



# Leica RM2125/ Leica RM2125 RT

## Rotary microtome



### **Instruction manual**

Leica RM2125 / RM2125 RT

V2.3 English - 02/2009

Always keep this manual together with the instrument.

Read carefully before working with the instrument.

**Leica**  
MICROSYSTEMS



## NOTE

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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.

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

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## 1.1 Symbols in the text and their meaning



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



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

(5)

Figures in brackets refer to item numbers in drawings.

## 1.2 Qualification of personnel

- The Leica RM 2125 may be operated only by trained laboratory personnel.
- All laboratory personnel designated to operate the Leica RM2125 must read this instruction manual carefully and must be familiar with all technical features of the instrument before attempting to operate the Leica RM2125.

## 1.3 Designated use

The Leica RM2125 / Leica RM2125 RT are manually operated rotary microtomes, used to produce thin sections of specimens of different hardness in both routine and research applications in biology, medicine and industry.

They are designed to section soft materials embedded in paraffin as well as harder specimens, provided those specimens are still suitable for manual sectioning.

**Any other use of the instrument is considered improper!**

## 1.4 Instrument type

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

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



Fig. 1

## 2. Safety

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

### 2.1 Safety instructions

This instruction manual contains important instructions and information regarding the operational safety and maintenance of the instrument. The instruction manual is an important part of the product, which must be read carefully prior to setup and use and must always be kept near the instrument.



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

This instrument was built and tested in accordance with machinery directive 98/37/EC and the safety regulations for laboratory devices as specified below:

The latest information on the standards applied can be found in the CE declaration of conformity on the Internet under:

**[www.histo-solutions.com](http://www.histo-solutions.com)**

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 may neither be removed nor modified. Only authorized and qualified service personnel 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.

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 cleans the instrument.

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

### Warnings - safety instructions / warning labels attached to the instrument



- Safety instruction labels on the instrument marked with a warning triangle indicate that the correct operating instructions (as described in this manual) must be followed when operating or replacing the instrument component bearing the label. Failure to adhere to these instructions may result in an accident, personal injury, damage to the instrument or accessory equipment.

### Warnings - Transport and installation



- Once uncrated, the instrument may only be transported in an upright position.
- For transport, do not grab the instrument neither by the handles of the handwheel or coarse feed wheel nor by the section thickness adjusting knob.
- The protective devices on both instrument and accessories must neither be removed nor modified.

### Warning - Operating the instrument



- Be very careful when handling microtome knives or blades. The knife or blade edges are extremely sharp and can cause severe injuries!
- Always remove the knife / blade before detaching the knife holder from the instrument. Knives that are not in use should always be stored in the knife case!
- 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.
- 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!
- Always wear safety goggles when sectioning brittle specimens! Specimen may splinter!
- No fluid must enter the interior of the instrument during work!
- Leica RM2125 RT only:  
Specimen blocks must not be oriented during the retraction phase.  
If a block is oriented during retraction, prior to the next section the block will advance by the retraction value PLUS the selected section thickness. This may cause damage to both specimen and knife!

## 2. Safety

### Warnings - cleaning and maintenance



- Only authorized and qualified service personnel may repair the instrument and access the instrument's internal components.
- Lock the handwheel before you starting to clean the instrument!
- Do not use any solvents containing acetone or xylene for cleaning!
- No fluid must enter the interior of the instrument during cleaning!
- When using cleaners, comply with the safety instructions of the manufacturer and the labor-safety regulations of your laboratory!

### 2.3 Integrated safety devices

The instrument is equipped with the following protection features:

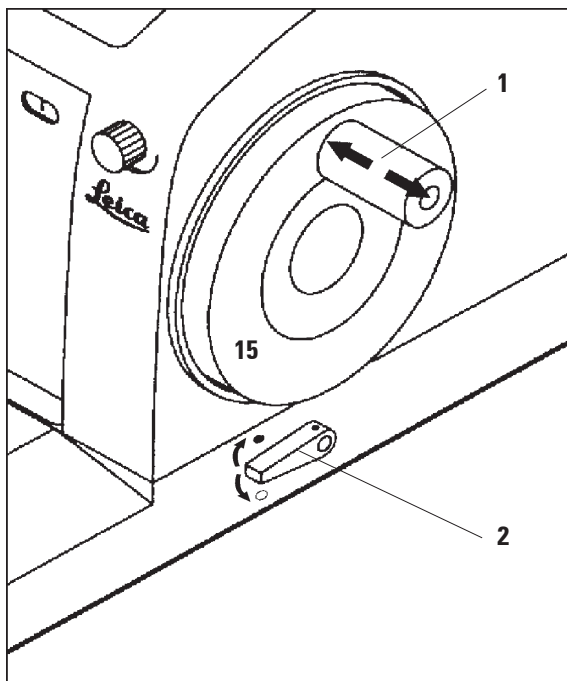


Fig. 2

Lever in ● position = handwheel locked  
Lever in ○ position = handwheel released

#### Handwheel locking mechanism

The handwheel (15) can be locked in the 12-o'clock position (Fig. 2).

When pushing the handwheel handle (1) inwards (to the left), the handwheel will lock in place when next reaching the 12-o'clock position.

Function check:

- To activate the locking mechanism, push the handle (1) to the left. The handwheel locks in place in the 12 o'clock position and cannot be rotated any further.
- To unlock the handwheel, pull the handle (1) outwards (to the right).

#### Handwheel brake

With the lever (2) on the right side of the microtome base plate, the handwheel brake can be activated with the handle in any position. When the lever is pushed upward, the handwheel is locked in position. Two symbols on the microtome base plate indicate the 'locked' and 'unlocked' position (Fig. 2).



### Knife guard on the knife holder

All knife holders are equipped with a permanent knife guard (3, 5) capable of covering the entire length of the knife / blade edge in any position.



**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!**

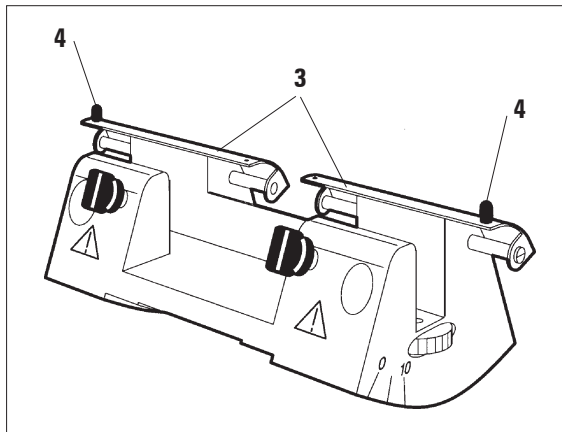


Fig. 3

### Knife holder N

The knife guard (3) of the knife holder N can be easily positioned via the two buttons (4) (Fig. 3).

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

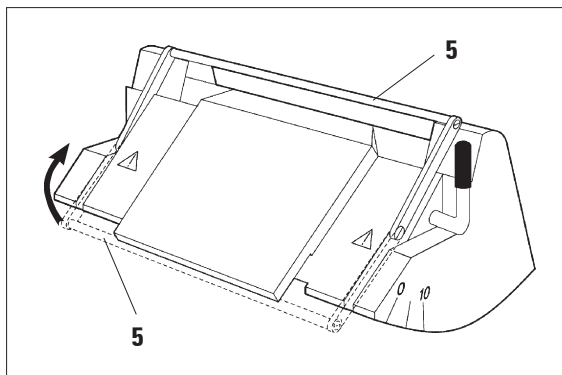


Fig. 4

### Knife holder E

The knife guard of the knife holder E consists of a hinged shackle (5).

To cover the edge, turn the shackle (5) upwards as shown in Fig. 4.

### 3. Instrument components and specifications

#### 3.1 Overview - instrument components

##### Leica RM2125

Universal  
Cassette clamp

Knife holder N

Knife holder base,  
without lateral  
displacement feature

Clamping lever for  
knife holder base



Fixture for specimen  
clamps, non-orientable

Handwheel  
handle with  
locking  
mechanism

Smooth-turning  
handwheel

Lever for activating  
the handwheel  
brake

Fig. 5

##### Leica RM2125 RT

Orientable fixture for  
specimen clamps

Coarse feed  
wheel

Lever for activating  
the mechanical  
trimming function

Clamping lever for  
lateral displacement  
function of knife  
holder



Control knob  
for section  
thickness setting

Section  
thickness  
indication

Knife holder E

Knife holder base  
with lateral  
displacement  
feature

Fig. 6

### 3.2 Instrument specifications

The Leica RM2125 and Leica RM2125 RT are manually operated rotary microtomes.

- The advance and vertical stroke mechanisms run on cross roller guides that are free from backlash and maintenance-free. Both mechanisms as well as the coarse feed system are protected by a dust-proof plastic housing.
- The handwheel can be locked in the 12 o'clock position via the handwheel handle. In addition, a handwheel brake mechanism allows you to lock the handwheel in any position via a locking lever integrated into the base plate.
- Sectioning is done manually by rotating the exceptionally smooth-running, counterbalanced handwheel. .
- The coarse feed function is operated via the coarse feed wheel on the left side of the instrument housing.
- Section thickness is selected via a turning control knob and indicated in the small window integrated into the instrument housing. Section thickness settings from 0.5 to 60  $\mu\text{m}$  can be selected.
- Both models are equipped with a slot cover preventing section waste from entering the interior of the instrument.

Both the Leica RM2125 and Leica RM2125 RT are available in two versions:

1. Leica RM2125 / RM2125 RT, course-feed wheel left, clockwise sense of rotation.
2. Leica RM2125 / RM2125 RT, course-feed wheel left, counterclockwise sense of rotation.

The direction of feed of the coarse feed wheel is indicated by an arrow.

