

**SAA<sup>®</sup> 8100**

---

*SELECTIVE ADSORPTION ANALYZER*



**micromeritics<sup>®</sup>**

**Effective Solutions for  
Material Characterization**

***PRE-INSTALLATION INSTRUCTIONS AND  
CHECKLIST***

---

810-42870-01  
Sep 2019  
(Rev-)

## ***TRADEMARKS***

---

Micromeritics is a registered trademark of Micromeritics Instrument Corporation.

Cirrus is a trademarks of MKS Instruments, Inc.

SAA is a registered trademark of Micromeritics Instrument Corporation.

## **Copyright**

The software described in this manual is furnished under a license agreement and may be used or copied only in accordance with the terms of the agreement.

## CORPORATE PROFILE

---

Micromeritics Instrument Corporation is a leading global provider of solutions for material characterization with best-in-class instrumentation and application expertise in five core areas: density; surface area and porosity; particle size and shape; powder characterization; and catalyst characterization and process development. Founded in 1962, the company is headquartered in Norcross, Georgia, USA and has more than 400 employees worldwide. With a fully integrated operation that extends from a world class scientific knowledge base through to in-house manufacture, Micromeritics delivers an extensive range of high-performance products for academic research and industrial problem-solving. The implementation of tactical partnerships to incubate and deliver valuable new technologies exemplifies the company's holistic, customer-centric approach which extends to a cost-efficient contract testing laboratory – the Particle Testing Authority (PTA). The strategic acquisitions of Freeman Technology Ltd and Process Integral Development S.L. (PID Eng & Tech) reflect an ongoing commitment to optimized, integrated solutions in the industrially vital areas of powders and catalysis.

Freeman Technology (Tewkesbury, UK) brings market-leading powder characterization technology to Micromeritics' existing portfolio of particle characterization techniques. The result is a suite of products that directly supports efforts to understand and engineer particle properties to meet powder performance targets. With over 15 years of experience in powder testing, Freeman Technology specializes in systems for measuring the flow properties of powders. In combination with detailed application know-how these systems deliver unrivalled insight into powder behavior supporting development, formulation, scale-up, processing and manufacture across a wide range of industrial sectors.

PID Eng & Tech (Madrid, Spain) complements Micromeritics' renowned offering for catalyst characterization with technology for the measurement and optimization of catalytic activity, with a product range that extends to both standard and bespoke pilot scale equipment. Launched in 2003, PID Eng & Tech is a leading provider of automated, modular microreactor systems for the detailed investigation of reaction kinetics and yield. These products are supported by a highly skilled multidisciplinary team of engineers with in-depth expertise in the design, construction and operation of laboratory units and process scale-up.

The Particle Testing Authority (PTA) provides material characterization services for fine powders and solid materials using Micromeritics' instrumentation alongside complementary solutions from other vendors. With the certification and expertise to operate across a wide range of industries the PTA offering runs from single sample analysis to complex method development, method validation, new product assessment, and the analytical support required for large scale manufacturing projects. An experienced, highly trained team of scientists, engineers, and lab technicians works closely with every client to ensure that all analytical requirements are rapidly and responsively addressed.

Micromeritics has a strong global network with offices across the Americas, Asia, and Europe complemented by a dedicated team of distributors in additional locations. This ensures that local, knowledgeable support is available for every customer, in academia or industry. Micromeritics works across a truly diverse range of industries from oil processing, petrochemicals and catalysts, to food and pharmaceuticals, and at the forefront of characterization technology for next generation materials such as graphene, metal-organic-frameworks, nanocatalysts, and zeolites. Engineering solutions that work optimally for every user is a defining characteristic of the company.

