

Anexa tehnica, lot 1 Model: M-240, Semi-Automated Rotary Microtome

Prodicator: Especialidades Médicas Myr. Tara de origine: Spania

Specificarea tehnică deplină solicitată, Standarde de referință	Specificarea tehnică deplină oferită, Standarde de referință
Descriere Microtom semiautomat de tip rotativ pentru secționarea probelor histologice în intervale subțiri și controlate, destinat laboratoarelor clinice, anatomopatologice și de cercetare. Parametru Specificație Componente principale Unitate principală Panou de control Mecanism secționare Suport specimen Suport lamă Recipient pentru deșeuri Mecanism retracție, ajustabil Sistem orientare Alte componente, necesare pentru a asigura funcționalitatea pe deplin a dispozitivului Specificații/parametri tehnici: Tip microtom Semiautomat, rotativ Alimentare 220 V 50 Hz Plaja de alimentare orizontală ≥ 28 mm Interval grosime secțiune 0.5 – 100 μm cu pași Interval grosime fasonare prin intermediul motorului (Trimming) 0.5 – 500 μm cu pași Control grosime ajustabil Vertical specimen ≥ 72 mm Control secționare Manual / opțiuni Motor feed Siguranță/Protecție lame Obligatoriu Viteza de avansare a specimenului inclusiv ($\mu\text{m/s}$) 300-400 (slow) 800 (fast) ≥ 1200 (superfast), opțional Orientare specimen Ajustabilă pe două axe X/Y ($\pm 8^\circ$ sau echivalent) Retracție specimen Ajustabilă, ON/OFF Sistem de avans și poziționare specimen Obligatoriu Capacitatea tavei detașabile cu suport pentru mana $\geq 1,7$ L Funcționalități operaționale: Funcție de memorie Obligatoriu	Descriere Microtom semiautomat de tip rotativ pentru secționarea probelor histologice în intervale subțiri și controlate, destinat laboratoarelor clinice, anatomopatologice și de cercetare. Parametru Specificație Componente principale Unitate principală Panou de control Mecanism secționare Suport specimen Suport lamă Recipient pentru deșeuri Mecanism retracție, ajustabil in deapazonul 5 – 250 μ Valoare presetata: 40 μ , optional functia poate fi deactivate Sistem orientare: $\pm 8^\circ$ orizontal si vertical. Capabilitate rotatională: 360° Indicatie pentru “0-position” prin “click” (x and y) Alte componente, necesare pentru a asigura funcționalitatea pe deplin a dispozitivului Specificații/parametri tehnici: Tip microtom Semiautomat, rotativ Alimentare 220 V 50 Hz Plaja de alimentare orizontală 28 mm ± 1 mm Interval grosime secțiune 0.5 – 100 μm cu pași de: - Interval 0,5 - 5 cu pas de 0,5 μ - Interval 5 - 20 cu pas de 1 μ - Interval 20 - 60 cu pas de 5 μ - Interval 60 - 100 cu pas de 10 μ Interval grosime fasonare prin intermediul motorului (Trimming) 0.5 – 600 μm cu pași: Control grosime ajustabil - Interval 1 - 10 cu pas de 1 μ - Interval 10 - 20 cu pas de 2 μ - Interval 20 - 50 cu pas de 5 μ - Interval 50 - 100 cu pas de 10 μ - Interval 100 - 600 cu pas de 50 μ Vertical specimen 72 mm ± 1 mm Control secționare Manual / opțiuni Motor feed Siguranță/Protecție lame Obligatoriu Viteza de avansare a specimenului inclusiv ($\mu\text{m/s}$) 300 (slow) 800 (fast) 1800 (superfast) Orientare specimen Ajustabilă pe două axe X/Y ($\pm 8^\circ$) Retracție specimen Ajustabilă, ON/OFF Sistem de avans și poziționare specimen DA Capacitatea tavei detașabile cu suport pentru mana 1,7 L Funcționalități operaționale: Funcție de memorie DA

Indicator secțiuni Obligatoriu	Indicator secțiuni DA
Funcție Anti-tilt Obligatoriu	Funcție Anti-tilt DA
Suport de casete Obligatoriu	Suport de casete DA
Suport pentru lame de microtom Obligatoriu	Suport pentru lame de microtom DA



Technical data

	M-240	M-250
SECTION THICKNESS		
Total range(μ)	0,5 - 100	0,5 - 100
Thickness settings(μ)	0,5 - 5 in increments of 0,5 5 - 20 in increments of 1 20 - 60 in increments of 5 60 - 100 in increments of 10	0,5 - 5 in increments of 0,5 5 - 20 in increments of 1 20 - 60 in increments of 5 60 - 100 in increments of 10
TRIMMING		
Total range(μ)	1 - 600	1 - 600
Thickness settings(μ)	1 - 10 in increments of 1 10 - 20 in increments of 2 20 - 50 in increments of 5 50 - 100 in increments of 10 100 - 600 in increments of 50	1 - 10 in increments of 1 10 - 20 in increments of 2 20 - 50 in increments of 5 50 - 100 in increments of 10 100 - 600 in increments of 50
SPECIMEN FEED (mm)	28 ± 1 mm	28 ± 1 mm
VERTICAL STROKE (mm)	72 ± 1 mm for sectioning of mega-cassettes	72 ± 1 mm for sectioning of mega-cassettes
USER INTERFACE	7" capacitive touchscreen display	7" capacitive touchscreen display
OPERATING MODES	Manual: Rotational and Rocking	Manual: Rotational and Rocking Motorized: Interval, Single, Continuous and Multi Stroke
SPECIMEN RETRACTION		
Total range(μ)	Selectable between 5 – 250 Default value: 40μ Optional function that can be deactivated	Selectable between 5 – 250 Default value: 40μ Optional function that can be deactivated
MOTORIZED COARSE FEED (μm/sec)	300 (slow speed forward) 800 (fast speed forward) 1800 (superfast speed backwards) Additional function for forward/ backward feed in step mode	300 (slow speed forward) 800 (fast speed forward) 1800 (superfast speed backwards) Additional function for forward/ backward feed in step mode
SECTIONING SPEED		0,5 - 450 mm/s
BLADE HOLDER TYPE	2 in 1 for high and low profile blades	2 in 1 for high and low profile blades
MAX.SPECIMEN SIZE (mm)	50x60x40 (w x h x d) Super Cassette Clamp 68x48x15	50x60x40 (w x h x d) Super Cassette Clamp 68x48x15
SPECIMEN ORIENTATION	± 8° horizontal and vertical. Rotational capability: 360° Indication of 0-position by means of "click" (x and y)	± 8° horizontal and vertical. Rotational capability: 360° Indication of 0-position by means of "click" (x and y)
POWER REQUIREMENTS	100-240 VAC / 50-60Hz	100-240 VAC / 50-60Hz
CONSUMPTION (VA)	40	100
DIMENSIONS (W - D - H)	465 x 540 x 298 mm	465 x 540 x 298 mm
WEIGHT (kg)	33,9	39



M-240 & M-250

State-of-the-art technology provides the operational comfort and stability required for high-quality cutting in routine, research and industrial applications.

AUTOMATED AND SEMI-AUTOMATED ROTARY MICROTOMES
M-240 / M-250



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FIXATIONGROSSINGPROCESSINGEMBEDDINGCUTTINGSTAINING/COVERSLIPPING

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AUTOMATED & SEMI-AUTOMATED
ROTARY MICROTOMES

M-240 & M-250

State-of-the-art technology provides the operational comfort and stability required for high-quality cutting in routine, research and industrial applications



INTUITIVE CONTROL PANEL
7" full-color TFT display with cutting-edge PCAP touchscreen technology. Its ideal size and tilt angle allow smooth, intuitive parameter selection. The ergonomic design ensures maximum user comfort and enhances operational safety during routine use.



KNIFE CARRIER SYSTEM: LESS EFFORT, MORE PERFORMANCE
The blade holder glides effortlessly side-to-side, allowing full blade usage. Compatible with both low and high-profile blades, every holder includes a protective finger guard to ensure operator safety without compromising performance.



RAPID MOVEMENTS, WITH MOTORIZED SPECIMEN FEED
Select between continuous or step-by-step coarse feed via touchscreen. Speed is adjustable for controlled advancement, while a high-speed retraction function quickly brings the sample back to home position for fast repositioning.



ULTRA-PRECISE POSITIONING, WITH Advanced Specimen Orienting Head
Indication of 0-position in x and y direction by palpable "click" for the precise alignment of the specimen. The 360° rotational capability of the specimen clamp and 8° mobility range along the x and y-axis of the orienting specimen head enables.



EXTRA-LARGE WASTE TRAY
Spacious 1.7-liter tray with advanced antistatic coating to repel paraffin and reduce cleaning time. Designed with user comfort in mind, it includes a resting surface for the arm and a practical top tray for convenient tool placement.



ERGONOMIC & FLUID HANDWHEEL
Innovatively counterbalanced, the handwheel guarantees smooth, fatigue-free rotation in either direction. It locks securely in any position, offering maximum cutting control and ergonomic support for long working sessions.



Exclusive M-250 features

LATERAL BUTTON

Embedded in the left side of the automatic microtome for speed/start-stop functions. It is possible to adjust the cutting speed while the motorized cutting is running.

EXTERNAL PANEL *Optionally available*

The entire touch screen functions are integrated into the external control panel for higher adaptability to technicians' preferences.

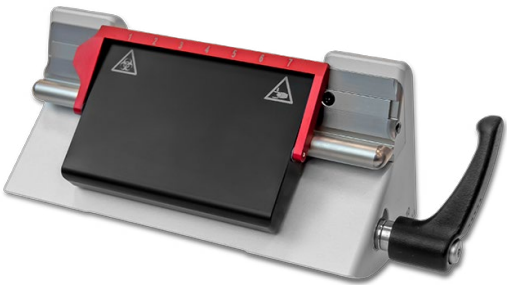
ELECTRONIC BRAKE

Once the automatic sectioning mode is paused, the electronic brake automatically activates, or alternatively, when sectioning manually, it can be activated by pressing the brake key on the touchscreen.

FOOTSWITCH *Optionally available*

Blade holders and clamps

KNIFE CARRIER ME
M240-4101



KNIFE CARRIER MR
M240-4002C



UNIVERSAL CLAMP
M240-2200



UNIVERSAL CLAMP
For Super Mega-Cassettes
M240-2300



STANDARD CLAMP
M240-2100



ORDERING INFORMATION

M250-01 M240-01	Microtome with knife carrier MR (for High and Low profile blades, lateral adjustment), quick release clamp.
M250-02 M240-02	Microtome with knife carrier MR, (for High and Low profile blades, lateral adjustment), standard specimen clamp.
M250-03 M240-03	Microtome with knife carrier ME (for High and Low profile blades, lateral adjustment), quick release clamp.
M250-04 M240-04	Microtome with knife carrier ME, (for High and Low profile blades, lateral adjustment), standard specimen clamp.

OPCIONAL ACCESSORIES

M250-1000	Footswitch
M250-2000	External control panel
M240-1000	Fixed specimen head
M240-1100	Orienting specimen head
M240-2100	Standard specimen clamp 55x50 mm
M240-2200	Universal specimen clamp (Quick release clamp)
M240-2300	Universal specimen clamp (for Super Mega-cassettes)
M240-4002C	Knife carrier for disposable Blades, model MR
M240-4101	Knife carrier for disposable Blades, model ME

Essential accessories



DISPOSABLE BLADES

MCUT microtome disposable blades are aimed to section the specimens at a certain selected stable thickness through required technical expertise such as sophisticated heating processes and polishing/coating techniques.

REFERENCE	DESCRIPTION	EDGE ANGLE	SIZE (W - H - D)
MCUT-3508	Disposable microtome blades (low profile)	35°	80 x 8 x 0,254 mm
MCUT-3514	Disposable microtome blades (high profile)	35°	80 x 14 x 0,317 mm

EC Declaration of Conformity / *Declaración de Conformidad CE*

Manufacturer / *Fabricante*

Especialidades Médicas MYR S.L.

C/ Lleida 17-23 - 43712 Llorenç del Penedès - Tarragona - Spain

We declare under our own responsibility that the product / *Declaramos bajo nuestra responsabilidad que el producto*

Microtome M-240 / *Microtomo M-240*

meets all the requirements of the following European Directives that are applicable
cumple todos los requisitos aplicables de las siguientes Directivas Europeas

98/79/EC:	In Vitro Diagnostic Devices Directive Classification: General IVD (Other), neither listed in Annex II of IVD 98/79/EC nor IVDs for self-testing purpose
2014/30/EU:	Electromagnetic Compatibility (EMC) Directive
2014/35/EU:	Low Voltage Directive
2011/65/EU:	Restriction of the Use of Hazardous Substances in electrical and electronic equipments (RoHS) Directive

The product is designed and manufactured according to the relevant parts of the following International Standards
El producto está diseñado y fabricado de acuerdo con las partes relevantes de los siguientes estándares

IEC 61010-1: 2010 + A1:2016	IEC 61010-2-101: 2015
EN 61326-1: 2013	EN 61326-2-6: 2013
EN ISO 14971: 2012	

In addition, the following standards are applied:

Además, la empresa trabaja de acuerdo con las siguientes normas:

ISO 9001-2015:	Quality Management system
ISO 13485-2016:	Medical Devices - Quality Management system

Llorenç del Penedès, 19/06/2019

Francisco Ruiz Robles
Managing Director / *Director General*

AENOR



Quality Management System Certificate



ER-0031/2014

AENOR certifies that the organization

ESPECIALIDADES MEDICAS MYR, S.L.

has a quality management system according to the ISO 9001:2015 Standard

for the activities: Design, development and production of machines for pre-treatment before analysis and diagnosis of all types of tissues: human, animal and vegetable.

which is/are carried out in: CL LLEIDA, 17-23. 43712 - LLORENÇ DEL PENEDES (TARRAGONA)

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Medical Devices Management System Certificate



GS-0002/2014

AENOR certifies that the organization

ESPECIALIDADES MEDICAS MYR, S.L.

has a medical devices management system according to the UNE-EN ISO 13485:2018 Standard

for the activities: Design, development and production of machines for preparation of all types of human tissues for in vitro diagnostic.

which is/are carried out in: CL LLEIDA, 17-23. 43712 - LLORENÇ DEL PENEDES (TARRAGONA)

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SEMI-AUTOMATED ROTARY MICROTOME

MODEL M-240



User's Manual

Version 17 – 14/12/2022

Keep this manual always with the instrument

Read carefully before installing and working with the instrument

Especialidades Médicas Myr, S.L.

Would like to thank you for the purchase of this equipment and for your confidence in choosing our company. We are committed to offer you the best and most reliable service. Don't hesitate to contact your local dealer for any question related to this semi-automated rotary Microtome.

Your Especialidades Médicas Myr, S.L. team.

NOTIFICATION

The information contained in this manual represents the current state of the art technology as we understand it following throughout investigation in this field.