#### Leica RM2125 RT - additional features

- A mechanical trimming function, activated via a lever and featuring 10  $\mu\text{m}$  and 50  $\mu\text{m}$  trimming thickness.
- Specimen retraction, designed to protect both knife and specimen. During the return stroke, the specimen is pulled back from the knife by 220  $\mu\text{m}$ . Prior to the next section, the specimen advances by the selected section thickness plus the retraction value.

### 3. Instrument components and specifications

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#### 3.3 Technical data

##### General

Approvals:	The instrument-specific marks are located on the rear panel of the instrument next to the name plate
Operating temperature range:	+10 °C to +40 °C
Section thickness setting range:	0.5 - 60 µm
Section thickness selection:	from 0 - 2 µm in 0.5-µm steps from 2 - 10 µm in 1-µm steps from 10 - 20 µm in 2-µm steps from 20 - 60 µm in 5-µm steps
Total horizontal specimen feed:	25 mm
Vertical specimen stroke:	59 mm
Specimen retraction (RM2125 RT only):	220 µm

##### Dimensions and weight

Width	400 mm
Depth	470 mm
Height	295 mm
Working height (knife edge)	105 mm
Weight (without accessories)	29 kg

##### Optional features and optional accessories

Specimen orientation (optional)	
horizontal:	8 °
vertical:	8 °
Rotability:	± 90 °
Trimming thickness (RM2125 RT only):	10 µm, 50 µm
Knife holder base with lateral displacement feature:	
north-south:	± 25 mm
east-west:	± 20 mm
Knife holder base without lateral displacement feature:	
north-south:	± 25 mm

### 4.1 Installation site requirements

- Stable, vibration-free laboratory bench with horizontal and even table top; practically vibration-free floor.
- No other instruments nearby which might cause vibrations.
- Room temperature permanently between + 15 °C and + 40 °C.
- Unobstructed and convenient access to both handwheel and coarse feed wheel.

### 4.2 Standard delivery

The Leica RM2125 standard delivery includes:

1 Leica RM2125 basic instrument (without retraction) ..... 14 0457 37986

Basic instrument includes the following accessories:

1 Fixture for spec. clamps, orientable (attached to instrument) ... 14 0457 37990

1 Tool set - consisting of:

1 Allen key with handle, size 3 ..... 14 0194 04764

1 Allen key with handle, size 4 ..... 14 0194 04782

1 Allen key, size 8 ..... 14 0222 04143

1 bottle (50 ml) of oil for drives, type 405 ..... 14 0336 06086

1 dust protective cover (104 R) ..... 14 0212 04091

1 Instructions manual (+ language-CD) ..... 14 0498 80001

The above accessories plus any further accessories you ordered you will find in the cardboard box packed on top of the instrument (see [Fig. 7](#)).



**Carefully check the delivery against the packing list, delivery note and your order.**

**Should there be any discrepancy, please contact the Leica sales unit handling your order or your Leica dealer.**

## 4. Setup

### 4.3 Unpacking and installation

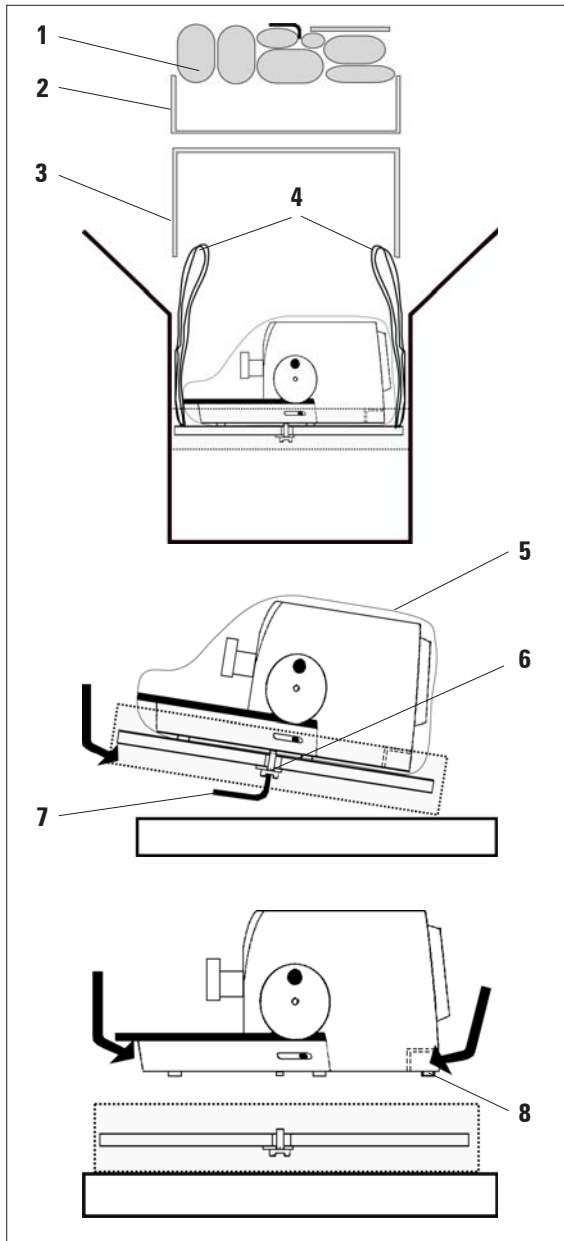


Fig. 7

- Open the crate.
- Remove all accessories (1) and the instruction manual.
- Remove Allen key, size 8 and set aside.
- Remove cardboard tray (2).
- Remove cushioning material.
- Remove cardboard cover (3).
- Use the two straps (4) attached to the front and back of the wooden pallet to remove the instrument from the crate.



**For transport, do not grab the instrument neither by the handles of the handwheel or coarse feed wheel nor by the section thickness adjusting knob.**

- Place wood pallet with instrument onto a stable bench.
- Grasp the front edge of the pallet and lift it slightly.
- Use size-8 Allen key (7) to remove the securing bolt (6) and washer located underneath the pallet.
- Cut open plastic cover (5) and remove.
- Grasp front and rear edge of instrument base plate and lift instrument from pallet.
- Place instrument on stable laboratory bench. Two sliders (8) attached to the base plate make it easier to move the instrument on the bench.
- To reposition the instrument, grasp the front edge of the base plate, lift the instrument slightly and slide it into the desired position.

## 4.4 Inserting the specimen clamp

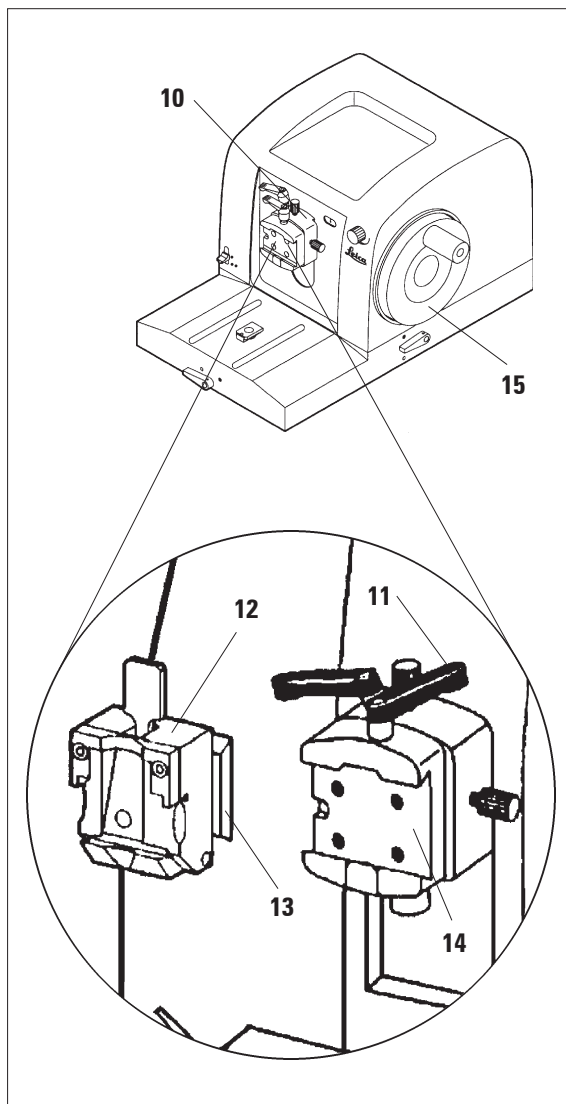


Fig. 8

The fixture for specimen clamps is available in two different versions – with and without specimen orientation – the two versions are interchangeable.

The specimen orientation feature allows you to orient the specimen surface without having to release the specimen clamping mechanism.

All specimen clamps listed in [chapter 5.8 'Accessories'](#) fit into the fixture.

To fasten a specimen clamp in the fixture, proceed as follows:

- With handwheel (15) move fixture (10) to uppermost position and activate the handwheel locking mechanism.
- Release clamping lever (11) (rotate counter-clockwise).
- Slide the dovetailed tenon (13) of the specimen clamp from the left into the dovetail mortise of the clamping device (14) of the fixture.
- To secure the specimen clamp, rotate the clamping lever (11) clockwise as far as it will go.

