



Leica VT1000 S

Vibrating-blade
microtome

CE

Instruction Manual

Leica VT1000 S V1.6 English - 11/2007

Always keep this manual near the instrument.
Read carefully prior to operating the instrument.

Leica

MICROSYSTEMS

Note

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

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1.1 Symbols used in this manual and their meaning



Warnings appear in a grey box and are marked by a warning triangle:



Useful notes, i.e. important user information appear in a grey box and are marked by an information symbol:

- (5) Figures in brackets refer to item numbers in drawings or to the drawings themselves.

1.2 Qualification of personnel

The Leica VT1000S should be operated by trained laboratory personnel only.

Prior to starting work with the instrument, all laboratory personnel designated to operate the instrument must carefully read the present instruction manual and must be familiar with all technical features of the instrument.

1.3 Designated use / improper use

The VT1000S has been designed for sectioning of specimens in medicine, biology and industry, especially for sectioning fixed or fresh tissue immersed in buffer solution.

The instrument must be operated exclusively according to the instructions contained in this manual.

Any other use of the instrument is considered improper.

Instrument type:

All information given in this instruction manual applies only to the VT1000 S.

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



Required information for all inquiries:

For any inquiries please specify:

- Instrument type
- Serial number

2. Safety

This instruction manual includes important instructions and information regarding the operating safety and maintenance of the instrument.

The instruction manual is an important part of the product. It must be read carefully before using the instrument for the first time and must always be kept with the instrument.

If additional requirements, which exceed the scope of this manual, are imposed by regulations and/or laws on accident prevention and environmental protection in the country of operation, appropriate instructions for compliance with such requirements must be added to this manual.

Read this instruction manual carefully before attempting to work on or operate the instrument.

2.1 General safety instructions

These instruments have been built and tested in accordance with the safety regulations for electrical measuring, control, regulating and laboratory devices.

In order to maintain this condition and to ensure safe operation, the user must follow the instructions and warnings contained in this Operating Manual.

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

www.histo-solutions.com

2.2 Safety instructions for handling the instrument

Caution / danger



Caution: risk of injury when touching the knives and blades as these are extremely sharp.



Warning: risk of infection when working with fresh tissue or with material where an infection cannot be excluded.



Caution: When not in use, cover magnifier with corresponding lid to avoid risk of fire.



Warning: Avoid touching live parts under any circumstances!

Correct behavior

Be sure to handle knives and blades very cautiously!

Never touch the cutting edge of knives and blades!

Do not leave knives, blades and bladed knife holders unprotected.

Take adequate protective measures to eliminate risk of infection!

Protective clothes according to safety regulations "Working with harmful substances" (Safety mask, gloves, protective clothing) must be worn!

The magnifier must be covered while the instrument is not in use, as it may act as a burning glass when not covered!

In case of emergency, press the red EMERGENCY STOP switch (at the right side of the instrument). To release the switch, turn it in the direction of the arrow.

The instrument cover may only be removed by qualified service personnel!

Before removing the cover, ensure that the instrument is unplugged.

3. Instrument properties

3.1 Technical Data

General:

Sectioning frequency ($\pm 10\%$)	0 - 100 Hz
Amplitude	adjustable in 5 steps: 0.2; 0.4; 0.6; 0.8; 1 mm
Sectioning speed ($\pm 10\%$)	0.025 - 2.5 mm/s
Return stroke speed ($\pm 10\%$)	5 mm/s
Total vertical specimen stroke	15 mm (motorized)
Sectioning range	1 - 40 mm (adjustable)
Specimen retraction	0 - 999 μm (adjustable; can be deactivated)
Maximum specimen size:	
with standard knife holder	33 x 40 mm
with knife holder L	70 x 40 mm
Specimen orientation	330°
Section thickness selection	1 - 999 μm , in 1- μm steps
Magnifier, assy. (Standard accessory)	2 x

Ambiance conditions:

Working temperature range	min. 10 °C to max. 40 °C
Relative humidity of air	max. 60 %
Altitude (site):	max. 2,000 m above sea level

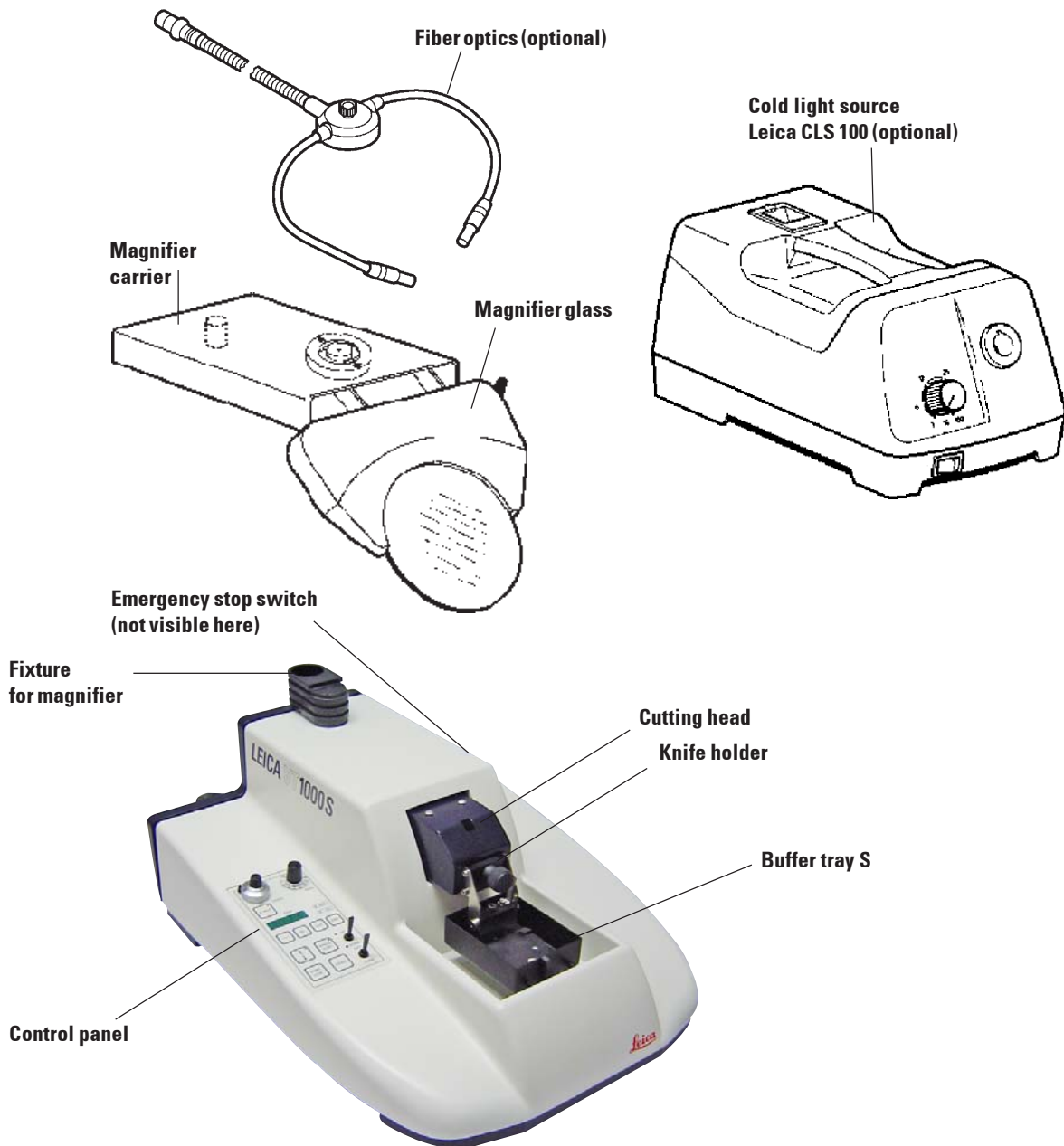
Electrical specifications:

