MIC SAS® II 5800

OPERATOR MANUAL

TRADEMARKS

MIC SAS is a registered trademark of Micromeritics Instrument Corporation.
Micromeritics 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.

WARRANTY

MICROMERITICS INSTRUMENT CORPORATION warrants for one year from the date of shipment each instrument it manufactures to be free from defects in material and workmanship impairing its usefulness under normal use and service conditions except as noted herein.

Our liability under this warranty is limited to repair, servicing and adjustment, free of charge at our plant, of any instrument or defective parts when returned prepaid to us and which our examination discloses to have been defective. The purchaser is responsible for all transportation charges involving the shipment of materials for warranty repairs. Failure of any instrument or product due to operator error, improper installation, unauthorized repair or alteration, failure of utilities, or environmental contamination will not constitute a warranty claim. The materials of construction used in MICROMERITICS instruments and other products were chosen after extensive testing and experience for their reliability and durability. However, these materials cannot be totally guaranteed against wear and/or decomposition by chemical action (corrosion) as a result of normal use.

Repair parts are warranted to be free from defects in material and workmanship for 90 days from the date of shipment.

No instrument or product shall be returned to MICROMERITICS prior to notification of alleged defect and authorization to return the instrument or product. All repairs or replacements are made subject to factory inspection of returned parts.

MICROMERITICS shall be released from all obligations under its warranty in the event repairs or modifications are made by persons other than its own authorized service personnel unless such work is authorized in writing by MICROMERITICS.

The obligations of this warranty will be limited under the following conditions:

1. Certain products sold by MICROMERITICS are the products of reputable manufacturers, sold under their respective brand names or trade names. We, therefore, make no express or implied warranty as to such products. We shall use our best efforts to obtain from the manufacturer, in accordance with his customary practice, the repair or replacement of such of his products that may prove defective in workmanship or materials. Service charges made by such manufacturer are the responsibility of the ultimate purchaser. This states our entire liability in respect to such products, except as an authorized person of MICROMERITICS may otherwise agree to in writing.
2. If an instrument or product is found defective during the warranty period, replacement parts may, at the discretion of MICROMERITICS, be sent to be installed by the purchaser, e.g., printed circuit boards, check valves, seals, etc.
3. Expendable items, e.g., sample tubes, detector source lamps, indicator lamps, fuses, valve plugs (rotor) and stems, seals and O-rings, ferrules, etc., are excluded from this warranty except for manufacturing defects. Such items which perform satisfactorily during the first 45 days after the date of shipment are assumed to be free of manufacturing defects.

Purchaser agrees to hold MICROMERITICS harmless from any patent infringement action brought against MICROMERITICS if, at the request of the purchaser, MICROMERITICS modifies a standard product or manufactures a special product to the purchaser's specifications.

MICROMERITICS shall not be liable for consequential or other type damages resulting from the use of any of its products other than the liability stated above. This warranty is in lieu of all other warranties, express or implied, including but not limited to, the implied warranties of merchantability or fitness for use.

MICROMERITICS CORPORATE PROFILE

Micromeritics is the global leader in analytical instrumentation for the physical characterization of particles, powders, and porous materials. Our advanced technologies provide precise measurement of density, surface area, porosity, activity, and powder flow, supporting research, product development, and quality control. Serving industries like materials science, chemicals, energy, and natural resources, our instruments enable critical advancements in fields such as battery materials, hydrogen economy, and carbon capture. Founded in 1962, Micromeritics operates globally with over 15,000 instruments in daily use, delivering expert support and cutting-edge solutions from our U.S. headquarters and international locations.For more information, please visit www.micromeritics.com.

PATENTS

For patent information, visit www.Micromeritics.com/patents.

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ABOUT THIS MANUAL

The following can be found on the Micromeritics web page (www.micromeritics.com).

- Calculations document (PDF)
- Error Messages document (PDF)
- Operator Manual (PDF)

- Parts and Accessories

The following symbols or icons indicate safety precautions and/or 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 instrument or components.

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

GENERAL SAFETY

> ⚠️ Do not service or modify this instrument without authorization from Micromeritics Service Personnel. It does not include any user-serviceable parts.

Any laboratory equipment can pose a risk to personnel if not operated or maintained correctly. All employees who operate and maintain Micromeritics instruments should be well-familiar with their operation and receive proper safety training and instruction

- Read the operator manual for any special operational instructions for the instrument.
- Know how the instrument functions and understand the operating processes.

> ⚠️
> - Ensure that personnel use the appropriate personal protective equipment (PPE) when removing, handling, or repairing equipment. This may include gloves, safety glasses, or other items specific to the equipment or environment.
> - When lifting or relocating the instrument, use appropriate lifting and transporting devices designed for heavy equipment. Ensure that enough personnel are available to assist with the movement of the instrument.
>   The MIC SAS II weighs approximately 29 kg (62 lb).
> - Always follow the safety instructions on the labels affixed to the instrument, and never alter or remove them. During inspections, verify that the safety labels are intact and not worn or damaged.
> - Regular maintenance is essential for ensuring personnel safety and the efficient operation of instruments. Consistent upkeep helps enhance safety, ensures optimal test results, and minimizes costly downtime. Neglecting proper maintenance procedures can create unsafe conditions and reduce the lifespan of the instrument.
> - Improper handling, disposal, or transportation of potentially hazardous materials can result in serious injury or damage to the instrument. Always consult the MSDS when working with hazardous substances. Safe operation and handling of the instrument, supplies, and accessories are the responsibility of the operator.

EQUIPMENT REMOVAL AND REPLACEMENT PROCEDURES

Follow these procedures to safely remove equipment from service for repair or disposal and to ensure safety is maintained when new equipment is put into service.

