



# Leica CM1510 S

## Cryostat



### **Instruction manual**

Leica CM1510 S – Cryostat

V1.4 English – 04/2010

Always keep this manual near the instrument.

Read carefully prior to operating the instrument.

*Leica*

MICROSYSTEMS



## NOTE

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For the instrument serial number and year of manufacture, please refer to the name plate at the back of the instrument.

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# 1. Important information

## 1.1 Symbols used in the text and their meaning



Dangers, warnings and cautions appear in a gray box and are marked by a warning triangle .



Notes, i.e. important user information appear in a gray box and are marked by an information symbol .

(5)

Figures in brackets refer to item nos. in drawings.

## 1.2 Instrument type

All information provided in this manual applies only to the instrument type indicated on the title page.



Fig. 1

## 1.3 Designated use

The Leica CM1510S is a powerful cryostat for routine and research applications in biology, medicine and industry, where it serves for quick-freezing and subsequent sectioning of specimen material.

The instrument is not designed for unattended storage of specimen material.

The instrument must be operated only according to its designated use (see description above) and according to the instructions contained in this manual.

**Any other use of the instrument will be considered improper.**

## 1.4 Qualification of personnel

- Der Leica CM1510S may be operated only by trained laboratory personnel.
- All laboratory personnel designated to operate the Leica CM1510S must read this instruction manual carefully and must be familiar with all technical features of the instrument before attempting to operate the Leica CM1510S.

A name plate indicating the serial number of the instrument is attached to the back of the instrument.



**Be sure to comply with the safety instructions and warnings in this chapter. Be sure to read these instructions, even if you are already familiar with the operation and use of other Leica products.**

### 2.1 Safety instructions

This instruction manual contains important instructions and information regarding the operational safety and maintenance of the instrument.

The instruction manual is an important part of the product, which must be read carefully prior to setup and use and must always be kept near the instrument.

This instrument was built and tested in accordance with the safety regulations for electrical measuring, control, regulating and laboratory devices.

For current information about applicable standards, please refer to the CE declaration of conformity on our Internet site:

**[www.leica-microsystems.com](http://www.leica-microsystems.com)**



**If additional requirements on accident prevention and environmental protection exist in the country of operation, this instruction manual must be supplemented by appropriate instructions to ensure compliance with such requirements.**

In order to maintain this condition and ensure safe operation, the operator must observe all the instructions and warnings contained in this instruction manual.

### 2.2 Dangers, warnings and cautions

The safety devices installed in this instrument by the manufacturer only constitute the basis for accident prevention. Primarily responsible for accident-free operation is above all the institution which owns the instrument and, in addition, the designated personnel who operates, services or repairs the instrument. To ensure trouble-free operation of the instrument, be sure to comply with the following instructions and warnings.



**The protective devices on both instrument and accessories must neither be removed nor modified.  
Only authorized and qualified service personnel may repair the instrument and access the instrument's internal components.**

## 2. Safety

---

### Warnings - Transport and installation



The instrument must be transported either in an upright position or, if inclined, at an angle of max. 30 degrees!

Do not operate in rooms with explosion hazard!

To ensure the instrument works trouble-free, the instrument must be set up with a least 10 cm distance from all walls and furniture.

Do not place anything next to the compressor ventilation grid (right side of the cabinet) to ensure adequate ventilation!

The protective foam parts between microtome and compressor **MUST** be removed prior to operating the instrument!

### Warnings - Electrical connection



Please refer to and comply with the 'Technical data'!

The instrument must be connected to a grounded mains power outlet socket!

During the start-up of the compressor the nominal voltage must not drop below the values specified in the 'Technical Data' chapter!

The compressor requires a start-up current between 45 and 50 A.

Therefore, the electric circuit at the installation site must be inspected by a qualified electrician to ensure that it meets the requirements for a smooth operation of the instrument.

For trouble-free operation, a constant power supply according to specification must be ensured at all times. Failure to comply with the above will cause damage to the instrument.

After transporting, wait at least 4 hours before switching the instrument on!

This waiting period is necessary to allow the compressor oil, which may have been displaced during transport, to return to its original position.

Failure to comply with this can cause severe damage to the instrument.



### Warnings - sectioning



**Be careful when handling microtome knives and disposable blades. The cutting edge is extremely sharp and can cause severe injury!**

**Never leave knives/blades or knife holders with a knife/blade mounted lying around!  
Always store knives in the knife box when not in use!**

**Never place a knife anywhere with the cutting edge facing upwards!**

**NEVER try to catch a falling knife!**

**Always clamp the specimen before the knife!**

**Be careful when picking up the sections! The cutting edge is exposed!**

**When working inside the cryochamber, keep hands away from gilled evaporator – high risk of injury from sharp edges!**

**Prior to manipulating knife and specimen, when changing the specimen or during breaks, always lock the handwheel and cover the cutting edge with the knife guard!**

**Avoid skin contact with cold parts of the instrument as this can cause frostbite!**

### Cleaning and disinfection



**Do not use organic solvents or any other aggressive substances for cleaning and disinfection! The instrument is suitable for spray disinfection with Leica Cryofect!  
Only use alcohol or commercial disinfectants based on alcohol for disinfection!**

**For spray disinfection follow the instructions for use supplied with the disinfectant!**

**Do not use any external heaters for drying the cryochamber. This can cause severe damage to the heating system!**

## 2. Safety

---

### Warnings - maintenance



**Only qualified and authorized service personnel may access the internal components of the instrument for service and repair.**

**Clean the compressor ventilation grid at least once a year or more often if required!**

**Replacing the fuses:**

**Before replacing the fuses, turn off the instrument mains switch and pull the mains plug!**

**Only use replacement fuses of the same specification. For the required values, please refer to chapter 3.2 'Technical Data'!**

**Replacing the fluorescent light lamp:**

**Before replacing the lamp, turn off the instrument mains switch and pull the mains plug!**

**If the lamp is broken, it must be replaced by the technical service, as the replacement procedure involves a high risk of injury!**

**Do not use any lamp type other than the one inserted by the manufacturer!**

### Removing the microtome from the cryochamber



**Prior to removing the microtome turn off the instrument mains switch and pull the mains plug.**

**Before removing the microtome, rotate the handwheel until the specimen cylinder is positioned in the lowest position. Otherwise, when removing the microtome, the specimen head will rapidly fall down and might injure the operator's hands!**

**Wear appropriate protective gloves to remove the cold microtome from the cryochamber. Prolonged skin contact with cold parts of the instrument can cause frost bite!**

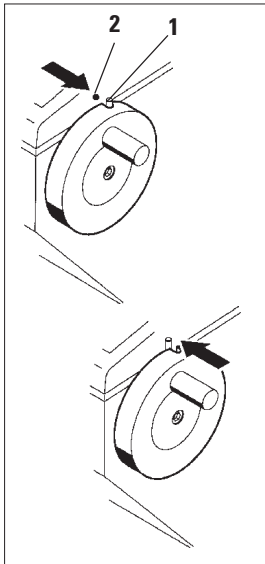
**The microtome must be completely dry before reinstallation. Humidity inside the microtome will condense and freeze in the cold cryostat and thus may cause malfunctions or damage!**

### 2.3 Safety features

The instrument is equipped with the following safety features: hand-wheel locking mechanism and knife guard on knife holder.

The consistent use of these safety features and strict observation of the safety instructions and warnings in this manual will safeguard the operator from accidents and/or personal injury to a great extent.

#### 2.3.1 Locking the handwheel



To lock the handwheel, rotate the handwheel until the handle is in the upper position and the metal pin **(1)** is located opposite the black dot **(2)**. Push the metal pin outward into the recess at the handwheel; if necessary move the handwheel slightly back and forth, until you feel that the locking mechanism engages.

To unlock the handwheel, push the metal pin **(1)** out of the recess at the handwheel, towards the cryostat housing.



**Prior to manipulating knife and specimen, when changing the specimen or during breaks, always lock the handwheel and cover the cutting edge with the knife guard!**

Fig. 2

#### 2.3.2 Knife guard

Knife holder CN is equipped with a knife guard; on the knifeholder CE, the glass plate of the anti-roll guide constitutes the knife guard (see separate instruction manual for your knife holder).