We are under no obligation to update the present manual periodically and on an ongoing basis according to the latest technical developments, nor to provide our customers with additional copies, updates etc. of this manual.

To the extent permitted in accordance with the national legal system as applicable in each individual case, we shall not be held liable for erroneous statements, drawings, technical illustrations etc. contained in this manual.

In particular, no liability whatsoever is accepted for any financial loss or consequential damage caused by or related to compliance with statements or other information in this manual.

Statements, drawings, illustrations and other information as regards contents or technical details of the present Instructions for Use are not to be considered as warranted characteristics of our products.

These are determined only by the contract provisions agreed between ourselves and our customers.

MYR reserves the right to modify manufacturing processes as well as technical specifications without prior notice. That way is it possible to continuously improve the technology and manufacturing techniques used in our products. This document is protected under copyright laws. All copyrights to this documentation are held by MYR

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Please refer to the nameplate attached to the instrument to identify the instrument serial number and year of manufacture.

Especialidades Médicas MYR, SL

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Tarragona Spain

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1 Important Information

1.1 Symbols in text and their understanding



Warnings appear in a gray box and are marked by a warning symbol.



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

(3)

Numbers in parentheses refer to item numbers in illustrations



Function keys which must be touched on the touch display are shown in the text in **BOLD CAPITAL LETTERS**



Manufacturer



Observe the Instructions for use



Manufacturer reference



Serial No.



The package contents are fragile and must be handled with care.



The package must be kept in a dry environment.



Indicates correct upright position of a package.



Indicates the temperature range permitted for transporting a package: **From -20 °C to +50 °C.**



Tip-n-Tell indicator to monitor that a shipment has been transported and stored in upright position according to your requirements.



Mechanical shock monitor to indicate if an inappropriate acceleration was applied to the instrument or material inside the packaging.



Do not stack other boxes on top of this packaging box.



Indicates that an item can be recycled where appropriate facilities exist.



Indicates that the instrument is of proper use for IVD applications

Certification

Especialidades Médicas Myr, S.L. certifies that this instrument has been tested and checked carefully. All technical data were checked before delivering to guarantee that fulfill published specifications.

The instrument complies with applicable international safety regulations.



1.2 Qualification of operating personal

The MYR M-240 Rotary Microtome is designed for professional use only. It must only be operated by trained and qualified laboratory personnel.

The users of the device must previously read the User Manual carefully and must be familiar with all aspects of operation and safety precautions before starting out to operate the instrument.

1.3 Intended use of instrument

The M-240 rotational microtome is a semi-automatic device designed to manually produce thin sections of human tissue specimens fixed in formalin and embedded in paraffin of varying hardness for medical histological diagnostic purposes by a pathologist.

The M-240 rotational microtome is exclusively intended for use in In Vitro diagnostic procedures and fulfils the corresponding in-force regulations.



Any other use not described above is considered improper use!

1.4 Instrument type and identification

The **MYR M-240** is a rotary microtome of the semi-motorized class offering a motorized feed and coarse feed operation. Specific care is applied for a smooth running and perfect balanced handwheel.

Two sectioning modes are incorporated: conventional full handwheel rotation sectioning and rocking mode with alternating handwheel movements. The handwheel can be locked at any position by engaging the handwheel brake.

All operator selections and all readouts are available on a 7" color touch-display which is positioned inclined for best visibility to the user. At the main screen, the operator selections are grouped into coarse feed selections and sectioning and trimming selections. Moreover, there are indications for retraction status, reaching of travel limits, travel distance or alternatively number of sections or sectioning sum. A memory key offers a specimen memory position function with an optional safety distance for a safer specimen change procedure. Further settings are available in a menu structured set of screens. Those settings refer to selections of retraction value, selection of safety distance value and language selection.

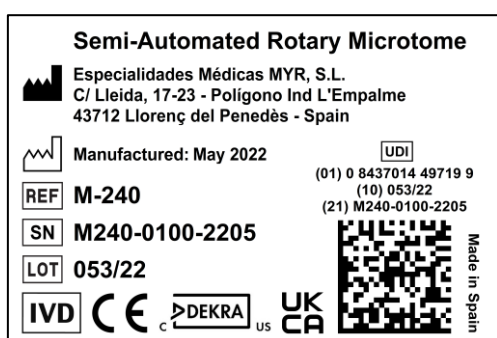


Figure 1

A nameplate, indicating instrument type, serial number and other descriptive data of this instrument is attached to the rear panel of the instrument. An example of that nameplate is shown in **Fig.1**

1.5 Documentation



This instruction manual will be supplied together with each instrument. Additional copies can be ordered by indicating the serial number of the instrument.

This manual has been written in the Spanish language and it has been translated into English and French. The Spanish version shall prevail. Especialidades Médicas Myr, S.L. shall not be liable for the consequences of mistakes, omissions or other defects in the translation of this manual.

Subject to amendment and improvement without notice.

2 Safety Elements



The safety and caution notes must be observed at all times. Be sure to read and understand these instructions, even if you are familiar with generic microtomes and their operation.

2.1 Safety notes

These Instructions for Use contain important information regarding the operational safety of the instrument. It also contains maintenance requirements which may be mandatory to be observed in order to keep the instrument in a safe operating condition.

The instructions for Use are an important part of the product. It must be read carefully prior set-up and using the instrument. This instruction should be kept close to the instrument and serve as perpetual reference.

This instrument has been built and tested according the safety requirements for electrical equipment for measurement, control and laboratory use. To maintain these conditions and ensure a safe operation, the user must observe all safety notes and warnings contained in these Instructions for Use.



These Instructions for Use must be appropriately supplemented by national regulations on occupational health and safety, work safety and environmental protection in the respective country of operation of this instrument!



The protective mechanisms and devices incorporated in the instrument must not be modified or removed by the user. Only qualified service personnel, certified by MYR, may service and repair the instrument and access the internal components of it.

2.2 Warnings

The incorporated safety devices of this instrument only constitute the basis for accident prevention. It is above all the responsibility of the owner and on his part designated personnel, who operate, clean and service the instrument, to ensure a safe operation.

Make sure to comply with the following instructions and warnings in order to ensure a safe and trouble-free operation.

Warnings - Safety notes attached to the housing and the operating elements



- The safety notes attached to the housing or the operating elements, which are labeled with the warning triangle, obligate the user to follow the correct operating instructions, as defined in this document, while operating the instrument or replacing a respective item.
- Failure to obey these instructions may result in personal injury and/or damage to the instrument or accessories.

Warnings – Transport condition and installation of the instrument



- The instrument must be transported only in an upright position
- Do not lift the instrument by the handwheel handle or the handwheel itself
- Do not lift the instrument by holding at the specimen head or a specimen clamp
- Always remove the section waste tray when lifting or transporting the instrument
- Before connecting the instrument to the line voltage ensure that your laboratory power conditions fulfill the power requirements of the instrument
- The instrument must be connected to the line voltage with the supplied power cord to a grounded socket
- The instrument must not be operated in a hazardous environment.
- Protective devices at the instrument and the accessories must not be modified or removed
- Temperature difference between transport or storage facility and the set-up site may cause condensation. Wait for a minimum of two hours before switching on the instrument in order to avoid damage to the instrument

Personal safety precautions and safety equipment



- When working with microtomes, personal safety precautions must always be observed. It is mandatory to wear safety shoes, safety goggles, a safety mask and safety gloves.

Safety instructions – operating the instrument



- Lock the handwheel by engaging the handwheel brake and cover the knife edge by applying the finger-guard at all manipulations and situations besides actual sectioning
- Always attach and clamp the specimen to the specimen clamp before clamping the knife or blade in the respective holder
- Be careful when handling microtome knives or disposable blades. The cutting edge of these tools is extremely sharp and can cause severe injuries
- Always remove the knife or disposable blade before detaching the knife carrier from the main instrument. Put knives back into a knife case when not in use.
- Never place a knife or blade anywhere with the unprotected cutting edge facing upward and never try to catch a falling knife or blade
- When approaching or orienting a specimen make sure to be not in a retraction position. Orienting a specimen in a retraction position will cause the next section to be of a thickness of the selected thickness value plus the retraction value. This may cause a collision between specimen and knife edge and may damage the specimen
- Prior to sectioning, ensure that the specimen is securely fixed in the specimen clamp
- When sectioning brittle specimen be aware of possible splinters and apply respective safety precautions
- Do not place liquids on top of the instrument and make sure that no liquids can enter the interior of the instrument

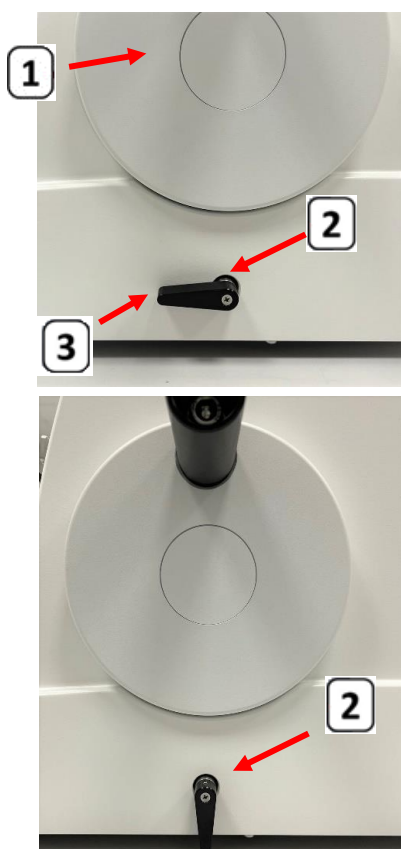
Hazards – servicing and cleaning



- Only qualified and authorized service personnel may service and repair the instrument and access the interior of it
- Before replacing fuses always switch off the instrument at the mains switch of the instrument and remove the power cord from the instrument. Then replace fuses of the correct specification according to 7.2.3 of this Instructions for Use
- Before starting cleaning, lock the handwheel, switch off the instrument, disconnect the power cord and remove the knife carrier without knife or blade for separated cleaning
- When using cleaning agents, comply with the safety instructions of the laboratory and the safety instructions of the manufacturer of the agents
- Do not use acetone or xylene as cleaning agents
- Avoid that cleaning liquids can enter the interior of the instrument
- After cleaning wait until the instrument is completely dry before switching on again

2.3 Integrated safety mechanisms

2.3.1 Handwheel brake



The handwheel (1) can be locked at any position on its perimeter by operating the brake mechanism.

This is achieved by pulling the lever (2) forward into brake position (3).

The brake is released by pushing the lever (2) backwards, until vertical position.

Note: At the rest of the travelling, instead the lever is not in unbraked position, the handwheel will be also free.

Figure 2



Caution!

The handwheel brake is subject to regular inspection in the course of an annual maintenance routine. Make sure to comply with this requirement. In any doubt of the correct function of the handwheel brake stop operating the microtome and call for service help.

2.3.2 Finger-Guard on the disposable blade carrier DBC, model MR

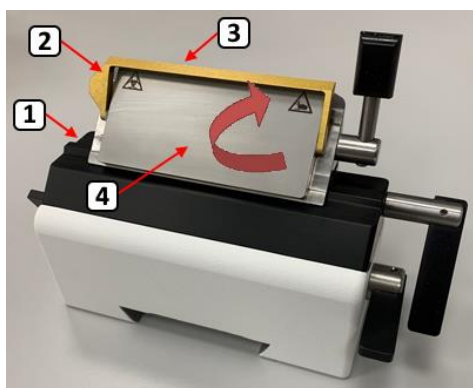


Figure 3

Each disposable blade carrier DBC (1) is equipped with a finger-guard (2) to protect the user from unintended contact to the disposable blade (3) which protrudes over the clamping plate (4) with its cutting edge. **Fig. 3** shows the disposable blade carrier DBC (1) with the finger-guard (2) in the protecting position. The finger-guard (2) is swiveled upwards to cover the cutting edge (5). This position should be applied in all situations besides actual sectioning.

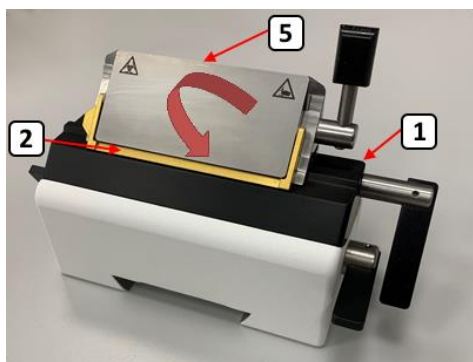


Figure 4

Fig. 4 shows the disposable blade carrier DBC (1) with the finger-guard (2) in the non-protecting position. The cutting edge (5) is unprotected. This position should only be applied while actual sectioning is ongoing.

3 Instrument Details and Specification

3.1 Overview of instrument details and elements



Figure 5

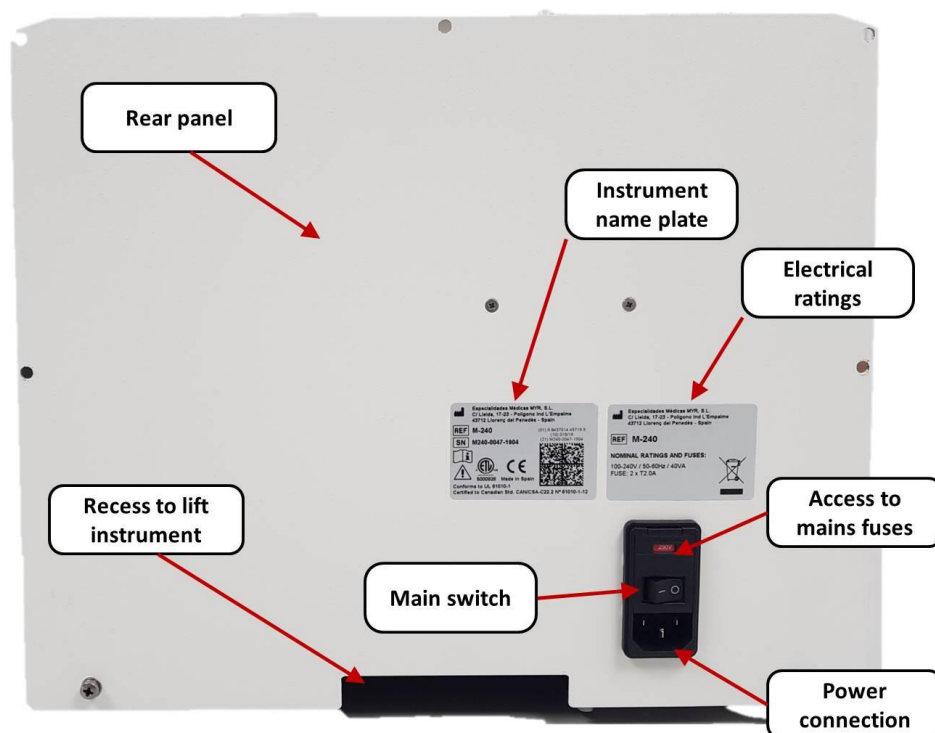


Figure 6

3.2 Technical Data

General:

Nominal line supply voltages	100 -240 VAC +/- 10%
Nominal line frequency	50/60 Hz
Maximum power consumption	40 VA
Power fuses	2 x T2,0A VDE, UL listed
Protection class*	I
Pollution degree*	2
Overvoltage category*	II
Maximum heat emission	40J/s
Operating temperature range	+5°C up to +40°C
Altitude	Up to 2000 m M.S.L.
Storage temperature range	-20°C up to +50°C
Relative humidity while operating	max. 80% r.H., non-condensing
Relative humidity in storage	min. 10% r.H., max. 85% r.H.

