

ETHOS UP

Main technical specifications

1. The system must be equipped with n°2 magnetron of 950W (each) for a total power of 1.900W.
2. The microwave cavity must have the following dimensions 43cm (W) 40cm (D) 41cm (H) and a volume of 70,5L to ensure maximum safety of operation and high throughput rotors capability.
3. The system must be able to run the following rotors:
 - a. Up to 15 positions segmented high pressure rotor (100 bar, 300°C, 100ml)
 - b. Up to 24 positions high performance and throughput rotor (60 bar, 300°C, 80 mL).
 - c. Up to 44 positions high throughput rotor (35 bar, 300°C, 100ml).
 - d. All rotors must have PTFE vessels and PEEK shields and vent-and-reseal technology.
4. The system must be equipped with Application (software) that works on external devices (PC, tablets or smartphones) connected to the microwave unit. It includes a database with multiple information (QC report, warranty terms, list of parts, technical notes, user manual, video tutorials, updated application notes, the complete library of available scientific articles, and a help-on-line section) as well as a remote monitor of the microwave system
5. The software must be available in 11 languages, icon-driven, with a built-in library of minimum 150 methods. The software must display simultaneously time, power, temperature and pressure. The software must be able to use the same method regardless the number of vessel or type of rotor used.
6. The system must be equipped with a backlit logo to indicates the digestion process status during all the run

HARDWARE

- 316 stainless steel housing with multi-layer of corrosion resistant coating with a large flange with 36 mm ID. Additional multiple ports on the side walls of the microwave cavity
- Chassis protected against acids and solvents with polymer coating on both inner and outer surfaces
- Self-resealing pressure responsive door mounted on sprigs, to ensure maximum safety even in case of overpressure release.
- Door completely made of 316 stainless steel
- An automatic door locking system ensures to keep the door closed until the set temperature is reached. User can modify the set temperature according to the lab needs.
- Four independent door safety interlocks to prevent microwave emission in case of improper door closure or misalignment
- Built-in exhaust system located above the microwave cavity and separated from the electronics to prevent corrosion.
- Built-in camera, with PTFE-Teflon foil protection

- Dual magnetron system with rotating diffuser for homogeneous microwave distribution in the cavity.
- Exclusive magnetron protection from reflected microwave power
- Continuous and PID-controlled microwave emission at all power levels
- Emission and Safety Norms: EN61010-1:2001; EN61010-2-010:2003; UL61010-1:2004; CAN/CSA-C22.2 No 61010-1:2004; CAN/CSA-C22.2 No 61010-2-010:2004; EN61326-1:2006; CEI EN 61326-2-6:2006

USER INTERFACE

- Touch-screen 6,5" TFT display. 640x480 VGA resolution with 64k colors. 5 USB ports, 1 RS232 port, 1 LAN port, 2 Video ports. Mouse, keyboard, balance and other accessories can be connected to the terminal.
- Icon-driven multi-language (Chinese, English, French, German, Italian, Japanese, Polish, Portuguese, Russian, Spanish, and Turkish) software allowing the user the edit, save, and run a virtually unlimited number of methods
- Multiple-level access by password, such as User, administrator, service.
- The terminal must display the view of the camera located into the cavity of the system.
- The software must have dedicated pages to the sample information, such as sample amount, reagents mixture.
- The software must display in a dedicated page the individual temperatures of each selected vessel during all the microwave program
- All temperatures profiles must be exportable to a PC
- Fully compliant to 21 CFR part 11

REACTION SENSORS

- Direct contactless temperature control in all positions of the 15 high pressure rotor and/ or 24 positions high performance and throughput rotor via a dedicated sensor. Temperature is controlled up to 300C. Display of the temperature in all positions is done through a dedicated page in the software. All temperature profiles can be exported.
- Direct contactless temperature control in all positions of the high throughput rotor via two dedicated sensors, suitable to control up to 300C in all vessels. Display of the temperature in all positions is done through a dedicated page in the software. All temperature profiles can be exported.
- Direct temperature monitor and control via shielded thermocouple or microwave-transparent fiber optic sensor up to 300C in a reference vessel. The thermocouple and the fiber optic are PTFE coated and allow the use of any acid combination including HF.
- Direct pressure monitor and control via pressure transducer up to 100 bar (ca. 1500 psi) in a reference vessel

- Contact-less pressure monitor and control up to 100 bar (ca.1500 psi) in all vessels (up to 44). The software automatically reduces the microwave power in case of overpressure, avoiding sample loss.

ROTORS AND VESSELS

- 15 position segmented high-pressure rotor. The rotor specifications are:

<i>Positions</i>	<i>MAX T</i>	<i>MAX P</i>	<i>Volume</i>	<i>Vessel material</i>	<i>Safety shield material</i>
Up to 15	Up to 300°C	Up to 100 bar or 1500psi	100ml	PTFE-TFM	PEEK reinforced with glass fiber

Every vessel must have a vent-and-reseal spring to safely release the pressure in case of overpressure. Burst-disk, membrane or self-releasing device are not suitable due to very low performance.

- 24-position high performance rotor. The rotor specifications are:

<i>Positions</i>	<i>MAX T</i>	<i>MAX P</i>	<i>Volume</i>	<i>Vessel material</i>	<i>Safety shield material</i>
Up to 24	Up to 300°C	Up to 60 bar or 900psi	80ml	PTFE-TFM	PEEK reinforced with glass fiber

- 44-position high throughput rotor. The rotor specifications are:

<i>Positions</i>	<i>MAX T</i>	<i>MAX P</i>	<i>Volume</i>	<i>Vessel material</i>	<i>Safety shield material</i>
Up to 44	Up to 300°C	Up to 35 bar or 500psi	100ml	PTFE-TFM	PEEK reinforced with glass fiber

- 10 positions high-pressure rotor can be accommodated into the ETHOS. The rotor works up to 300°C, 100bar (1500psi) and a volume of 100ml
- A dedicated extraction rotor with disposable glass vials can be placed into the same system to run extraction of pollutants from environmental samples
- The system is fully complying with the following methods: US EPA3052, US EPA3051A, US EPA3015A, US EPA3546, ASTM D4309-96, ATCM D-5765, ASTM D-6010, RoHS, WEEE, ELV, USP 232/233



ROTOR'S ACCESSORIES

- **Dedicated automatic capping station to simplify and expedite vessel's handling.**