Nominal voltage range ($\pm 10\%$):	100 V - 240 V
Rated frequency ($\pm 10\%$):	50 - 60 Hz
Power draw	35 VA
Mains fuse	T 1.25 A
Pollution degree	2
Overvoltage installation category	II
Overload protection	yes
Internal current limiter of electronics	yes

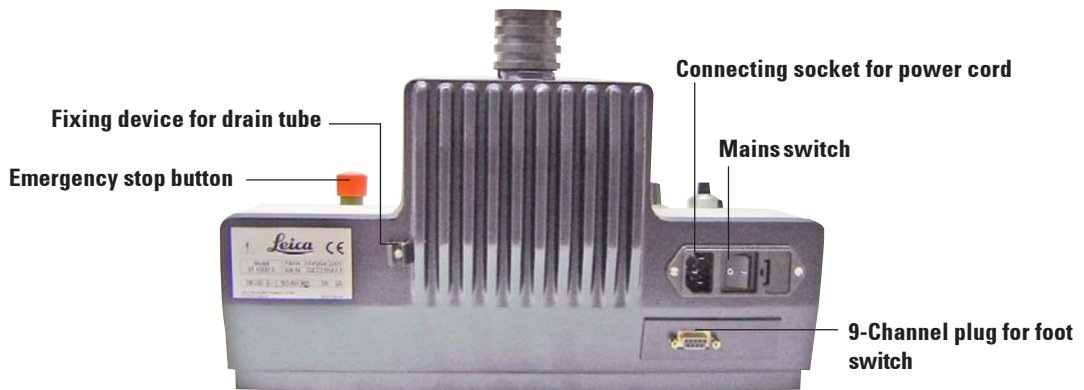
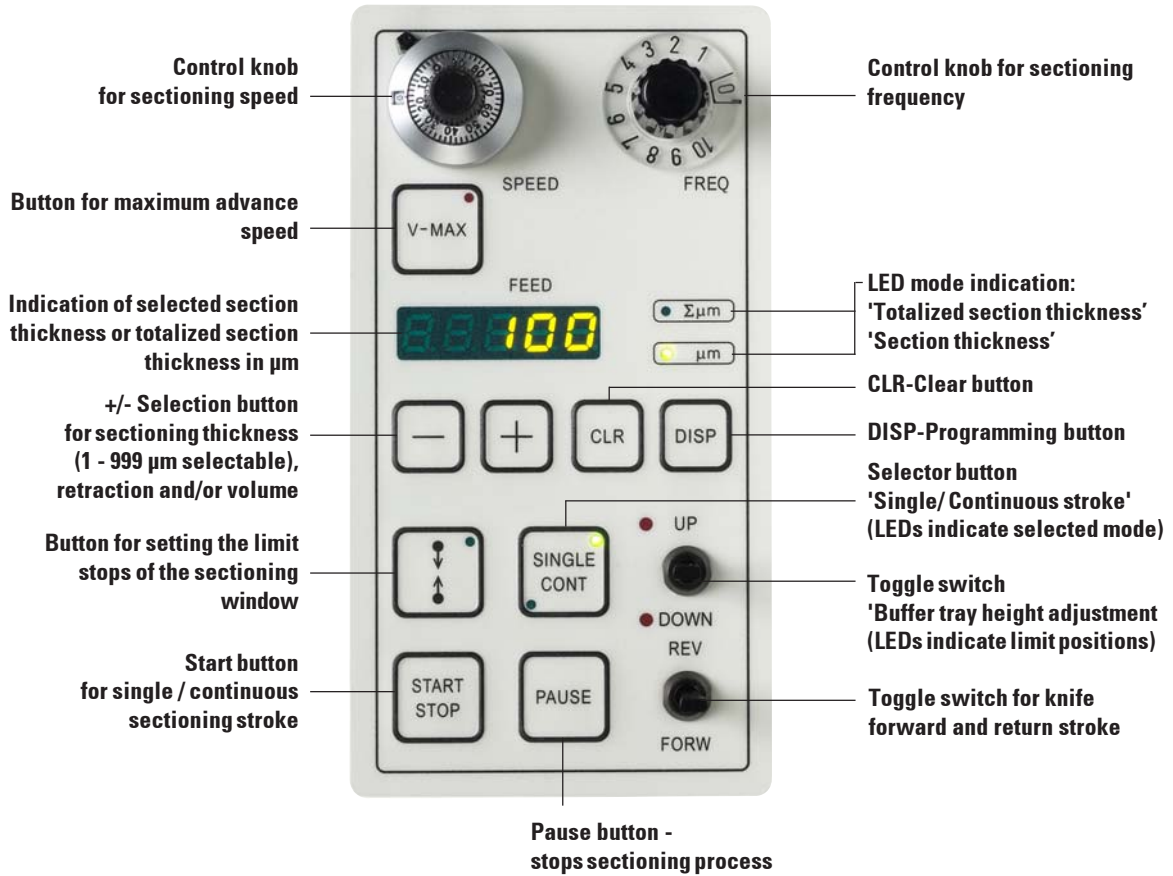
Dimensions:

L x W x H	480 mm x 360 mm x 200 mm
Height with magnifier	285 mm
Weight:	
(without magnifier)	17 kg
(magnifier only)	2 kg
(total)	19 kg

