

# Leica RM2125 RTS

## Rotary Microtome

Instructions for Use  
English

**Order No.: 14 0457 80101 - Revision Q**

Always keep these Instructions for Use with the instrument.  
Read carefully before working with the instrument.

CE





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.

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For the instrument serial number and year of manufacture, please refer to the nameplate on the instrument.

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Leica Biosystems Nussloch GmbH

Heidelberger Strasse 17 - 19

D-69226 Nussloch

Germany

Tel.: +49 - (0) 6224 - 143 0

Fax: +49 - (0) 6224 - 143 268

Web: [www.LeicaBiosystems.com](http://www.LeicaBiosystems.com)

Assembly contracted to Leica Microsystems Ltd. Shanghai

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# 1 Important Information

## 1. Important Information

### 1.1 Symbols in the text and their meanings

<b>Symbol:</b> 	<b>Title of the symbol:</b> <b>Description:</b>	Warning Warnings appear in a white box and are marked by a warning triangle.
<b>Symbol:</b> 	<b>Title of the symbol:</b> <b>Description:</b>	Note Notes, i. e. important user information, appear in a white box and are marked by an information symbol.
<b>Symbol:</b> → "Fig. 7 - 1"	<b>Title of the symbol:</b> <b>Description:</b>	Item number Item numbers for numbering illustrations. Numbers in red refer to item numbers in illustrations.
<b>Symbol:</b> 	<b>Title of the symbol:</b> <b>Description:</b>	Manufacturer Indicates the manufacturer of the medical product.
<b>Symbol:</b> 	<b>Title of the symbol:</b> <b>Description:</b>	Manufacturing date Indicates the date when the medical device was manufactured.
<b>Symbol:</b> 	<b>Title of the symbol:</b> <b>Description:</b>	Consult Instructions for Use Indicates the need for the user to consult the Instructions for Use.
<b>Symbol:</b> 	<b>Title of the symbol:</b> <b>Description:</b>	Article number Indicates the manufacturer's catalog number so that the medical device can be identified.
<b>Symbol:</b> 	<b>Title of the symbol:</b> <b>Description:</b>	Serial number Indicates the manufacturer's serial number so that a specific medical device can be identified.
<b>Symbol:</b> 	<b>Title of the symbol:</b> <b>Description:</b>	In vitro diagnostic medical device Indicates a medical device that is intended to be used as an in vitro diagnostic medical device.
<b>Symbol:</b> 	<b>Title of the symbol:</b> <b>Description:</b>	CE Compliance The CE marking is the manufacturer's declaration that the medical product meets the requirements of the applicable EC directives and regulations.
<b>Symbol:</b> 	<b>Title of the symbol:</b> <b>Description:</b>	Country of Origin The Country of Origin box defines the Country where the final character transformation of the product has been performed.

Symbol:



Title of the symbol:

Description:

UKCA Label

The UKCA (UK Conformity Assessed) marking is a new UK product marking that is used for goods being placed on the market in Great Britain (England, Wales and Scotland). It covers most goods which previously required the CE marking.

Symbol:



Title of the symbol:

Description:

Fragile, handle with care

Indicates a medical device that can be broken or damaged if not handled carefully.

Symbol:



Title of the symbol:

Description:

Store dry

Indicates a medical device that needs to be protected from moisture.

Symbol:



Title of the symbol:

Description:

This way up

Indicates correct upright position of the transport package.

Symbol:



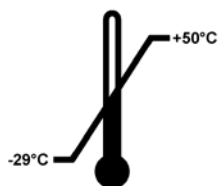
Title of the symbol:

Description:

Stack limit

The largest number of identical packages allowed to be stacked; "3" stands for the number of permitted packages.

Symbol:



Title of the symbol:

Description:

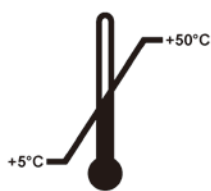
Temperature limit for transport

Indicates the temperature limits for transport to which the medical device can be safely exposed.

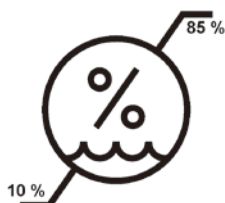
Symbol:

Title of the symbol:

Temperature limit for storage

**Description:**

Indicates the temperature limits for storage to which the medical device can be safely exposed.

**Symbol:****Title of the symbol:**

Humidity limitation for transport and storage

**Description:**

Indicates the range of humidity for transport and storage to which the medical device can be safely exposed.

**Symbol:****Title of the symbol:**

Tilt indicator

**Description**

Tip-n-Tell indicator to monitor whether the shipment has been transported and stored in upright position according to your requirements. With a pitch of 60° or more, the blue quartz sand flows into the arrow-shaped indicator window and sticks there permanently.

Improper handling of the shipment is immediately detectable and can be proven definitively.

**Symbol:****Title of the symbol:**

Shockdot Impact Indicator

**Description**

In the Shockwatch system, a shock dot shows shocks or impacts that are above a specified intensity through red coloration. Exceeding a defined acceleration (g value) causes the indicator tube to change color.

**Symbol:****Title of the symbol:**

Recycling

**Description:**

Indicates, that the item can be recycled where correct facilities exist.

## 1.2 Qualification of personnel

- The Leica RM2125 RTS may be operated by trained laboratory personnel only. The instrument is intended for professional use only.
- All laboratory personnel designated to operate the Leica instrument must read these Instructions for Use carefully and must be familiar with all technical features of the instrument before attempting to operate it.



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**1.3 Intended purpose**

The Leica RM2125 RTS is a manually operated rotary microtome specifically designed for creating thin sections of formalin fixed, paraffin embedded human tissue specimens of varying hardness used for histological medical diagnosis by a pathologist, e.g. for cancer diagnosis. It is intended for sectioning soft and hard human specimens, as long as they are suitable for being cut manually. The Leica RM2125 RTS is designed for in vitro diagnostic applications.

**ANY OTHER USE OF THE INSTRUMENT IS CONSIDERED IMPROPER!**

**1.4 Instrument type**

All information provided in these Instructions for Use applies only to the instrument type indicated on the title page.

An identification label with the serial number is fastened to the left side of the instrument.

### 2. Safety



#### Warning

The safety and caution notes in this chapter must be observed at all times.

Be sure to read these notes even if you are already familiar with the operation and use of other Leica products.

### 2.1 Safety Notes

These Instructions for Use include important information related to the operating 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.

To maintain this condition and ensure safe operation, the user must observe all notes and warnings contained in these Instructions for Use.

This instrument has been built and tested in accordance with the safety requirements for electrical equipment for measurement, control, and laboratory use.

For current information about applicable standards, please refer to the CE Declaration of Conformity and UKCA Certificates on our Internet site:

[www.LeicaBiosystems.com](http://www.LeicaBiosystems.com)



#### Note

These Instructions for Use must be appropriately supplemented as required by the existing regulations on accident prevention and environmental safety in the operator's country.



#### Warning

The protective devices located on the instrument and the accessories must not be removed or modified. Only service personnel qualified by Leica may repair the instrument and access the instrument's internal components.

### 2.2 Warnings

The safety devices installed in this instrument by the manufacturer only constitute the basis for accident prevention. Operating the instrument safely is, above all, the responsibility of the owner, as well as the designated personnel who operate, service or clean the instrument.

To ensure trouble-free operation of the instrument, make sure to comply with the following instructions and warnings.

### Warnings – Markings on the instrument itself



#### Warning

- Safety notes on the instrument itself, which are marked with a warning triangle, indicate that the correct operating instructions (as defined in these Instructions for Use) must be followed when operating or replacing the item marked.
- Failure to adhere to these instructions may result in an accident, personal injury, damage to the instrument or accessory equipment.

### Warnings – Transport and installation



#### Warning

- Extreme temperature fluctuations and high humidity levels may cause harmful condensation within the instrument. Always ensure appropriate environmental conditions are met during storage and operation. Refer to the Technical Data section for further details (→ p. 17 – 3.3 Technical Data).
- After transporting the instrument, wait for at least two hours to allow the instrument to adopt the ambient temperature before switching it on.
- Once unpacked, the instrument may be transported only in an upright position.
- Do not transport the instrument by holding it by the handwheel grips, coarse driving wheel or the knob for setting the section thickness.
- The protective devices located on the instrument and the accessories must not be removed or modified.

### Warnings – Operating the instrument



#### Warning

- Take care when handling microtome knives and disposable blades. The cutting edge is extremely sharp and can cause serious injuries! It is strongly recommended that you wear cut-resistant safety gloves (→ p. 56 – 7. Optional Accessories).
- Always remove the knife / blade before detaching the knife holder from the instrument.
- Always put the knives back into the knife case when not in use!
- Never place a knife anywhere with the cutting edge facing upwards and never try to catch a falling knife!
- Always clamp the specimen block **BEFORE** clamping the knife.
- Prior to manipulating the knife and specimen, or changing the specimen or knife, and during breaks, always lock the handwheel and cover the cutting edge with the knife guard!
- Always wear safety goggles when sectioning brittle specimens! Specimens may splinter!
- Ensure that liquids do not enter the interior of the instrument during work!
- Immediately pick up and dispose of wax that has fallen on the floor. It poses a slipping hazard, and therefore a risk of injury!
- When the specimen retraction is activated, the specimen **MUST NOT** be oriented or brought closer to the knife in the retraction phase. The same applies to the "rocking mode". If a block is oriented during retraction, the block will advance by the retraction value **PLUS** the selected section thickness before the next section. This may cause damage to both specimen and knife!
- Prior to sectioning, check that the specimen is securely clamped in the specimen clamp – failure to observe this poses the risk of damaging the specimen.

### Warnings – Maintenance and Cleaning



#### Warning

- Only authorized and qualified service personnel may access the internal components of the instrument for service and repair!
- Do **NOT** catch accessories that are falling down – there is a risk of injury!
- Lock the handwheel before cleaning!
- Do not use any solvents containing acetone or xylene for cleaning!
- Ensure that liquids do not enter the interior of the instrument during cleaning!
- When using cleaners, please comply with the safety instructions of the manufacturer and the laboratory safety regulations!
- Clean steel knives using an alcohol-based solution or acetone.



#### Warning

Oil is spilled and not cleaned-up immediately.

**Serious injury of persons, for example, by slipping and getting in contact with dangerous parts like the knife/blade of the instrument.**

- Always make sure that no oil is spilled.
- If oil has been spilled, clean it up immediately, thoroughly and completely.

### 2.3 Integrated safety devices

The instrument is equipped with the following safety devices:

#### Handwheel lock

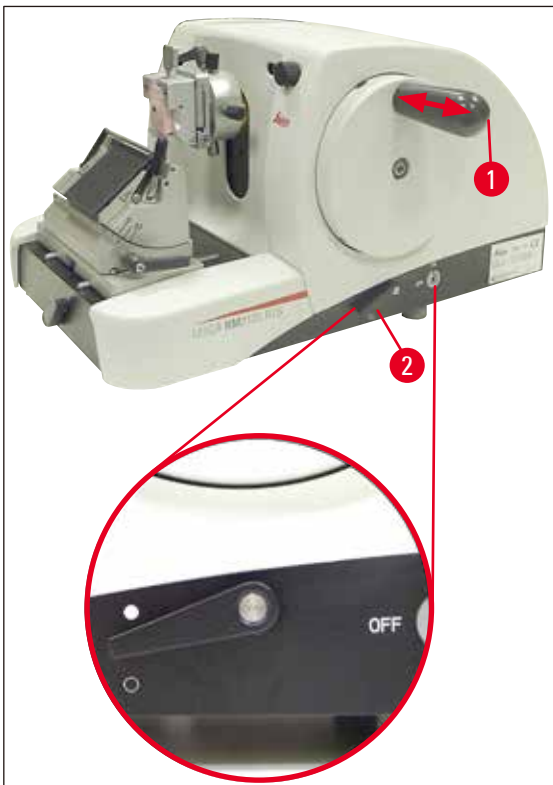


Fig. 1

- (→ Fig. 1-1) Handwheel handle
- (→ Fig. 1-2) Lever in position ● = handwheel locked
- (→ Fig. 1-2) Lever in position ○ = handwheel released

The handwheel can be locked in the 12 o'clock position (→ Fig. 1-1).

As soon as the handwheel handle (→ Fig. 1-1) is pushed in to the left, the handwheel engages the next time it reaches the 12 o'clock position, which locks it mechanically.

Functional test:

- To activate the lock, press the handwheel handle (→ Fig. 1-1) to the left. The handwheel is now mechanically locked in the 12 o'clock position and can no longer be rotated.
- To deactivate the lock, pull out the handwheel handle (→ Fig. 1-1) to the right.

### Handwheel brake

Using the lever (→ Fig. 1-2) on the right side of the microtome base plate, the handwheel brake can be activated with the handwheel in any position. If the lever is pressed upwards, the handwheel cannot be moved any more. The two lever positions are marked by corresponding dots on the microtome base plate (→ Fig. 1).

### Knife guard on the knife holder

Each knife holder is equipped with a tightly mounted knife guard ((→ Fig. 2-1), (→ Fig. 3-1)). This makes it possible to cover completely the cutting edge in every knife or blade position.



#### Warning

Lock the handwheel and cover the knife edge with the knife guard prior to any manipulation of knife or specimen, as well as prior to changing specimens and during all work breaks!

### Knife holder N

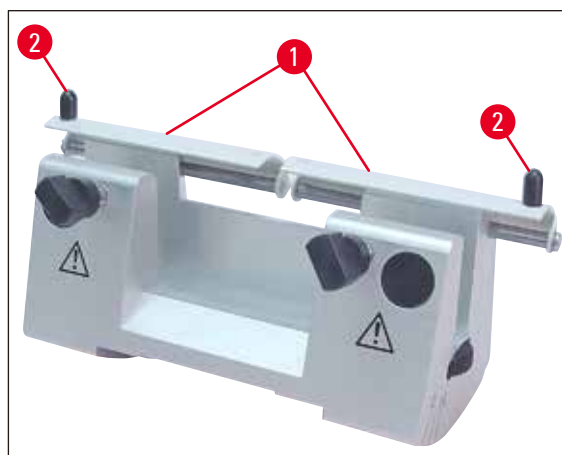


Fig. 2

## 2 Safety

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The knife guard (→ Fig. 2-1) of the knife holder N can be easily positioned via the two handles (→ Fig. 2-2).

To cover the knife edge, push both cover strips of the knife guard to the center.

