Leica CM3600

Cryomacrotome

Leica

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NOTE

The information, numerical data, notes and value judgments contained in this manual represent the current state of scientific knowledge and state-of-the-art technology as we understand it following thorough investigation in this field. We are under no obligation to update the present manual periodically and on an ongoing basis according to the latest technical developments, nor to provide our customers with additional copies, updates etc. of this manual.

For erroneous statements, drawings, technical illustrations etc. contained in this manual we exclude liability as far as permissible according to the national legal system applicable in each individual case. In particular, no liability whatsoever is accepted for any financial loss or consequential damage caused by or related to compliance with statements or other information in this manual..

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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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EC Declaration of conformity

We herewith declare in exclusive responsibility that the

Leica CM 3600 – Cryomacrotome

was developed, designed and manufactured to conform with:
Council Directive 89/392/EEC, Appendix II A (Machines),
Council Directive 73/23/EEC (low voltage) and
Council Directive 89/336/EEC, Appendix I (Electromagnetic compatibility),
including their amendments.

The following harmonized standards were applied:

DIN EN 292,
DIN EN 378 Part 1,   DIN EN 61010-1.

The following national standards, guidelines and specifications were applied: **MedGV**.

In addition, the following in-house standards were applied:

DIN EN 9001.

A complete set of technical documentation is available.
An instruction manual for subject product is available.

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December 13, 1995

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Dag Graupner
Managing Director

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1. Important notes

1.1 Symbols in the text and their meaning

⚠️

> **Warnings appear in a grey box and are marked with a warning triangle** ⚠️.

ℹ️

> **Notes, i.e. important user information appear in a grey box and are marked with an information symbol** ℹ️ .

ENTER
> **Buttons and function keys which need to be pushed on the data entry screen, are printed in bold capitals.**

(5)
> **Figures in brackets refer to item numbers in drawings.**

1.2 Qualification of personnel

Only trained laboratory personnel may operate the Leica CM3600.

Prior to operating the instrument, the operator must thoroughly read and understand this instruction manual and must familiarize him/herself with all technical details of the instrument.

1.3 Instrument type

All information contained in this instruction manual applies exclusively to the instrument type indicated on the title page.

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

1.4   Designated use

The Leica CM3600 is an SPS-controlled and motorized precision cryomacrotome for large-surface sections, equipped with a convection-cooled cryochamber for deep-freezing, sectioning, storing and freeze-drying large biological and industrial specimens.
The instrument is designed for the above described applications only and must be operated according to the instructions in the present instruction manual.

> ⚠ **Any other use of the instrument is considered improper.**

If you wish to use the instrument for special applications or modes of operation not listed in this manual, it is absolutely necessary that you contact your local Leica representation prior to doing so.
Otherwise, you will loose the Leica warranty on your instrument.

Only trained personnel, skilled in the use of the above-mentioned applications, may operate the Leica CM3600.
Prior to operating the instrument, the operator must thoroughly read and understand this instruction manual.

1. Important notes

1.5 Warranty

Leica Microsystems 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.

1.6 Service information

If you require technical service or replacement parts, please contact your Leica sales representative or Leica 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

1.7 Decommissioning and disposal

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

2. Characteristics of the Leica CM3600

2.1 Layout of the CM3600

PC   Emergency stop switch   Window   Microtome (in chamber)   Chamber lid

Port and switch panel   Drain tap   Knee lever   Chamber

Socket panel   Refrigeration and control unit   Port and switch panel

Drain tap
Condensation water is drained through the drain tap.

Refrigeration and control unit
The refrigeration and control unit cools the cryochamber and controls the microtome and the entire electronics.

Knee lever
The knee lever is used for manual operation of the specimen sledge.

Socket panel
The PC and peripherals are connected via the socket panel.

PC
Commercial PC, monitor, keyboard, mouse and internal modem.

Emergency stop switch
Press the emergency stop switch to stop the microtome immediately.

Cabinet
The cabinet contains the cryochamber which houses the microtome.

Chamber lid
The chamber lid can be opened completely for maintenance and cleaning work on microtome and/or cryochamber.

Window
The window is heated and can be opened completely.

Microtome
The microtome is used to section the specimens.

Port and switch panel
The port and switch panel contains the mains switch and several sockets and ports.

2. Characteristics of the Leica CM3600

2.2 Technical Data

2.2.1 Microtome type

450 C Sliding microtome	
Section thickness selection:	1 - 200 µm
Sectioning range:	0 - 450 mm
Max. sectioning speed:	80 mm/s
Knife retraction after sectioning stroke:	50 - 250 µm
Total vertical stroke of knife:	70 mm (standard)
Total vertical stroke of knife:	100 mm (model with extended vertical stroke)
Total horizontal stroke:	450 mm
Specimen orientation via ball-joint:	ca. 5° (x/y/z axis)
Specimen orientation w/large spec. stage (450 x 150 mm):	Rotation around longitudinal axis (x axis)
Maximum specimen size (L x W x H):	450 x 150 x 70 mm (standard)
Maximum specimen size (L x W x H):	450 x 150 x 200 mm (model with extended stroke length)
Knife holder for steel and Tungsten Carbide knives:	160 mm
Knife holder for disposable blade holder:	160 mm
Knife (160 mm) with facet angle of:	20°, 35°

2.2.2 Control unit

The Leica CM3600 is equipped with a commercial PC, monitor, keyboard, mouse and an internal modem. For further information, please refer to the manual of the PC.
Operating system: XP.
Software: CM3600 Version 3.0.0.

2.2.3 Dimensions and weight

Inner (cryochamber L x H x W):	1650 x 720 x 600 mm
Outer (L x H x W):	2800 x 1090 x 920 mm
(Overall dimensions with connecting cables)	
Outer length (total):	2800 mm
Outer length (chamber only):	1940 mm
Outer length (control unit with connections only):	860 mm
Outer height (total):	1090 mm
Outer height (work surface height):	1050 mm
Outer width:	920 mm
Weight (total, incl. microtome):	660 kgs
Weight (microtome only):	190 kgs

2.2.4 Electrical connections

380 V / 50 Hz, three-phase

Nominal voltage:	380 V AC ± 10 %
Nominal frequency:	50 Hz
Power draw:	2300 VA
Automatic cutout/ mains safety switch	3 x 8A / 1 x 16A, according to DIN IEC 127-2

208 V / 60 Hz, two-phase

Nominal voltage:	208 V AC ± 10 %
Nominal frequency:	60 Hz
Power draw:	2300 VA
Automatic cutout/ Mains safety switch	2 x 8A / 1 x 10A UL-listed

200 V / 50 Hz, two-phase

Nominal voltage:	200 V AC ± 10 %
Nominal frequency:	50 Hz
Power draw:	2300 VA
Automatic cutout/	2 x 8A / 1 x 10A
Mains safety switch	UL-listed

200 V / 60 Hz, two-phase

Nominal voltage:	200 V AC ± 10 %
Nominal frequency:	60 Hz
Power draw:	2300 VA
Automatic cutout/	2 x 8A / 1 x 10A
Mains safety switch	UL-listed

2.2.5 Refrigeration system - cooling chamber

Selectable temperature range: at ambient temperature of 22° C, with window closed and relative humidity ≤ 60 %:	0° C to -30° C -30° C ±10 % (selectable in 1 K steps)
Control accuracy:	+1 to -3 K
Electrical power draw:	1160 W
Refrigerating output at -25°C:	1370 W
Nominal pressure:	20 bar (maximum value)
Cutoff pressure:	25 bar (via Pressostat)
Safety factor:	2, as per UL 1262
Refrigerant:	1100 g, refrigerant R404A
Compressor oil:	1220 ccm alpha 22, Kyodo

Defrosting:	automatic hot-gas defrosting, programmable, 2 x automatic hot-gas defrosting cycles / 24 hours. Duration: 1 - 15 minutes, manual defrosting as needed.

2.2.6 General parameters

Protective class:	I
Pollution degree:	2
Overvoltage installation category:	II

2.3 Instrument parts

The Leica CM3600 consists of a sliding microtome in a large-volume cryochamber. The instrument is designed for cryosectioning large speci- mens or for processing specimens with the so-called cryo-planing technique.

The large-scale heavy-duty microtome is made for sectioning large biomedical and industrial specimens such as whole animals or large tissue specimens by applying the sectioning techniques for large-surface sections. The sturdy construction of the instrument also permits section- ing very hard specimens such as undecalcified bones.

The microtome is housed in a convection-cooled large-volume cryochamber.

The large chamber in connection with the special cooling system enables dehydration of sections within a very short time.

The low temperatures are achieved and maintained by cold air circulating inside the cryochamber. A fan controls the air circulation speed.

The large specimens are frozen onto metal specimen stages which are subsequently clamped in the specimen sledge.

Optionally the instrument can be operated with an extraction system which largely prevents the cryochamber being soiled with section waste.

2.4 Function

The motor-driven specimen sledge moves horizontally underneath the knife, either producing a section (cryosectioning) with each stroke or a high-quality specimen surface (cryo-planing technique).

Prior to each sectioning stroke, a stepper motor feeds the microtome knife downwards towards the specimen by a selected amount of microns (section thickness).

During each return stroke of the specimen sledge, the stepper motor automatically carries out a knife retraction movement, programmable between 50 and 250 µm. This protects both the knife edge and the specimen surface from being damaged.

Before starting the next sectioning stroke, the motor lowers the knife towards the specimen surface by the selected sectioning feed plus the set value for knife retraction.

Trimming is programmable; the desired section thickness can be preselected.

The number of sections to be preformed during trimming can be programmed via the section counter. When the programmed number of sections has been carried out, the microtome will stop automatically.

Once the desired specimen block height has been reached, those sections that will actually be used for further examination are collected manually via the knee lever.

The Leica CM3600 is operated via PC and/or manually via the knee lever. All data entries are made via the PC.

The Leica CM3600 features two automatic defrost cycles.

Defrost cycle duration is software-controlled. If the evaporator surface is already completely deiced before the programmed defrost time is up, the defrost cycle will be aborted. In addition, manual defrost cycles can be set as needed.

3. Safety

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

3.1 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.

> ℹ **This Instruction manual must be appropriately supplemented as required by the existing regulations on accident prevention and environmental safety in the operator's country.**

The Leica CM3600 was built and tested in accordance with the safety regulations for electrical measuring, control, regulating and laboratory devices listed below:

- DIN EN ISO 9001,
- EN 61010-1, EN 61010-2-010,
- EN 292-1, EN 292-2,
- EN 614-1,
- EN 954-1,
- EN 1050,
- EN 61326-1,
- EN 61000-3-3

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

> ⚠ **The protective devices on both instrument and accessories must neither be removed nor modified. Only qualified service personnel authorized by Leica may repair the instrument and access its internal components.**

3.2 Warnings

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.

3.3 Safety standards

The Leica CM3600 was built and tested in accordance with the safety regulations for electrical measuring, control, regulating and laboratory devices listed below:

- DIN EN 292,
- DIN EN 55011,
- DIN EN 61010-1,
- IEC 1000-4,
- IEC 50082-1,
- MedGV.

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

3.4 Safety devices

3.4.1 Emergency stop switch

The Leica CM3600 is equipped with an emergency stop switch (**1**) located on the chamber surface to the left of the window.

Activating the emergency stop switch
Press the Emergency stop switch (1) to stop the microtome immediately.
Resetting the emergency stop switch.
To reset the emergency stop switch (**1**) turn it in the direction of the arrow until it is released upwards back to its original position.
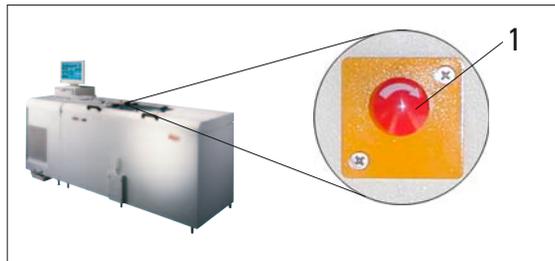
3. Safety

3.4.2 Knee lever

Never leave the instrument unattended when the knee lever is folded out (**1**) to prevent the microtome from being set in motion accidentally.

⚠️ **Always swing the knee lever upwards before leaving the instrument.**

3.4.3 Window
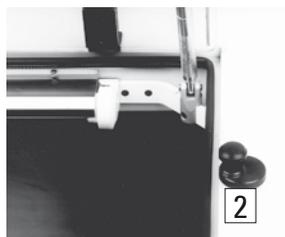
The window is heatable and equipped with a lock button (**2**). To open the window, lift lock button (**2**) slightly upwards and turn it by 180°.

3.4.4 Cryochamber

Before opening the large chamber lid, first close the window and lock with the lock button (2).
When opening the chamber lid, make sure the lid retainer (**3**) engages to prevent the chamber lid from falling.

⚠️ **When opening the chamber lid, the lid retainer must engage.**

3.5   Special safety instructions

The safety devices installed in the Leica CM3600 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, make sure to comply with the following instructions and warnings.

> **The protective devices on the instrument must neither be removed nor modified.**

> **Connect the instrument only to a grounded mains power outlet.**

> **Do not cancel the protective effect of the grounded power outlet by using extension cords without ground conductor.**

> **Use extreme caution when handling microtome knives and disposable blades.**

> **Handle knives / blades as per manufacturer's directions.**

> **Do not operate the instrument in non explosion-proof rooms.**

> **During instrument setup / installation do not switch the instrument on before being instructed to do so by this manual.**

3. Safety

⚠️ **As you work through the instruction manual, familiarizing yourself with the instrument, do not yet install a knife or specimen.**

Below you find a summary of all warnings contained in this instruction manual.

⚠️ **Any use of the instrument not described in this instruction manual is considered improper.**

⚠️ **Always swing the knee lever upwards before leaving the instrument.**

⚠️ **When opening the chamber lid, the lid retainer must engage.**

⚠️ **Prior to exchanging the fuse in the socket panel, switch the instrument mains switch off and unplug the instrument from mains. Only use fuses of the same type and characteristics as originally supplied (see chapter 2.2 'Technical data' for fuse specification).**

⚠️ **The control PC as well as all peripherals connected to it (printer, monitor, etc.) are set to an input voltage of 230V/50Hz. For reasons of compatibility (CE Directives, UL Approval) they may only be connected to the socket panel of the instrument, using the connecting cables supplied.**

⚠️ **Prior to any work involving the knife, microtome or inside the cryochamber, activate the emergency stop switch. For further information, refer to chapter 3.4.1.**

⚠ **Prior to any work involving the knife, microtome or inside the cryochamber, swing the knee lever upwards.**

⚠ **For any work involving the knife, microtome or inside the cryochamber always wear special protective gloves.**

⚠ **For reasons of safety and accuracy, the maximum trimming thickness should not exceed 100 µm per section.**

⚠ **When trimming biological material (particularly bone), section thickness should not exceed 50 µm.**

⚠ **Never try to catch or grab a knife.**

⚠ **Never introduce your hands into the space between specimen and knife.**

⚠ **Radioactive specimen waste must be disposed of according to the local radiation safety regulations.**

⚠ **For removing the microtome (approx. 190 kgs) from the cryochamber, a ceiling crane capable of carrying that weight should be available.**

⚠ **For safety reasons, we strongly advise you against lifting the microtome (190 kgs) from the cryochamber without appropriate lifting gear. Do not attempt to lift the microtome from the chamber manually, even if several persons are there to help.**

4.   Site requirements

4.1   Site requirements at place of installation

If possible at all, the room should be air-conditioned.
Relative humidity≤ 60 %.
Room temperature should not exceed 22 °C.