3.2 Overview - VT1000 S



3. Instrument properties



4.1 Standard delivery

VT1000 S – Basic instrument	0472 35612
1 Silicon tube D-6x1.5	0462 27513
1 Set of mains cables	
-Mains cable 'Germany'	0411 13558
-Mains cable 'USA-CAN-J'	0411 13559
-Mains cable 'UK' ST/BU F-5A	0411 27822
1 Set of replacement fuses 2 x T 1.25 A	6943 01251
1 Tool set	
-1 Allen key, size 2.5	0194 13195
-1 Allen key size 8.0	0194 04792
-1 Manipulator	0462 28930
1 Microtome protective cover, type 104 R – flexible	0212 04091
1 Instruction manual Leica VT1000 S, in 4 languages	0702 37104
VT1000S complete configuration	0472 35613
- 1 x VT1000 S Basic instrument	0472 35612
- 3 Specimen discs S, Ø 50 mm, non orientable	0463 27404
- Buffer tray S	0462 30132
- 5 Countersunk screw, M 5x8	2101 77121
- 2 Hose clamps	0481 41952
- Knife holder S – for injector and razor blades	0462 30131
- 1 Hexagon key w/handle, size 3 – metric	0194 04764
- 1 Bottle of Cyanoacrylate adhesive	0371 27414
- Magnifier assy. (magnifier glass & carrier)	0462 31191
VT 1000 S complete configuration & sapphire knife	9010 00001
- 1x VT1000 S Basic instrument	0472 35612
- Accessories as for complete configuration above	0472 35613
plus:	
- 1x Sapphire knife	0216 35654



If you ordered additional accessories, please compare the delivered parts with your order form. Should there be any discrepancies, please contact your local Leica sales representation immediately.

4. Installation

4.2 Unpacking and installing the instrument



If at all possible the instrument should be installed on a low-vibration workbench surface.

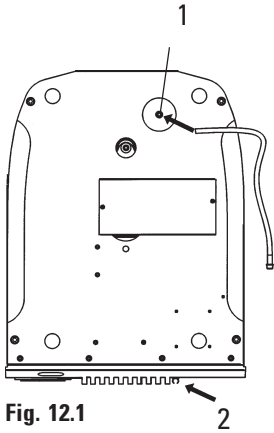


Fig. 12.1

Unpacking the instrument:

- Open the transport box and carefully remove all the parts from the box.
- Compare with the attached pack list to make sure the delivery is complete.
- Connect the drain tube (Fig. 13.1) of the cooling bath at the underside of the instrument **(1)**.
- Ensure that the loose end of the drain tube is closed tightly with the matching stopper.
- Secure the loose end of the drain tube in the holder at the rear of the instrument **(2)**.

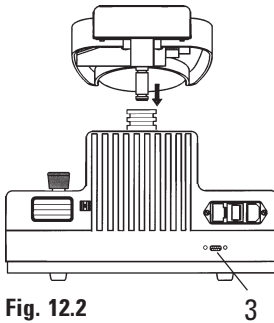


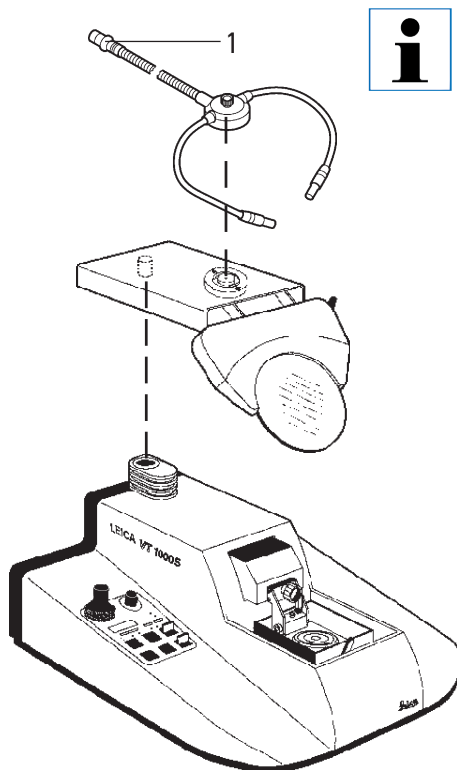
Fig. 12.2

Mounting the magnifier:

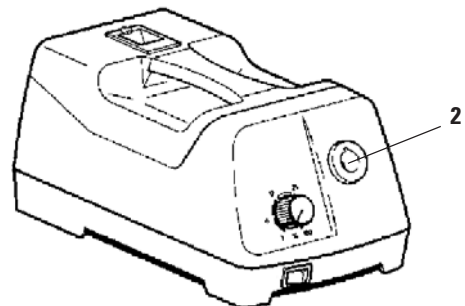
- The magnifier carrier is packed separately.
- Attach it to the instrument as shown in Fig. 11.2.
- Connecting the optional foot switch:
- Plug in the foot-switch into the 9-channel plug **(3)** at the rear of the instrument.

5.1 Setting up the instrument

1. Put the mains switch at the back of the instrument to the **OFF** position.
2. Make sure the mains cable is connected correctly to the instrument.
3. Attach the magnifier carrier.
4. Insert a blade into the knife holder.
5. Insert the buffer tray.
6. Insert the knife holder.
7. Connect magnifier carrier / optional fiber optics light guide to the cold light source as shown below: insert plug **(1)** of the fiber optics light guide into socket **(2)** at the cold light source.
8. Connect the optional foot switch at the rear of the instrument.
9. Plug the mains cable into the mains power wall outlet.
10. Switch the instrument **ON** (mains switch).



The Leica VT1000S is equipped with a wide-range power pack to cover voltages from 100 V to 240 V. Once the mains switch is turned on, the instrument carries out an initialization process: after performing a slight forward movement, the knife moves to the final rear position.



5. Operation

5.2 The VT 1000 S controls and their function



Attention: Practise working with the controls without a knife holder inserted. Only insert the knife holder when you are completely familiar with all control functions.



SPEED - 10-Speed rotating potentiometer with scale

- **Function:**

Continuous knife feed adjustment from 0.05 - 2.5 mm/s:

Knife return stroke is performed at constant speed of 5 mm/s.

Scale setting mm/s

0	0.00
0.5	0.025
1	0.05
2	0.10
3	0.15
4	0.20
5	0.25
6	0.50
7	0.75
8	1.00
9	1.75
10	2.50

The additional locking lever (lever in 12 o'clock position) prevents the speed setting from being accidentally changed while sectioning is in progress.



FREQ

FREQ - Control knob with scale from 0 to 10

- **Function:**

Continuous adjustment of knife sectioning frequency (vibration) from 8 - 100 Hz.