### 3. Instrument components and specifications

#### 3.1 Overall view - instrument parts

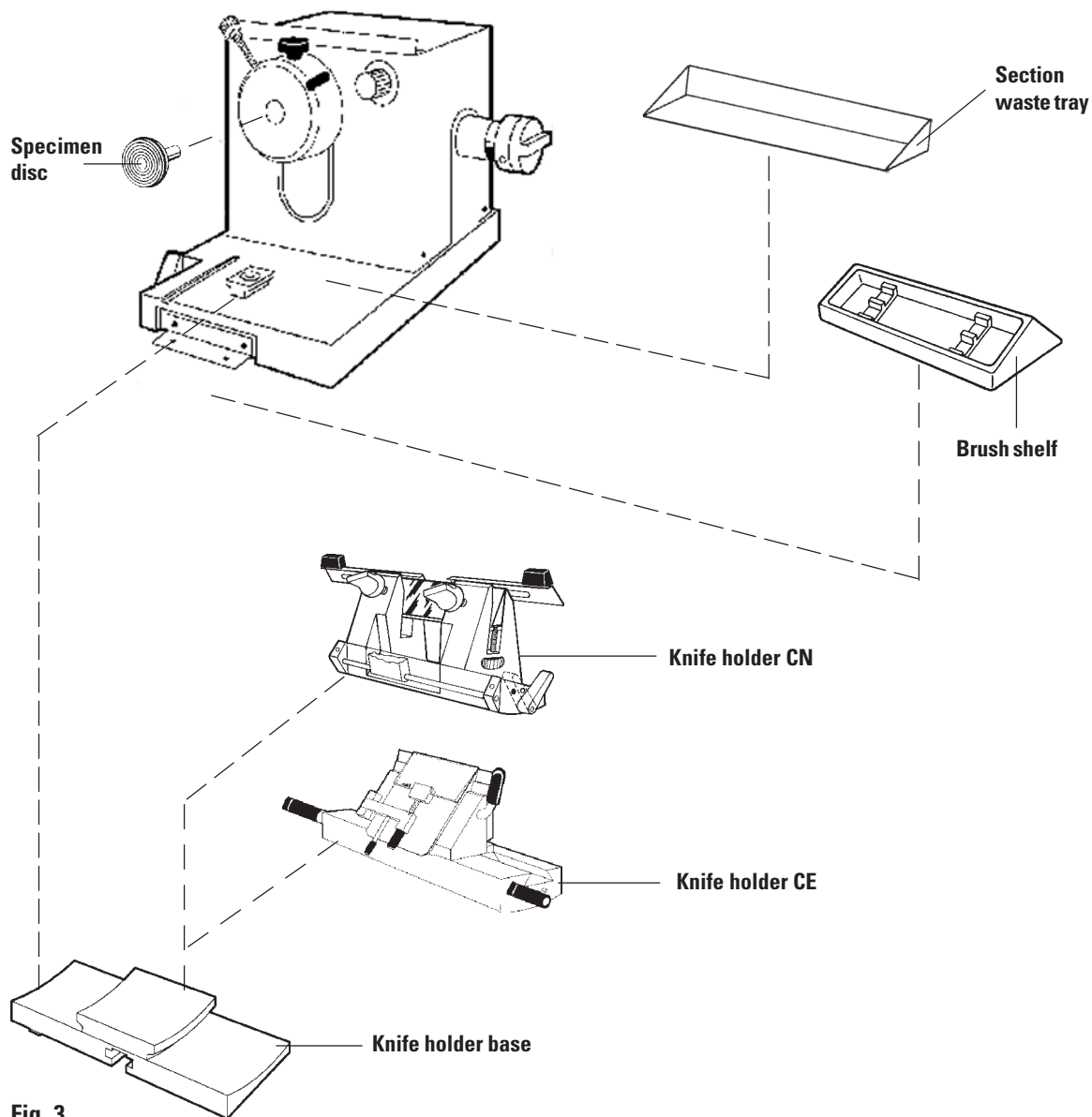


Fig. 3

### 3. Instrument components and specifications

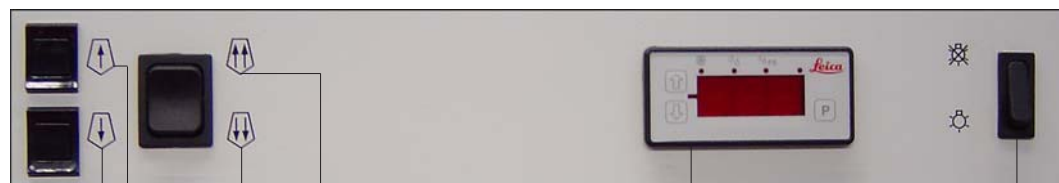


Fig. 4  
Control panel

Motorized coarse feed  
forward or backward - slow  
forward or backward - fast

Display indicating:  
- Set / actual temperature  
- Real time  
- Defrost time

On/Off switch for cryochamber illumination

Use the motorized coarse feed to rapidly move the specimen head towards or away from the knife.

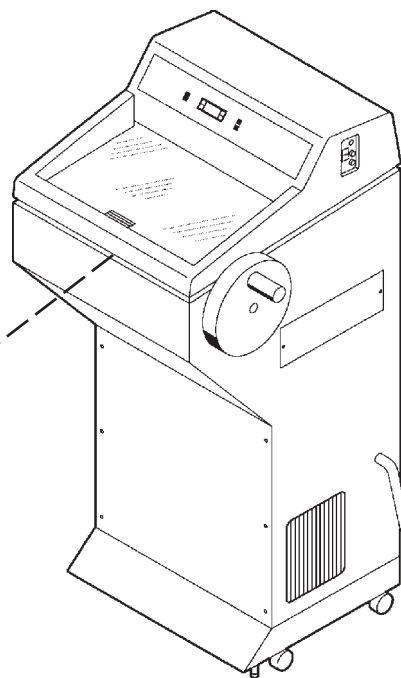


Carefully observe the specimen when moving it towards the cutting edge to avoid an accidental collision of the specimen with the knife edge, which can cause severe damage to both knife and specimen.

Heat extractor

Thermal block (optional accessory)

Quick-freezing shelf



### 3. Instrument components and specifications

#### 3.2 Technical data



**Operating temperature range from +18 °C to +35 °C. All specifications related to temperature are based on an ambient temperature of +22 °C and maximum air humidity of 60%!**

Type	CM1510 S	CM1510 S	CM1510 S
Nominal voltage	100 V AC $\pm 10\%$	120 V AC $\pm 10\%$	230 V AC $\pm 10\%$
Nominal frequency	50/60 Hz	60 Hz	50 Hz
Power draw	2000 VA	1300 VA	1500 VA
Protective class	I	I	I
Mains fuses	Automatic circuit breaker T 20 A	Automatic circuit breaker T 15 A	Automatic circuit breaker T 10 A
Pollution degree	2	2	2
Overtoltage inst. category	II	II	II
Power draw	495 W / 850 W	850 W	495 W
Refrigerating output at evaporator temperature of -25 °C	470 W / 780 W	780 W	470 W
Nominal pressure	25 bar (maximum value)		
Safety factor	3		
Refrigerant	215 g $\pm$ 5 g R404A *		
Compressor oil	0.6 l EMKARATE RL244b, ICI *		
<b>Refrigeration system</b>	<b>50 Hz</b>		<b>60 Hz</b>
Temperature setting range	0 °C to -30 °C $\pm 10\%$ at an ambient temperature of 22 °C and air humidity $\leq 60\%$ when sliding window is closed; adjustable in 1-degree increments		
Temperature of quick-freezing shelf	Max. -44 °C - at a temperature of -30 °C		
Defrosting	Automatic hot gas defrosting, defrost time freely programmable, manual defrosting of quick-freeze shelf and evaporator duration: 8 min.		

**\* Refrigerant and compressor oil must be replaced by authorized service personnel only!**



## 4. Setup

---

### 4.1 Installation site requirements



**Do not operate in rooms with explosion hazard!**

**To ensure the instrument works trouble-free, the instrument must be set up with at least 10 cm distance from all walls and furniture.**

**Do not place anything next to the compressor ventilation grid (right side of the cabinet) to ensure adequate ventilation!**

The place of installation must meet the following requirements:

- no direct sunlight,
- mains power socket at a distance no greater than 2.5 m (length of power cord = 2.5 m) - no extension cords must be used!
- no drafts (air condition outlets etc.),
- even floor,
- virtually vibration-free floor,
- handwheel freely and easily accessible,
- room temperature maximum 35°C, (<22°C recommended),
- relative humidity max. 60%,
- only for indoor use.



**High room temperature and excessive air humidity at the installation site affect the cooling capacity of the cryostat.**



## 4.2 Standard delivery - packing list

	<b>Order no.</b>
1 Basic instrument .....	14 0436 38461
1 Stationary heat extractor .....	14 0369 11197
1 Handwheel with marking, antibacterial .....	14 0471 42558
1 Optional clamping lever for object head .....	14 0112 28806
1 Set of specimen discs .....	14 0470 43550
-4 Specimen discs, 25 mm .....	14 0416 19275
-4 Specimen discs, 30 mm .....	14 0370 08587
1 Adapter for Miles Tissue Tek specimen discs.....	14 0436 26747
1 Section waste tray .....	14 0471 30787
1 Storage shelf, right.....	14 0471 30789
1 Storage shelf, left .....	14 0436 38503
1 Brush shelf.....	14 0398 13088
1 Tool set: .....	14 0436 43463
-1 Brush, fine .....	14 0183 28642
-1 "Leica" brush w/magnet.....	14 0183 40426
-1 Allen key, size 1.5 .....	14 0222 10050
-1 Allen key, size 2.5 .....	14 0222 04137
-1 Allen key, size 3.0 .....	14 0222 04138
-1 Allen key, size 4.0 .....	14 0222 04139
-1 Allen key with spherical head, size 4.0 .....	14 0222 32131
-1 Allen key, size 5.0 .....	14 0222 04140
-1 Allen key with handle, size 5.0 .....	14 0194 04760
-1 Allen key, size 6.0 .....	14 0222 04141
-1 Single-head wrench, size 13 .....	14 0330 33149
-1 Single-head wrench, size 16 .....	14 0330 18595
1 Bottle of cryostat oil, type 407, 50 ml .....	14 0336 06098
1 Bottle of OCT-Compound, mounting medium for cryosectioning, 125 ml .....	14 0201 08926
1 Instruction manual Leica CM1510 S - G/E/F/S .....	14 0436 80001

## 4. Setup

### 4.3 Unpacking and installation

Unpacking as per the unpacking instructions attached to the outside of the instrument shipping crate.



