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Technical Sheet

MC 5000 Microtome Cryostat Double Compressor



Manufacturer: Histo-Line Laboratories s.r.l.



In-vitro diagnostic medical device

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1. Features

1.2 Information and specified use

The MC5000 is an high-performance cryostat from Histo-Line Laboratories, able to offer stable temperature, precision in cutting, operator safety and maximum cleaning the instrument.

The semi-automatic cryostat, is designed for the rapid freezing of pathological sections of human and animal tissue. It is used in biological, medical and industrial application diagnosis in hospitals, medical schools, research institutes.

MC 5000 is suitable for in-vitro diagnostic (IVD) applications.

This unique dual compressor semiautomatic cryostat is equipped with double cooling circuit that allows user to set temperature of specimen differently from cryo-chamber and freezing shelf temperature.

The instrument consists of 4 major parts:

- Touch-screen control panel in top area. Displays the temperatures, all settings parameters and the general working conditions of the instrument.
- Cryo-chamber, wide and spacious with constant low temperature, ergonomic storage and flat freezing shelf with high number of specimen positions.
- High efficiency microtome arm with external stepper motor feed-in. Encapsulated microtome and sealed cryochamber seems help with minimizing cleaning and maintenance
- Lower area: the heart of the refrigeration system with the compressor units.

The stainless-steel freezing chamber is wide and spacious, thanks to the microtome mechanism located outside of the chamber.

The sliding window is anti-fog and anti reflection and when open, the UV lamp is automatically disabled.

The holder disks are located on left side of chamber and can be stored on freezing shelf area in 18 refrigerated places + 6 Peltier position for max cooling. On frontal touch-screen display, it's possible to check and regulate all necessary parameters for excellent cutting operations; like thickness, temperature, sample retraction and more.

The MC5000 is a microtome cryostat with ergonomic setting, allowing you to work both standing and seated, thanks to



the spacious area that offers the operator for the positioning of the legs.

On the upper part of the cryostat it is possible to keep at hand accessories such as slides, containers for extemporaneous stains, etc. The cryostat is equipped with wheels to facilitate the positioning and movement of the instrument.

The handwheel can be locked in any position to allow rapid replacement of the disposable blade in maximum safety.

Work operations, such as programming and use of functions, are very simple thanks to the external self-explanatory controls with easily recognizable **symbols**.

On the control panel, 10-inch color LCD touch screen the total number of slices, total thickness of slices, thickness of each slice, sample retraction value, temperature control, date, time, temperature, time suspension switch, defrosting and other functions can be displayed separately.

Through the control panel, it is possible to modify and adjust all the parameters necessary for an excellent cut:

- set and actual temperature control for the cryochamber
- temperature control for the sample holder arm
- temperature control for the sample stationing bar



There are other buttons on the side pillar of the instrument that are useful to the operator:

- chamber lighting
- UV disinfection lamp
- rapid advance and retreat
- forward and backward at normal speed

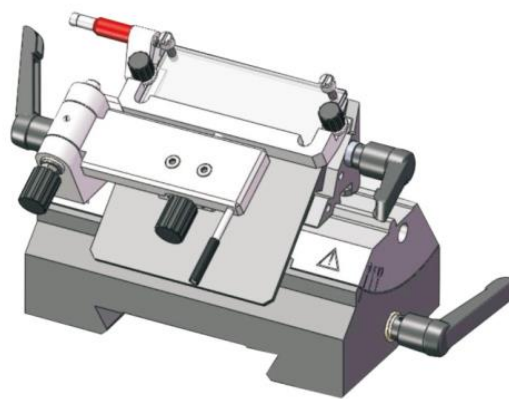


MC5000 has a large stainless-steel cooling chamber, with smooth surfaces for easy cleaning and disinfection.

The samples freeze rapidly because the pre-cooled discs have a large back surface in contact with the freezing bar. The support discs are located on the left side of the chamber and can be placed on an area that allows you to house 24 refrigerated seats.

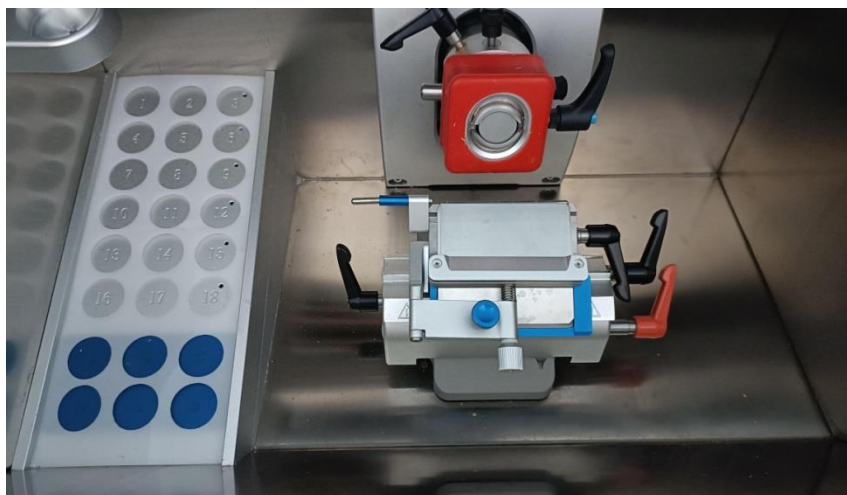
The sample discs have a large freezing surface, have numerous grooves to allow maximum stability during the cutting phase.

The cryostat allows you to cut normal and hard tissue or large samples thanks to the robust blade holder equipped with a dovetail attachment system that provides robust stability.