## 4. Setup

### 4.5 Fastening the specimen clamp directly to the fixture

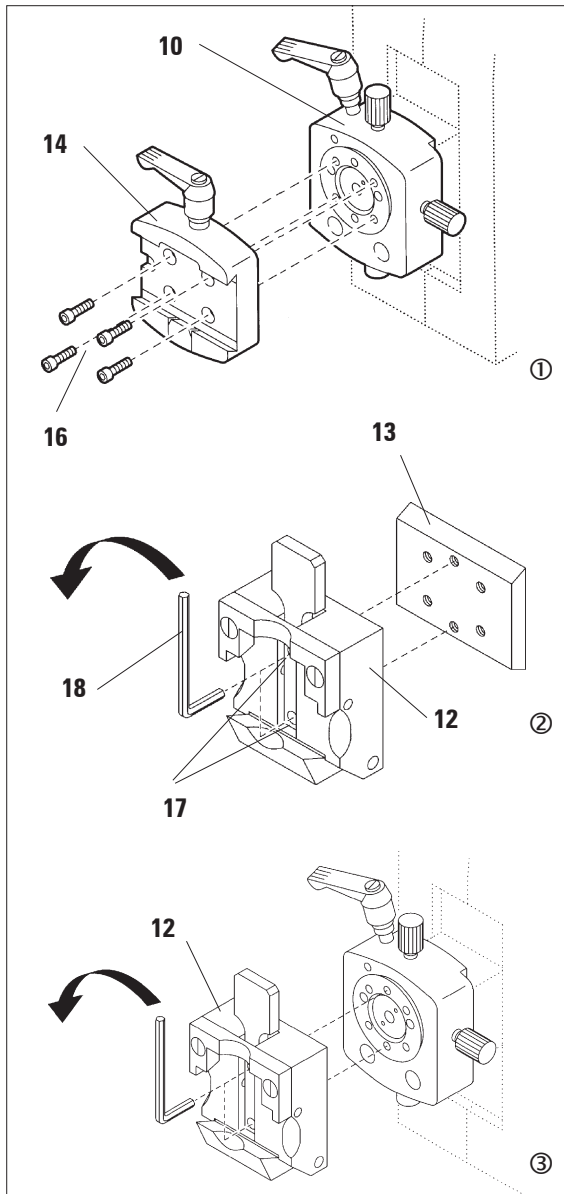


Fig. 9



The specimen clamps (standard or universal cassette clamp) can also be fastened directly to the fixture (without dovetail clamping system).

To do so, proceed as follows:

- Move fixture (10) to uppermost position (turning the handwheel) and activate the handwheel locking mechanism.
- Remove dovetail clamping device (14) from the fixture (Fig. 9.1).  
To do so, loosen the four screws (16) with an Allen key size 3 (18) and remove them.
- Remove the two screws (17) (use Allen key size 3) in order to detach the dovetail tenon (13) from the specimen clamp (12) (Fig. 9.2).
- Set specimen clamp (12) onto fixture for specimen clamps (see Fig. 9.3) and fasten with two screws (17).



#### 4.6 Mounting the knife holder base

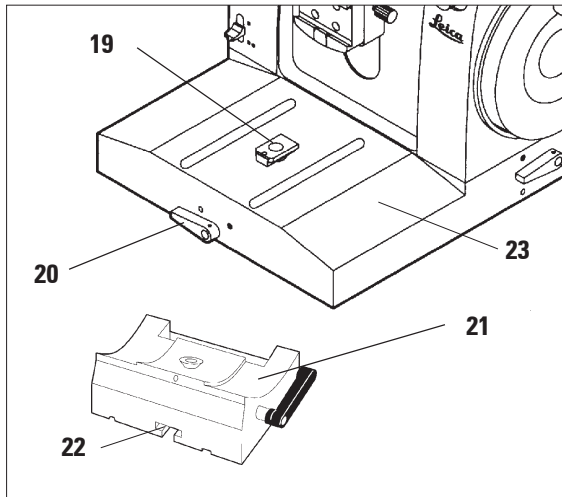


Fig. 10

- Rotate clamping lever (20) counterclockwise to release (position ○ = released).
- Slide groove (22) of universal knife holder base (21) onto T-piece (19) of microtome base plate (23).
- Rotate clamping lever (20) clockwise to secure the knife holder base on the microtome base plate (position ● = secured).

#### 4.7 Mounting the knife holder

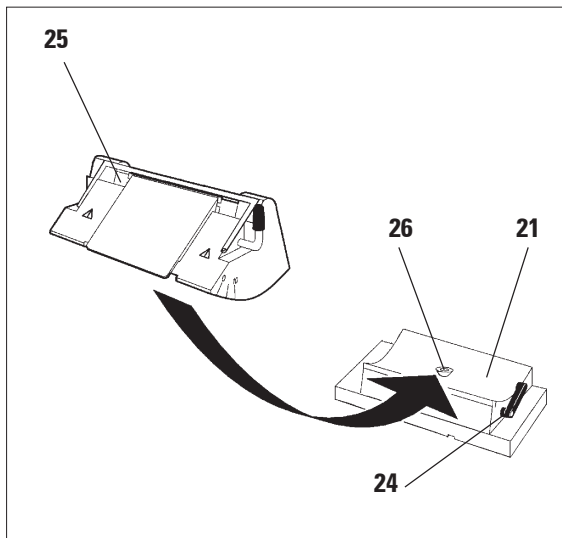


Fig. 11

- Rotate lever (24) counterclockwise to release.
- Slide groove of knife holder (25) onto T-piece (26) of knife holder base (21).
- Rotate lever (24) clockwise to clamp.

## 5. Operation

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### 5.1 Clamping the specimen



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

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!

- Rotate handwheel until specimen clamp is in uppermost position.
- Lock the handle of the handwheel in the 12 o'clock position.
- Insert a specimen block into the specimen clamp.



See [chapter 5.8](#) “Accessories” for details on how to insert the specimen block into the different types of specimen clamps.

### 5.2 Inserting the knife / disposable blade



Be very careful when handling microtome knives or blades. The knife or blade edges are extremely sharp and can cause severe injuries!

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



See [chapter 5.8](#) “Accessories” for details on how to insert the knife / blade into the different knife holders.

## 5.3 Adjusting the clearance angle

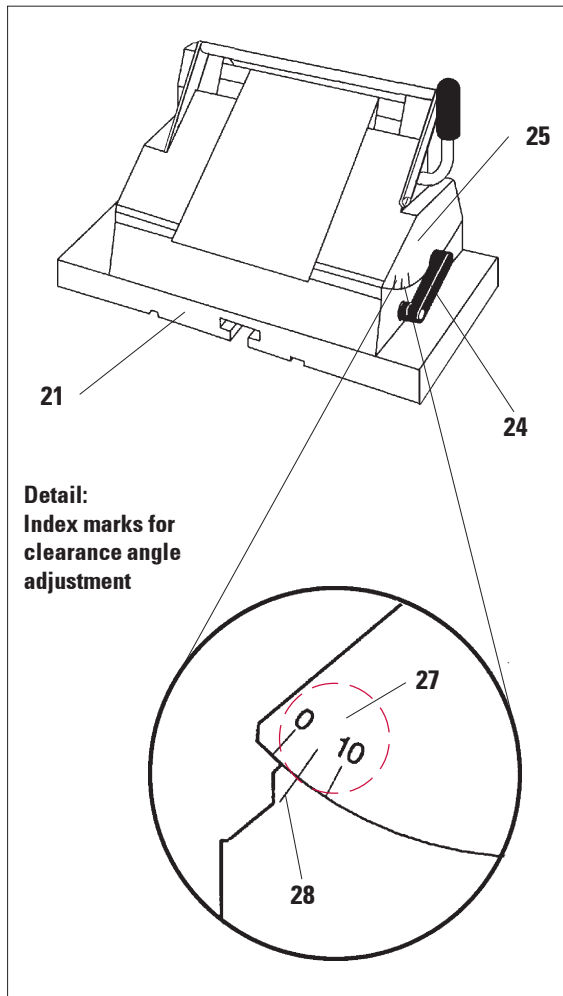


Fig. 12

- The index marks (0°, 5° and 10°) for adjustment of the clearance angle (27) are located on the right side of the knife holder (25).
- There is also an index mark (28) on the right side of the knife holder basis (21) which serves as a reference point when adjusting the clearance angle.
- Rotate lever (24) counterclockwise to release.
- 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°.



For knife holder E we recommend clearance angle settings between 1° and 3°.

- Hold the knife holder in the selected position and rotate lever (24) clockwise to clamp.

## 5. Operation

### 5.4 Orienting the specimen (possible only with orienting fixture for specimen clamps)

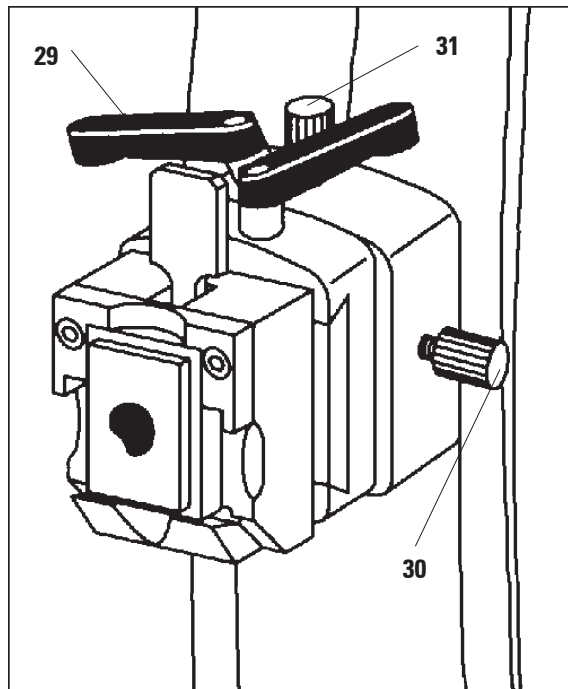


Fig. 13



When working with the large-size standard specimen clamp (50 x 55 mm), the north-south orientation can only be utilized up to an angle of about 4° instead of 8°.

The orientation feature allows you to adjust the position of the specimen surface without having to release the specimen clamping mechanism.

- Turn the coarse feed wheel until the fixture for specimen clamps (31) has reached the rear limit position (see [chapter 5.5](#)).
- Release the clamping lever (20, [Fig. 10](#)) on the front side of the microtome base plate and slide knifeholder base and knife holder to a position just before the specimen. See [Fig. 10, p.17](#) or [Fig. 26, p. 28](#).



