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Title: Leica RM2255 Fully Automated Rotary Microtome
Version: v1
Author: In Hwa Um

Effective from:	01/11/2021
Valid to:	01/11/2026

SOP History		
Number	Date	Reason for Change
v1	01/11/2021	Original

1.0 Purpose –

The purpose of this SOP is to outline the principles of the routine use of the Leica RM2255 Fully Automated Rotary Microtome in Laboratory 248 at the St Andrews School of Medicine (SASoM).

2.0 Scope –

This SOP applies to routine use and maintenance of the Leica RM2255 Fully Automated Rotary Microtome within the SASoM.

3.0 Responsibilities –

It is the responsibility of all users of the Leica RM2255 Fully Automated Rotary Microtome within the SASoM to comply with this SOP.

****** All users are required to be trained and signed off by supervisory personnel before using this equipment. ******

4.0 Procedure –

The RM2255 is a fully automatic, motorized rotary microtome with a separate control panel specifically designed for creating thin sections of human tissue specimens of varying hardness for histological medical diagnosis, e.g. cancer diagnosis. It is intended for sectioning soft and hard human specimens, as long as they are suitable for being cut motorized or manually. Any other use of the instrument will be considered as improper use!

4.1 Integrated safety devices

- Emergency stop function with E-STOP button (Figure 1A-1)
- Handwheel lock (manual operation only) (Figure 1B-5)
- Handwheel break (Figure 1B-3)
- Knife guard on the knife holder (Figure 1C-9,10)

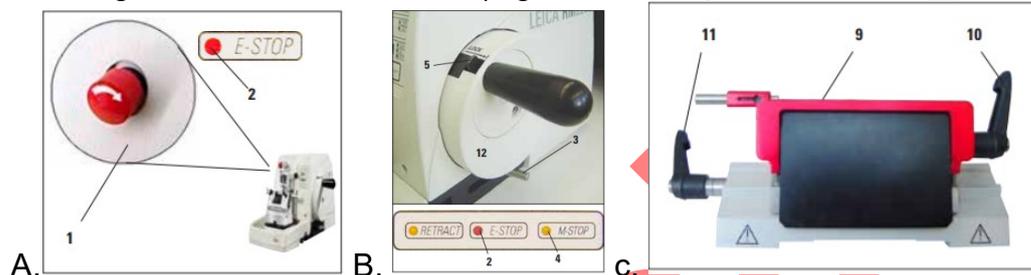


Figure 1 Integrated safety devices

4.2. Instrument specification (Figure 2)

- The specimen feed system with zero-backlash and maintenance-free cross roller guides and the stepper motor operated coarse feed system are located in a dust-proof plastic housing.
- The instrument is equipped with a safety handwheel with a handle that can be centered, as well as a mechanical handwheel lock.
- All controls and LEDs are centralized in a separate control panel. All control elements are logically arranged in functional groups and easily identifiable.
- The specimen retraction can be turned off. In manual operation the retraction can be adjusted. In motorized operation the retraction value varies with the selected sectioning speed. An LED illuminates while the sample is in retraction.
- The electric coarse feed operates at two speeds. In the sectioning mode, the coarse feed buttons have a STEP function.
- Three motorized sectioning modes (CONT, SINGLE, and STEP) are available as well as one manual sectioning mode, the rocking mode ROCK. In rocking mode, it is enough to move the handwheel a short distance back and forth in order to create a section.

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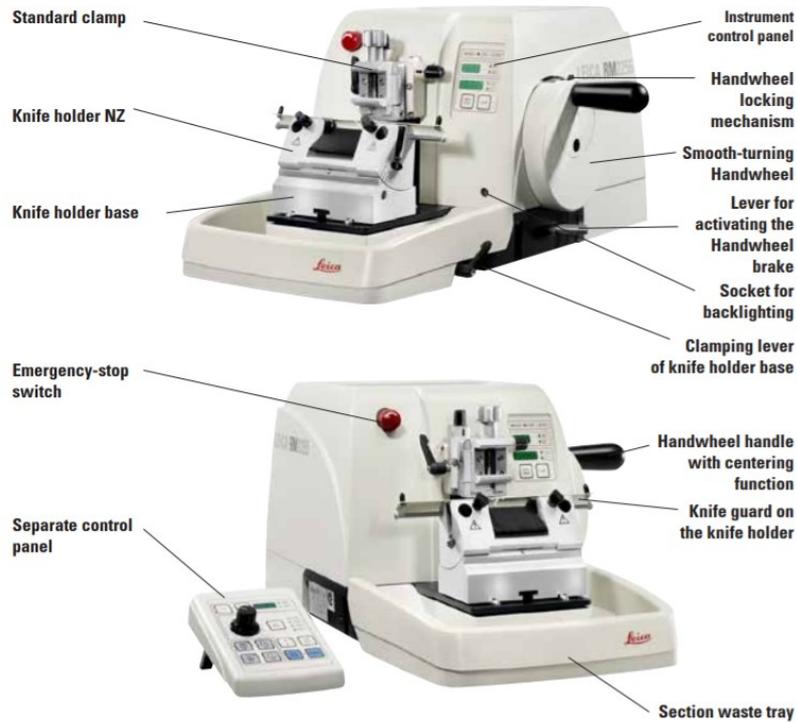


