	Cutting Speed Control
17	Trim Button	24	Motorized Cutting Start / Stop Button
18	Joystick	25	Handwheel Electronic Brake Button
19	Specimen Head	26	Vacutome Filter Cover
20	Blade Holder with Anti-Roll Plate	27	Vacutome Filter Cover Release Knob
21	Vacutome	28	Section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

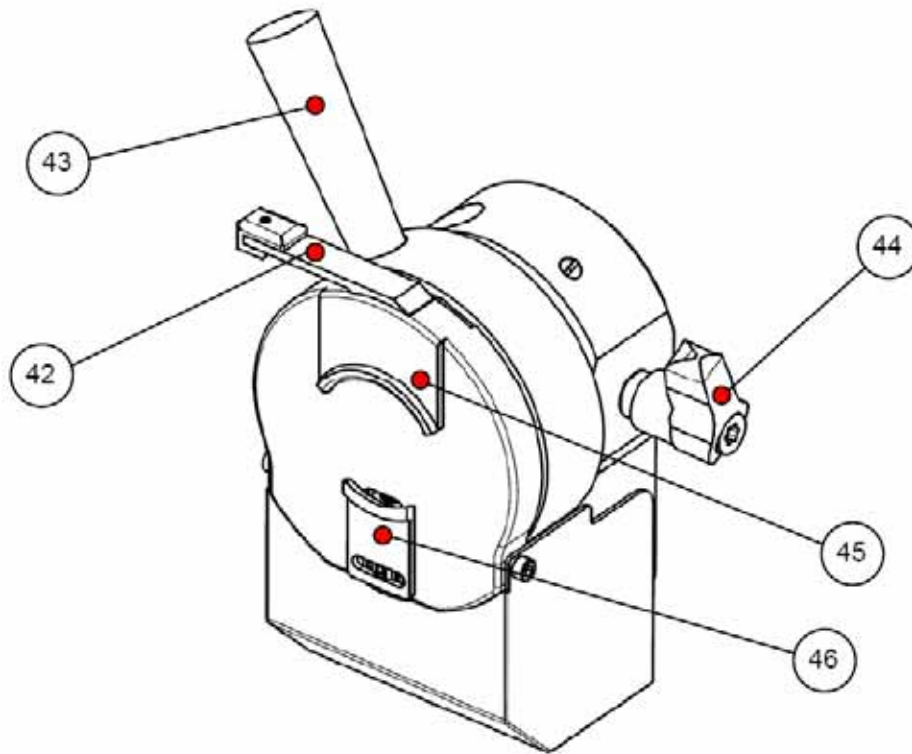
Specimen Head NX70



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)

Specimen Head NX50

NX50



42	Specimen Chuck Release Lever	45	Upper Specimen Chuck Jaw (Static)
43	Orientation Handle	46	Lower Specimen Chuck Jaw (Moving)
44	Specimen Head Clamping Lever		

Set Up

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

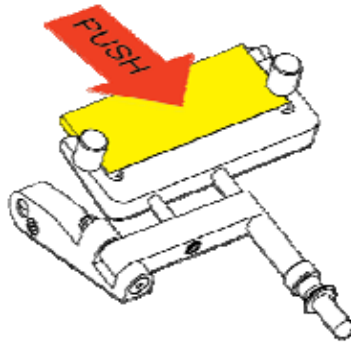
All tools which come into contact with the sections or which are used to manipulate the specimen must also be cooled to prevent the tissue from sticking to them. Therefore all accessories should be stored on the shelves or in the brush tray in the cryo chamber. The exceptions to this rule are the specimen 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 favorable working conditions and a lower frost build-up.

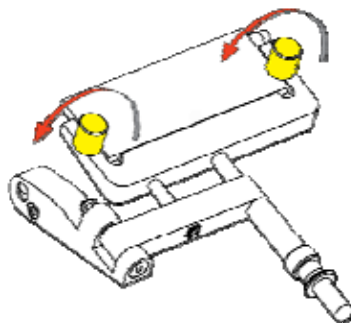
Ensure that the vacutome filter is properly inserted in the filter unit and is suitably maintained - see Cleaning and Maintenance.

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



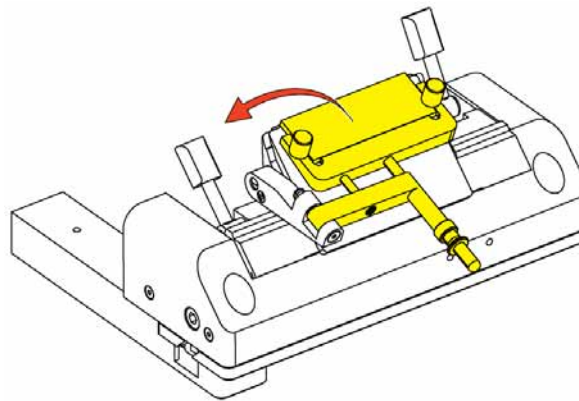
MICROTOME BLADES ARE EXTREMELY SHARP AND CAN CAUSE SEVERE INJURIES- ALWAYS USE GOOD LABORATORY PRACTICE WHEN HANDLING THEM.

ALWAYS COVER THE BLADE WITH THE KNIFE / BLADE GUARD AND ACTIVATE THE BRAKES PRIOR TO MAKE MODIFICATIONS TO THE BLADE/KNIFE AND SPECIMEN OR CHANGING THE SPECIMEN.

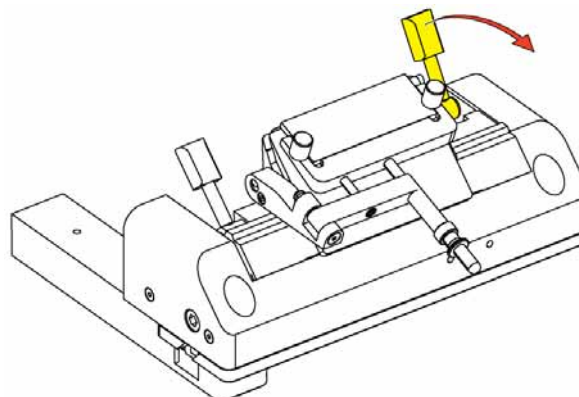
The blade holder should be fitted with low profile blades (80mm x 8mm; 35° facet angle) as standard.

To fit or exchange low profile blades:

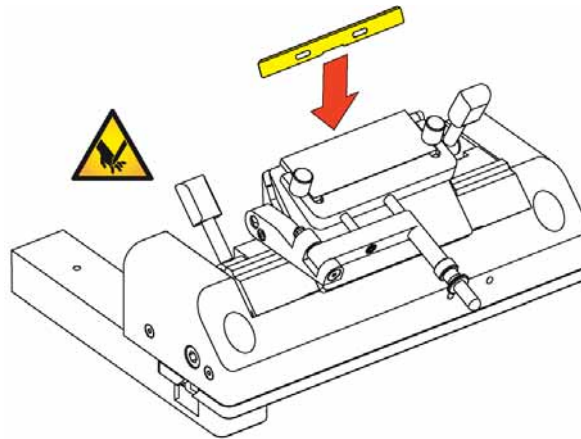
- Move the anti-roll plate to the side.



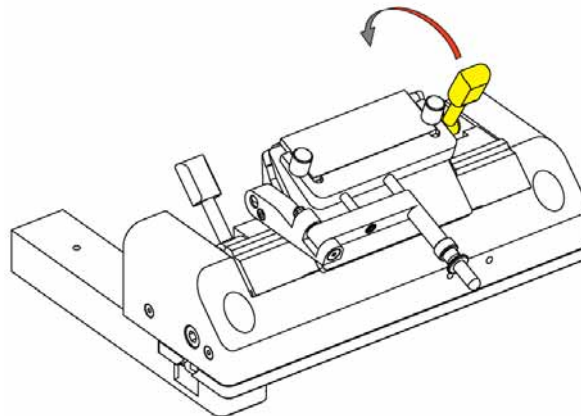
- Pull the blade clamping lever towards the front of the instrument to release the clamping plate.



- Carefully slide a low profile blade into the slot.



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

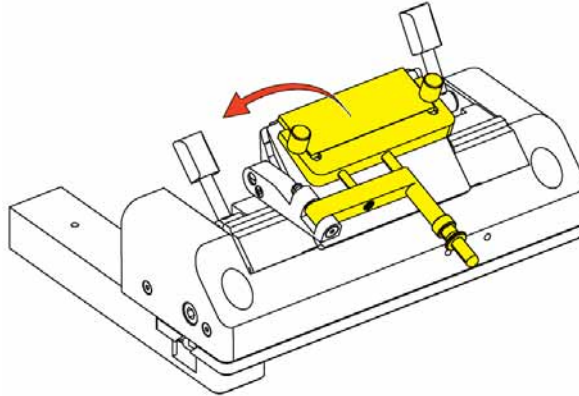


Removing Used Blades with the Magnetic Blade Tool

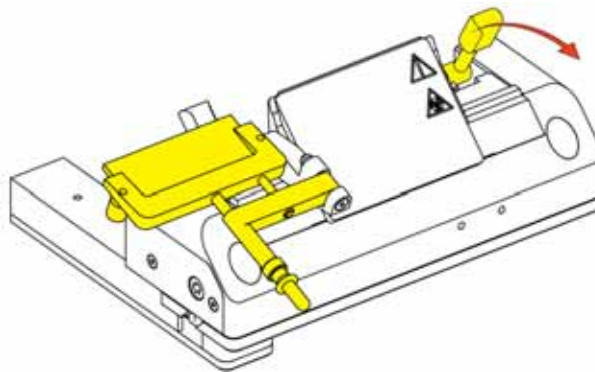
The magnetic blade tool allows the user to remove used blades from the blade holder in a safe way.

Remove the used blade with the magnetic blade tool:

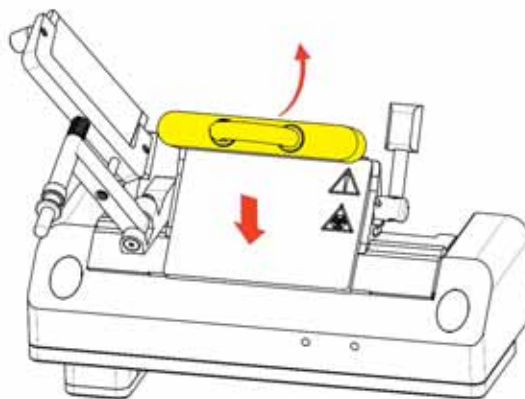
- Move the anti-roll plate to the side.



- 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

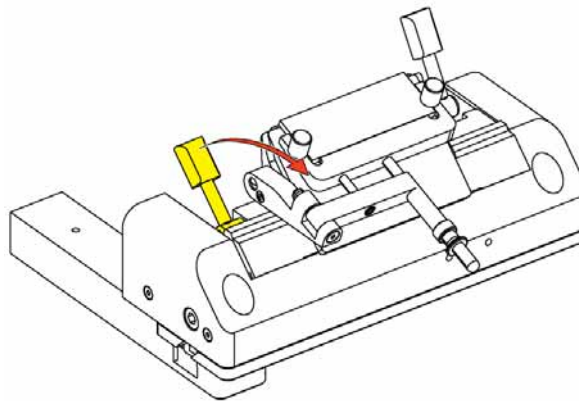


ALWAYS COVER THE BLADE WITH THE KNIFE/BLADE GUARD AND ACTIVATE THE BRAKE PRIOR TO MAKE MODIFICATIONS TO THE BLADE/KNIFE!

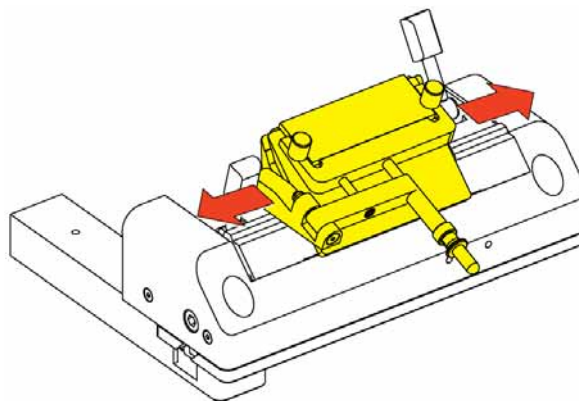
If the cutting area of the blade is no longer usable, the upper part of the blade holder can be moved without removing the blade.