*according to IEC-1010, UL3101, EN61010

For indoor use only

Dimensions and weight:

Width (including handwheel and handle)	465 mm
Width (excluding handwheel)	390 mm
Depth (including waste tray)	540 mm
Height	298 mm
Working Height (cutting edge of blade/knife)	100 mm (measured from baseplate)
Working Height (cutting edge of blade/knife)	173 mm (measured from table top)
Weight	33,9 kg (included waste tray)

3.3 Instrument specifications

Sectioning and trimming thickness settings

Section thickness setting range	0,5 µm – 100 µm				
Available setting selections	from	0,5 µm	–	5 µm	in 0,5 µm increments
	from	5 µm	–	20 µm	in 1 µm increments
	from	20 µm	–	60 µm	in 5 µm increments
	from	60 µm	–	100 µm	in 10 µm increments
Trimming thickness setting range	1 µm – 600 µm				
Available setting selections	from	1 µm	–	10 µm	in 1 µm increments
	from	10 µm	–	20 µm	in 2 µm increments
	from	20 µm	–	50 µm	in 5 µm increments
	from	50 µm	–	100 µm	in 10 µm increments
	from	100 µm	–	600 µm	in 50 µm increments
Specimen feed range	28 mm +/- 1mm				
Vertical stroke length	72 mm +/- 1mm				
Maximum sectioning length	68 mm				
Specimen retraction selections	5 µm – 250 µm selection in 1µm increments				
	plus 5 predefined values 20, 30, 40, 60, 80 µm				
	Optional function that can be deactivated				
Electric coarse feed speeds	Coarse feed forward slow				300 µm/s
	Coarse feed forward fast				800 µm/s
	Coarse feed backward ultrafast				1800 µm/s
Specimen orientation x/y axis	+/- 8°, 0-position click-stop				
Specimen orientation z axis	360°				
Maximum specimen size (L x H x W)	50 x 60 x 40 mm				

Accessory specifications**Disposable blade carrier DBC**

Model MR with lateral displacement of holder

Model ME

Clearance angle adjustment

16°

Lateral displacement function

3 click-stop positions

Finger-guard

swivel function

Standard knife carrier SKC

Clearance angle adjustment

12°

Lateral displacement function

+/- 10 mm lateral shifting possible

Finger-guard

close/open by shifting sideways

Quick release clamp QRC

Cassette clamping

all standard cassettes 38-42 x 28-29 mm

Standard specimen clamp SSC

Rectangular specimen blocks

all rectangular specimens up to 55 x 50 mm

4 Instrument Setup

4.1 Standard delivery content

The MYR M-240 includes the following items as standard delivery content:

- 1 Knife carrier model MR (base + segment + blade holder)
- 1 Orienting head
- 1 Quick release clamp
- 1 Antistatic section waste tray
- 1 Mains cord
- 1 Allen key with handle Nr. 6
- 2 fuses 5x20 mm, 2,0 AT
- 6 Touch screen protectors
- 1 Dust cover
- 1 25 ml Guides lubricating oil
- 1 User's manual (printed)



Ordered accessories are delivered in a separate package. That package also includes the required power cord specifically selected for the country of installation of the instrument.

Please check delivery note and packing list carefully!

4.2 Requirements on installation site

- Provide a stable vibration-free laboratory bench of adequate ergonomic height
- Avoid other equipment on same bench to reduce vibrations
- Permanent room temperature between +10°C and +35°C at max. r.H. of 80%
- Keep the surrounding of the microtome clear of other items. Free access to the handwheel must not be obstructed by any object



Never operate the instrument in an environment having an explosion hazard

4.3 Unpacking and installing



Before unpacking check the tilt indicator right after delivery on site. A blue arrowhead will indicate an unacceptable transport condition, such as upside down or sideways tilting in transport.

Note that abnormality on the shipping documents and check the instrument and the accessories for possible damage!



Before unpacking also check the mechanical shock indicator right after delivery on site. A red color in the middle window will indicate an unacceptable high mechanical shock in transport.

Note that abnormality on the shipping documents and check the instrument and the accessories for possible damage!

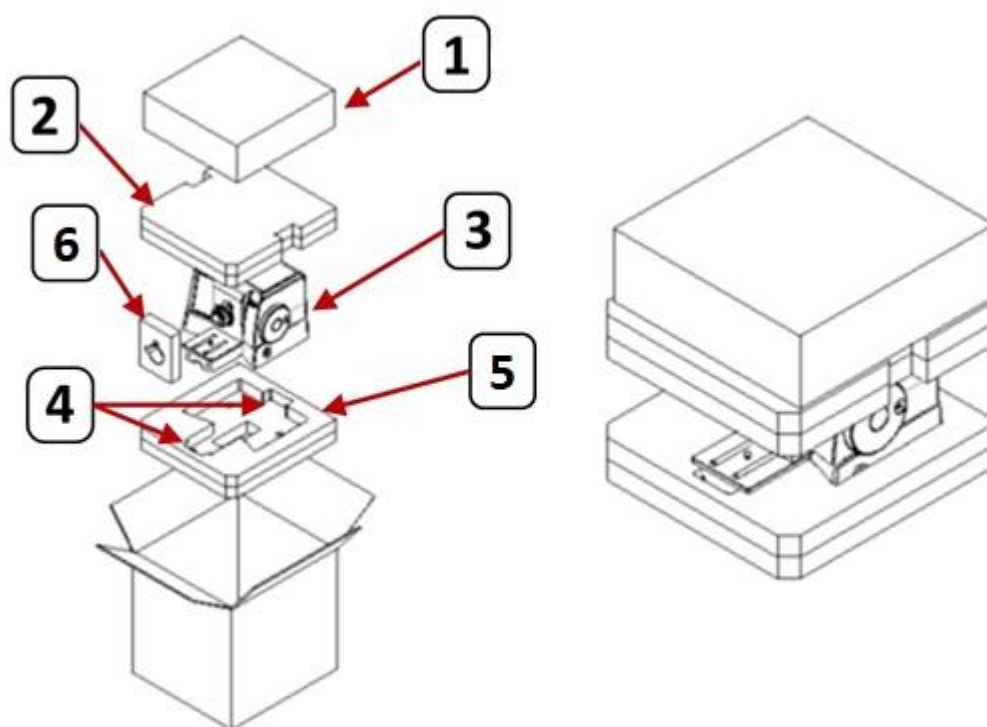


Figure 7

For unpacking, remove the accessories packaging (1) and top foam (2). Then pull out the instrument (3) by grabbing under the front and the rear, thru the front and rear recesses (4) at the bottom foam support (5). Finally, remove the head immobilizer (6) once the lever is mounted on the handwheel.



Keep the transport case and related packaging material together and store for eventually later shipping need such as return shipment or factory maintenance request.

4.4 Mounting steps for completion

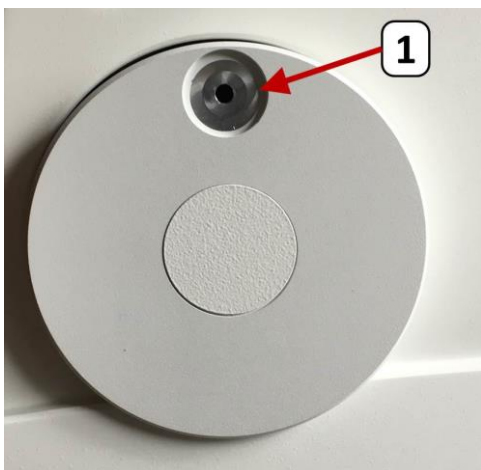


Figure 8

The instrument is delivered with the handwheel handle dismantled for safer transport conditions. The handwheel handle must be mounted at position (1) at the handwheel.

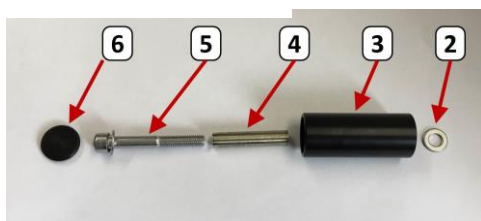


Figure 9

To do so, take the handwheel handle parts out of the packaging and assemble it. The handle assembly consists of the following parts:

- Washer (2)
- Handle (3)
- Sleeve (4)
- Screw with washer (5)
- Cover disk (6)



Figure 10

Use an Allen key (size 6) to assemble the parts and screw it into the handwheel at position (1). Washer (2) must sit between the handle (3) and the handwheel body.

Finally attach Cover disk (6) to close the opening by pressing it in.



Do not overtighten the screw!

The handle must rotate smoothly.

4.5 Electrical connections



The instrument must be connected to a grounded power socket. Only use a correct power cord which is certified for the country of installation of the instrument. Do not use extension cables!



Figure 11

Checking power conditions!

Before connecting the instrument to the line voltage at the site of installation, check that the actual power conditions fulfill the power requirements of the instrument. The power requirements are: line voltage of 100-240 V AC +/- 10% at a frequency of 50 or 60Hz. Power conditions outside that ranges are not allowed.



Do not connect the instrument to a power line with power conditions outside the range of 100-240 V AC +/- 10% at a frequency of 50 or 60Hz. A severe damage to the instrument may occur if power conditions outside that range are applied.

4.6 Turning-on the instrument



Ensure that the instrument had a minimum of 2 hours rest after transport before switching on. Exposure to temperature changes at high air humidity may cause condensation of water inside the instrument! Failure to comply with this requirement may cause damage to the instrument and will forfeit warranty.

Be sure that the power switch at the instrument is positioned to the 0=OFF position. Connect the correct power cord to the power inlet. Switch on the power switch to I=ON. A beep will signalize that the instrument is in initialization routine. The display will show the company logo.

After about 3 s, the initialization is finished and the display shows the main screen.

The instrument will now carry out automatically a feed system positioning routine. The horizontal drive mechanism will move the specimen head to the most rear position of the feed range.

5 Instrument Operation

5.1 Operating elements and their functions

5.1.1 Instrument display - MAIN Screen

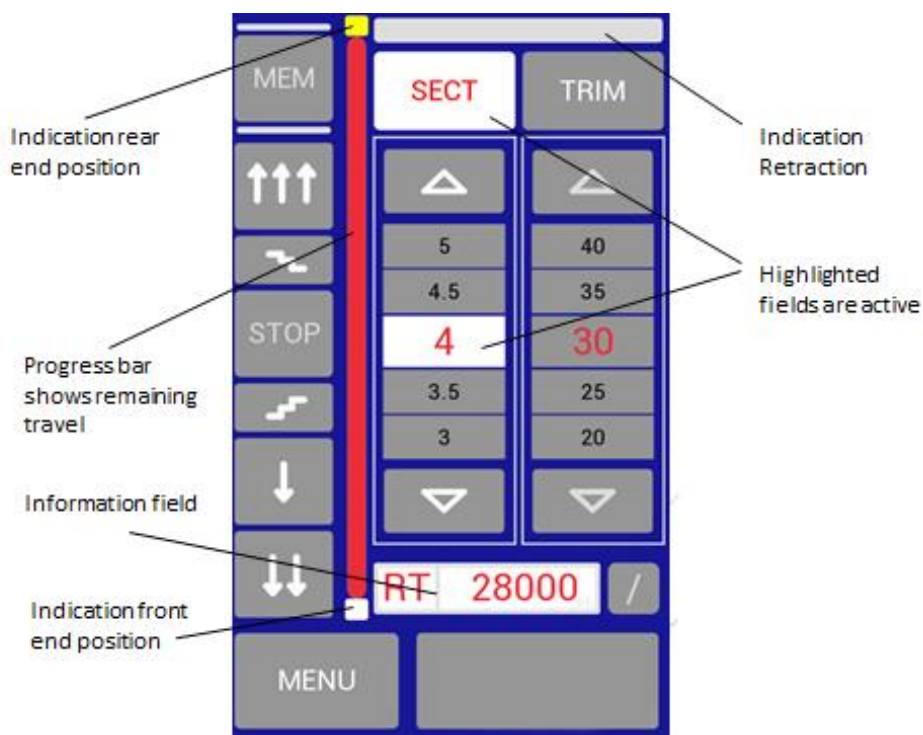


Figure 12

The display is organized in fields which are indication fields only and fields which are touch buttons. The touch buttons are explained within chapters 5.1.2 onwards.



Figure 13

The indication fields include a field to monitor the RETRACTION status of the instrument. When the field is shown in red it indicates that the instrument is now in a retracted position, when the field is white the status of the instrument is non-retracted.



Figure 14



Figure 15



Figure 16

The display also shows a Progress bar which represents the current horizontal position of the specimen head within the available horizontal movement range. After switching on the instrument an initialization takes place which brings the specimen head to the far-most rear position and offers the full range of horizontal travel. In that position the Remaining Travel is maximal and the progress bar indication is all red. When moving forward with the specimen head the Remaining Travel is decreasing and thus the red indication at the Progress bar is also decreasing. Above and below the Progress bar are little square fields which will flash in yellow when the rear or front limits will be reached. No further movement in the respective direction will then be possible.

The Information field offers a choice of three different indications which can be preselected on the MENU screen (see 5.1.3). The choices are RT=Remaining Travel, SC=Section Counter or SS=Section Sum.

SC is counting each movement of the handwheel which triggers a sectioning (or trimming) feed. In ordinary Continuous Mode this would be each revolution and in Rocking Mode this would be each reversing of the handwheel in clockwise direction.

SS is the summing up of the SC numbers multiplied by the sectioning or trimming feed values which apply at the respective actions.

The SC and SS indications can be reset at any time by the small RESET button (Fig.16) next to the right of the indication field.



Figure 17

If none of the three possible indications would be selected by the user (**see 5.1.3**) the field may also be blank.

In a situation where the Remaining Travel is below 2000μ (2mm), there will be a flashing indication of the frame of the Information field with flashing indication of the Remaining Travel value (Fig. 17). That mode is independent of what was selected at that time to be displayed in the Information field. If the fields SC or SS were selected at that moment, the display will flash alternatively between RT and SC or SS. Additionally, an acoustic alarm will beep every second.

