

COMPACT BLOCK DIGESTION SYSTEM MBC SERIES

EFFICIENT, VERSATILE AND
SCALABLE DIGESTION BLOCK
TO PERFORM SAFE KJELDAHL
DIGESTIONS AND MUCH MORE



Compact block digestion system

Our **MBC Series** block digesters are available in 6 different models with varying amount of sample positions and compatible sample tube sizes to process from 6 up to 40 samples at a time. The system is composed of a heating block, a mobile samples tubes rack and a mobile fumes collector.

MBC Series digesters provide excellent temperature homogeneity in all sample positions with customizable programs with up to 10 segments and a maximum temperature of 450°C.

Among the most common applications they are excellent to perform protein digestion according to the Kjeldahl method, acid hydrolysis for subsequent fat analysis determination of heavy metals.

MBC Series digesters are ideal to be used along with our Kjeldahl distillers (DNP Series) to perform the previous digestion step or with our Fat extraction system (SX-6 TS Series) for sample acid hydrolysis.



MAIN FIELDS OF APPLICATION



FOOD, FEED & BEVERAGES

Nitrogen, Protein, Fat hydrolysis.



ENVIRONMENTAL ANALYSIS

Nitrogen, Chemical oxygen demand, Heavy metal traces.



PHARMACEUTICAL INDUSTRY

Protein, Organic nitrogen, Ammonia, Urea, Formaldehyde.



CHEMICAL INDUSTRY

Organic nitrogen.



FEATURES

VERSATILITY

MBC digesters are versatile for a wide range of applications and samples, even fatty, inhomogeneous and highly foaming samples are compatible with the equipment.

FLEXIBILITY

Delay time, ramps, digestion temperatures and digestion times can be adjusted according to each analysis requirements. It has a total of 10 programs available that can be saved and edited at any time.

HOMOGENEITY

Temperature is homogeneously distributed throughout the heating block, ensuring that all samples work under exactly the same conditions, achieving a high reproducibility among the most common applications.

SECURITY

In the event of a equipment failure, a message on the screen indicates the cause and, if appropriate, digestion is automatically stopped. Temperature control is supported by a safety thermostat to avoid overheating.

SCALABLE

There are 6 different models available depending on sample tube size and number of sample positions.

DURABLE

Digestion tubes rack, back support, antidrip tray, fumes collector and heating block cover are all made of AISI-304, with the latter covered with Halar® coating. Heating block made of aluminum. Rock wool and ceramic fiber are used for thermal insulation.

BENEFICIOS



Heating block made of aluminum for fast and uniform heating.



Several different models available.



Choose from 10 programs, with the ability to personalize the name.



Up to 10 editable temperature segments for each program.



Full control of digestion conditions.



Useful for the determination of multiple components.



Temperature control by microprocessor and safety thermostat.



Easy to use.



Fumes collector and antidrip tray included.



Warning messages in case of breakdown.



Calibration port included.



Mobile sample tubes rack and fumes collector for a faster samples cooling.

COMPACT

The equipment is thoughtfully designed for a minimal footprint, featuring a fully integrated, vertical assembly to conserve space effectively.

FASTER COOLING

The equipment has a support to place the mobile samples tubes rack away from the heating block for a faster cooling, avoiding long waiting times.

PROTECTION

The exhaust fumes collector has improved characteristics to guarantee that the vapors that come out of each sample tube are properly collected and directed to the Fumes neutralization system (SCRUBBER).

CALIBRATION

Includes calibration port for external probes and adjustable settings to calibrate the device when required.

Compact block digestion system

RAYPAnet: A NEW ONLINE PLATFORM



Equipped with Wi-Fi connectivity.



The results of each assay are accessible either directly on the platform or by consulting the assay history log.



Utilize Wi-Fi to effortlessly connect to the online platform RAYPAnet on your PC. Visualize and export assay information in a user-friendly graphical format, and generate comprehensive reports.



All relevant information can be exported in both .CSV and .PDF formats for further review, study and archival purposes.

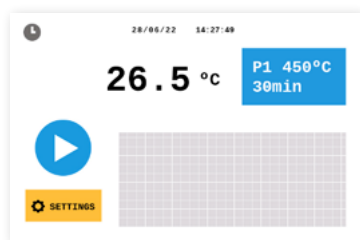


RAYPAnet is compatible with most web browsers.