If ambient conditions are not maintained as specified, instrument perfor-
mance may be negatively affected (lowest specified temperature may not
be reached, frost may accumulate).

All transportations paths for the Leica CM3600 must at least be 1.5 meters
wide, especially doorways must have that width. 1.5 m is wide enough for
the instrument to pass through the doorway at an angle (if the instrument
can pass straight through the doorway, a width of 95 cm will be suffi-
cient).
The Leica CM3600 has a total length (refrigeration and control unit plus
cryochamber) of 2.7 meters or 2.8 meters including the connecting cables
on the left side of the refrigeration and control unit, i.e. a minimum wall
length of 2.9 meters is required to install the instrument. Ideally the wall
should measure 3.5 meters or more to provide easy access to the left side
of the unit for technical service work. The required minimum distance
between the back panel of the instrument and the wall is 30 cm, the
recommended distance is 50 cm.

Installation wall, ideal dimensions (view from above)
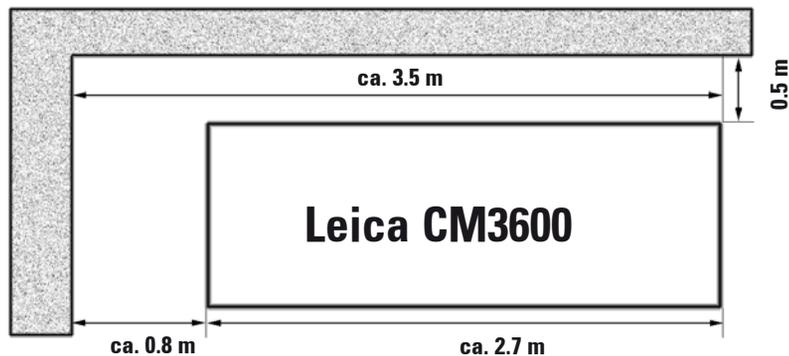
ca. 3.5 m

0.5 m

Leica CM3600

ca. 0.8 m

ca. 2.7 m

⚠️ **For removing the microtome (approx. 190 kgs) from the cryochamber, a ceiling crane capable of carrying that weight should be available.**

ℹ️ **If no ceiling crane is installed yet, we recommend the special Leica crane „KR-CM3600".**

4.2   Electrical connections

Country:	Europe	USA	Japan
Installation cord cross section:	2.5 mm^2	2.5 mm^2	2.5 mm^2
Fuse/connection:	16 A/380 V	25 A/208V	25 A/200V

4.3   Other connections

Telephone connection
For remote failure diagnosis, a telephone connection must be available to hook up the modem. The phone connection must be direct, i.e. must not be controlled by an additional computer (server).

Compressed air supply
If you want to use the optional extraction system:
Compressed air supply for the extraction system (p = 5 - 8 bar) must be available.

5   Installation

5.1   Unpacking and installation

Only duly trained personnel may unpack and install the Leica CM3600.
Please contact your local Leica sales organization for appropriate advice.

5.2   Standard delivery

The standard delivery includes:

- 1 Leica CM3600, consisting of:
  - Cabinet
  - Refrigeration and control unit
  - PC (computer, monitor, keyboard, mouse)
  - Microtome 450 C with integrated knife holder

- 1 Disposable blade holder 157 AR
- 1 Dispenser with 10 disposable blades, type H 45 L
- 1 Roll of section collecting tape, type 810
- 1 Roll of section collecting tape, type 4248
- 1 Bottle of low temperature oil PDP 40, 500 ml
- 1 Positioning tool for disposable blade holder

- 1 Tool set, consisting of:
  - Allen keys, set of 7, in different sizes: 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0
  - Fork wrenches, set of 2, sizes 15 and 17

- 1 Syringe 10 ml with hypodermic needle
- 1 Instruction manual
- 1 Set of manuals for PC
- 1 Pressure plate
- 1 Pair of protective gloves

> **Please compare the delivered parts carefully with the packing list, delivery note and with your order.**
> **If you notice any discrepancies, please contact your local Leica sales office or dealer immediately.**

5.3   Port and switch panel

Connecting block

Switch for
socket panel

Interface
RS 232

Connection for
foot switch

External
alarm
signal switch

Connection for
external alarm

Connection for
compressed air

Control
lamps

Ground fault circuit
interruption

Mains switch

Automatic
cutout

Socket panel
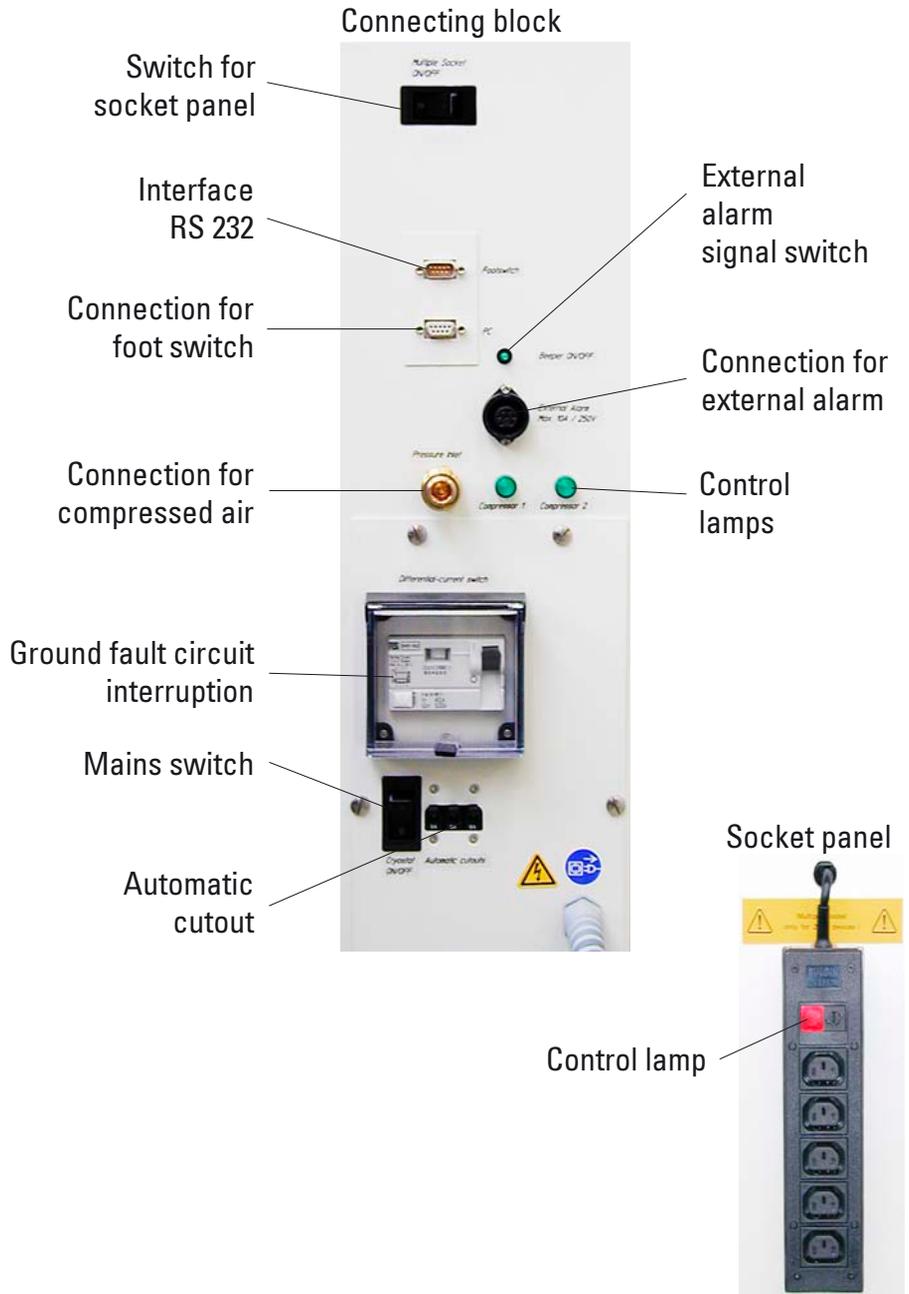
Control lamp

5. Installation

5.3.1 Port and switch functions

Mains switch
Switch in position "0" - instrument disconnected from mains except for the socket panel.

Socket panel switch
Control light is on (red), when the socket panel switch is ON.

Foot switch connection
Optionally, a foot switch can be connected for the purpose of section thickness documentation (GLP).

RS 232 interface
The RS 232 interface links the PC to the PLC.

Switch for external alarm signal
The external alarm (acoustic signal) is triggered, when the chamber temperature exceeds the selected value. When the temperature dips back down below the defined threshold, the external alarm is immediately switched off. Loss of mains power supply (instrument switched off or power failure) will also trigger the external alarm. On return of mains supply the alarm is automatically switched off.
To activate the external alarm function, press the alarm signal switch. The green LED in the switch button lights up. To deactivate the external alarm function, press the alarm signal switch once again. The green LED in the switch button is extinguished.

Connection for external alarm
Forwarding an external alarm.

Compressed air supply
Connection of compressed air hose to extraction unit.

Control lamps
Indicate function of the refrigerating sets.

GFCI switch
Protects the entire instrument.

Automatic cutout
Protects the refrigerating sets and all electronic components.

5.3.2   Fuses

The Leica CM3600 is equipped with the following fuses:

- GFCI switch
- Automatic cutout
- Fuse protecting the mains switch
- Fuse protecting the socket panel

GFCI switch
After the GFCI switch has been activated, it will be in the lower position.
To switch it back on, flip the GFCI switch upwards.

GFCI switch

Automatic cutout
After the automatic cutout has been activated, it will be in the lower
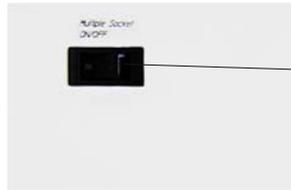position. Flip it upwards to switch it back on.

Automatic cutout

Fuse protecting the mains switch

🛈	**If the mains switch fuse has blown, please call Technical Service.**

Fuse protecting the mains
switch

Fuse protecting socket panel
If the socket panel fuse has blown, please proceed as follows:

⚠	**Prior to exchanging the fuse in the socket panel, switch the instrument mains switch off and unplug the instrument from mains. Only use fuses of the same type and characteristics as originally supplied (see chapter 2.2 'Technical data').**

1. Push the fuse carrier inwards with a screw driver and turn the screw driver approx. one quarter turn to the left.
2. Pull out the fuse carrier.
3. Remove the fuse.
4. Insert a replacement fuse of identical specification.
5 Reinsert the fuse carrier.
6. Push the fuse carrier slightly inwardswith the screw driver and turn it one quarter turn to the right.
7. Reconnect the instrument to mains and switch back on.

Fuse protecting socket panel
Fuse carrier

5.4   PC

The Leica CM3600 is equipped with a commercial PC, monitor, keyboard, mouse and an internal modem. For further information, please refer to the manual of the PC.

> ⚠ **The control PC as well as all peripherals connected to it (printer, monitor, etc.) are set to an input voltage of 230V/50Hz. For reasons of compatibility (CE Directives, UL approval) they must be connected only to the socket panel of the instrument (see chapter 5.3 for more details), using the connecting cables supplied.**

6. Software

6.1 Start and log-in procedure

Requirements:
PC must be on and the Microsoft Windows XP® operating system must have booted and be ready for service.

Doubleclicking on Icon „CM3600" starts the application.

Registration mask
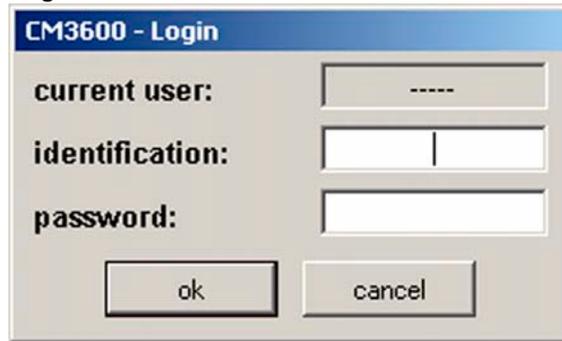
1. Type the user name in the identification field.
2. Type the correct password in the password field.
3. Click the **OK** button to complete registration.

After successful registration, the „Main window" will open. For further information, refer to chapter 6.4.

> **After 5 faulty registration attempts, access to the unit will be denied. Only an Administrator can remove the lock. For further information, refer to chapter 6.5.2.**

6.2 Description of the window elements
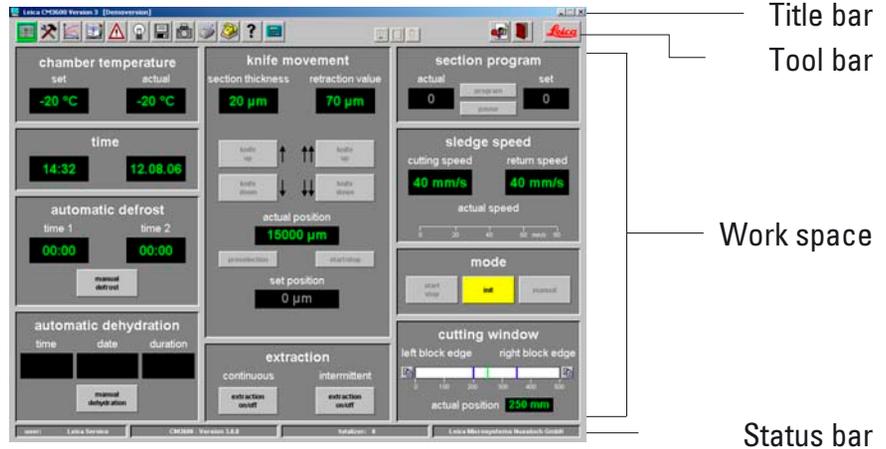
The window surface is divided into several areas:

- Title bar
- Tool bar
- Work space
- Status bar

6.2.1 Title bar

The „Title bar" displays information on instrument name and software version number.

6.2.2 Tool bar

The „Tool bar" provides quick access (via mouse-click) to individual software functions.
When clicking on an icon, the corresponding window will open up.
Active icons will light up in green.

6. Software

Icons

Clicking on the icon opens the „Main window", which also opens up after completion of the start and log-in procedure.

Clicking on the icon opens the „Parameter settings" window.

Clicking on the icon opens the „Temperature curve" window.