### Knife holder E

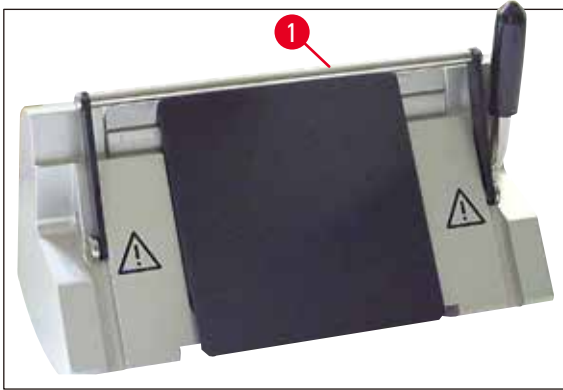


Fig. 3

The knife guard on knife holder E consists of a foldaway handle (→ Fig. 3-1).

To cover the cutting edge, fold the knife guard handle (→ Fig. 3-1) upwards as illustrated in (→ Fig. 3).

### 3. Instrument components and specifications

#### 3.1 Overview — instrument components

##### Leica RM2125 RTS (from the right)

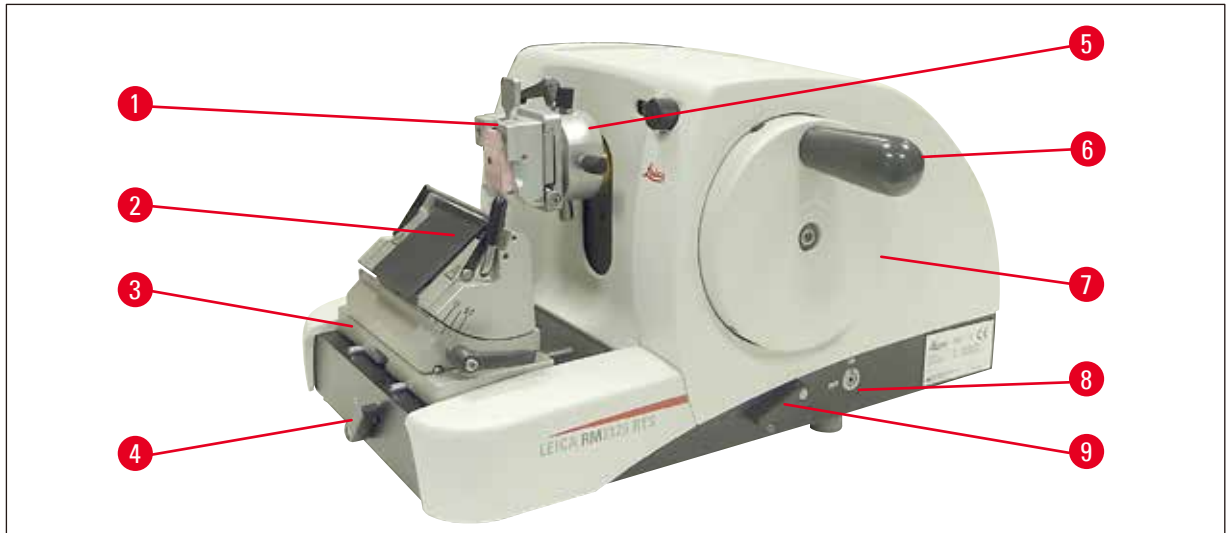


Fig. 4

- (→ Fig. 4-1) Universal cassette clamp
- (→ Fig. 4-2) Knife holder E
- (→ Fig. 4-3) Knife holder base with lateral movement
- (→ Fig. 4-4) Clamping lever for Knife holder base
- (→ Fig. 4-5) Directional fixture for specimen clamp
- (→ Fig. 4-6) Handwheel handle with locking function
- (→ Fig. 4-7) Handwheel
- (→ Fig. 4-8) Specimen retraction ON/OFF
- (→ Fig. 4-9) Lever for activating the Handwheel brake

### 3 Instrument components and specifications

#### Leica RM2125 RTS (from left)

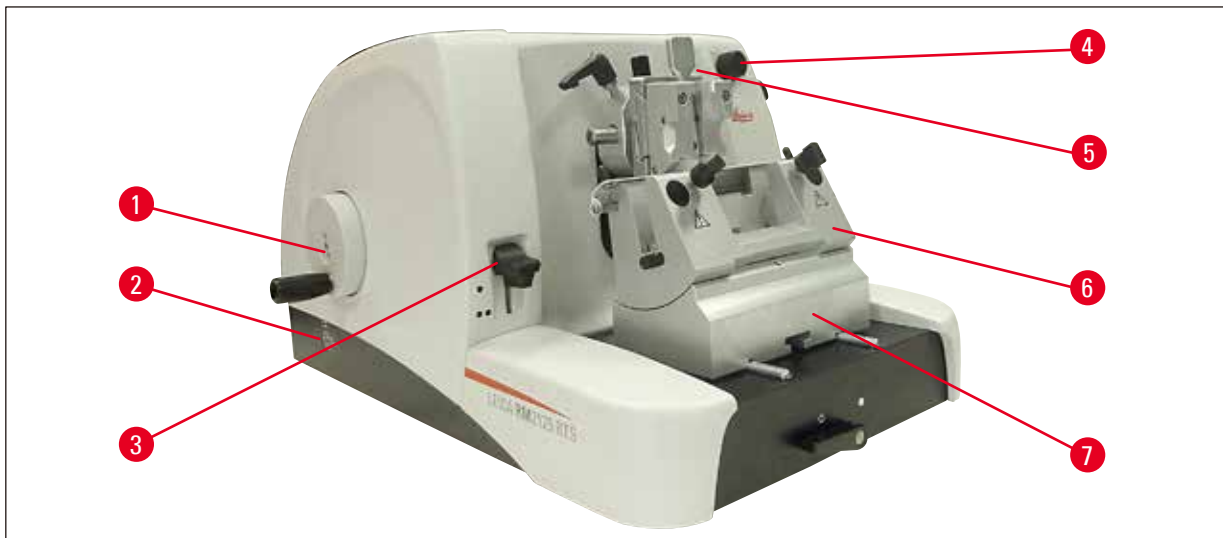


Fig. 5

- (→ Fig. 5-1) Coarse feed wheel
- (→ Fig. 5-2) Select the running direction for the coarse feed wheel
- (→ Fig. 5-3) Lever for activating the mechanical trimming function
- (→ Fig. 5-4) Adjusting knob for setting the section thickness
- (→ Fig. 5-5) Window for displaying the section thickness
- (→ Fig. 5-6) Knife holder N
- (→ Fig. 5-7) Knife holder base, non-orientable

### 3.2 Instrument specifications

The Leica RM2125 RTS is a manually operated rotary microtome.

- The specimen feed system and stroke mechanism are equipped with slack-free and maintenance-free cross roller bearings. They are housed in a polymer housing and protected against dust just like the coarse feed system.
- The handwheel can be locked into place in the upper position via the handwheel handle. In addition, it is possible to lock the handwheel in any position via the clamping lever on the baseplate.
- Sectioning is done manually by rotating the easy-to-move handwheel, which is accurately balanced by means of a counterweight.
- The coarse feed is actuated via the coarse feed wheel on the left side of the instrument. The user can select the coarse feed wheel direction of rotation depending on the requirements (clockwise or counterclockwise).
- The section thickness is set via a rotary knob and can be read accurately in the viewing window. Section thickness setting of 0.5 to 60  $\mu\text{m}$ .
- The instrument has a slit cover that prevents section waste from ingressing into the interior of the instrument.
- The instrument has a mechanical trimming function that is activated by a key lever. Steps are possible at 10  $\mu\text{m}$  and 50  $\mu\text{m}$ .



- Another additional function is the specimen retraction, which protects the knife and specimen. The user can switch the retraction function ON or OFF.  
When retracted, the specimen is drawn back 20 µm into the upper end position after the sectioning stroke during the return movement. Before the feed motion of the new section thickness, first it advances by the retraction value.

### 3.3 Technical Data

#### Installation site requirements

Operating temperature range:	18 °C- 30 °C
Temperature range during storage:	5 °C - 50 °C
Relative humidity:	max. 80 %, non-condensing
Storage humidity:	min. 10 % r.H., max. 85 % r.H.

#### General

Section thickness range:	0.5 - 60 µm
Section thickness settings:	from 0 - 2 µm in 0.5 µm increments from 2 - 10 µm in 1 µm increments from 10 - 20 µm in 2 µm increments from 20 - 60 µm in 5 µm increments
Object feed:	25 mm
Vertical stroke:	59 mm
Max. sectioning area without retractions:	58 mm
Max. sectioning area with retractions:	52 mm
Specimen retraction:	approx. 20 µm; can be turned off
Max. specimen size (WxHxD):	50 x 50 x 40 mm

#### Dimensions and weight

Width	438 mm
Depth	472 mm
Height	265 mm
Working height (knife blade)	105 mm
Weight (without accessories)	29 kg

#### Optional equipment and optional accessories

Specimen orientation (option)	
Horizontal:	± 8°
Vertical:	± 8°
Angle of rotation:	± 90°

Trimming stages:	10 $\mu\text{m}$ 50 $\mu\text{m}$
Repositioning of knife holder base with lateral movement	
North-south:	$\pm 24$ mm
East-west movement:	$\pm 20$ mm
without lateral movement	
North-south:	$\pm 25$ mm

## 4. Instrument Setup

### 4.1 Installation site requirements

- The instrument requires an installation area of approx. 438 x 472 mm.
- Room temperature consistently between +18 °C and +30 °C
- Relative humidity 80 % maximum - non-condensing
- Ambient pressure from 740 hPa to 1100 hPa
- Elevation: up to max. 2000 m NN
- The instrument is designed for indoor use only.
- Obstruction-free access to the handwheel.
- For smooth function, also make sure that no other instruments that cause vibrations are standing in the immediate vicinity of the instrument.
- The substrate must be largely vibration-free and have sufficient load capacity and rigidity for the weight of the instrument.
- Avoid vibrations, direct sunlight, and large temperature fluctuations.
- The chemicals to be used are easily inflammable and hazardous to health. Therefore the installation location must be well ventilated, and must contain no sources of ignition of any kind.

### 4.2 Standard delivery

#### Leica RM2125RTS Configuration: 1492125RTS1

Quantity	Part description	Order No.
1	Leica RM2125 RTS basic instrument	14 0457 46960
1	Knife holder base with lateral movement	14 0502 37992
1	Knife holder E for low-profile blades	14 0502 37995
1	Universal cassette clamp	14 0502 37999
1	Knife holder pressure plate for high-profile blades	14 0502 29553

#### Leica RM2125RTS Configuration: 1492125RTS2

Quantity	Part description	Order No.
1	Leica RM2125 RTS basic instrument	14 0457 46960
1	Knife holder base with lateral movement	14 0502 37992
1	Knife holder E for low-profile blades	14 0502 37995
1	Standard specimen clamp	14 0502 37998
1	Knife holder pressure plate for high-profile blades	14 0502 29553

Leica RM2125 RTS basic instrument includes the following delivery list.

Quantity	Part description	Order No.
1	Leica RM2125 RTS basic instrument	14 0457 46960
The basic instrument includes the following:		
1	specimen holder fixture, directional with quick change system for specimen clamps (installed on the instrument)	14 0457 46961
1	tool set - consisting of:	
1	Hexagon key with handle, No. 3	14 0194 58333
1	Hexagon key with handle, No. 4.	14 0194 04782
1	Hexagon key, No. 8	14 0222 04143
1	bottle of oil for drives, Type CONSTANT OY 46 K, 50 ml	14 0336 06086
1	dust protective cover	14 0212 53157
1	Leica RM2125 RTS English Instructions for Use (Printed Instructions for Use in English with additional languages on a data storage device)	14 0457 80001

**It is possible to configure a basic instrument with the below listed accessories to fit your application. To have a workable configuration, at least one item of the categories mentioned below must be ordered.**

<b>Basic instrument</b>	14045746960	Basic instrument Leica RM2125 RTS without all of the following: specimen clamp and knife holder set-up
<b>Leica RM2125 RTS</b>		

#### Order at least one specimen clamp

<b>Specimen clamps</b>	14050237998	Standard specimen clamp
	14050237999	Universal cassette clamp
	14050238002	Round specimen holder, with 3 clamping rings, silver

#### Order at least one knife holder base and one knife holder

<b>Knife holder bases</b>	14050237962	Knife holder base, non-orientable, silver
	14050237992	Knife holder base, can be moved laterally, silver
<b>Knife holders</b>	14050237993	Knife holder N, silver
	14050237994	Knife holder NZ, silver
	14050237995	Knife holder E, for low-profile microtome blades, silver
	14050237996	Knife holder E, for high-profile microtome blades, silver
	14050237997	Knife holder E-TC for carbide metal disposable blades, silver

**Additional optional accessories and knives/blades can be found in Chapter 7 (→ p. 56 – 7. Optional Accessories).**

You will find this, as well as other accessories you may have ordered, packed in the top of the carton (→ Fig. 6).

**Note**

Compare the delivered components with the parts list and your order.  
Should you find any discrepancies, please contact your Leica sales office without delay.

**4.3 Unpacking and installation****Note**

The packaging has one ShockDot Impact Indicator, which indicates improper transport. When the instrument is delivered, check the indicator first. If it is triggered, the package was not handled as prescribed. In this case, please mark the shipping documents accordingly and check the shipment for damage.



Fig. 6

- Remove the packing strap and the adhesive tape (→ Fig. 6-1).
- Remove the carton lid (→ Fig. 6-2).
- Take out the accessory carton (→ Fig. 6-3).
- Take Hexagon key No. 8 out of the accessory carton and put it aside for later use.
- Remove the fixing carton (→ Fig. 6-4).
- Remove the outer carton wall (→ Fig. 6-5).
- Use both carrying straps (→ Fig. 6-6) at the front and rear to remove the instrument on the wooden pallet from the carton.

## 4 Instrument Setup



### Warning

Do not transport the instrument by holding it by the handwheel grip, coarse feed wheel, or rotary knob for setting the section thickness!