To move the upper part of the blade holder:

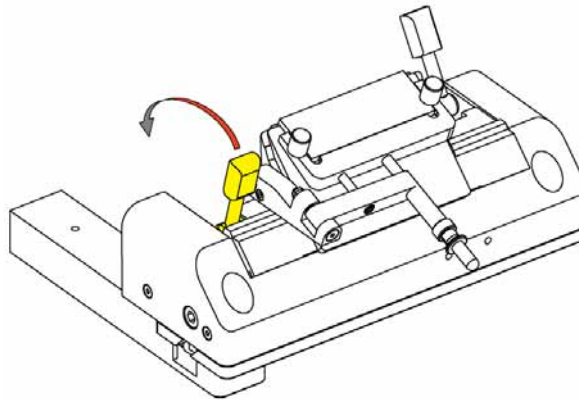
- Loosen the lateral adjustment lever.



- 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.



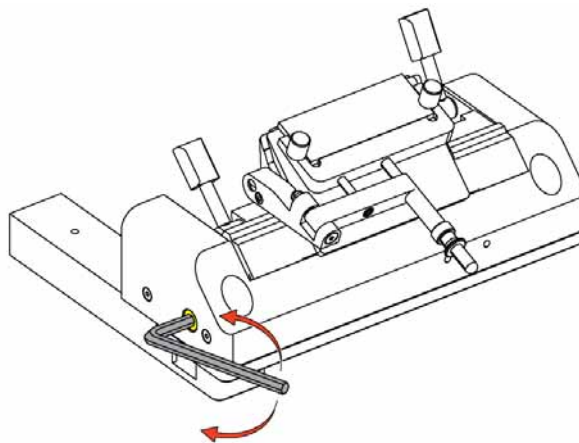
Adjusting the Cutting Angle

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

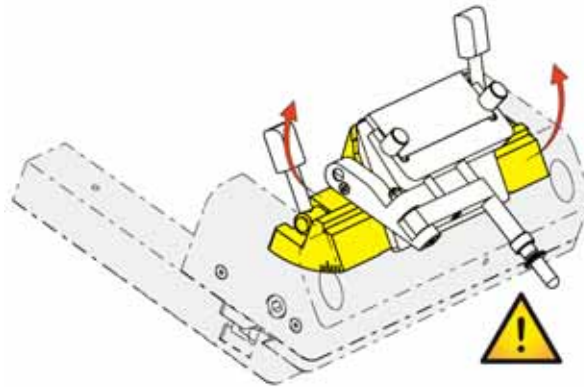
Note

The factory preset cutting angle is 10°, this value is the recommended cutting angle for Thermo blades. The minimum angle is 8°, the maximum angle is 12°.

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



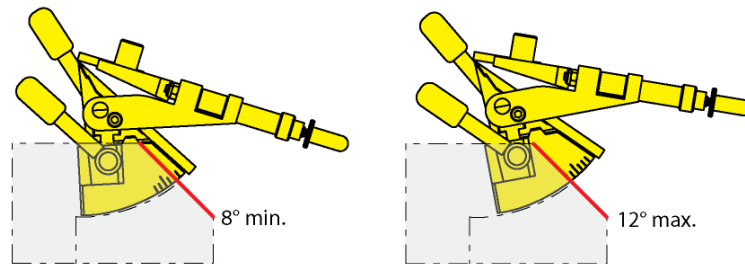
- Gently push both sides of the blade holder base to select the desired angle.



WARNING: THE SURFACE OF THE BLADE HOLDER BASE MIGHT BE COLD. USE GLOVES IF NECESSARY.

Note

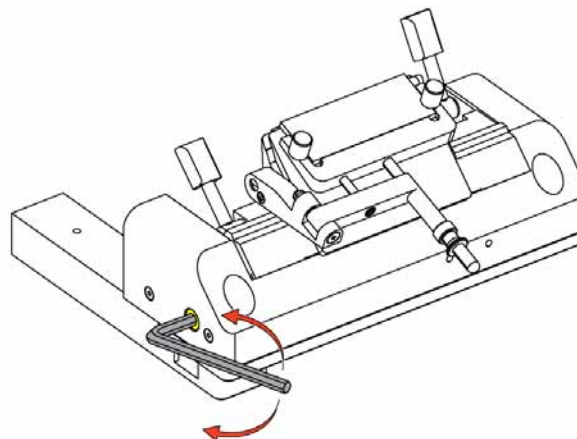
The clearance angle can be read on the scale on the left side on the upper part of the blade holder.



Note

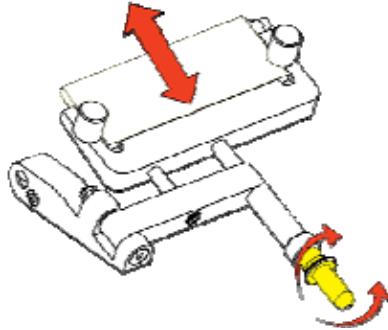
10° is indicated by the longer increment in the middle of the scale.

- 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.

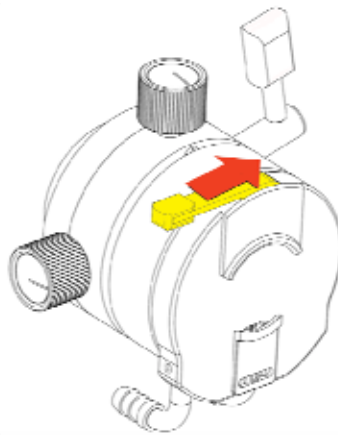
Specimen Setup

Specimen Orientation NX70

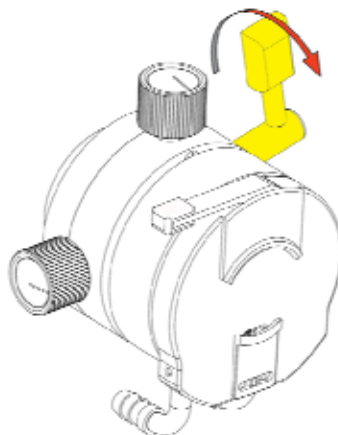
Before sectioning can begin, the specimen must be correctly clamped and oriented in the specimen head.

To clamp and orient the specimen:

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

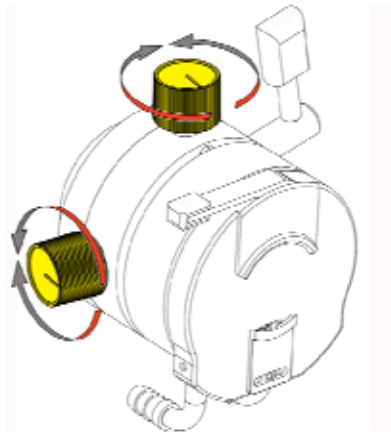


- Release the specimen chuck release lever again to allow the jaws to grip the chuck.
- Loosen the specimen head clamping lever to allow adjustment of the specimen parallel to the cutting edge.



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

NX70

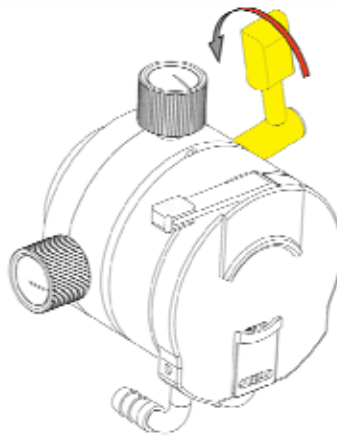


Note

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

- Tighten the specimen head clamping lever again.

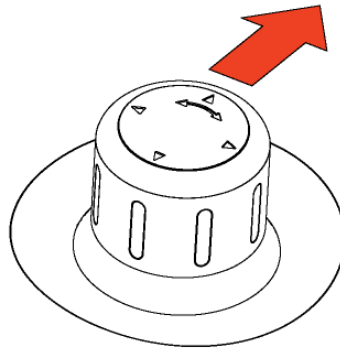
NX70



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.



Note

Tilting the joystick further forwards will increase the speed of approach.



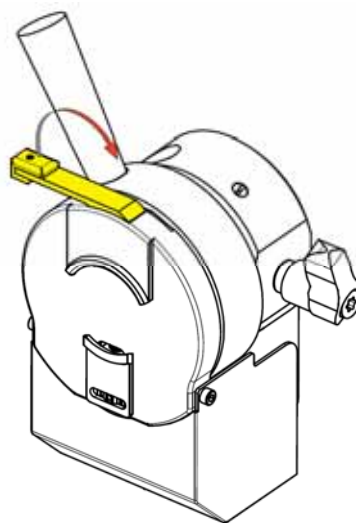
WARNING: TO AVOID SEVERE DAMAGE ENSURE THAT THE BLADE DOES NOT CRASH INTO THE SPECIMEN.

Specimen Orientation NX50

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

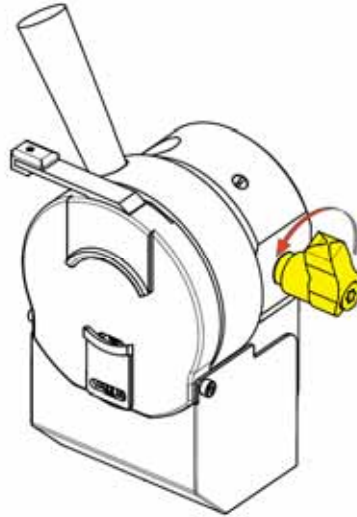
To clamp and orient the specimen:

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



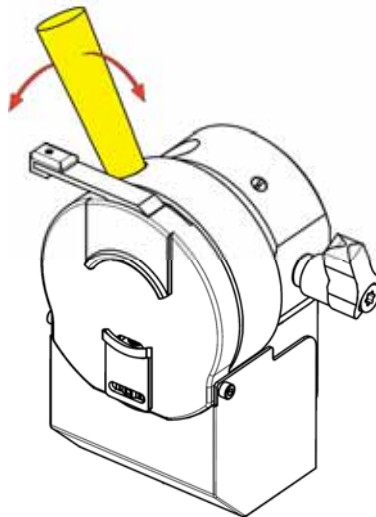
- Release the specimen chuck release lever again to allow the jaws to grip the chuck.
- Loosen the specimen head clamping lever to allow adjustment of the specimen parallel to the cutting edge.

NX50



- Use the orientation handle to orient the specimen on the x- and y-axes.

NX50

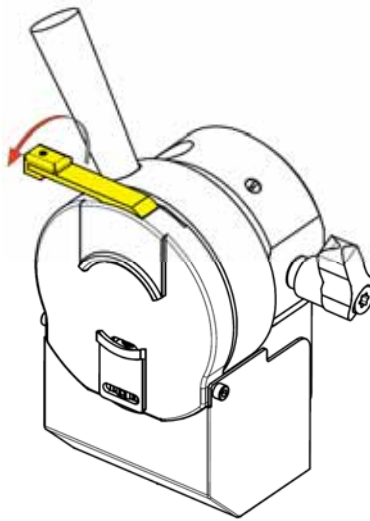


Note

The orientation handle will click into place when the center position has been reached.

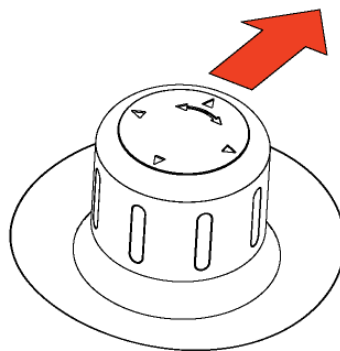
- Tighten the specimen head clamping lever again.

NX50



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.



Note

Tilting the joystick further forwards will increase the speed of approach.



WARNING: TO AVOID SEVERE DAMAGE ENSURE THAT THE BLADE DOES NOT CRASH INTO 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 cryo-chamber.

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.

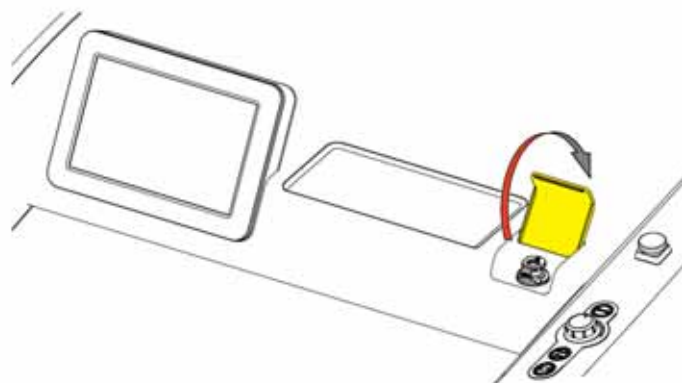


WARNING: TO AVOID FROSTING OF THE CHAMBER, COLD D SHOULD NOT BE USED MORE THAN 2 TIMES PER DAY PLUS ONE CYCLE OVERNIGHT.

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.