## ***CONTACT US***

---

### **Micromeritics Instrument Corporation**

4356 Communications Drive  
Norcross, GA / USA / 30093-2901  
Phone: 1-770-662-3636  
Fax: 1-770-662-3696  
[www.Micromeritics.com](http://www.Micromeritics.com)

### **Instrument Service or Repair**

Phone: 1-770-662-3666  
International — contact your local distributor or call 1-770-662-3666  
[Service.Helpdesk@Micromeritics.com](mailto:Service.Helpdesk@Micromeritics.com)

### **Micromeritics Learning Center**

Phone: 1-770-662-3607  
[www.Micro.edu](http://www.Micro.edu)

---

## ***ABOUT THIS MANUAL***

---

The following symbols indicate safety precautions and supplemental information and may appear in this manual:



**NOTE** — Notes contain important information applicable to the topic.



**CAUTION** — Cautions contain information to help prevent actions that may damage the analyzer or components.



**WARNING** — Warnings contain information to help prevent actions that may cause personal injury.

---

## Table of Contents

Corporate Profile .....	i
Contact Us .....	ii
About this Manual .....	iii
<b>1 Pre-installation Document Overview .....</b>	<b>1 - 1</b>
Micromeritics Installed Instruments Only .....	1 - 2
<b>2 Pre-installation Instructions .....</b>	<b>2 - 1</b>
Unpacking and Inspection .....	2 - 1
Shipping Damage .....	2 - 1
Analyzer Space .....	2 - 2
Environmental Factors .....	2 - 3
Gas Supply .....	2 - 4
Gas Cylinders and Gas Supply Lines .....	2 - 4
Laboratory Equipment and Supplies .....	2 - 7
Gas for Analyzer Test .....	2 - 7
<b>3 Pre-installation Checklists .....</b>	<b>3 - 1</b>
Unpacking and Inspection Checklist .....	3 - 1
Analyzer Space Checklist .....	3 - 1
Installation Configuration Checklist .....	3 - 1
Environmental Factors Checklist .....	3 - 2
Gas Supply Checklist .....	3 - 3
Laboratory Equipment and Supplies Checklist .....	3 - 3
Application Related Issues Checklist .....	3 - 4
Personnel Security Clearance Checklist .....	3 - 4
<b>4 Dates and Signatures .....</b>	<b>4 - 1</b>
Projected Installation Date .....	4 - 1
Commitment Statement and Signature Form .....	4 - 1

## ***1 PRE-INSTALLATION DOCUMENT OVERVIEW***

---



This document describes how to prepare a site for installation of the SAA 8100. If Micromeritics will be performing this installation, when the enclosed procedures have been completed, return the signed and dated form to Micromeritics as outlined in [Dates and Signatures on page 4 - 1](#). If unsure about any part of this document or the checklist, contact the Micromeritics Service Department for clarification.

---

## ***MICROMERITICS INSTALLED INSTRUMENTS ONLY***

### ***APPLICATION RELATED ISSUES***

To ensure a thorough installation, it will be helpful for Micromeritics to know which types of samples will be tested. If known, list them in [Application Related Issues Checklist on page 3 - 4](#).

Please advise Micromeritics if samples require any pretreatment. If required, do you have the proper equipment to pretreat your samples? Micromeritics offers application assistance through our materials analysis laboratory (Micromeritics Particle Testing Authority).

### ***HAZARDS AND PRECAUTIONS***

Inform Micromeritics of any on-site conditions that may present hazards to Micromeritics employees or equipment. Advise Micromeritics of any precautions that need to be taken.

### ***SAFETY MEASURES***

Inform Micromeritics of any safety equipment, requirements, or procedures necessary for Micromeritics employees to enter and install the system at your facility.

### ***PERSONNEL SECURITY CLEARANCE***

If security clearances, insurance certificates, or any other special arrangements are required for Micromeritics employees to enter your facility, see [Personnel Security Clearance Checklist on page 3 - 4](#) to explain. Inform Micromeritics how much advance notice you require to obtain clearance.

### ***PROJECTED INSTALLATION DATE***

Read this entire document carefully. Complete all checklists in this document. Sign and return all checklists and the form in [Dates and Signatures on page 4 - 1](#) to Micromeritics. Micromeritics will contact you to confirm an installation date.