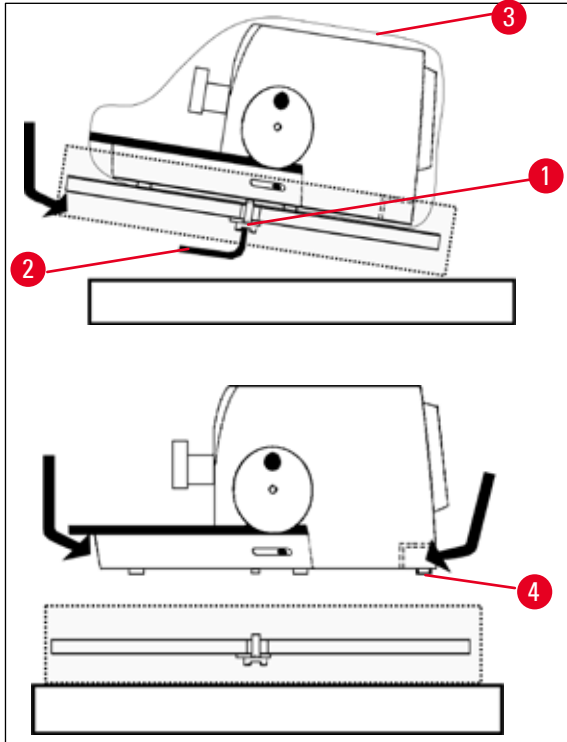


Fig. 7

- Set the wooden pallet with the instrument on a stable table.
  - Slightly lift the wooden pallet in front from below.
  - Loosen the safety screw (→ Fig. 7-1) with washer under the wooden pallet using the provided Hexagon key No. 8 (→ Fig. 7-2).
  - Cut open and remove the protective sleeve (→ Fig. 7-3).
  - To lift the instrument, grasp the front and rear of the baseplate and lift it from the wooden pallet.
  - Place the instrument on a stable laboratory table.
- The two sliding elements (→ Fig. 7-4) located on the rear of the base plate make it easier to move the instrument on the table.
- To move the instrument, hold it by the front of the base plate, lift it up gently and slide it on the sliding elements.



### Note

The transport carton and included retaining elements should be kept in case a return shipment is necessary later. To return the instrument, follow the instructions below in reverse order.

#### 4.4 Inserting the specimen clamp

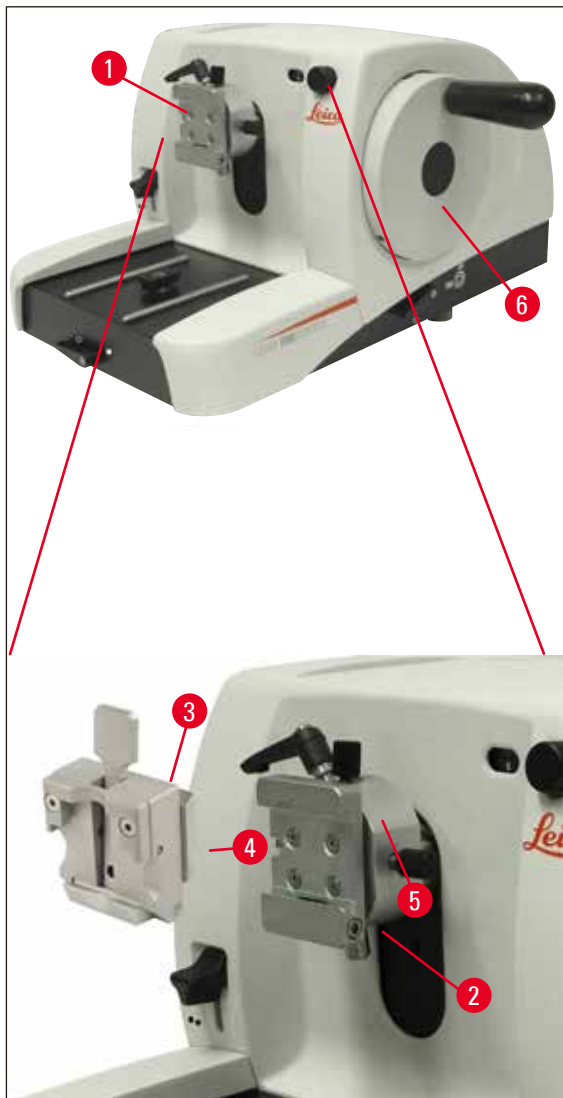


Fig. 8

There are two versions of the specimen holder fixture – with and without specimen orientation.

Specimen orientation must be replaced **ONLY** by service (→ p. 67 – 9. Warranty and Service).

The specimen orientation allows for simple position correction of the specimen surface when the specimen is clamped into place.

You can use the specimen holder fixture (→ Fig. 8-1) to hold all available accessory specimen clamps (→ p. 35 – 5.9 Accessories).



#### Note

The basic instrument is equipped at the factory with a directional fixture for specimen clamp and a quick clamping system.

## 4 Instrument Setup

To do so, proceed as follows:

1. Move the specimen holder fixture (→ Fig. 8-1) to the upper end position by turning the handwheel (→ Fig. 8-6) and engage the handwheel lock.
2. To release the clamp, turn the Hexagon screw (→ Fig. 8-2) counterclockwise.
3. Push the guide (→ Fig. 8-4) of the specimen clamp (→ Fig. 8-3) from the left into the dovetail receptacle (→ Fig. 8-5) as far as it will go.
4. To clamp the specimen clamp (→ Fig. 8-3) turn the Hexagon screw (→ Fig. 8-2) clockwise as far as it will go.

### 4.5 Direct mounting of the specimen clamp on the specimen holder fixture



#### Note

The specimen clamps (standard or universal cassette clamps) can also be fastened directly to the specimen holder fixture.

To do so, proceed as follows:

1. Move the specimen holder fixture (→ Fig. 9-1) to the upper end position by turning the handwheel and engage the handwheel lock.

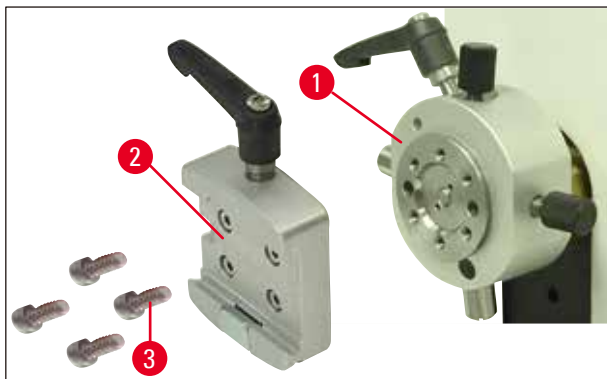


Fig. 9

2. Then remove the dovetail receptacle (→ Fig. 9-2) from the specimen holder fixture (→ Fig. 9). To do so, loosen and unscrew the four screws (→ Fig. 9-3) using a Hexagon key with handle, No. 3 (→ Fig. 10-1).

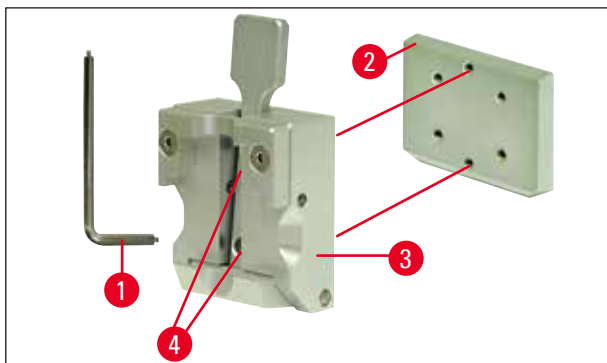


Fig. 10



- To remove the dovetail guide (→ Fig. 10-2) from the specimen clamp (→ Fig. 10-3), unscrew the two screws (→ Fig. 10-4) from the dovetail guide (→ Fig. 10). Again, use the Hexagon key with handle, No. 3.

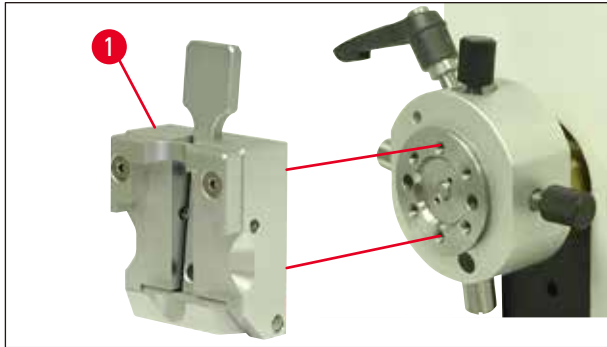


Fig. 11

- Attach the specimen clamp (→ Fig. 11-1) to the specimen holder fixture as shown (→ Fig. 11) and fasten it using the two screws (→ Fig. 10-4).

#### 4.6 Attaching the knife holder base, non-orientable

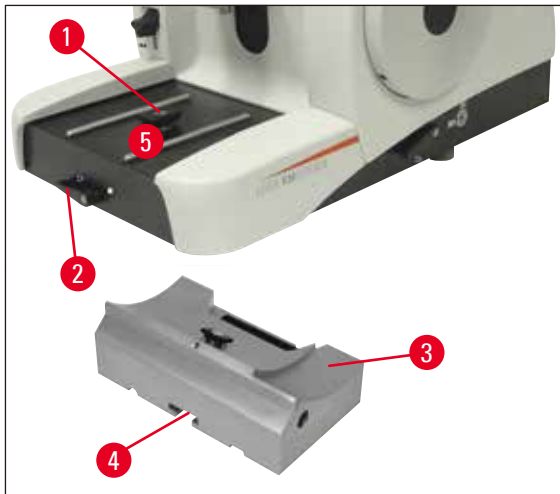


Fig. 12

- Release the clamping lever (→ Fig. 12-2) by rotating it counterclockwise. (Position ○ = released)
- Insert the universal knife holder base (→ Fig. 12-3) using the notch (→ Fig. 12-4) on the bottom into the T-piece (→ Fig. 12-1) of the microtome base plate (→ Fig. 12-5).
- To secure the knife holder base, turn the clamping lever (→ Fig. 12-2) clockwise. (Position ● = locked)

## 4.7 Inserting the knife holder, non-orientable

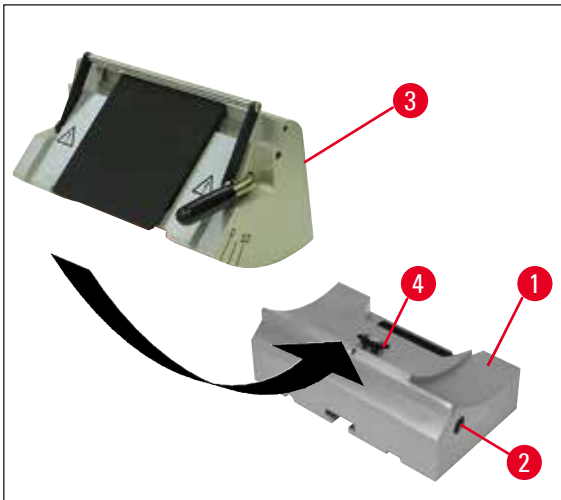


Fig. 13

- Loosen the Hexagon screw (→ Fig. 13-2) by turning it counterclockwise.
- Slide the notch of the knife holder (→ Fig. 13-3) onto the T-piece (→ Fig. 13-4) of the knife holder base (→ Fig. 13-1).
- To clamp, turn the Hexagon screw (→ Fig. 13-2) clockwise.

## 5. Operation

### 5.1 Clamping the specimen



#### Warning

Always clamp the specimen block **BEFORE** clamping the knife or the blade.

Lock the handwheel and cover the knife edge with the knife guard prior to any manipulation of knife or specimen, prior to changing the specimen block and during all work breaks!

1. Rotate the handwheel until the specimen clamp is in the uppermost position.
2. Activate the handwheel lock by allowing the handwheel handle to lock in place.
3. Insert a specimen into the specimen clamp.



#### Note

A detailed description for inserting the specimen into various specimen clamps and specimen holders is provided in ([→ p. 35 – 5.9 Accessories](#)).

### 5.2 Clamping the knife / disposable blade



#### Warning

Take care when handling microtome knives and disposable blades. The cutting edge is extremely sharp and can cause serious injuries!

- Carefully insert knife or disposable blade into the knife holder and clamp.



#### Note

A detailed description for inserting the blade or knife into the individual knife holders is provided in ([→ p. 43 – 5.9.8 Knife holder E/E-TC](#)), ([→ p. 44 – 5.9.9 Knife holder E](#)), ([→ p. 49 – 5.9.10 Overview – accessories](#)).

### 5.3 Adjusting the clearance angle

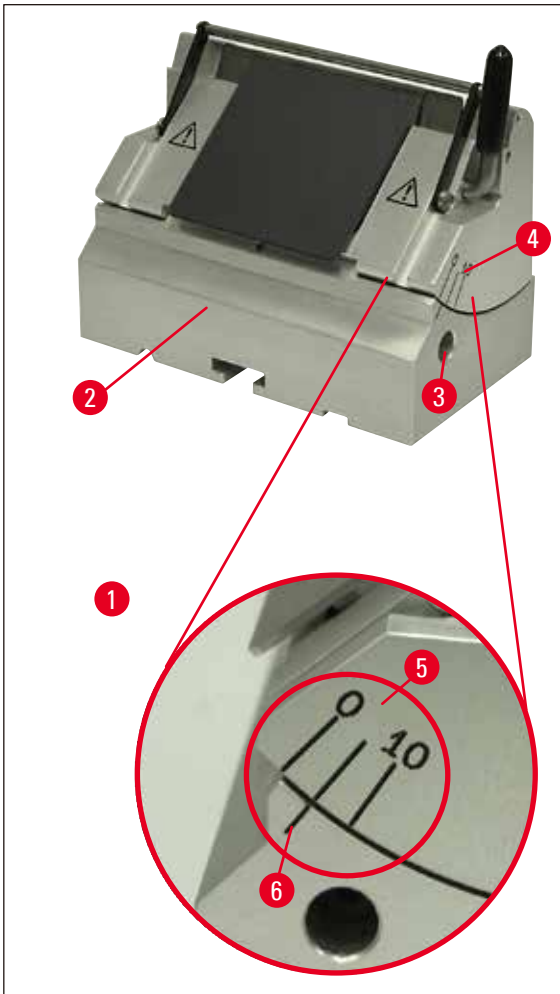


Fig. 14

(→ Fig. 14-1) Enlarged detail: Index marks for clearance angle adjustment

- The index marks (0°, 5° and 10°) for adjustment of the clearance angle (→ Fig. 14-5) are located on the right side of the knife holder (→ Fig. 14-4).
- There is also an index mark (→ Fig. 14-6) on the right side of the knife holder base (→ Fig. 14-2) which serves as a reference point when adjusting the clearance angle.
- When using the knife holder base (non-orientable), loosen the Hexagon screw to release the clamp by turning Hexagon key with handle, No. 4 (→ Fig. 14-3) counterclockwise.
- When using the knife holder base (with lateral movement), rotate the lever on the right side of the knife holder base counterclockwise.
- Move the knife holder until the index mark of the desired clearance angle coincides with the reference line on the knife holder base.