Multiple devices can be connected and controlled simultaneously.

NEW TOUCHSCREEN MICROPROCESSOR



Enjoy up to 10 customizable programs, adjustable for either fixed temperature or with up to 10 temperature segments, with optional start and stop timers for added convenience.

- Intuitive user interface with a colour LCD touchscreen that displays all relevant parameters of each assay in real time.
- Intuitive icons indicate the status and progress of each assay.
- Compatible with Celsius and Fahrenheit scales with a resolution of 0,1°C/°F.
- Control of timer start and timer stop by date and hour.
- Language selection: ENG, FR, ESP, CAT. Other languages available on request.
- Audiovisual safety alarms at the end of the assay, heating error, overheating, temperature out of range, and sensor failure.
- Programs can be stored in the program library.
- An acoustic signal indicates the end of the assay.
- It features a restricted-access section intended for authorized technicians.



COMPLETE KJELDAHL SOLUTION

Enhance your laboratory's productivity with our comprehensive solution for executing the Kjeldahl method that includes a digester, a fumes neutralization system, a distiller and a titrator. Every component of our Kjeldahl suite is crafted for optimal productivity, minimizing costs, and emphasizing user-friendliness and safety. It offers a seamless, hassle-free solution that not only streamlines your workflow but also enhances the quality of your assays.



COMPACT BLOCK DIGESTION SYSTEM

Efficient, versatile and scalable block digestion for safe Kjeldahl digestions and much more.

FUMES NEUTRALIZATION SYSTEM

Closed fumes neutralization system with active aspiration, for use in conjunction with our compact block digestion system.

KJELDAHL DISTILLERS

Steam distillation system optimised to perform distillations according to the Kjeldahl method.

KIT FOR AUTOMATIC TITRATION

Potentiometric titrator with colour display validated for use with DNP Series distillers.

EXTERNAL TITRATOR SOFTWARE

Communication software between the titrator and a PC that enables real-time data display, management, and export capabilities directly from the workstation.

Compact block digestion system

POPULAR COMPATIBLE METHODS



KJELDAHL METHOD

The **Kjeldahl digestion** process entails the breakdown of nitrogen in organic samples. This is achieved by heating the sample in a concentrated acid solution, facilitated by a catalyst. At the end of the reaction, ammonium sulphate solution is formed, which can be later distilled and quantified.

Organic N + H₂SO₄ → (NH₄)₂SO₄ + H₂O + CO₂ + other byproducts of the sample matrix.



HEAVY METALS DIGESTION

Heavy metals digestion in soil, compost and similar samples can be performed with MBC digesters. Firstly, the sample is dried and digested using several temperature ramps with a mixture of HNO₃-HClO₄ for foliar analysis and HNO₃-HCl for the rest of samples. After digestion, the sample is dissolved in HCl and the parameters are analyzed by ICP-OES.



CHEMICAL OXYGEN DEMAND

The **Chemical Oxygen Demand (COD)** is the amount of oxygen consumed to totally oxidize organic material into inorganic nutrients.

The sample is heated in the digestion block in presence of sulphuric acid, and a known amount of potassium dichromate. The excess of dichromate is titrated with an Iron(II) salt. To avoid interferences with chlorides, mercuric sulphate must be added.