**Important for Leica RM2125 RT!**  
Specimen blocks must not be oriented during the retraction phase!  
If a block is oriented during retraction, prior to the next section the block will advance by the retraction value PLUS the selected section thickness. This may cause damage to both specimen and knife!

- Move fixture for specimen clamps to uppermost position (turn handwheel) and lock the handwheel in 12 o'clock position.
- Rotate eccentric lever (29) counterclockwise to release the clamping mechanism.
- Turn adjusting screw (31) to orient the specimen in north-south direction. Turn adjusting screw (30) to orient the specimen in east-west direction.
- Rotate eccentric lever (29) clockwise to secure the clamping mechanism.

### 5.5 Trimming the specimen

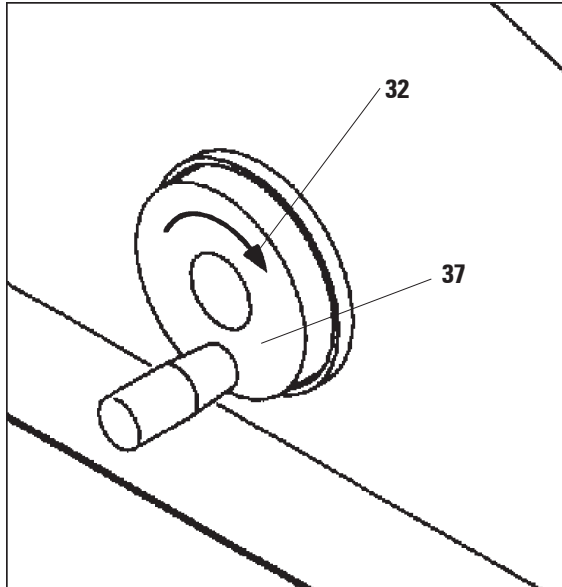


Fig. 14

#### Coarse feed wheel (37)

The coarse feed is used for fast horizontal specimen movement - forward, towards the knife - and backward, away from the knife.

The instrument is available either with coarse feed (37) in either clockwise or counterclockwise sense of rotation. An arrow (32) indicates the sense of rotation.

When the coarse feed wheel is rotated in the direction of the arrow, the specimen advances towards the knife.

Once the specimen block has reached the rear or front limit stop, the coarse feed wheel becomes difficult to turn; in the front limit position, the specimen feed mechanism stops working.

#### Trimming the specimen with the coarse feed

- Unlock the handwheel (push handle (1) inward or release brake mechanism via lever (2)).
- Turn coarse feed wheel (31) to bring the specimen gradually closer to the knife. At the same time, turn handwheel (15) to trim the specimen down to the desired level where you want to start sectioning.

#### Trimming the specimen via the section thickness selection

- Select a section thickness appropriate for trimming (e.g. 50  $\mu\text{m}$ ) with the section thickness selection knob (33). The thickness selected shows through window (34).
- Turn handwheel (15) until the specimen has been trimmed down to the desired level.

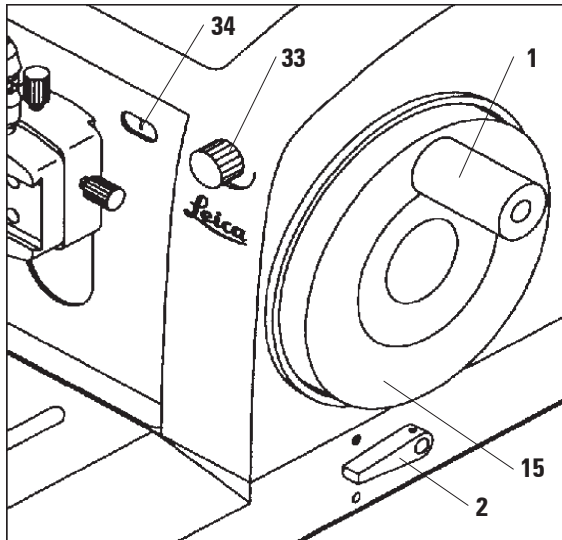
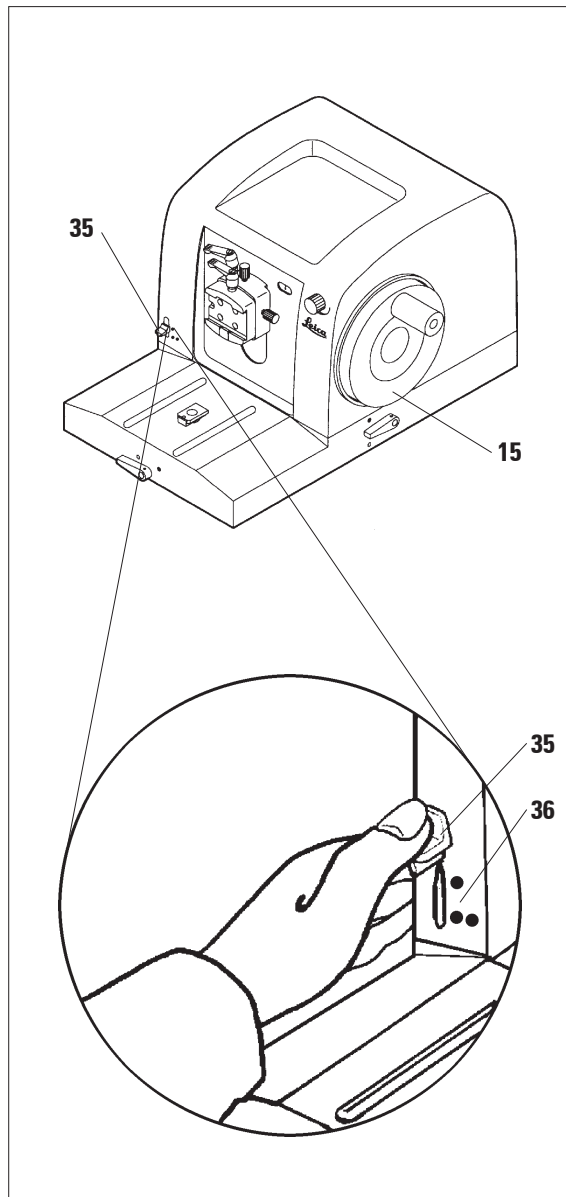


Fig. 15

## 5. Operation

### Trimming with the mechanical trimming function (Leica RM2125 RT only)



The Leica RM2125 RT is equipped with a mechanical trimming function which is activated via the trimming lever (35).

The trimming lever can be locked in 3 positions: 0 µm, 10 µm and 50 µm.

The two dots (36) mark the two trimming positions:

- = 10 µm
- = 50 µm

- To activate the trimming function, push the trimming lever down to the desired position and hold.
- With every turn of the handwheel the specimen advances by 10 µm or 50 µm respectively.
- When the lever is released trimming is deactivated (lever flips back to zero position).



**The selected section thickness is not added to the trimming value. If, however, the section thickness selected is greater than the trimming value, the specimen will advance by the section thickness without the trimming value being added.**

- Turn the coarse feed wheel to bring the specimen close to the knife.
- Select desired trimming value.
- Trim the specimen (turning handwheel (15)) down to the desired level.
- Release trimming lever (35).

Fig. 16

## 5.6 Sectioning



Always rotate the handwheel evenly with the rotation speed of the handwheel depending on the hardness of the specimen being sectioned. Harder specimens should be selected at slower speed.

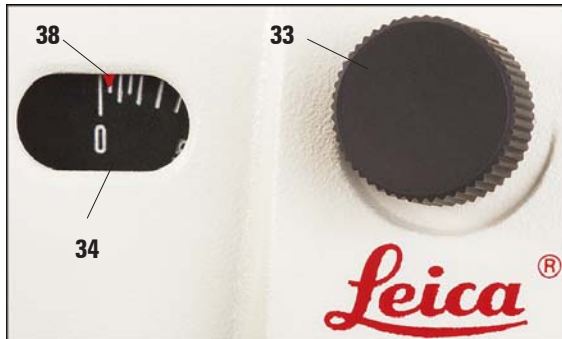


Fig. 17

- Use the adjusting knob (33) on the right side of the microtome front panel to selected the desired section thickness unless the appropriate value already shows in window (34). The line of the graduated scale that coincides with the red reference mark (38) corresponds to the thickness value selected.
- For sectioning use another part of the blade edge than the one used for trimming.

- For that purpose - if you work with a knife holder with lateral adjustment option - move the knife holder base / knife holder to the desired position (see [chap. 5.8.7](#)) or - if your knife holder base is without lateral adjustment - move the knife or blade itself.
- Start sectioning by rotating the handwheel (15) evenly in clockwise direction.
- Pick up the sections and mount them on microscope slides.

## 5.7 Changing specimen



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!

- Bring specimen to uppermost position (via handwheel) and lock the handwheel in 12 o'clock position.
- Cover the blade edge with the knife guard.
- Remove the specimen from the specimen clamp and insert a new specimen block.
- Use the coarse feed wheel to move the specimen clamp backwards far enough to be able to start trimming the new specimen block.

## 5. Operation

### 5.8 Accessories



All specimen clamps available as accessories fit into the orientable as well as in the non-orientable fixture for specimen clamps.