Example:

Enlarged detail showing a clearance angle setting of 5°.

**Note**

The recommended clearance angle setting for knife holder E is approx. 1° - 3°.

- Firmly hold the knife holder in this position and rotate the lever (→ Fig. 14-3) or Hexagon screw (depending on the knife holder base used) clockwise to clamp it.

**5.4 Specimen retraction (specimen orientation)**

Fig. 15

To prevent the knife or blade from touching the overlapped specimen while returning to the upper end position, the specimen is retracted 40 µm when retraction is activated.

**Note**

The user can switch the specimen retraction **ON** or **OFF**.

To do so, use a Hexagon key with handle, No. 4 (included in the delivery package) and turn the screw depicted in the detail picture (→ Fig. 15-1) so that the red dot indicates "**OFF**" = retraction is disabled. Red dot on "**ON**" means = retraction is switched on.

**Important if retraction is enabled:****Warning**

The specimen must **NOT** be oriented or approached in the retraction phase (if the black dot on the handwheel is visible – see enlarged detail (→ Fig. 15) – you are in the sectioning phase)! The previously retracted specimen will advance by the retraction value **PLUS** the selected section thickness before the next section.

There is a danger of the specimen and knife being damaged by an incision that is too thick.

The same applies to the "rocking mode", during which the specimen is trimmed by rocking motion (no complete rotation of the handwheel).

Carry out "rocking mode" **ONLY** in the sectioning phase – **NEVER** in the retraction phase!

### 5.5 Orienting the specimen (only a directional fixture for specimen clamp)

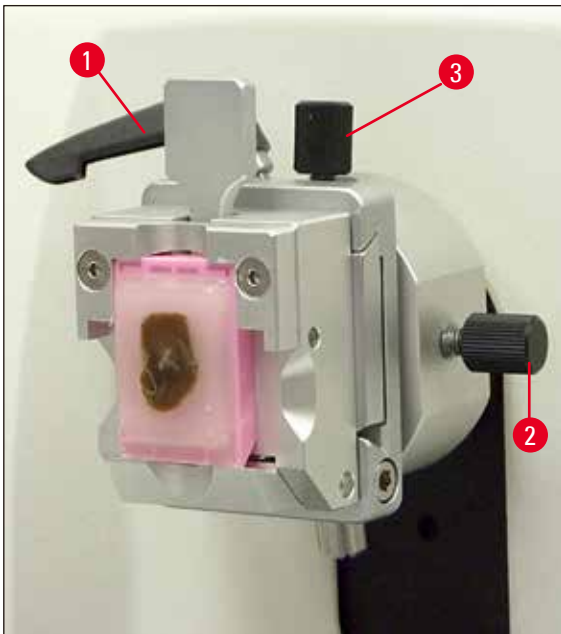


Fig. 16

The specimen orientation allows for simple position correction of the specimen surface when the specimen is clamped into place.

- Run the specimen to the rear end position by turning the coarse feed wheel (→ p. 16 – Fig. 5). (→ p. 31 – 5.6 Cutting (trimming) the specimen).
- Loosen the clamping lever in front on the microtome base plate and slide the knife holder base with knife holder until it is almost in front of the specimen.  
For additional information, refer to (→ p. 25 – Fig. 12) or (→ p. 42 – Fig. 30).



#### Warning

Specimen blocks must **NOT** be oriented during the retraction phase!

If a block is oriented during retraction, the block will advance by the retraction value **PLUS** the selected section thickness before the next section.

This may cause damage to both specimen and knife!

- Move the specimen holder fixture to the upper end position by turning the handwheel and engage the handwheel lock.
- To release the clamp, turn the eccentric lever (→ Fig. 16-1) counterclockwise.
- Turn setscrew (→ Fig. 16-3) to orient the specimen in north-south direction. Turn setscrew (→ Fig. 16-2) to orient the specimen in east-west direction.
- To lock the current orientation, turn the eccentric lever (→ Fig. 16-1) clockwise.

## 5.6 Cutting (trimming) the specimen

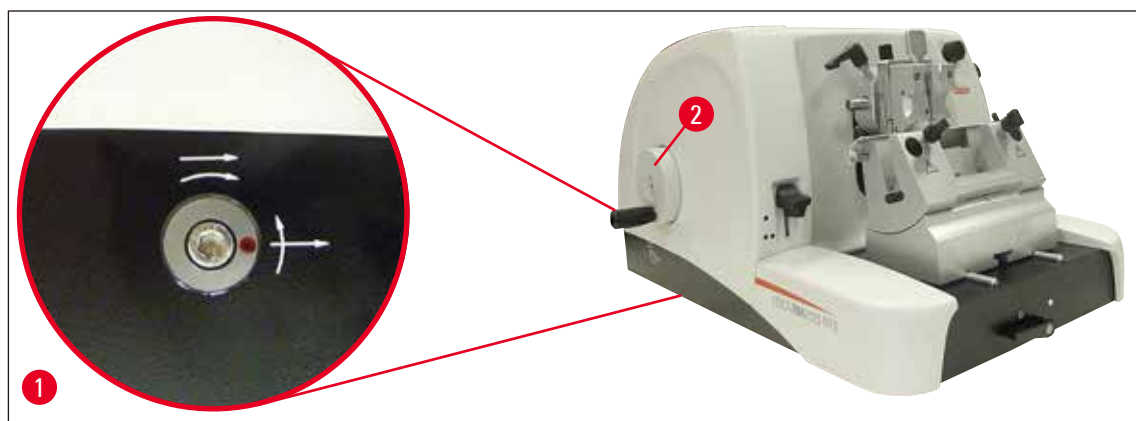


Fig. 17

### Coarse feed wheel (→ Fig. 17-2)

The coarse feed serves for a fast horizontal forwards movement of the specimen – towards the knife – and backwards – away from the knife.

The instrument can be used optionally with either clockwise rotation or counterclockwise rotation for the coarse feed wheel (→ Fig. 17-2).

To do so, use a Hexagon key with handle, No. 4 (included in the delivery package) to turn the screw as shown in the detail picture (→ Fig. 17-1):

1. Red dot at 3 o'clock: Turning the coarse feed wheel counterclockwise (see curved arrow) means the specimen advances.  
Turning the coarse feed wheel clockwise means the specimen retracts (away from the knife).
2. Red dot at 12 o'clock: Turning the coarse feed wheel clockwise (see curved arrow) means the specimen advances.  
Turning the coarse feed wheel counterclockwise means the specimen retracts (away from the knife).



### Note

When the rear or front end position is reached, the coarse feed wheel will be difficult to rotate (if you continue turning it at this point anyway, the torque limitation will be exceeded – this is not a malfunction!).

In the front end position, no more feed motion takes place.

### Trimming the specimen with the coarse feed



Fig. 18

- Release the handwheel lock. To do so, pull the handle (→ Fig. 18-5) of the handwheel out to the right and use the lever (→ Fig. 18-1) to release the brake.
- Brake engaged
- Brake released
- Bring the specimen closer to the knife by rotating the coarse feed wheel (→ Fig. 17-2) and trim it by simultaneously rotating the handwheel (→ Fig. 18-2) until the desired specimen plane is reached.

### Trimming the specimen by setting a large section thickness

- Set a correspondingly large section thickness (e.g. 50  $\mu\text{m}$ ) using the section thickness setting knob (→ Fig. 18-3) at the front of the microtome on the right. The current setting is displayed in the section thickness window (→ Fig. 18-4).
- Trim the specimen by rotating the handwheel (→ Fig. 18-2) until the desired specimen plane is reached.



**Trimming with the mechanical trimming function**

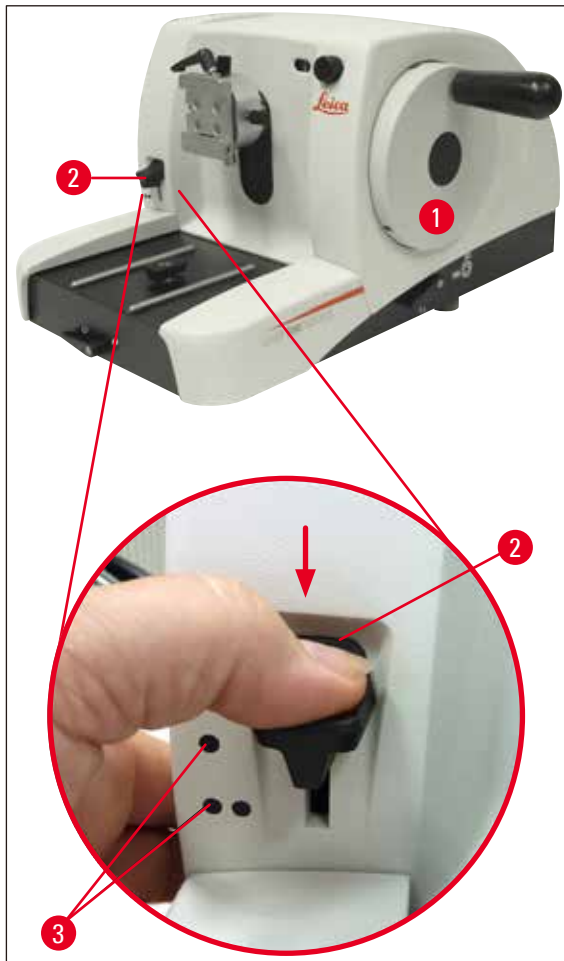


Fig. 19

The Leica RM2125 RTS is equipped with a mechanical trimming function that is activated via the trimming lever (→ Fig. 17-2).

The trimming lever has 3 click stops:

0  $\mu\text{m}$ , 10  $\mu\text{m}$ , and 50  $\mu\text{m}$ .

The points (→ Fig. 17-3) mark the two trimming stages:

● = 10  $\mu\text{m}$

●● = 50  $\mu\text{m}$

- To activate the trimming function, press the lever downwards into the desired position and keep it pressed down.
- With each rotation of the handwheel, a feed motion of 10  $\mu\text{m}$  or 50  $\mu\text{m}$  takes place.
- After you let go of the lever, it springs back to its original position (zero position). The trimming function is thereby deactivated.

## 5 Operation



### Warning

The section thickness that has been set is not added to the selected trimming value.

If the section thickness that has been set is greater than the selected trimming value, the section thickness is fed.

- Bring the specimen closer to the knife by rotating the coarse feed wheel.
- Select the desired trimming stage.
- Trim the specimen by rotating the handwheel (→ Fig. 17-1) until the desired specimen plane is reached.
- Release the trimming lever (→ Fig. 17-2).

### 5.7 Sectioning



### Warning

Always rotate the handwheel at a uniform speed. The rotation speed of the handwheel must be adapted to suit the hardness of the specimen.

For harder specimens, use a slower speed.

The handwheel continues turning if it has been rotated very quickly and then released – this can cause crushing or other injuries!



Fig. 20

- Set the desired section thickness using the section thickness setting knob (→ Fig. 20-1) at the front of the microtome on the right, or check the set value in the viewing window (→ Fig. 20-2). The red indicator (→ Fig. 20-3) indicates the selected section thickness (on the scale).
- Use a different area of the cutting edge for trimming than for sectioning.
- To do so, move the knife holder laterally on the knife holder base accordingly (→ p. 41 – 5.9.7 Knife holder N/NZ) or, when using the knife holder base without lateral movement, move the knife or disposable blade in the knife holder.
- For sectioning, turn the handwheel (→ Fig. 17-1) evenly in a clockwise direction.
- Pick up the sections and mount them on microscope slides.

## 5.8 Changing specimens



### Warning

Lock the handwheel and cover the knife edge with the knife guard prior to any manipulation of knife or specimen, as well as prior to changing specimens and during all work breaks!

- Move the specimen to the upper end position by turning the handwheel and engage the handwheel lock.
- Cover the sectioning edge with the knife guard.
- Remove the specimen from the specimen clamp and mount a new specimen.
- Run the object clamp with the coarse feed back far enough until the new specimen can start being cut.

## 5.9 Accessories



### Note

All specimen clamps available as accessories can be integrated into either the directional or non-directional fixture for specimen clamp.

### 5.9.1 Standard specimen clamp (optional)

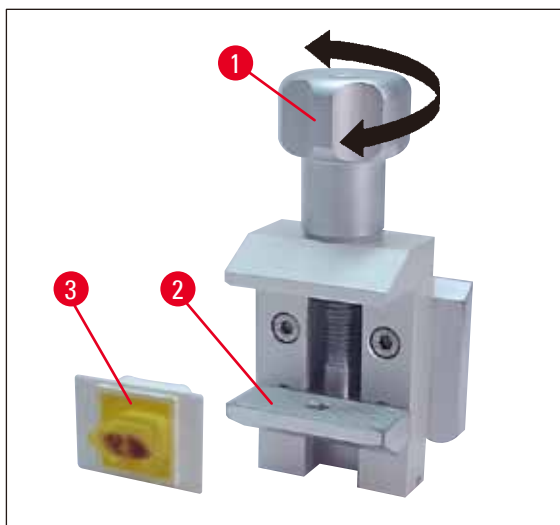


Fig. 21

The standard specimen clamp is suitable for holding specimens of 40 x 40 mm.

They are designed for direct clamping of rectangular blocks. In addition, they accommodate the foil clamps.

- Turn the knurled screw (→ Fig. 21-1) counterclockwise to move the lower movable jaw (→ Fig. 21-2) downward.
- Mount the specimen (→ Fig. 21-3) as required.
- Turn the knurled screw (→ Fig. 21-1) clockwise to move the lower jaw upward against the fixed jaw to clamp the specimen securely.

## 5 Operation



### Note

When clamping cassettes, make sure that they are not clamped too tightly, since the cassette bodies can bend and result in sections that are too thick or thin, or the entire specimen may fall out and become damaged.