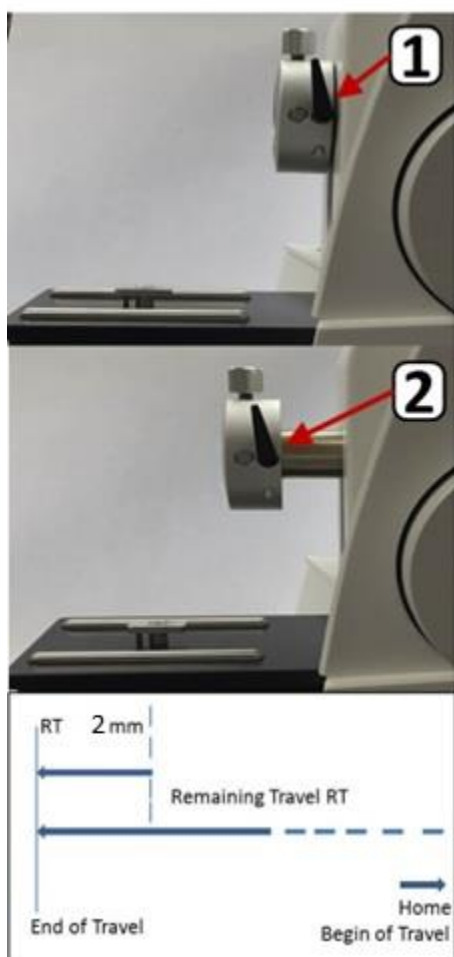


Figure 18

The picture in Fig.18 shows the Home or Begin of Travel (1) position of the specimen head and the End of Travel (2) position when the complete feed range is used. When the End of Travel is reached, no further feed movements can be carried out in the forward direction.

5.1.2 Touch control MAIN Screen

5.1.2.1 Coarse feed functions

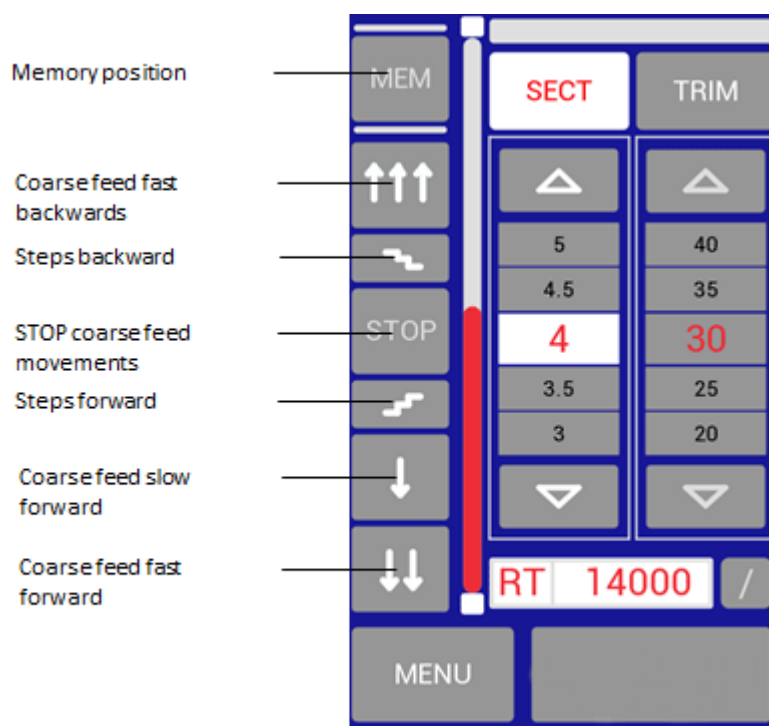


Figure 19

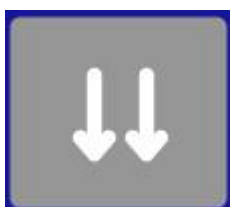


Figure 20

The COARSE FEED FAST FORWARD button of the touch control on the main screen is represented by the downward double arrow symbol shown in Fig.20. A horizontal fast forward movement of the specimen takes place as long as the button is pressed.

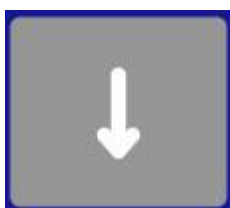


Figure 21

The COARSE FEED SLOW FORWARD button of the touch control on the main screen is represented by the downward single arrow symbol shown in Fig.21. A horizontal slow forward movement of the specimen takes place as long as the button is pressed.



Figure 22

The STEPS FORWARD button of the touch control on the main screen is represented by a symbol which indicates a small staircase (up) as shown in Fig.22. A stepwise forward movement of the specimen takes place each time the button is pressed. The size of the step depends on the pre-selections of the SECT or TRIM values which are active at that moment.



Figure 23

The STOP button can be used in any situation while manipulating the horizontal coarse feed functions in forward or backward direction and will stop the movement.



Figure 24

When the coarse feed movement is in continuous mode, for example COARSE FEED FAST BACKWARD, it will be indicated by a red color of the sign STOP. The movement can be stopped at any time by pressing STOP.



Figure 25

The STEPS BACKWARD button of the on the main screen is represented by a symbol which indicates a small staircase (down) as shown in Fig.25. A stepwise backward movement of the specimen takes place each time the button is pressed. The size of the step depends on the pre-selections of the SECT or TRIM values which are active at that moment.



Figure 26

The COARSE FEED FAST BACKWARD button of the main screen is represented by an upward triple arrow symbol shown in Fig.26. A horizontal fast backward movement of the specimen takes place as long as the button is pressed. If the button is pressed for longer than 2 seconds, the function will become a continuous mode, e.g. the backward movement will go on until either a STOP command will take place or until the rear limit of the travel range is reached.

MEMORY FUNCTION



Figure 27

The memory position key (Fig.27) controls the memory function. The memory function is useful to memorize a set-up position when uniform blocks or cassettes will be cut in a series. After having determined an adequate trim position just press the MEM key for 2 sec and it will respond with a red underline (Fig. 27), confirming that the current position is stored as a memory position.



Figure 28

With further trim or sectioning activity the specimen holder will advance and leave the memory position in forward direction and the MEM key will appear as in Fig.28. When finishing with a specimen block and after having inserted a new block of similar height as the previous one, just press MEM again and the coarse feed will automatically move backwards to the stored memory position and indicate that status with the red underline (Fig.27). Trimming and sectioning the new block can now start right from that position.

MEMORY DISTANCE



Figure 29

The MEM function also offers an additional feature for more safety. This feature can be activated in the MENU screen (see 5.1.3.4). When activated the MEM button appears as in Fig.29 with an underline and also an upper line. The routine for setting a MEM position is the same as described above.



Figure 30

When having finished with a block it is recommended to use this safety feature and press MEM. The coarse feed will now move backwards to a safety position which is behind the stored MEM position and indicate it with a red line above the MEM symbol (Fig.30). This is now the safest position to change the specimen block against the next one of similar height.



Figure 31

After having inserted the new block, just press MEM again and the coarse feed will move forward to reach the formerly stored MEM position again and will indicate it by the red underline (Fig.31) below the MEM symbol. Trimming and sectioning the new block can now start right from that position.

If the sample block is moved away from the blade with the FAST-BACKWARDS key beyond the position stored in memory, the MEM key is disabled.

5.1.2.2 SECTIONING and TRIMMING selections

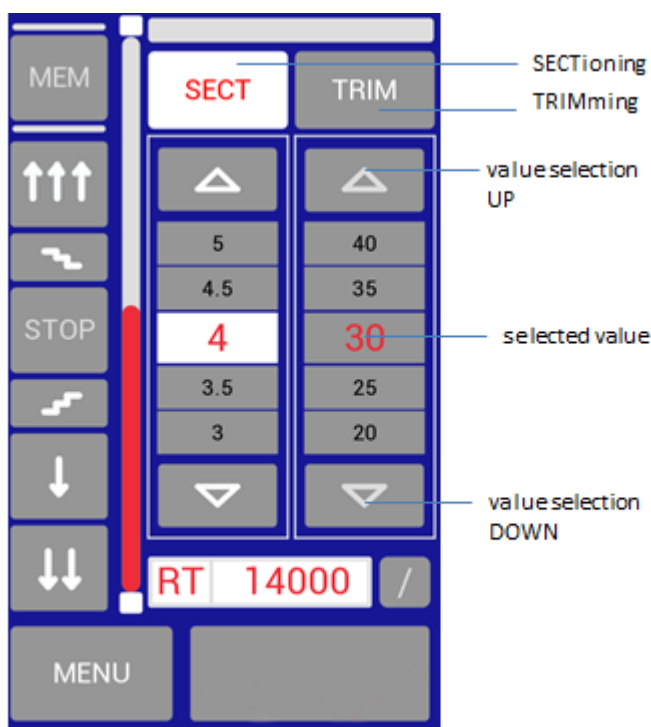


Figure 32

To select a sectioning or trimming value the SECT or TRIM button must be active. This is achieved by pressing the respective button which then will be highlighted in a white field and with red writing. The selected value is always shown in the middle of the column of values and is also highlighted in a white field in red color. To select other values, press either the buttons with the UP or DOWN arrows. All possible values will roll up or down while the middle value always will be the one which is selected.

When turning the handwheel, trimming or sectioning will be carried out, depending on the pre-selection of mode and with the selected value of trimming or sectioning.

5.1.2.3 Touchscreen safety lock



The touchscreen can be locked by pressing the MENU key during 3 seconds. The unlocking is done by a simple movement of the handwheel as indicated in the message shown on the screen (Fig.33).



Figure 33

5.1.3 Touch control MENU Screen

5.1.3.1 Overview of structure of MENU screen

To enter the MENU screen, press the button MENU on the lower left side of the MAIN screen. The MENU screen (Fig. 34) contains 4 sections with selections to choose from. The sections are:

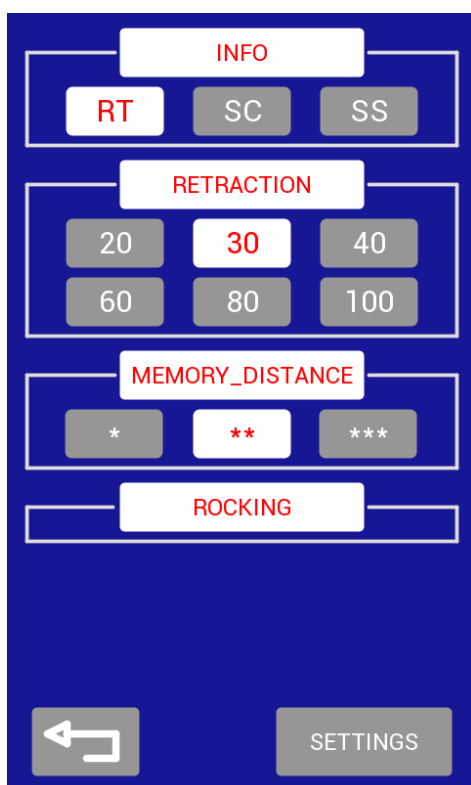


Figure 34

INFO, which offers choices of information to be displayed on the MAIN screen.

RETRACTION, which allows to enable or disable the RETRACTION function and to select a value which determines the amount of a retraction movement.

MEMORY DISTANCE, which allows to enable or disable the MEMORY DISTANCE function and to select a value which determines the amount of a memory safety distance.

ROCKING, which enables or disables the ROCKING function of the sectioning mode, while the continuous mode of the handwheel operation is always available.

The MENU screen has at the bottom part two buttons:



Figure 35

This button (Fig.35) on the right lower side of the MENU screen leads to the SETTINGS screen which offers to adjust necessary settings of the instrument. (see 5.1.4)



Figure 36

This button (Fig. 36) on the left lower side of the MENU screen leads back to the MAIN screen. (Moreover, this button is used also at other screens and always leads back to the previous screen)

5.1.3.2 Detailed description of MENU screen: INFO



Figure 37

With the choice of an INFO-source it will be determined which information is displayed on the information field on the MAIN screen (Fig. 12). There is a choice between RT=Remaining Travel, which is the remaining distance from the current position on the feed path up to

the front-end limit. This is useful information to know how much further space is left. Alternatively, SC=Section Counter can be selected. Section Counter is the number of feed movements which were carried out since last reset of this function. Feed movements are carried out each time a full rotation of the handwheel takes place and, if ROCKING mode is enabled, also each time a rocking forward and backward movement with the handwheel was performed. Another choice of information is SS=Section Sum. Section Sum indicates the sum of all sections (feed movements; see above) multiplied by the respective amount of feed which was valid at the moment of each feed.



Figure 38

The function SS and SC can both be reset to 0 by pressing the RESET button (Fig.38) on the MAIN screen.

There is also the choice to elect to have no information displayed on the information field. To do so, the toggle button INFO should be pressed. All offered selections will now appear in grey color and no information will be displayed. To elect one of the INFO sources again, press INFO first.

5.1.3.3 Detailed description of MENU screen: RETRACTION

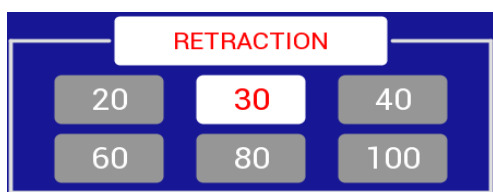


Figure 39

The RETRACTION button offers the choice of enabling or disabling the RETRACTION-function. When enabled there is a choice out of 5 fixed values: 20, 30, 40, 60, 80 μm of retraction movement during the up-stroke of the sectioning movement. In addition, there is a sixth value available (lower right box) which can be freely selected

via the SETTINGS and PARAMETER screens in the range of 5 to 250 μm in steps of 1 μm . RETRACTION can also be switched off by touching the RETRACTION button. All buttons will then appear in grey color.



Ensure that the selected retraction value is compatible with sectioning speed. If high retraction values are used, there could be not enough time to complete the retraction movement.

5.1.3.4 Detailed description of MENU screen: MEMORY DISTANCE



Figure 40

The MEMORY function offers a choice of two different ways to operate (see 5.1.2.1). It can be operated with or without a safety distance. When operated with safety distance, the backwards movement will lead to a position behind the actually stored MEMORY position. The

amount of distance behind the MEMORY position will be the selected MEMORY DISTANCE. When pressing the MEM key again (see 5.1.2.1) a coarse feed forward movement will take place up to the stored MEMORY position.

There is a choice out of three different MEMORY DISTANCES which are indicated by

*, ** and ***.

* - 500 μ , ** - 1000 μ , *** - 2000 μ .

The MEMORY DISTANCE feature can be switched off by pressing the MEMORY DISTANCE button. All buttons will then appear in grey color and the MEMORY function will work without the safety distance feature.

5.1.3.5 Detailed description of MENU screen: ROCKING



Figure 41

With the button ROCKING, the user can select between two modes of handwheel operation for producing sections. The button ROCKING is a toggle switch. When deactivated, the button appears in grey color. In this status only full turns of a handwheel operation will trigger sectioning or trimming feeds to produce sections.