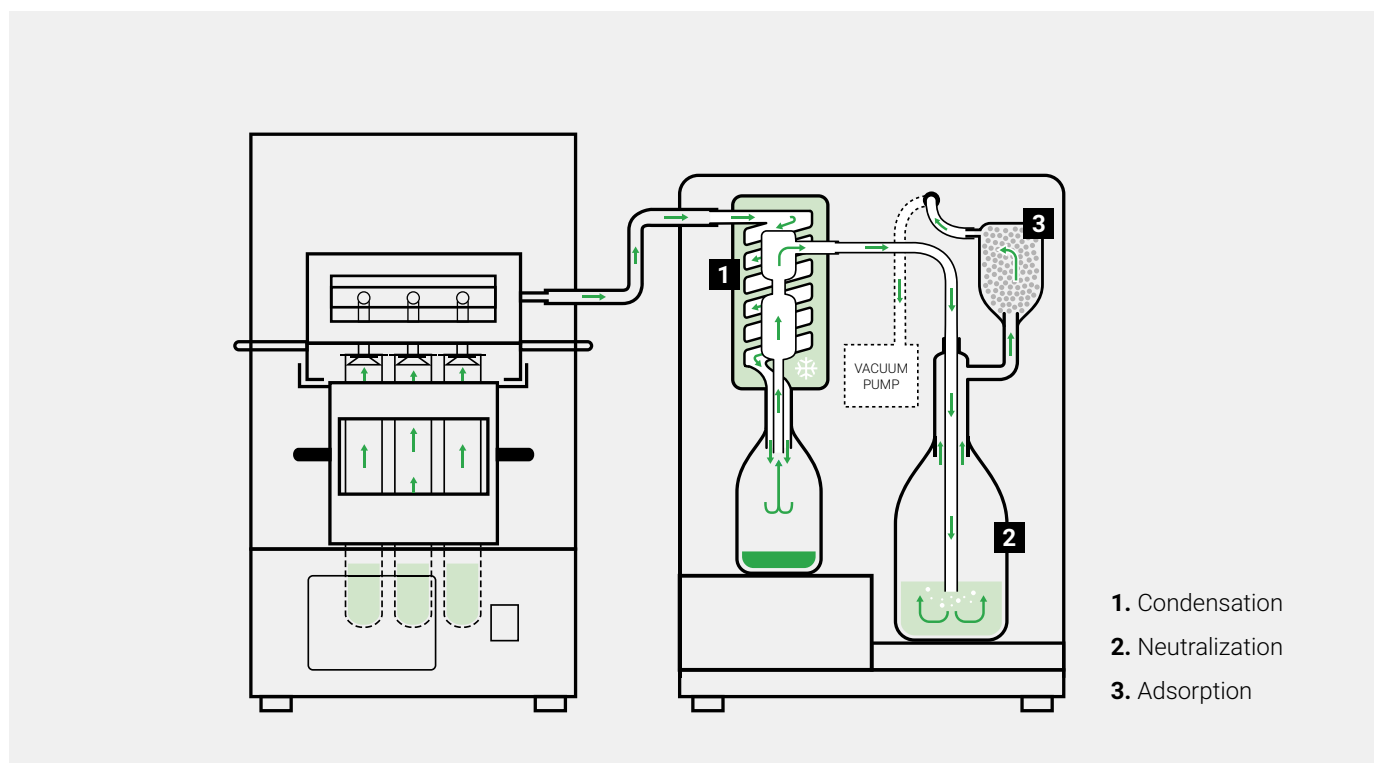
FAT HYDROLISIS

Fat hydrolysis is the breakage of fat molecules bound as lipoproteins, liposaccharides or sterol esters. In some food and feed samples this is a necessary step to make the fat accessible for extraction. Therefore, the hydrolysis step is key for obtaining reproducible and accurate results in routine fat determination procedures.

The sample is mixed with diluted hydrochloric acid (normally 4N) and heated to break down proteins and high molecular weight carbohydrates into acid soluble constituents. Then it is filtrated and washed with water to remove any impurities. Finally, water is dried from the filter residue for fat extraction.



OPERATION



After loading the samples with the corresponding reagents within the sample tubes rack, the sample tubes rack is placed inside the heating block and the fumes collector is placed on top of the sample tubes rack. The next step is choosing the appropriate program and the equipment starts to heat up, following the predefined temperature and time segments.