### 5.9.2 Vee insert (optional)

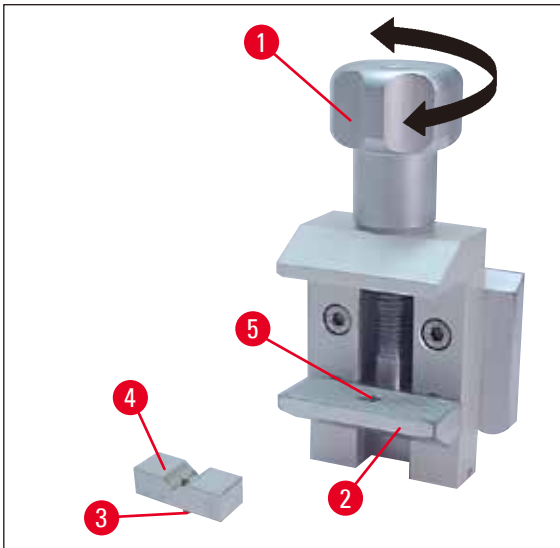


Fig. 22

The vee insert (→ Fig. 22-4) is mounted in the hole provided in the lower movable jaw of the standard specimen clamp.

This makes it possible to clamp round specimens in the standard specimen clamp.

- Turn the knurled screw (→ Fig. 22-1) counterclockwise to move the lower movable jaw (→ Fig. 22-2) downward.
- Insert the pin (→ Fig. 22-3) of the vee insert (→ Fig. 22-4) in the hole (→ Fig. 22-5) of the lower jaw (→ Fig. 22-2).
- Mount the specimen as required.
- Turn the knurled screw (→ Fig. 22-1) clockwise to move the lower jaw with the vee insert upward against the fixed jaw to clamp the specimen securely.

### 5.9.3 Foil clamp Type 1 (optional)

The foil clamp type 1 is appropriate both for clamping very small and thin foil pieces and flat, angular specimens. It is mounted in the standard specimen clamp.

### Clamping of foil pieces

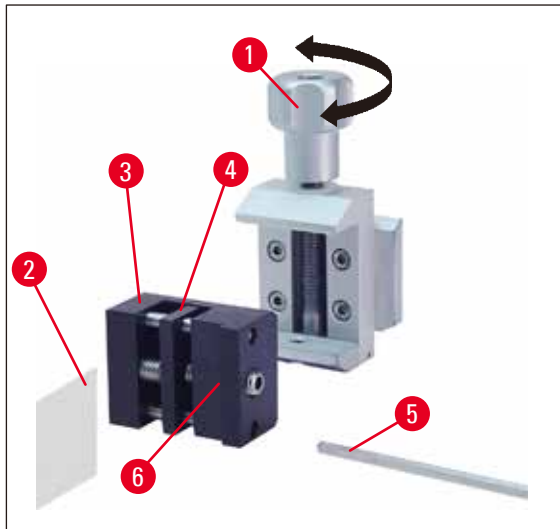


Fig. 23

- Move the movable jaw (→ Fig. 23-4) to the right as required by turning the setscrew with a Hexagon key with handle, No. 4 (→ Fig. 23-5).
- Place the foil (→ Fig. 23-2) between the movable jaw (→ Fig. 23-4) and the fixed jaw (→ Fig. 23-3).
- To clamp the foil, screw the movable jaw (→ Fig. 23-4) against the fixed jaw (→ Fig. 23-3) by using the Hexagon key.
- Insert the foil clamp (→ Fig. 23-6) in the standard specimen clamp as shown.
- Turn the knurled screw (→ Fig. 23-1) clockwise until foil clamp is clamped securely.

### Clamping of flat, angular specimens

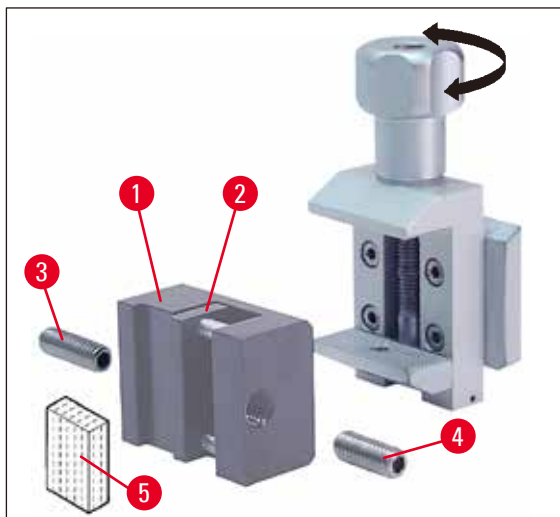


Fig. 24

To clamp angular specimens, replace the long setscrew (→ Fig. 24-3) with the short setscrew (→ Fig. 24-4) provided with the foil clamp.

- Unscrew the long setscrew (→ Fig. 24-3) to the left with a Hexagon key with handle, No. 4 (→ Fig. 23-5).

## 5 Operation

- Screw the short setscrew (→ Fig. 24-4) in the hole.
- Place the specimen (→ Fig. 24-5) between the movable jaw (→ Fig. 24-2) and the fixed jaw (→ Fig. 24-1).
- To clamp the specimen, press the movable jaw (→ Fig. 24-2) against the fixed jaw (→ Fig. 24-3) by screwing in the setscrew (→ Fig. 24-4).
- Insert the foil clamp in the standard specimen clamp as shown.
- Turn the knurled screw (→ Fig. 23-1) clockwise until foil clamp is clamped securely.

### 5.9.4 Universal cassette clamp (optional)

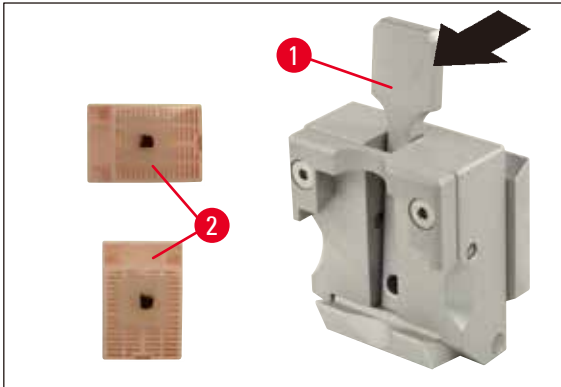


Fig. 25



#### Note

Prior to sectioning, laboratory personnel must check that the cassette is seated securely in the universal cassette clamp.

- Push the lever (→ Fig. 25-1) forwards.
- Mount the cassette (→ Fig. 25-2) horizontally or vertically as required.
- To clamp the cassette, release the lever.



**Warning**

Leica Biosystems cassettes with minimum dimensions of 39.8 x 28 mm and maximum dimensions of 40.9 x 28.8 mm may be clamped in the universal cassette clamp (UCC) horizontally as well as vertically.

When using other – particularly thin-walled – cassettes, the cassette may become deformed or other problems may arise with the clamping system. If the user tries clamping the cassette and realizes that it is not securely clamped into place, an alternative tensioning clamp must be used.

When using cassettes whose lid is molded on, make sure that the broken edge left by removing the lid does not prevent the specimen from being securely clamped – if necessary, the specimen must be clamped horizontally.

Before clamping the cassette into the universal cassette clamp, remove excess wax on the outside of the cassette to ensure that the cassette clamps in securely.

Wax deposits on the outside of the cassette can make the universal cassette clamp dirty. The dirt prevents the cassette from clamping in securely and can lead to sections being too thick or thin, chattering within the section and, in the worst-case scenario, damage to the specimen.

Prior to sectioning, the user has to verify that the specimen is clamped securely and, if necessary, remove wax deposits from the universal cassette clamp according to the specifications in ([→ p. 51 – 6.1 Cleaning the instrument](#)).

**5.9.5 Round specimen holder (optional)**



**Note**

The holder for round specimens is designed to accommodate cylindrical specimens. Inserts for specimens of 6, 15 and 25 mm diameter are available.

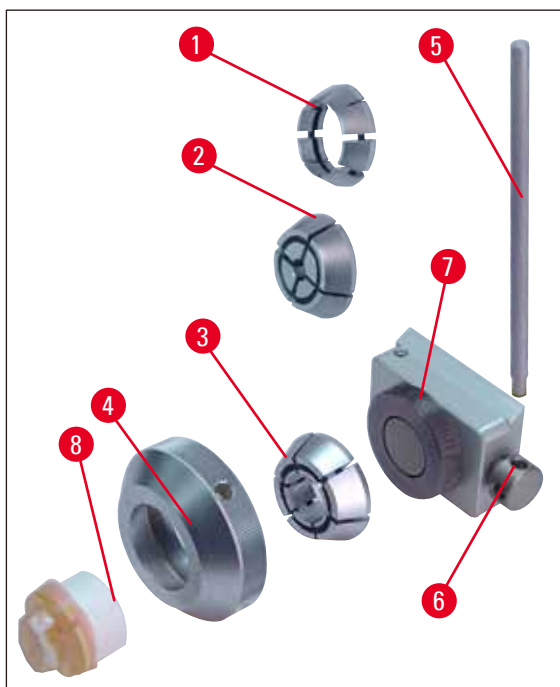


Fig. 26

## 5 Operation

- To mount the required insert (→ Fig. 26-1), (→ Fig. 26-2), (→ Fig. 26-3) turn the clamping ring (→ Fig. 26-4) counterclockwise and remove it.
- Place the required insert into the tension ring (→ Fig. 26-4) and screw the tension ring onto the thread (→ Fig. 26-7) by turning it clockwise.
- Mount the specimen (→ Fig. 26-8) and clamp it by turning the clamping ring (→ Fig. 26-4) clockwise.
- To orient the inserted specimen, insert the pin (→ Fig. 26-5) into the bore (→ Fig. 26-6) and rotate it counterclockwise to release the clamp. You can now rotate the specimen so that the side you want faces upwards.
- To lock it in the position you have chosen, tighten the pin (→ Fig. 26-5) by turning it clockwise.

### 5.9.6 Knife holder base

#### Knife holder base without lateral movement



Fig. 27

The one-piece knife holder base without lateral movement (→ Fig. 27) can be moved only forwards and backwards on the microtome base plate.

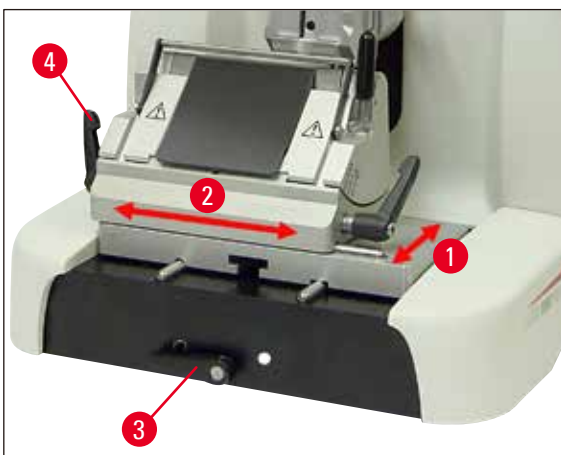


Fig. 28



### Moving in the north-south direction (→ Fig. 28-1)

The north-south movement allows you to bring the knife holder into the optimal cutting position in relation to the specimen.

- To release the clamp, rotate the clamping lever (→ Fig. 28-3) on the front of the microtome base plate counterclockwise.
- Reposition the knife holder together with the knife holder base forward or backward as appropriate.
- Secure the clamping mechanism by rotating the lever (→ Fig. 28-3) clockwise.

### Knife holder base with lateral movement



Fig. 29

The knife holder base with lateral movement (→ Fig. 29) has two pieces and therefore can be moved forward and backward on the microtome base plate as well as laterally.

### East-west direction (→ Fig. 28-2)

The lateral movement feature of the knife holder base enables the use of the entire length of the blade or knife, eliminating the need for readjusting the knife holder.

- To release the clamp, fold the clamping lever (→ Fig. 28-4), (→ Fig. 29-1) on the left of the knife holder base forward.
- Move the knife holder base with knife holder laterally.
- To clamp, fold the lever (→ Fig. 29-1) back.

#### 5.9.7 Knife holder N/NZ



#### Note

The knife holders N and NZ are appropriate for standard steel and tungsten carbide knives, profile c and d, up to 16 cm long. The integrated height adjustment feature allows you to also use knives that have been resharpened numerous times.

## 5 Operation

- (→ Fig. 30) Knife holder N  
For holding conventional knives up to 16 cm in length.  
Enlarged detail:  
Knife inserted and height-adjusted

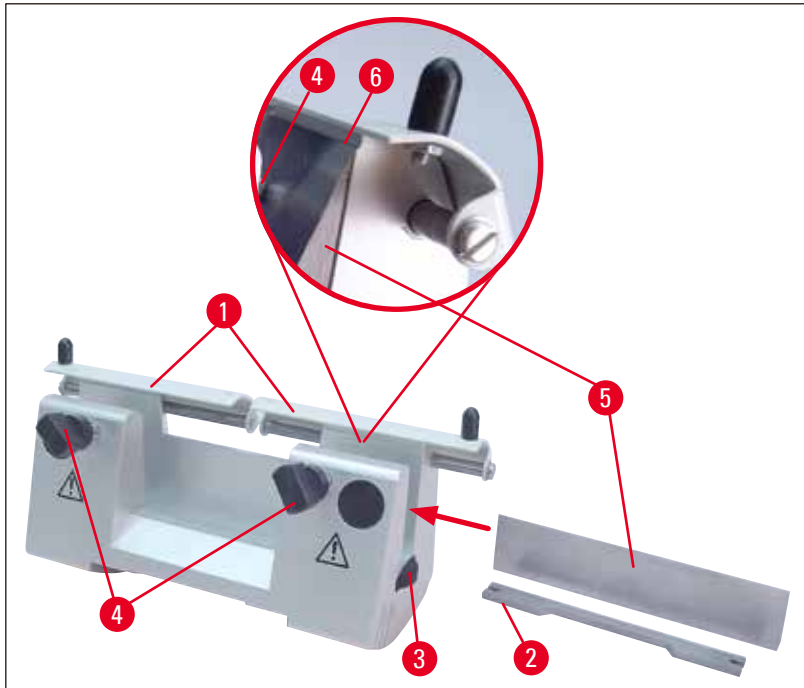


Fig. 30

### Mounting the knife support bar

- Push knife guard (→ Fig. 30-1) to the center.
- Set the knife support bar (→ Fig. 30-2) onto the height adjustment screws (not visible) in the position shown. The flat ends of the height adjustment screws must be located in the slots at each end of the knife support bar.



### Warning

Prior to inserting the knife, both knife holder and knife holder base must have been installed on the instrument!