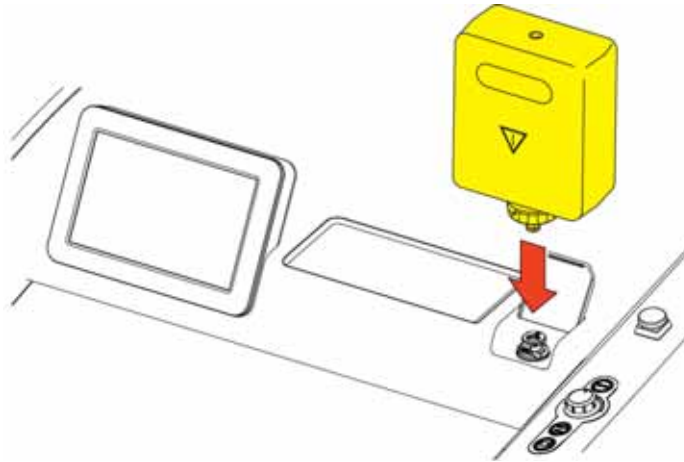
Notes

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

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.

- The Sanosil® bottle is equipped with a special seal.
- Place the top of the Sanosil® one-way bottle into the tank inlet.
- Push the bottle downwards to break the seal.

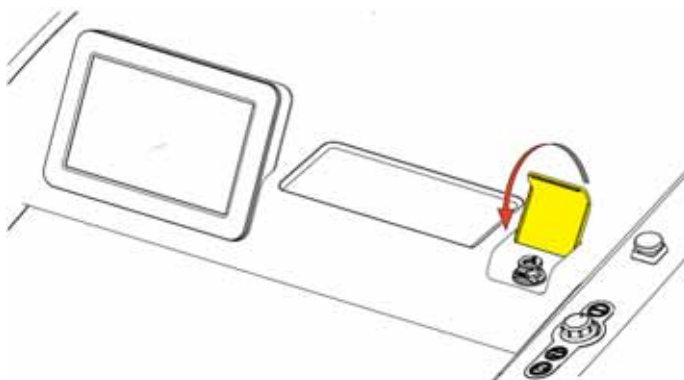
- Remove the fitting on top of the bottle.



- Empty the contents into the tank.



- Pull out the empty bottle and close the reservoir cover.



Notes

*The maximum capacity of the disinfectant tank is 1 liter, which is sufficient for approximately 18 Cold D cycles.
If the fluid level in the disinfectant tank is too low, an error message will be shown on the touch screen display.*

- Dispose of the empty disinfectant bottle in accordance with laboratory regulations.

4 - Operation

Switching On



WARNING: 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.

Notes

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.

Notes

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

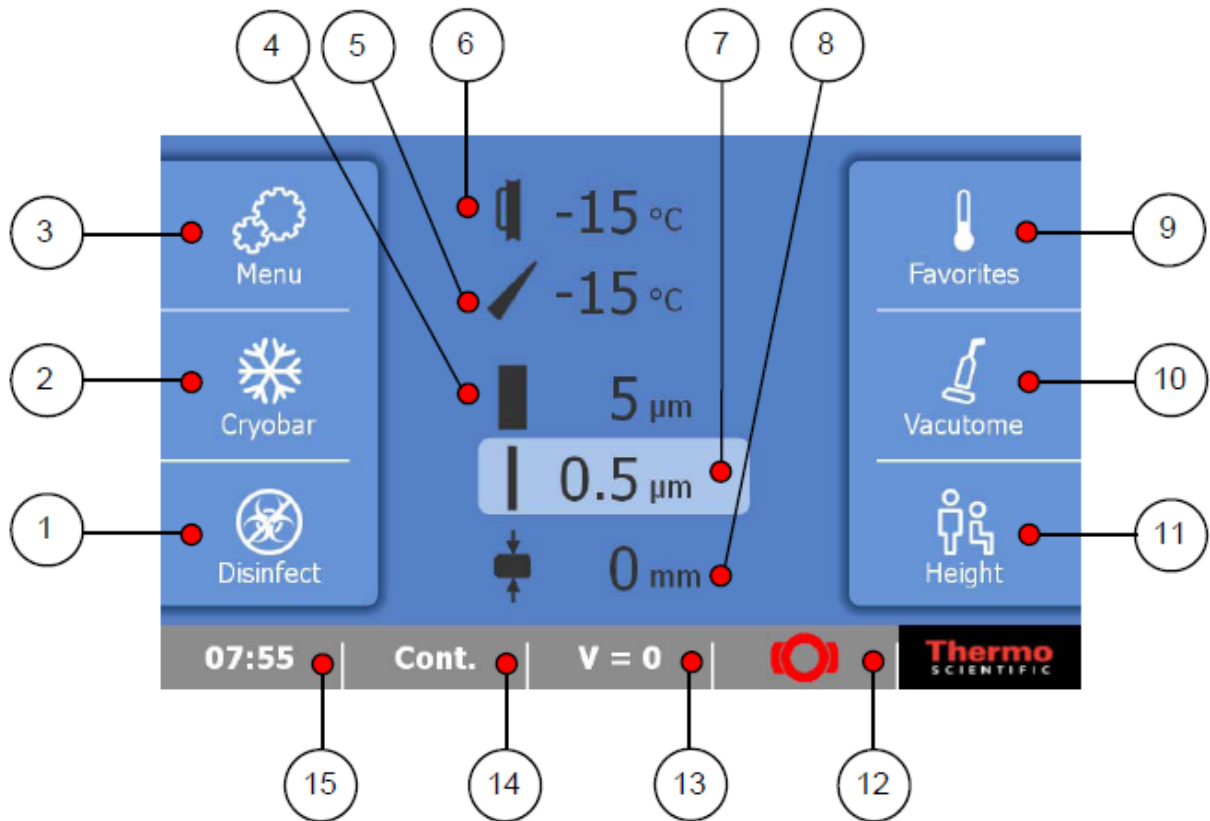
Using the Touchscreen

The CryoStar NX70 / NX50 has an embedded touchscreen user interface which is used to set all preferences.

WARNING: 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	Favorite 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

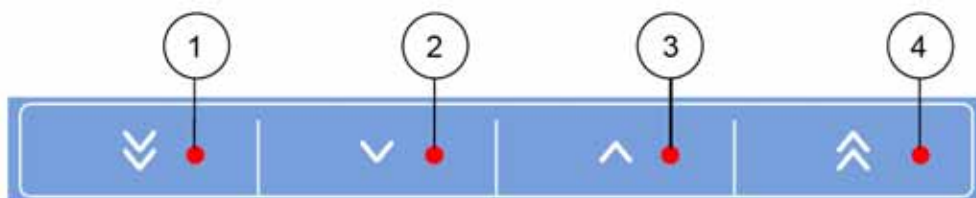
- Press the "Back" button to return to the previous menu without saving any changes.



"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.

Notes

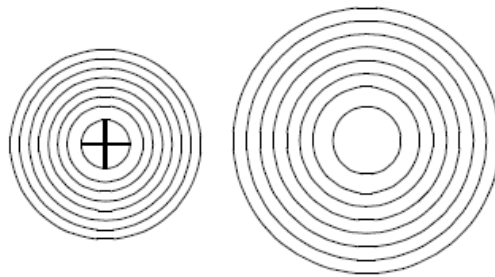
When the cryobar is activated, it will take approximately 2 - 3 minutes for the cryobar to reach a temperature of -60°C.

The cryobar remains active for approximately 10 minutes.

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

Note

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.



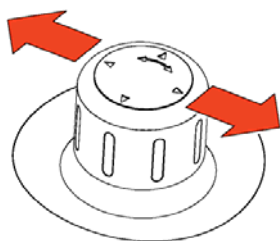
- To turn off the Cryobar function, press the highlighted "Cryobar" button again.

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

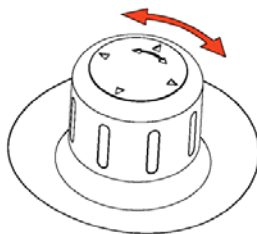


Trim Section Thickness

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 - see Technical Specifications.

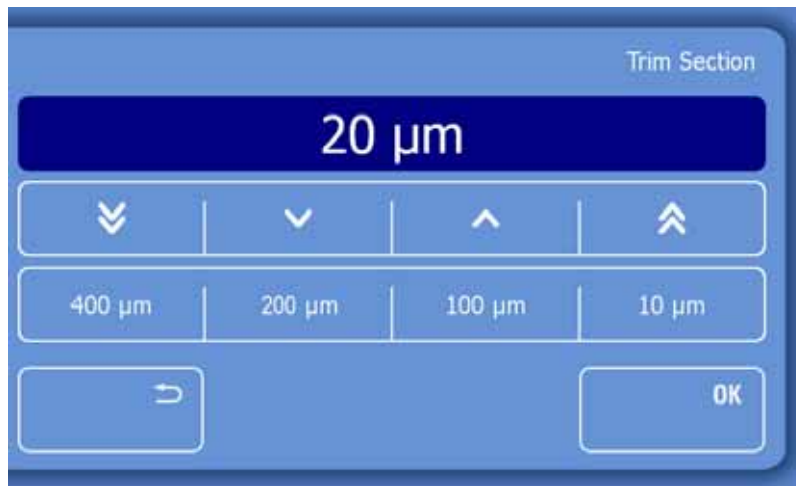
Using the touch screen display

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 preset values (400μm, 200μm, 100μm or 10μm) or adjust the value using the arrow keys.
- For details of the thickness steps see Technical Specifications.
- 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 preset values (100μm, 50μm, 10μm or 5μm) or adjust the value using the arrow keys.
- For details of the thickness steps see Technical Specifications
- 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

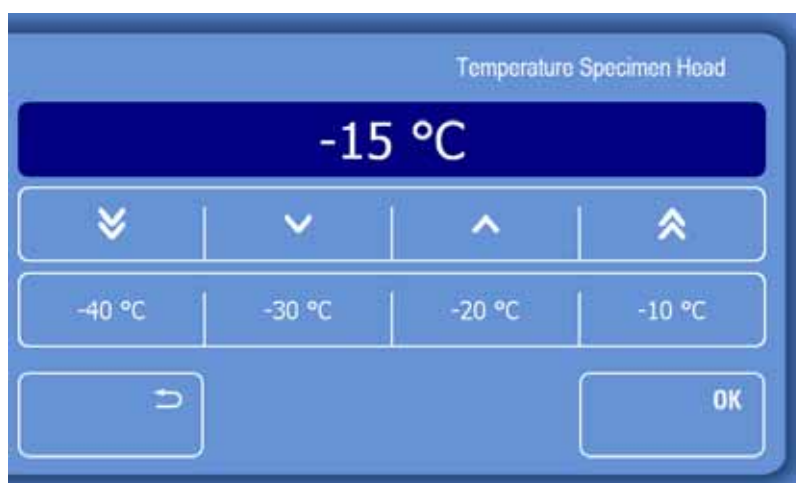
Both the specimen head and the blade holder are actively cooled and the user can adjust either temperature independently.

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.

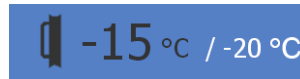


- Either select one of the preset temperatures (-40°C, -30°C, -20°C or -10°C) or adjust the temperature using the arrow keys.
- Press "OK" to confirm the setting and to return to the Main screen.

- 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 preset 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.



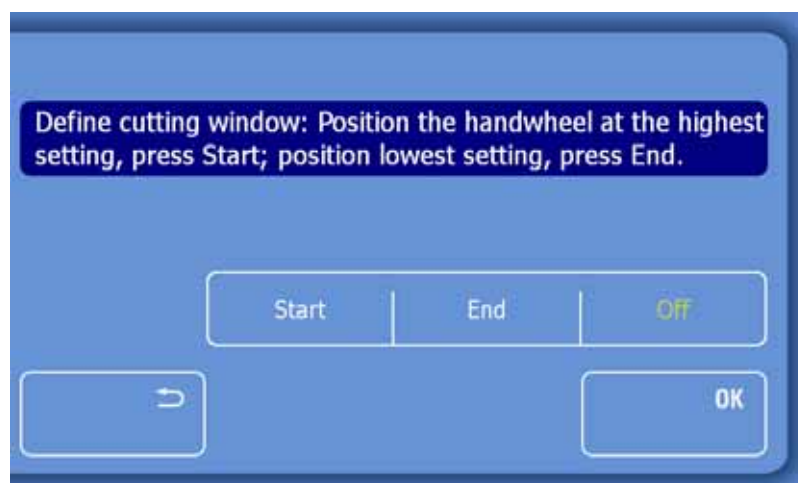
Cutting Window

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 Favorite

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

To select one of the preset Favorites:

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



- Press the desired favorite to select it.
- The sliding window disappears and the selected Favorite is highlighted in yellow.
- To program favorites - see Setting Preferences - Favorites.