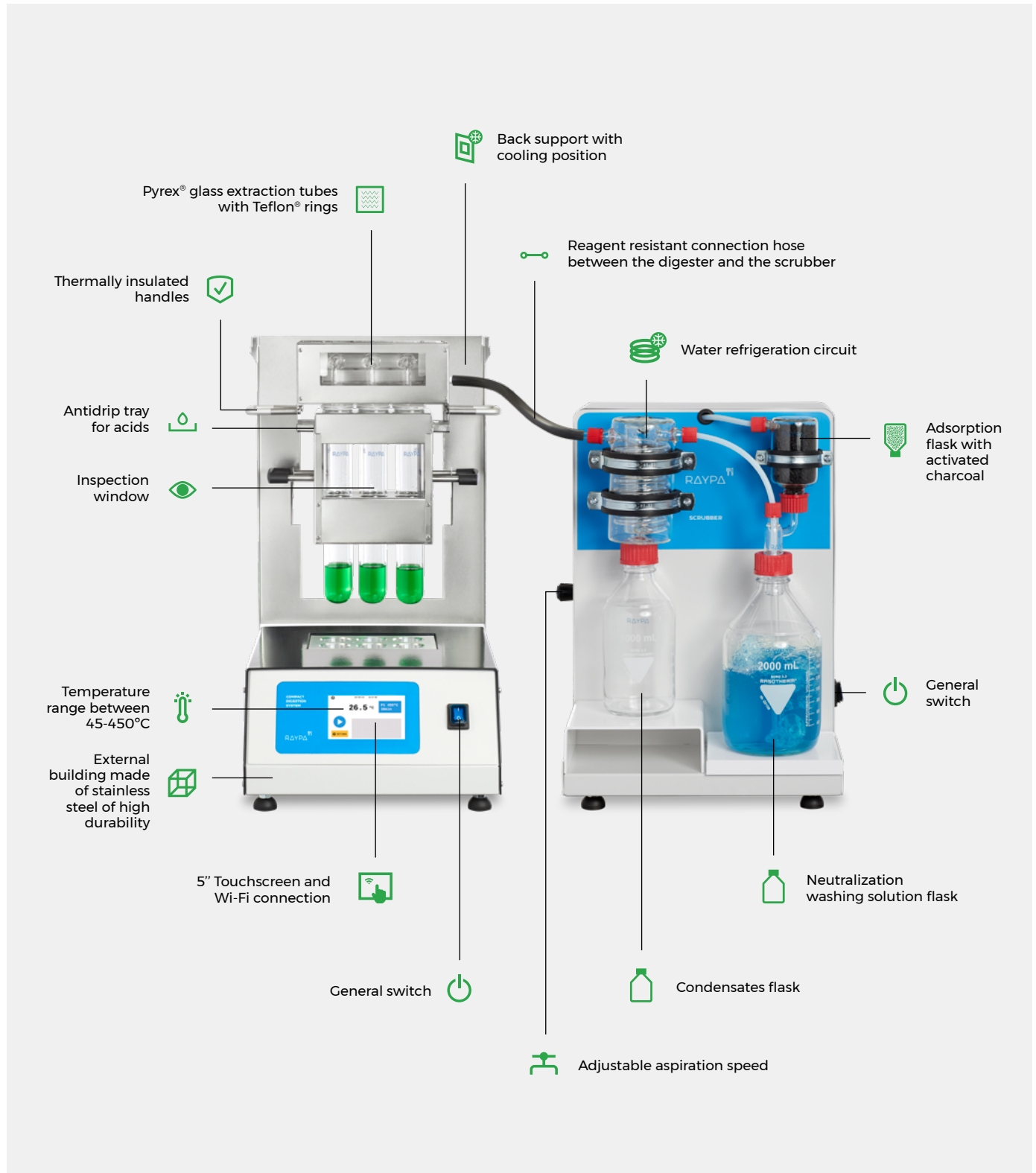
In the process, the generated exhaust fumes are captured by the fumes collector which in turn are mechanically displaced into the scrubber through the vacuum pump that the scrubber possesses.

The exhaust fumes that enter the scrubber undergo a phase of condensation that acts as a preliminary extractor for steams and dragged liquids, avoiding warming or volume increase in the posterior wash-up solution. The acid or alkaline vapors are then washed and neutralized in the next step. In the final step, the remaining particles are retained through granules of activated charcoal.



Compact block digestion system

MAIN FEATURES





MBC



TECHNICAL DESCRIPTION

- 5" touchscreen and Wi-Fi connection.
- Wide model range with units ranging from 6 to 40 sample positions compatible with sample tubes ranging from 100 to 250mL.
- Vertically assembled and mobile sample tubes rack and fumes collector for a faster cooling and minimum footprint.
- Heating block with extensive thermal insulation by rock wool and ceramic fiber and covered with Halar® resin coating.
- Advanced microprocessor with 10 programs that can be set up with up to 10 individual segments adjustable by maintenance temperature, maintenance time and temperature increase speed.
- Programmable auto-start.
- Easy-to-clean and corrosion resistant fumes collector and external frame made of AISI-304.
- Safety thermostat to prevent overheating.
- Contains calibration port for external probes.