Schematic blade holder

The blade holder allows the use of low- or high-profile disposable blades and evenly distributes the clamping pressure over the entire length of the blade, guaranteeing vibration-free sectioning.



The cryostat has a **lighting system** of the integrated chamber, with a LED light that can be activated by the control switch.

1.3 Reliability and precision of the cut

The most important points of the MC5000 cryostat cutting are:

1. Sample advancement and retraction system with step-by-step motor.
2. Blade holder device with adjustable cutting angle for the use of any type of disposable blades.
3. Integrated anti-roll system.
4. The uniform orientation system allows perfect alignment of the sample.
5. Orientation of the sample in the X-Y axes of 12 °.
6. Very large sample freezing plate able to keep 18 discs and equipped with **six** Peltier units for rapid cooling of the preparations up to -60 °C.
7. Side control panel with rapid and slow electrical advancement buttons and display of sectioning and roughing thickness adjustment. Acoustic end-of-stroke indicator with the "beep".
8. Heat **extractor** housed in the left wall of the cryostatic chamber to facilitate freezing of the preparation.

Freezing plate



1.4 Safety and operator comfort

Ergonomic cryostat that allows to work both standing and seated, thanks to a large space for the legs, guaranteeing maximum precision and comfort for the operator.

1. Suction system with power adjustment of the cutting waste (accessory outside the cutting chamber).
2. Glass **anti-fog system**.
3. Acoustic window sliding alarm with the “beep”, which warns the operator of its closing / opening.
4. **Finger-saving protection** system incorporated in the support.
5. Liquid collection system of condensation in an integrated and removable PVC container.
6. Handwheel locking system in each position.
7. Extractor stainless steel to flat the sample



1.5 Disinfection and defrosting systems

For the disinfection of the chamber it is equipped a **UVC lamp**, effective against bacteria, viruses and fungi, at low temperatures that can be activated / deactivated at any time by the operator.

The disinfection cycle does not produce condensation or contaminated waste and is effective at low temperatures and can be interrupted at any time in extemporary procedure.

Equipped with a system for **collecting washing**, disinfecting and defrosting water through the use of a flexible tube that conveys the wastewater into a large capacity container that can be easily removed from the instrument.

The **defrosting system** for use in manual or automatic mode programmable both for any day of the week and for the cycle operating time.

Hibernation function: after selecting the hibernation state, the temperature of the freezer compartment can be automatically controlled between -1 and -9°C. After canceling hibernation, the sectioning temperature can be reached within 15 minutes.

Two essential features for the operator:

1. Disinfection system settable through the control panel with UVC lamp
2. Manual and automatic defrosting system, with immediate start.



2. Technical specifications

2.1 Technical details

1. Room temperature: the working temperature is adjustable between 10° and -50° C, with electronic control and indication of the set and in real time temperature.
2. Sample clamp temperature can be set from 10 °C to -50 °C
3. Rapid cooling system of the sample holder bar, equipped with a separate cooling system that allows rapid freezing of the samples.
4. Freezing plate: for 18 samples, with positions equipped with independent cooling down to -35°C, and 6 positions with maximum electronic cooling point (Peltier), about ≤-60 °C.
5. Defrost system: automatic every 24 hours, with the possibility of exclusion and manual management.
6. Support surfaces: provided in the refrigerated chamber and on the upper flat surface of the instrument.
7. Safety systems: blade protection system incorporated in the support.
8. Working room lighting system.
9. Real-time display of all modifiable temperatures.

2.2 Cooling features

| | | |
|------------------------|-----------------------------------|--|
| Refrigeration chamber | Chamber temperature | 10°C ~ -50°C adjustable |
| | Defrosting | manual/automatic |
| | | Automatic every 24 hours for 9 minutes |
| | Refrigerant | R404a, 500g±10g |
| | Compressor oil | 0.6L EMK RL-22S, ICI |
| Refrigerating capacity | 690 W | |
| Specimen Holder | Specimen temperature | -10°C ~ -45°C adjustable |
| Freezing plate | Minimum temperature | -50°C |
| | Time to reach minimum temperature | ~ 3 h, from room temperature |
| | Number of freezing stations | 18 |
| | Peltier number | 6 at ≤-60 °C |

2.3 Cutting specifications and advancement

| | | |
|--|----------------|---|
| Section thickness range: 0,5 µm -100 µm | Value | Move value/step |
| | 0,5 µm – 5 µm | 0,5 µm |
| | 5 µm – 20 µm | 1 µm |
| | 20 µm – 40 µm | 2 µm |
| | 40 µm – 100 µm | 5 µm |
| Trimming thickness range: 10µm - 600µm | Value | Move value/step |
| | 1µm - 50µm | 5µm |
| | 50µm - 100µm | 10µm |
| | 100µm - 600µm | 50µm |
| Horizontal feed: | | 25mm |
| Vertical stroke: | | 65mm |
| Specimen retraction | | Range: 0,5 µm -100 µm Increments 0,5 µm (deactivatable) |
| Specimen's max size: | | 80 mm X 55 mm |
| Specimen orientation: | | 12° X, Y and 360° Z |
| Specimen moving speed: | | Fast: 900 µm/s |
| | | Slow: 300 µm/s |

2.4 Dimensions and weight

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| Width: | 760 mm |
| Depth: | 700 mm |
| Height: | 1160 mm |
| Weight: | 135 kg |
| Weight with packaging | 190 kg |

2.5 Electrical data

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|-----------------------------------|------------------------------|
| Power supply: | 220V~ 50Hz |
| Maximum absorbed power: | 850 V/A |
| Absorption power during start-up: | (5 sec. 45A) |
| Relative humidity: | maximum 60 %, non-condensing |
| Noisiness: | ≤ 70dB (A) |