Note

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

Vacutome and Cleaning Mode

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

Notes

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 stretching and aids in keeping the cryo chamber 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.



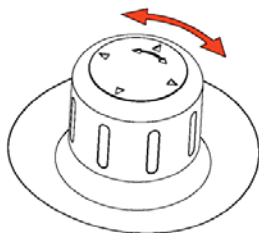
- Use the arrow keys to increase or decrease the Vacutome suction value - the default setting is 100%.

- 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.

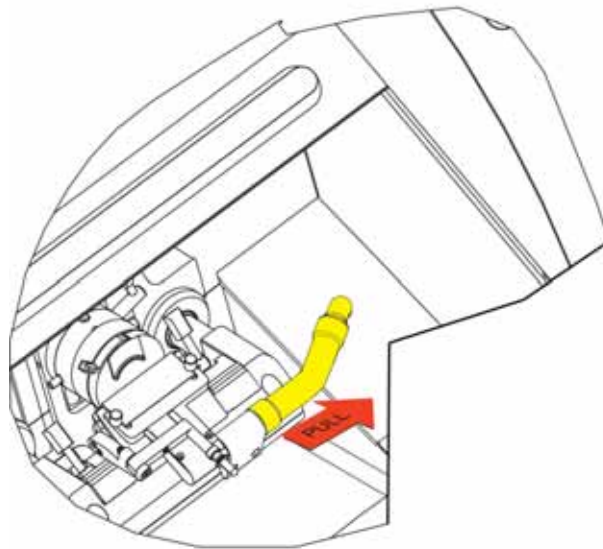
Notes

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.
- Remove the Vacutome hose from the blade holder and use it to remove any section waste from the cryo 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 / NX50 cryostat has an electronic height adjustment which enables the user to raise or lower the cryostat to a convenient working height.



WARNING: Do not lean on the instrument when the height adjustment is carried out to avoid damage to the instrument. Take care that the power cord is free to move.

To adjust the height of the cryostat:

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



- A sliding 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.

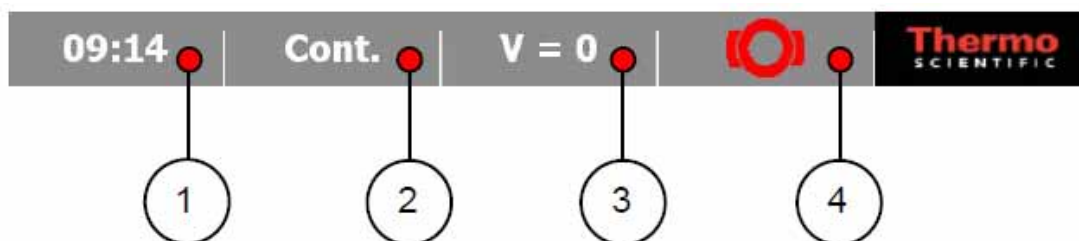
Note

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.



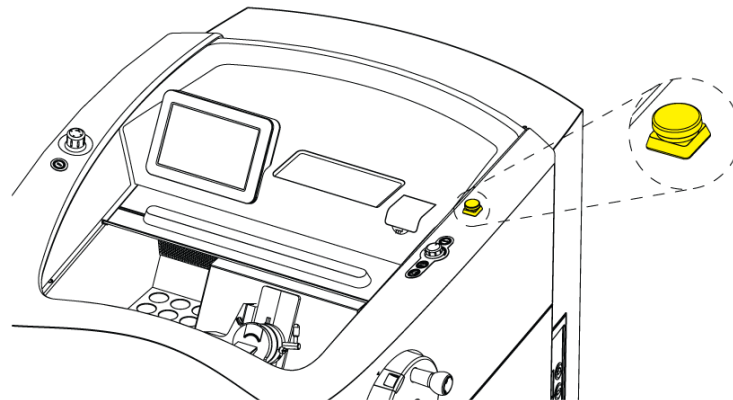
Cutting Mode Selection

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

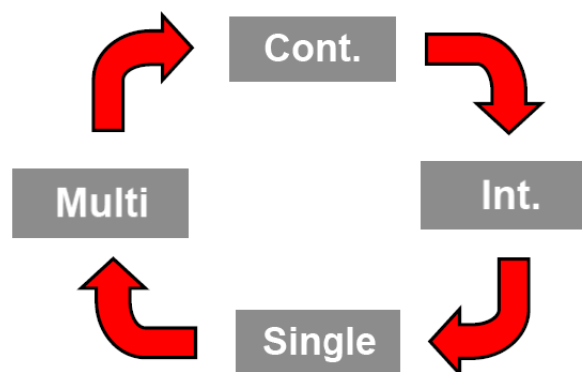
In case of emergency, the motor drive can be stopped in every operating mode by pressing the emergency stop button or the emergency stop in the (optional) foot pedal. To continue sectioning pull out the emergency stop button or unlock the emergency stop in the foot pedal.



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.



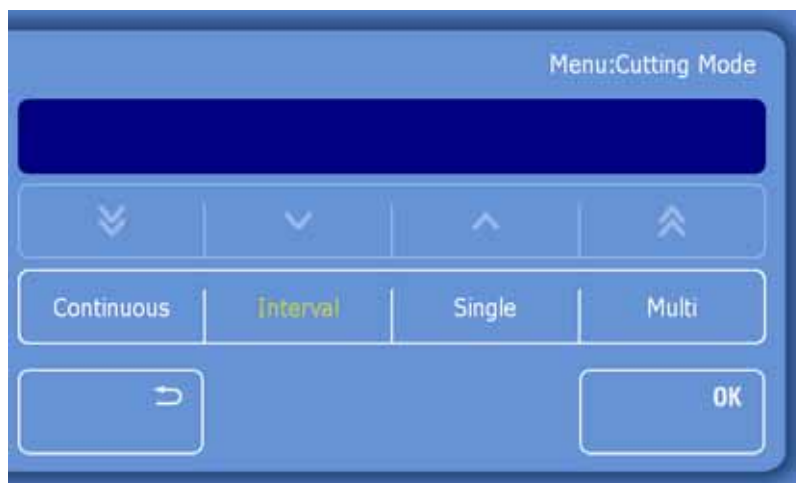
- The Menu screen will be displayed.



- Press the "Cutting Mode" button.

Cutting Mode

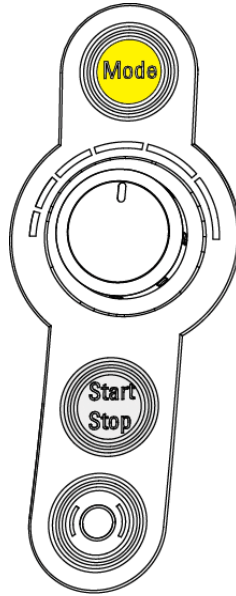
- The Menu: Cutting Mode screen will be displayed.



- 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 preset 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.

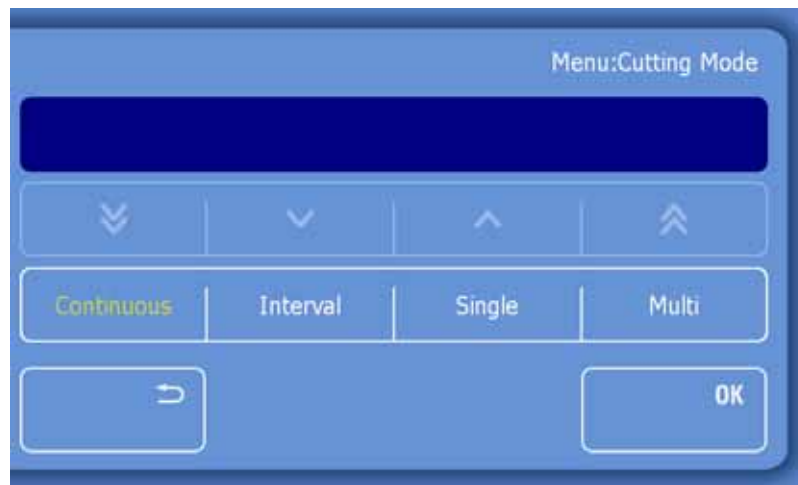


- The Menu screen will be displayed.

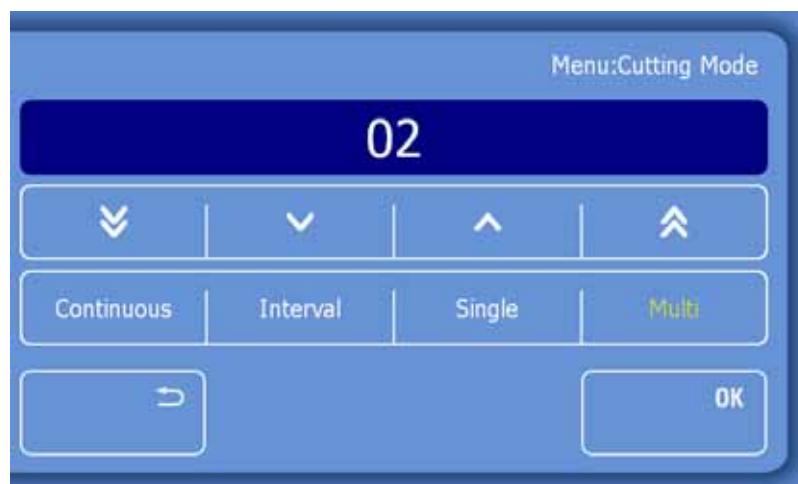
- Press the "Cutting Mode" button.

Cutting Mode

- 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.

Notes

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 preset 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.

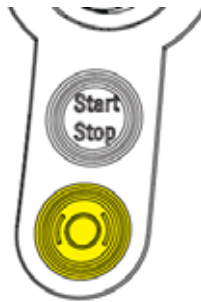
Handwheel Brake



WARNING: ALWAYS ACTIVATE THE BRAKE WHEN MANIPULATING THE BLADE/KNIFE AND SPECIMEN.

To activate the Handwheel Brake:

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

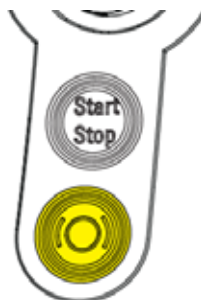


Note

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

To deactivate the Handwheel Brake:

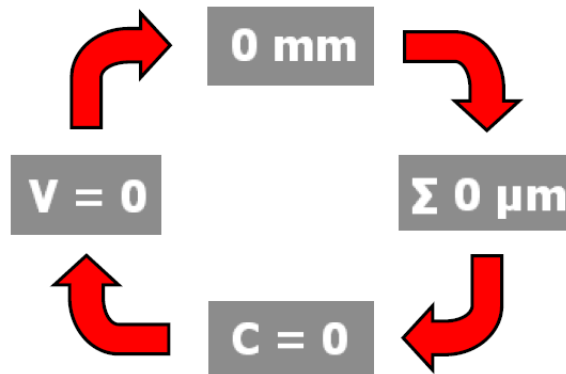
- Press the red highlighted "Brake" button on the Main screen or the "Brake" button on the right touch pad.



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

Indicates the remaining distance to front end position of the blade holder.

0 mm

Section Thickness Sum

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

$\Sigma 0 \mu\text{m}$

- 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.

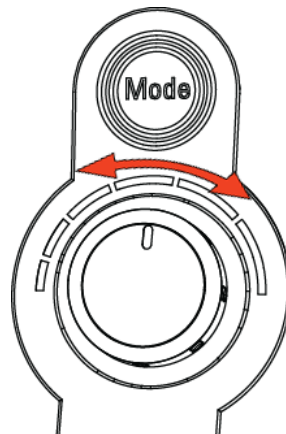
Setting the Cutting Speed

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

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

V = 0

- 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.



WARNING: 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

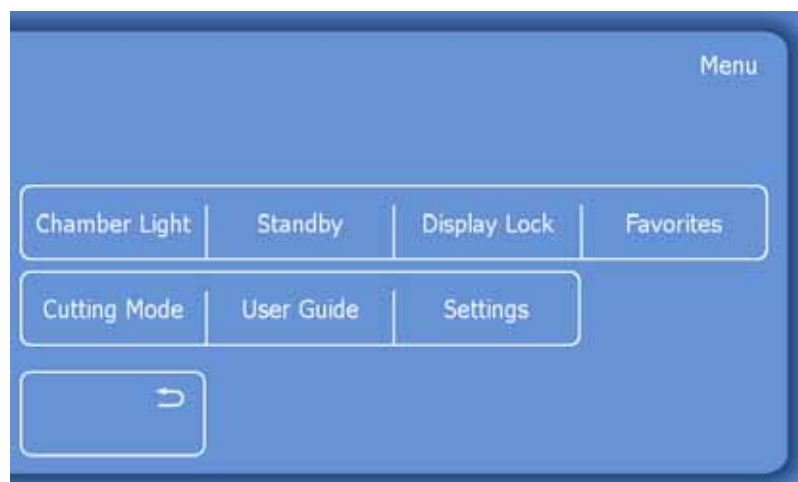
The "Menu" button provides access to submenus for adjustments, settings and the user guide.