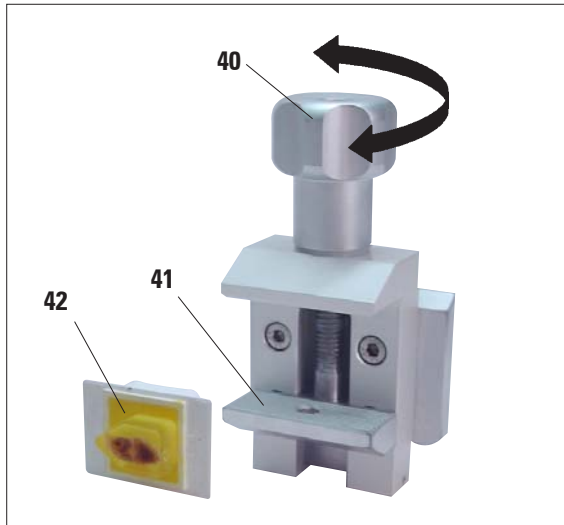


Fig. 18

#### 5.8.1 Standard specimen clamp

The standard specimen clamp is available in two sizes: 40 x 40 mm and 50 x 55 mm. Rectangular blocks can be clamped directly in the standard specimen clamp. In addition, this clamp accommodates the foil clamps.

- Turn knurled screw (40) counterclockwise to lower the movable jaw (41).
- Insert block (42) as required (perpendicular of square).
- Turn knurled screw (40) clockwise to raise the movable jaw until the block is securely clamped.

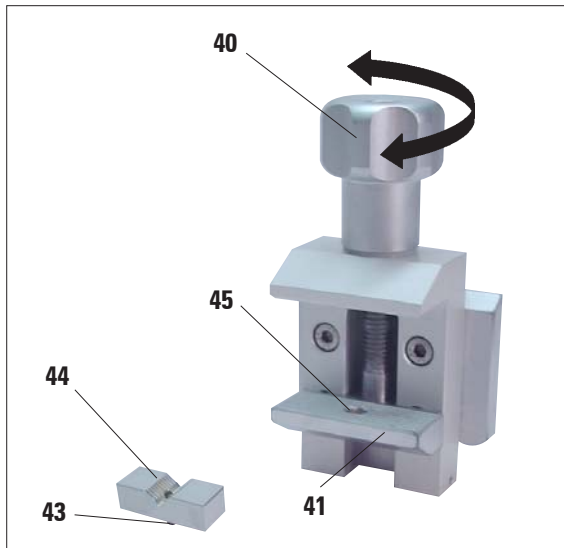


Fig. 19

#### 5.8.2 Vee insert

The vee insert (44) fits into the movable jaw of the standard specimen clamp, for clamping round specimens.

- Turn knurled screw (40) counterclockwise lowering the movable jaw (41) as far as it will go.
- Insert pin (43) of vee insert (44) into the hole (45) of the movable jaw (41).
- Insert the specimen.
- Turn knurled screw (40) clockwise to raise the movable jaw / vee insert until the block is securely clamped.



### 5.8.3 Foil clamp type 1

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

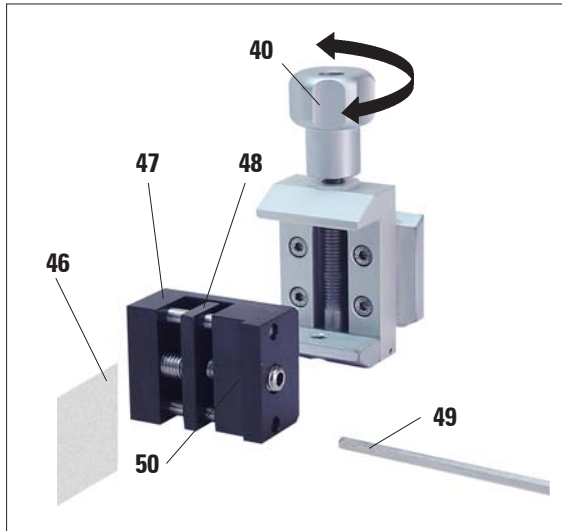


Fig. 20

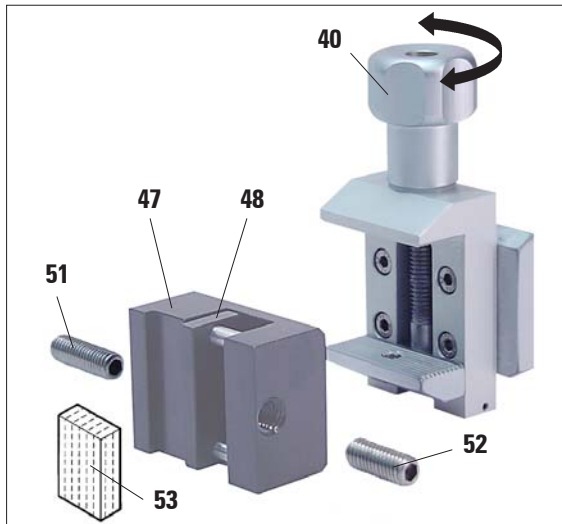


Fig. 21

### Clamping foils

- Move the movable jaw (48) to the right by turning the set screw with an Allen key size 4 (49).
- Insert foil sample (46) between movable jaw (48) and fixed jaw (47).
- Clamp the foil by bringing the movable jaw (48) close to the fixed jaw (47) (use Allen key).
- Insert foil clamp (50) into standard specimen clamp as shown.
- Turn knurled screw (40) clockwise until the foil clamp is securely clamped.

### Clamping flat specimens

To clamp flat samples, remove the longer set-screw (51) and insert the shorter one (52):

- Use Allen key size 4 (49) to unscrew longer setscrew (51) to the left.
- Insert shorter setscrew (52) into the thread.
- Insert specimen (53) between movable jaw (48) and fixed jaw (47).
- To clamp the specimen, screw setscrew (52) inwards bringing the movable jaw (48) close to the fixed jaw (47).
- Insert foil clamp into standard specimen clamp as shown.
- Rotate knurled screw (40) clockwise until the foil clamp is securely clamped.

## 5. Operation

### 5.8.4 Foil clamp type 2



Foil clamp type 2 is appropriate for clamping ribbons of foil.  
Foil clamp type 2 is clamped in the standard specimen clamp.

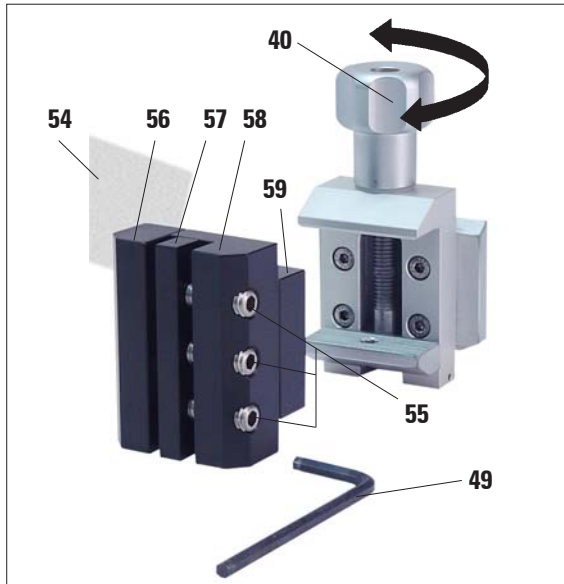


Fig. 22

- To open the jaws (56) and (57) release the three screws (55) somewhat using an Allen key size 4 (49).
- Insert the foil ribbon (54) from the back between the movable jaw (57) and the fixed jaw (56).
- To clamp the foil, tighten first the center screw and then the two outer screws (55) with the Allen key (49).
- Place the foil clamp (59) into the standard specimen clamp so that the bevelled surface (58) on the back of the foil clamp is pointing to the right or to the left.
- Rotate knurled screw (40) clockwise until the foil clamp is securely clamped.

### 5.8.5 Universal cassette clamp

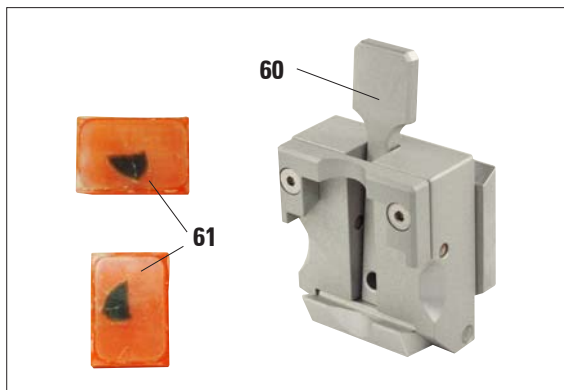


Fig. 23



All common brands of cassettes fit into the universal cassette clamp (UCC), either horizontally or vertically.

- Pull lever (60) forward.
- Insert cassette (61) horizontally or vertically.
- Release the lever to secure the cassette in position.

## 5.8.6 Holder for round specimens



The holder for round specimens accommodates cylindrical samples. Inserts for cylindrical specimens of 6, 15 and 25 mm diameter are available.

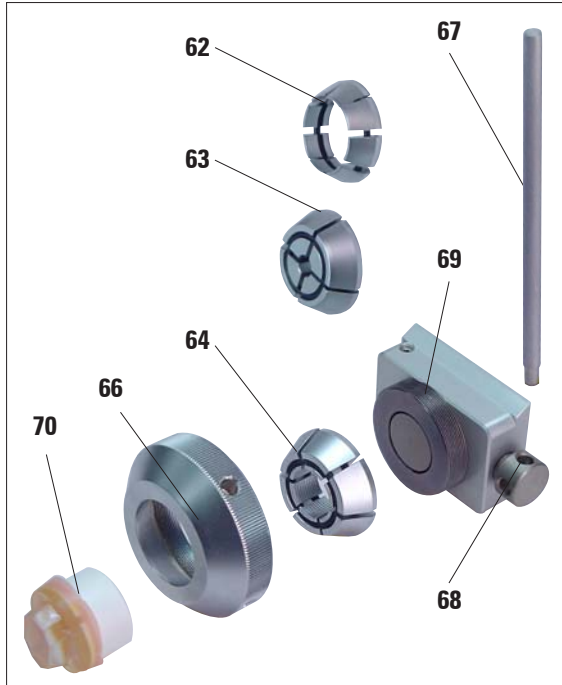


Fig. 24

- To mount the required insert (**62**, **63**, **64**) turn the clamping ring (**66**) counterclockwise and remove it.
- Place the required insert into the clamping ring (**66**) and screw the clamping ring onto the thread (**69**) (rotate clockwise).
- Insert specimen (**70**) and secure rotating the clamping ring (**66**) clockwise.
- To orient the specimen insert pin (**67**) into hole (**68**) and turn counterclockwise to release the clamping mechanism. The specimen can now be oriented as desired.
- Turn pin (**67**) clockwise to secure the specimen.