## 2 PRE-INSTALLATION INSTRUCTIONS

---

### **UNPACKING AND INSPECTION**

When the equipment is received, unpack and inspect the contents of the shipping container(s). Use the packing list to verify that all products, accessories, software (if applicable), and documentation are received intact and in the correct quantity. The shipping container(s) and contents should be inspected within a few days of receipt in the event damage or loss has occurred. Sort through all packing material before declaring missing equipment or parts.



Micromeritics recommends saving all shipping containers until installation of the equipment is complete. All shipping containers where equipment is to be declared as damaged or lost must be examined by the claims investigator prior to completion of the inspection report.

### **SHIPPING DAMAGE**

If equipment is damaged or lost in transit, you are required to make note of the damage or loss on the freight bill. The freight carrier, not Micromeritics, is responsible for all damage or loss occurring during shipment. If damage or loss of equipment is discovered during shipment, report the condition to the carrier immediately. Insurance claims **MUST** be made with the freight carrier, **NOT** Micromeritics.

- Keep all software, manuals, and accessories with the equipment.
- Report any shipping damage immediately to the carrier and follow their directions.
- Report missing or wrong parts to Micromeritics, in addition to any shipping damage, only after filing a claim with the carrier.
- Micromeritics will NOT file a claim for shipping damage.
- Do not discard shipping boxes and containers until installation is complete. If space is available, it is recommended that shipping containers be saved for future use in the event of return to factory for repair.

## ***ANALYZER SPACE***



### **Analyzer**

Height	79 cm (31 in.)
Width	75 cm (30 in.)
Depth	58 cm (23 in.)
Weight	120 kg (265 lbs)

### **Computer**

Width	54 cm (22 in.) Approx.
-------	------------------------

### **Gas Supply**

1 square ft (0.1 square m) for each gas cylinder needed for installation. For standard installations, the cylinders must be within 6ft. (2m) of the instrument.

### **MKS Cirrus 3**

Refer to the MKS Cirrus 3 specifications supplied with the mass spec.

## ***ENVIRONMENTAL FACTORS***

### ***POWER***

- The SAA 8100 requires 220 VAC standard, frequency 50/60 Hz
- The MKS Cirrus 3 requires 100-240 VAC, 50 - 60 Hz



The analyzer and peripheral devices **must** be installed on their own dedicated power line. Other devices — such as motors, generators, or ovens — **should not** be placed on the same power line.

### ***TEMPERATURE AND HUMIDITY***

Temperature and humidity must be controlled to within:

- **Temperature:** 0 to 40 °C (32 to 104 °F) operating
- **Humidity:** Up to 60%

#### **Do Not:**

- Allow room temperature or humidity to exceed limits.
- Install the analyzer where it is exposed to direct sunlight.
- Locate the analyzer near air conditioning or heating vents.

## **GAS SUPPLY**

### **GAS CYLINDERS AND GAS SUPPLY LINES**

See [Gas for Analyzer Test on page 2 - 7](#) for the analytical gas needed during installation. Gas cylinders must be placed within 6 ft (2 m) of the analyzer inlet valves.

- The customer is required to ensure the purity of gases.
- It is required that the 1/8 in. × 6 ft (2 m) single piece copper gas line in the analyzer accessories kit is used. Stainless steel gas lines are available from Micromeritics for use with gases that are not compatible with copper.



Gas lines not supplied by Micromeritics will not be installed by Micromeritics Service Personnel.



Gas supply lines made of materials other than copper or stainless steel may cause operational problems.

- **Do not** use gas cylinders with less than 500 psig (3549 kPag) pressure.
- **Do not** use any other gas lines to connect the gas supply to the analyzer except those supplied in the accessories kit.
- **Do not** use gas purifiers; they can cause operational problems. Oxygen traps are preferred.

## ***GAS SUPPLY HARDWARE***

Micromeritics recommends the gas regulators to be used with the analyzer be purchased from Micromeritics. The regulators Micromeritics provides have been carefully evaluated and tested to provide superior performance.