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 preset 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 NX70 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 -15°C and for the specimen head to -15°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.

A blue rectangular button with the word "Standby" in white text.

- 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.

Display Lock

To deactivate the Display Lock:

- Press the "Lock" Symbol three times.

Note

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



Favorites

Favorites are a set of preset values for the specimen head and blade temperature.

The user can program three favorites 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 preset value is reached.

To program Favorites:

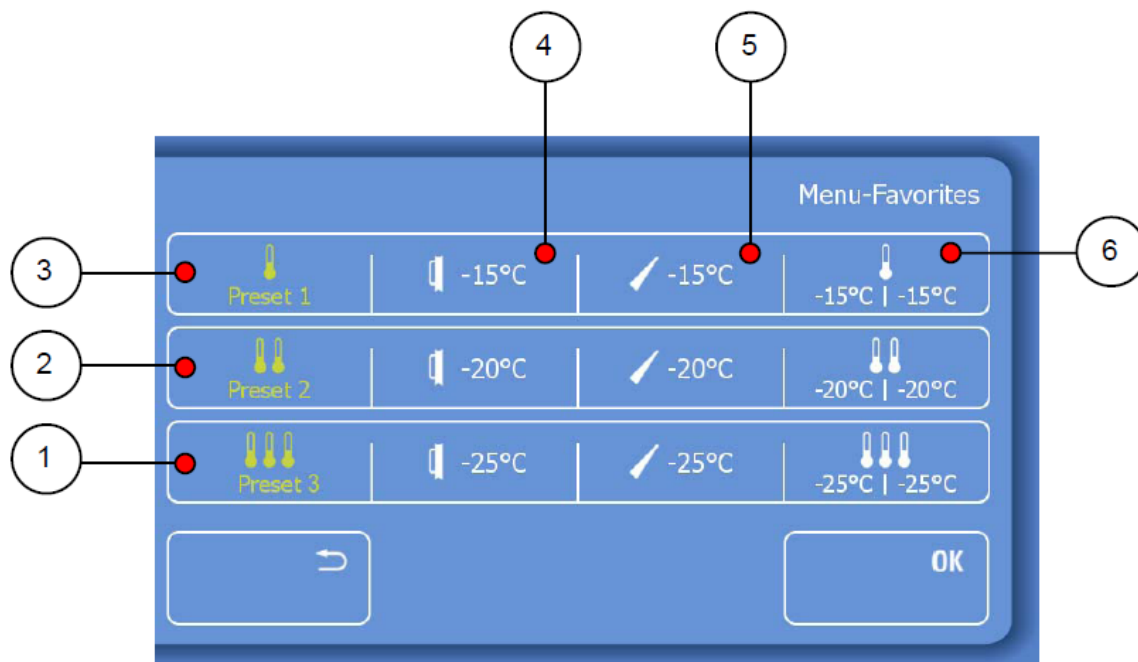
- Press the "Menu" button on the Main screen.



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

Favorites

- The Menu: Favorites screen will appear.



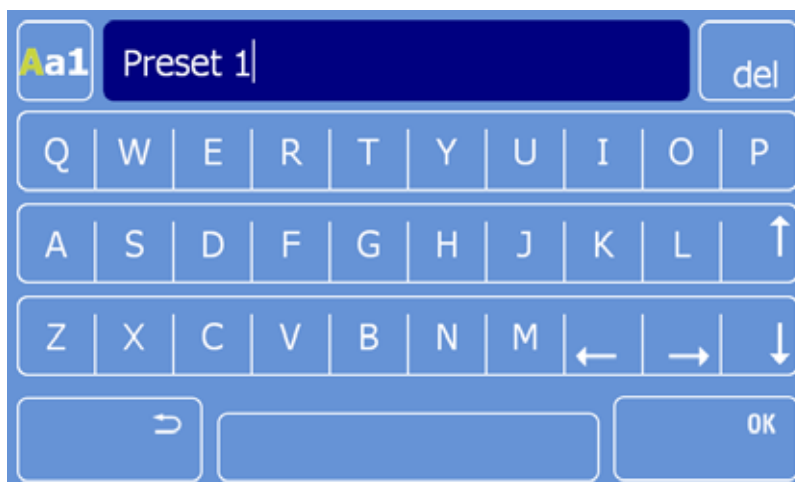
1	Preset 3 Title Box	4	Specimen Head Temperature
2	Preset 2 Title Box	5	Blade Temperature
3	Preset 1 Title Box	6	Alternative Indication

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

- Favorite 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 Favorite name:

- Press the name of the preset 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 favorite (for example "Muscle" / "Fat" / "Bone").
- Press "OK" to confirm the setting and to return to the Favorites menu.
- Press the "Back" button to exit back to the Favorites 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 favorite 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:

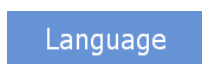
- Press the "Menu" button on the Main screen.



- 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.

Day

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

Set the Month

- Press the "Month" button to highlight it.

Month

- Use the arrow keys to select the desired month.

Set the Year

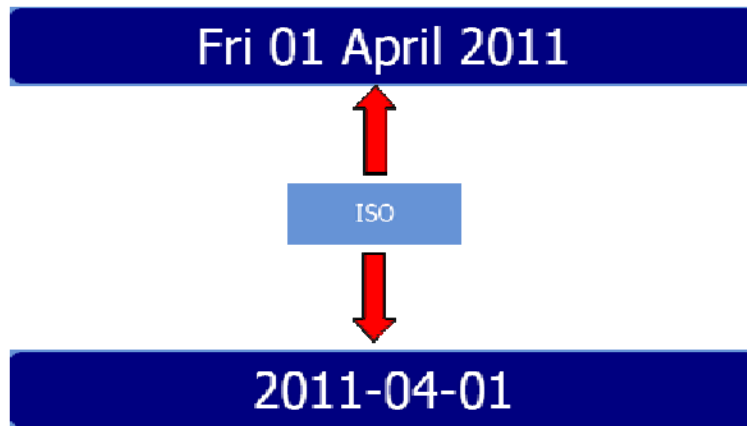
- Press the "Year" button to highlight it.

Year

- 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.

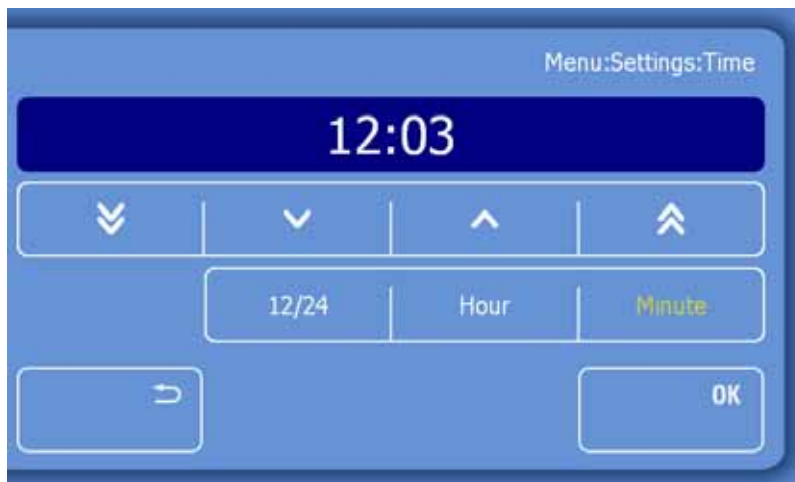


- The Menu: Settings screen will appear.

- Press the "Time" button.



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



Set the minutes

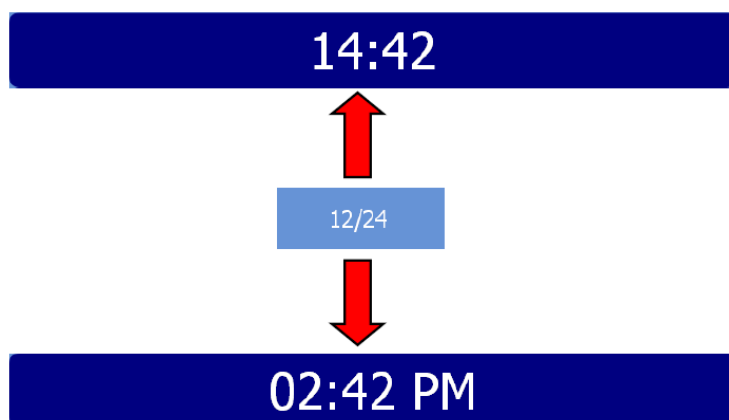
- Press the "Minute" button to highlight it.
- Use the arrow keys to select the desired minute.

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.



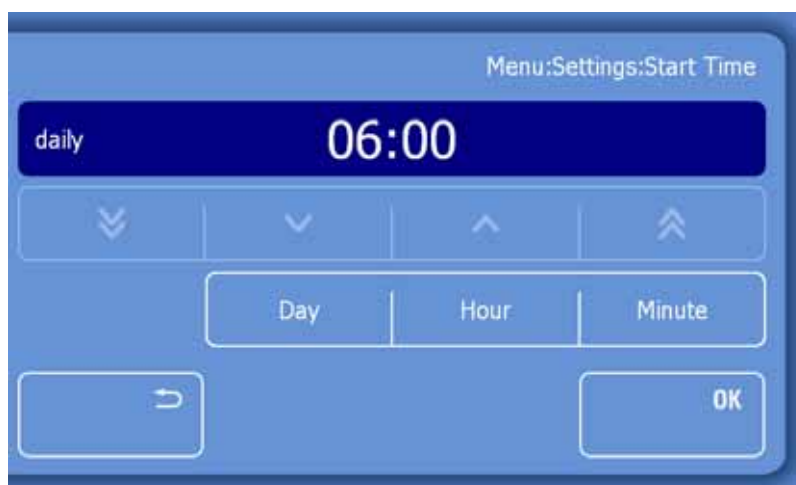
- Press the "Settings" button.



- 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 preset 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

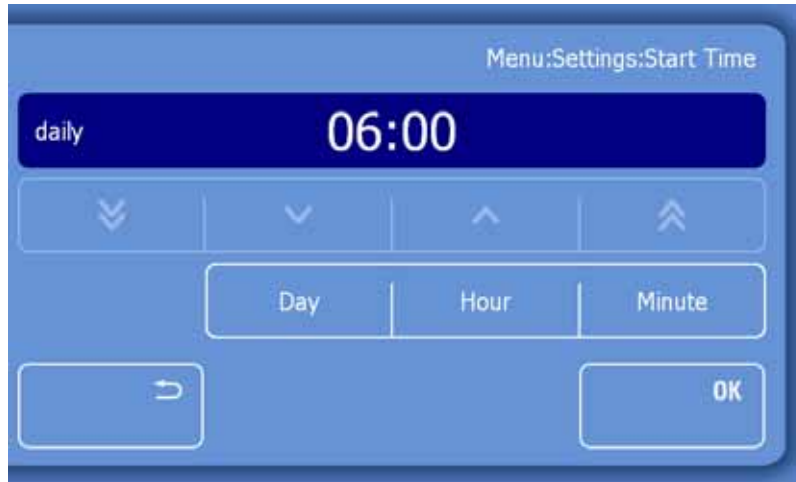
The default setting is every day, from Monday to Sunday.

- 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 cryo chamber 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.

WARNING: DURING DEFROSTING, REMOVE THE SPECIMENS FROM THE CRYO CHAMBER, 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.

Notes

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 built-up on the microtome or on the knife carrier are 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.

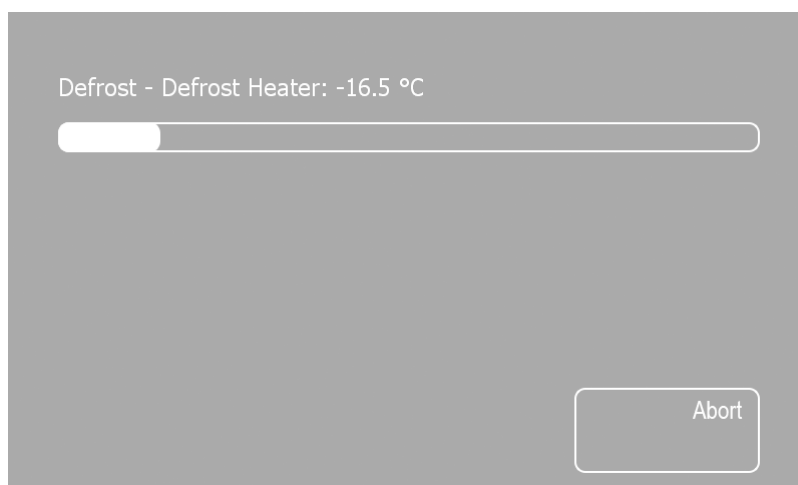
- Press the "Defrost" button.