## 5. Operation

### 5.8.7 Knife holder base

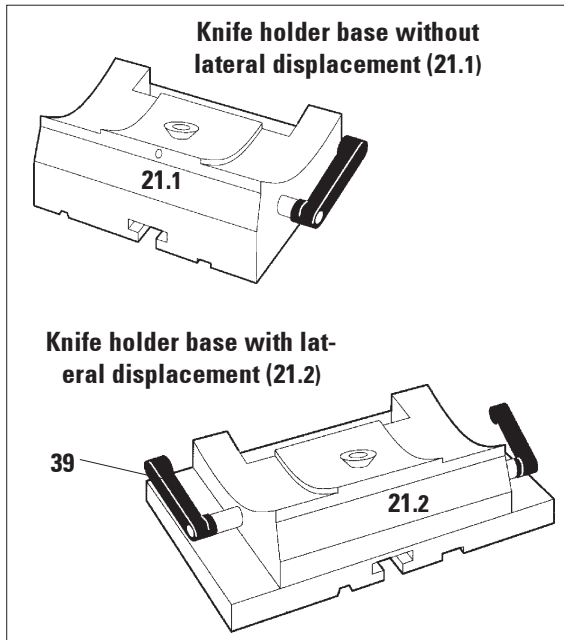


Fig. 25

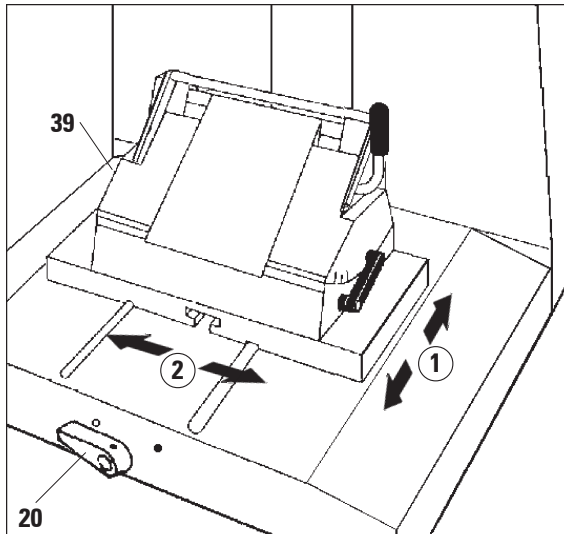


Fig. 26

#### Knife holder base without lateral displacement

The knife holder base without lateral adjustment feature (21.1) can only be moved on the microtome base plate in north-south direction.

#### North-south adjustment ①

The north-south orientation allows you to bring the knife holder as closely as possible to the specimen - to the optimal sectioning position.

- Rotate the clamping lever (20, Fig. 26) at the front of the microtome base plate counter-clockwise to release the clamping mechanism.
- Move knife holder base with knife holder forward or backward as needed.
- Secure the clamping mechanism by turning the lever (20) clockwise.

#### Knife holder base with lateral displacement

The knife holder base with lateral displacement feature (21.2) consists of two pieces and can be adjusted in north-south as well as in east-west direction

#### East-west adjustment ②

The lateral displacement feature makes it possible to use the entire length of the cutting edge of the knife without having to change any of the settings at the knife holder.

- To release the clamping mechanism rotate clamping lever (39, Fig. 25) (located on the left side of the knife holder base) forward.
- Adjust the knife holder base / knife holder laterally.
- To retighten the clamping mechanism rotate lever (39) backward.

### 5.8.8 Knife holder N



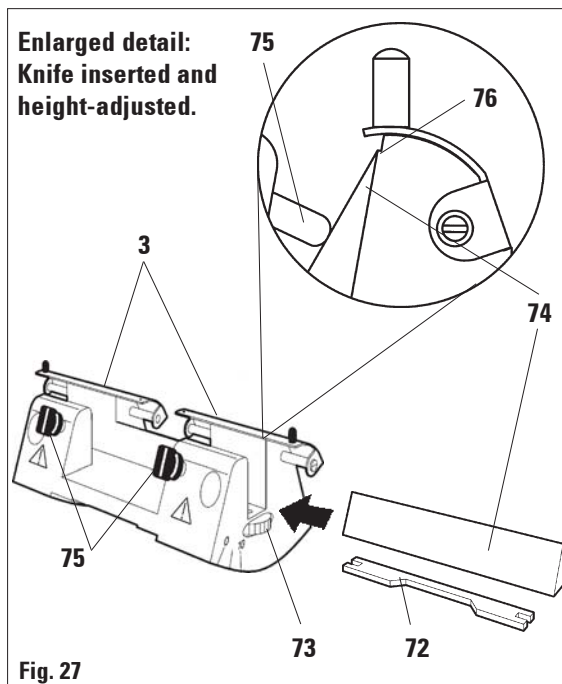
Knife holder N accommodates standard knives made of steel or tungsten carbide, profiles c or d, up to a length of 16 cm. The integrated height adjustment feature allows you to also use knives that have been resharpened numerous times.

#### Mounting the knife support bar

- Push knife guard (3) to the center.
- Set the knife support bar (72) onto the height adjustment screws (not visible) as shown. The flat ends of the height adjustment screws must be located in the slots at each end of the knife support bar.



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 (73) on the right and left of the knife holder forward, 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 (75) as far out as possible (turn counterclockwise).
- Hold the knife (74) at the knife back and carefully insert it from one with, the cutting edge facing upwards.

#### 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. Edge (76) of the rear clamping jaws serves as a reference position for correct knife height adjustment. The knife is positioned correctly when its cutting edge is parallel to edge (76).

- Rotate the knurled nuts (73) backward in opposite directions until the knife edge is parallel to edge (76) (see enlarged detail) of the rear clamping jaws.
- To clamp the knife (74) evenly screw the two knife clamping screws (75) inward (turn clockwise).

## 5. Operation

### 5.8.9 Knifeholder E



Knife holder E is appropriate for all common brands of conventional disposable knives. It is available in two versions: with rear pressure plate (80) for low profile blades (77) or for high profile blades (78). Both rear pressure plates are also available separately and one type can easily be exchanged for the other.

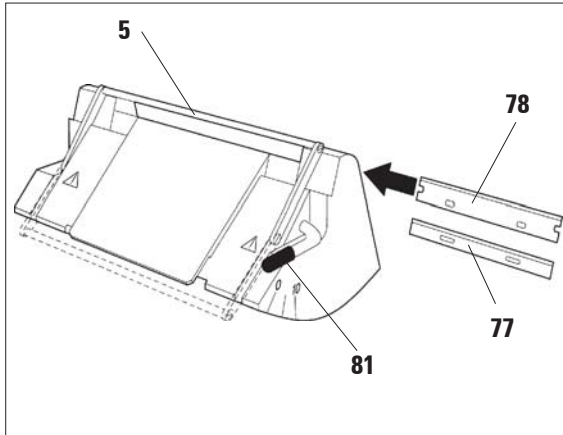


Fig. 28

#### Inserting the blade



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

- Fold knife guard (5) downward.
- To insert the blade, rotate clamping lever (81) forward.
- Carefully insert blade (77 or 78) from one side.
- To clamp the blade, rotate clamping lever (81) back upwards.

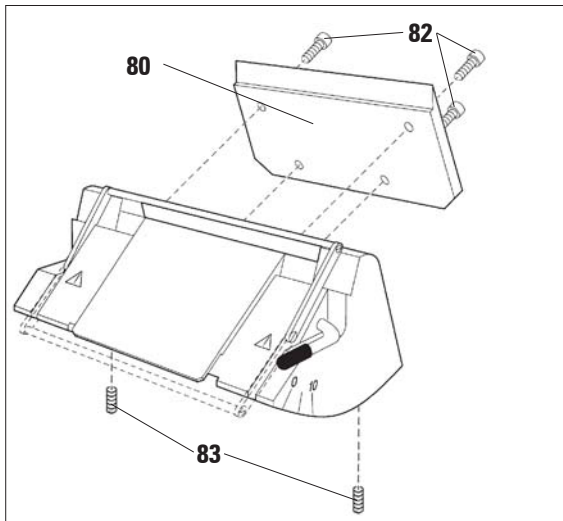


Fig. 29

#### Changing the rear pressure plate (80)

- With an Allen key size 4, loosen the four screws (82) at the rear of the knife holder and remove them.
- Remove pressure plate (80).
- Fasten the new pressure plate with 4 screws (82). Do not tighten the screws completely, you still have to be able carry out a height and parallel adjustment of the pressure plate.

## Adjusting the rear pressure plate



Every time after the pressure plate has been changed, you have to check whether it needs to be adjusted.

The rear pressure plate (80) sits on two setscrews (83, Fig. 29) enabling height and parallel adjustment.

The two screws can be accessed through two openings on the underside of the knife holder. A size-2 Allen key is required for adjustment.