Scale setting Hz

0	0
0.5	8
1	10
2	20
3	30
4	40
5	50
6	60
7	70
8	80
9	90
10	100



Button with LED

Function:

- When the **V-Max** button is activated in manual mode (LED on - red light) and the **REV/FORW** button is pressed, the knife moves towards the specimen at maximum speed.
- When the **START** button is pressed, the LED in the **V-Max** button is extinguished. Sectioning starts at the speed previously selected.

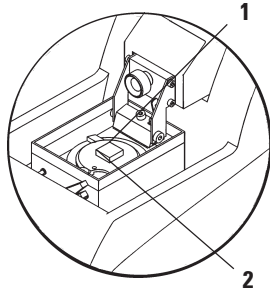




Button with LED

Setting a sectioning window:



If - accidentally - only one limit stop of the sectioning window is set, the knife covers the maximum sectioning range!



- Activate the **V-Max** button. Press **REV/FORW** toggle switch for fast movement of the knife towards the specimen. Press the  button to set the first limit of the sectioning window.
- Press **REV/FORW** once again, moving the knife edge past the specimen block and press  once more to set the second sectioning window limit.
- Press **START** to deactivate **V-Max**. The knife edge moves back to the first sectioning window limit and resumes sectioning at the previously selected speed (10-speed rotary potentiometer).



Function:

- Start single or continuous sectioning stroke – according to whether SINGLE or CONT mode has previously been selected (see description of Single/Cont mode for further details)
- Specimen feed (section thickness) takes place prior to each section.
- Retraction (specimen is lowered) takes place when the knife reaches the rear inverse point.
- In SINGLE mode, the knife stops automatically in the rear end position.
- In CONT mode, **START/STOP** has to be pressed again to stop the sectioning movement.
- The knife stops in the rear end position once the current section has been completed.

5. Operation



Function:

Immediate interruption of knife movement.

- Press **PAUSE** once again to continue sectioning.



Toggle switch

Function:

To move the knife towards the specimen.

Can also be used for manual sectioning.

Because of safety aspects the **FORW**-movement is carried out only while the toggle switch is pressed and held; the **REV**-movement is carried out completely once the switch has been locked into place.

To stop the **REV**-movement before reaching the rear end position, switch the toggle switch manually back into its center position.

The **REV/FORW** switch can also be used to stop a sectioning stroke which has been activated by pressing the **START/STOP** button.



LED indication with -/+ adjusting button, DISP and CLR function keys

Function of LED indication:

Indicates the selected sectioning thickness or totalized section thickness.

Function of the -/+ button:

Selection of section thickness in 1- μm steps from 0 to 999 μm .

The specimen feed (in the preselected section thickness) takes place at the beginning of each sectioning stroke.

Function of the DISP button:

To select between two modes of operation:

' $\Sigma \mu\text{m}$ ' = section thickness totalizing

' μm ' = section thickness

Function of the CLR button in section thickness totalizing mode:

Sets the value indicated in the section thickness totalizer mode ($\Sigma \mu\text{m}$) to zero.



Button with LED

Function:

Switch between single stroke (1 sectioning stroke / 1 return stroke of the knife) and continuous stroke (continuous sectioning until the **START/STOP**-button is pressed).

- To stop the knife at the rear end position in **CONT** mode press the **START/STOP** button. The sectioning stroke in progress will be completed and the knife will then stop at the selected end position of the sectioning range.



Toggle switch

• Function:

Motorized height adjustment of buffer tray within a total vertical range of 15 mm (= total vertical specimen stroke).

The upper and lower end positions of the buffer tray are indicated each by an audible sound signal and a red LED.

While the knife is in motion the UP/DOWN toggle switch is inoperational.

For the **DOWN** motion the toggle switch can be locked in the DOWN position; for the **UP** motion, the switch must be pressed and held in the UP position.

When the lowest possible position is reached with the toggle switch being locked in DOWN there will be both an audible and a visible signal. Once the switch is unlocked, the buffer tray is automatically raised until both signals switch off.

- To select the retraction thickness, to deactivate retraction or to set the volume of the VT1000 S sound signal, press the following function key combinations:

Volume adjustment:



- Select section thickness mode ('µm') pressing the **DISP** button.
- Press the **CLR** and **+** buttons simultaneously. The indication 'BE 15' will be displayed. The volume can now be adjusted via the **-/+** button. '0' is equivalent to no sound signal.
- To quit the programming mode, press **CLR**.

5. Operation



- Adjusting the retraction

- In programming mode, press **DISP** to display the specimen retraction menu.
- The indication 'LO' will be displayed.
- Press the **-/+** button to set a specimen retraction value between 1 and 999 μm . Or to turn off the retraction by selecting '0'.
- The selected value will be displayed in the FEED window.
- Press CLR to quit the menu function.

5.3 Adjusting the amplitude

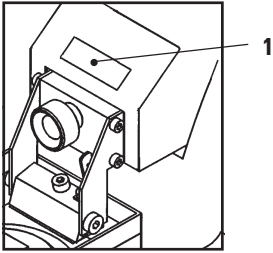


Fig. 18

- To obtain excellent sectioning results, the amplitude requires adjustment according to the specimen type being sectioned.

To this end:

- With a 2.5 mm Allen key loosen the clamping screw (**1**) and secure the eccentric on the bottom with your finger. Selectable amplitude positions are, from left to right: 0.2 mm; 0.4 mm; 0.6 mm; 0.8 mm; 1 mm.
- Slide the amplitude clamping screw to the desired amplitude position and retighten.



**When adjusting the amplitude setting, do not remove the clamping screw, simply loosen it.
The instrument is shipped with the amplitude set to 0.6 mm.**

5.4 Working with the VT 1000 S on a daily base

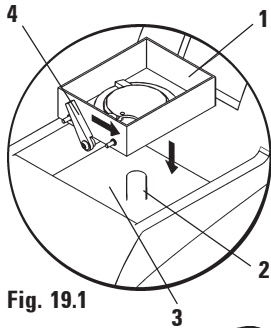


Fig. 19.1

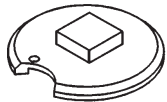


Fig. 19.2

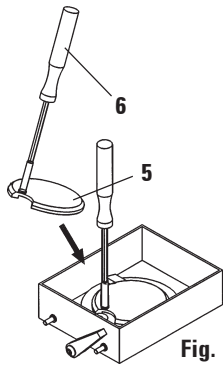


Fig. 19.3

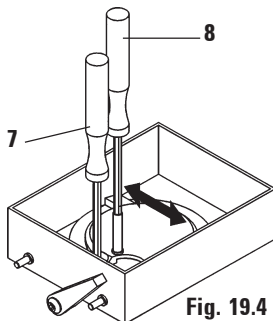
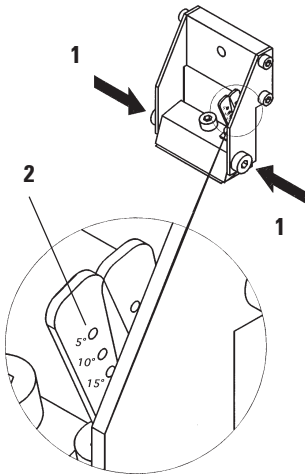