Defrost

- 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.

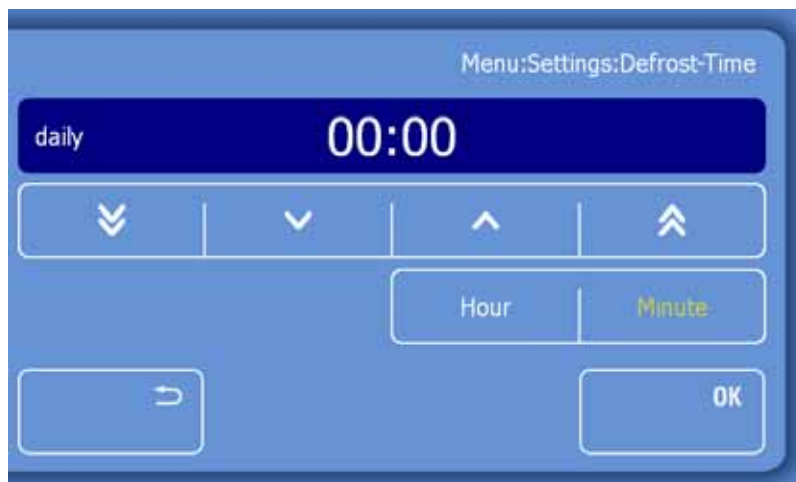


- The Menu: Settings: Defrost screen will be displayed.



- 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.

Settings

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

Screen

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



- Select one of the preset 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.

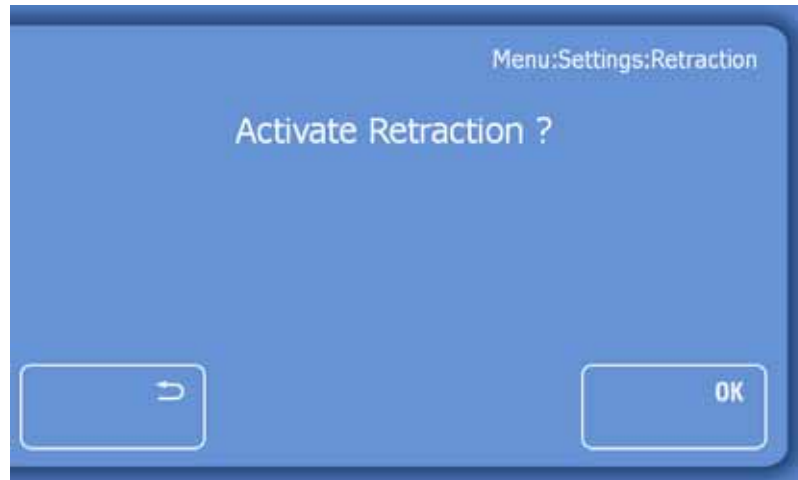


- Press the "OK" button to turn off the Retraction and to return to the Main screen.
- Press the "Back" button three times to return to the Main screen without saving the changes.

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 an 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.

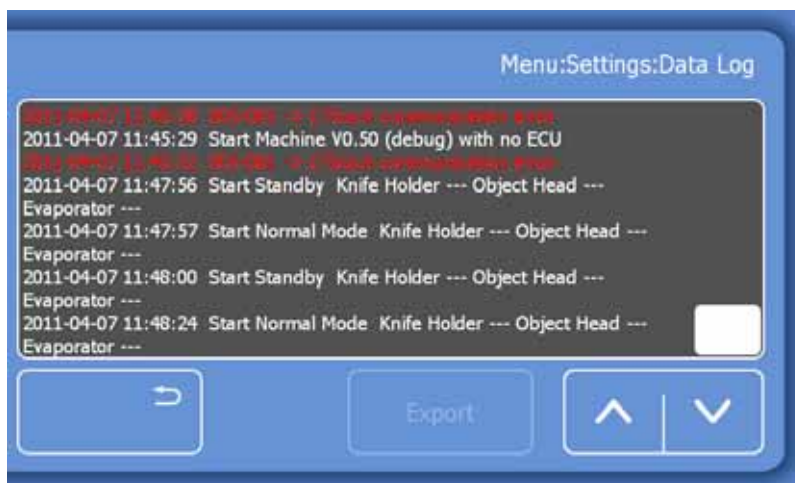
- Press the "Settings" button.

Settings

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

Data Log

- 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:

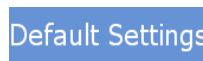
- Press the "Menu" button on the Main screen.



- 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

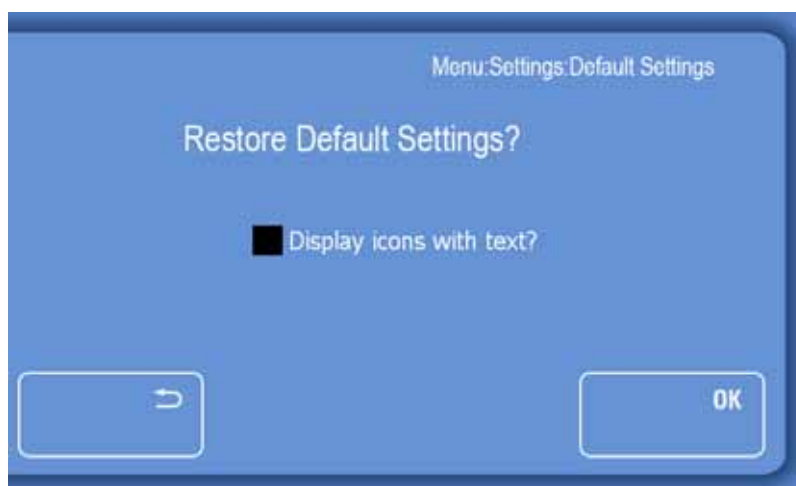
The text underneath the Main screen icons can be switched off if required.

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.



WARNING: PRESSING "OK" WILL RESET THE INSTRUMENT TO THE DEFAULT SETTINGS!



Service

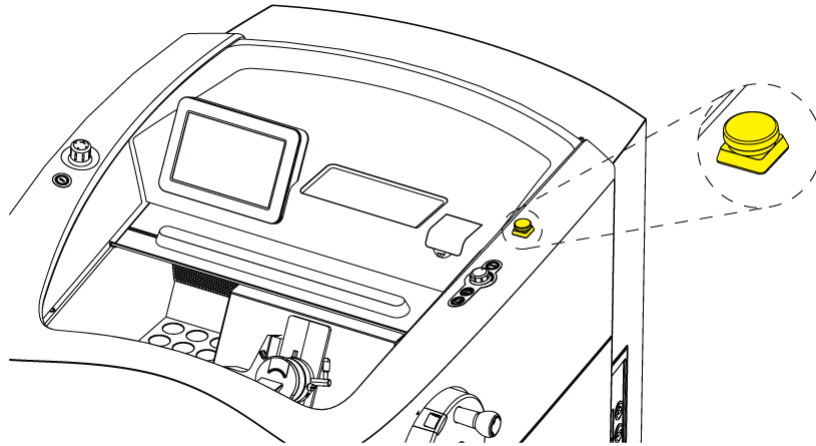
This submenu is only for service purposes. A password is required to enter the Service menu.

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 is 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 cryo chamber.

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 $+10^{\circ}\text{C}$ and -50°C .

The instrument is also equipped with an active cryobar.

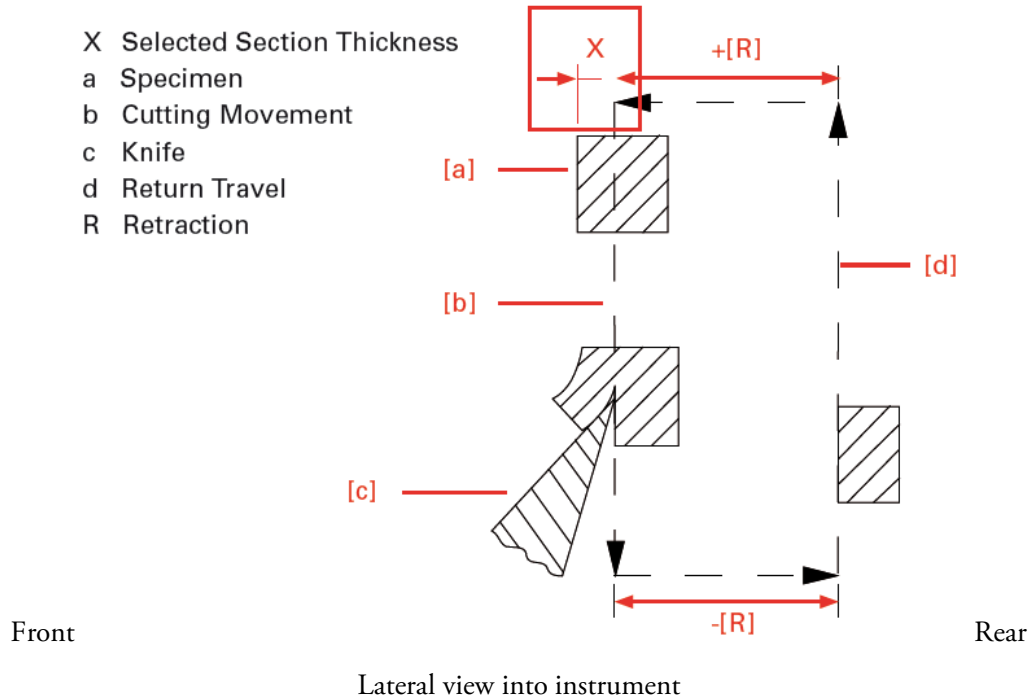
The cryobar area actively cools down to -60°C .

Note

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

Sectioning Procedures

Cutting Movement and Retraction



Notes

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.

- Hold down the "Trim" button and turn the hand-wheel in a clockwise direction to begin trimming.

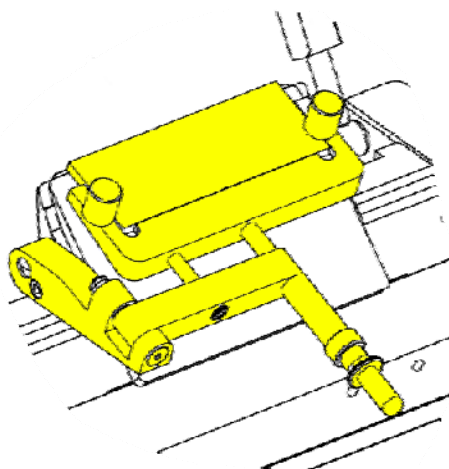


Note

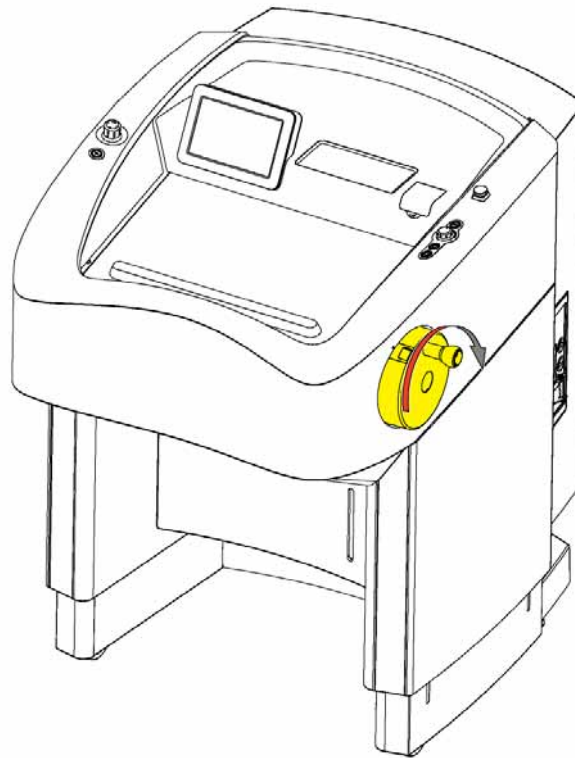
The blade holder will move forwards by the preset trim thickness value every cycle.

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

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.