SUPPLIED WITH THE FOLLOWING COMPONENTS:

- Heating block.
- Fumes collector
- Acid antidrip tray.
- Sample tubes support.
- Sample tubes rack.
- Back support.
- Complete set of either Micro (100mL) or Macro (250mL) sample tubes.

SCRUBBER



TECHNICAL DESCRIPTION








- Efficient and closed fumes evacuation system assisted by a vacuum pump.
- Manually adjustable vacuum pump, with acoustic insulation and an adjustable absolute vacuum between 10mBar and 800mBar.
- Adsorption flask filtrates and neutralizes fumes by a filter of activated charcoal.
- Water refrigeration circuit that condensates the fumes produced during digestions.
- Washing solution flask neutralizes acid or basic fumes.

SUPPLIED WITH THE FOLLOWING COMPONENTS:

- Scrubber with vacuum pump.
- Refrigeration unit.
- Condensates flask of 1L.
- Neutralization flask of 2L.
- Adsorption flask.
- Complete Teflon® gasket set.
- Complete fluorinated elastomer hoses set.
- Anti-drip tray for neutralization flask.
- Support for condensates flask.

Compact block digestion system




TECHNICAL SUMMARY OF MBC SERIES

	Reference	MBCM (micro)	MBC (macro)
 General information	Standards compliance	AOAC, DIN, EPA, ISO	
	Sample positions	12, 24 or 40	6, 12 or 20
	Compatible sample tubes volume mL	100	250
	Compatible sample tubes size Ø x H mm	26 x 300	42 x 300
	Wi-Fi connection and RAYPAnet access	✓	
 Main applications	Kjeldahl digestions	+	
	Chemical Oxygen Demand	+	
	Heavy metals analysis	+	
	Fat hydrolysis	+	
 Materials	Sample tubes rack, back support, antidrip tray and fumes collector	AISI-304 stainless steel	
	Heating block cover	AISI-304 stainless steel with Halar® resin coating	
	Heating block	Aluminum	
	Thermal insulators of the heating block	Rock wool and ceramic fiber	
	Tube that connects fumes collector with the scrubber	Fluorinated elastomer	
	Gaskets between sample tubes and tubes of the fumes collector	Teflon®	
 Control panel	Sample tubes and tubes of fumes collector	Borosilicate 3.3	
	Type of microprocessor regulation	PID digital	
	Type of screen	LCD TS	
	Size of screen	5"	
	Audiovisual alarms and error messages	Overheating, temperature out of range, heating error, sensor failure and end of digestion	
	Programmable parameters per each segment	Maintenance temperature, Maintenance time and Temperature increase speed	
	Process control	Current date and time, Current temperature, Programmed parameters (temperature and time), Real-time assay evolution graph, Accumulated assay time, Current temperature and time	
	Access by authorized technical personnel to specific parameters	INFO, RED, MODEL, TEST, PID	
 Adjustable program parameters	Total number of programs	10	
	Maximum number of segments per program	10	
	Initial time delay of each program (timer start)	yyyy:mm:dd hh:min	
	Time to reach target temperature of the next segment hours:minutes	00:00 - 1666:65	
	Maintenance time of target temperature of each segment hours:minutes	00:00 - 499:99	
	Target temperature of each ramp °C	Ambient temp. +5 - 450	
 Performance data and recommended environment conditions	End time of each program at fixed temperature (timer stop)	yyyy:mm:dd hh:min	
	Typical capacity for solid loads	Up to 1g per tube	Up to 5g per tube
	Typical capacity for liquid loads	Up to 3mL per tube	Up to 20mL per tube
	Heating time to 400°C (depending on model) min	20 - 40	
	Temperature resolution °C	0,1	
	Temperature stability at 400°C	± 1	
 Functions gained with the scrubber	Homegeneity at 420°C	± 5	
	Mechanical evacuation of fumes with adjustable speed and acoustic insulation	✓	
	Condensation of exhaust fumes by water refrigeration circuit	✓	
	Neutralization of exhaust fumes with alkaline or acidic washing solution	✓	
	Filtration and adsorption of exhaust fumes with activated charcoal	✓	

+ Recommended ✓ Included



TECHNICAL SUMMARY OF SCRUBBER

 General information	Type	Closed fumes evacuation system with vacuum pump
	Aspiration	Vacuum pump of adjustable power
 Included processes	Condensation	Circulating water through refrigeration circuit
	Neutralization	Washing alkaline or acid solution
	Filtration and adsorption	Activated charcoal
	Vacuum pump maximum vacuum mBar	10
 Performance data	Scrubber water consumption (depending on exhaust fumes) L/min	3 - 5