Fig. 19.4

- Mount the buffer tray (1) onto the bolt (2) inside the cooling bath (3).
- Secure the buffer tray by relocating the clamping lever (4) to the right (in the direction of the arrow).
- Via the **UP/DOWN** toggle switch lower the buffer tray to its lowest position (indicated by audible signal and red LED).
- Move the toggle switch back to the mid-position - the audible signal stops.
- If necessary, fill crushed ice into the cooling bath (3).
- Fill the buffer tray (1) with cooled buffer solution.
- Fix the specimen onto the specimen disc with cyanoacrylate adhesive (19.2).
- Insert the specimen disc (5) with the specimen into the buffer tray using the manipulator (6).
- Use the manipulator (8) to rotate the specimen disc into the desired position. Tighten with a 3 mm Allen key (7).
- The clamping screw or one of the clamping devices must not be located over the gap in the specimen disc, as in these positions clamping the specimen disc is not possible.
- Remove the manipulator (8).

5. Operation



Adjusting the clearance angle

- Adjust the clearance angle (2) of the knife holder.

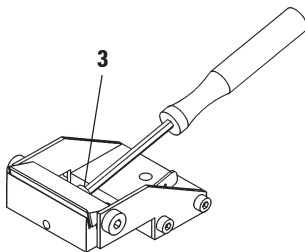
To this end:

- Loosen the two lateral screws (1) with a 3-mm Allen key).
- Use the adjusting lever (2) to select the desired clearance angle.
- Secure the selected clearance angle by tightening the two screws (1).



The Leica VT1000S does not require the readjustment of the clearance angle every time you change the knife. The clearance angle needs to be readjusted only, when required by a different application (e.g. different type of tissue to be sectioned).

Fig. 20.1



- To insert the blade, loosen the clamping screw (3) located on the knife holder.
- Clean the blade.
- Insert the blade into the knife holder (4).
- Secure the blade with clamping screw (5).

Fig. 20.2



The blade must fit tightly against the entire length of the inner limit stop of the knife holder.

The blade must be clamped parallel to the front edge of both knife holder clamping jaws.

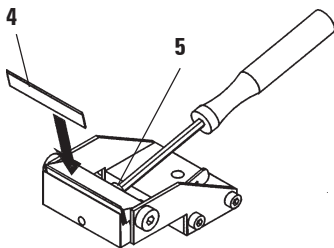


Fig. 20.3

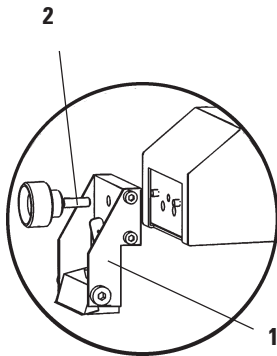


Fig. 21.1

- Fix the knife holder (1) with the knife holder clamping screw (2).
- Use the **REV/FORW**-rocker button to place the knife edge right behind the rear edge (from user's view) of the specimen.
- Pull the **UP/DOWN**-rocker button into the **UP**-direction and keep it in the **UP** position until the specimen surface is shortly below the level of the knife edge (see arrow (3)).

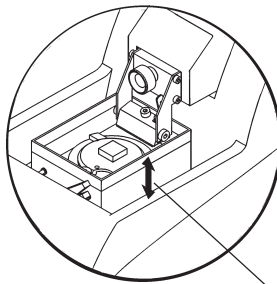


Fig. 21.2

- Select sectioning speed and sectioning frequency with the control knobs **SPEED** and **FREQ.**
- Use the **+/-** button to select a sectioning thickness for trimming.
- Select a sectioning range appropriate to the size of the specimen with the **SECTIONING WINDOW**-button.
- Switch the **SINGLE/CONT**-button to **CONT.**
Push the **START/STOP**-button.

The instrument will now trim the specimen at the selected trimming thickness until you push the **START/STOP** button once more.

- Once you have reached the desired specimen level for sectioning, use the **+/-** button to select the desired thickness for sectioning..

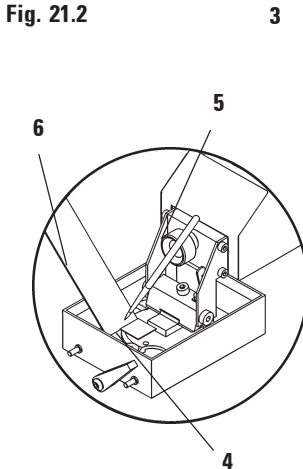


Fig. 21.3

3 For sectioning proceed as follows:

- Select the desired section thickness via the **+/-** button.
- Switch the **SINGLE/CONT**-button to **SINGLE**.
- Push the **START/STOP**-button.

The instrument will now produce a section (4). When the section is finished, the knife will automatically stop at the rear end position behind the specimen (from the user's view).

Pick up the section as shown on the left using a brush (5) to mount it on a glass slide (6).

5. Operation

5.5 Daily routine maintenance / switching the VT1000 S off


After you finish working, proceed as follows:

- Switch off the mains switch at the back of the instrument.
- Place the lid onto the magnifier
- Remove the knife holder.
- Take the knife out of the knife holder and dispose of it properly and safely.
- Remove the specimen disc and lay flatwise on table surface.
- Remove the specimen using a single-edge blade. Then, remove remains of cyanoacrylate adhesive from the specimen disc.
- Remove the buffer tray and drain it. Make sure to dispose properly of the contents of the buffer tray.
- Drain the cooling bath.
For that purpose, take the drain tube off the fixing device at the rear of the instrument and dispose of the contents of the cooling bath into a suitable recipient. Then wipe off with a dry cloth.



Caution: the contents of the cooling bath may also have been contaminated by buffer solution that has spilled over.