Clicking on the icon opens the „Chronological event list" window.

Clicking on the icon opens the „Alarm list" window.

Clicking on the icon switches the chamber illumination on or off. Active icons will light up in yellow.

Clicking on the icon opens the „Section documentation" window.

Clicking on the icon activates the „Photo mode".

Clicking on the icon creates a printout of the current screen.

Clicking on the icon opens the „Remote inquiry" window.

Clicking on the icon opens the „Help" window.

Clicking on the icon opens the „Saves" window. When activated, the icon will light up in green.

Clicking on the icon opens the „Label printing" window. When activated, the icon will light up in green.

Clicking on the icon activates the „Foot switch". When activated, the icon will light up in green and the current sectioning data will be saved.

The 'Stop' icon appears immediately when the emergency stop switch is pressed - it will be blinking in red color. The instrument will be inoperational until the operator acknowledges the corresponding error message in the „Alarm list" window. For further information, refer to chapter 6.8.

Clicking on the „Log off" icon logs off the user currently logged on. Clicking again reopens the registration mask for Log-in.

Clicking on „Quit" closes the application.

Clicking on the icon opens a window providing information on software version number, date, copyright and serial number of the application.

6.2.3 Work space

In the work space area all control entries and settings are made. Display format may vary depending on the icon selected in the tool bar.

6.2.4 Information bar

The information bar displays the following information:

- the currently registered user,
- instrument name and software version number,
- number of sections carried out so far,
- name of laboratory.

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6.3 Initialization

> **i** **To be able to work with the instrument, after completion of the start and log-in procedure the microtome must be initialized.**

For initialization, proceed as follows:

1. In the „Main window", click on the **INIT** button blinking in yellow color (in 'Mode' field).
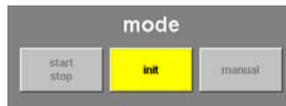
The „Safety check - initialization" window will open up.
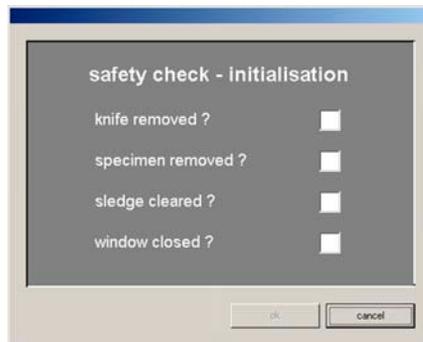
2. Check wheter you can confirm each safety query - if not, carry out the required actions. Subsequently, confirm each safety query by mouse click on the corresponding check box.
3. Having confirmed all safety queries, click on **OK**.

The microtome will then be initialized:

- The knife holder moves to the uppermost position.
- The microtome sledge moves to the end positions on the right and left.

> **Once initialization has been started, it can only be interrupted by pressing the emergency stop switch. For further information, refer to chapter 3.4.1.**

After the initialization procedure has been completed, the color of the **INIT** button will first change from yellow to green and after a few seconds, the caption on the button will change from **INIT** to **AUTOMATIC**.

The microtome is now ready for service. For further information, refer to chapter 6.4.9.

6.4   Main window

The main window either opens up automatically after completion of the start and log-in procedure or by clicking on the „Main window" icon.
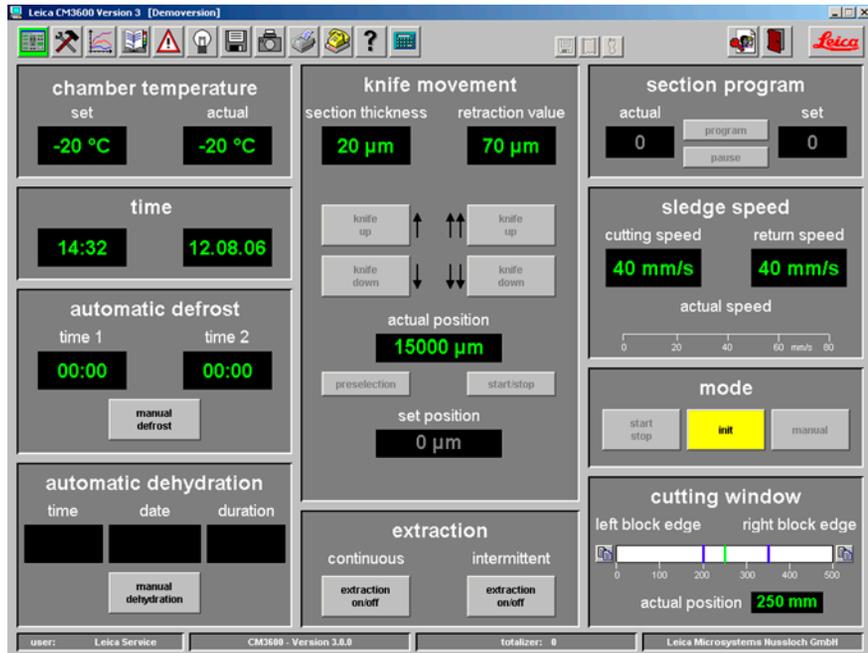
The work space of the main window is divided as follows:

- Chamber temperature
- Time
- Automatic defrost
- Automatic dehydration
- Knife movement
- Extraction
- Section program
- Sledge speed
- Mode (of operation)
- Cutting window

6.4.1 Chamber temperature

Indication of set or actual chamber temperature.
See chapter 6.5.1 'Parameter settings' on how to set the chamber temperature.

6.4.2 Time

Indication of real time and date.
See chapter 6.5.1 'Parameter settings' on how to set the time.

6.4.3 Automatic defrost cycle

Indication of start time of 1st or 2nd automatic defrost cycle.
See chapter 6.5.1 'Parameter settings' on how to set the defrost cycle.

Manual defrost button
Clicking on this button immediately starts a defrost cycle. During the defrost cycle, the button blinks in yellow color. Clicking on the button once more aborts the defrost cycle.

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6.4.4   Automatic dehydration

Indication of start time, start date and duration of the automatic dehydration.

See chapter 6.5.1 Parameter settings on how to set the automatic dehydration parameters.

MANUAL DEHYDRATION button

Clicking on this button immediately starts a dehydration cycle. Clicking on this button once more, stops dehydration. When activated, the button blinks in yellow color.

If the temperature is to be decreased during automatic dehydration, this must be specified in the „Parameter settings" window. For further information, refer to chapter 6.5.1.

6.4.5   Knife movement
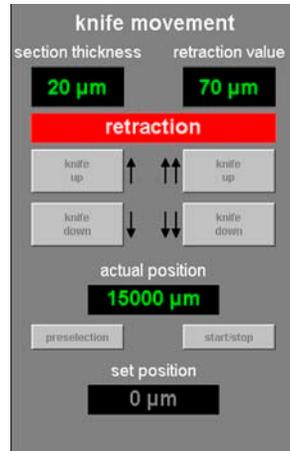
Indication of section and retraction thickness. Actual indicates the current position of the knife holder. Set indicates the desired position of the knife holder.

The red „Retraction" caption is displayed only during the return stroke of the sledge.

> **The 'Knife movement' icons can be activated only in MANUAL Mode. For further information, see chapter 6.4.9.**

> **The entry limit for actual and set position may vary between 70 - 200 µm, depending on the instrument version. The standard version is shipped with a limit of 70 µm.**

To modify any of the settings, mouse-click on the corresponding icon. Entries are completed by pressing the **ENTER** key.

KNIFE UP button on the left
Clicking on this icon moves the knife holder upwards for a short while. If you click on and hold this icon, the knife holder will continue to move upward until the left mouse button is released. While active, the icon blinks in yellow color.

KNIFE DOWN button on the left
Clicking on this icon moves the knife holder downwards for a short while. If you click on and hold this icon, the knife holder will continue to move downward until the left mouse button is released. While active, the icon blinks in yellow color.

KNIFE UP button on the right
Clicking on the **KNIFE UP** button on the right activates the corresponding function. The knife holder will move upwards until reaching the upper limit position. To stop the knife movement, click on the button once more. When activated, the button will light up in green.

KNIFE DOWN button on the right
Clicking on this button moves the knife holder fast downwards for a short while. If you click on and hold this button, the knife holder will continue to move downward until the left mouse button is released. While active, the button blinks in yellow color.

PRESELECTION button
Clicking on this button activates the 'Set position' display. Click on the displayed value to change the setting. While active, the icon lights up in green color.

START/STOP button
The **START/STOP** button can be activated only when the **PRESELECTION** button is active. Clicking on **START/STOP** moves the knife holder so the selected set position. When activated, this button will light up in green. Clicking on this button once more stops the knife holder.

Once the knife holder has reached the upper limit position, both KNIFE UP buttons blink in green color.
Once the knife holder has reached the lower limit position, both KNIFE DOWN buttons blink in yellow color.

Once the set position has been reached, it can only be left by activating the knee lever. For further information, refer to chapter 3.4.2. A corresponding message will appear on the screen.

6.4.6   Extraction system

ℹ️	**The extraction function can only be activated when an extraction unit is connected to the instrument. For further information, refer to chapter 9.1.**

Button EXTRACTION ON/OFF in continuous mode
Clicking on this button activates or deactivates continuous extraction.
When activated, the button will light up in green.

Button EXTRACTION ON/OFF in intermittent mode
Clicking on this button activates or deactivates intermittent extraction.
When activated, the button will light up in green.

6.4.7   Sectioning program
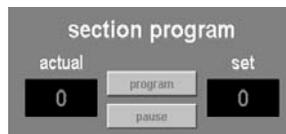
Indication of set or actual number of sections.
To modify any of the settings, mouse-click on the corresponding button.
Entries are completed by pressing the **ENTER** key.

ℹ️	**The buttons can be activated only in AUTOMATIC Mode. Clicking on the START/STOP button located in the 'Mode' field starts or stops the sectioning program. For further information, refer to chapter 6.4.9.**

PROGRAM button
Clicking on this button activates the set value display.

Click on the activated set value field to modify the setting.

PAUSE button
Clicking on this button stops the sectioning program. Clicking on the button once more restarts the sectioning program, resuming the current section where if was left off.

6.4.8   Sledge speed
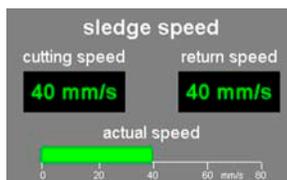
Indication of current sectioning or return stroke speed in mm/s (millimeters per second). To modify any of the settings, click on the corresponding value.

The graphic display is active only while sectioning is in progress. The currently selected sectioning and return stroke speed are displayed via a green bar on a scale from 0 - 80 mm/s.

6.4.9   Mode of operation

To be able to work with the instrument, after completion of the start and log-in procedure the microtome must be initialized. For further information, refer to chapter 6.3.

Buttons prior to initialization

Buttons after initialization
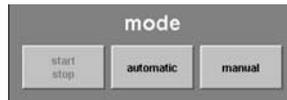
INIT button
Clicking on INIT opens the 'Initialization' window. For further information, refer to chapter 6.3. Prior to initialization, the button blinks in yellow color. After the initialization procedure has been completed, the color of the INIT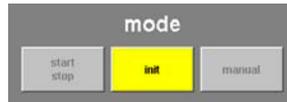 button will change from yellow to green. After a few seconds, the caption on the button will change from **INIT** to **AUTOMATIC**.

AUTOMATIC button
Clicking on this button switches the instrument to automatic mode. When activated, the button will light up in green.

MANUAL button
Clicking on this button switches the instrument to manual mode. When activated, the button will light up in green.

START/STOP button
This button can only be activated in automatic mode, where it starts or stops the sectioning program. When activated the **START/STOP** and **AUTOMATIC** buttons will light up in green.

6. Software

6.4.10 Cutting window

Indication of the left and right block edge, graphically displayed by blue lines. They indicate the maximum horizontal stroke of the microtome sledge on a scale from 0 - 500 mm.

Indication of the actual position of the microtome sledge. The sledge position is graphically displayed by the green line.
To modify any of the settings, mouse-click on the 'Actual position' indication.

Clicking on the icons on the left an right of the scale lets you adjust the left and/or right half of the block to the actual microtome sledge position indicated.

LEFT BLOCK EDGE
Clicking on the inscription LEFT BLOCK EDGE opens up an entry window. Select the left limit position to where the microtome sledge can move on a scale from 0 - 500 mm.

RIGHT BLOCK EDGE
Clicking on the inscription RIGHT BLOCK EDGE opens up an entry window. Select the right limit position to where the microtome sledge can move on a scale from 0 - 450 mm.

6.5   Parameter settings

Click on „Parameter settings" to open the corresponding window.
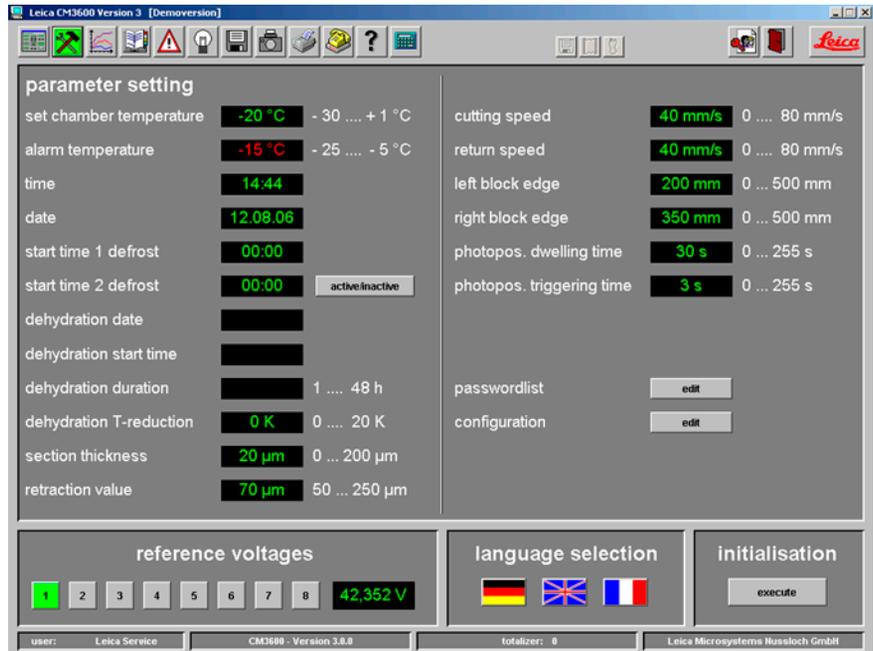
The work space of the parameter settings window is divided as follows:

- Parameter setting
- Password list
- Configuration
- Reference voltages
- Language selection
- Initialization

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6.5.1 Parameter setting

parameter setting					
set chamber temperature	-20 °C	- 30 .... + 1 °C	cutting speed	40 mm/s	0 .... 80 mm/s
alarm temperature	-15 °C	- 25 .... - 5 °C	return speed	40 mm/s	0 .... 80 mm/s
time	14:44		left block edge	200 mm	0 ... 500 mm
date	12.08.06		right block edge	350 mm	0 ... 500 mm
start time 1 defrost	00:00		photopos. dwelling time	30 s	0 ... 255 s
start time 2 defrost	00:00	active/inactive	photopos. triggering time	3 s	0 ... 255 s
dehydration date					
dehydration start time					
dehydration duration		1 .... 48 h	passwordlist	edit	
dehydration T-reduction	0 K	0 .... 20 K	configuration	edit	
section thickness	20 µm	0 ... 200 µm			
retraction value	70 µm	50 ... 250 µm			

Set chamber temperature

Click on this indication to change the currently selected value. Temperature values from -30 to +1° C can be selected.