**The instrument must be transported either in an upright position or slightly inclined, at an angle of max. 30 degrees!**  
**When pushing the instrument, do not grip the cabinet at the lid.**  
**Grip the cabinet only at the marked areas (○)!**

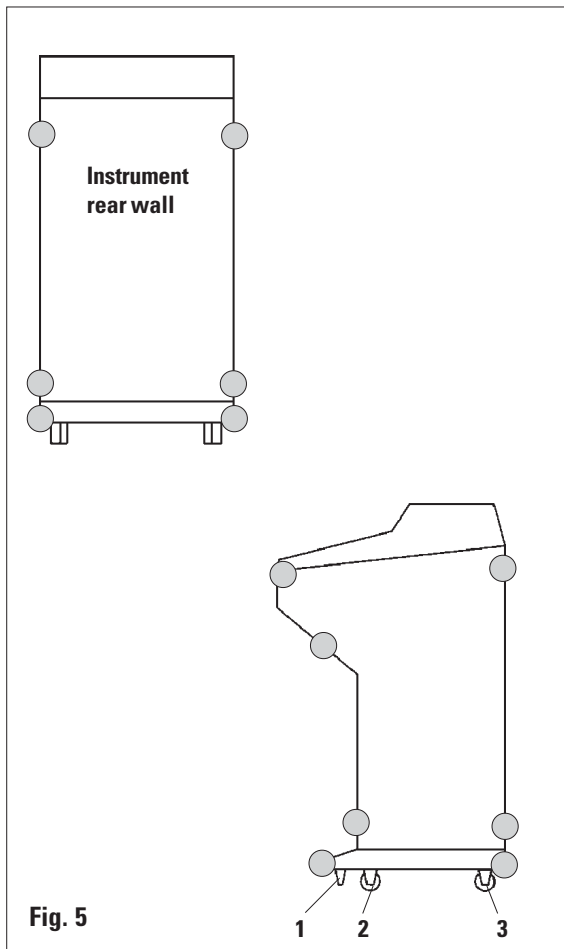


Fig. 5

- Use the size 16 fork wrench (1) to completely screw in the adjustable feet.
- Move instrument to installation site on rollers (2 and 3).
- The adjustable feet (1) can be used to slightly tilt the instrument (max. 30 degrees).
- To lift the instrument please use the handle straps provided attaching them to the front (2) and rear rollers (3).
- At the installation site, unscrew the adjustable feet (1) with the fork wrench to ensure stability.
- Align the adjustable feet to level the instrument.



**After transporting, wait at least 4 hours before switching the instrument on!**  
**This waiting period is necessary to allow the compressor oil, which may have been displaced during transport, to return to its original position.**

## 4.4 Fastening the handwheel

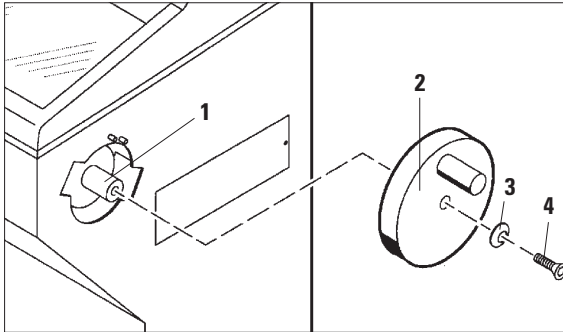


Fig. 6

The handwheel is lockable with the handle in the upper position.

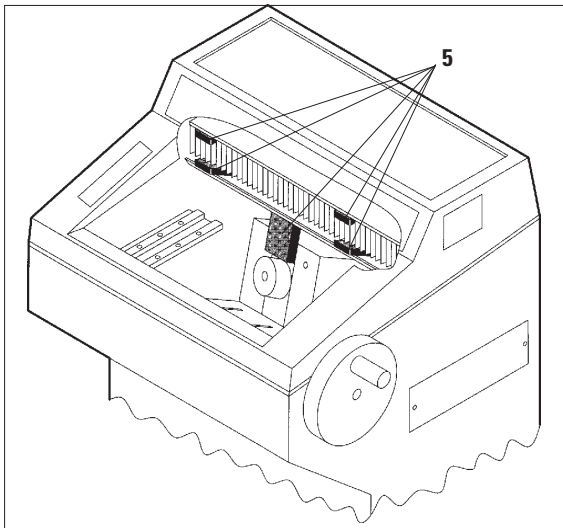


Fig. 7



The handwheel and all hardware items needed to attach it to the cryostat are packed in the accessory box. The handwheel can be dismounted e.g. for transport through narrow doors.

- Insert the pin (1) of the handwheel shaft into the bore (2) of the handwheel.
- Place spring washer (3) onto screw (4) with the curved surface pointing to the right side (see also Fig. 6).
- Tighten screw (4) with the size 6 Allen key.

To disassemble, proceed in reverse order.



The protective foam parts between microtome and compressor **MUST** be removed prior to operating the instrument (see Fig. 7)!

**Caution!** Edges of gilled evaporator are extremely sharp! High risk of injury!

## 4. Setup

### 4.5 Electrical connection



During the start-up of the compressor the nominal voltage must not drop below the values specified in the "Technical Data"! The compressor requires a start-up current between 45 and 50 A. Therefore, the electric circuit at the installation site must be inspected by a qualified electrician to ensure that it meets the requirements for a smooth operation of the instrument. For trouble-free operation, a constant power supply according to specification must be ensured at all times. Failure to comply with the above will cause damage to the instrument.

- Protect the electric circuit at the place of installation separately.
- Do not connect any other consumers to this electric circuit.

### 4.6 Prior to operation

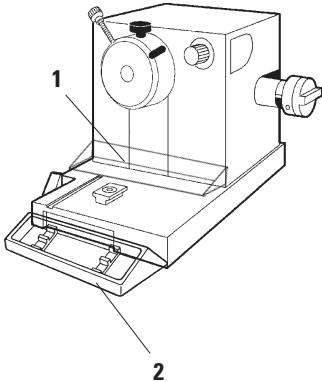


Fig. 8

- Verify if mains voltage and frequency in your laboratory comply with the power rating indicated on the name plate of the instrument!
- Place the storage shelves into the chamber.
- Insert section waste tray (1) and brush shelf (2).
- Place the knife holder base on the microtome base plate and clamp.
- Mount the knife holder onto the knife holder base and clamp (see separate instruction manual for your knife holder).
- Open the knife box with the knife and place the open box into the cryochamber for precooling.
- Place all tools needed for specimen preparation into the cryochamber.
- Close the sliding window.
- Connect the mains plug to the wall outlet socket.



After transporting, wait at least 4 hours before switching the instrument on! This waiting period is necessary to allow the compressor oil, which may have been displaced during transport, to return to its original position. Failure to comply with this can cause severe damage to the instrument.

### 4.6.1 Mains switch and automatic circuit breaker



Fig. 9

The automatic circuit breakers (mains fuses) are also used as mains switch.

To turn the automatic circuit breaker on, flip it to the upper position. To disconnect, set the circuit breaker in the lower position.

The temperature controller display first reads the actual temperature of the cryochamber.



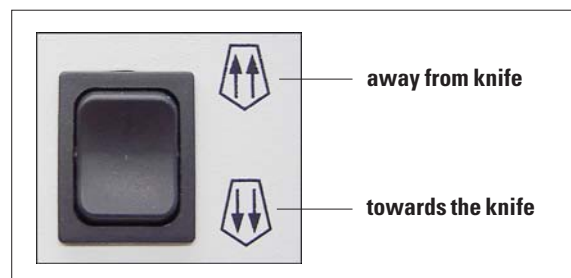
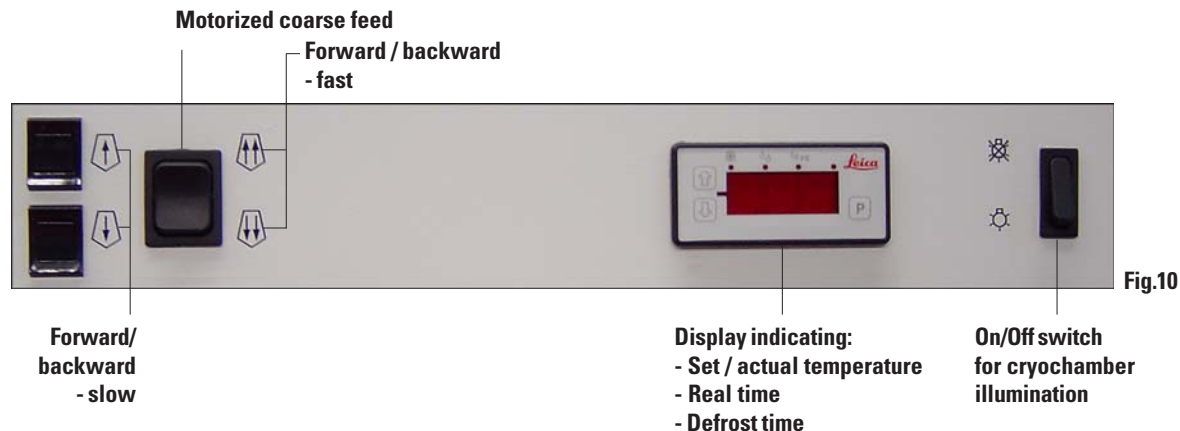
**After the instrument mains switch has been switched on, it will take about 5 seconds until the compressor starts operating. Bear in mind the required minimum switch-off period!**

- Turn the automatic circuit breaker on. The instrument is initialized.
- The factory configuration settings are as follows:

Real time:	00:00
Defrost time:	23:50 (adjustable, see chapter 5.2)
Chamber cooling:	on (temperature indication)

## 5. Operation

### 5.1 Control panel



#### Motorized coarse feed

The motorized coarse feed moves the specimen towards or away from the knife!

The fast specimen movement towards the cutting edge must be observed carefully to prevent the specimen from colliding with the cutting edge as this can cause severe damage to both the knife and the specimen!

5.2 Controller



Fig. 12

The controller has a 3-digit display, with additional LEDs and three function keys.



indicates activation of cooling mode



indicates activation of cryochamber defrosting



indicates activation of quick-freeze shelf defrosting

(LED 1, Fig. 12) - no function allocated



User-definable parameters can be accessed by pressing the P-button. Each programming field is displayed for 30 seconds for entering new parameter settings. After that time the display automatically resets to actual temperature indication. Parameters can be modified via the arrow keys:

Defrosting the chamber



Fig. 13

(LED 1 and LED 2 ON)



- (Press and hold „P” button and also press „Arrow up”). Press the two buttons once again to **deactivate** the defrost function.



The duration of the cryochamber and quick-freeze shelf defrost cycles is set to 8 minutes in the factory.