WARNINGS: WHEN THE INSTRUMENT IS TURNED OFF, THE ELECTRONIC HANDWHEEL BRAKE CANNOT BE ACTIVATED! WHENEVER THE INSTRUMENT IS TURNED OFF, THE MECHANICAL HANDWHEEL BRAKE HAS TO BE ACTIVATED.

FOR YOUR PERSONAL SAFETY, ONE OF THE TWO 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.

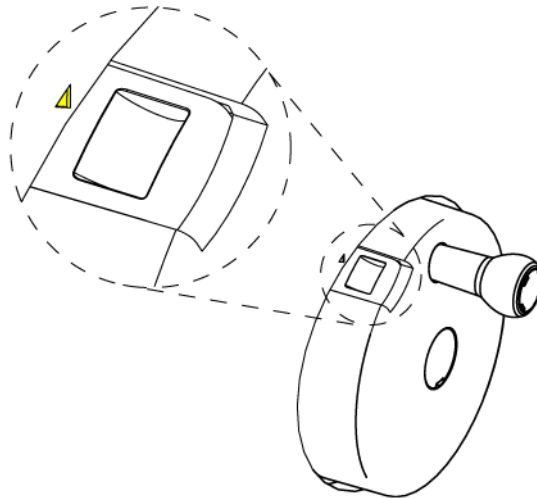


Note

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

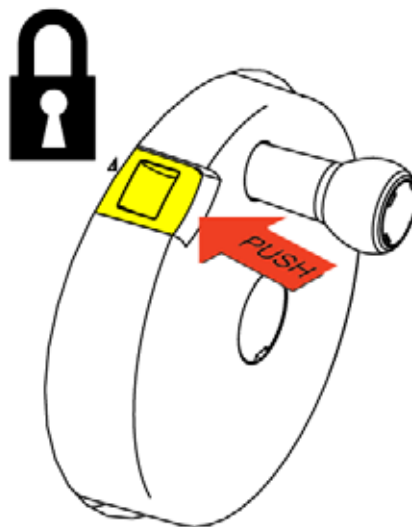
Mechanical Handwheel Brake

The mechanical handwheel brake acts as an additional safety device, especially when the instrument is turned off and the electronic handwheel brake is inoperable. To 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.



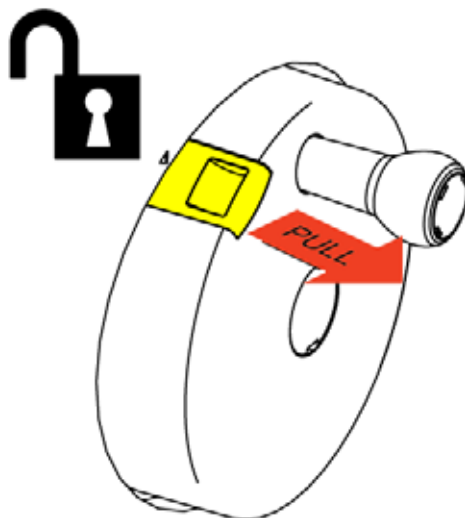
Notes

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 cryo chamber with Sanosil®. Disinfection is either on-demand or pre-programmed.

The Cold D cycle takes 50 minutes to complete.



THE WINDOW OF THE CRYO CHAMBER 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.

WARNING: BEFORE STARTING THE COLD D FUNCTION, REMOVE ALL SPECIMENS FROM THE CRYO CHAMBER.

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



- The Disinfection screen will appear.

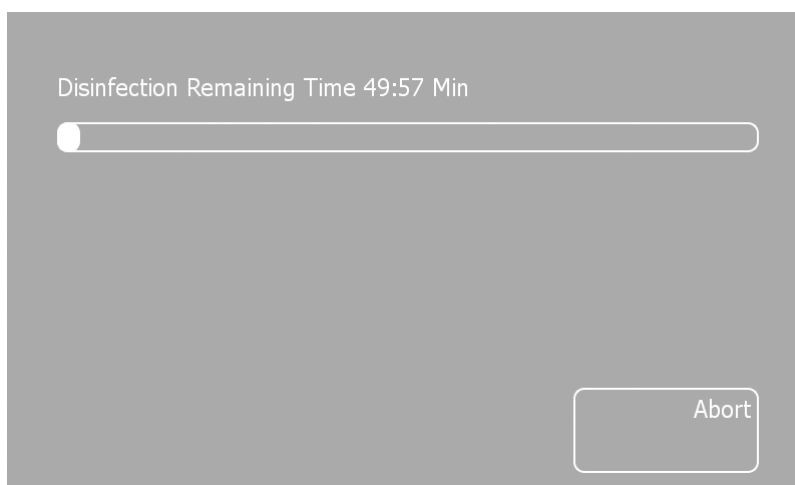


- Press "OK" to start the disinfection immediately.
- Press the "Back" button to return to the Main screen without starting the disinfection.

Note

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

- The Disinfection Remaining Time screen will appear.

**Notes**

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 cryo chamber following completion of a Cold D cycle. These byproducts of the Cold D cycle will normally evaporate from the cryo chamber 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.

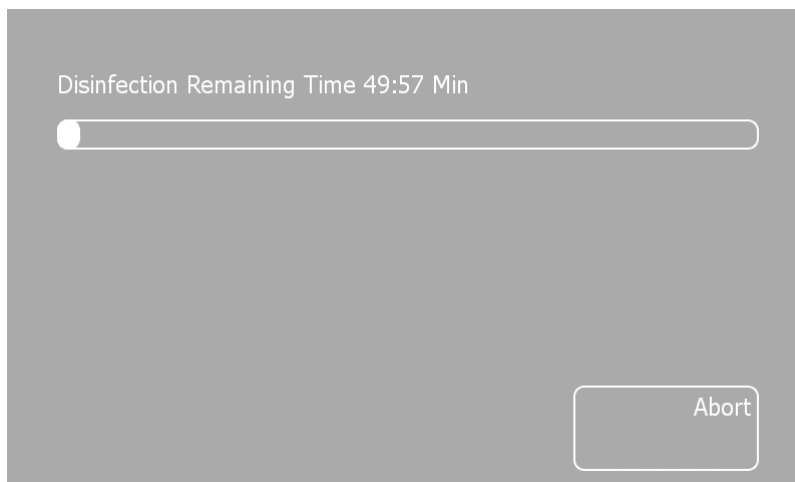
Any occasional build-up of crystalline material in the cryo chamber can also be easily removed with an alcohol spray and paper towel.

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.

Note

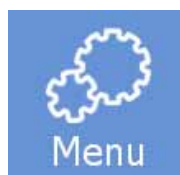
An interrupted Cold D cycle will not adequately disinfect the cryo chamber. However, the instrument can be used immediately afterwards.

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.

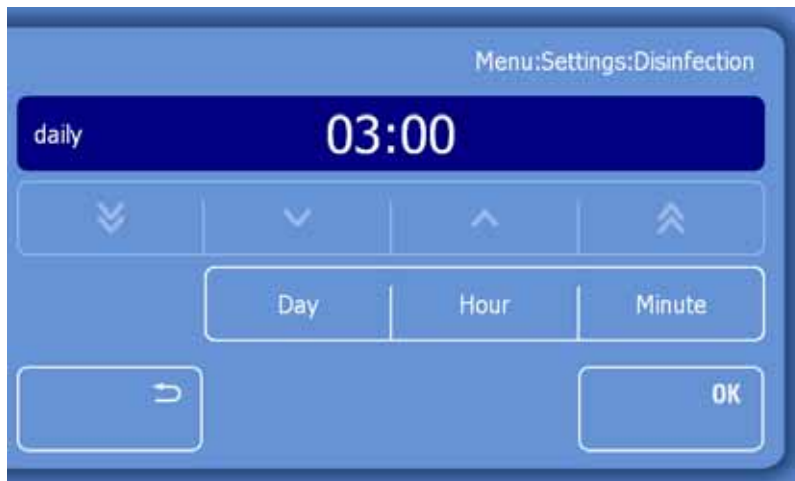


- The Settings Menu screen will be displayed.

- Press the "Disinfection" button.

Disinfection

- 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.

Day

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



Note

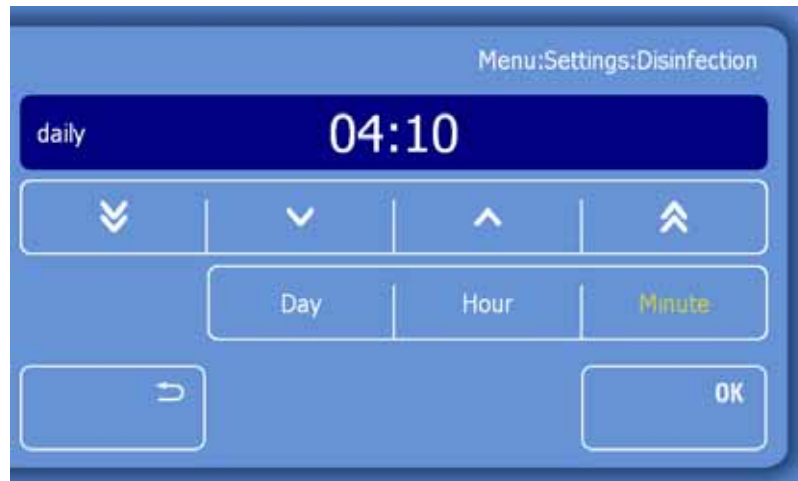
The default setting is every day, from Monday to Sunday at 3:00 am.

- 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.

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. <i>Tip – use freezer spray on clamp plate and blade to confirm.</i>
	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 <i>Tip – use freezer spray on clamp plate and blade to confirm.</i>
	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.

Problem	Possible Reason	Advice
Sections thick-thin	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.
	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.

WARNING: DURING DEFROSTING, REMOVE THE SPECIMENS FROM THE CRYO CHAMBER, 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.

Optimum Temperature Ranges for Sectioning Different Types of Fresh Specimen

Specimen Type	Knife/Blade Temp	Specimen Temp
Adipose Tissue	-35°C to -40°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 to -40°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 to -40°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

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.



WARNING: 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

- Turn off the main switch; pull the main plug off.
- 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.

Cleaning and care of the Blade Holder

- Carefully clean and dry the dismantled 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.

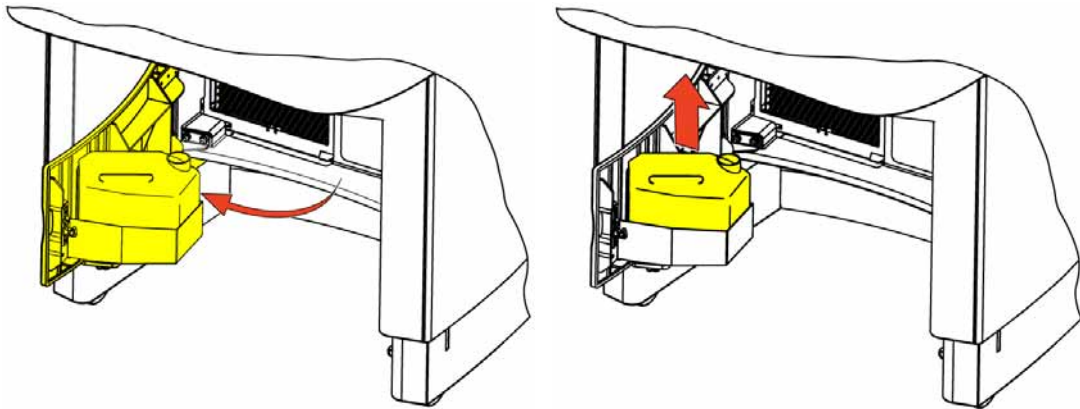
Notes

The capacity of the bottle is 2.5 Liters (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.

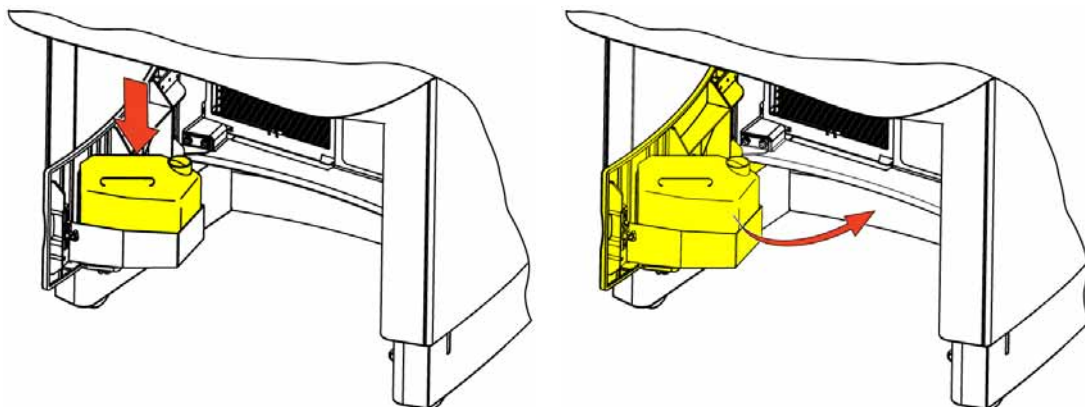


- Dispose of the liquid in accordance to the laboratory regulations and clean it.

