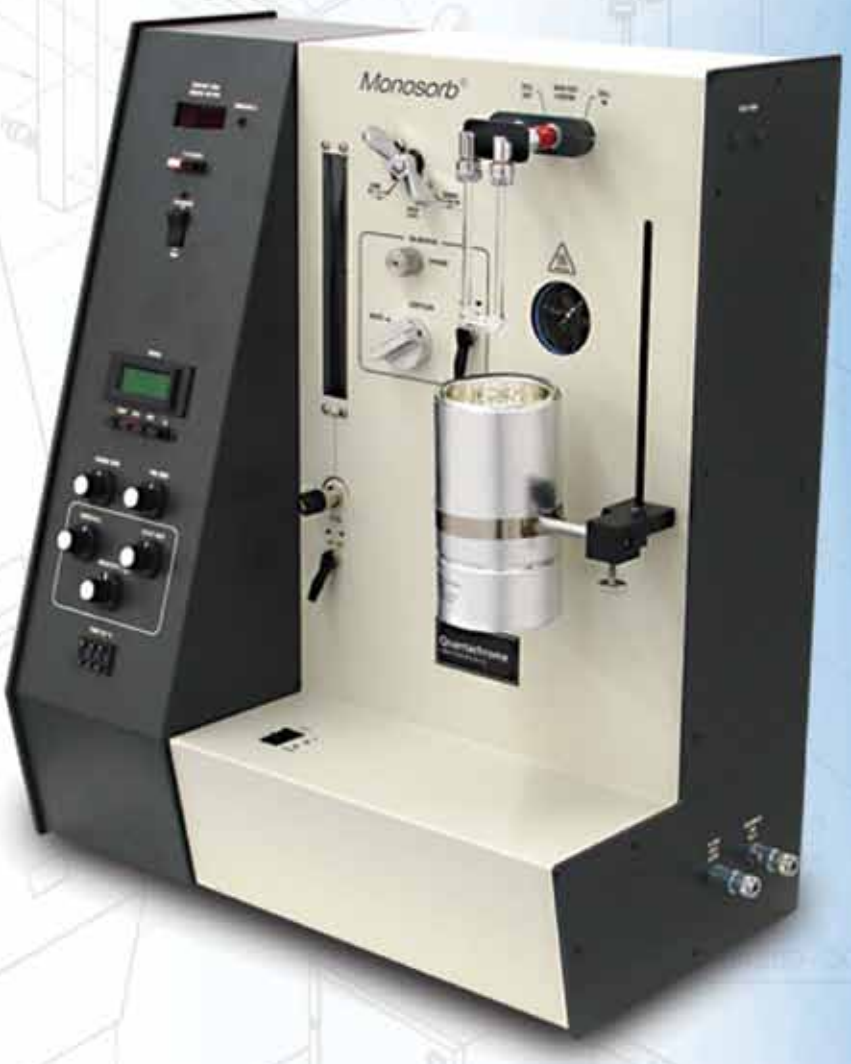
QUANTACHROME

MONOSORB™

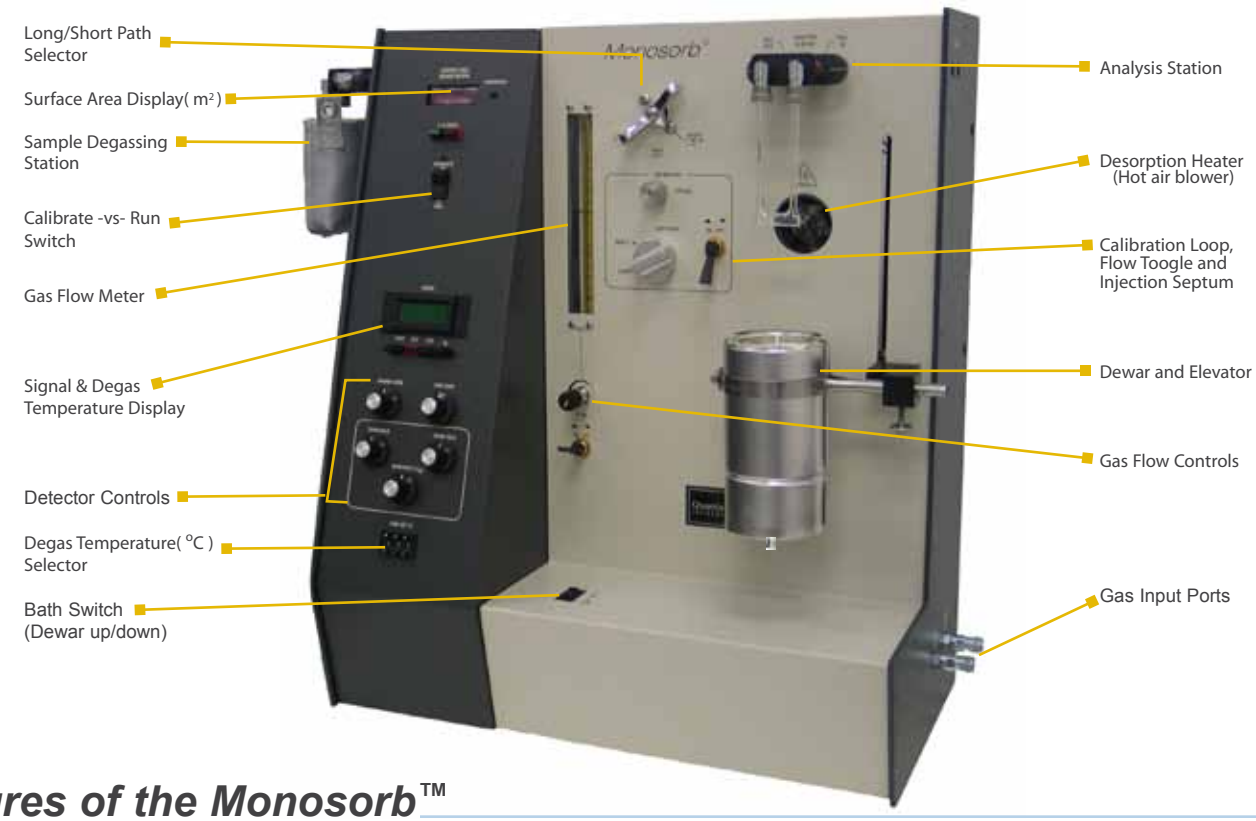
RAPID SURFACE AREA ANALYZER



Quantachrome
INSTRUMENTS

MONOSORB™

AUTOMATION • SPEED • RELIABILITY



Features of the Monosorb™

The Monosorb utilizes a modified BET equation for extremely rapid, single-point determinations of surface area.Over the years, the Monosorb has evolved into a highly sophisticated instrument with increased ease of operation, accuracy, reliability, and full automation.

Ease-of-Use

- Direct display of surface area upon completion of analysis.
- Personnel can learn to operate the Monosorb in a matter of minutes.
- Sample cells are held in self-sealing Quick Connect fittings, which automatically snap closed when the sample cell is removed.

Speed

- Requires approximately six minutes to complete an analysis.
- Uses small quantities of sample, resulting in short degassing and analysis times.
- Utilizes a modern and reliable method for rapid and accurate BET surface area measurements.
- Does not require void volume measurements and ideal gas corrections.

Autocalibration

- A calibrated gas loop makes calibration fast and easy.
- The microprocessor-controlled autocalibra tion permits users to confirm calibration quickly and easily.
- For adsorbates other than nitrogen, a manual override permits the instrument to be recalibrated in a matter of minutes.

Reliability

- The unique autocalibration feature ensures that the Monosorb will produce reliable data for years.
- Electronic circuitry operates the filaments of the specially designed, ultra-stable thermal conductivity detector at extremely low current to prevent burn out.

Sensitivity and Range

- Uses samples weighing less than one gram and performs measurements of surface areas as low as 0.1 square meters in the sample cell regardless of adsorbate gas used.