## 5. Operation


### Defrosting the quick-freeze shelf



Fig. 14

(LED 1 and LED 3 on)



- (Press and hold „P“ button and simultaneously press ).
- Press the two buttons once again to **deactivate** the defrost function.

### 5.3 Setting user-definable parameters




#### Set temperature:



Fig. 15






During normal operation, the actual cryochamber temperature is displayed.

- Press  once.
- Press  or  to select the desired temperature.

#### Defrost time:



Fig. 16

- Press  once more.
- Press  or  to modify the indicated value.

The first two digits correspond to the hours, the last digit indicates minutes. Since there is only one digit indicating minutes, the indicated value must be multiplied by 10. Defrost time is selectable in 10-minute steps.

Fig. 16 shows defrosting time set at 23:50 hours.



### Real time:



Fig. 17

- To set real time, press **P** once more.
- Press **↑** or **↓** to modify the indicated value (**hour**).



Fig. 18

- Press **P** again.
- Press **↑** or **↓** to modify the indicated value (**minutes**).

### Code parameter:



Fig. 19


- If 'P' is pressed once more, the display reads 'C00'. In this mode a code needs to be entered.



**Code parameter settings may be accessed only by authorized technical service personnel.**

- Press 'P' again to return set temperature indication, or wait 30 seconds until the display indication returns to actual temperature.

### Minimum switch-off period

When the instrument is switched on (via mains plug), the compressor starts operating after approx. 5 secs. If the compressor does not switch on after that period of time, the  LED will start blinking, indicating that the period during which the instrument was switched off was too short. (Safety measure to avoid major instrument damage).

## 6. Daily work with the instrument

### 6.1 Specimen freezing

#### 6.1.1 Quick-freeze shelf

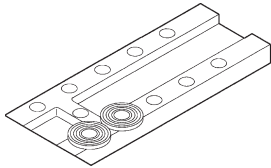


Fig. 20

The cryochamber is equipped with a quick-freezing shelf (Fig. 20) for up to 10 specimen discs.



**When working inside the cryochamber, keep hands away from gilled evaporator – high risk of injury from sharp edges!**

#### Specimen freezing

- Cut the specimen to size.  
The specimen block should not be any bigger than 2x2 cm.
- Use a specimen disc at **room temperature**.
- Apply a sufficient quantity of cryocompound to the disc.
- Place the specimen on the disc and orient.
- Remove the cover from the quick-freeze shelf.
- Place the specimen disc with the specimen in one of the bores of the quick-freeze shelf and freeze the specimen.



**Specimen freezing on the quick-freeze shelf can be accelerated by additionally using a mobile or a stationary heat extractor.**

- Once the specimen is frozen, insert the specimen disc in the specimen head and start sectioning.

#### 6.2 Inserting the specimen discs



Fig. 21

Specimen discs are available in three sizes ( $\varnothing$  20, 25, 30 mm). The grooved surface ensures firm contact with the specimen.

- A black dot (1) helps orienting the specimen.

### 6.2.1 Fixing the specimen discs in the specimen head

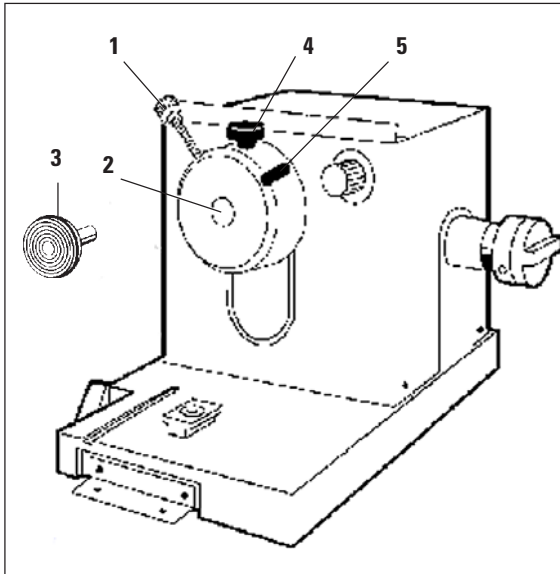


Fig. 22

- Lock handwheel with handle in upper position.
- If the knife holder and a knife are in place, cover the knife edge with the knife guard.
- Loosen clamping screw (1) on the specimen head.
- Insert the shaft of the specimen disc (3) with the frozen specimen into the opening (2) of the specimen head.

Make sure that the shaft of the specimen disc is fully inserted. The entire rear surface of the specimen disc must fit closely against the specimen head.

- Retighten clamping screw (1).

### 6.2.2 Specimen orientation

- Loosen screw (4).
- Use lever (5) to orient the specimen on the ball socket.
- Retighten screw (4).

### 6.3 Inserting the knife or blade into the knife holder



**All components of the cryostat as well as the knife or blade and the tools for specimen preparation should be precooled in the cryostat before starting sectioning.**

- Insert the precooled knife or blade in the knife holder and clamp. For further details on how to handle the knife holder, please refer to the separate instruction manual for your knife holder.

## 6. Daily work with the instrument

---

### 6.4 Sectioning / trimming



**For all settings on knife holder and anti-roll guide, please refer to the separate instruction manual for your knife holder.**



**Be careful when handling microtome knives and disposable blades. The cutting edge is extremely sharp and can cause severe injury!**

- Remove the knife guard from the cutting edge.
- Remove anti-roll guide from knife.
- Insert precooled knife / blade into knife holder.
- Select appropriate clearance angle on knife holder. Settings between 4° - 6° (knife holder CN) and 1° to 2° (knife holder CE) are appropriate for most applications.
- Unlock the handwheel.
- Rotate the handwheel cautiously and check if the specimen comes in contact with the cutting edge of the knife.
- Adjust knife / knife holder relative to the specimen.
- To trim the specimen, select a section thickness of approximately 30 µm with the section thickness selection knob on the front of the microtome.
- Trim the specimen to the desired sectioning plane, gradually decreasing the section thickness.
- Select the desired section thickness and start sectioning.
- During sectioning and for picking up the sections, place the anti-roll guide on the knife and adjust relative to the cutting edge.  
Readjust the anti-roll guide when necessary.

### 6.4.1 Moving the specimen with the coarse / precision feed



Fig. 23



The specimen movement towards the cutting edge must be observed carefully to avoid that the specimen collides with the cutting edge which can cause severe damage both to the knife and the specimen!

- Press the coarse feed button for fast or slow specimen movement towards the cutting edge.

### 6.4.2 Section thickness setting



Fig. 24

To select the section thickness, rotate knob **(1)** to a setting between 1 and 60  $\mu\text{m}$ :  
from 0 - 10  $\mu\text{m}$  in 1- $\mu\text{m}$  steps,  
from 10 - 20  $\mu\text{m}$  in 2- $\mu\text{m}$  steps,  
from 20 - 60  $\mu\text{m}$  in 5- $\mu\text{m}$  steps.

The graduation scale on the microtome reflects the selected section thickness.

- Select the desired section thickness via the rotary knob on the microtome.  
Start sectioning at approx. 20  $\mu\text{m}$ .
- Decrease section thickness continually down to the appropriate value.  
After changing from one section thickness to another, the first two or three sections should be rejected.
- When sectioning, turn the handwheel clockwise at a constant speed.

## 6. Daily work with the instrument

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### 6.5 Defrosting

Defrosting the cryochamber actually means defrosting the evaporator to prevent excessive frost buildup. The gilled evaporator is flushed with hot gas during defrosting. The cryochamber itself is virtually frost-free and does not need to be defrosted.

The condensation water produced during chamber defrosting is collected in a container located at the front of the cryostat cabinet.



**After defrosting, drops of water remaining on the surface of the quick-freeze shelf need to be wiped off manually with an absorbent cloth to prevent new frost buildup.**

**To make sure that the condensation water stemming from the defrost cycles drains into the waste container and to avoid the risk of possible contamination, ensure that the drain hose of the cryostat is placed into an appropriate waste container at all times during operation.**



**During the automatic cryochamber defrosting the quick-freeze shelf continues to be cooled.**

**The maximum duration of a defrost cycle is 8 minutes. Defrosting is, however, automatically terminated once the cryochamber has reached a temperature of -5°C. Cooling turns back on automatically.**

#### 6.5.1 Automatic defrosting of the cryochamber

An automatic defrost cycle takes place once in 24 hours.

The time of the automatic defrost cycle is programmed via the control panel.

#### 6.5.2 Manual defrosting of the cryochamber



**Once the manual defrost cycle is completed, the instrument automatically goes back to refrigeration mode.**

In addition to the programmable automatic defrost cycle a manual cryochamber defrost cycle can be activated when necessary (see chapter 5.2, Fig. 13).

### 6.5.3 Manual defrosting of the quick-freeze shelf



**The quick-freeze shelf may become hot during defrosting!  
Therefore, do not touch it!**

If heavy frost builds up on the quick-freeze shelf, especially after spray disinfection (see chapter 5.2, Fig. 14), a manual defrost cycle (which can be terminated at any time) should be started.

When the quick-freeze shelf is being defrosted (independently of the cryochamber temperature selected) frost will build up on specimen head, knife holder and microtome. During defrosting, the chamber temperature will increase by approx. 8-10K. Due to the frost formation and change in temperature, specimen sectioning during the defrost cycle is not possible. After the quick-freeze shelf defrosting cycle has been activated (1. defrosting, 2. wiping dry, 3. recooling) a waiting period of approx. 45 min. must be observed before sectioning can be resumed. If the chamber temperature exceeds -5°C, the defrosting cycle is interrupted.

## 6.6 Finishing work

### 6.6.1 Finishing the daily work

- Lock the handwheel.
- Take the knife/blade out of the knife holder and put it back into the knife box.
- Remove frozen section waste with a cold brush.
- Empty the section waste tray.
- Clean the storage shelves and brush shelf.