Figure 2 Overview of RM2255 fully automated rotary microtome

4.3 Instrument control panel (Figure 3) and remote control panel (Figure 4)

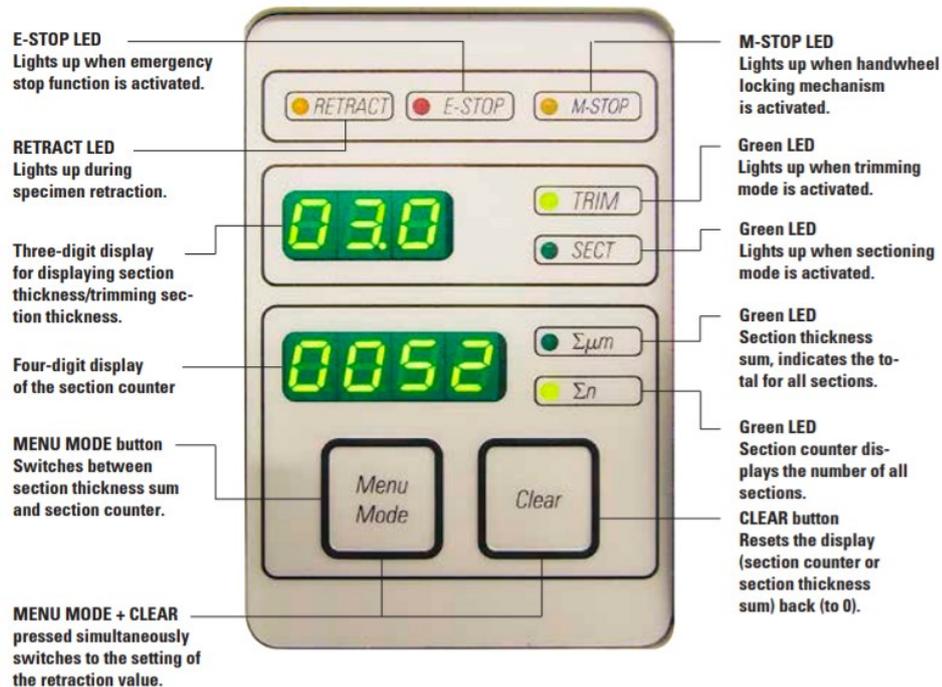


Figure 3 Instrument control panel

4.4 Display and control elements

- Three-digit display (Figure 3)

This display is located both on the instrument and on the control panel. If the SECT LED is lit up, the display shows the section thickness setting in



Equipment Operation Procedure

- μm . If the TRIM LED is lit up, the display shows the trimming section thickness setting in μm .
- Selecting the sectioning and trimming mode (Figure 3)
To switch between sectioning mode and trimming mode, press the TRIM SECT button. Whenever the button is pressed, the display toggles between SECT and TRIM. In the SECT display, the sectioning thickness in the range from 0.50 to 100.0 μm is shown, and in the TRIM display, the trimming section thickness between 1.0 and 600 μm is displayed.
 - Setting the section thickness/trimming section thickness (Figure 4)
Adjust these settings using the - keys on the control panel. Section thickness setting range: 0.50 - 100 μm
 - Coarse feed functions (Figure 4)
The electric coarse feed at two speeds is used for a rapid movement of the specimen towards and away from the knife. With the double-arrow buttons, the coarse feed operates at 800 $\mu\text{m/s}$; with buttons with one arrow, it is 300 $\mu\text{m/s}$. In sectioning mode, the coarse drive can be used in (STEP mode) or with continuous feed. The instrument is delivered with the STEP function deactivated (standard configuration).
 - Sample retraction
To prevent damage to the blade and specimen, the specimen is moved away from the blade during the return motion to the upper home position. To call up the retraction settings, press the MENU MODE and CLEAR buttons simultaneously. +/- button can be used to adjust the value of retraction. To switch off, press - button on the control panel until the display indicates "OFF".
 - Manual sectioning mode
 - Select ROCK operating mode.
 - Turn the handwheel a short distance forwards and backwards for sectioning (rocking mode). Each change in the sense of rotation will be electronically detected and automatically converted into an advance or retraction movement of the specimen.
 - Motorised sectioning is not recommended in the 248 lab.