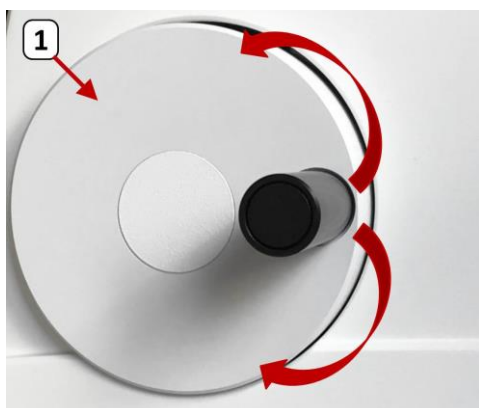
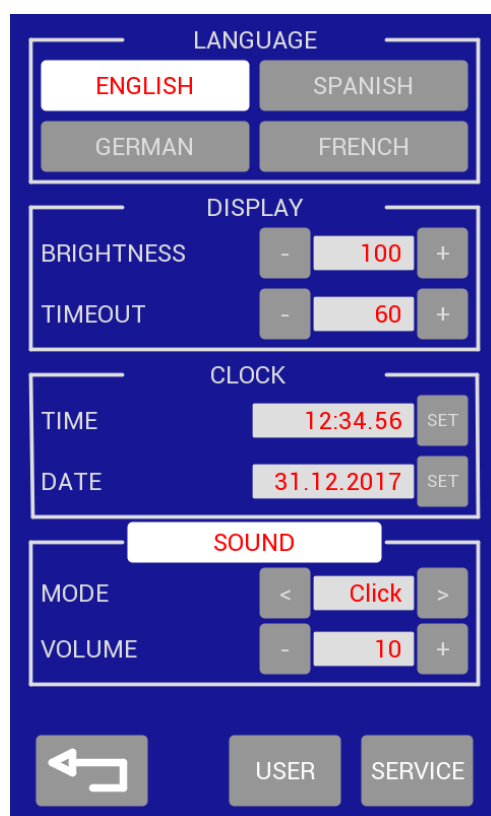


Figure 42

When ROCKING is activated, the handwheel (1) operation may be also a reversing forward (clockwise) and backward (counterclockwise) movement and at each reversing into the clockwise direction, a triggering for sectioning or trimming feeds will take place.

5.1.4 Touch control SETTINGS screen

5.1.4.1 Overview of structure of SETTINGS screen



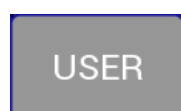
LANGUAGE: Selection out of 4 offered languages for user dialogue

DISPLAY: two functions to select; the brightness of the screen can be adjusted from 2-100% and a screensaver function can be activated if a selected time out with no activity is reached

CLOCK: Time and date are available within the system and can be set to local requirements

SOUND: A sound effect can be selected as feedback when touching a key or button. There is a choice of 8 different sound types and the loudness of each can be adjusted on a scale from 0-10

Figure 43



The USER button leads to a next screen for parameter selections which are accessible by the user.

Figure 44



The SERVICE button leads to a screen which is reserved for service access only and restricted by a password. It is not available at USER level.

Figure 45

5.1.4.2 Detailed description of SETTINGS screen: LANGUAGES



There are 4 languages to choose from. By pressing one of the selections the language is changed to that selection immediately.

Figure 46

5.1.4.3 Detailed description of SETTINGS screen: DISPLAY



Figure 47

The BRIGHTNESS of the display can be adjusted in the range from 2-100%. Press the + or – button to increase or decrease the brightness setting.

A screen saver function is available. If there is no activity with the instrument for a time defined in TIMEOUT, the screen brightness will be decreased. The TIMEOUT time can be selected in minutes by pressing the + or – button. The screen saver will disappear by any touch on the Touchscreen.

5.1.4.4 Detailed description of SETTINGS screen: CLOCK

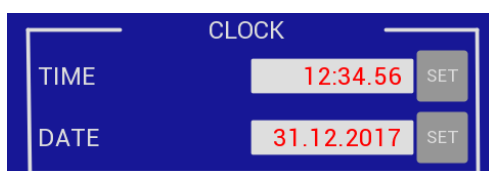


Figure 48

Time and date can be selected according individual or local requirements. Just press the SET key and you enter a selection screen to make the respective settings.

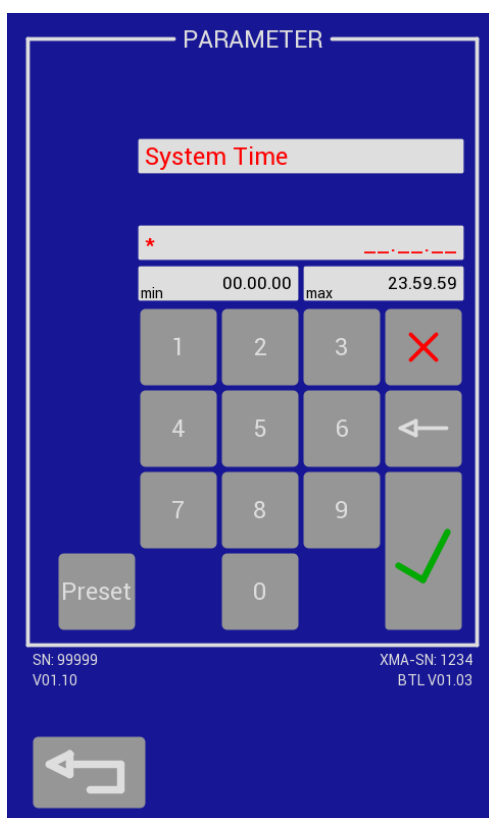


Figure 49

The SYSTEM TIME can be set to any required time. Preferably it should be set to the local time at the institution of the instrument. Just enter the 6-digit format of the actual time and press ✓ for confirmation.



Figure 50

The SYSTEM DATE can be set to any required date. Preferably it should be set to the actual date. Just enter the 8-digit format of the actual date and press ✓ for confirmation.

5.1.4.5 Detailed description of SETTINGS screen: SOUND



Figure 51

A sound effect can be selected as acoustic feedback when touching a key or button. With the MODE button you can select out of 8 different sound types by pressing the < or > key. The loudness of the selected sounds can be adjusted by the VOLUME button on a scale from 0 to 10 by pressing the + or – buttons.

5.1.5 PARAMETER screen

5.1.5.1 Overview of structure of PARAMETER screen

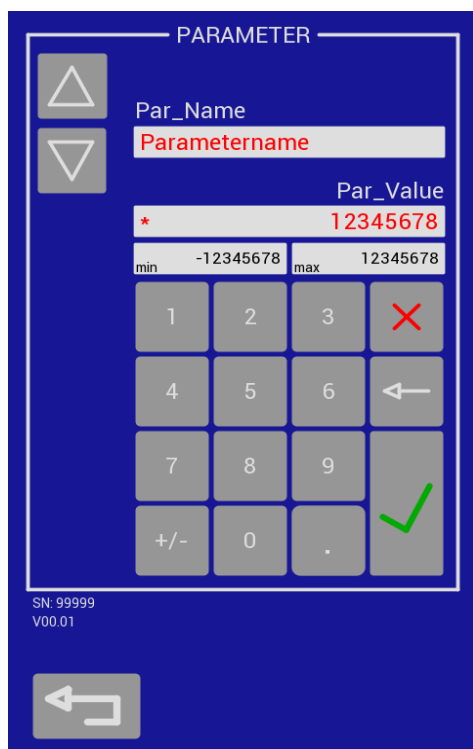


Figure 52

Pressing USER key, the parameter screen offers to the user to select individually certain parameters. This version of the instrument offers to select an individual RETRACTION value as a parameter only.

Under Par_Name you find the currently selected parameter. Other choices (if implemented) are accessible by UP or DOWN keys.

Under Par_Value you find the currently selected value of the shown parameter. In the line below is indicated which range from min to max is available as a choice for that parameter.

5.1.5.2 Detailed description of parameter setting: CUSTOMER RETRACTION

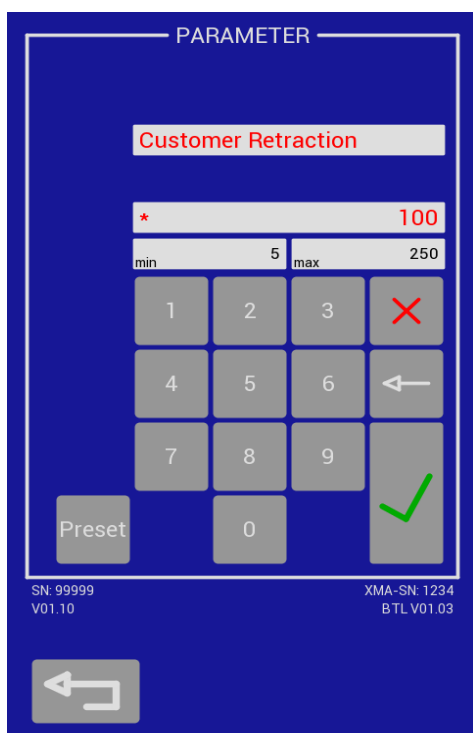


Figure 53

The parameter CUSTOMER RETRACTION can be chosen as an individualized value besides the always fixed and preset values of 20, 30, 40, 60 and 80 μ m (see 5.1.3.3). The individualized CUSTOMER RETRACTION value may be selected within the range of 5-250 μ in increments of 1 μ m.

To select a new value for CUSTOMER RETRACTION first press the X key to delete the existing value. Then type in a new value in the range of 5-250 and confirm by pressing the $\checkmark$ key.



Ensure that the selected retraction value is compatible with sectioning speed. If high retraction values are used, there could be not enough time to complete the retraction movement.

5.2 Knife Carrier set-up

5.2.1 Installing the Knife Carrier base

The Knife Carrier consists of a Knife Carrier base part and, depending on the type of the used sectioning tool, a choice of upper parts. The different upper parts are always mounted to the same Knife Carrier base, achieving an outstanding stability.

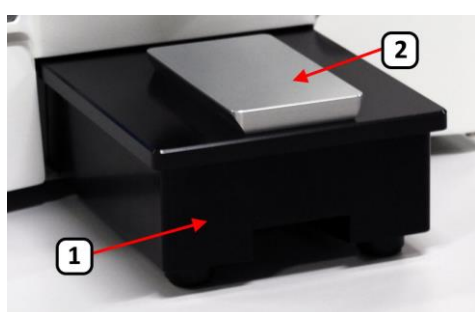


Figure 54

The knife carrier base is sitting on the microtome base plate (1) and can be moved forward and backward on the dovetail block (2) for an optimized prepositioning of the sectioning tool in regard to the specimen. The Knife Carrier base is fixed to the microtome base by a dovetail groove arranged in the middle of the Knife Carrier base. Fixation is achieved by the clamping lever located on the left side of the knife carrier base.

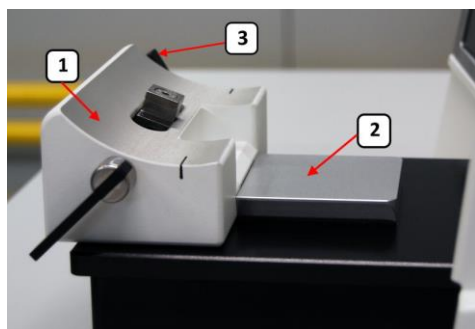


Figure 55

Carefully guide the Knife Carrier base (1) on the dovetail block (2) and shift it forward until the desired position is reached. Turn the clamping lever in cw direction (3) to fix it.

5.2.2 Setting up the Disposable Blade Holder DBC, model MR

The Disposable Blade Carrier, model MR, serves as support and clamping device to use commercially available disposable microtome blades. It supports standardized low-profile blades as well as high profile blades.

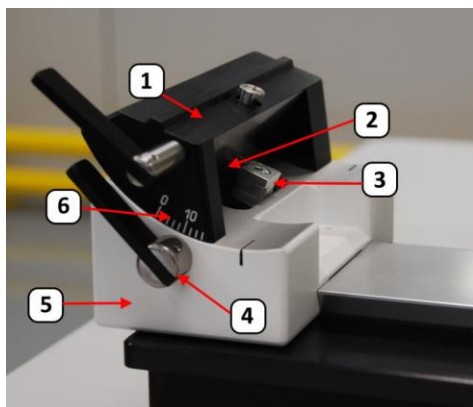


Figure 56

The Disposable Blade Carrier (DBC), model MR consists of a middle part and an upper part both sitting together on the Knife Carrier base. The middle part is the Segment (1). To place the Segment (1) on the Knife Carrier base (5), first open the clamping by turning the clamping lever (4) in ccw direction, then guide the Segment (1) with the groove (2) to engage with the bolt (3). The Segment (1) can be swiveled on the base on a radius to adjust the correct Clearance Angle for the respective application. The Clearance Angle is

indicated on a scale (6) from 0° to 16°. After adjustment of the correct Clearance Angle tighten the clamping by turning the clamping lever (4) now in cw direction. When sectioning with disposable blades with a facet angle of 35°, the recommended clearance angle adjustment would be 10°.

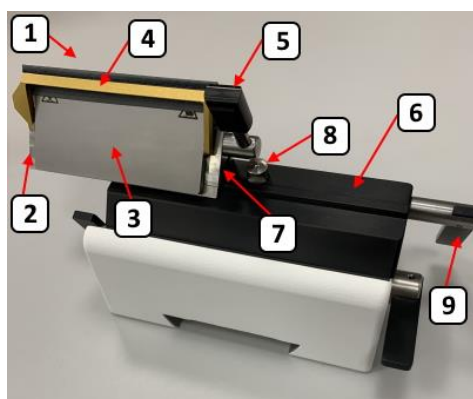


Figure 57

The top part (1) of the DBC, model MR, also named blade holder, is composed of the holder part (2), the clamping plate (3), with the finger guard (4) attached to it and the clamping lever (5).

The top part (1) is attached to the segment (6) via the groove (7) and the bolt (8) and fixed by the lateral clamping lever (9). When opened the top part can be shifted sideways right and left.

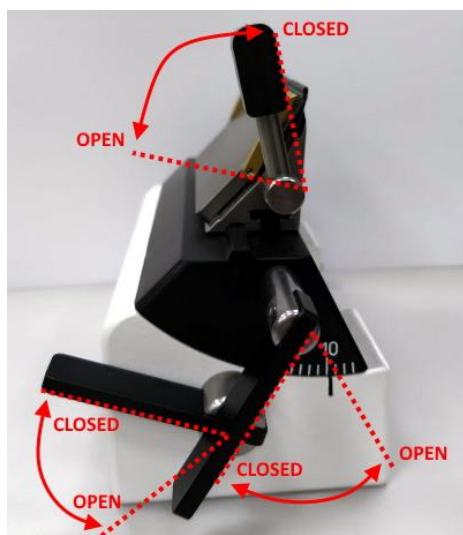


Figure 58

In order to ensure a perfect stability of the knife carrier, make sure that the levers are pushed in the correct locking position as indicated by the red dotted lines in Fig. 58.