**Only common detergents and alcohol-based disinfectants should be used for cleaning and disinfection.  
All components removed from the cold environment will collect condensation. Therefore they must be dried thoroughly before placing them back into the cryochamber.**

- Remove all specimens from the cryostat.
- Close the sliding window.
- Switch off the cryochamber illumination.
- **Do not** switch the instrument off with the automatic circuit breaker as there would be no cooling.

## 6. Daily work with the instrument

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### 6.6.2 Shutdown for a longer period



If you do not intend to use the instrument for several weeks, you may turn it off.

Please note, however, that it may take up to several hours to cool the cryochamber down to very low temperatures after turning the instrument on again.

After turning off, the instrument should be cleaned and disinfected thoroughly (see chapter. '8. Cleaning and maintenance').

- Lock the handwheel.
- Take the knife/blade out of the knife holder. Put the knife back into the knife box or push the blade into the receptacle for used blades provided at the bottom of the dispenser.
- Remove all specimen material from the cryochamber.
- Remove frozen section waste with a cold brush.
- Empty the section waste tray.
- Remove storage shelves and brush shelf for cleaning.
- Switch the instrument off with the automatic circuit breaker.
- Open the sliding window so that the cryochamber can dry out.

Switching off the instrument with the automatic circuit breaker will not affect the programmed parameters.

Prior to switching the instrument back on, the cryochamber, the microtome and all other parts of the instrument must be completely dry.



### 6.7 Temperature selection chart

Tissue	-10 °C - -15 °C	-15 °C - -25 °C	-25 °C - -35 °C
Adrenal	*	*	
Bone marrow		*	
Brain		*	
Bladder		*	
Breast, fatty			*
Breast, little fat		*	
Cartilage	*	*	
Cervical		*	
Fatty			*
Heart and vascular		*	
Intestinal		*	
Kidney		*	
Laryngeal		*	
Lip		*	
Liver		*	
Lung			*
Lymphoid		*	
Muscle		*	
Nose		*	
Pancreatic		*	
Prostate		*	
Ovarian		*	
Rectal		*	
Skin with fat			*
Skin without fat		*	
Spleen or bloody tissue		*	
Testicular	*	*	
Thyroid		*	
Tongue		*	
Uterus curettage	*		

The temperature values given above are based on long-term experience, however, these are only approximate values, as any tissue may require particular adjustments.

## 7. Troubleshooting

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### 7.1 Possible causes and remedies

<b>Problem</b>	<b>Cause</b>	<b>Remedy</b>
Frost on chamber walls and microtome	<ul style="list-style-type: none"><li>- Cryostat is exposed to air currents (open windows and doors, air conditioning).</li><li>- Sliding window open over a longer period of time at a very low chamber temperature.</li><li>- Frost built up by breathing into the cryochamber.</li></ul>	<ul style="list-style-type: none"><li>- Change place of installation for the cryostat.</li><li>- Close sliding window correctly.</li><li>- Wear mask if necessary.</li></ul>
Ice formation on the bottom of the cryochamber.	<ul style="list-style-type: none"><li>- Drain of the quick freeze shelf defrosting water obstructed.</li></ul>	<ul style="list-style-type: none"><li>- Switch off the instrument and let it thaw and dry completely.</li><li>- Align the instrument with a spirit level.</li></ul>
Sections smear	<ul style="list-style-type: none"><li>- Specimen not cold enough.</li><li>- Knife/blade and/or anti-roll plate not yet cold enough and thus warm the sections.</li></ul>	<ul style="list-style-type: none"><li>- Select lower temperature.</li><li>- Wait until knife/blade and/or anti-roll plate have reached cryochamber temperature.</li></ul>
Sections splinter	<ul style="list-style-type: none"><li>- Specimen too cold</li></ul>	<ul style="list-style-type: none"><li>- Select higher temperature.</li></ul>
Sections not properly flattened	<ul style="list-style-type: none"><li>- Static electricity/air currents.</li><li>- Specimen not cold enough.</li><li>- Large area specimen.</li><li>- Anti-roll plate poorly positioned.</li><li>- Anti-roll plate poorly aligned with knife edge.</li><li>- Incorrect clearance angle.</li><li>- Knife/blade blunt or damaged.</li></ul>	<ul style="list-style-type: none"><li>- Remove cause.</li><li>- Select lower temperature.</li><li>- Trim the specimen parallel, increase section thickness.</li><li>- Reposition anti-roll plate.</li><li>- Align correctly.</li><li>- Set correct angle.</li><li>- Use different part of the cutting edge or replace.</li></ul>

## 7. Troubleshooting

<b>Problem</b>	<b>Cause</b>	<b>Remedy</b>
Sections not properly flattened despite correct temperature and correctly aligned anti-roll plate	<ul style="list-style-type: none"><li>- Knife/blade and/or anti-roll plate dirty.</li><li>- Edge of anti-roll plate damaged.</li><li>- Blunt knife/blade.</li></ul>	<ul style="list-style-type: none"><li>- Clean with dry cloth or brush.</li><li>- Replace plate.</li><li>- Use different part of the cutting edge or replace.</li></ul>
Sections curl on the anti-roll plate	<ul style="list-style-type: none"><li>- Anti-roll plate does not protrude far enough beyond the cutting edge.</li></ul>	<ul style="list-style-type: none"><li>- Readjust correctly.</li></ul>
Scraping noise during sectioning and specimen return movement	<ul style="list-style-type: none"><li>- Anti-roll plate protrudes too far beyond the cutting edge; scraping against the specimen.</li></ul>	<ul style="list-style-type: none"><li>- Readjust correctly.</li></ul>
Rippled sections	<ul style="list-style-type: none"><li>- Knife/blade damaged.</li><li>- Edge of anti-roll plate damaged.</li></ul>	<ul style="list-style-type: none"><li>- Use different part of the cutting edge or replace.</li><li>- Replace the plate.</li></ul>
Chatter during sectioning	<ul style="list-style-type: none"><li>- Specimen insufficiently frozen onto the specimen disc.</li><li>- Specimen disc not clamped tightly.</li><li>- Specimen holder ball joint not clamped.</li><li>- Knife/blade not clamped tightly enough.</li><li>- Section thickness too thick - specimen has detached from the specimen disc.</li><li>- Very hard, inhomogeneous specimen.</li><li>- Blunt knife/blade.</li><li>- Cutting geometry (profile) of knife used not suitable.</li><li>- Incorrect clearance angle.</li></ul>	<ul style="list-style-type: none"><li>- Refreeze specimen onto the disc.</li><li>- Check disc clamping.</li><li>- Check ball joint clamping.</li><li>- Check knife/blade clamping.</li><li>- Refreeze specimen onto the disc.</li><li>- Increase section thickness; reduce specimen surface area if necessary.</li><li>- Use different part of the cutting edge.</li><li>- Use knife with different cutting geometry.</li><li>- Adjust clearance angle.</li></ul>

## 7. Troubleshooting

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<b>Problem</b>	<b>Cause</b>	<b>Remedy</b>
Thick/thin sections	<ul style="list-style-type: none"><li>- Temperature incorrect for the tissue cut.</li><li>- Knife geometry (profile) inappropriate for the specimen cut.</li><li>- Ice buildup on the knife back.</li><li>- Handwheel speed not uniform or speed inappropriate.</li><li>- Knife not clamped tightly enough.</li><li>- Specimen disc not clamped tightly.</li><li>- Cryocompound applied to cold specimen disc. Specimen therefore detaches from disc after freezing.</li><li>- Knife blunt.</li><li>- Incorrect clearance angle.</li><li>- Microtome not properly dried before reinstallation.</li><li>- Specimen dried up.</li></ul>	<ul style="list-style-type: none"><li>- Select correct temperature and wait until correct temperature is reached.</li><li>- Use knife with different profile (c or d) or try working with disposable blades.</li><li>- Remove ice.</li><li>- Turn handwheel uniformly / adapt speed.</li><li>- Check knife clamping.</li><li>- Check disc clamping.</li><li>- Apply cryocompound on warm disc; place disc inside cryochamber, mount specimen and freeze.</li><li>- Use different part of knife edge.</li><li>- Set correct clearance angle.</li><li>- Dry microtome thoroughly.</li><li>- Prepare new specimen.</li></ul>
Tissue sticks to anti-roll guide.	<ul style="list-style-type: none"><li>- Anti-roll guide too warm or incorrectly positioned.</li><li>- Static electricity.</li><li>- Fat on corner or edge of anti-roll plate.</li><li>- Rusty knife.</li></ul>	<ul style="list-style-type: none"><li>- Cool or reposition anti-roll guide.</li><li>- Remove static electricity.</li><li>- Use alcohol to remove fat.</li><li>- Remove rust.</li></ul>
Flattened sections curl up when anti-roll plate is tilted up.	<ul style="list-style-type: none"><li>- Static electricity or air currents.</li><li>- Anti-roll plate too warm.</li></ul>	<ul style="list-style-type: none"><li>- Remove static electricity / air current.</li><li>- Cool anti-roll guide.</li></ul>