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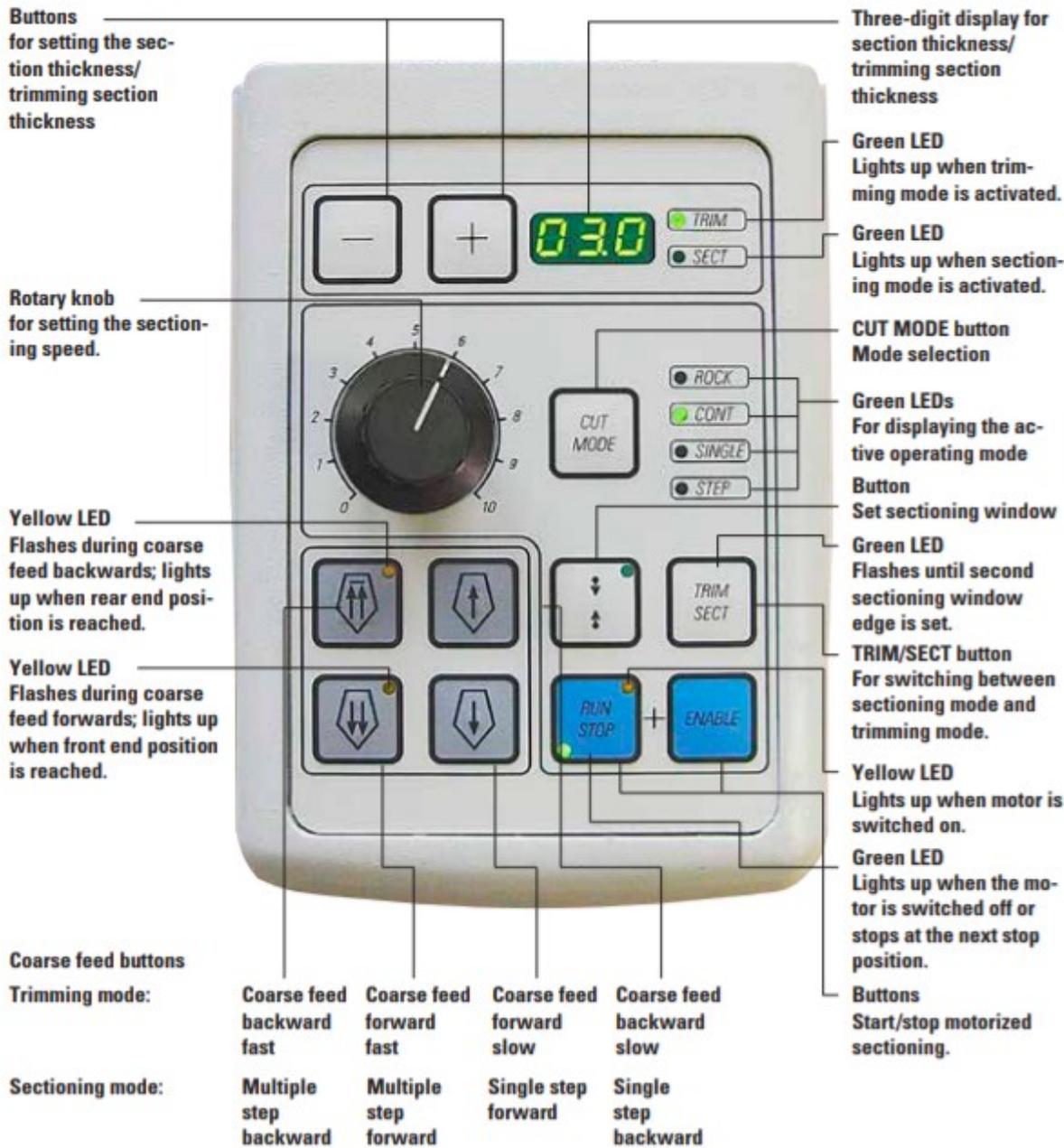


Figure 4 Remote control panel

4.5 Inserting the knife holder

- Setting up the knife holder base (Figure 5)
 - Release the clamping lever (50) by rotating it counter clockwise.
 - Insert the knife holder base (51) using the notch (52) on the bottom into the T-piece (55) of the microtome base plate (53).
 - To secure the knife holder base, turn the clamping lever (50) clockwise.
- Inserting the knife holder (Figure 5)
 - Loosen the screw (58) using an Allen key size 4 (71) until the knife holder (57) can be moved.

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- Place the knife holder (57) with the underside groove onto the T-piece (56) of the knife holder base (51).
- To clamp, retighten the screw (58).