If purchased from a source other than Micromeritics, please keep in mind that many commercially available gas regulators lack key features which are required for gas adsorption measurements. These vital criteria must be met:

- **Cleanliness.** Clean regulators designed specifically for high-vacuum service are required. Other regulators often contain elastomeric material or oils which can contaminate the gas.
- **High stability.** Excess pressure at the gas inlet ports to the analyzer can interfere with accurate gas dosing and flow rates. The combined change in the outlet pressure from the gas regulator, as the gas cylinder pressure decreases or as the flow rate stops, should not change more than 5 psig (34.4 kPag) from the selected setting. When the analyzer is idle for an extended period of time, such as 8 to 10 hours, this same stability of gas delivery pressures should be achieved.
- **Suitable sub-assemblies.** The regulator must have a shutoff or outlet isolation valve compatible with 1/8 in. or 1/4 in. Swagelok<sup>®</sup> compression fittings.



To purchase regulators from Micromeritics, contact your local Micromeritics Sales Representative.

## ***REGULATOR EXPANSION KITS***

It is sometimes beneficial to attach more than one analyzer, and/or accessory device, or different inlet ports to a single gas supply. Any time this is done, it is critically important that there be a means of isolating, or shutting-off, each device attached to the gas supply regulator. Micromeritics recommends the use of a vacuum rated shutoff/isolation valve for this purpose.

This shutoff/isolation valve is required in order to prevent problems when changing gas cylinders or servicing any of the devices attached to the gas supply.

If the need to attach more than one inlet or one analyzer and/or accessory device is anticipated, one or more of the following regulator expansion kits must be acquired:

- **004-33601-00** – Regulator Expansion Kit (2 outlet, 1000 psi maximum). This kit contains one T fitting, two vacuum rated shutoff valves, and other necessary hardware. This expansion kit allows gas to be provided to two inlets.
- **004-33601-01** – Regulator Expansion Kit (3 outlet, 1000 psi maximum). This kit contains one cross fitting, three vacuum rated shutoff valves, and other necessary hardware. This expansion kit allows gas to be provided to three inlets.

---

## ***LABORATORY EQUIPMENT AND SUPPLIES***

### ***ANALYSIS EQUIPMENT AND SUPPLIES***

Since the analysis results are expressed in units of surface area per gram of sample, the true mass of the sample must be known. This requires an analytical balance with the capability of 100 grams measurement and 0.1 mg readability.

In order to obtain accurate analysis results, the sample tubes must be clean. The following items are suggested for cleaning sample tubes:

- Alconox<sup>®</sup> or similar laboratory detergent
- Balance for weighing sample
- Brush
- Clean, dry compressed air or dry nitrogen
- Drying oven
- Isopropyl alcohol
- Sink
- Small plastic tub for detergent solution
- Ultrasonic bath

### ***GAS FOR ANALYZER TEST***

To verify proper analyzer operation and to train users, Micromeritics representatives will provide and analyze test samples.

If the required gas is not available, Micromeritics representatives will only be able to perform a limited number of analyzer tests during installation and operator training.

### ***REQUIRED GAS***

- A quality gas typically used in your environment.

Any additional gases that may be used after the installation is complete can be connected by the Micromeritics representative.

**Blank Page**

---



### 3 PRE-INSTALLATION CHECKLISTS

For each question, circle **Yes** if the condition applies to your laboratory or **No** if it does not. When this *Pre-installation Checklist* has been completed, see [Dates and Signatures on page 4 - 1](#). Sign and date the form, then send it along with all completed checklists to Micromeritics.

#### UNPACKING AND INSPECTION CHECKLIST

Unpacking and Inspection		
Have the shipping cartons been unpacked and their contents inspected?	Y	N
Was there any shipping damage?	Y	N
If <b>Yes</b> , has a claim been filed with the freight carrier?	Y	N
Were all items on the packing list received?	Y	N
If <b>No</b> , has Micromeritics been notified?	Y	N

#### ANALYZER SPACE CHECKLIST

Analyzer Space		
Can the lab area where the analyzer and computer will be placed accommodate the combined dimensions of the analyzer, accessories, and computer?	Y	N
Can the area accommodate the mass spectrometer?	Y	N