## 7. Troubleshooting

<b>Problem</b>	<b>Cause</b>	<b>Remedy</b>
Sections tear.	<ul style="list-style-type: none"><li>- Temperature too low for the tissue cut.</li><li>- Blunt part, dirt, dust, frost or rust on the knife/blade.</li><li>- Front edge of anti-roll guide damaged.</li><li>- Hard particles in the tissue.</li><li>- Knife back dirty.</li></ul>	<ul style="list-style-type: none"><li>- Increase temperature setting and wait.</li><li>- Remove cause (--&gt; see individual remedies).</li><li>- Replace anti-roll plate.</li><li>- If possible, continue to cut at deeper level of the specimen.</li><li>- Clean.</li></ul>
Uneven or inconsistent specimen feed.	<ul style="list-style-type: none"><li>- Microtome was not entirely dry when switching on refrigeration; consequently, ice built up in the micrometer feed system.</li><li>- Defective microtome.</li></ul>	<ul style="list-style-type: none"><li>- Remove microtome and dry - (possibly with hair dryer - <u>hair dryer only outside of cryo-chamber!</u>) or let dry at room temperature.</li><li>- Call technical service.</li></ul>
Specimen disc cannot be removed.	<ul style="list-style-type: none"><li>- Moisture on the underside caused the disc to freeze to the freezing shelf or specimen head.</li></ul>	<ul style="list-style-type: none"><li>- Apply concentrated alcohol to contact point.</li></ul>
Cryostat inoperational.	<ul style="list-style-type: none"><li>- Mains plug not properly connected.</li><li>- Automatic circuit breaker has been activated.</li></ul>	<ul style="list-style-type: none"><li>- Check whether mains plug is properly connected.</li><li>- Switch circuit breaker back on (flip to upper position).</li></ul>
No or insufficient refrigeration.	<ul style="list-style-type: none"><li>- Compressor defective.</li><li>- Leak in the cooling system.</li><li>- Inappropriate site conditions.</li><li>- Ventilation grid of condenser dirty.</li></ul>	<ul style="list-style-type: none"><li>- Call technical service.</li><li>- Call technical service.</li><li>- Check site conditions.</li><li>- Clean ventilation grid.</li></ul>
Scraping noise at microtome slot cover.	<ul style="list-style-type: none"><li>- Friction between slot cover and microtome housing.</li></ul>	<ul style="list-style-type: none"><li>- Apply cryostat oil to the slot cover and distribute by turning the handwheel or with a clean cloth.</li></ul>

## 7. Troubleshooting

### 7.2 Display error messages

Error messages are displayed on the panel. The following error message might occur during normal operation:

Error	Cause	Remedy
105	Sensor broken	Call technical service.
-55	Sensor short-circuited	Call technical service.

### 7.3 Thermal circuit breaker (120V model only)

On the back of the cryostat there is a thermal circuit breaker **(1)**. If the temperature of the cryochamber exceeds 60 °C, the thermal circuit breaker is automatically activated and turns the instrument off.



Fig. 25

#### Possible causes and remedies:

- Temperature in the immediate surroundings is constantly higher than 40 °C.  
→ Decrease temperature in the immediate surrounding area.
- The required minimum distance of 10 cm to walls and furniture was not kept when setting up the instrument.  
→ Install instrument at required minimum distance.
- Ventilation grids of the condenser are dirty.  
→ Clean ventilation grids.
- Compressor is running but there is no refrigeration.  
→ Call Leica Technical Service.

Having eliminated the possible sources of error, press the thermal circuit breaker **(1)** to turn the instrument back on. If the instrument fails to switch on, call technical service.

### 8.1 General maintenance instructions



**Only qualified and authorized service personnel may access the internal components of the instrument for service and repair!**

The microtome is virtually maintenance-free. Nevertheless, to ensure smooth operation of the instrument over many years, we recommend the following:

- Have the instrument inspected by a qualified service engineer authorized by Leica at least once a year.
- Enter into a service contract at the end of the warranty period. For further information, please contact your local Leica service center.
- Clean the instrument every day.
- From time to time - above all after the instrument has been dried repeatedly in a laboratory oven, apply a thin coat of cryostat oil onto:
  - clamping device (T-piece) and clamping levers of the microtome base plate,
  - guiding device of the knife holder base,
  - clamping lever of the knife holder base,
  - the specimen cylinder. To do so, move the specimen cylinder out to the front limit stop (pressing the coarse feed button), apply a few drops of cryostat oil onto the cylinder and once again push the coarse feed button in opposite direction to move the specimen cylinder back to the rear limit position.
- Visible dirt (dust fluff, etc.) on the ventilation grid of the condenser at the bottom of the right cabinet side wall, should be removed with a brush, broom or vacuum cleaner, cleaning in the direction of the fins.

## 8. Cleaning and maintenance

---

### 8.2 Automatic circuit breaker



Fig. 26

The automatic circuit breaker (mains fuses) is also used as mains switch and is located on the right side wall of the cryostat housing - see Fig. 26, left.

→ The value indicated will correspond to the voltage of your instrument.



**If the automatic circuit breakers cannot be switched back on or if they are activated several times, call Leica technical service!**

To switch the automatic circuit breaker back on after it has been activated:

- Wait approx. 5 minutes (the automatic circuit breaker can be switched back on only after it has cooled).
- Switch the circuit breaker back on flipping it to the upper position.



### 8.3 Cleaning

- Remove frozen section waste from the cryochamber with a cold brush.
- Remove section waste tray for emptying.
- Remove storage shelves and brush shelf for cleaning.
- Switch off the cryochamber illumination. Do not start cleaning cryochamber and microtome before the lamp has cooled to ambient temperature.



**Remove infectious material from the cryochamber and dispose of according to the applicable laboratory regulations.**



**Do not use organic solvents or any other aggressive substances for cleaning and disinfection! Only use the cleaning agents specified in this instruction manual such as Leica Cryofect, alcohol or common commercial disinfectants based on alcohol!**

#### 8.3.1 Spray disinfection with Leica Cryofect



**Store only in tightly closed original bottle, at temperature no higher than 25 °C!**



**Easily flammable (VbF: B)  
Ignition point: 18 °C (DIN 51755)  
Keep away from sources of ignition!  
Do not spray into flames! Be careful when cleaning alcohol-sensitive surfaces!**



**Wear appropriate protective gear for cleaning and disinfection!  
Disinfect instrument and accessories every day!  
The efficiency of Cryofect has been proven experimentally at temperatures down to -20 °C.**

## 8. Cleaning and maintenance

---

### Spray disinfection with Leica Cryofect

1. Select a temperature of -20 °C or higher.
2. Remove knife or blade from the knife holder.
3. Remove all specimen material, microscope slides and tools from the cryochamber.
4. Remove section waste from the cryochamber.
5. Allow the cryochamber to reach the previously selected temperature; once that temperature is reached, either
  - 5a. spray the disinfectant evenly on the contaminated surfaces - the surfaces should be covered with an even layer - or
  - 5b. soak a cloth with disinfectant and apply it on the contaminated surfaces.
6. In either case, allow at least 15 minute contact time.
7. Wipe up with a cloth.
8. Dispose of cloth in compliance with the applicable waste disposable regulations of your laboratory.
9. Set cryochamber temperature back to the originally selected value.



**If increased frost buildup occurs, start a manual defrost cycle.**

- Place an appropriate vessel under the drain tube on the right side of the cabinet.
- Pull the stopper at the bottom of the cryochamber to drain any condensate, waste or cleaning liquid that may have collected in the cryochamber.
- Replace the stopper.
- Dispose of waste liquid according to the applicable local waste disposal regulations.

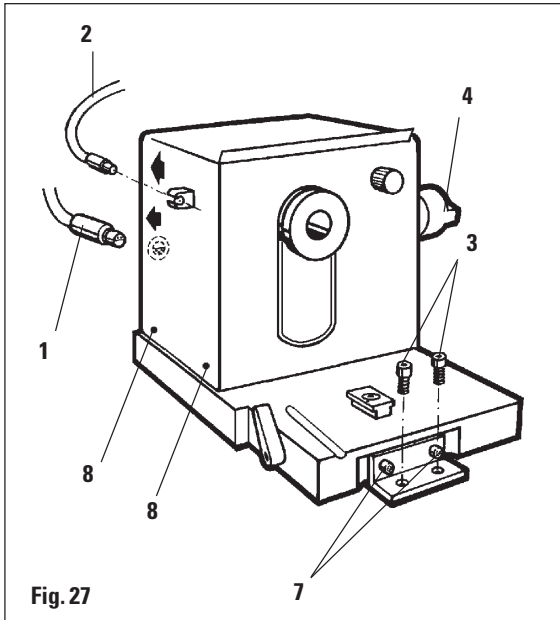


**All components removed from the cold environment will collect condensation. Therefore, all components should be dried thoroughly before placing them back into the cryochamber.**



**Do not use external heaters for drying the cryochamber. This can cause severe damage to the cooling system!**

### 8.4 Removing the microtome



- Close sliding window, hold window at grip on front edge, lift it slightly and pull it out to the front (Fig. 32) – see also '8.5 Replacing the lamp'.
- Remove the accessories from the chamber in the following order:
  - brush shelf,
  - knife holder,
  - section waste tray,
  - specimen discs,
  - stationary heat extractor,
  - storage shelf, left,
  - storage shelf, right.
- Loosen screws (3) with Allen key (4mm). Do not loosen screws (7) for removing the microtome.
- Hold plug (1) of coarse feed motor at metal head and disconnect.
- Disconnect temperature sensor (2).