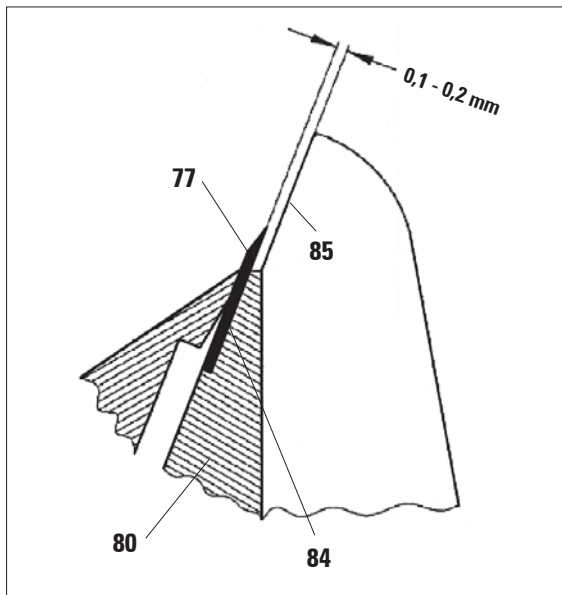


Fig. 30

- Insert pressure plate (80) and tighten screws (82) only slightly so that orienting the pressure plate is still possible.
- With setscrews (83) adjust the pressure plate, so that the bearing surface (84) for the blade (77) is approx. 0.1 - 0.2 mm higher than the surface of the lateral jaws of the knife holder (85).  
This is particularly important for instruments the knife holder base of which is not equipped with a lateral displacement feature.
- When doing the adjustment, also make sure that the pressure plate is parallel to the lateral jaws of the knife holder.
- Tighten screws (82).

## 5. Operation

### Adjusting the front pressure plate

The setscrews (**87**) on the underside of the knife holder (accessible through openings in the underside of the knife holder) enable you to height-adjust the front pressure plate. A size- 2 Allen key is needed to do the adjustment.

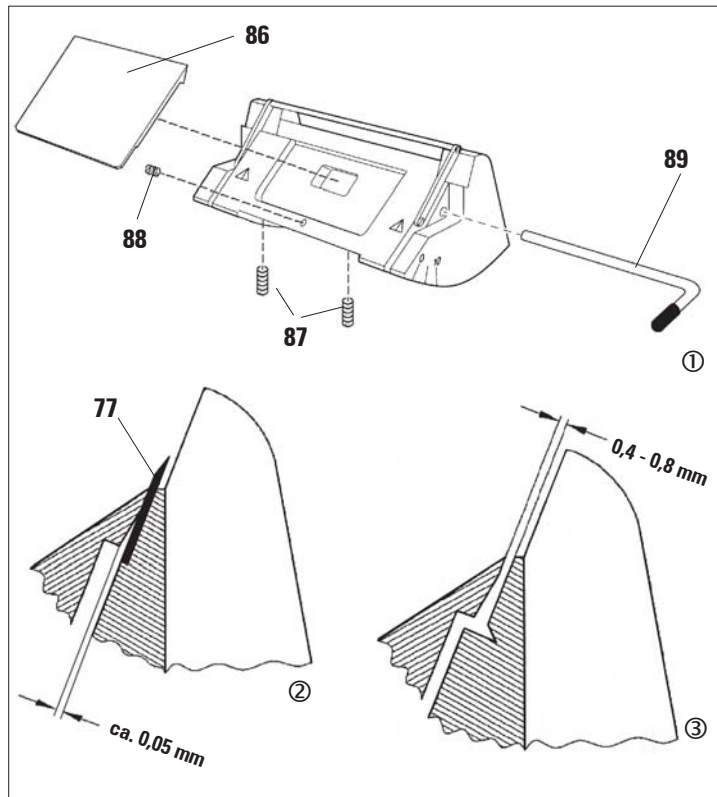


Fig. 31

- Position the pressure plate (**86**) correctly, insert clamping lever (**89**) and fasten the pressure plate slightly (tightening the clamping lever just a bit).
- Height-adjust the pressure plate via screws (**87**). The upper edges of the two pressure plates (**86**) and (**80**) must be at the same height and parallel to each other.

The clearance angle of the front pressure plate (**86**) is adjusted with a setscrew (**88**), which is accessible through an opening on the underside of the knife holder (see drawing).

- Insert a blade (**77**) and tighten the clamping mechanism (**89**) lightly.

- With screw (**88**) adjust pressure plate (**86**) so that only the upper edge of the pressure plate actually exerts pressure on the blade. A gap must remain visible (Fig. 31/②). A small screwdriver (ca. 3.0 x 70) is necessary for adjustment.
- When adjusting, ensure that a gap of approx. 0.4-0.8 mm remains between the two pressure plates with the clamping mechanism not yet tightened (Fig. 31/③).



5.8.10 Overview - accessories

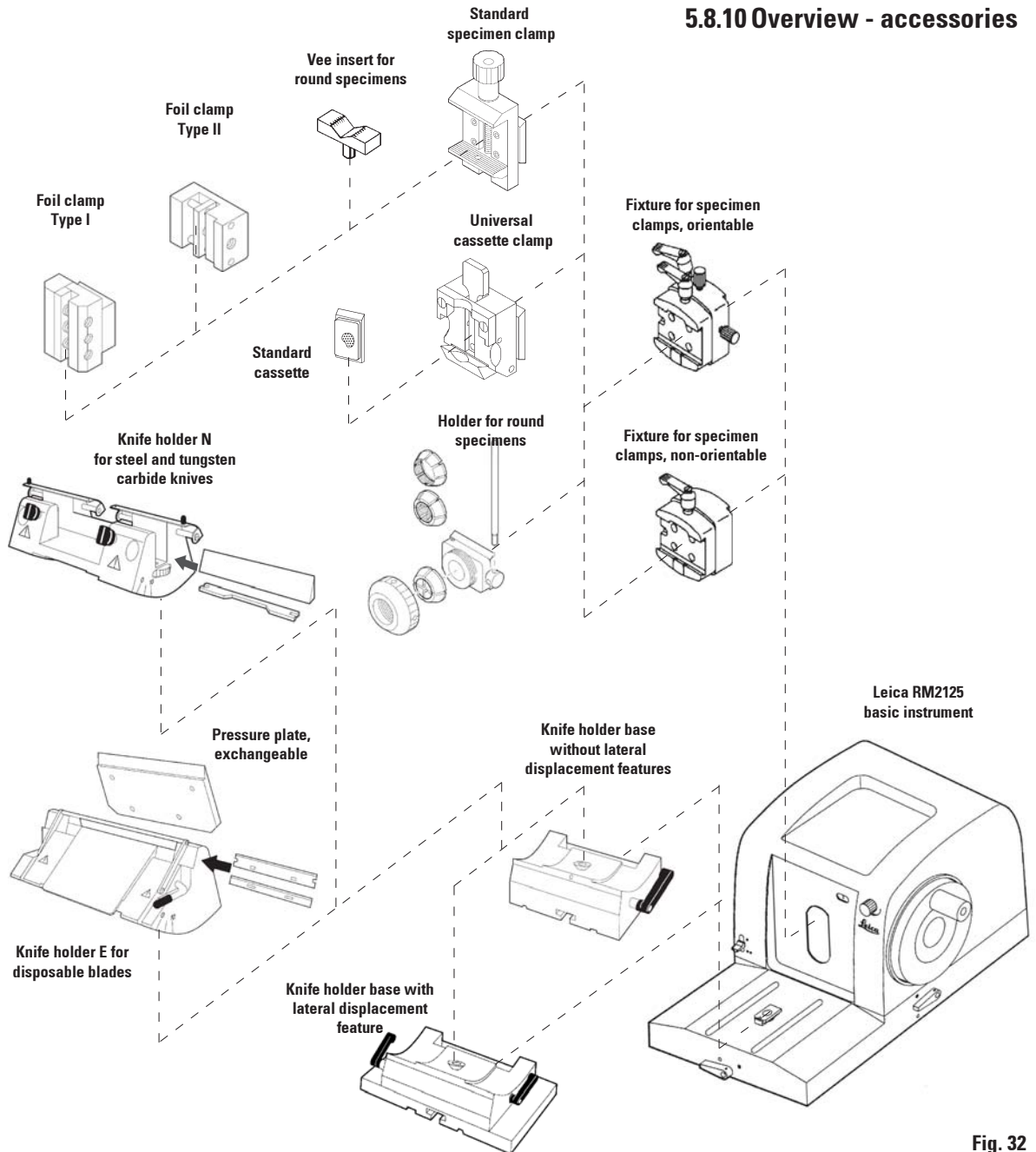


Fig. 32

## 5. Operation

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### 5.9 Optional accessories (ordering information)

Fixture non-orient.silver .....	14 0502 38006
UCC with adapter RM2125, silver .....	14 0502 37999
Standardclamp with adapter 40x40, silver .....	14 0502 37998
V-insert for Standardclamp, silver .....	14 0502 38000
Foil clamp - type 1, black .....	14 0402 09307
Foil clamp - type 2, black .....	14 0402 26922
Round specimen holder, silver .....	14 0502 38001
Round specimen holder, 3 rgs. silver .....	14 0502 38002
Clamping ring d = 6 mm .....	14 0356 08322
Clamping ring d = 15 mm .....	14 0356 09200
Clamping ring d = 25 mm .....	14 0356 08320
Knifeholdbase non-orientable, silver .....	14 0502 37962
Knifeholdbase orientable, silver .....	14 0502 37992
Knifehold E low-profile, silver .....	14 0502 37995
Pressure plate rear HP, 22° .....	14 0502 29553
Knifehold E high-profile, silver .....	14 0502 37996
Pressure plate rear LP, 22° .....	14 0502 29551
Water trough for RM21.. .....	14 0502 37787
Knifehold N RM2200, silver .....	14 0502 37993
Knifehold NZ RM2200, silver .....	14 0502 37994
Knifehold E-TC RM2200, silver .....	14 0502 37997
section waste tray .....	14 0402 13128
Dust cover .....	14 0212 30350

### 6.1 Cleaning the instrument



**Always remove the knife / blade before detaching the knife holder from the instrument. Knives that are not in use should always be stored in the knife case!**

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

**When using cleaners, comply with the safety instructions of the manufacturer and the labor-safety regulations of your laboratory!**

**Do not clean the outer surfaces with alcohol, alcohol-based cleaners (window cleaner!), abrasive cleaners or solvents containing acetone or xylene! The varnished surfaces are not resistant to acetone or xylene!**

**No fluid must enter the interior of the instrument during cleaning!**

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

- Move specimen clamp to upper limit position and lock handwheel.
- Remove blade or knife from knife holder and insert into the receptacle for used blades in the base of the blade dispenser or store in knife case.
- Remove knife holder and knife holder base for cleaning.
- Remove specimen from 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.