5.2.3 Setting up the Disposable Blade Holder DBC, model ME

The Disposable Blade Carrier, model ME, serves as support and clamping device to use commercially available disposable microtome blades. It supports standardized low-profile blades as well as high profile blades.

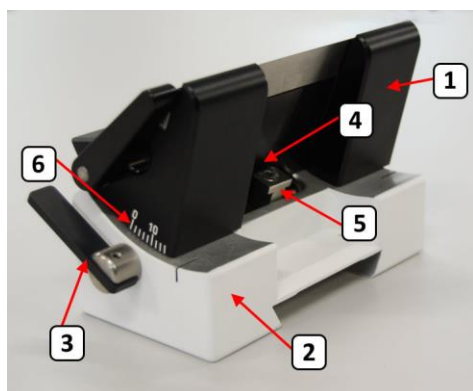


Figure 59

The Disposable Blade Carrier (DBC), model ME consists of a holder part sitting on the Knife Carrier base. To place the Holder (1) on the Knife Carrier base (2), first open the clamping by turning the clamping lever (3) in ccw direction, then guide the Holder (1) with the groove (4) to engage with the bolt (5). The Holder (1) can be swiveled on the base on a radius to adjust the correct Clearance Angle for the respective application. The Clearance Angle is indicated on a scale (6) from 0° to 16°. After adjustment of the correct

clearance Angle tighten the clamping by turning the clamping axle (3) now in cw direction. When sectioning with disposable blades with a facet angle of 35°, the recommended clearance angle adjustment would be 10°.

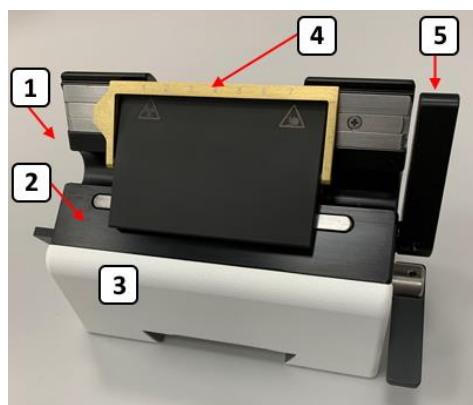


Figure 60

The Holder (1) of the DBC, model ME, is composed of the holder part (2), the clamping plate (3), with the finger guard (4) attached to it and the clamping lever (5). The clamping lever (5) serves for clamping of the blade. When opened, blades can be exchanged and the clamping plate can be moved laterally for better blade usage. When performing this lateral movement, finger guard must be closed. It will move the blade.

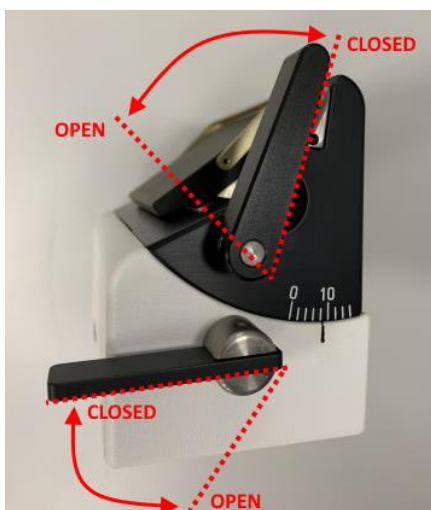
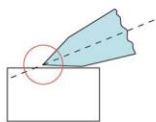


Figure 61

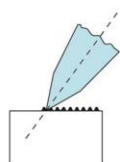
In order to ensure a perfect stability of the knife holder assembly, make sure that the levers are pushed in the correct locking position as indicated by the red dotted lines in Fig. 61.

5.2.4 Adjusting the clearance angle

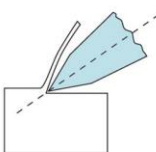
For successful sectioning, the clearance angle (Fig. 62) of the sectioning tool must be correctly adjusted. When sectioning with solid knives, the clearance angle may vary depending on the angle conditions of the knife, specifically when re-sharpened knives would be used.



Clearance angle is too small: the blade would not cut



Clearance angle too steep (too large): the blade would chatter into the specimen with chatter marks



Clearance angle correct: good sections at low compression

Figure 62

When sectioning with disposable blades with a facet angle of 35° , the recommended clearance angle adjustment would be 10° . However, the optimum setting may vary from type of blade and consistence of the specimen and must be investigated.

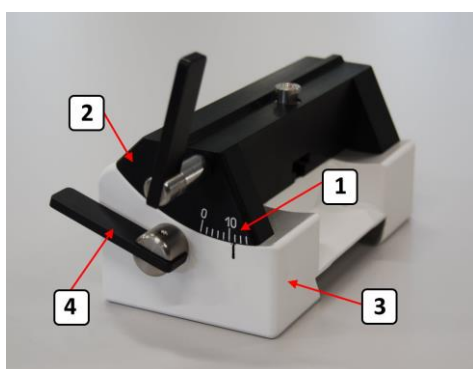


Figure 63

The clearance angle adjustment will be achieved by opening the clamping between segment (2) and base (3) of the knife carrier with the clamping lever (4). After opening the clamping, the segment (2) can be swiveled on the base (3) and the required clearance angle (1) can be adjusted according to the angular scale which is engraved on the segment (2).

5.3 Quick release clamp set-up

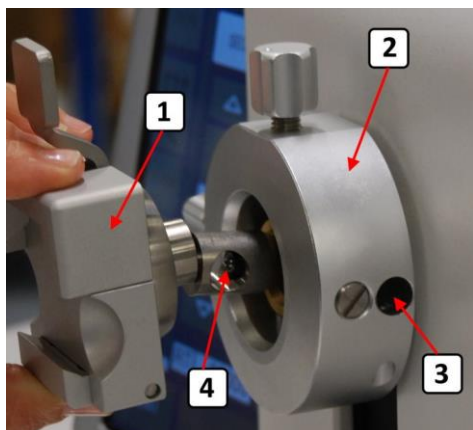


Figure 64

The Quick Release Clamp (QRC) (1) will be inserted to the Specimen Head (2) of the microtome by guiding the QRC (1) into the center opening of the Specimen Head (2). Thereby it must be observed that the side opening (3) of the Specimen Head (2) is matching in direction with the opening (4) at the shaft end of the QRC (1).

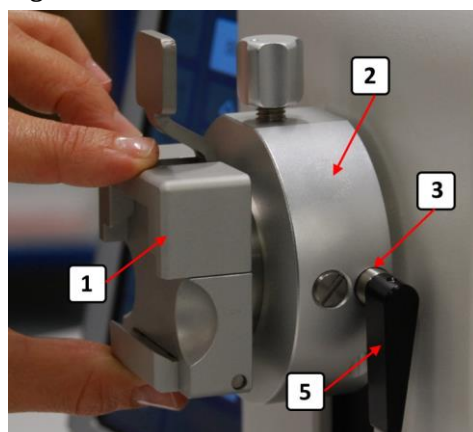


Figure 65

Once the QRC (1) is attached to the Specimen Head (2) insert the clamping lever (5) into the side opening (3) with the lever pointing downwards.

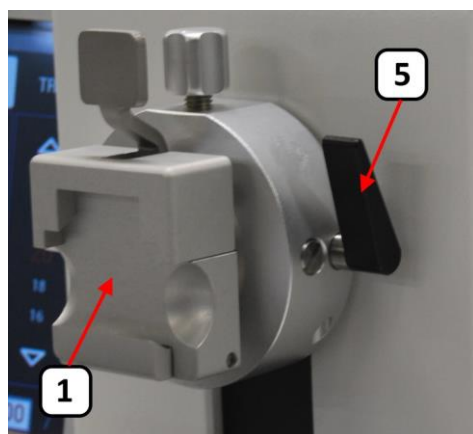


Figure 66

Then clamp the QRC (1) by pushing the lever (5) upwards until tightened.

In case that the clamping lever does no longer clamp sufficiently or in case that the clamping position is not favorable, a readjustment should be done.

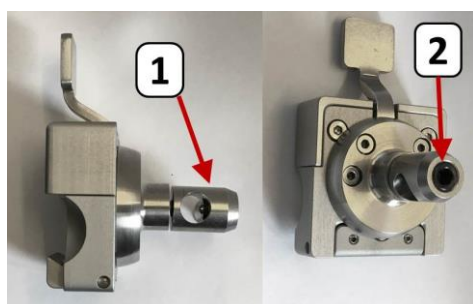


Figure 67

If the position of the clamping lever is too high or if the clamping force is not sufficient, readjust the rear screw (2) at the clamp adapter (1) a bit clockwise and check the result.

If the position of the clamping lever is too low, readjust the rear screw (2) at the clamp adapter (1) a bit counterclockwise and check the result.

5.4 Clamping the specimen



Always first insert and clamp the specimen before inserting a knife or disposable blade to the knife carrier. Lock the handwheel and use the finger-guard prior to any manipulation at the blade or knife and at the specimen.

For inserting a specimen block into the specimen holder, rotate the handwheel that the specimen holder is in the upmost position. Then lock the handwheel brake and insert the specimen block into the specimen clamp.



Clean the excess of paraffin from the cassettes. Not performing an accurate cleaning of laterals, could cause problems as bad fixation on the clamp and vibration on the sectioning.

5.5 Clamping disposable blades

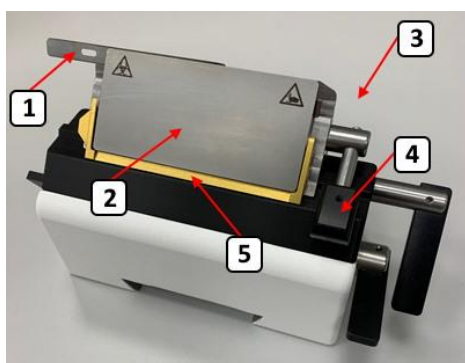


Figure 68

For clamping disposable blades (1) first the clamping plate (2) of the blade holder (3) must be unclamped in order to insert the disposable blade. Pull the clamping lever (4) down to open the clamping. Carefully insert the disposable blade (1) sideways and align with the clamping plate (2). Ensure that the blade (1) has a perfect seating on clean surfaces.

Then clamp the blade (1) by pushing the clamping lever (4) upwards until it is tightened. Apply afterwards the finger-guard (5) immediately by swiveling upwards to cover the blade edge and protect from injury (see also 2.3.2!)

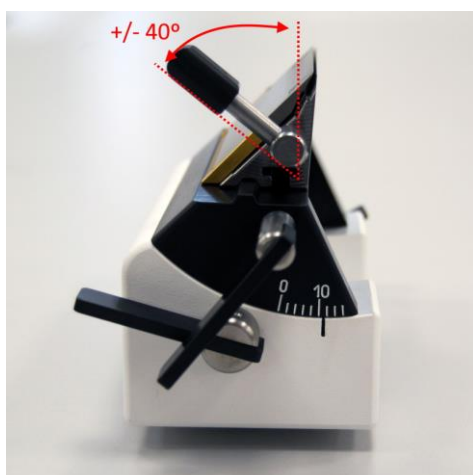


Figure 69

For a correct insertion of the disposable blade, pull the clamping lever down at a maximum angle of 40°, until the clamping plate is opened.

5.6 Trimming of specimen

The sectioning process of a new specimen starts with the trimming of the, in general, uneven sectioning surface. Make sure that all clamping at the knife carrier and the specimen orientation as well as at the specimen holder are fastened and tight.

Turn the handwheel of the microtome in clockwise direction and position the center part of the specimen surface opposite the sectioning tool e.g. microtome knife or disposable blade.

Eventually adjust the distance between sectioning tool and specimen by moving the knife carrier closer to the specimen surface. To do so follow the description of **5.1.2.3 Clamping the Knife Carrier Base**. Then start to approach with the feed system to come closer just before touching between blade and specimen by using the functions described in **5.1.2.1 Coarse feed functions**. While doing so, carefully observe the gap between the knife and the specimen in order to avoid touching or even damage the blade or the specimen. This process can be assisted by slightly rocking the handwheel forward and backward for better observation.

Now the trimming process can be started. Follow the description under **5.1.2.2 SECTIONING and TRIMMING** selections to select a trimming value and start rotating the handwheel to produce trim sections in order to create a flat sectioning surface and/or to reach the intended depth into the specimen.

5.7 Sectioning of specimen

After trimming the specimen, fine sectioning can immediately take place. To do so follow the steps under **5.1.2.2 SECTIONING and TRIMMING** selections to select a fine sectioning value and start rotating the handwheel to produce fine sections.

5.8 Changing the specimen or pausing sectioning



When changing a specimen or a pause during a sectioning or trimming process is made bring the specimen head to the upper position and lock the handwheel brake (see 2.3.1) prior to any other action on the microtome. Also, the finger guard at the knife carrier must be put into the protecting position

For changing a specimen with the Quick Release Clamp (QRC) just pull the lever forward and hold it while taking out the used specimen cassette and inserting a next one and afterwards release the lever. Make sure that the clamping mechanisms are always free of debris and residue of former specimen or paraffin material!

For changing a specimen with the Standard Specimen Clamp (SSC) open the clamping by turning the grip of the spindle ccw and take the used specimen out. For inserting a next specimen just follow the step above in reverse and tighten the clamp. Make sure that the clamping mechanisms are always free of debris and residue of former specimen or paraffin material!

5.9 Daily routine essentials

A daily cleaning procedure is recommended in order to maintain an undisturbed ongoing work process in microtome sectioning.

The produced debris and paraffin waste from trimming sections should be removed from time to time depending on the production rate. The waste tray should be never filled to the top but emptied regularly. Debris should be brushed away from all clamping devices around the specimen head, specimen clamp and knife carrier. After finished with the daily workload, cleaning of the devices and the instrument according **7.1 Cleaning the instrument** should be followed.

6 Optional Accessories

6.1 Overview of adaption for clamps

6.1.1 Rigid fixture for specimen clamps



Figure 70

A Fixed Specimen Head (FSH) is available for an instrument set-up where no specimen orientation in x/y direction is required or wanted. A rotation of the specimen (z-direction) is possible all 360°. All kind of specimen clamps can be used together with the FSH.

6.1.2 Orienting fixture for specimen clamps

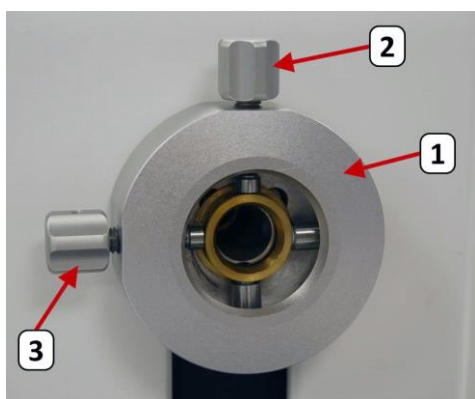


Figure 71

An Orienting Specimen Head (OSH) (1) is available for an instrument set-up where specimen orientation in x/y direction is required or wanted in addition to z-direction (360° rotation) orientation. All kind of specimen clamps can be used together with the OSH (1). With the X- orienting knob (2) an adjustment to orientate a specimen in x-direction with a maximum range of $\pm 8^\circ$ can be realized. With the Y- orienting knob (3) an adjustment to orientate a specimen in y-direction with a maximum range of $\pm 8^\circ$ is given as well. The inserted specimen clamps can, when unclamped, be rotated by 360° for a z-direction adjustment.