**Switch the instrument off and disconnect the mains plug before removing the microtome!**

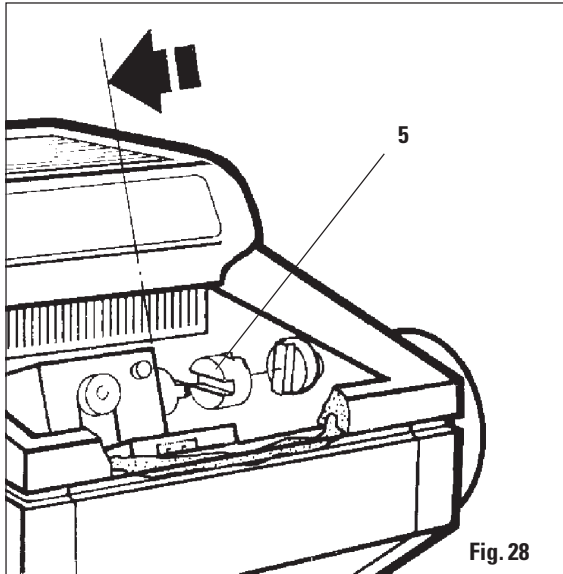
**Prior to removing the microtome, rotate handwheel to place the specimen head to the lowest position.**

**Otherwise, when removing the microtome, the specimen head will rapidly fall down and might injure the operator's hands!**

**Wear appropriate protective gloves to remove the cold microtome from the cryochamber.**

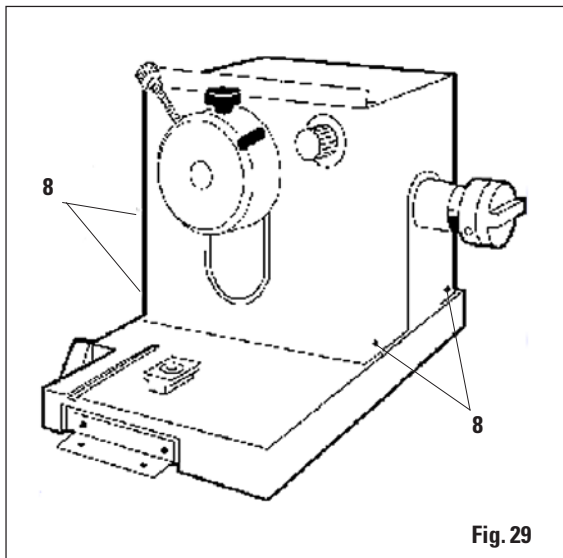
**Prolonged skin contact with cold parts of the instrument can cause frost bite!**

## 8. Cleaning and maintenance



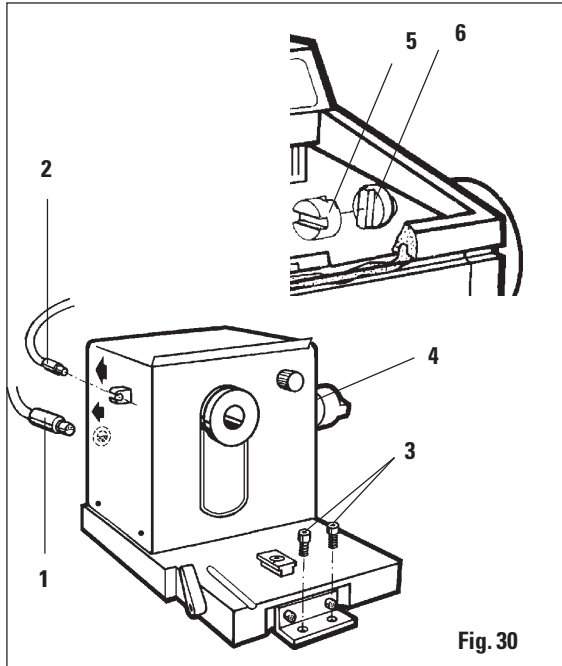
- Lift microtome slightly and pull it to the left to disengage the plastic coupling (5) connecting the axles.
- Take microtome out of cryochamber.

### 8.5 Removing the microtome housing



The microtome cover may be removed to expedite thorough drying of the microtome in an oven. Place the microtome in an oven at 40 °C to 50 °C for several hours. After repeatedly drying the microtome in this manner, it is recommended to relubricate the cross roller bearings inside the microtome! For further information, please contact your Leica sales company!

- Loosen the two screws (8) on both sides of the housing.
- To remove, pull the housing upwards. The front plate of the microtome with the specimen head remains in place.



### 8.6 Reinstalling the microtome



The microtome must be completely dry before reinstallation.

Humidity inside the microtome will condense and freeze in the cold cryostat and thus may cause malfunctions or damage.

- Place the microtome into the cryochamber slightly left from the original position. Make sure the specimen head is in the lowest position.
- Lubricate the surface of the plastic coupling (5) with a drop of cryostat oil.
- Mount plastic coupling (5) on shaft (4).
- Use your right hand to bring the handwheel handle in the lowest position and keep the handle in place.
- Push the microtome to the right with your left hand and, if necessary for proper alignment of the parts, slightly turn the handwheel back and forth until coupling (5) engages into shaft (6).
- Tighten screws (3).
- Reconnect the coarse feed motor plug (1) and the temperature sensor (2) (ensure that temperature sensor (2) fits against the copper spring with the polished bush).
- Put shelves, heat extractor, section waste tray, brush shelf and knife holder back into cryochamber.
- Reinstall sliding window.
- The instrument is ready to be switched back on.

## 8. Cleaning and maintenance

### 8.7 Replacing the fuses

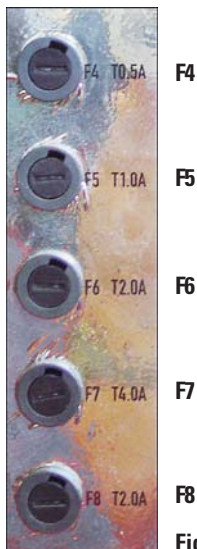


Fig. 31



**Before replacing the fuses, turn off the instrument mains switch and pull the mains plug!**

**Only use replacement fuses of the same specification as the original ones. For the required values, please refer to chapter 3.2 'Technical Data'!**

**Fuses other than the ones specified can cause severe damage to the instrument.**

#### Replacing the fuses

On the back of the instrument there is a fuse board with 5 fuses:

- Insert a screw driver into the slot in the fuse cap; lightly press the fuse inwards, then rotate 1/4 turn to the left and let go. The fuse will automatically be released and can then be easily removed.
- Remove defective fuse (1) from cap (2) and insert a replacement fuse of identical specification.
- Put the fuse cap back in, lightly press inwards with the screw driver and fasten rotating 1/4 turn to the right.



Fuse	Protects:	Type
F4	Elreha controller	T 0.5 A
F5	Defrost valves 1 and 2	T 1.0 A
F6	Pipe defrost heater	T 2.0 A
F7	Heating of condensate water collection tray	T 4.0 A
F8	Sliding window heater	T 2.0 A

### 8.8 Replacing the lamp

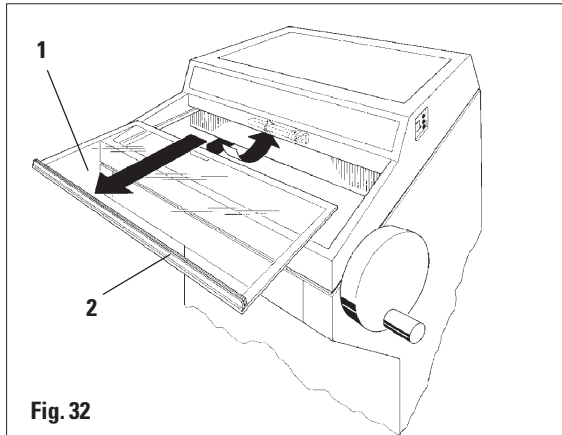


Fig. 32

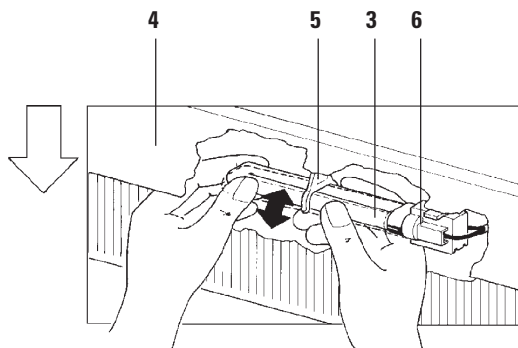


Fig. 33

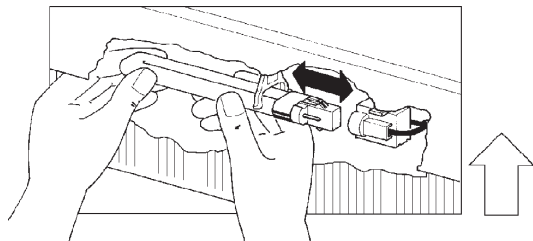


Fig. 34



**Before replacing the lamp, turn off instrument mains switch and pull mains plug!**

- Hold sliding window (1) at grip (2), lift slightly and pull it out to the front.



**If the lamp is broken, it must be replaced by the technical service - high risk of injury!**

#### Removing the lamp

- Lamp (3) is mounted behind glare shield (4) and therefore not visible.
- Touch the lamp for better orientation.
- Lightly tilt the fluorescent tube down to the left and pull it out of clip (5).
- Hold lamp with both hands and pull it to the left, out of socket (6).



**Do not use any lamp type other than the one inserted by the manufacturer!**

#### Installing the new lamp



**Lamp type:**  
(230 V/50 Hz) OSRAM DULUX S - 11 W  
(115 V/60 Hz) OSRAM DULUX S - 13 W

- Hold lamp in correct mounting position - see Fig. 34 - and push to the right until it engages in the socket.
- Lightly push the lamp upward to engage in the clip.
- Reinsert sliding window.
- Reconnect instrument to mains power and turn it back on.

## 9. Optional accessories

### 9.1 Heat extractors

Specimen freezing with the freezing shelf can be accelerated by the additional use of a heat extractor.

#### 9.1.1 Mobile heat extractor

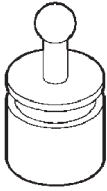


Fig. 35

- Store the heat extractor in the cryochamber.
- Place it on the specimen surface to accelerate freezing.
- Remove the heat extractor once the specimen is entirely frozen.

#### 9.1.2 Stationary heat extractor

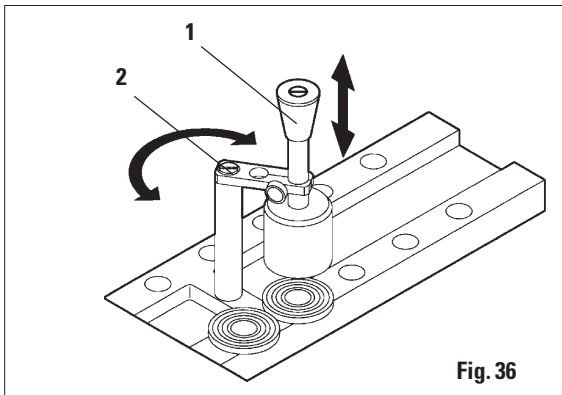


Fig. 36

- Screw heat extractor into quick-freeze shelf.
- Place it directly on the specimen surface. After approx. 30 seconds (depending on tissue type and specimen size) the specimen is entirely frozen.