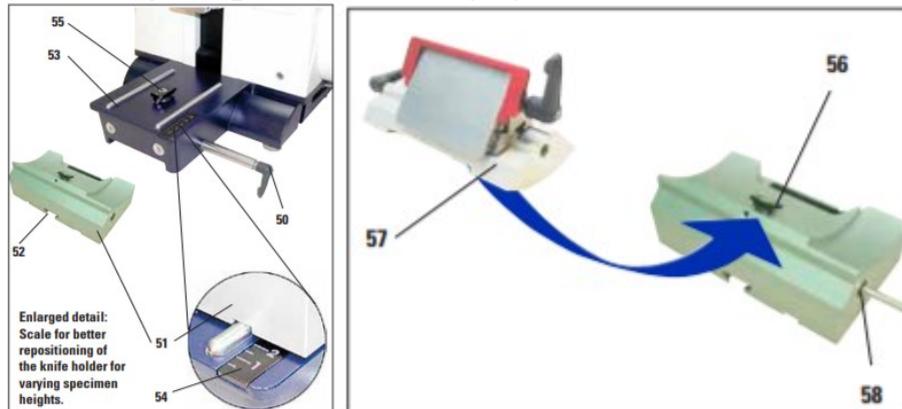


Figure 5 Inserting knife holder

4.6 Adjusting the clearance angle

- Inserting the knife holder (Figure 6)
- Loosen the screw (58) using an Allen key size 4 (71) until the knife holder (57) can be moved.
- Place the knife holder (57) with the underside groove onto the T-piece (56) of the knife holder base (51).
- To clamp, retighten the screw (58).

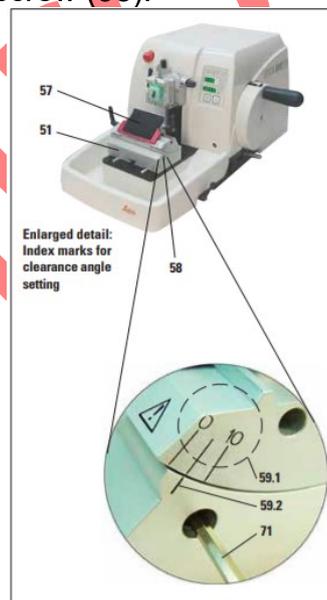


Figure 6 Adjusting the clearance angle

4.7 Clamping the specimen

- Rotate the handwheel until the specimen clamp is in the uppermost position.
- Activate the handwheel lock by allowing the handwheel handle to lock in place and then activate the brake.
- Insert a specimen into the specimen clamp.

4.8 Clamping the knife/ disposable blade

Equipment Operation Procedure

- Fold knife guard (9) downward (Figure 7).
 - To insert the blade, flip the right clamping lever (10) forward and down.
 - Carefully push in the blade from above or from the side. Make sure that the blade is clamped in the center and, most importantly, parallel to the upper edge of the pressure plate.
 - To clamp the blade, rotate clamping lever (10) clockwise back upwards.
 - To remove the blade, fold the clamping lever (10) downwards counter clockwise.
- The ejector (9a) ensures safe blade changing.
- Another option for moving the blade is to use the brush with magnet. To do so, fold the clamping lever (10) downwards counter clockwise. Likewise, fold the knife guard (9) downward. Guide the brush with magnet to the blade and lift it upwards and out.

Once the blade has been removed from the blade holder, it is disposed of into the dispenser container (underside, see image).



Figure 7 Clamping the knife / disposable blades

4.9 Trimming the specimen

Using the CUT MODE key, select the ROCK operating mode and cut the specimen with forward and backward motions of the handwheel. • Terminate trimming when the desired sectioning surface and depth have been reached.

4.10 Sectioning



Equipment Operation Procedure

- Center the handle of the handwheel.
- Use the TRIM/SECT key to select the sectioning mode.
- Adjust the appropriate sectioning thickness

4.11 Cleaning and maintenance

- Before each cleaning, carry out the following preparatory steps:
 - Raise the specimen clamp to the upper end position and activate the handwheel lock.
 - Switch the unit off and unplug it.
 - Remove the blade from the knife holder and insert it in the receptacle at the bottom of the dispenser or remove the knife from the knife holder and put it back in the knife case.
 - Remove knife holder base and knife holder for cleaning.
 - Remove the specimen from the specimen clamp.
 - Remove section waste with a dry brush.
 - Remove specimen clamp and clean separately.
- Empty the section waste tray
- Wipe the blade holder and specimen holder with the Lotoxane to remove excess of wax

5.0 Personal protection –

Howie coat must be worn at all times.

6.0 Training –

All users must be trained by a designated person before using the Instrument.

7.0 Related documents –

- Risk Assessment: CHARM_20176_Serial Sectioning of FFPE blocks.
- Manual for the instrument (available online).



8.0 Approval and sign off –

Author:

Name: In Hwa Um

Position: Post Doc

Signature:

Date: 02/11/2021

Management Approval:

Name: Peter Mullen

Position: SOP Administrator

Signature:

Date: 03/11/2021

QA release by:

Name: Claire Sneddon

Position: QA Manager

Signature:

Date: 03/11/2021

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