Alarm temperature

Click on this indication to change the currently selected value. Temperature values from -25 to -5° C can be selected.

> **The alarm temperature should not be too close to the set chamber temperature. If the alarm temperature is too close to the set chamber temperature, an alarm can be triggered simply when working with the instrument during a prolonged period of time or during the daily defrost cycle.**
> **A temperature difference of approx. 5 K (Kelvin) is recommended.**

Time and date
Indication of time and date. Clicking on this indication opens the dialog box „System time".

Clicking on individual parameters (day, month, year,
hour or minutes) the corresponding setting can be changed.
Click **OK** to confirm.

Start time 1 defrost
Indication of start time of the 1st automatic defrost cycle.
Clicking on this indication opens the dialog box „defrost time".1
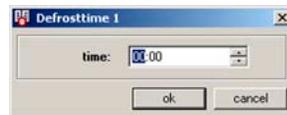
Click on individual parameters (hours or minutes) to change the corresponding settings. Click **OK** to confirm.

Start time 2 defrost
Indication of start time of the 2nd automatic defrost cycle. Clicking on this indication opens the dialog box „defrost time".2

Click on individual parameters (hours or minutes) to change the corresponding settings. Click on **OK** to confirm.

Button active/inactive
Clicking on this button activates or deactivates the 2nd automatic defrost cycle.

Dehydration date
Dehydration start time
Dehydration duration
Indication of start date and time, and duration of the automatic dehydration cycle. Clicking on one of the parameters opens the dialog box „Dehydration time".
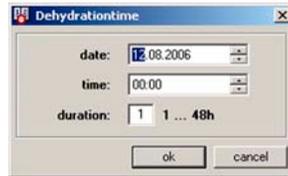
Click on individual parameters (day, month, year, hour or minutes) to change the corresponding settings.

The desired duration of the dehydration procedure can be selected in the duration field. Values from 1 - 48 hours can be selected. Click **OK** to confirm.

> **To speed up the dehydration procedure, the dehydration cryochamber temperature can be lowered. This can be done via the 'Dehydration T-reduction' indication.**

Dehydration T-reduction
Indication of temperature reduction for dehydration. Click on this indication to change the currently selected value. Values from 0 - 20 K can be selected.

Section thickness
Indication of section thickness. Click on this indication to change the currently selected value. Values from 0 - 200 µm can be selected.

Retraction value
Indication of the currently selected retraction value. Click on this indication to change the currently selected value. Values from 50 - 250 µm can be selected.

Cutting speed
Return speed
Indication of cutting and return speed. Click on one of the indications to change the currently selected value. Values from 0 - 80 mm/sec can be selected.

Left block edge
Right block edge
Indication of left and right block edge. Click on the individual indication to change the currently selected value. Values from 0 - 500 mm can be selected. For further information, refer to chapter 6.4.10.

Photo position dwelling time
Photo position triggering time
Indication of photo position dwell and triggering time. Click on the individual indication to change the currently selected value. Values from 0 - 255 seconds can be selected. For further information, refer to chapter 6.11.

EDIT button in the password list
Clicking on this button opens the „User configuration' window. For further information, refer to chapter 6.5.2.

EDIT button in the configuration field
Clicking on this button opens the „Configuration' window. For further information, refer to chapter 6.5.3.

6.5.2 Password list

> **i** **To access the 'User configuration', the registered user must be an administrator.**

no.	active	user name	full name	user rights	
1	X	Service	Leica Service	supervisor	
2	X	CM	Customer	user	
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

The „user configuration" indication consists of the following columns:

- **No.**
  Indication of the program-controlled running number.

- **Active**
  Indication of status of the user selected. Active users are displayed with an „X".

- **User name**
  Indication of the user name, which is introduced in the identification field during the start and log-in procedure.

- **Full name**
  Indication of full user name.

- **User rights**
  Indication of the corresponding access right. The administrator has full access to all application functions. Users have only limited access.

CLOSE button
Clicking on this button closes the 'User configuration' window.

> ℹ️ **Doubleclicking on a line in the configuration indication opens the dialog box „User configuration".**

In the „user configuration" dialog box the following settings can be selected:

- **No.**
  Indication of the running number. No changes can be made in this field.

- **Active**
  Clicking on the check box sets the user status to „active". Only after this step can a user successfully register via the start and log-in procedure.

- **User name**
  Enter the desired user name. A maximum of 10 characters (numerical or alphanumerical) can be entered.

- **Full name**
  Enter full first and last name of user.

- **Access rights**
  Click on the **USER RIGHTS** line to open a drop down menu.
  User property 'Administrator' or 'User' can be selected.

> **i** | **Administrators have full access to all application functions. Users do not have access to the password list and to the configuration parameters in the "Parameter settings" window.**

- **Identification**
  Type in the identification which is needed for the start and log-in procedure.

- **Confirm identification**
  Repeat the identification.

DELETE button
Clicking on this button deletes the selected user without any prior safety query.

OK button
Clicking on this button saves the the entries and closes the „User con-figuration" dialog box.

CANCEL button
Clicking on this button closes the „User configuration' dialog box. Any changes made are not saved.

6.5.3 Configuration

> **ℹ** **To access 'Configuration', the registered user must be an administrator.**

The „Configuration" window contains the following tabs:

- Text main study
- Text substudy
- Measured values
- General
- Labels
- Comments

OK button
Clicking on this button saves the entries and closes the „Configuration" dialog box.

CANCEL button
Clicking on this button closes the „Configuration" window without saving any of the changes made.

6. Software

Tabs „Text main study" and „Text substudy"
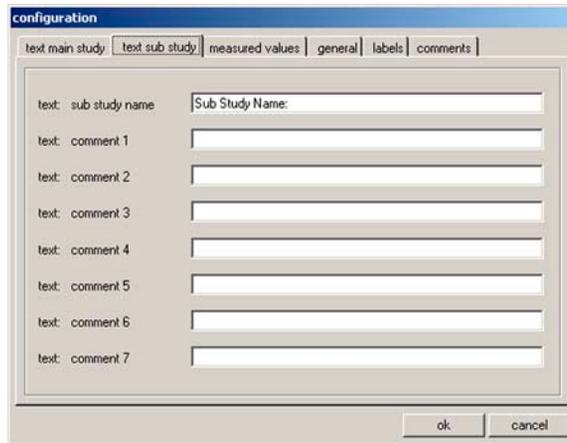
The structure of the two tabs is identical. A header and 7 freely selectable comments for each main and/or substudy can be defined.

The text entered into the 8 entry fields is copied into the dialog box for creating main and substudies. Each individual text can consist of up to 30 characters. For the configuration of a main or substudy see chapter 6.10.

Tab „Measured values"
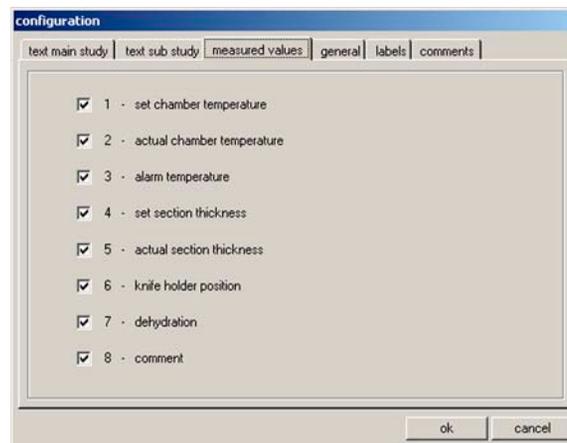
For selecting the measured values to be displayed in the 'section documentation' window after having selected a main or substudy.

For the configuration of a main or substudy see chapter 6.10.

The following measured values can be selected:

- Set chamber temperature
- Actual chamber temperature
- Alarm temperature
- Set section thickness
- Actual section thickness
- Knife holder position
- Dehydration
- Comment

Tab „General"
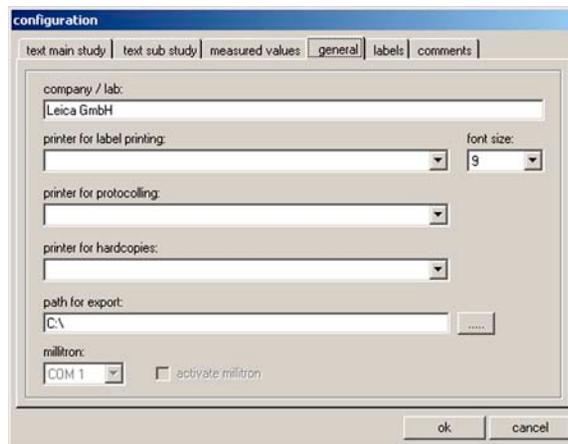
The „General" tab contains the following entry fields:

- Company/lab
- Printer for label printing
- Font size
- Printer for protocoling
- Printer for hardcopies
- Path for export
- Millitron
- Activate millitron

Company/lab
Enter the name of the company or the laboratory. The name will be displayed in the „information bar", on the right side, see chapter 6.2.4.

Printer for label printing
Clicking on this line opens a drop down menu. If a printer for label printing is connected, it can be selected in this menu.

Font size
Clicking on this line opens a drop down menu. Here you can select the desired font size for the labels.

Printer for protocoling
Clicking on this line opens a drop down menu. If a printer for protocoling is connected, it can be selected in this menu.

Printer for hardcopies
Clicking on this line opens a drop down menu. If a printer for hardcopies is connected, it can be selected in this menu.

> **If no printer can be selected, a printer must be retroinstalled in the PC's Microsoft Windows XP® operating system.**

Path for export
Clicking on the „Export path" symbol opens the dialog box „Path for export".
Here you can select a directory where you want to save the data.

Die export file is filed as a text file and according to the export path selected.

Millitron
Provided an external Millitron measuring device is connected to the PC, the corresponding serial connecting port can be selected via the drop down menu.

Activating the millitron
Clicking on the check box activates the external millitron measuring device.

'Labels' tab
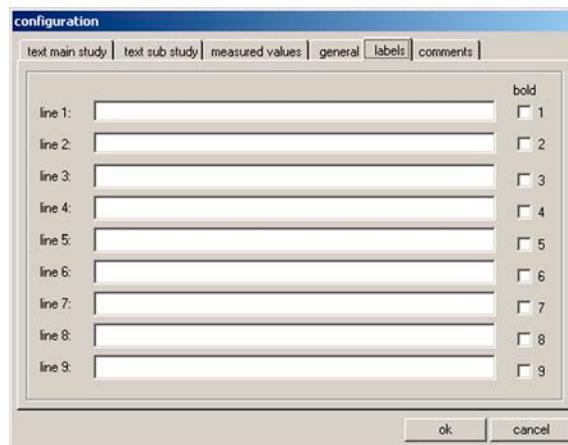
In the label tab you can enter the text for the labels. For further information, refer to chapter 6.16.

9 lines of 50 characters each can be entered. Lines where no characters have been entered are printed as empty lines.

Clicking on the **BOLD** check box in the corresponding line activates bold print.

Predefined variables commencing with the special character „@", represent specific information on the labels. See following page for details.

6. Software

The following information can be represented as variables:

@a	Main study - name
@b	Main study - comment line 1
@c	Main study - comment line 2
@d	Current date (date)
@e	Main study - comment line 3
@f	Main study - comment line 4
@g	Main study - comment line 5
@h	Main study - comment line 6
@i	Main study - comment line 7
@j	Substudy - name
@k	Substudy - comment line 1
@l	Substudy - comment line 2
@m	Substudy -comment line 3
@n	Substudy - comment line 4
@o	Substudy - comment line 5
@p	Substudy - comment line 6
@q	Substudy - comment line 7
@t	Current time (time)
@0	Measured value - no. of section
@1	Measured value - date of section
@2	Measured value - time of section
@3	Measured value - set chamber temperature
@4	Measured value - actual chamber temperature
@5	Measured value - alarm temperature (yes/no)
@6	Measured value - set section thickness
@7	Measured value - actual section thickness
@8	Measured value - knife holder position
@9	Measured value - dehydration (on/off)

Repeating the variable wild card defines the length of the variable. The variable wild card @333 will display 4 characters for 'set chamber temperature', as '@' already represents one character. Text variables are always printed left-justified, numbers right-justified.

„Comments" tab
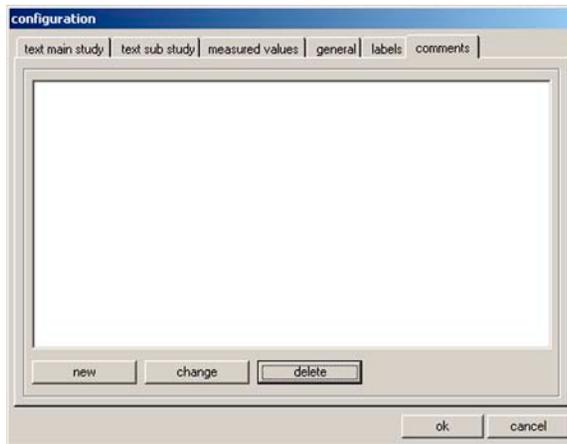
Frequently used comments can be entered into this tab.

Button NEW
Clicking on this indication opens the dialog box 'Comment on section'

Here you can enter a comment on a section.

Clicking on **OK** saves the entry and closes the window. Clicking on **Cancel** closes the 'Comment on section' dialog box. Any entry made is not saved.

CHANGE button
Clicking on this indication opens the dialog box 'Comment on section'. The existing entry can be changed.

DELETE button
Clicking on this indication opens a safety query dialog. If the safety query is confirmed by clicking on **OK**, the comment will be permanently deleted.

6.5.4 Reference voltages

Indication of the current reference voltage in Volt.

Buttons 1 to 8
Clicking on these buttons changes the reference voltage. The individual reference voltage values are predefined and cannot be changed. The display will read the new selected value. Activated buttons will light up in green.

6.5.5 Language selection

The flag buttons indicate the languages that can be selected. Clicking on one of the flag symbols changes the user interface to the corresponding language.

6.5.6 Initialization

Clicking on **EXECUTE** in the initialization field opens the „Main window" and the **INIT** buton reappears in the 'Mode of operation' field.

Clicking on **INIT** opens the dialog box „Safety check - initialization". For further information, refer to chapter 6.3.