## 6. Cleaning and maintenance

### Knife holder E

- Remove the front pressure plate for cleaning.

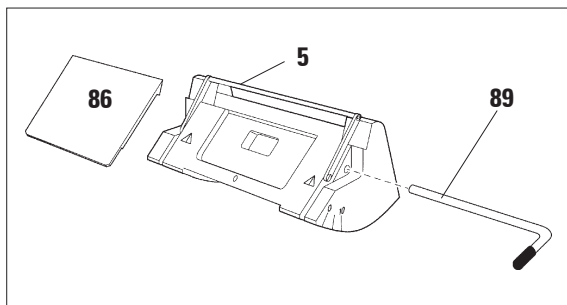


Fig. 33

- Fold knife guard (5) downward.
- Rotate the blade clamping lever (89) downward.
- Carefully remove the blade.
- Pull out clamping lever (89) sideways.
- Remove pressure plate (86).

- Clean with a moist (not wet!) cloth. For cleaning use only mild commercial household cleaners or soap water!
- Dry knife holder and reassemble.
- When reassembling, ensure that the upper edge of pressure plate (86) is parallel to and at the same height as the upper edge of the rear pressure plate (80) (sde [Fig. 30, page 31](#)).  
If necessary, adjust the pressure plate ([chapter 5.8.9](#)).

### Cassette clamp

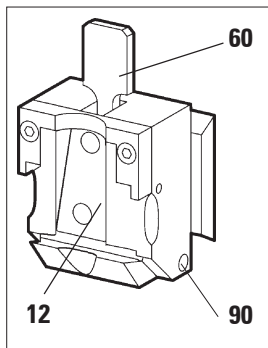


Fig. 34

- Detach cassette clamp for a thorough cleaning, removing all paraffin residues (12).
- Place cassette clamp (12) in a maximum 65 °C hot oven and keep there until all paraffin has become liquefied and drained off the clamp.
- Remove paraffin residues with a dry cloth.
- After such a cleaning procedure in an oven, always be sure to lubricate the axle (90) of the clamping lever (60) (see also [chapter 6.2](#)).

### 6.2 Maintenance instructions



Only authorized and qualified service personnel may repair the instrument and access the instrument's internal components.

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

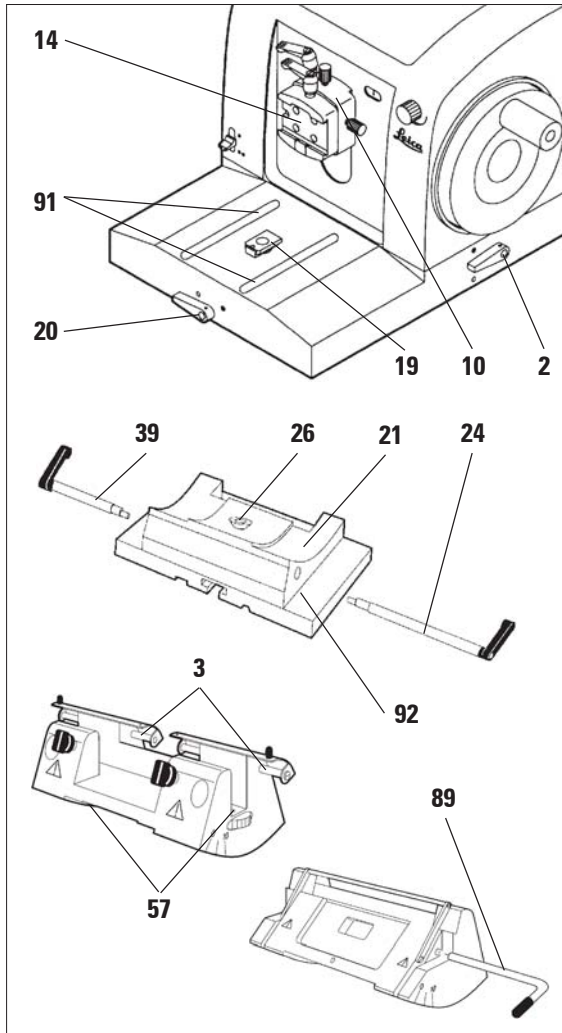


Fig. 35

- Have the instrument inspected at least once per 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 daily.
- Once a month, lubricate the following components with oil no. 405 (part of standard delivery. 1 to 2 drops are sufficient):
  - The movable parts of the fixture for specimen clamps (10) and of the dovetail mortise (14).
  - The T-piece (19) on the microtome base plate.
  - Clamping levers (2) and (20) on the microtome
  - Guide rails (91) for the knife holder base on the microtome base plate.
  - Clamping levers (39) and (24) on the right and left side of the knifeholder base.
  - Guide rail (92) of the lateral displacement mechanism on the knife holder base (21).
  - T-piece (26) on the knife holder base (21).
  - The sliding surfaces of knife guard (3) and knurled nuts (73) on knife holder N.
  - Clamping lever (89) of knife holder E.
  - Axle (90) of the clamping lever of the cassette clamp (see Fig. 34).

## 7. Troubleshooting



The table below shows the most frequent problems that occur when working with the instrument and gives advice for troubleshooting.

Problem	Possible causes	Corrective action
<b>7.1 Possible errors</b>		
<b>1. Thick/thin sections</b> Alternately thick and thin sections are produced. In extreme cases, every second section is skipped, being followed by a very thick section.	<ul style="list-style-type: none"> <li>• Blade insufficiently clamped.</li> <li>• Blunt cutting edge.</li> <li>• Pressure plate damaged or not correctly adjusted.</li> <li>• Knife / blade clearance angle too narrow.</li> </ul>	<ul style="list-style-type: none"> <li>• Re-clamp blade.</li> <li>• Adjust knife holder laterally or use new blade.</li> <li>• Insert new pressure plate or use new knife holder.</li> <li>• Readjust pressure plate.</li> <li>• Systematically try wider clearance angle settings until optimum angle width has been found.</li> </ul>
<b>2. Sections compressed</b> Sections are extremely compressed, wrinkled or jammed together.	<ul style="list-style-type: none"> <li>• Blunt cutting edge.</li> <li>• Specimen too warm.</li> <li>• Sectioning speed too high.</li> </ul>	<ul style="list-style-type: none"> <li>• Use different zone of cutting edge or use new blade.</li> <li>• Cool specimen prior to sectioning.</li> <li>• Work at slower sectioning speed.</li> </ul>
<b>3. Streak present in sections</b> with knife holder E	<ul style="list-style-type: none"> <li>• Paraffin has accumulated at rear pressure plate of knife holder.</li> </ul>	<ul style="list-style-type: none"> <li>• Remove paraffin debris regularly.</li> </ul>
<b>4. Noise during sectioning</b> Knife "sings" when sectioning hard specimens. Sections shows scratches and chatter marks.	<ul style="list-style-type: none"> <li>• Sectioning speed too high.</li> <li>• Clearance angle too wide.</li> <li>• Insufficient clamping at specimen and/or knife holder.</li> </ul>	<ul style="list-style-type: none"> <li>• Turn handwheel at slower speed.</li> <li>• Systematically reduce clearance angle settings until optimum angle width has been found.</li> <li>• Check all screws and clamping mechanisms at specimen holder system and knife holder. Retighten, if necessary.</li> </ul>
<b>7.2 Malfunction</b>		
<b>1. No specimen feed, i.e. no more sections</b>	<ul style="list-style-type: none"> <li>• Specimen cylinder has reached front limit stop position.</li> </ul>	<ul style="list-style-type: none"> <li>• Move specimen backwards (coarse feed wheel).</li> </ul>
<b>2. Blades wear out very quickly</b>	<ul style="list-style-type: none"> <li>• Cutting forces too high.</li> </ul>	<ul style="list-style-type: none"> <li>• Select sectioning speed and/or trimming thickness according to specimen hardness. Reduce section thickness, turn handwheel at slower speed.</li> </ul>

### 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 characteristics warranted.

The scope of warranty depends on the contents of the individual contract concluded, being regarded as binding only the warranty conditions of your local Leica sales unit or of the company from which you acquired the product.

### Technical service information

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

Please provide the following information:

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

### Decommissioning and disposal

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



## EC Declaration of Conformity

We herewith declare, in exclusive responsibility, that the instrument

### **Leica RM2125/RM2125 RT – Rotary Microtome**

was developed, designed and manufactured to conform with the

- Directive 98/79/EC of the European Parliament and of the Council (in-vitro diagnostic medical devices)
- Directive 2006/42/EC of the European Parliament and of the Council on machinery including their amendments up to the date mentioned below.

The following harmonized standards were applied:

- **DIN EN ISO 12100-1: 2003**  
Safety of machinery.  
Basic concepts, general principles for design.  
Part 1: Basic terminology, methodology.
- **DIN EN ISO 12100-2: 2003**  
Safety of machinery.  
Basic concepts, general principles for design.  
Part 2: Technical principles and specifications.

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

- **DIN EN ISO 9001: 2000.**

Leica Biosystems Nussloch GmbH  
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D-69226 Nussloch  
October 11, 2007

Anne De Greef-Safft  
President Biosystems Division