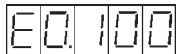
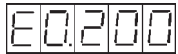
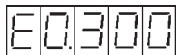
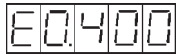

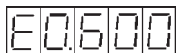
6. Trouble shooting

Error message	Source of error	Corrective action
<ul style="list-style-type: none">- Collision of knife and specimen holder.	<ul style="list-style-type: none">- Clearance angle adjustment:- If a clearance angle wider than 5° is selected, specimen disc and knife edge can potentially collide with each other.	<ul style="list-style-type: none">- Lower the specimen disc sufficiently to prevent collision.
	<ul style="list-style-type: none">- When working with orientable specimen holders, knife edge and specimen holder can collide at any selected clearance angle.	<ul style="list-style-type: none">- Lower the specimen disc sufficiently to prevent collision.
		 <div style="border: 1px solid black; padding: 5px;"><p>When working with orientable specimen discs, move the buffer tray to its lowest position directly after switching on the instrument!</p></div>
<ul style="list-style-type: none">- Audible sound signal.- Return stroke is not completed.	<ul style="list-style-type: none">- Operating error due to locking function of the REV/FORW button:- With the REV/FORW-button locked the instrument is switched off via the main switch at the rear of the instrument and is switched on again without releasing the REV/FORW-button to its center position.	<ul style="list-style-type: none">- Unlock the REV/FORW-button by pulling it back to the center position.- To reactivate the return stroke movement, lock the REV/FORW-button again (to REV position).
<ul style="list-style-type: none">- Audible sound signal.- Return stroke is not completed.	<ul style="list-style-type: none">- With the REV/FORW-locked the instrument was switched off via the emergency Stop and after that the emergency stop was released again without releasing the REV/FORW-button to its center position.	<ul style="list-style-type: none">- Unlock the REV/FORW-button by pulling it back to the center position.- To reactivate the return stroke movement, lock the REV/FORW-button again (to REV position).


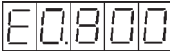
6. Trouble shooting

Error message	Source of error	Corrective action
<ul style="list-style-type: none">- Audible sound signal.- Downward stroke is not completed.	<ul style="list-style-type: none">- Operating error due to locking function of the UP/DOWN-button:- With the UP/DOWN-button locked in the DOWN position the instrument was switched off via the main switch at the rear of the instrument switched on again without releasing the UP/DOWN-button to its center position	<ul style="list-style-type: none">- Release the UP/DOWN-button to its center position.- To reactivate the downward motion, activate the UP/DOWN-button again (DOWN).
<ul style="list-style-type: none">- Audible sound signal.- Downward stroke is not completed.	<ul style="list-style-type: none">- With the UP/DOWN button locked the instrument was switched off via the emergency stop (foot switch or Emergency stop button) and after that the emergency stop was released without unlocking the UP/DOWN-button.	<ul style="list-style-type: none">- Release the UP/DOWN-button to its center position.- To reactivate the downward motion, activate the UP/DOWN-button again (DOWN).
<ul style="list-style-type: none">- The sectioning motor stops.- Any processing step (sectioning stroke etc.) is interrupted immediately.- Any UP/DOWN motion of the buffer tray is interrupted immediately.- Any locked buttons are indicated by an audible sound signal.- When pressing any key, the instrument gives an audible sound signal.- In case the Emergency stop function has been activated, the instrument will remain inoperational when pressing the foot switch.- The indication "SP" is displayed.	<ul style="list-style-type: none">- The Emergency stop function has been activated.	<ul style="list-style-type: none">- Release the Emergency stop button.- Select an operating mode and continue working.

6. Trouble shooting

Error message	Source of error	Corrective action
<ul style="list-style-type: none">- Audible sound signal.- Error code E0.1xx is displayed.  <p>xx - there are several error codes, 00 - there is only one error code.</p>	<ul style="list-style-type: none">- Button(s) jammed or defective.- Locking function /REV of REV/FORW-button defective. - Locking function /REV of REV/FORW-button defective.	<ul style="list-style-type: none">- Push the button several times to unlock; have defective button replaced by the Technical Service.
<ul style="list-style-type: none">- Audible sound signal.- Error code E0.200 is displayed. 	<ul style="list-style-type: none">- Feed mechanism defective.	<ul style="list-style-type: none">- Switch the instrument off; call the Technical Service.
<ul style="list-style-type: none">- Audible sound signal.- Error code E0.300 is displayed. 	<ul style="list-style-type: none">- Important electronic component defective.	<ul style="list-style-type: none">- Switch the instrument off; call the Technical Service.
<ul style="list-style-type: none">- Audible sound signal.- Error code E0.400 is displayed. 	<ul style="list-style-type: none">- Feed motor defective.	<ul style="list-style-type: none">- Switch the instrument off; call the Technical Service.
<ul style="list-style-type: none">- Audible sound signal.- Error code E0.5xx is displayed. 	<ul style="list-style-type: none">- Light barrier error (forward feed)	<ul style="list-style-type: none">- Switch the instrument off; call the Technical Service.
<ul style="list-style-type: none">- Audible sound signal.- Error code E0.600 is displayed. 	<ul style="list-style-type: none">- Light barrier error (section thickness feed)	<ul style="list-style-type: none">- Switch the instrument off; call the Technical Service.

6. Trouble shooting

Error message	Source of error	Corrective action
<ul style="list-style-type: none">- Audible sound signal.- Error code E0.700 is displayed for approx. 2 secs. 	<ul style="list-style-type: none">- Software detected severe hardware fault.	<ul style="list-style-type: none">- Switch the instrument off; call the Technical Service.
<ul style="list-style-type: none">- Audible sound signal.- Error code E0.8xx is displayed. 	<ul style="list-style-type: none">- E-EPROM defective.	<ul style="list-style-type: none">- Instrument can still be used, though there will be certain limitations: all values will be set to default values. New values (sectioning window, feed, lowering) cannot be saved.- Call the Technical Service.
<ul style="list-style-type: none">- Audible sound signal.- Optical signal via red LED.	<ul style="list-style-type: none">- The upper limit of the specimen feed has been reached.	<ul style="list-style-type: none">- Leave the upper limit position (Switch the UP/DOWN-button in DOWN direction).- Mount a new specimen onto the specimen holder and start again.
<ul style="list-style-type: none">- Audible sound signal.- Optical signal via red LED.	<ul style="list-style-type: none">- The lower limit of the specimen level has been reached (height adjustment of specimen via buffer tray).	<ul style="list-style-type: none">- After unlocking the DOWN position the buffer tray is automatically raised until the audible and optical signals turn off.
<ul style="list-style-type: none">- Audible sound signal..	<ul style="list-style-type: none">- User has tried to select a specimen thickness via the +/- button, which is below the minimum value (0 µm) or above the maximum (999 µm).	<ul style="list-style-type: none">- Release the +/- button.