**To prevent unnecessary distortion of the specimen during contact freezing, the weight of the heat extractor can be balanced.**

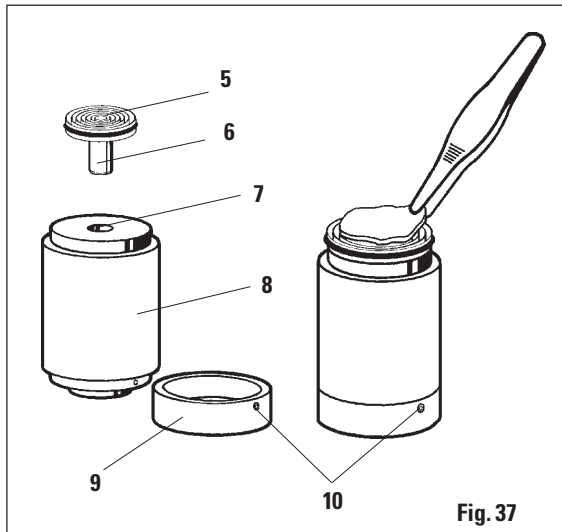
- For that purpose, loosen screw (2) and adjust knob (1) upwards or downward.
- Retighten screw (2) to fix knob (1) in the appropriate position.



### 9.1.3 Thermal block

The thermal block (8) facilitates the removal of frozen specimens from the specimen disc.

- Place the cap (9) on the end opposite to the end containing the appropriate size bore for the specimen disc you wish to insert.



**Do not keep the thermal block inside the cryochamber. Store at room temperature and place it into the cryochamber only for specimen removal.**

- Insert pin (6) of specimen disc (5) into the appropriate bore (7) at the top or bottom of the thermal block.
- After about 20 seconds, the frozen specimen can be removed from the specimen disc with a pair of forceps.
- If the cap sits too loosely, retighten with screw (10). Be careful not to overtighten the screw!
- Once the specimen is removed from the disc, take the thermal block out of the cold cryochamber.

## 9. Optional accessories

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- Knife holder base for knife holders CN and CE ..... 14 0419 26140
- Knife holder CN for standard microtome knives or blade rails. .... 14 0419 33993  
Clearance angle and knife height adjustable  
Knife support rails for short and long knives  
Anti-roll guide and adjustable knife guard.
- Glass insert - 50 mm ..... 14 0419 33816  
for knife holder CN
- Anti-roll system CN, glass - 50 mm ..... 14 0419 33981  
Consisting of:
  - glass insert 50 mm
  - metal frame CN
- Knife support bar for knife holder CN ..... 14 0419 19426  
for short knives - up to 16 cm long
- Knife support bar for knife holder CN ..... 14 0419 19427  
for long knives - over 16 cm long
- Anti-roll system CE, glass - 70 mm ..... 14 0419 37258  
Consisting of:
  - Glass insert 70 mm
  - Metal frame CE
  - 50 µm spacer for special applications

## 9. Optional accessories

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- Anti-roll system CE, glass - 70 mm ..... 14 0419 37260  
Consisting of:
  - Glass insert 70 mm
  - Metal frame CE
  - 150 µm spacer for special applications
  
- Anti-roll system CE, glass - 70 mm ..... 14 0419 33980  
Consisting of:
  - Glass insert 70 mm
  - Metal frame CE
  - 100 µm spacer for standard applications
  
- Knife holder CE for low-profile disposable blades ..... 14 0419 33990  
- with lateral displacement feature and glass anti-roll guide.  
Clearance angle adjustable.
  
- Knife holder CE for high-profile disposable blades ..... 14 0419 33991  
- with lateral displacement feature and glass anti-roll guide.  
Clearance angle adjustable.
  
- Knife holder CE for low-profile disposable blades ..... 14 0419 33992  
- without clearance angle adjustment.  
Including knife holder base and pressure plates.
  
- Pressure plate B, 22°, ..... 14 0502 29553  
for high-profile disposable microtome blades
  
- Pressure plate S, 22°, ..... 14 0502 29551  
for low-profile disposable microtome blades
  
- Glass insert - 70 mm ..... 14 0419 33813  
for all CE knife holders

## 9. Optional accessories

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- Knife holder CE retrofit kit: ..... 14 0419 35693  
Tilting device with anti-roll system  
Consisting of:  
Tilting device  
Anti-roll system CE:  
- Glass insert 70 mm  
- Metal frame CE
- Knife holder CE-TC for Tungsten Carbide disposable blades ..... 14 0419 32073  
Especially suitable for sectioning harder specimens,  
such as tissue with bone or cartilage.
- Specimen disc, 20 mm ..... 14 0370 08636
- Specimen disc, 25 mm ..... 14 0416 19275
- Specimen disc, 30 mm ..... 14 0370 08587
- Transfer block for specimen discs ..... 14 0416 38207
- Adapter for Miles Tissue Tek specimen discs ..... 14 0436 26747
- Heat extractor (stationary) - for mounting on quick-freeze shelf ..... 14 0369 11197
- Heat extractor - mobile ..... 14 0443 26836
- 1 pair of cut-resistant safety gloves ..... 14 0340 29011  
size M
- Embedding medium for cryosectioning ..... 14 0201 08926  
(‘OCT-Compound’), 125 ml
- Cryostat oil - type 407, bottle of 250 ml ..... 14 0336 06100
- Caution - dangerous goods ..... 14 0387 36193  
Leica Cryofect - low-temperature disinfectant,  
4 bottles of 250 ml each, for temperatures down to -20°C.

### Warranty

Leica Biosystems Nussloch GmbH guarantees that the contractual product delivered has been subjected to a comprehensive quality control procedure based on the Leica in-house testing standards, and that the product is faultless and complies with all technical specifications and/or agreed characteristics warranted.

The scope of the warranty is based on the content of the concluded agreement. The warranty terms of your Leica sales organization or the organization from which you have purchased the contractual product shall apply exclusively.

### Technical service information

If you require technical service or replacement parts, please contact your Leica sales representative or dealer who sold the product.

Please provide the following information:

- Model name and serial number of the instrument.
- Location of the instrument and name of the person to contact.
- Reason for the service call.
- Date of delivery.

### Decommissioning and disposal

The instrument or parts of the instrument must be disposed of in compliance with the local laws.

## 11. Decontamination Certificate (master)

Dear Customer,

any product that is to be returned to Leica Biosystems or serviced on site, must be cleaned and decontaminated in the appropriate manner. Since it is not possible to decontaminate for prion diseases, such as CJD, BSE, CWD etc., equipment exposed to specimens containing prion diseases cannot be returned to Leica Biosystems for repair. On-site repair of prion contaminated equipment will only be conducted after the Field Service Engineer has been educated in the risks, instructed in the policies and procedures of the institution and provided with personal protective equipment. This certificate, duly completed, must be placed in the instrument, attached to the outside of the shipping crate or handed directly to the service engineer.

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

### Description

<b>Name/Model</b>	<b>Fabr. No.</b>
<b>KAT No.</b>	<b>Quantity</b>



**Tick Box A if applicable. Otherwise please complete all parts of B, providing further information as requested or appropriate.**

**A** Yes  This equipment has not been in contact with unfixed biological samples.

**B** **1** This equipment has been exposed internally or externally to hazardous materials as indicated below:

Yes No

Blood, body fluids, pathological samples

Other biohazards

Chemicals/substances hazardous to health

Other hazards

**Please provide further detail here:**

**2**

This equipment has been cleaned and decontaminated:

Yes No

If yes, give details of the method:

**Please provide further detail here:**

If no\*, please indicate why not:

\* Such equipment must not be returned without the written agreement of Leica Biosystems.

3

**Yes**  **No**  The equipment has been prepared to ensure safe handling/transportation.  
Whenever possible, please use the original transportation case/box.

**Important - to avoid refusal of shipment:**

Place one copy in the unit prior to packaging or hand it over to the service engineer. Customer assumes all responsibility for the immediate return shipment of articles sent to Leica without proper decontamination documentation.

If you have any further question, please call your local Leica organisation.

**Leica Internal Use** :If applicable, note corresponding Job and RAN-/RGA-Number:

Job Sheet No.: \_\_\_\_\_

SU Return Goods Authorisation: \_\_\_\_\_

BU Return Authorisation Number: \_\_\_\_\_

**Signature/Date**

**Name**

**Position**

**eMail**

**Institute**

**Department**

**Adress**

**Phone**

**Facsimile**



MICROSYSTEMS

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www.leica-microsystems.com

## 12. Information for the People's Republik of China

### - Administrative Measures on the Control of Pollution Caused by Electronic Products -

部件名称 Name of the part	有毒有害物质或元素 Hazardous substances					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr <sup>6+</sup> )	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 printed circuit boards	X	O	O	O	O	O
电子元器件 electronic components	X	O	O	O	O	O
机械部件 mechanical parts	X	O	O	X	O	O
光学元器件 optical components	X	O	X	O	O	O
电缆 cables	O	O	O	O	X	X
光源 light sources	O	X	O	O	O	O

- o : 表示该有毒有害物质在该部件中的含量均在SJ/T 11363-2006标准规定的限量要求以下。  
Indicates that the concentration of the hazardous substance in all materials in the parts is below the relevant threshold of the SJ/T 11363-2006 standard.
- x : 表示该有毒有害物质至少在该部件的某一材料中的含量超出SJ/T 11363-2006标准规定的限量要求。  
Indicates that the concentration of the hazardous substance of at least one of all materials in the parts is above the relevant threshold of the SJ/T 11363-2006 standard.

**Note: The actual product may or may not include in all the part types listed above**