6.6   Temperature curves

Click on the temperature curve symbol to open the corresponding window.
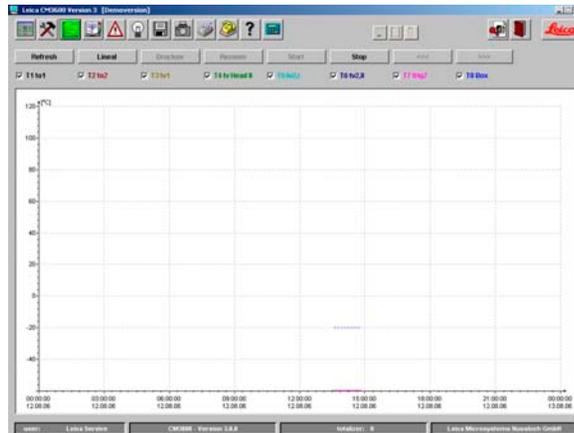
The window contains the following window panes:

- Work space
- Diagram

> **The „Temperature curves" window is only for failure analysis by Leica Service engineers.**

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6.6.1 Work space

REFRESH button
Clicking on this button updates the diagram display.

RULER button
If you click on this button, a ruler will be displayed in the diagram. Use the mouse cursor to move ruler to a certain measuring value position in order to read the measured value more exactly.

PRINT button
Clicking on this button creates a screen printout of the current diagram display.

REZOOM button
Clicking on this button resets the diagram display back to how it was.

START and STOP buttons
Clicking on one of these buttons starts or stops the recording of measured values in the diagram.

Buttons <<< and >>>
Clicking on one of these buttons starts a forward or backward scroll in the diagram.

Clicking on one of the check boxes in the work space, the 8 temperature sensors of the instrument can be displayed individually in the diagram. The font color of the check boxes helps to identify the corresponding measured values in the diagram, which are displayed in the same color.

The following check boxes can be activated / deactivated via a mouse click:

- T1 to,
- T2 to 2,
- T3 tv1,
- T4 tv Head II,
- T5 tv2,I,
- T6 tv2,II,
- T7 tHg2,
- T8 Box.

6.6.2   Diagram
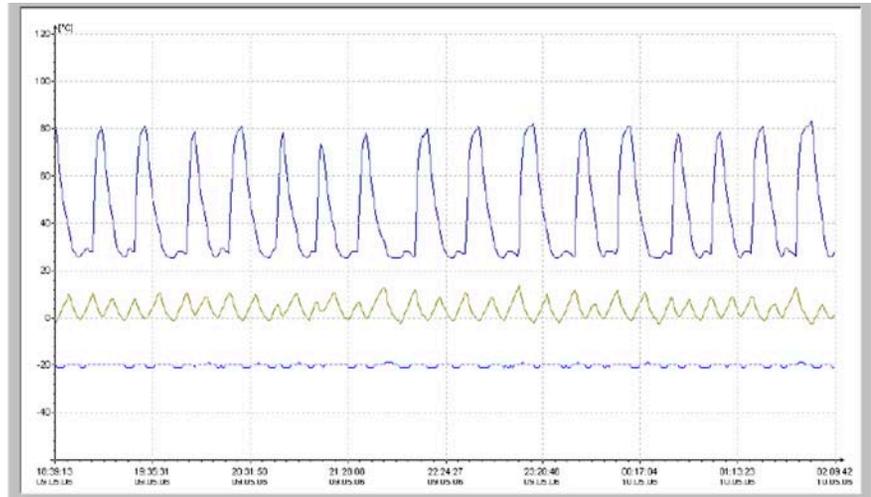
The diagram indicates the following:

- Temperature in degree centigrade on the y-axis
- Time and date on the x-axis
- Graphical representation of the 8 temperature measuring points in the instrument by colored lines

The diagram can be enlarged as follows:

1. Within the diagram, click and hold the left mouse button.
2. With the mouse, create a zoom box on the area to be enlarged by dragging the mouse cursor to the right and downwards at the same time.
3. Release the left mouse button.

The selected diagram zoom box is enlarged. All measured values activated via the check boxes in the work space are displayed.

6.7   Chronological event list

Click on „Event list" to open the corresponding window.
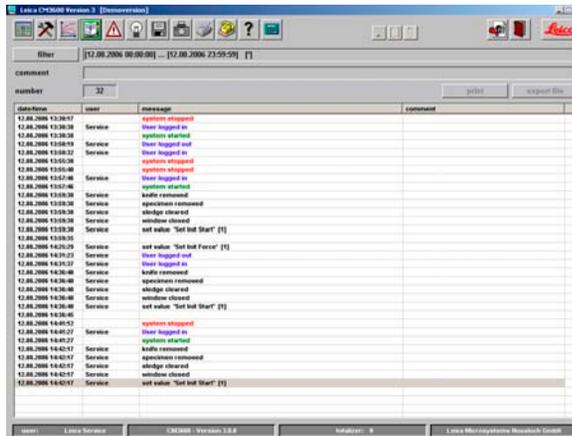
Work space

Event table

The events list is a table displaying the events chronologically, in order of date and time. In this list all events concerning the program are saved.

The work space is divided up as follows:

• Work space
• Event table

6.7.1 Work space

FILTER button

Clicking on this indication opens the dialog box „Filter"

Here you can define a time filter limiting the event table indication to one day, one week or one month.

To set a filter, proceed as follows:

1. Click on one of the check boxes **DAY**, **WEEK** or **MONTH** to define the desired time interval.
2. In the calendar field, select the desired start day for the event information. For this purpose, you can also use the two navigation buttons on the left and right of the 'Month' header.

In the „Time filter" field you can now see the start time (left) and end time (right) of the selected time interval.

You can set an additional filter in the „Text filter" field.

Click on **OK** to close the dialog box and display the desired alarm messages in the events list.
Click on **CANCEL** to close the window without changing any of the changes made.

Comment
Clicking on an event in the events list activates the „Comment" field. You can enter a comment regarding the selected event. After confirmation with the **ENTER** key, the note will be displayed in the event table.

Number
Number of events displayed in the events list.

Print button
Clicking on this button creates a screen printout of the current display.

Export file button
Click on this button to export the events table into a text file.

6. Software

6.7.2 Event table

date/time	user	message	comment	
12.08.2006 13:38:17		system stopped		
12.08.2006 13:38:38	Service	User logged in		
12.08.2006 13:38:38		system started		
12.08.2006 13:50:19	Service	User logged out		
12.08.2006 13:50:32	Service	User logged in		
12.08.2006 13:55:30		system stopped		
12.08.2006 13:55:40		system stopped		
12.08.2006 13:57:46	Service	User logged in		
12.08.2006 13:57:46		system started		
12.08.2006 13:59:30	Service	knife removed		
12.08.2006 13:59:30	Service	specimen removed		
12.08.2006 13:59:30	Service	sledge cleared		
12.08.2006 13:59:30	Service	window closed		
12.08.2006 13:59:30	Service	set value 'Set Init Start' [1]		
12.08.2006 13:59:35				
12.08.2006 14:25:29	Service	set value 'Set Init Force' [1]		
12.08.2006 14:31:23	Service	User logged out		
12.08.2006 14:31:37	Service	User logged in		
12.08.2006 14:36:40	Service	knife removed		
12.08.2006 14:36:40	Service	specimen removed		
12.08.2006 14:36:40	Service	sledge cleared		
12.08.2006 14:36:40	Service	window closed		
12.08.2006 14:36:40	Service	set value 'Set Init Start' [1]		
12.08.2006 14:36:45				
12.08.2006 14:41:12		system stopped		
12.08.2006 14:41:27	Service	User logged in		
12.08.2006 14:41:27		system started		
12.08.2006 14:42:17	Service	knife removed		
12.08.2006 14:42:17	Service	specimen removed		
12.08.2006 14:42:17	Service	sledge cleared		
12.08.2006 14:42:17	Service	window closed		
12.08.2006 14:42:17	Service	set value 'Set Init Start' [1]		

The table is divided into the following columns:

- **Date/time**
  Date and time of the events.

- **User**
  Name of the user who was logged in when the event occurred.

- **Message**
  Event messages (short description of event).

- **Comment**
  Comments on the events. For further information, refer to chapter 6.7.1.

> **Individual events messages will be displayed on the events list for a maximum of 90 days from the date when the event occurred. After that, the data will be saved into a text file.**

6.8   Alarm list

Click on the „Alarm list" symbol to open the corresponding window.
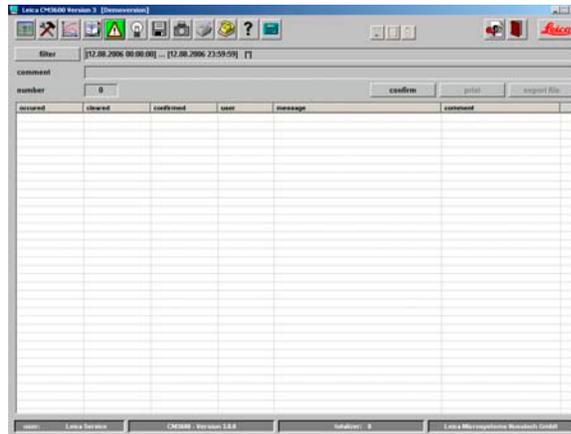
Work space

Event table

Chronological display of the alarm list as a table, in order of date and time. In this list, all events concerning the program are saved.

The window contains the following window panes:

• Work space
• Event table

6. Software

6.8.1 Work space

filter	[12.08.2006 00:00:00] ... [12.08.2006 23:59:59] [*]			
comment				
number	0	confirm	print	export file

In the work space the following parameters can be selected:

FILTER button
Clicking on this indication opens the dialog box „Filter"
For further information, refer to chapter 6.7.1.

Comment
Clicking on an event in the alarm list activates the 'Comment' field. You can enter a comment regarding the selected event. After confirmation with the **ENTER** button, the note will be displayed in the event table.

Number
Quantity of alarm messages displayed in the alarm list.

CONFIRM button
By clicking on this button the currently registered user confirms the alarm message previously selected in the alarm list.

PRINT button
Clicking on this button creates a screen printout of the current indication.

EXPORT FILE button
Click on this button to export the alarm list into a text file.

6.8.2 Event table

occured	cleared	confirmed	user	message	comment	

The table is divided into the following columns:

- **Occurred**
  Indication of date and time when the alarm started

- **Cleared**
  Indication of date and time when the alarm stopped

- **Confirmed**
  Indication of date and time when the registered user confirmed the alarm message. For further information, refer to chapter 6.8.1.

- **User**
  Name of the user who confirmed the alarm.

- **Message**
  Indication of alarm messages.

- **Comment**
  Indication of the comment made on the corresponding alarm message.

6. Software

6.8.3 Error codes: meaning and troubleshooting

Error code	Error message	Trouble shooting
Error 01	Knife holder - limit position exceeded.	• Re-initialize instrument. If the problem recurs, call Technical Service.
Error 02	Limit position of sledge exceeded	• Re-initialize instrument. If the problem recurs, call Technical Service.
Error 03	Chamber - Alarm temperature exceeded	• Check whether there has been a power failure! • Check the selected alarm temperature value. It must differ at least 5 K from the chamber temperature selected.
Error 04	Power failure	
Error 05	Data transfer failed (happens rather frequently subsequent to a power failure)	• Check the cable connection between PC and control unit. • If problem recurs, call Technical Service
Error 06		• Not defined
Error 07	Emergency stop activated	• Deactivate emergency switch
Error 08	Stepper motor - step error	• Call Technical Service.
Error 09	Refrigerating system – pressure exceeded	• Check the air circulation between the condenser and the control unit. • Check the distance of the instrument to the wall (at least 50 cm)! • If problem recurs, call Technical Service
Error 10	Flap limit switch malfunction	• Re-initialize instrument. If the problem recurs, call Technical Service
Error 11	Call Technical Service	• Call Technical Service.

6.9   Chamber illumination

Click on the symbol to switch on the illumination of the cryochamber. Another mouse click will switch the chamber illumination back off. Active icons will light up in yellow.

6.10   Section documentation

Click on the 'Section documentation' symbol to open the corresponding window.

Tree diagram

Studies protocol

Event table

The window contains the following window panes:

- Tree diagram
- Protocol of studies
- Event table

6.10.1 Tree diagram
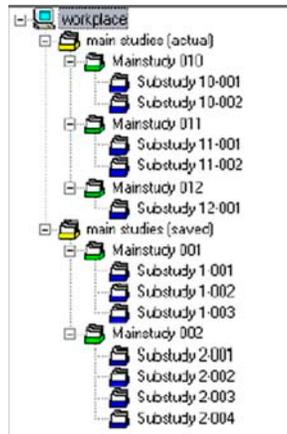
Indication of all main studies or substudies in a tree diagram. For navigation purposes, click on the preceding plus or minus sign.

The different study types are identified by the preceding colored folder symbols:

- **Yellow folder symbol**
  Main studies (several).

- **Green folder symbol**
  Main study.

- **Blue folder symbol**
  Substudy.

- **Yellow folder symbol „saved"**
  Main studies (several).

If you click on a study, the studies protocol and the events table will be displayed on the right. For further information, refer to chapter 6.10.2.

6.10.2 Studies protocol

By clicking on a main study in the tree diagram, the following indication will be displayed in the „Studies protocol" area:

no.	date	main study name	

The table is divided into the following columns:

- **No.**
  Running number automatically allocated by the application.

- **Date**
  Date when the main study was created.

- **Name of main study**
  Name of main study.

To create a new main study or substudy proceed as follows:

1. Right-mouse-click on a spot anywhere in the upper table. A context menu will open up.
2. Select **NEW**. A dialog box for a new main study or substudy will open up.

3. Insert the name of the new main or substudy.
4. Press **ENTER** to confirm your entry and to close the dialog box.

6. Software

When clicking on an existing substudy in the tree diagram the following indication will be displayed in the „studies protocol" area:

n..	date/time	T-set	T-actual	T..	set t..	act..	knife holder position	dehydration	comment
1	09.05.2006 12:42:10	-25 °C	-25 °C	no	35 µm	35 µm	18475 µm	off	
2	09.05.2006 12:43:15	-25 °C	-25 °C	no	35 µm	35 µm	18440 µm	on	
3	09.05.2006 12:44:21	-25 °C	-25 °C	no	35 µm	35 µm	18405 µm	on	
4	09.05.2006 12:45:17	-25 °C	-25 °C	no	35 µm	35 µm	18370 µm	on	
5	09.05.2006 13:22:10	-25 °C	-25 °C	no	35 µm	35 µm	18335 µm	on	
6	09.05.2006 13:23:43	-25 °C	-25 °C	no	35 µm	35 µm	18300 µm	off	
7	09.05.2006 13:24:41	-25 °C	-25 °C	no	35 µm	35 µm	18265 µm	off	
8	09.05.2006 13:46:10	-25 °C	-25 °C	no	35 µm	35 µm	18230 µm	off	
9	09.05.2006 13:47:02	-25 °C	-25 °C	no	35 µm	35 µm	18195 µm	off	
10	09.05.2006 13:49:16	-25 °C	-25 °C	no	30 µm	30 µm	18165 µm	off	
11	09.05.2006 13:51:34	-25 °C	-25 °C	no	30 µm	30 µm	18135 µm	off	

The table is divided up as follows:

- **No.**
  Indication of the running number automatically allocated by the application, in the order of date of creation of the main study.