Accuracy and Reproducibility

- The Monosorb typically achieves a reproducibility better than 0.5%.
- Linearization of the measured surface area with the voltage signal is accomplished using a highly accurate A/D converter.

Versatility

- Utilizes a modified BET equation for single-point surface area determinations.
- A selectable flow path accommodates larger samples of high surface area.
- Can be used with many different adsorbates, including argon, krypton, carbon monoxide, carbon dioxide and other non-corrosive gases.

Optional Accessories

- The THERMOFLOW for simultaneous preparation of three additional samples.
- The FLOW CONTROLLER for gas blending.

MONOSORB™ SPECIFICATIONS

Operation of the Monosorb™

Samples are prepared for analysis in the built-in degas station. Flowing gas sweeps away impurities, resulting in a clean surface upon which adsorption may occur. The sample can be heated to a user-selectable temperature with the supplied heating mantle. Digital temperature control and display are mounted on the instrument front panel. After degassing is complete, the sample cell is transferred to the analysis station. Quick connect fittings automatically seal the sample cell during transfer.

With the push of a single button, analysis commences. A dewar flask filled with coolant is automatically raised, immersing the sample cell and causing adsorption. The instrument detects when adsorption is complete (2-3 minutes), automatically lowers the dewar flask, and gently heats the sample cell back to room temperature using a built-in hot-air blower. As a result, the desorbed gas signal is displayed on a digital meter and the surface area is directly presented on a front panel display. The entire measurement (adsorption and desorption) cycle typically requires less than six minutes.