#### INSTALLATION CONFIGURATION CHECKLIST

Gas and Gas Supply Lines		
Will 1/8 in. copper gas supply lines (supplied with the analyzer for standard installation) be used?	Y	N
If <b>NO</b> , have 1/8 in. stainless steel gas supply lines been ordered and received from Micromeritics?	Y	N

## ***ENVIRONMENTAL FACTORS CHECKLIST***

<b>Environmental Factors</b>		
Is power available with the correct voltage and frequency, and a safety earth ground?	<b>Y</b>	<b>N</b>
Are temperature and humidity controlled within specifications?	<b>Y</b>	<b>N</b>
Are hazards present or precautions necessary in area of installation?	<b>Y</b>	<b>N</b>
If <b>Yes</b> , please explain:		
Are safety measures required?	<b>Y</b>	<b>N</b>
If <b>Yes</b> , please explain:		

## ***GAS SUPPLY CHECKLIST***

<b>Gas Supply</b>		
Is the gas cylinder located within 6 ft (2 m) of where the instrument will be located?	<b>Y</b>	<b>N</b>
Was the gas regulator purchased from Micromeritics?	<b>Y</b>	<b>N</b>
If <b>NO</b> , does the gas regulator meet Micromeritics' specifications?	<b>Y</b>	<b>N</b>
<b>Required Gases</b>		
Is a quality gas typically used in your environment available?	<b>Y</b>	<b>N</b>
<b>Additional Gases</b>		
Additional gases for use after installation can be connected by the Micromeritics service representative. Please list any gases that will be available for connection during installation.		

## ***LABORATORY EQUIPMENT AND SUPPLIES CHECKLIST***

<b>Laboratory Equipment and Supplies</b>		
Are sufficient quantities of quality gas available?	<b>Y</b>	<b>N</b>
Are sufficient quantities of isopropyl alcohol available?	<b>Y</b>	<b>N</b>
Is a balance available for weighing samples?	<b>Y</b>	<b>N</b>
Is a drying oven available?	<b>Y</b>	<b>N</b>

### ***APPLICATION RELATED ISSUES CHECKLIST***

<b>Application Related Issues</b>		
What types of samples will be tested?		
Will these samples require pretreatment?	Y	N
Will any application assistance from Micromeritics Particle Testing Authority be required?	Y	N

### ***PERSONNEL SECURITY CLEARANCE CHECKLIST***

<b>Security Clearance</b>		
Are there any special arrangements required concerning security clearance?	Y	N
If <b>Yes</b> , please explain:		

## 4 DATES AND SIGNATURES



All checklists and this completed form should be returned only if Micromeritics will be performing this installation.

### **PROJECTED INSTALLATION DATE**

This is not a commitment for a specific installation date. After reading the site preparation requirements in this document, enter a date your site will be prepared and a preferred date for installation. After returning the checklist and signed form to Micromeritics, your Micromeritics representative will contact you to confirm an installation date.

When would installation be most convenient? Date: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

### **COMMITMENT STATEMENT AND SIGNATURE FORM**

I have read this document and understand my responsibilities regarding preparations for the installation of our analysis system. I believe this site is ready for the system to be installed.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
Name (Printed): \_\_\_\_\_  
Title (Printed): \_\_\_\_\_  
Company: \_\_\_\_\_  
City / State / Zip: \_\_\_\_\_  
Phone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_  
E-mail: \_\_\_\_\_  
Analyzer: \_\_\_\_\_ Model: \_\_\_\_\_ Serial No.: \_\_\_\_\_

Is the Customer Representative also the End User? **Yes** \_\_\_\_\_ **No** \_\_\_\_\_

### **RETURN THE COMPLETED CHECKLIST AND FORMS TO:**

Micromeritics Instrument Corporation  
ATTN: Service Operations Manager  
4356 Communications Drive  
Norcross, GA / USA / 30093-2901

Email: [Service.Helpdesk@Micromeritics.com](mailto:Service.Helpdesk@Micromeritics.com)  
Fax: 1-770-662-3604

**Blank Page**

---