Error message	Source of error	Corrective action
<ul style="list-style-type: none"> - Audible warning signal. (When operating the instrument for the first time or after the E-EPROM has been exchanged.) 	<ul style="list-style-type: none"> - The visible clamping screws have become loose during sectioning. 	<ul style="list-style-type: none"> - The warning signal will cease automatically after the initialization phase.
<ul style="list-style-type: none"> - A clattering sound can be heard. 	<ul style="list-style-type: none"> - The visible clamping screws have become loose during sectioning. 	<ul style="list-style-type: none"> - Retighten the loose clamping screws.
	<div> </div> <div> <p>These symptoms may occur from time to time and are unavoidable, as the clamping screws which have to be operated by the user cannot be sealed.</p> </div>	<div> </div> <div> <p>If the clattering sound does not cease once the clamping screws have been retightened, do not hesitate to immediately call the Technical Service. Do not use the instrument when in this condition.</p> </div>

7. Cleaning and maintenance

7.1 Cleaning the instrument



Always remove the knife / blade before detaching the knife holder from the instrument. Always put the knife (blade) back into the knife case or blade dispenser when not in use!
When using cleaners, comply with the safety instructions of the manufacturer and the labor safety regulations of your laboratory!
When cleaning the outer surfaces, do not use xylene or 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!

Before each cleaning carry out the following preparatory steps:

- Switch the instrument off and unplug it from mains.
- Remove the blade from the knife holder and insert it in the receptacle at the bottom of the blade dispenser.
- Remove the knife holder for cleaning.
- Remove the specimen disc from the buffer tray and lay it flatwise on the table surface. Carefully remove the specimen with a single-edge blade.
- Remove section waste with a forceps or a brush.
- Remove the buffer tray, empty it and rinse it separately with water (see also page 22).

Instrument and outside surfaces

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

The instrument must be completely dry before it can be used again.

Cleaning the knife



When cleaning the knife/blade, always wipe from the knife or blade back towards the cutting edge, NEVER the other way round. Risk of injury!

Clean with alcohol-based detergent or with acetone.

7.2 Exchanging the main fuses



Warning:
Prior to exchanging the fuses disconnect the mains plug!

- To exchange the fuses carefully open the sealing cover at the rear of the instrument with a small screw driver. Insert the screw driver into the small gap on the extreme left **(1)**.
- Remove the fuses and insert new ones **of the same specification!**

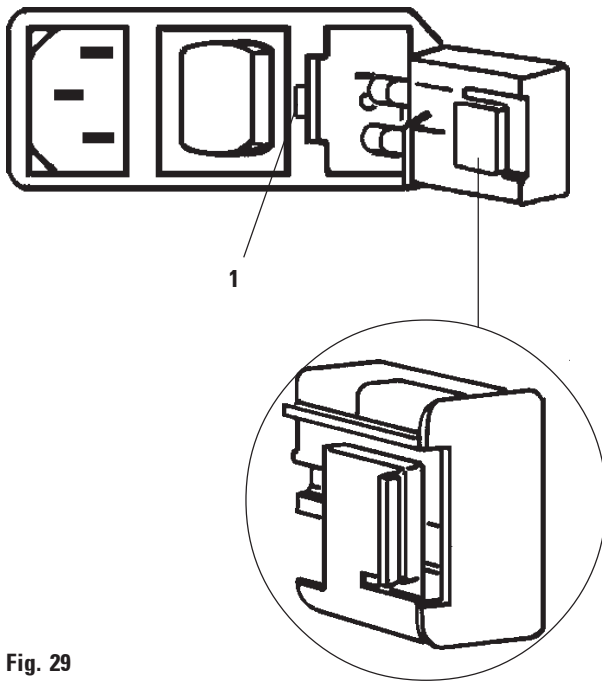


Fig. 29

8. Ordering information: replacement parts, accessories and consumables

Vise S	046327409
Knife holder S	046230131
Buffer tray S.....	046230132
Buffer tray S, double-walled	046330365
Specimen disc S, Ø 50 mm, non orientable*	046327404
Specimen disc S, orientable*	046327406
Magnetic specimen holder, orientable	046232060
Foot switch with protective guard	046327415
Magnifier, assy.	046231191
Fiber optics	050230028
Cold light sources	
Leica CLS100X 100-120V/50-60Hz	050230214
Leica CLS100X 230-240V/50-60Hz	050230215
Leica CLS100X 240V/ 50-60Hz	050230216
Knife holder L, for standard low-profile blades, 70x50mm	046327402
Buffer tray L**	046327408
Buffer tray L**, double-walled	046330364
Specimen disc L***, non orientable*	046327405
Specimen disc L***, orientable	046327407
Vise L***	046327410
Knife holder S, for maximum specimen height 20 mm	046231950
Knife holder L, for specimens 20 mm high	046231949
Injector blades, 1 dispenser containing 20 blades	035827411
Sapphire knife	021639372
Cyanoacrylate glue	037127414



*) The orientable specimen discs S can be rotated around their center as well as tilted on one axis. The non-orientable specimen discs S can be rotated but not tilted. The orientable specimen discs L can be tilted on one axis - they can, however, not be rotated. The non orientable specimen discs L are laterally adjustable but not tiltable. For sectioning large specimens, all three accessories marked with two asterisks (**) have to be ordered, as knife holder L can only be used together with buffer tray L and low-profile disposable blades. In addition, at least one of the specimen holding devices marked (***) is needed for sectioning large specimens.

8. Ordering information: replacement parts, accessories and consumables

8.1 Additional accessories for standard size specimens (functional description)

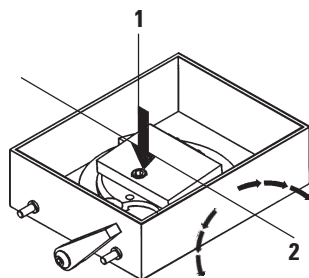


Fig. 31.1

Specimen disc S, orientable

- By turning the screw (1) the specimen holder can be tilted on the x-axis (see arrow 2).
The orientable specimen disc S can be rotated by 330°.

Ref. no. 0463 27406

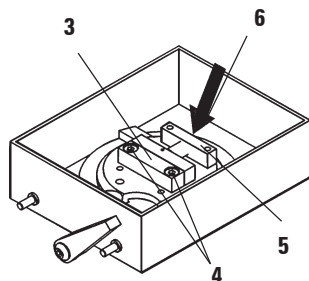


Fig. 31.2

Vise S, orientable

- The vise S can be rotated by 330°. It is used to clamp specimen blocks. The clamping mechanism consists of one fixed and one movable clamping jaw. The fixed jaw (3) can be fixed in 3 different positions to adjust the vise individually according to the size of the specimen. In order to relocate the fixed clamping jaw, unscrew the two screws (4) and move the clamping jaw to the desired position. Retighten the screws. The regular fixed clamping jaw can also be replaced by a fixed clamping jaw with a V cut for round specimens (w/o illustration). The flexible clamping jaw (5) is used to clamp the specimen via a clamping screw (see arrow 6).