Accessories

DISTILLATION TUBES

References	TB-100DNP	TB-250DNP	TB-250DNP-R*
Recommended sample volume mL	100	250	250
Material	glass	glass	reinforced glass
Dimensions Ø x H mm	26 x 300	42 x 300	42 x 300
Compatible maximum number of sample tubes per model	MBC-6 TS	-	6
	MBC-12 TS	-	12
	MBC-20 TS	-	20
	MBCM-12 TS	12	-
	MBCM-24 TS	24	-
	MBCM-40 TS	40	-

*Reinforced distillation tube recommended for the analysis of waste water and slurry.

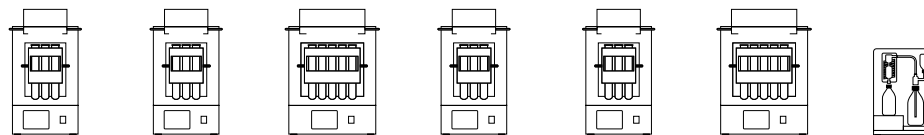


FUMES NEUTRALIZATION UNIT

Reference	SCRUBBER	
Aspiration	Vacuum pump of adjustable power	
Included processes	Condensation	Water circulation through cooling circuit
	Neutralization	Alkaline and acidic solution washing
	Filtration and adsorption	Activated charcoal
Performance data	Maximum vacuum mBar	10
	Water consumption as a function of fumes produced L/min	3 - 5
	Dimensions L x D x H mm	375 x 310 x 540
	Weight Kg	13
Installation requirements	Power W	100
	Voltage* V	230
	Frequency Hz	50/60
	Ambient temperature °C	5 - 40
	Ambient humidity %	30 - 80

*Other voltages and electrical configurations available on request.





Specifications

References	MBC-6 TS	MBC-12 TS	MBC-20 TS	MBCM-12 TS	MBCM-24 TS	MBCM-40 TS	SCRUBBER
External dimensions L x D x H mm	350 x 400 x 635	350 x 560 x 635	460 x 560 x 635	350 x 400 x 635	350 x 560 x 635	460 x 560 x 635	375 x 310 x 540
Power W	1500	2000	2500	1500	2000	2500	100
Voltage* V	230	230	230	230	230	230	230
Weight Kg	27	38	47	30	39	48	13
Frequency Hz	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Sample positions	6	12	20	12	24	40	-
Compatible sample tubes mL	250	250	250	100	100	100	-
Range of adjustable temperature °C	45 - 450	45 - 450	45 - 450	45 - 450	45 - 450	45 - 450	-
Temperature stability at 400°C	±1	±1	±1	±1	±1	±1	-
Homogeneity at 420°C	±5	±5	±5	±5	±5	±5	-

*Other voltages and electrical configurations available on request

Safety

- Multiple audiovisual alarms and error messages for maximum security.
- Integrated antidrip tray on fumes collector for eventual acid splashes after equipment cools down.
- Corrosion-resistant easy-to-clean external frame made of AISI-304 stainless steel.
- Heating block covered with Halar® coating.

Regulations

Our MBC Series digesters are designed to comply with the strictest international directives and standards, including the following:

- **EN-61010-1** Safety requirements for electrical equipment for measurement, control and laboratory use. Part 1: General requirements.
- **EN-61010-2-010 Part 2-010** Particular requirements for laboratory equipment for the heating of materials.
- **EN-61326** Electrical equipment for measurement, control and laboratory use. EMC Requirements.
- **2014/35/UE** Low voltage.
- **2014/30/UE** Electromagnetic compatibility.

International standardized methods

Our MBC Series digesters are fabricated guaranteeing compliance with a variety of international standards such as AOAC, ISO, EPA and DIN.

Main fields of application



FOOD, FEED & BEVERAGES



ENVIRONMENTAL ANALYSIS



PHARMACEUTICAL INDUSTRY



CHEMICAL INDUSTRY

CLICK!
ACCESS
THE MBC
SERIES
VIDEO

+ info

YouTube



Find out more about our **MBC Series** digesters on our Youtube Channel



Installation guide available for download on our website.