- **Date/time**
  Date and time when the section was made

- **T-set**
  Set temperature at the time the section was made

- **T-actual**
  Actual temperature at the time the section was made

- **T-error**
  Alarm temperature at the time the section was made

- **Set section thickness**
  Set section thickness at the time the section was made

- **Actual section thickness**
  Actual section thickness at the time the section was made

- **Dehydration,**
  Time when dehydration started / finished.

- **Comment**
  Comments can be entered by the user

- **Knife holder position,**
  Knife holder position at the time the section was made

6.10.3 Event table

If you click on a main or substudy in the tree diagram, the following indication will be displayed in the „Event table":

The table is divided into the following columns:

- **No.**
  Indication of the running event number automatically allocated by the application.

- **Date/time**
  Indication of date or time when the event occurred.

- **User**
  Indication of the user who was logged in when the event occurred.

- **Event**
  Indication of the event message.
  Red: procedure stopped
  Green: procedure started
  Black: parameter modified (e.g. section thickness, sledge speed)

6.11   Photo mode

Clicking on the photo symbol activates or deactivates the „Photo mode" and moves the microtome sledge to the mechanical limit stop. When active, the symbol will light up in green.

The photo mode enables you to position the specimen or rather the microtome sledge exactly for photos to be taken after each section.

In „Parameter settings" the „Photo position dwell time" and the „Photo position triggering time" can be selected.

Photo position dwelling time
To define how long the microtome sledge will remain stopped in the camera position.

Photo position triggering time
Time until the camera will actually take the photo.
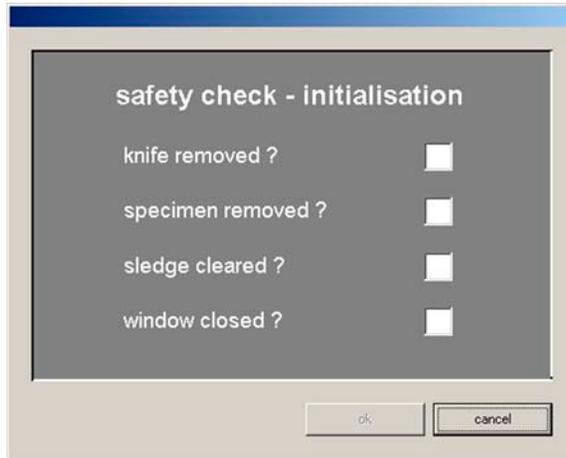For further information, refer to chapter 6.5.1.

6.12   Screen printout

Clicking on the 'Screen printout' symbol creates a printout of the current screen on a defined printer. For further information, refer to chapter 6.5.3.

6. Software

6.13 Remote inquiry

 Clicking on the „Remote inquiry" symbol opens the dialog box 'Safety check - initialization'.

Carry out the required safety query and subsequently confirm each safety query by mouse click on the corresponding check box. Having confirmed all safety queries, click on **OK**.

The pcAnywhere application will be started. The pcAnywhere window opens up.

Note:
The latest pcAnywhere version will always be displayed.

The control PC of the CM3600 is equipped with a modem enabling Leica Service Support in case of an instrument malfunction to access directly the control software. The modem connection will be set up by the pcAnywhere software installed on the PC.

To establish a connection proceed as follows:

1.   Doubleclicking on Icon „CM3600" establishes the connection. The „pcAnywhere window waiting" window will open up. Click on **CANCEL** to stop the connection from being established.

After the connection has been successfully established, the window „Remote Connection Attempted" opens up.

3.   Click on **YES** to enable access to the PC of the Leica CM3600. Click on **NO** to deny access.

> **Access to the PC of the Leica CM3600 must be confirmed with 'YES' within the defined time - otherwise the connection will be severed.**

> **For instructions on how to install, configure and operate pcAnywhere, please refer to the manual supplied together with the software.**

The icon in the Systray list indicates whether a connection has successfully been established or not.

6.   Software

6.14   Help

Clicking on the „Help" symbol starts Adobe Acrobat Reader®
and opens the manual in pdf format.

6.15   Saving

Click on the „Saving" symbol to save the section data.

'Saving' must be clicked on as a first step to enable section documentation via the foot switch. For subsequent steps, refer to chapter 6.17.

6.16   Printing labels

Clicking on the label printing symbol opens the „Label printing"
window. When activated, the icon will light up in green.

When the label printing feature is activated, a label will be printed every
time a section has been completed.

Please see chapter 6.5.3 „Configuration" on how to select the printing
parameters and the printer for label printing.

Without activating the „Saving icon", no labels can be printed.

6.17   Foot switch

Clicking on this symbol activates the foot switch connected to
the instrument , i.e. documentation of the last section carried
out will be saved,when the foot switch is pressed.

**Without first clicking on the 'Saving' icon, the foot switch
cannot be used.**

6.18   User log-in / log-out

Clicking on the symbol logs off the user currently logged in. Click again to open the 'Start-and-login' window. For further information, refer to chapter 6.2.

Logging off does not automatically stop or delete the actions and settings initiated in the application.

6.19   Quitting the application

Clicking on the „Quit" symbol closes the application.

When quitting the application, all settings made are reset. Any application steps still in progress are terminated.

> **i**
> **To ensure proper operation of the Leica CM3600 as well as use of the specimen stages and the specimen blocks themselves, we strongly recommend to attend a Leica application training.**

7.1   Check list

The checklist below provides an overview on how to successfully operate the Leica CM3600.

> **i**
> **We recommend that you make a copy of this checklist and attach it to an instrument surface where it is clearly visible to ensure that all points of the list are observed.**

1. Switch the instrument on.
    For further information, refer to chapter 7.2.

2. Start the software.
    For further information, refer to chapter 7.3.

3. Select desired chamber temperature for sectioning
    For further information, refer to chapter 7.4.

4. Insert the specimen stage.
    For further information, refer to chapter 7.5.

5. Insert the knife.
    For further information, refer to chapter 7.6.

6. Set the trimming parameters.
    For further information, refer to chapter 7.7.

7. Change the knife.
    For further information, refer to chapter 7.6.

8. Set the sectioning parameters.
    For further information, refer to chapter 7.8.

9. Dehydrate the section.
    For further information, refer to chapter 7.9.

7.2   Switching the instrument on

Proceed as follows:

1. Switch on the mains switch. For further information, refer to chapter 5.3. The refrigeration and control unit is activated.

2. Switch on the socket panel switch. For further information, refer to chapter 5.3.

3. Switch on the PC and peripherals. For further information, please refer to the manual of the PC.

7.3   Starting the software

Proceed as follows:

1. Carry out the software „Start and log-in' procedure. For further information, refer to chapter 6.1.

> **If the Leica CM3600 had been completely switched off, an initialization procedure must be carried out. For further information, refer to chapter 6.3.**

7.4   Setting the chamber temperature

Proceed as follows:

1. Open the „Parameter settings" window and select the desired chamber temperature for sectioning. For further information, refer to chapter 6.5.1.

7.5   Specimen stages

This chapter provides instructions on how to insert the knives.

There are three different types of specimen stages:

• Special holder, orientable, with ball-and-socket joint,

• Specimen stage, orientable, with ball-and-socket joint,

• Specimen stage, non-orientable.

When inserting the specimen stages, bear in mind the following:

- Prior to sectioning, the specimen stage should have been stored inside the cryochamber for at least 24 hours, to make sure it has the correct sectioning temperature (ca. -20° C).

- To mount the entire block (specimen block on specimen stage) onto the sledge, first bring the knife holder to its upper limit position. For further information, refer to chapter 6.4.5.

- The total height of the specimen stage plus specimen block must not exceed 70 mm.

Since there is a considerable risk of injury when inserting the specimen stage/block, please observe the following safety measures:

⚠ **Prior to any work involving the knife, microtome or inside the cryochamber, activate the emergency stop switch. For further information, refer to chapter 3.4.1.**

⚠ **Prior to any work involving the knife, microtome or inside the cryochamber, swing the knee lever upwards. For further information, refer to chapter 3.4.2.**

⚠ **For any work involving the knife, microtome or inside the cryochamber wear special protective gloves. For further information, refer to chapter 5.2.**

7.5.1   Inserting the specimen stage, orientable, with ball-joint

To insert the specimen stage, orientable, with ball-and-socket joint proceed as described below. The special holder, orientable, with ball joint is inserted the same way.
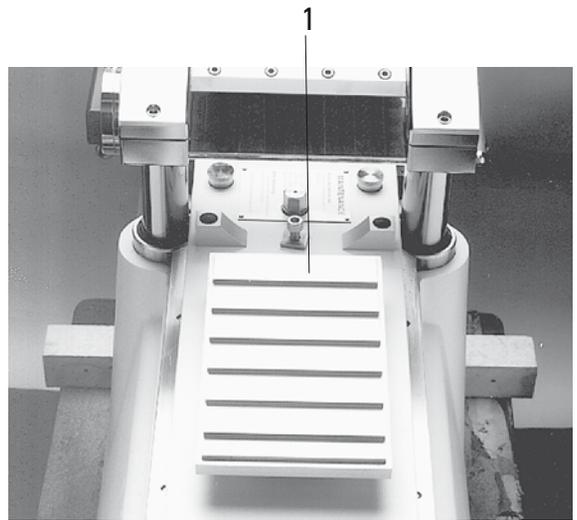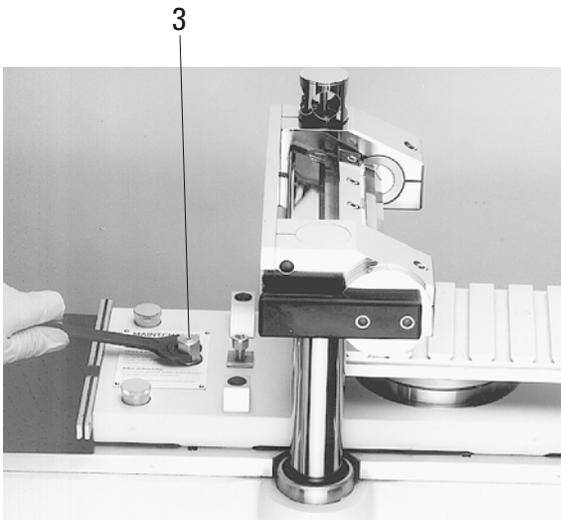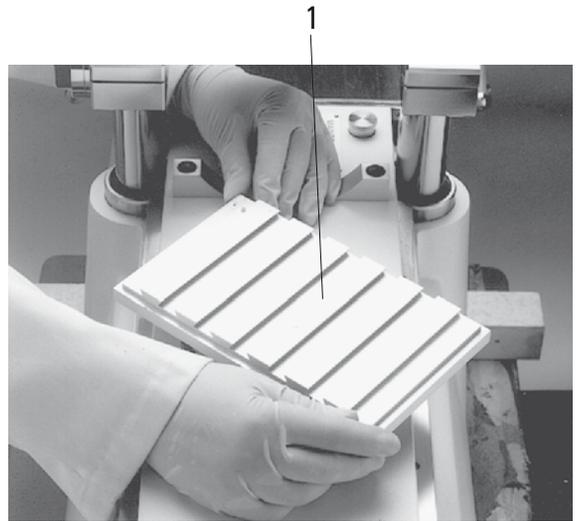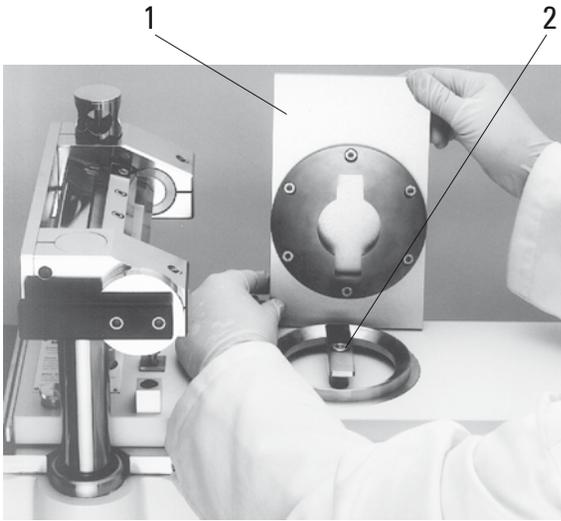
Tools required:

• Fork wrench (size 17).

Proceed as follows:

1. Use the knee lever to move the sledge to the right-side reversal point. For further information, refer to chapters 3.2.2 and 6.4.9.

2. Comply with the safety instructions provided in chapter 7.5.

3. Open the window. For further information, refer to chapter 3.4.3.

4. Place specimen stage (**1**) on T-piece (**2**).

5   Rotate specimen stage (**1**) 90° clockwise.

6. Orient the specimen stage (**1**) by eye.

7. Tighten screw (**3**).

8. Check specimen stage (**1**) for correct orientation and proper tightening.

### 7.5.2   Inserting the specimen stage, non-orientable

Tools required:

- Allen key (size 6).

Proceed as follows:

1. Use the knee lever to move the sledge to the right-side reversal point. For further information, refer to chapters 3.4.2 and 6.4.9.