### Inserting the knife

- Rotate the knurled nuts (→ Fig. 30-3) on the right and left of the knife holder forward in opposite directions, lowering the knife support bar to the lowest possible position, thus ensuring that the knife edge will not be damaged when inserting the knife.
- Unscrew the clamping screws (→ Fig. 30-4) as far out as possible (rotate counterclockwise).
- Hold the knife (→ Fig. 30-5) at the knife base and carefully insert it in the holder from the side as shown with the cutting edge facing upward.

### Knife height adjustment

When adjusting the clearance angle, the knife edge should be positioned as exactly as possible in the actual center of rotation of the knife holder. The lay-on edge (→ Fig. 30-6) of the rear clamping chucks serves as a reference position for correct knife height adjustment. The knife edge should be parallel with the locating edges.

- Rotate the knurled nuts (→ Fig. 30-3) uniformly and backwards until the knife blade is parallel to the lay-on edge (→ Fig. 30-6) of the rear clamping chucks.
- To clamp the knife (→ Fig. 30-5) evenly screw the two knife clamping screws (→ Fig. 30-4) inward (rotate clockwise).

### Lateral repositioning of the knife

- Push knife guard (→ Fig. 30-1) to the center.
- Loosen the clamping screws (→ Fig. 30-4) by turning them counterclockwise.
- Push the knife (→ Fig. 30-5) to the left or right as required.
- To clamp the knife (→ Fig. 30-5), always tighten the clamping screw (→ Fig. 30-4) first which is located on the side to which the knife has been repositioned by turning it clockwise.



Fig. 31

(→ Fig. 31) Knife holder NZ

For holding conventional and carbide metal knives up to 16 cm in length.

Knife pressure plate (→ Fig. 31-1) for extreme stability and full utilization of the knife blade.

#### 5.9.8 Knife holder E/E-TC



#### Note

The knife holder E-TC is designed for the Leica TC-65 tungsten carbide blades.



#### Warning

Prior to inserting the blade, both knife holder and knife holder base must have been installed on the instrument!

## 5 Operation

### Inserting the blade, knife holder E and E-TC

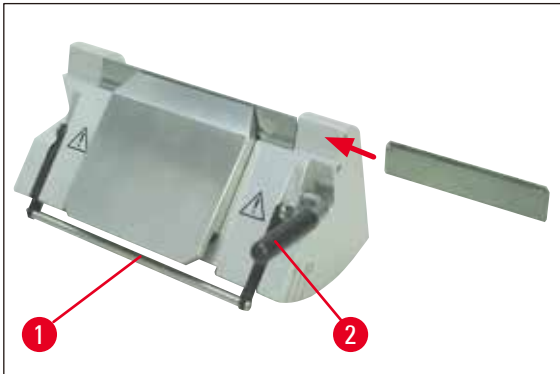


Fig. 32

(→ Fig. 32) Knife holder E-TC

- Fold knife guard (→ Fig. 32-1) downward.
- To insert the blade, flip the right clamping lever (→ Fig. 32-2) forward and down.
- Carefully insert the blade from the side. Make sure that the blade is clamped parallel to the upper edge of the pressure plate.
- To clamp the blade, rotate clamping lever (→ Fig. 32-2) back upwards.

#### 5.9.9 Knife holder E



##### Note

The blade holder is optimized for usage with Leica Biosystems disposable blades.

The blades are available in two dimensions.

For low-profile blades (→ Fig. 33-3) (L x H x W): (80 +/-0.05) mm x (8 +/-0.1) mm x (0.254 +/-0.008) mm, and for high-profile blades (→ Fig. 33-2) (L x H x W): (80 +/-0.05) mm x (14 +/-0.15) mm x (0.317 +/-0.005) mm, which differs in the rear pressure plate (→ Fig. 34-1).

The pressure plate for each blade type is available individually and can be replaced easily.

#### Inserting the blade



##### Warning

Prior to inserting the blade, both knife holder and knife holder base must have been installed on the instrument!

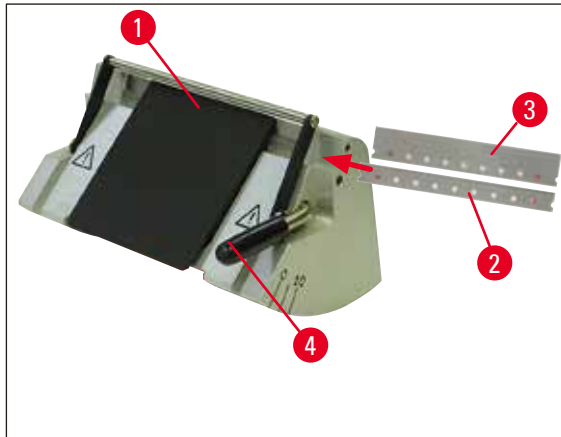


Fig. 33

- Fold knife guard (→ Fig. 33-1) downward.
- To insert the blade, rotate clamping lever (→ Fig. 33-4) forward.
- Carefully push in the blade (→ Fig. 33-2) or (→ Fig. 33-3) from the side.
- To clamp the blade, rotate clamping lever (→ Fig. 33-4) back upwards.

**Changing the rear pressure plate (→ Fig. 34-1)**

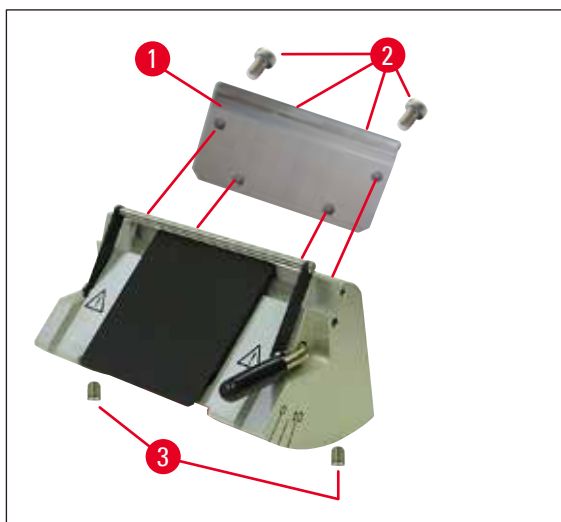


Fig. 34

- Loosen and unscrew the four screws (→ Fig. 34-2) on the rear side of the knife holder using a Hexagon key with handle, No. 4.
- Remove pressure plate (→ Fig. 34-1).
- Fasten the new pressure plate using the 4 screws (→ Fig. 34-2). When doing so, tighten the screws only far enough that the height and parallelism of the pressure plate can then be adjusted.

## 5 Operation

### Adjusting the rear pressure plate



#### Warning

After each uninstallation or replacement, make sure the pressure plate sits correctly.  
If necessary, readjust it.

The rear pressure plate (→ Fig. 35-3) rests on two stud screws (→ Fig. 34-3), which enable height and parallel adjustment.

They can be accessed through bores on the bottom of the knife holder. A Hexagon key No. 2 is required to make the adjustment.

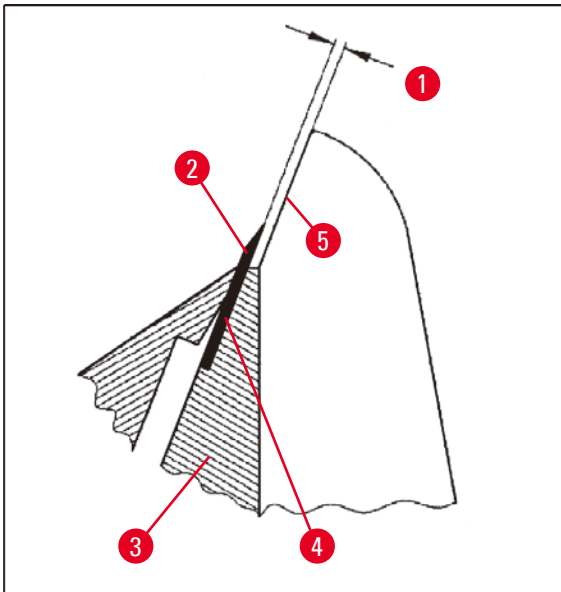


Fig. 35

(→ Fig. 35-1) 0.1 - 0.2 mm

- Insert the pressure plate (→ Fig. 35-3) and tighten the screws (→ Fig. 34-2) only far enough that the pressure plate remains movable.
- Adjust the pressure plate with the stud screws (→ Fig. 34-3) so that the contact surface (→ Fig. 35-4) for the blade (→ Fig. 35-2) stands approx. 0.1 - 0.2 mm higher than the footprint of the side flanges of the knife holder (→ Fig. 35-5).  
This is important primarily for instruments whose knife holder base has no lateral movement.
- When making an adjustment, make sure that the pressure plate is aligned parallel to the side flanges of the knife holder.
- Tighten the screws (→ Fig. 34-2).

### Adjusting the front pressure plate

The height of the front pressure plate can be adjusted using the stud screws (→ Fig. 36-1) on the bottom of the knife holder. They can be accessed through bores on the bottom of the knife holder. A Hexagon key No. 2 is required to make the adjustment.

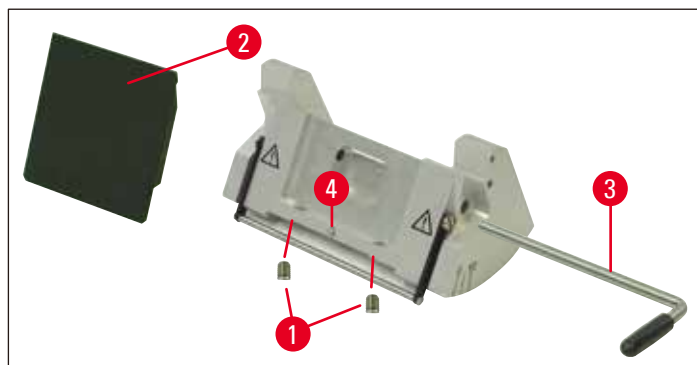


Fig. 36

- Bring the pressure plate (→ Fig. 36-2) into position, insert the clamping lever (→ Fig. 36-3), and use the clamping lever to clamp the pressure plate only lightly.
- Adjust the height of the pressure plate using the screws (→ Fig. 36-1).  
The upper edges of the two pressure plates (→ Fig. 36-2) and (→ Fig. 35-3) must be at the same height and parallel to one another.

The clearance angle of the front pressure plate (→ Fig. 36-2) is adjusted with a stud screw (→ Fig. 36-4) that is accessible at an angle from inside through a bore on the bottom of the knife holder (→ Fig. 36).

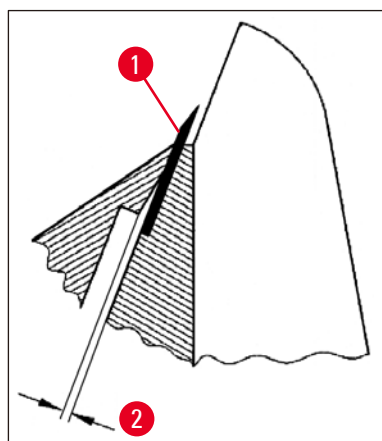


Fig. 37

- (→ Fig. 37-2) approx. 0.05 mm
- (→ Fig. 38-1) 0.4 - 0.8 mm

## 5 Operation

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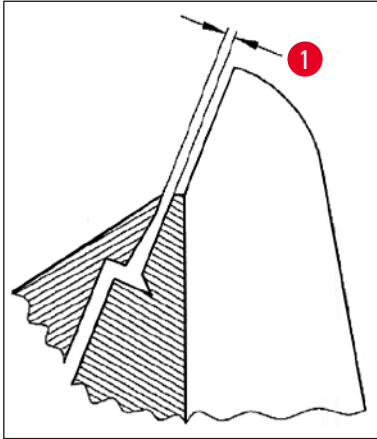


Fig. 38

- Insert a blade (→ Fig. 37-1) and clamp it lightly using the clamping lever (→ Fig. 36-3).
- Use the screw (→ Fig. 36-4) to adjust the pressure plate (→ Fig. 36-2) so that only the upper edge of the pressure plate puts pressure on the blade. A gap must be visible (→ Fig. 37). A small screwdriver (approx. 3.0 x 70) is required to make the adjustment.
- When making the adjustment, make sure that the distance between both pressure plates is approx. 0.4-0.8 mm when open (→ Fig. 38-1).