6.2 Specimen clamps and holders

6.2.1 Standard specimen clamp

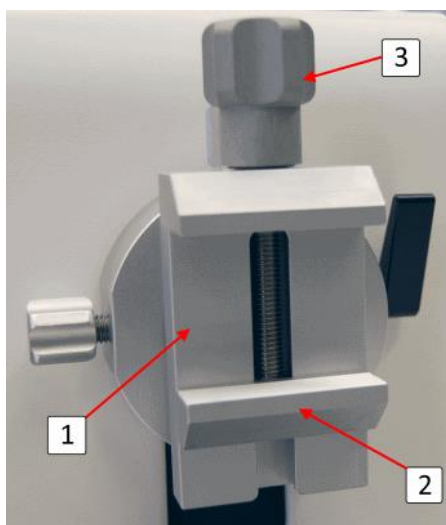


Figure 72

The Standard Specimen Clamp (SSC) (1) is a universal holding device for specimen blocks of all rectangular dimensions of a maximum of 50x55mm. The blocks can be inserted vertically oriented or horizontally oriented. The specimen blocks are fixed by screwing down the upper jaw (2) of the SSC by turning the knob (3) clockwise.

6.2.2 Quick release clamp

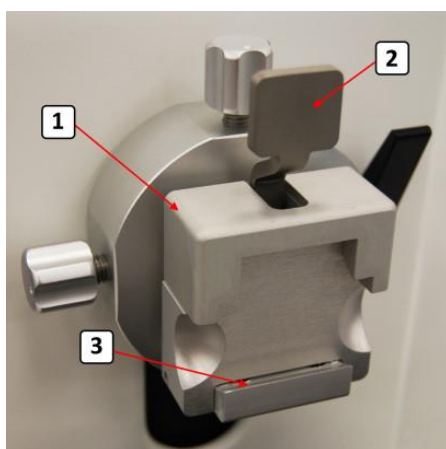


Figure 73

The Quick Release Clamp (QRC) (1) is a universal holding device for all normal sized specimen cassettes of most common brands. The cassettes can be inserted vertically oriented or horizontally oriented. A simple pull at the lever grip (2) of the cassette opens the clamping jaw (3) of the cassette for inserting a cassette. A release of the grip will clamp the cassette by internal spring force.

6.3 Knife holder base and knife holders

6.3.1 Knife carrier base

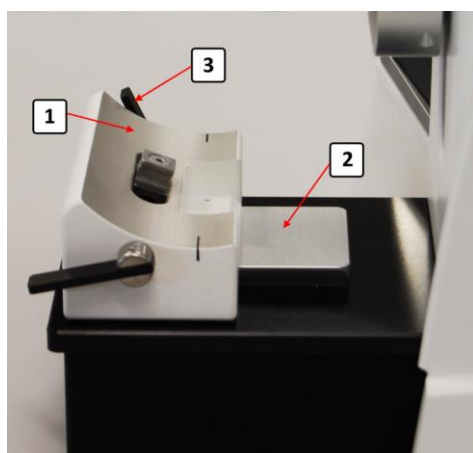


Figure 74

The knife carrier base (1) is the universal base part for all types of knife carrier top parts. It is sitting on the microtome dovetail block (2) where it can be adjusted in longitudinal position and fixed via the clamping lever (3) located on the left side of the knife carrier base.

6.3.2 Knife carrier for disposal blades DBC, model MR

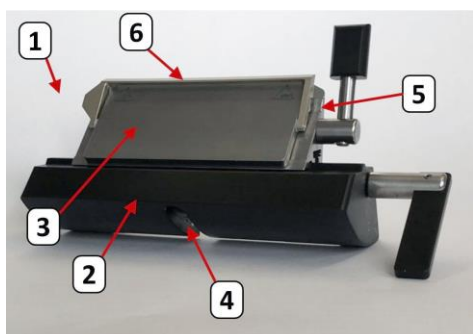


Figure 75

The knife carrier for disposal blades (DBC), model MR (1) consists of the segment (2) and the holder (3). The groove (4) of the segment engages with the counterpart at the knife carrier base (see Fig.74). The DBC, model MR, is suitable for lateral adjustment of the holder part for convenient usage of the full length of disposable blades. The holder takes all brands of low profile and high-profile blades. For insertion of high-profile blades, the support strip (5) must be removed. The holder also incorporates a finger guard (6) for user protection.

6.3.3 Knife carrier for disposal blades DBC, model ME

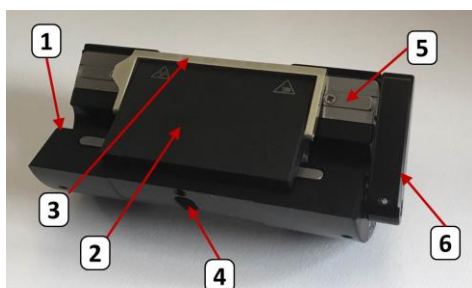


Figure 76

The knife carrier for disposal blades (DBC) model ME consists of a holder part (1), a clamping plate (2) with a finger guard (3). The groove (4) of the holder part (1) engages with the counterpart at the knife carrier base (see Fig.74). The DBC, model ME takes all brands of low profile and high-profile blades. For insertion of high-profile blades, the support strip (5) must be removed. The holder also incorporates a finger guard (3) for user protection. The clamping lever (6) serves for clamping of the blade. When open, blades can be exchanged and the clamping plate can be moved laterally.

6.3.4 Knife carrier for standard knives SKC, model MN

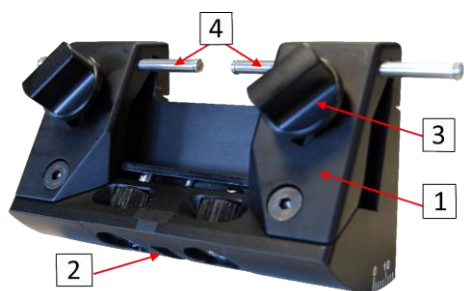


Figure 77

The knife carrier for solid microtome knives (SKC) (1) engages with its groove (2) with the counterpart at the knife carrier base (see Fig.74). The SKC takes all types of standardized C- and D-profile microtome knives. A knife height adjustment via the curled disks (3) is offered to overcome the reduced height of re-sharpened knives. The holder also incorporates a finger guard (4) for user protection.

6.4 Section waste tray



Figure 78

A spacious Section Waste Tray with an easy to clean surface due to an antistatic coating is part of the standard delivery of the microtome.

7 Cleaning and Maintenance

7.1 Cleaning the instrument



Remove the microtome blade or knife always before detaching the knife carrier from the microtome!
Put the knives always back into the knife box when not in use!
Never place a knife anywhere with the cutting edge facing upwards!
Never try to catch a falling knife!
Do not use xylene or acetone as cleaning agents!
When using cleaning agents, observe the safety instructions given by the manufacturer of the agent and observe the respective regulations of your laboratory!
Make sure that cleaning agents cannot enter the interior of the instrument!

Following steps should be carried out before each cleaning procedure:

- Bring the specimen head to the upper position and lock the handwheel brake.
- Unclamp and remove the disposable blade from the blade holder and dispose it of in the receptacle at the bottom of the blade dispenser, or in the case of usage of a solid microtome knife, remove the knife from the knife carrier and store it in the respective knife box.
- Unlock the knife carrier base by turning the clamping lever in ccw direction.
- Switch off the instrument and unplug the power cord.
- Remove the knife carrier from the instrument.
- Remove the specimen from the specimen clamp and remove the specimen clamp.
- Brush away all visible waste from the instrument into the waste tray.
- Remove waste tray and dispose of the waste according the laboratory's policy and requirements.

Cleaning steps:

7.1.1 Cleaning the microtome housing and touchscreen

Paraffin residue can be removed from all varnished instrument surfaces with agents known as paraffin removers such as paraffin oil or xylene substitutes.

The Touchscreen can be wiped with mild commercial household cleaners. Don't soak the Touchscreen! No liquid should enter the inside! Keep the rim of the Touchscreen free of liquids.

7.1.2 Cleaning a solid knife



Protect your hands by wearing gloves!
Carefully remove the knife from the knife box!
Always wipe the knife from the back of the knife towards the cutting edge!
Never wipe the knife in opposite direction nor touch the knife edge because of risk of injury!
Place the knife back into the knife box immediately after cleaning!

Soak the solid microtome knife in an ethanol-based solution or in acetone and wipe carefully with a soft tissue.

7.1.3 Cleaning the Disposable Blade Carrier DBC, model MR



Protect your hands by wearing gloves!
Assure that no blade is remaining in the Disposable Blade Carrier!



Figure 79

Dismantle the Disposable Blade Carrier for a comprehensive cleaning procedure by following these steps:

- Rotate the clamping lever (1) for the lateral clamping counterclockwise to open the clamping.



Figure 80

- Remove the DBC top part (2) from the middle part by shifting sideways.

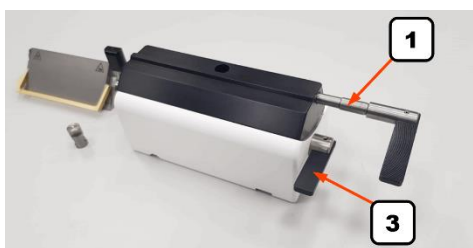


Figure 81

- Pull out completely the clamping lever (1)
- Unclamp the clearance angle fixation (3) by turning the clamping lever ccw.



Figure 82

- Detach the middle part (4) from the base part (5) by swiveling forward and disengage.

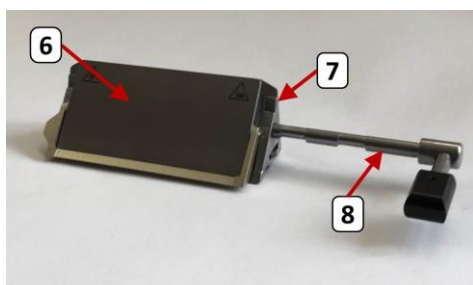


Figure 83

- Take the DBC top part, turn the clamping lever (8) ccw in a forward position, press the clamping plate (6) firmly against the holder part (7) and simultaneously pull out the clamping lever (8).

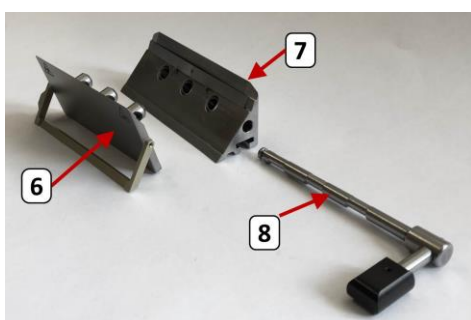


Figure 84

- Now pull the clamping plate (6) away from the holder part (7).



Keep the parts of the complete knife carrier together and do not mix the parts with other assemblies which might be cleaned within same procedure!



Do not use xylene or ethanol-based solvents to clean the knife carrier!



Figure 85

Now clean all disassembled parts of the knife carrier. The best method is to place the parts on an absorbent underlay in a drying chamber at a temperature of 65°C max. The paraffin will melt and will be soaked by the underlay.



Wear safety gloves to avoid a burn hazard when removing the parts from the drying chamber (65°C)

After that procedure just wipe and dry the single parts. Finally reassemble the knife carrier by using the steps above in reverse manner. While assembling, apply a little bit of oil (see **Chapter 7.2.2**) to the moveable parts.

7.1.4 Cleaning the Disposable Blade Carrier, model ME



**Protect your hands by wearing gloves!
Assure that no blade is remaining in the Disposable Blade Carrier!**

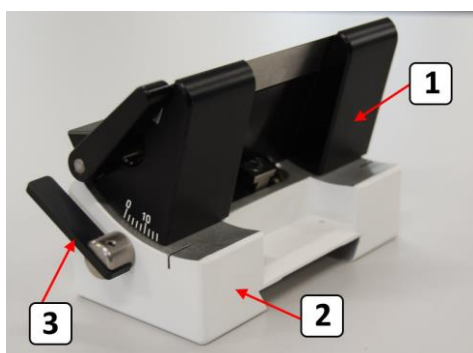


Figure 86

Disassemble the DBC, model ME, for a comprehensive cleaning procedure by following these steps:

- Unclamp the clearance angle fixation by turning the clamping lever (3) ccw.
- Detach the holder part (1) from the base part (2) by swiveling forward and disengage.

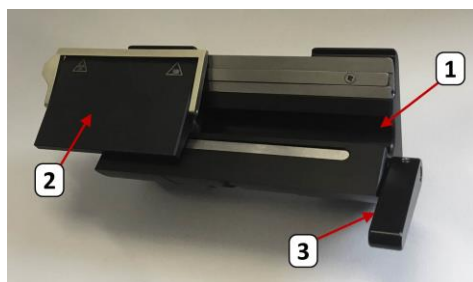


Figure 87



Do not use xylene or ethanol-based solvents to clean the knife carrier!

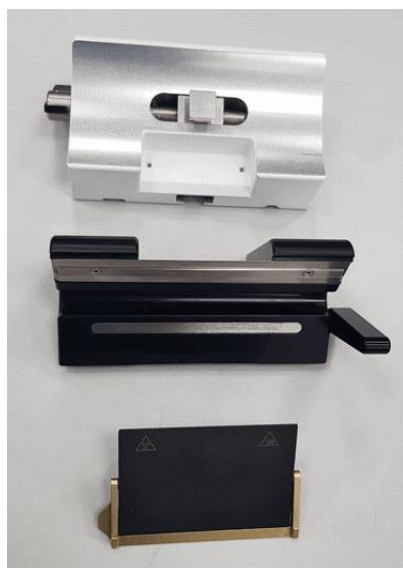


Figure 88



Wear safety gloves to avoid a burn hazard when removing the parts from the drying chamber (65°C)

- Turn the clamping lever (3) ccw to unclamp the clamping plate (2). Move the clamping plate (2) sideways and take it off from the holder part (1).

- Now clean all disassembled parts of the knife carrier. The best method is to place the parts on an absorbent underlay in a drying chamber at a temperature of 65°C max. The paraffin will melt and will be soaked by the underlay.

After that procedure just wipe and dry the single parts. Finally reassemble the knife carrier by using the steps above in reverse manner. While assembling, apply a little bit of oil (see **Chapter 7.2.2**) to the moveable parts.