2. Comply with the safety instructions provided in chapter 7.5.

3. Open the window. For further information, refer to chapter 3.2.3.

4. Remove screw (**1**).

5 Lift off T-piece (**2**) and support ring (**3**).

6. Remove screws (**4**) and washers (**5**) located on the right and left side of the sledge.

7. Insert specimen stage, non-orientable (**6**) and orient by eye.

8. Put washers (**5**) in place and tighten screws (**4**) on the right and left side of the sledge.

9. Check specimen stage, non-orientable (**6**) for correct orientation and proper tightening.
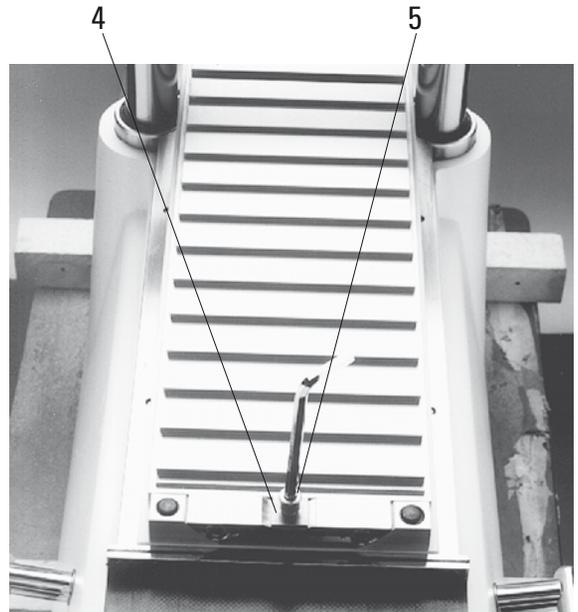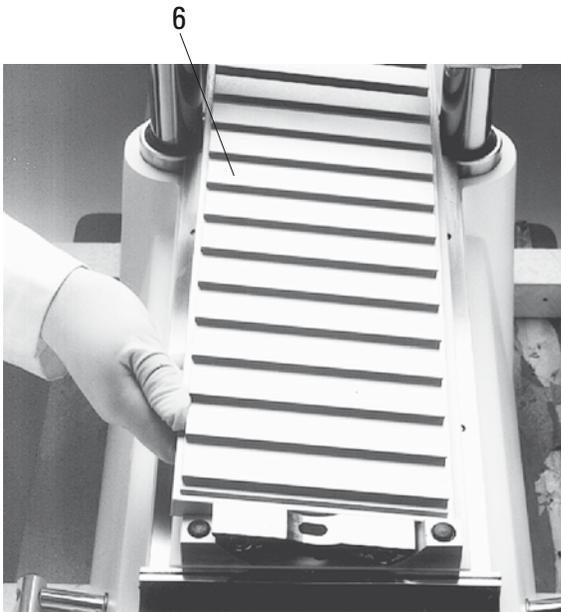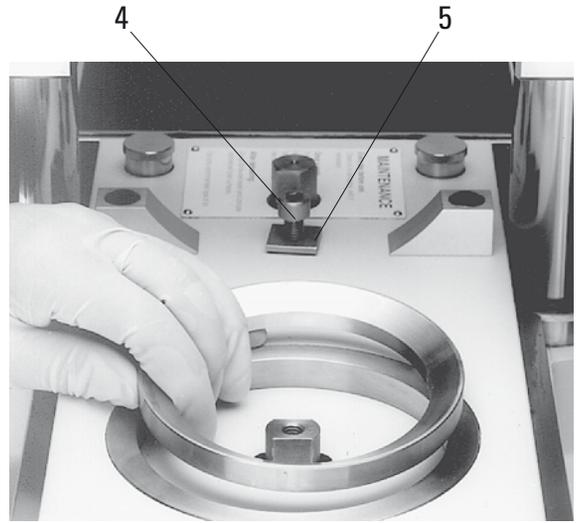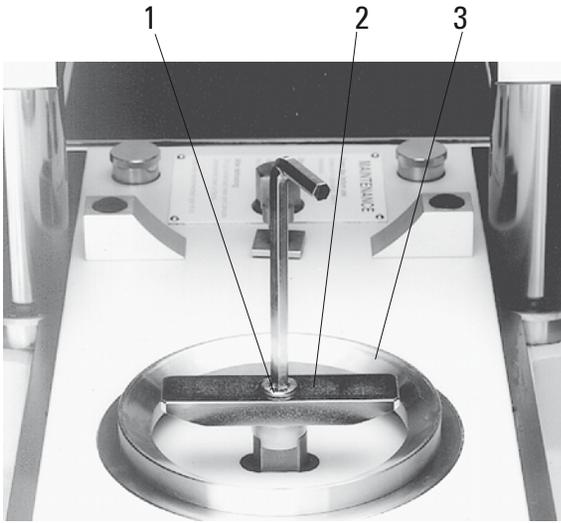
7.6 Knife

This chapter provides instructions on how to insert the knives.

Two types of knives can be used in the CM3600:

- Standard knives

- Disposable blade holder with disposable blade

Since there is a considerable risk of injury, please be sure to comply with the following safety instructions:

⚠	**Prior to any work involving the knife, microtome or inside the cryochamber, activate the emergency stop switch. For further information, refer to chapter 3.4.1.**
⚠	**Prior to any work involving the knife, microtome or inside the cryochamber, swing the knee lever upwards. For further information, refer to chapter 3.4.2.**
⚠	**For any work involving the knife, microtome or inside the cryochamber wear special protective gloves. For further information, refer to chapter 5.2.**

7.6.1   Inserting standard knives

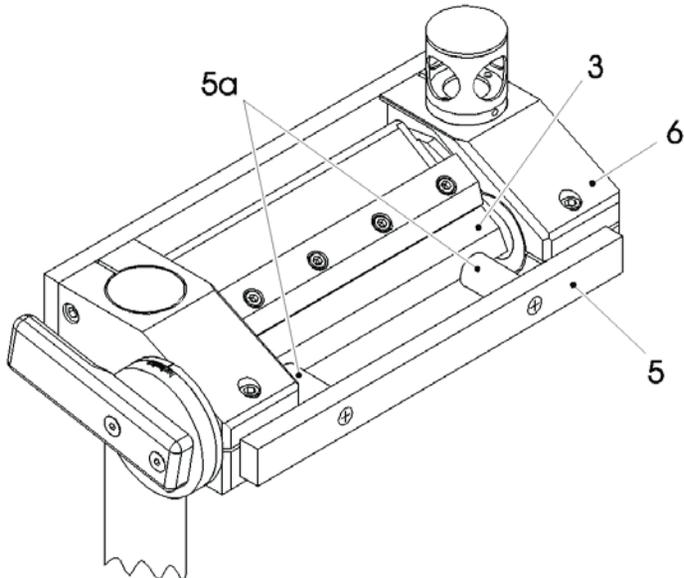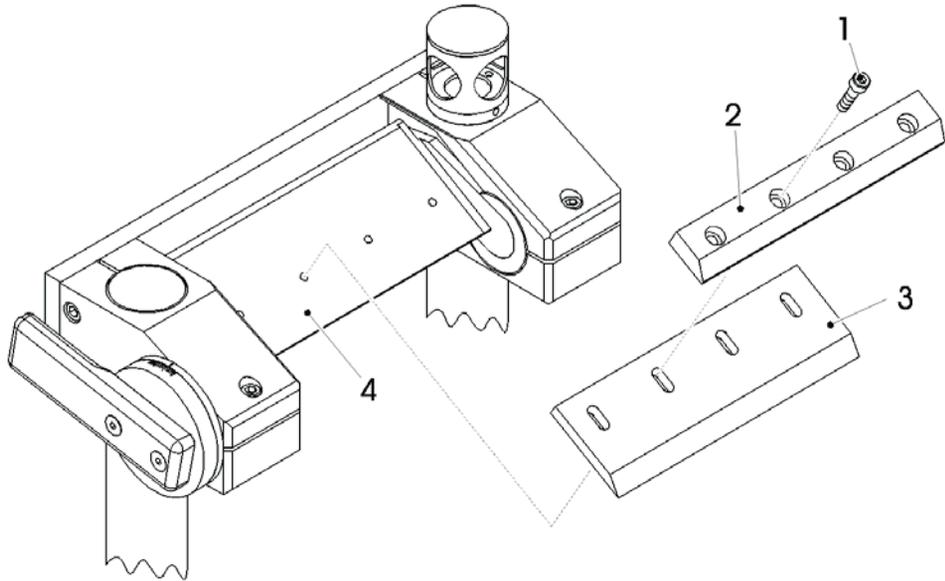To insert a standard knife, proceed as follows.

Tools required:

• Allen key (size 4).

Proceed as follows:

1. Use the knee lever to move the sledge to the right-side reversal point. For further information, refer to chapters 3.2.2 and 6.4.9.

2. Comply with the safety instructions provided in chapter 7.6.

3. Open the window. For further information, refer to chapter 3.4.3.

4. Remove screws (**1**) and remove pressure plate (**2**).

5 Place knife (**3**) on support plate (**4**).

6. Place pressure plate (**2**) on knife (**3**).

7. Tighten screws (**1**) slightly.

8. Adjust the knife (**3**) using the positioning tool (**5**). Attach the positioning tool (**5**) to the knife holder (**6**) as shown. The two plastic pegs (**5a**) press the knife (**3**) into the correct position.

9. Tighten screws (**1**) completely.

10. Adjust the knife angle. For further information, refer to chapter 7.6.3.

7.6.2 Inserting the disposable blade holder with disposable blade

To insert the disposable blade holder with disposable blade proceed as described below.

Tools required:

- Allen key (size 4).
- Allen key (size 2.5).

Proceed as follows:

1. Use the knee lever to move the sledge to the left-side reversal point. For further information, refer to chapters 3.4.2 and 6.4.9.

2. Comply with the safety instructions provided in chapter 7.6.

3. Open the window. For further information, refer to chapter 3.4.3.

4. Remove screws (**1**) and remove pressure plate (**2**).

5 Place disposable blade holder (**3**) on support plate (**4**).

6. Place pressure plate (**2**) on disposable blade holder (**3**).

7. Insert screws (**1**) and tighten.

8. Loosen screws (**3a**) of the disposable blade holder (**3**).

9. Insert disposable blade (**5**). The disposable blade (**5**) is in correct position, when the entire blade back (**5**) fits close to the limit stop of the disposable blade holder (**3**).

10. Tighten screws (**3a**) of the disposable blade holder (**3**).

11. Loosen screws (**1**).

12. Adjust the disposable blade holder (**3**) using the positioning tool (**6**). Attach the positioning tool (**6**) to the knife holder (**7**) as shown. The two plastic pegs (**6a**) press the disposable blade holder (**3**) into the correct position.

13. Tighten screws (**1**).

14. Adjust the knife angle. For further information, refer to chapter 7.6.3.
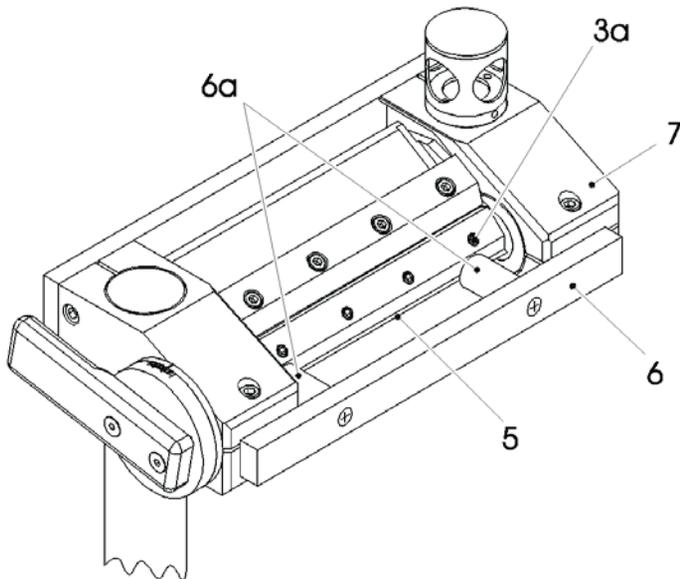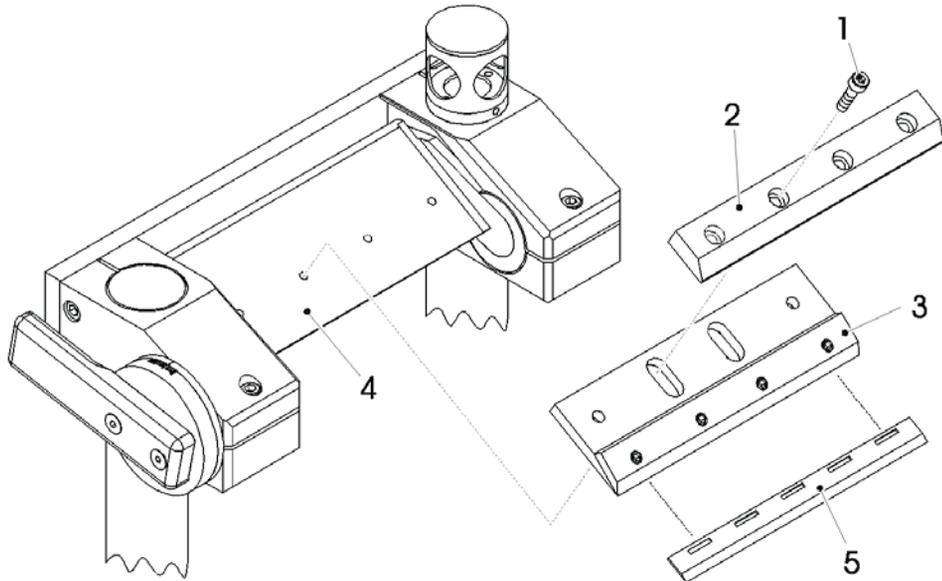
7.6.3   Adjusting the knife angle

Tools required:

- Allen key (size 5).

Proceed as follows:

1. Comply with the safety instructions provided in chapter 7.6.

2. Loosen screws (**1**).

3. Rotate knife holder (**2**) selecting the desired knife angle on scale (**3**) (recommended angle = 20°).

4. Tighten screws (**1**).
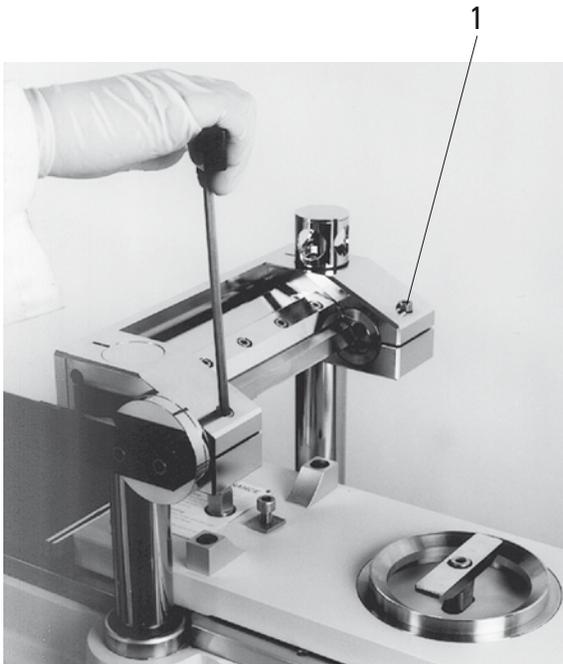
7.7 Setting the trimming parameters

Proceed as follows:

1. On the computer screen, open the 'Main window'. Select the desired section thickness, sledge speed, cutting window and sectioning program. For further information, refer to chapter 6.4.

⚠ **For reasons of safety and accuracy, the maximum trimming thickness should not exceed 100 µm per section.**

⚠ **When trimming biological material (particularly bone) the section thickness should not exceed 50 µm.**

2. Open the „Main window" on the computer screen. Click on the START icon. For further information, refer to chapter 6.4.

The trimming procedure will be carried out automatically.

7.8 Setting the sectioning parameters

Proceed as follows:

1. On the computer screen, open the „Main window", select „**MANUAL**" mode of operation. Subsequently, select the desired section thickness and the cutting window. For further information, refer to chapter 6.4.