5.9.10 Overview – accessories

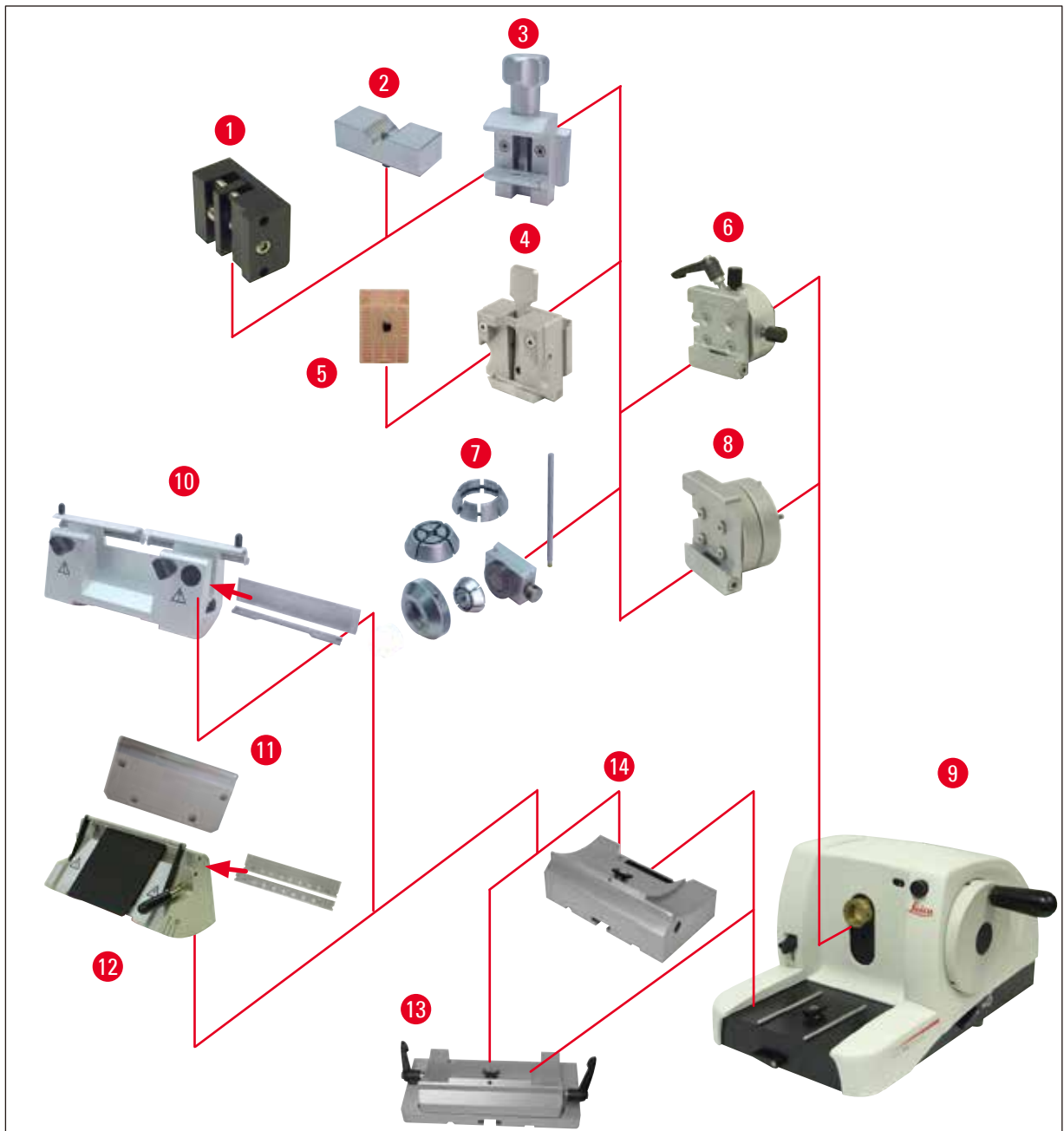


Fig. 39

- (→ Fig. 39-1) Foil clamp Type I
- (→ Fig. 39-2) Vee insert for round specimens
- (→ Fig. 39-3) Standard specimen clamp
- (→ Fig. 39-4) Universal cassette clamp
- (→ Fig. 39-5) Standard cassette
- (→ Fig. 39-6) Specimen holder fixture, directional
- (→ Fig. 39-7) Round specimen holder
- (→ Fig. 39-8) Specimen holder fixture, non-orientable

- (→ Fig. 39-9) Leica RM2125 RTS Basic instrument
- (→ Fig. 39-10) Knife holder N for steel and carbide metal knives
- (→ Fig. 39-11) Pressure plate, interchangeable
- (→ Fig. 39-12) Knife holder E for blades
- (→ Fig. 39-13) Knife holder base with lateral movement
- (→ Fig. 39-14) Knife holder base, non-orientable

## 6. Cleaning and Maintenance

### 6.1 Cleaning the instrument



#### Warning

Always remove the knife / blade before detaching the knife holder from the instrument.

Always put the knives back into the knife case when not in use!

Never place a knife anywhere with the cutting edge facing upwards and never try to catch a falling knife!

Clean steel knives using an alcohol-based solution or acetone.

When using cleaning agents, observe the manufacturer's safety instructions and the laboratory regulations valid in the country of use.

Do not use any of the following for cleaning the outside surfaces of the instrument: alcohol, detergents containing alcohol (window cleaner!), abrasive cleaning powders, solvents containing acetone or xylene. Xylene or acetone will damage the finished surfaces!

Ensure that liquids do not enter the interior of the instrument during cleaning!



#### Warning

Oil is spilled and not cleaned-up immediately.

**Serious injury of persons, for example, by slipping and getting in contact with dangerous parts like the knife/blade of the instrument.**

- Always make sure that no oil is spilled.
- If oil has been spilled, clean it up immediately, thoroughly and completely.

#### Before each cleaning, carry out the following preparatory steps:

- Move the specimen clamp to the upper end position and activate the handwheel lock.
- Remove the blade from the knife holder and insert it in the receptacle at the bottom of the dispenser, or remove the knife from the knife holder and put it back in the knife case.
- Remove knife holder base and knife holder for cleaning.
- Remove the specimen from the specimen clamp.
- Remove section waste with a dry brush.
- Remove specimen clamp and clean separately.

#### Instrument and outside surfaces

If necessary, the varnished outside surfaces can be cleaned with a mild commercial household cleaner or soap water and then be dried with a moist cloth.

## Knife holder E

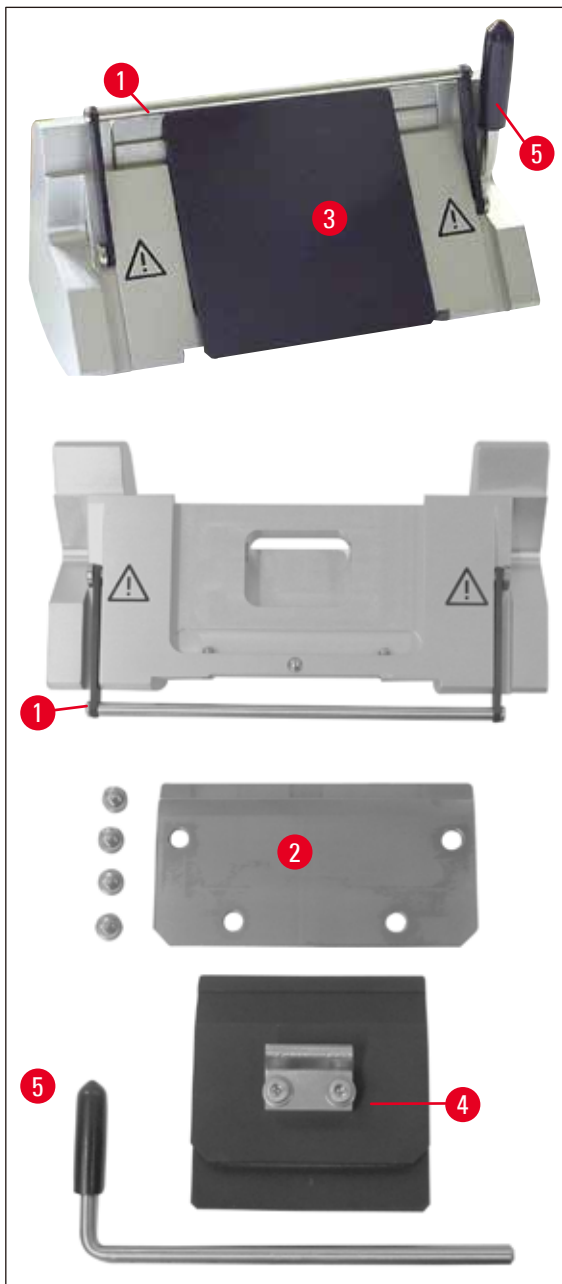


Fig. 40

Take the knife holder apart for cleaning. The front pressure plate can be removed for cleaning.

To do so, proceed as follows:

- Fold knife guard (→ Fig. 40-1) downward.
- Rotate the blade clamping lever (→ Fig. 40-5) downward.
- Carefully remove the blade and dispose of it properly.
- Pull out the clamping lever (→ Fig. 40-5) sideways.
- Remove pressure plate (→ Fig. 40-4).
- Clean all parts of the knife holder.



### Note

If several knife holders are cleaned at the same time, the parts must **NOT** be mixed up! Failure to adhere to this may result in sectioning problems!



### Warning

For cleaning and removal of paraffin, do not use xylene or cleaning fluids containing alcohol (e.g. glass cleaner).

- Lay the removed parts on an absorbent cloth into the drying chamber (up to a max. of 65°C) and let the paraffin contamination run off.



### Warning

There is a burn hazard when removing the parts from the drying chamber (65°C). Wearing safety gloves is recommended!

- After cleaning the moving parts, apply a thin coat of drive part oil to them (→ p. 54 – 6.2 Maintenance instructions).
- Reassembly takes place in reverse order.
- When performing the installation, make sure that the upper edge of the pressure plate (→ Fig. 40-4) is parallel and level with the upper edge of the rear pressure plate (→ Fig. 40-2) (see also (→ p. 45 – Fig. 34), (→ p. 46 – Fig. 35)). If necessary, adjust the pressure plates (→ p. 49 – 5.9.10 Overview – accessories).

## Universal cassette clamp

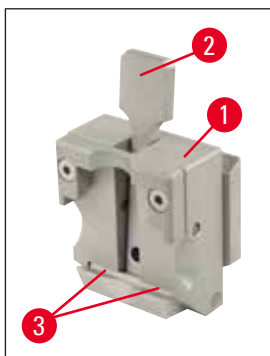


Fig. 41

- Detach cassette clamp (→ Fig. 41-1) for a thorough cleaning, removing all paraffin residues.
- For cleaning, do not use xylene. Use xylene substitutes or paraffin removers such as "Para Gard."
- The cassette clamp (→ Fig. 41-1) can also be placed in a drying chamber heated to a maximum of 65°C, until the liquid wax escapes.



### Warning

There is a burn hazard when removing the parts from the drying chamber (65°C). Wearing safety gloves is recommended!

- Remove paraffin residues with a dry cloth.
- After such a cleaning procedure in an oven, always be sure to lubricate the axle and spring of the clamping lever (→ Fig. 41-2) (see also (→ p. 54 – 6.2 Maintenance instructions)).

### 6.2 Maintenance instructions



#### Warning

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

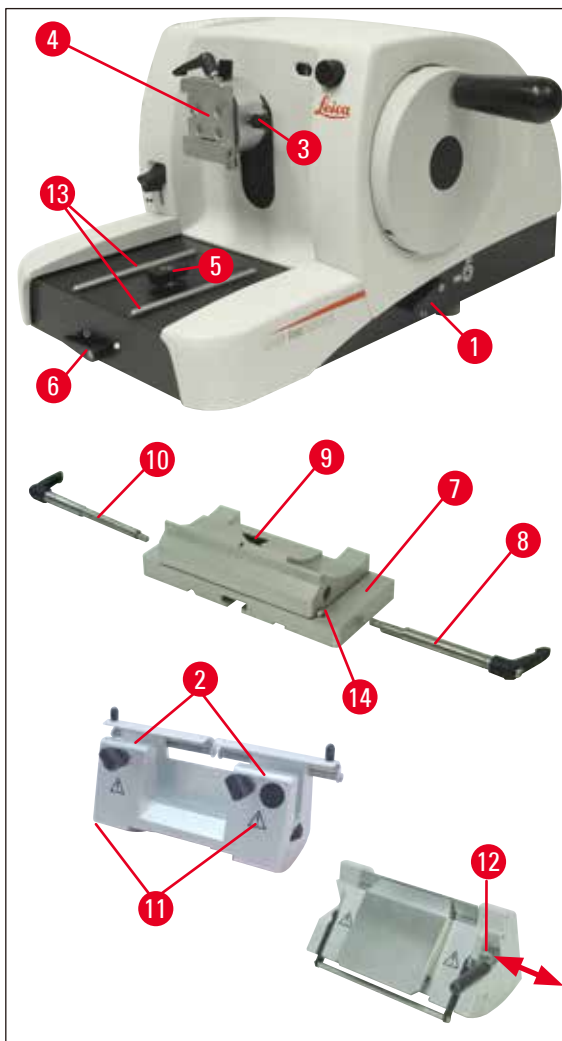


Fig. 42

The instrument is basically maintenance-free. To ensure trouble-free operation of the instrument over a long period of time, the following is recommended:

- Have the instrument checked at least once a year by a qualified service technician authorized by Leica.
- At the end of the warranty period, enter into a service contract. For more information, please contact your local Leica technical service center.
- Clean the instrument every day.

- Once a month, lubricate the following parts with the included oil (1-2 drops are enough):
- The movable parts of the specimen holder fixture (→ Fig. 42-10) and the dovetail receptacle (→ Fig. 16).
- T-piece (→ Fig. 42-5) on the microtome base plate.
- Clamping levers (→ Fig. 42-1) and (→ Fig. 42-6) on the microtome.
- Guide rails (→ Fig. 42-13) for the knife holder base on the microtome base plate.
- The clamping lever (→ Fig. 42-10) and (→ Fig. 42-8) on the right and left on the knife holder base.
- The guide (→ Fig. 42-14) of the lateral movement on the knife holder base (→ Fig. 42-7).
- The T-piece (→ Fig. 42-9) on the knife holder base (→ Fig. 42-7).
- The sliding surfaces of the knife guard (→ Fig. 42-2) and knurled nuts (→ Fig. 42-11) on knife holder N.
- The clamping lever (→ Fig. 42-12) on knife holder E.
- Shaft (→ Fig. 41-3) of the clamping lever of the cassette clamp (→ Fig. 41).

## 7. Optional Accessories

Designation	Order No.
Knife holder base, non-orientable, silver	14 0502 37962
Knife holder base, can be moved laterally, silver	14 0502 37992
Knife holder N, silver	14 0502 37993
Knife holder NZ, silver	14 0502 37994
Knife holder E, for low-profile microtome blades, silver	14 0502 37995
Knife holder E, for high-profile microtome blades, silver	14 0502 37996
Knife holder pressure plate, for low-profile microtome blades	14 0502 29551
Knife holder pressure plate, for high-profile microtome blades	14 0502 29553
Knife holder E-TC for carbide metal disposable blades, silver	14 0502 37997
Leica 819 disposable blades – low-profile, 1 pack of 50	14 0358 38925
Leica 819 disposable blades – low-profile, 10 packs of 50	14 0358 38382
Leica 818 disposable blades – high-profile, 1 pack of 50	14 0358 38926
Leica 818 disposable blades – high-profile, 10 packs of 50	14 0358 38383
Disposable blades Leica TC-65	14 0216 26379
Knife 16 cm - profile c - steel	14 0216 07100
Knife 16 cm - profile d - steel	14 0216 07132
Knife 16 cm - profile d - carbide metal	14 0216 04813
Knife 16 cm - profile c - carbide metal	14 0216 04206
Knife case, variable	14 0213 11140
Specimen holder fixture, non-orientable, silver	14 0502 38006
Standard specimen clamp, silver	14 0502 37998
Vee insert, silver	14 0502 38000
Universal cassette clamp, silver	14 0502 37999
Foil clamp, Type I, black	14 0402 09307
Round specimen holder, with 3 clamping rings, silver	14 0502 38002
Section waste tray	14 0402 13128
Dust cover	14 0212 53157
Safety gloves, cut-resistant, size S	14 0340 40859
Safety gloves, cut-resistant, size M	14 0340 29011





Fig. 43

**Knife holder base, non-orientable**

silver for knife holders N, NZ, E, and E-TC

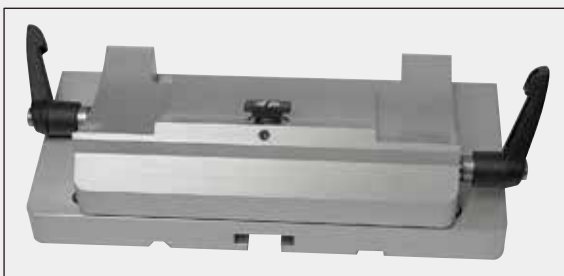
**Order No.:****14 0502 37962**

Fig. 44

**Knife holder base**

can be moved laterally for Leica RM2125 RTS, silver for knife holders N, NZ, E, and E-TC, incl. clamping lever

**Order No.:****14 0502 37992**

Fig. 45

**Knife holder N**

silver, for holding conventional knives up to 16 cm in length, height adjustment of the knife blade, separate clearance angle adjustment, movable knife guard.