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.

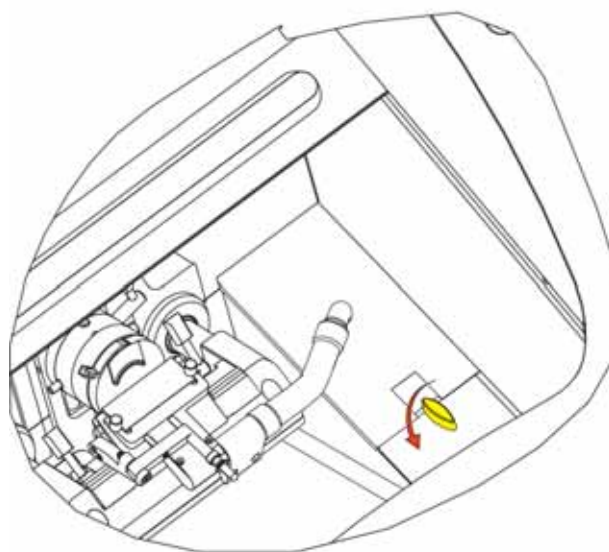
The Vacutome Filter Bag collects all section waste which has been removed with the vacutome function.



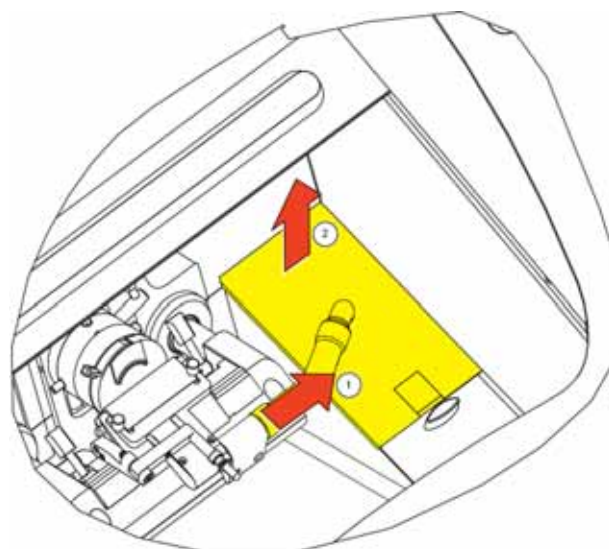
WARNING: Section waste can be hazardous! Dispose of the used vacutome filter bag in accordance to the laboratory regulations.

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

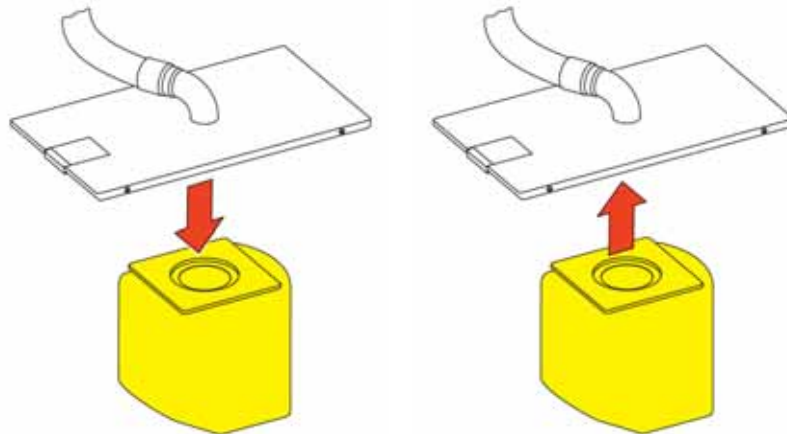
- Open the lever of the cover.



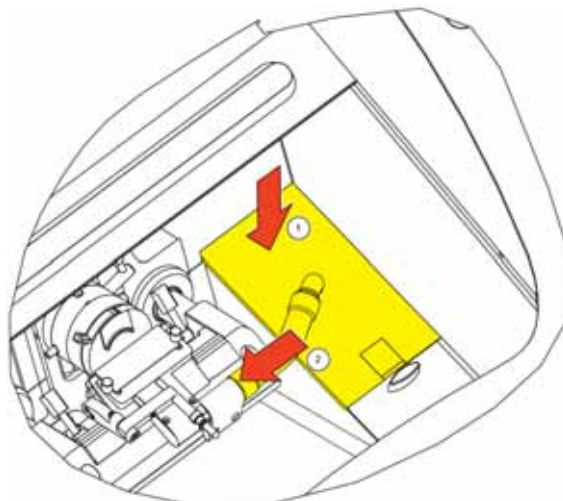
- Remove the vacutome hose (1) and lift off the cover (2).



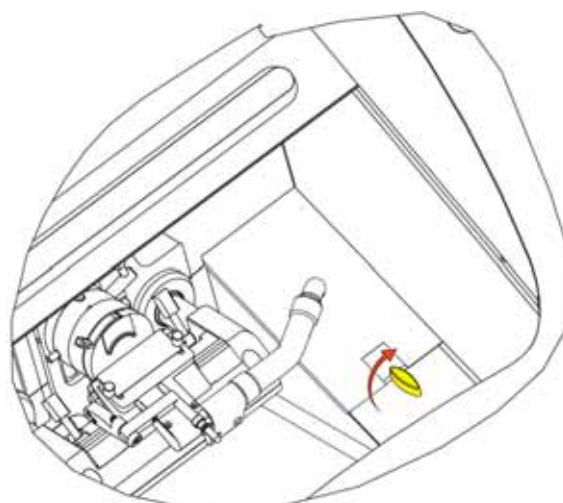
- Clean the vacutome hose with a flexible brush.
- Slip off the old vacutome filter and replace it by a new one.



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



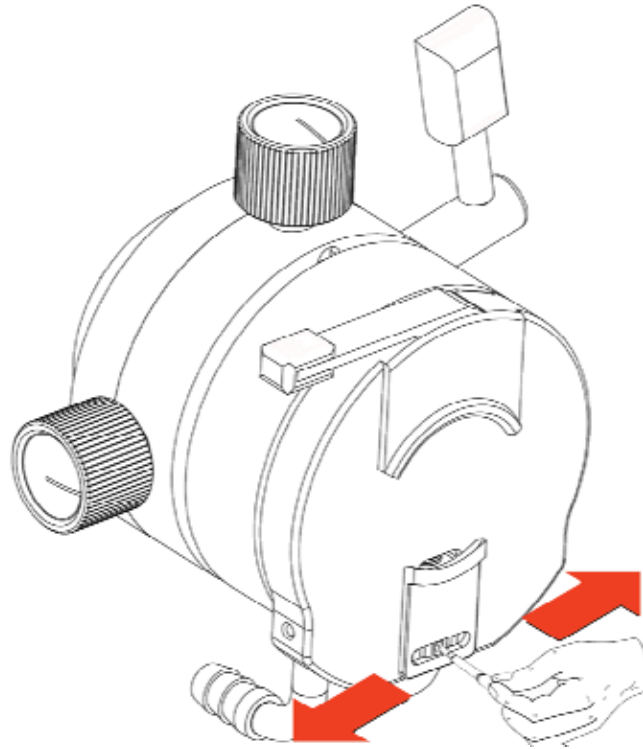
- Lock the cover with the lever.



Adjustment of the Movable Specimen Head Jaw

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

- Lock the handwheel brake.
- 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.

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 cryo chamber.
- 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.

WARNING: 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 cryo chamber - 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 cryo chamber does not heat up. This avoids the formation of condensation water inside the chamber.



WARNING: Two persons are necessary for the transport of the instrument.

Bringing the instrument back into service:

After moving the CryoStar NX70 / NX50, 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 cryo chamber.
- 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 cryo chamber - see Recommended Disinfection Procedure.

Note

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

- For repacking of the instrument - see Unpacking and Repacking

Taking back the instrument for the repair or routine maintenance:

Repair or maintenance work are normally carried out at the site of installation. If this is not possible, the instrument can be returned to Thermo Fisher Scientific Microm International. The contact address can be found at the beginning of this operation manual - see also Product Return Safety Declaration.

Appendices

Appendix A - Spares and Accessories

Description	Part Number
Knife and Blade Holder	
Standard Knife Holder	
Disposable Blade Holder for high profile blades	
Disposable Blade Holder for low profile blades	
Heat Extractor	
Specimen Chucks	
Ø 20 mm	715530
Ø 30 mm	715600
Ø 40 mm	715610
Ø 60 mm	715620
Cryo-Molds	
10 mm	570400
15 mm	570380
22 mm	570390
Brushes	
Brush	334000
Small brush, beveled	334180
Large brush	334170
Neg-50 Freezing-Medium	
2 x 118 ml bottles	161425
6 x 118 ml bottles	161426
Sanosil S010, 1L	175200
Cryostat Disinfectant Protect II	350270
Coarse filter for Vacutome	281080
Nozzle (for trimming)	
Blade handling tool	

Description	Part Number
Foot pedal (optional)	
Conventional Knives	
Profile C; 16 cm	152020
Profile D; 16 cm	152070
Knife Case for 2 Knives, 16 cm	152230
Disposable Blades	
High Profile Blades, 50 pcs. in dispenser	152450
Low Profile Blades SEC 35, 50 pcs. in dispenser	152200
Low Profile Blades SEC 35e, 50 pcs. in dispenser	152215
Low Profile Blades SEC 35p, 50 pcs. in dispenser	152570
Paraffin repellent PARA GARD, 100 ml	350170
Lubrication Oil	
1 x 100 ml bottle	350110
1 x 250 ml bottle	350120

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).

Recommended Disinfection Procedure

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 Nx70 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 3% 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 3% 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. 175190).

www.sanosil.ch

WARNING! TO GUARANTEE FUNCTIONALITY AND RELIABILITY OF THE DISINFECTION UNIT, IT IS HIGHLY RECOMMENDED TO USE ONLY SANOSIL. WHEN USING OTHER DISINFECTION MEDIA, THERMO FISHER SCIENTIFIC MICROM INTERNATIONAL GMBH ASSUMES NO LIABILITY CONCERNING FUNCTIONALITY AND DISINFECTION EFFECTIVENESS.

Index

A

Anti Roll Plate..... 16, 20, 27

B

Blade Clamping Lever..... 17, 21, 23, 24

Blade Holder..... 17, 20, 21, 23, 24, 25, 41, 45, 91, 105, 110

Blade Positioning..... 24

Blade Temperature 41, 64

Brake 14, 16, 88, 93, 94, 109

C

Chamber Light..... 8, 62

Cleaning 45, 105, 106

Mode 45, 105

Clearance Angle Adjustment 7

Coarse Feed..... 7

Coarse Filter..... 7, 105, 113

Cold D

disinfectant..... 33

function 5, 33, 36, 96

programming..... 98

Connections Panel..... 14, 15

Continuous-Stroke 7, 52

Cryobar 7, 8, 16, 36, 38

Cryochamber Window..... 14

Cutting Mode 27, 36, 52

Cutting Movement..... 90

Cutting Speed 7, 16, 59, 103

Cutting Window 7, 8, 36, 43

D

Data Log..... 84

Date 36, 70

Defrost 8, 77, 80

E

Emergency Stop Button..... 14, 52, 88

F

Favorites..... 8, 45, 64

H

Heated Window 35, 77

Height Adjustment 5, 36, 50

J

Joystick 5, 7, 8, 16, 39

L

Language..... 8, 69

Lock..... 11, 63, 94, 109

M

Multi Function Bar..... 36, 51

Multi-Function Button 36, 59

P

Power Save 63, 74

R

Reservoir 8, 14, 33

Retraction..... 7, 8, 83, 90

S

Section Counter..... 61, 86

Section Thickness 7, 27, 36, 39, 59

Section Thickness Sum..... 59

Serial Number 15

Sleep 63, 86

Specimen Head. 16, 24, 27, 36, 41, 63, 64, 89, 103, 109

Specimen Orientation 7, 24

Start Time 8

T

Temperature.. 6, 7, 8, 35, 36, 38, 41, 45, 63, 64, 77, 89, 103, 104

Trimming..... 7, 36, 39, 90, 91

V

Vacutome..... 8, 16, 36, 45, 103, 105

W

Waste Tray..... 16