7.8.1 Sectioning the specimen

For the sectioning procedure, you need brush, sectioning tool and special section collecting tape and - depending on the application - a dehydration frame.

i	**The required accessories should be stored in the cryochamber for some time prior to sectioning to make sure they have the same temperature as the specimen.**

Proceed as follows:

1. Activate the knee lever - for further steps, please see chapter 3.4.2.

7.8.2 Collecting the sections

Prior to removing a section, an appropriately sized piece of tape must be attached to the specimen block surface. When doing so, please comply with the following safety instructions:

⚠	**Wear protective gloves.**

⚠	**Never try to catch or grab the knife.**

⚠	**Never introduce your hands into the space between specimen and knife.**

Proceed as follows:

1. Select manual mode of operation and the desired section thickness.
2.   Activate the section documentation function.
3.   Use the knee lever to move the sledge to the right-side reversal point (left edge of the specimen block just about clears the knife).
4. Cut the section and clean the specimen surface with the brush.
5   Cut off a desired length from the tape roll. The width of the tape should not be larger than the specimen block; the length should be long enough to easily hold the tape with your left hand while sectioning and to attach the completed section to a dehydration frame.
6.   In case the tape has been kept outside the cryochamber, let the tape length rest a few seconds inside the cryochamber before attaching it to the specimen block - this will ensure that tape and specimen block have the same temperature.
7.   Use the sectioning tool to aid in pressing the tape onto the block surface.
8.   Fix the tape first in the middle and then press out to both ends. This method prevents air bubbles from being trapped between tape and block surface.
9. Rub with a precooled brush, paper towel or cotton wool to assure good contact of the tape with the specimen surface. Never touch the specimen block face with your hands.
10. Hold the left end of the tape in your left hand. Drive the microtome gently until some of the embedding medium is apparent on the left edge of the tape.
11. Use the sectioning tool to aid in pressing the tape onto the block surface. To do this, press the sectioning tool firmly on the block close to the knife edge.
12. Shift the knee lever to start sectioning - keep the sectioning tool pressed on the specimen block.
    Carefully guide the tape to the upper left (away from the specimen) - do not pull tightly!
13. Completely remove the section and stop the sledge behind the knife.
    Be sure to leave the section in the cryochamber.
    It must not be exposed to room temperature.
14. Check the section.
15. Add the section data to the documentation.

16. Attach the section to a dehydration frame which has already been kept in the cryochamber for a while.
17. To speed up the dehydration process once you are done with the sectioning work, the automatic or manual dehydration function of the instrument can be activated.

7.9 Dehydrating the sections

To be able to store the sections or use them otherwise outside the cryochamber, they must be properly dehydrated. For this purpose, the instrument has a automatic as well as a manual dehydration function. During dehydration, the fan speed is increased, thus speeding up the removal of moisture-saturated cold air. The moisture is separated at the evaporator.
During the course of a dehydration cycle, the automatic defrost cycles are skipped and carried out immediately after the dehydration procedure is completed.

Proceed as follows:

1. Open the „Main window" on the computer screen and select automatic dehydration. For further information, refer to chapter 6.4.

8. Cleaning and maintenance

8.1 Cleaning

For cleaning and disinfection of the stainless steel cryochamber and the microtome, use commercial alcoholic disinfectants or alcohol.
The outer surfaces of the cryochamber and the control unit can be cleaned with mild household cleaners or with alcohol-based disinfectants or pure alcohol.

ℹ️	**Do not use any other cleaning products. The enamel is neither resistant to acetone nor to xylene.**
⚠️	**Radioactive specimen waste must be disposed of according to the local radiation safety regulations.**

8.1.2 Removing the microtome from the cryochamber

Normally it is not necessary to extract the microtome from the cryochamber. However, if you wish to do so, i.e. for thorough cleaning, it is strongly recommended to use an overhead crane which has to be installed on the ceiling above the instrument.

|	
⚠️	**For safety reasons we strongly advise you against lifting the microtome (190 kgs) from the cryochamber without appropriate lifting gear!** **Also, do not attempt to lift the microtome from the chamber manually, even if several persons are there to help.**
⚠️	**For removing the microtome (approx. 190 kgs) from the cryochamber, a ceiling crane capable of carrying that weight should be available.**

Tools required:

• Allen key (size 6).

Proceed as follows:

1. Comply with the safety instructions provided in chapter 8.1.2.

2. Switch the instrument off and unplug from mains, see chapter 5.3.1.

3. Extract the knife from the knife holder, see chapter 7.6.

4. Lock the window, see chapter 3.4.3.

5   Open the cabinet lid, see chapter 3.4.4.

6. Remove screws (**1**) and screws (**2**). When removing screws (**1**), make sure the spacer rings (**3**) located between the console (**4**) and and the microtome (**5**) do not get lost.

7. Fold down the sledge cover belts (**6**).

8. Disconnect the connectors (**7**) from the left side of the cryochamber (do not disconnect from the microtome).

9. Fasten ropes or straps of sufficient lifting capacity to the microtome handles (**8**).

10. Carefully lift the microtome (**5**) out of the chamber using the crane. To avoid damages to the cryochamber, make sure that the microtome (**5**) does not rotate or dangle.
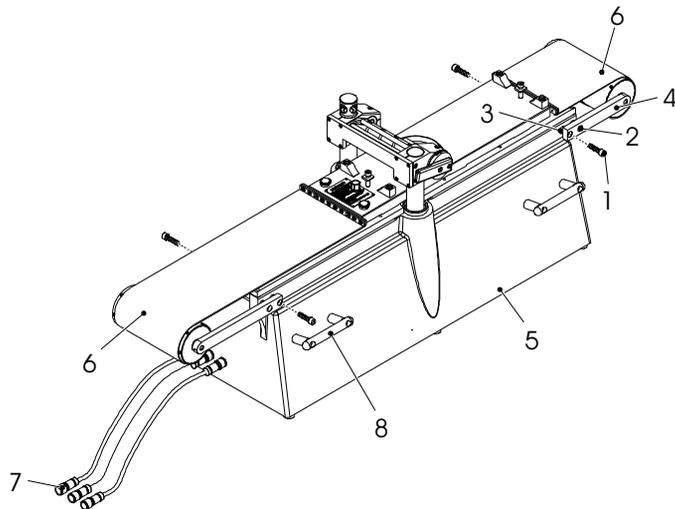
8. Cleaning and maintenance

8.2 Maintenance

8.2.1 Oiling

> **ℹ** **Be sure to check the oil level every and before each sectioning procedure.**

Checking the oil level
Unscrew both lids (**1**). The oil level must always be above the small capillary tubes (**2**).
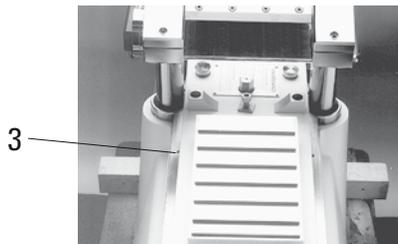
Filling up the oil reservoirs
Unscrew both lids (**1**) and add low temperature oil PDP 40 (order no. - see chapter 9.2). Screw both lids (**1**) back on.

Oiling the sledge guides
Once a month oil the sledge guides (**3**) with low temperature oil PDP 40 (order no. - see chapter 9.2).

8.2.2 Defrosting

Three different defrost procedures can be selected:

- Automatic defrost I
- Automatic defrost II
- Manual defrost

Automatic defrost I
This defrost cycle takes place automatically once every 24 hours. The defrost cycle itself is mandatory, i.e. cannot be deactivated by the user, while the start time of the cycle is freely selectable. For further information, refer to chapter 6.5.1.

Automatic defrost II
Where the automatic defrost I is not sufficient (high humidity, high ambient temperature), automatic defrost II must be activated in addition. For further information, refer to chapter 6.5.1.

Manual defrost
This defrost cycle can be activated manually as needed and starts immediately. For further information, refer to chapter 6.4.3.

9. Optional accessories

9.1 Extraction system

The Leica CM3600 can be optionally equipped with an extraction device. This device greatly reduces the buildup of cutting waste in the cryochamber and microtome and simplifies cleaning of the instrument. To operate the extraction device, access to compressed air of at least 5 bar is required.

Instruments with a 70 mm high knife bridge can also be retrofitted with the extraction system. Please contact your Leica representative for further details.

> **i** **Only duly authorized Leica service engineers may install the extraction system.**

9.1.1 Design and function of the extraction system

Design
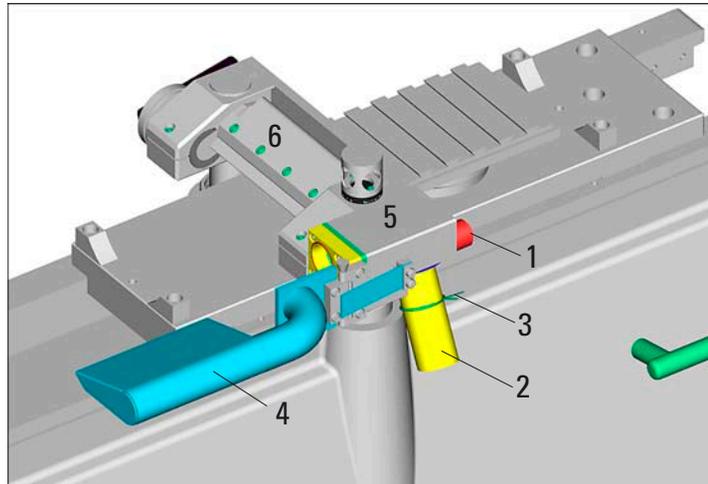
Legend:
1 - Compressed air connection   4 - Extraction attachment
2 - Extraction tube   5 - Housing w/internal nozzle system
3 - Locking ring   6 - Knife holder

Function

The extraction device is mounted sideways to the knife holder (**6**).
Extraction is achieved by a nozzle system located in the housing (**5**),
which is powered by compressed air (5 bar).
To facilitate optimal removal of cutting waste, the swivel-mounted extrac-
tion attachment (**4**) must be located directly in front of the knife edge.
Cutting waste is collected in a disposable bag, which is located inside a
cloth bag attached to the extraction sleeve (**3**).

The extraction device is activated via the software- see chapter 6.4.6.

9. Optional accessories

9.1.2 Exchanging the disposable bag

The cutting waste collection system (similar to a household vacuum cleaner) consists of a disposable paper bag, protected by a sealable cloth bag. Both bags are attached to the extraction tube.

Proceed as follows:

1. Press together the ends of the locking ring (**1**) and remove it together with the collection bags from the sleeve.

2. Open the zipper of the cloth bag (**2**), remove the full disposable bag.

3. Fold the new bag as depicted (**3**), so that it can be inserted through the opening of the cloth bag (**2**) without tearing.

4. Insert the disposable bag (**3**) into the cloth bag (**2**) and pull it up a short distance so it protrudes slightly from the cloth bag. Slide the locking ring (**1**) over the opening of the cloth bag.

5 Reattach both bags to the extraction sleeve (**4**) fastening them with the locking ring. Make sure the locking ring sits^0 in the groove (**5**).
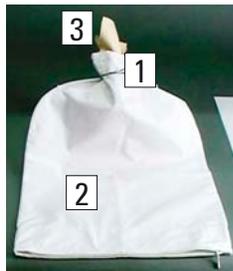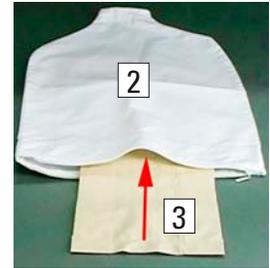
9.2 Ordering information

Specimen stages

Specimen stage, non-orientable, 40 x 80 mm	0022 50103
Specimen stage, non-orientable, 80 x 180 mm	0022 50105
Specimen stage, orientable, with ball-and-socket joint 120 x 200 mm	0022 50106
Specimen stage, orientable, with ball-and-socket joint 120 x 250 mm	0417 19635
Specimen stage, orientable, 150 x 450 mm	0022 50107
Specimen stage, orientable, 140 x 160 mm	7022 50109
Further specimen stages on request	

Specimen holders

Special holder, orientable, with ball-and-socket joint, for non-orientable specimen stages, maximum specimen size 55 x 70 mm	0417 24784

Embedding frames

Embedding frame, 40 x 80 mm	0022 50123
Embedding frame, 80 x 180 mm	0022 50126
Embedding frame, 120 x 200 mm	0022 50125
Embedding frame, 120 x 250 mm	0417 19632
Embedding frame, 150 x 450 mm	0022 50127

Disposable blade system for large-surface cryosections

Leica disposable blade holder 157 AR, for disposable blades, type H 45 L (not suitable for use w/other blade holders or instruments)	0417 26152
Disposable blades H 45 L, with special coating, 45°, 157 mm length	0216 26153

Sectioning tool

Sectioning tool, 150 mm, for Leica CM3600	0417 19039

9. Optional accessories

Positioning tool

Positioning tool for disposable blades	0417 28760
Positioning tool for steel or Tungsten Carbide knives	0417 19141

Microtome knives

Knife, facet angle 20°, 160 mm long, steel	7022 50143
Knife, facet angle 35°, 160 mm long, steel	0022 50144
Tungsten carbide knife, facet angle 35°, 160 mm long	0216 19157
Tungsten carbide knife, facet angle 20°, 160 mm long	0216 19156
Knife case for knife 160 mm	7022 50148

Freezing accessories

Freezing box for freezing with liquid nitrogen (-196°C) or with hexane/dry ice (-70°C), capacity of approx. 50 l	0022 50164
Freezing box for freezing with liquid nitrogen (-196°C) or with hexane/dry ice (-70°C), capacity of approx. 7 l	0022 50161
Freezing tongs for safe handling of frozen embedding frames and specimen stages	7022 50151
Freezing device for specimen alignment	0022 50152

Extraction system

Extraction system, cpl., for section waste, for Leica CM3600, only for 70 mm vertical stroke version	0417 32984
Cloth bag for disposable bags no. 7022 50173 for section waste	7022 50173
Disposable bags, 100 units, for section waste for cloth bag no. 7022 50173	7022 50174
Suction tube for extraction system, cpl., No. 0417 32984	0417 33136

Section collecting tape

Section collecting tape,   38 mm x 66 m, type 810   7022 50203
Section collecting tape,   76 mm x 66 m, type 810   7022 50206
Section collecting tape,   148 mm x 66 m, type 810   7022 50215
Section collecting tape,   110 mm x 66 m, type 4248   0391 24390
Section collecting tape, type 810, for autoradiography.
Section collecting tape Tesa 4248, can be used for both staining and
autoradiography

Microtome oils and grease

Special oil PDP 40, bottle with 100 ml, for Leica CM3600   0336 19182
Special oil PDP 40, bottle with 500 ml, for Leica CM3600   0336 19483
Low-temperature grease, for Leica CM3600   0022 50192

Dehydration accessories

Dehydration frames (plastic) for CM3600   0417 32995
Frame holder (for 4 dehydration frames) for CM3600   0417 32996

Other accessories

Section waste tray, assy.   0417 32980
Storage shelf, assy.   0417 32993
Height adjustment frame, 100 mm, cpl.   0417 33970

Service agreements

Maintenance contract CM3600 -
Comprehensive annual service for Leica CM3600   0417 32590

Applications Training

Applications Training for Leica CM3600   0417 32587