**Order No.:****14 0502 37993**

Fig. 46

**Knife holder NZ**

silver for holding conventional and carbide metal knives up to 16 cm in length, knife pressure plate for extreme stability and full utilization of the knife blade, height adjustment of the knife blade, separate clearance angle adjustment, movable knife guard.

**Order No.:****14 0502 37994**



Fig. 47

**Knife holder E**

The knife holder E is optimized for usage with Leica Biosystems low profile disposable blades with the dimensions (L x H x W):

(80 +/-0.05) mm x (8 +/- 0.1) mm x (0.254 +/-0.008) mm,

for Leica RM2125 RTS, silver, quick clamping system, clearance angle adjustment, movable knife guard

Enclosed toolset:

- 1 Hexagon key with pin, No. 4.0 14 0222 33111
- 1 Hexagon key with handle, No. 2.0 14 0194 04790
- 1 screwdriver 3 x 50 14 0170 11568

**Order No.:**

**14 0502 37995**



Fig. 48

**Knife holder E**

The knife holder E is optimized for usage with Leica Biosystems high profile disposable blades with the blade dimensions (L x H x W):

(80 +/-0.05) mm x (14 +/-0.15) mm x (0.317 +/-0.005) mm,

Leica RM2125 RTS, silver, quick clamping system, clearance angle adjustment, movable knife guard

Enclosed toolset:

- Hexagon key with pin, No. 4.0 14 0222 33111
- Hexagon key with handle, No. 2.0 14 0194 04790
- Screwdriver 3 x 50 14 0170 11568

**Order No.:**

**14 0502 37996**



Fig. 49

**Knife holder pressure plate S**

22°, for low-profile microtome blades

**Order No.:** 14 0502 29551

22°, for high-profile microtome blades

**Order No.:** 14 0502 29553



Fig. 50

**Knife holder E-TC**

for carbide metal disposable blades TC-65, silver quick clamping system, rustproof clamping plate made of stainless steel, rear pressure plate made of carbide metal

**Order No.:** 14 0502 37997



Fig. 51

**Disposable blades – low-profile (819)**

Dimensions (L x H x W):

(80 +/-0.05) mm x (8 +/-0.1) mm x (0.254 +/-0.008) mm

01 package of 50 pcs

**Order No.:** 14 0358 38925

10 packages of 50 pcs

**Order No.:** 14 0358 38382



Fig. 52

**Disposable blades – high-profile (818)**

Dimensions (L x H x W):

(80 +/-0.05) mm x (14 +/-0.15) mm x (0.317 +/-0.005) mm

01 package of 50 pcs

**Order No.:** 14 0358 38926

10 packages of 50 pcs

**Order No.:** 14 0358 38383



Fig. 53

**Disposable blades Leica TC-65**

Leica TC-65 microtome, disposable blade system for sectioning hard specimen materials. The Leica TC-65 carbide metal disposable blades were specially developed for the requirements in labs where hard, blunt materials are routinely sectioned. The one-of-a-kind fine-grain carbide metal guarantees sections to approx. 1  $\mu\text{m}$ . The blades are fully recyclable.

Length: 65 mm  
 Thickness: 1 mm  
 Height: 11 mm  
 1 pack of 5 pcs.

**Order No.:** 14 0216 26379

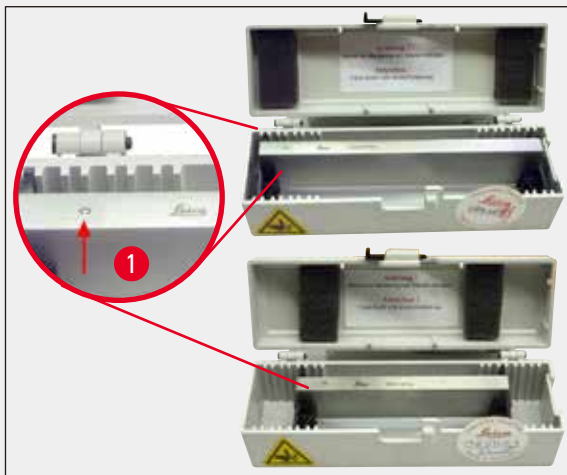


Fig. 54

**Knife 16 cm - profile c - steel**

Knife, 16 cm long, profile c  
 Note: Knife case 14 0213 11140 included

**Order No.:** 14 0216 07100

(→ Fig. 54-1) Profile



Fig. 55

**Knife 16 cm, profile d - steel**

Knife, 16 cm long, profile d  
 Note: Knife case 14 0213 11140 included

**Order No.:** 14 0216 07132



Fig. 56

**Knife, 16 cm, profile d, tungsten carbide**

Knife, 16 cm long, tungsten carbide, profile d  
 Note: Knife case 14 0213 11140 included

**Order No.: 14 0216 04813**

**Knife 16 cm, profile c, tungsten carbide**

Knife, 16 cm, tungsten carbide, profile c  
 Note: Knife case 14 0213 11140 included

**Order No.: 14 0216 04206**

(→ Fig. 56-1) Serial number carbide metal knife



Fig. 57

**Knife case**

Variable knife case (plastic),  
 for 1 or 2 knives: 10 - 16 cm long  
 (Carbide metal or SM2500 knife: only for 1 knife!)

**Order No.: 14 0213 11140**



Fig. 58

**Specimen holder fixture**

non-orientable  
Leica RM2125 RTS, silver

**Order No.:** 14 0457 46996

**Note**

To modify your microtome with these accessories, please contact your Leica representative or the Technical Service department of Leica Biosystems Nussloch GmbH.



Fig. 59

**Standard specimen clamp**

40 x 40 mm  
with adapter, silver

**Order No.:** 14 0502 37998

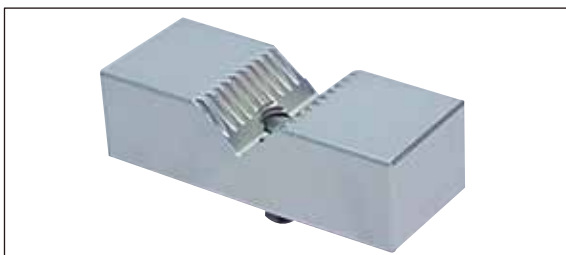


Fig. 60

**Vee insert**

for standard specimen clamp,  
silver

**Order No.:** 14 0502 38000



Fig. 61

**Universal cassette clamp**

with adapter

Leica RM2125 RTS, silver

For use with standard cassettes with dimensions that are 39.8 x 28 mm at minimum and 40.9 x 28.8 mm at maximum.

**Order No.:**

**14 0502 37999**



Fig. 62

**Foil clamp Type I**

for standard specimen clamp, black

Maximum specimen size: 25 x 13 mm

**Order No.:**

**14 0402 09307**

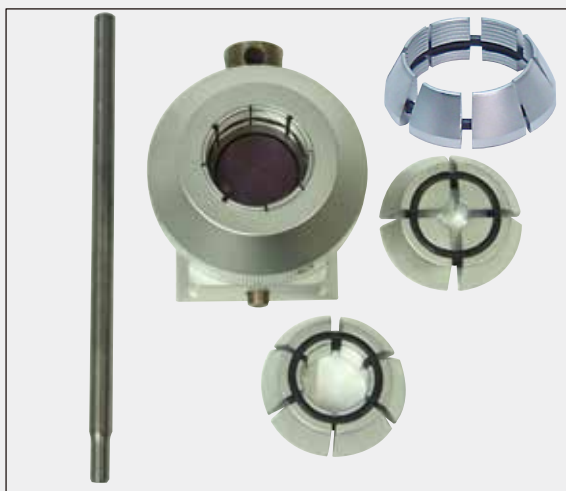


Fig. 63

**Round specimen holder**

with adapter,

with 3 clamping rings, silver

**Order No.:**

**14 0502 38002**

## 7 Optional Accessories

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Fig. 64

### Section waste tray

**Order No.:** 14 0402 13128



Fig. 65

### Dust cover

**Order No.:** 14 0212 53157



Fig. 66

### Safety gloves

cut-resistant, size S

**Order No.:** 14 0340 40859

cut-resistant, size M

**Order No.:** 14 0340 29011



## 8. Troubleshooting



### Note

In the following table there is a list of the most common problems which can arise while working with the instrument, along with possible causes and troubleshooting procedures.

### 8.1 Possible faults

Problem	Possible cause	Corrective action
<p><b>1. Thick/thin sections</b></p> <p>The sections alternate between being thick and thin, or there is chattering in the sections, or the specimen is torn out of the embedding. In extreme cases, there are no sections whatsoever.</p>	<ul style="list-style-type: none"> <li>Blade, knife holder or orientation is not clamped properly.</li> </ul>	<ul style="list-style-type: none"> <li>Check that the cassette is securely clamped in the universal cassette clamp.</li> <li>If the universal cassette clamp is soiled by wax, clean the UCC (→ p. 51 – 6.1 <a href="#">Cleaning the instrument</a>).</li> <li>When using cassettes whose lid is molded on, check that the broken edge allows the cassette to be clamped securely; if necessary, remove burrs or clamp the cassette into the universal cassette clamp horizontally instead of vertically.</li> <li>If the cassette dimensions are within the specified tolerances and the cassette still cannot be securely clamped into place, it may be that the universal cassette clamp is configured incorrectly or is defective. In this case, have Technical Service inspect and reconfigure the universal cassette clamp.</li> <li>When using cassettes, particularly thin-walled cassettes, from a company other than than Leica Biosystems, the cassette may become deformed or other clamping problems may arise. If while trying to clamp the cassette you realize that it is not securely clamped into place, an alternative tensioning clamp must be used.</li> </ul>

Problem	Possible cause	Corrective action
	<ul style="list-style-type: none"> <li>The blade is dull.</li> <li>The pressure plate is damaged or incorrectly adjusted.</li> <li>Clearance angle of the knife/ blade too small.</li> </ul>	<ul style="list-style-type: none"> <li>Laterally displace the knife holder or insert a new blade.</li> <li>Insert a new pressure plate or use a new knife holder.</li> <li>Methodically experiment with larger clearance angle settings until you have found the optimum angle.</li> </ul>
<p><b>2. Section compression</b></p> <p>The sections are very compressed, show folds or are squeezed together.</p>	<ul style="list-style-type: none"> <li>The blade is dull.</li> <li>The specimen is too warm.</li> <li>The sectioning speed is too fast.</li> </ul>	<ul style="list-style-type: none"> <li>Use another area of the blade or a new blade.</li> <li>Cool the specimen before sectioning.</li> <li>Reduce the sectioning speed.</li> </ul>
<p><b>3. "Stripes" in sections</b></p> <p>For knife holder E</p>	<ul style="list-style-type: none"> <li>There is an accumulation of paraffin on the rear pressure plate of the knife holder.</li> </ul>	<ul style="list-style-type: none"> <li>Remove paraffin from this area on a regular basis.</li> </ul>
<p><b>4. Noises during sectioning</b></p> <p>The knife "sings" when sectioning hard specimens. The sections show scratches or chatter marks.</p>	<ul style="list-style-type: none"> <li>The sectioning speed is too fast.</li> <li>The clearance angle is too wide.</li> <li>Insufficient clamping of specimen and/or knife holder.</li> </ul>	<ul style="list-style-type: none"> <li>Turn the handwheel at a slower speed.</li> <li>Methodically reduce the clearance angle setting until you have found the optimum angle.</li> <li>Check all screw and clamp connections on the specimen holder system and the knife holder. If necessary, tighten the levers and screws.</li> </ul>

## 8.2 Instrument malfunctions

Problem	Possible cause	Corrective action
<b>1. There is no further feed motion and thus no sectioning.</b>	<ul style="list-style-type: none"> <li>The front end position has been reached.</li> </ul>	<ul style="list-style-type: none"> <li>Run the specimen back by turning the coarse driving wheel.</li> </ul>
<b>2. High blade consumption</b>	<ul style="list-style-type: none"> <li>Too great of a sectioning force was applied.</li> </ul>	<ul style="list-style-type: none"> <li>Adjust the sectioning speed and/or section thickness when trimming. Select a smaller section thickness, rotate the handwheel more slowly.</li> </ul>

---

## **9. Warranty and Service**

### **Warranty**

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

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

### **Service Information**

If you are in need of technical customer support or spare parts, please contact your Leica representative or the Leica dealer where you purchased the instrument.

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
- Delivery date

### **Decommissioning and Disposal**

The instrument or parts of the instrument must be disposed of according to existing applicable, local regulations.

**10. Decontamination Confirmation**

Every product that is returned to Leica Biosystems or that requires on-site maintenance must be properly cleaned and decontaminated. You can find the dedicated template of the decontamination confirmation on our website [www.LeicaBiosystems.com](http://www.LeicaBiosystems.com) within the product menu. This template has to be used for gathering all required data.

When returning a product, a copy of the filled and signed confirmation has to be enclosed or passed on to the service technician. The responsibility for products that are sent back without this confirmation or with an incomplete confirmation lies with the sender. Returned goods that are considered to be a potential source of danger by the company will be sent back at the expense and risk of the sender.



www.LeicaBiosystems.com



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Leica Biosystems Nussloch GmbH  
Heidelberger Strasse 17 - 19  
D-69226 Nussloch  
Germany

Tel.: +49 - (0) 6224 - 143 0  
Fax: +49 - (0) 6224 - 143 268  
Web: www.LeicaBiosystems.com