The technique uses a high sensitivity, thermal conductivity detector to measure the change in concentration of an adsorbate/inert carrier gas mixture as adsorption and desorption proceed. When integrated by the on-board electronics and compared to calibration, the detector provides the volume of gas adsorbed or desorbed. A built-in microprocessor ensures linearity and automatically computes the sample's BET surface area.

Performance

Surface Area Range: 0.1 m^2 to >250 m^2 (0.01 m^2/g to 3,000 m^2/g)

Adsorbate*: Nitrogen (standard operation)
Argon
Krypton (very low surface areas)
Carbon Dioxide

Ads/Des cycle: Automatic

Dewar elevator: Automatic

Desorption: Hot air blower

Calibration loop: 1cc

Analysis Stations: One (quick disconnect fitting)

Preparation Station: One (quick disconnect fitting)

Degas Temperature: Room Temp to 350°C (450°C optional)

* In a mixture with Helium

Gases

Compatibility: Ar, Kr, He, CO_2

Input Pressure(gauge): 140 kPa

Gas lines(supplied): quick disconnect to 1/8" swage

Physical

Depth: 32 cm (12.5 in.)

Width: 62.5 cm (24.5 in.)

Height: 65 cm (25.5 in.)

Weight: 24 kg (53 lbs.)

Electrical

Voltage: 110-120 V or 220 V

Frequency: 50/60 Hz

Connection: Grounded single plug outlet

Environmental

Ambient Temperature: 15-40°C

Related Humidity: 20-90% (non-condensing)

Accessories Included

- One Dewar Flask
- Three Sample Cells
- Two Cell Holder Assemblies
- Heating Mantle (350°C max)
- Spare O-rings and septums
- Instructional Manual

Accessories

Gas Regulator Assembly

Proper Monosorb functioning is assured when high-quality gas regulators are used. Quantachrome supplies complete assemblies which include two stage regulators with dual gauges, cylinder connector, isolation valve and 1/8" gas line connector. The regulators feature stainless steel, non-venting diaphragms and the appropriate CGA fitting for specific gases. Different assemblies are available for nitrogen and other inerts including helium, hydrogen, carbon monoxide, oxidizing gases etc.

Gas Blender (Mass Flow Controller)

Physisorption measurements require mixed gases, e.g. 30% N_2 in He for BET surface area. Quantachrome offers this two-channel gas mixer. Simply dial in the required gas flow, up to 20 ml/min, into each of the two precision mass flow controllers. One channel comes ready calibrated for helium the other for seven other gases.

Rotary Micro Riffler

Like most powder and porous materials characterization, sufaces area studies generally require sub-samples much smaller than the original samples. The Rotary Micro Riffler uses the most accurate way of splitting a powder sample into smaller fractions- spin riffling. The vibrating hopper features adjustable feed rate and the variable-speed collector uses standard or micro test tubes.

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For almost half a century Quantachrome's scientists and engineers have revolutionized measurement techniques and designed instrumentation to enable the accurate, precise, and reliable characterization of powdered and porous materials. We have an unwavering commitment to providing state of the art technology, along with superior and unparalleled customer service and support. Our commitment to customers is to support you before, during, and after the sale throughout the lifetime of our instruments. This is a big commitment because our products are so robust and reliable that we regularly find many still in use for decades.

Characterizing Today's Materials —Discovering Tomorrow's

Quality - Function - Dependability

The quality of Quantachrome's after sales service support is the reason we are proud to maintain life time relationships with our customers.

Field Service

Our global service staff assure you that Quantachrome Instruments will continue to be the reliable engines of material characterization laboratories. We offer you the flexibility of choosing from service contracts tailored to provide you with the response time, service package, and spare parts discounts that best fit your needs.

Spare Parts

Quantachrome spare parts are certified to work with our instruments. We provide rapid response spare parts orders, and keep large inventories of replacement parts and hardware available.

Application Lab

Our fully equipped, state-of-the-art powder characterization laboratory, LabQMC (www.labqmc.quantachrome.com, qc.lab@quantachrome.com), provides the option of contracting for expert testing services. Laboratory services are also available to validate the applicability of our products prior to your purchase using your actual samples.

Lifetime Application Support

We view the field support of our instruments as an essential component of our business strategy. Our expert scientists are always available to answer questions on applications, or the use of our instruments. We do this as a standard service regardless of whether you have a service contract with us or not.

Partners in Science

Quantachrome has a scientific research department consisting of world renowned experts in material characterization. Our staff, led by Dr. Matthias Thommes, conducts collaborative research projects with leading material research labs around the world. They regularly publish articles in leading peer reviewed journals, and speak at technical symposiums around the world.

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