Ref. no. 0463 27409

8.2 Additional accessories for large specimens (functional description)

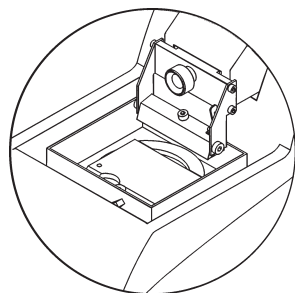


Fig. 31.3

- Fig. (32.3) shows a configuration for large specimens, consisting of knife holder L, buffer tray L and specimen disc L, not orientable.

Ref. no. 0463 27402 (Knife holder L)

Ref. no. 0463 27408 (Buffer tray L)

Ref. no. 0463 27405 (Specimen disc L, non orientable)

8. Ordering information: replacement parts, accessories and consumables

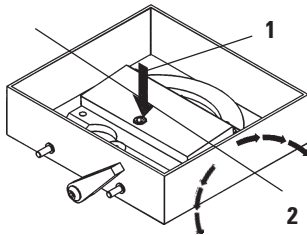


Fig. 32.1

Specimen disc L, orientable

- By rotating the screw (1) the specimen disc can be tilted on the x-axis (see arrow 2).

Since the orientable specimen disc L cannot be rotated.

Ref. no. 0463 27407

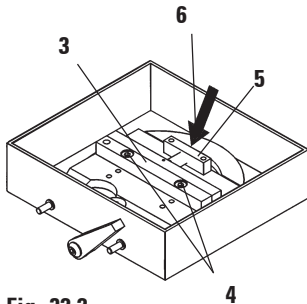


Fig. 32.2

Vise L, orientable

- The vise L is used to clamp specimen blocks. The clamping mechanism consists of one fixed and one movable clamping jaw. The fixed jaw (3) can be fixed in 3 different positions to adjust the vise individually according to the size of the specimen. In order to relocate the fixed clamping jaw, unscrew the two screws (4) move the clamping jaw to the desired position and retighten the screws.

The regular fixed clamping jaw can also be replaced by a fixed clamping jaw with a V cut for round specimens (w/o illustration).

The flexible clamping jaw (5) is used to clamp the specimen via a clamping screw (see arrow 6).

Ref. no. 0463 27410

8.3 Foot switch (functional description)

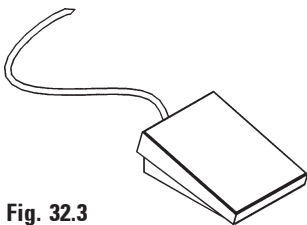


Fig. 32.3

Foot switch

- The foot switch is an optional accessory which can be used instead of the **START/STOP**-button.

Ref. no. 0463 27415

8. Ordering information: replacement parts, accessories and consumables

8.4 Magnifier, fiber optics, cold light source

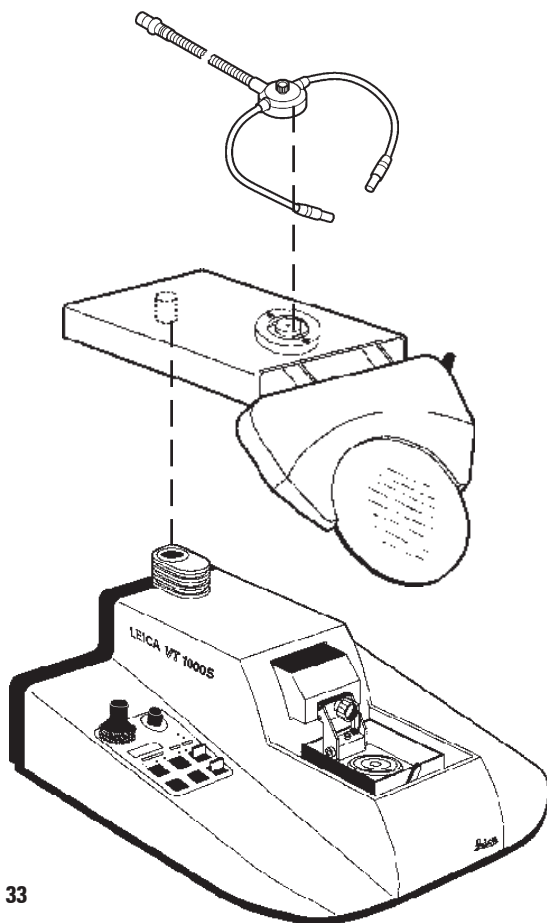


Fig. 33

Fiber optics

- To be mounted onto the magnifier after the magnifier has been mounted into the fixture. Then, connect the fiber optics to the cold light source.

Ref. no. 0502 30028

Magnifier

- To be inserted into the fixture.

Ref. no. 0462 31191

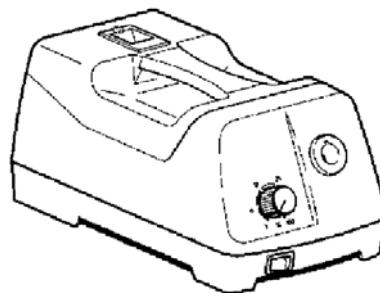
Cold light source Leica CLS 100

- Light source of the fiber optics.

100-120 V, 50/60 Hz, Ref. no. 0502 30214

230 V, 50/60 Hz, Ref. no. 0502 30215

240 V, 50/60 Hz, Ref. no. 0502 30216



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 service or spare parts, please contact your Leica representative or the Leica dealer where you purchased the unit.

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 unit or parts of the unit must be disposed of according to existing local applicable regulations.



EC Declaration of Conformity

We herewith declare, in exclusive responsibility, that the instrument

Leica VT1000 S – Vibrating Blade Microtome

was developed, designed and manufactured to conform with the

- Council Directive 73/23/EEC, (Low Voltage) and
- Council Directive 89/336/EEC, Appendix I (Electromagnetic Compatibility), including their amendments up to the date mentioned below.

The following harmonized standards were applied:

- **EN 61010-1: 2001**

Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements

- **EN 61326-1: 1997 + EN 61326/1: 1998**

Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements

- **EN 61000-3-2: 1995 + A1: 1998 + A2: 1998 + A14: 2000**

Electromagnetic compatibility (EMC)
Part 3-2: Limits - Limits for harmonic current emissions

- **EN 61000-3-3: 1995**

Electromagnetic compatibility (EMC)
Part 3: Limits -
Section 3: Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current ≤ 16 A

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

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

Leica Biosystems Nussloch GmbH
Postfach 1120
D-69222 Nussloch
October 11, 2007

Anne De Greef-Safft
President Biosystems Division

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

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

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

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