7.1.5 Cleaning the Quick Release Clamp QRC

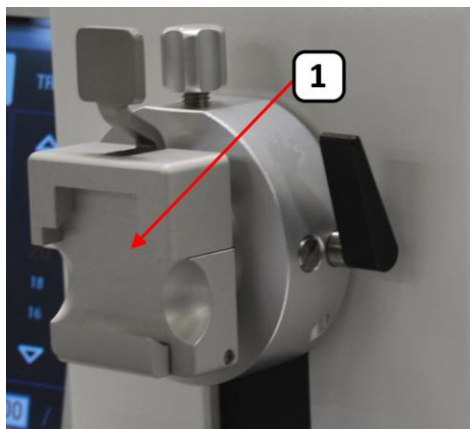


Figure 89

Detach and clean the Quick Release Clamp QRC by following these steps:

- Bring the QRC (1) in the up position by turning the handwheel and then lock the handwheel

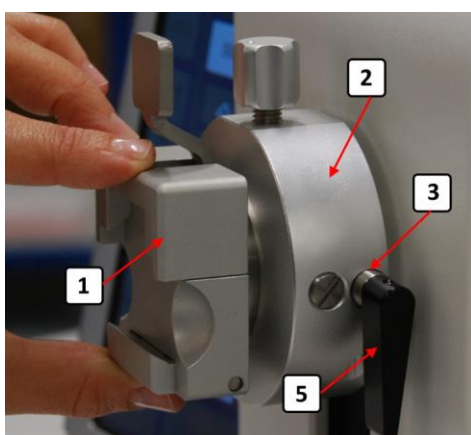


Figure 90

- Unclamp the fixation lever (5) from the Orienting Specimen Head (2) in a ccw direction. Pull out the lever (5) while holding the QRC (1) in your hand.

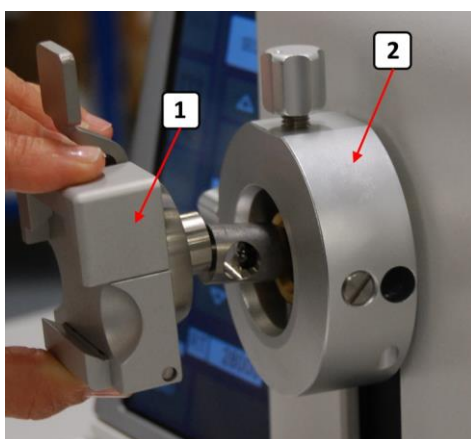


Figure 91

- Take away the QRC (1) by pulling it forward, out of the Orienting Specimen Head (2).



Do not use xylene or ethanol-based solvents to clean the Quick Release Clamp!

Now clean the QRC. The best method is to place the assembly on an absorbent underlay in a drying chamber at a temperature of 65°C max. The paraffin will melt and will be soaked by the underlay.



Wear safety gloves to avoid a burn hazard when removing the parts from the drying chamber (65°C)

After that procedure just wipe and dry the outside carefully. Apply a little bit of oil (see **Chapter 7.2.2**) to the moveable parts inside the QRC. To do so, pull the lever forward and apply a drop of oil right and left down at the opening jaw. Operate the lever a few times while turning the QRC upside down.

7.2 Maintenance

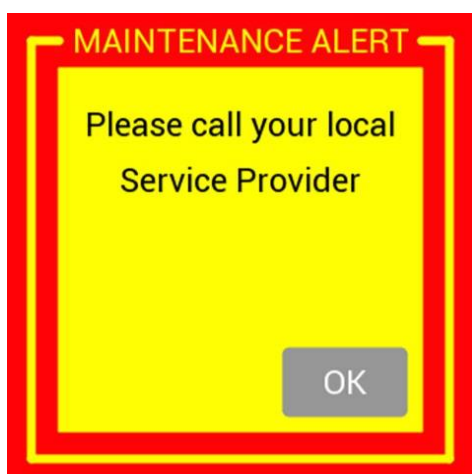
7.2.1 Maintenance instructions

The instrument MYR M-240 is a robust instrument which is virtually maintenance free over a long period of time and usage. In order to ensure a long trouble-free operation and a long instrument life time it is recommended to conduct maintenance service on a regular basis.



Service and maintenance should only be conducted by qualified and authorized service personnel trained by MYR company.

An internal MAINTENANCE ALERT is available on the instrument on three of the following values: date, number of sections (revolutions of handwheel) and operating hours whichever comes earlier.



When reaching a limit of one of the monitored values, the user will be informed by a MAINTENANCE ALERT Pop-up window that a preventive maintenance is recommended.

Please follow the recommendation and arrange for a service date with your local service provider.

The Pop-up window will disappear when pressing the OK button.

Figure 92



Figure 93

The next day or when switching on the instrument next time, another Pop-up window will appear asking for confirmation that a service date is already planned. If confirmed with the YES button, the Pop-up window will disappear and reappear only, if there was no service within next 4 weeks.

If confirmed with NO, the Pop-up window will reappear next day or when switching on the instrument next time.

7.2.2 Lubricating the microtome and the accessories

The following parts may need a slight lubrication (1-2 drops) depending on the frequency of their use. Lubrication may be applied as needed or on a regular basis every month. Please use Special Oil only:

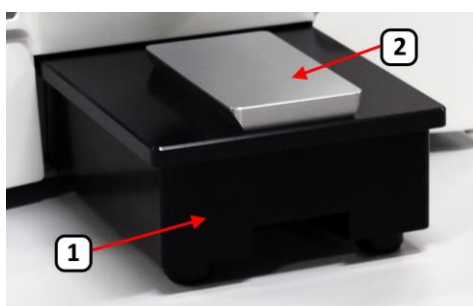


Figure 94

Instrument:

- Dovetail Block (2)
- Microtome base plate (1)

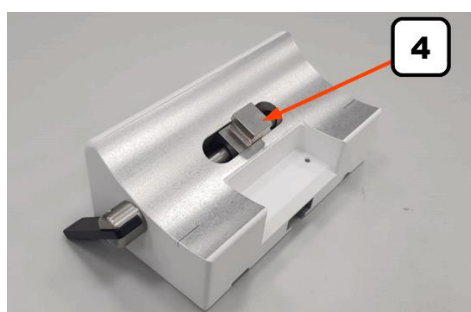


Figure 95

- Pulling Piece (4)

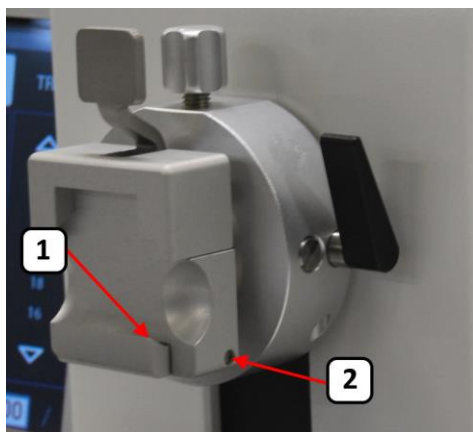


Figure 96

Accessories:

Quick Release Clamp QRC

- Lever axle (right and left) (2)
- Clamping jaw recess (right and left) (1)

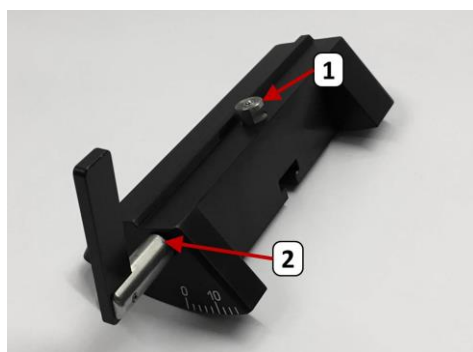


Figure 97

Disposable Blade Carrier DBC, model MR

- Segment Link Piece (1)
- Clamping Lever lateral displacement (2)

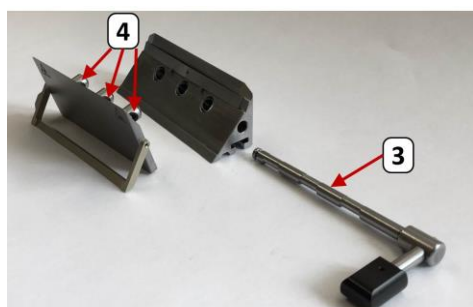


Figure 98

- Clamping Lever blade holder (3)
- Clamping plate bolts (4)

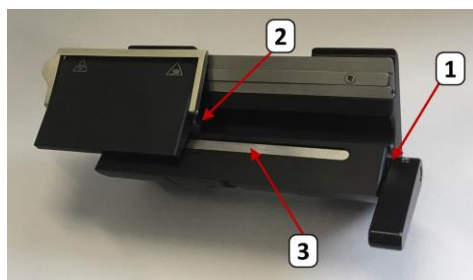


Figure 99

Disposable Blade Carrier, model ME

- Clamping lever (1)
- Clamping plate guidance (2)
- Pressure bar for clamping plate (3)

7.2.3 Replacing fuses



For replacing mains fuses, please check the fuse rating and triggering characteristic given on the Nominal ratings and fuses type plate at the rear plate of the instrument!



Figure 100

Disconnect the unit from mains

Open the door of the fuse compartment (1)

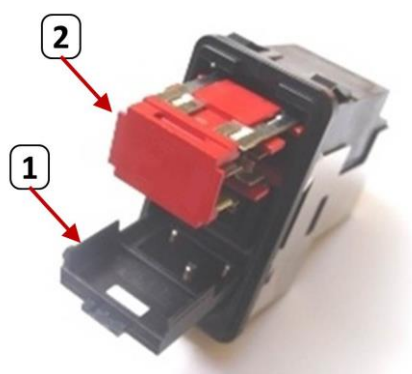


Figure 101

Pull out the fuse holder (2) and replace defective fuses with correct rating and characteristic

Push in the fuse holder (2) and close the door (1)

8 Troubleshooting

Below is a list of the most common practical problems when sectioning with microtomes. It is divided into application-based problems and possible instrument malfunctions. For each problem possible causes and related corrective actions are listed. If a potential problem cannot be solved by applying the listed corrective action, inform your local MYR service provider.

8.1 Application hints

Problem	Possible cause	Corrective action
Thick/Thin sections The section thickness is not evenly but alternates; the sections are of different alternating length	Blade not clamped properly	Clean and clamp blade again
	Blade is dull	Try another portion of the blade by lateral shifting the blade and clamping again or replace the blade
	Pressure plate is not adjusted correctly or has a damage	Readjust or exchange defective parts
	Knife carrier clearance angle adjustment not optimal	Check clearance angle setting, clamp clearance angle position
	Knife carrier base not clamped properly	Unclamp and tighten the knife carrier base again with the clamping lever.
	Specimen clamping not sufficient	Check specimen in cassette or block, check clamping force of specimen clamp, specimen cassettes must not be too weak, the surroundings of the cassettes must be clean of paraffin, the rear of the cassette must be sufficiently filled with paraffin to guarantee attachment of the specimen block to the cassette, the Quick Release Clamp must not be blocked by waste paraffin (see Chapter 7: Cleaning and Maintenance)
Sectioning creates a sound There is a singing noise during the sectioning process	Specimen orientation not clamped properly	Check the specimen orienting device for secure clamping
	Clearance angle is too wide	Adjust for smaller clearance angle settings
	Sectioning speed is too high for that application	Reduce speed

Problem	Possible cause	Corrective action
Sections have chatter marks The sections have regular parallel horizontal marks	Specimen, blade or knife carrier vibrate because of insufficient clamping Clearance angle is too wide Sectioning speed is too high for that application	Check for loose parts or insufficient lever clamping in the system Adjust for smaller clearance angle settings Reduce speed
Sections have splits The sections tend partly to split and come down in stripes	Paraffin or other residues sitting on blade edge or on rear of blade or knife carrier	Clean blade and/or rear of knife carrier

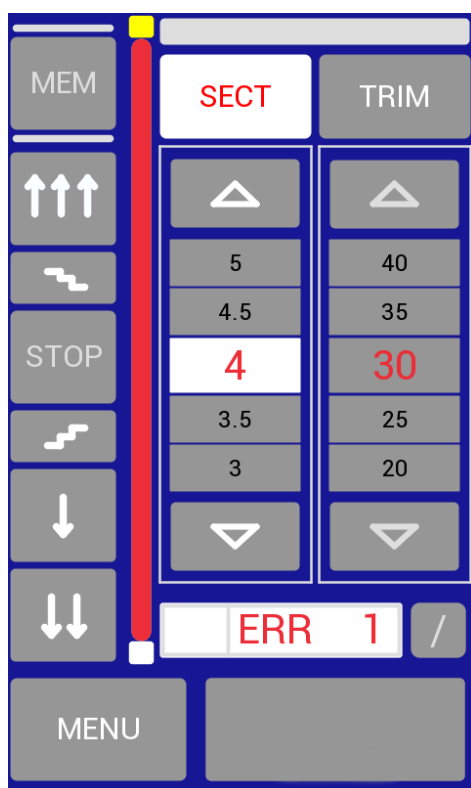
8.2 Instrument malfunctions detection

8.2.1 Malfunctions, possible causes and troubleshooting

Problem	Possible cause	Corrective action
Instrument switched on, no display presentation The instrument is switched on but there is no initialization movement and no display activity	Power cable loose or not connected Mains fuse blown	Check connection and plug correctly Replace mains fuse(s) (see Chapter 7.1.1)

8.2.2 Error messages

In the event that a malfunction of the instrument is detected during the initialization process, an error message may occur in the information field of the display on the main screen:



Error 1 indicates that the end of horizontal travel sensing of the feed mechanism did not work properly. Please call your local service provider and report the occurred message.

Figure 102

9 Warranty and Service

9.1 Warranty confirmation

ESPECIALIDADES MEDICAS MYR S.L. guarantees that this product is produced and tested according the standards of a complete quality management system as described in ISO13485. The product is faultless and complies with the technical specifications stipulated in chapters 3.2 and 3.3 of these Instructions for Use.

The scope of the warranty is limited to the content of the concluded purchase agreement. The terms of warranty of your MYR sales office or the local organization from which you have purchased this product shall apply exclusively.

9.2 Service information

Technical customer support, routine service and service contracts as well as spare part supply is handled by your authorized local distributor in your country. Contact information is given in your purchase contract.

When contacting service personnel please provide the following information:

- Model and serial number of the instrument (see nameplate in rear)
- Institution and name of a contact person where the instrument is located
- Delivery date of the instrument
- Reason for the requested service

9.3 End of service life

At the end of service life, the instrument and/or parts of the instrument must be disposed of according to the applicable laws and regulations in your country.



Separate taking back of electrical and electronic instruments in the European Union countries.

This is to be applied in the countries of the European Union and other European countries with a separate collecting system within the waste management.



This product, being an electro and/ or electronic instrument, must be treated separately within the waste management process (WEEE).

For non-European union countries, the disposal of the instrument of the final shutdown must be done according to local laws in force.



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