⚠️ If equipment has been exposed to hazardous substances, chemicals, or biological agents, ensure it is properly decontaminated before removal. This helps prevent contamination of personnel, transport vehicles, and the environment. Follow these steps:

1. Identify the type of contaminants and select appropriate decontamination procedures based on material safety data sheets (MSDS) or other safety guidelines.

2. Use suitable decontamination agents and PPE as required.

3. Document all decontamination procedures performed, including agents used and personnel involved.

If decontamination involves liquids or creates waste materials, ensure that all residues are collected and contained properly. Dispose of waste according to local regulations for hazardous or contaminated materials. After decontamination, inspect and verify that the equipment is free of contaminants before proceeding with removal, repair, or transport. Consider having a qualified person sign off on the decontamination if required by safety protocols.

- Before removing equipment from use for repair or disposal, ensure that all power sources are disconnected and all stored energy sources have been discharged to prevent accidental injury to personnel. Refer to the "Power Instrument On and Off" guidelines for more information.

- Only qualified personnel should perform repairs or dispose of the equipment. This ensures that the work is done safely and that the equipment is properly disposed of in accordance with local regulations.

- When removing equipment for repair, clearly label it with the reason for removal and the date it was taken out of service. This helps ensure that the equipment is not put back into service until it has been properly repaired and tested.

- Depending on the type of equipment being handled, it may be necessary to address environmental safety, such as preventing spills or leaks of hazardous substances during removal or transport.

- When moving an instrument to another location (e.g., by car, truck, or plane), the following is recommended:
  - Pack the instrument in the original shipping materials. If such materials are no longer available, use packaging material (such as a sturdy box with bubble wrap or foam) that will keep the instrument safe from damage during transport.
  - Identify any special handling the package requires (e.g., "Fragile," "This Side Up," or "Do Not Stack Heavy Items on Top").
  - Strap or anchor the package so that it will not tip or fall during transport.
  - Inspect the package on arrival to ensure no damage has occurred. If damage has occurred, contact the responsible party (such as the shipping carrier) for the next steps.

- Follow local regulations and guidelines when disposing of electrical and electronic equipment, especially if classified as hazardous waste. This may include specific requirements for removal, transportation, recycling, or other disposal methods.

- Keep records of all equipment removed from service, including the reason for removal and any repair or disposal actions taken. This helps ensure that the equipment is properly tracked and that safety issues are addressed in a timely manner.

- Ensure that all replacement equipment meets the same safety standards as the equipment being replaced. This helps ensure that safety is not compromised when new equipment is put into service.

- After replacing or repairing equipment, re-calibration or verification may be necessary to ensure the equipment functions correctly and meets operational standards.

- Before returning equipment to service, ensure that it has been properly repaired and tested to ensure that it meets all safety requirements. Only qualified personnel should perform this work.

INTENDED USE

The Micromeritics Sub-Sieve AutoSizer (MIC SAS) II determines particle size, surface area, and powder bed porosity by air permeability.

⚠️	The instrument is intended to be operated by trained personnel familiar with the proper operation of the equipment recommended by the manufacturer and as well as relevant hazards involved and prevention methods. Other than what is described in this manual, all use is seen as unintended use and can cause a safety hazard.
✏️	The instrument is intended to be used as per applicable local and national regulations.

TRAINING

It is the customer's responsibility to ensure that all personnel operating or maintaining the equipment participate in training and instruction sessions. All personnel operating, inspecting, servicing, or cleaning this instrument must be properly trained in operation and machine safety before operating this instrument.

ENVIRONMENTALLY FRIENDLY USE PERIOD

Hazardous Substances Table

Part Name	Hazardous Substances					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr (VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
Cabinet	o	o	o	o	o	o
Power Supplies	o	o	o	o	o	o
Printed Circuit Boards	o	o	o	o	o	o
Touch Panel & SBC	x	o	o	o	o	o
Brass Components	x	o	o	o	o	o
Connectors	o	o	o	o	o	o
Transducers	o	o	o	o	o	o

o   Hazardous substance is below the specified limits as described in SJ/T11363-2006.

x   Hazardous substance is above the specified limits as described in SJ/T11363-2006.

The Environmentally Friendly Use Period (EFUP) for all enclosed products and their parts are per the symbol shown here unless otherwise marked. Certain parts may have a different EFUP (for example, battery modules) and are marked to reflect such. The Environmentally Friendly Use Period is valid only when the product is operated under the conditions defined in the product manual.

SYMBOLS THAT MAY APPEAR ON THE INSTRUMENT

The following symbols or icons indicate safety precautions and/or supplemental information and may appear on your instrument:

⚠️	Use extreme caution when working on the instrument where one of these symbols may be displayed. These symbols indicate the part may be hot and cause serious burns. Use the cotton gloves provided in the accessory kit when handling heated surfaces. These cotton gloves are not intended to protect hands when heated surfaces are above 60 °C.
⚠️	When working on an instrument where this symbol is displayed, refer to the corresponding Operator Manual for additional information.
⚠️	When this symbol is displayed, toxic or flammable gases require proper venting of exhaust. This symbol can also indicate the instrument uses mercury which is an extremely toxic substance. Read the Safety Data Sheet (SDS) and be aware of the hazards of mercury and know what to do in the event of a spill or an exposure incident.

![micromeritics logo]

Table of Contents

1 ABOUT THE MIC SAS II

The system includes an anvil and piston inside a steel, open-ended sample tube. The piston and anvil have O-ring seals against the inside of the tube. A brass plug covered with filter paper is placed on the anvil, the sample tube is positioned over it, a powdered sample is loaded into the tube, and a second brass plug with filter paper is placed on top of the sample. The piston is driven down by a stepper motor to compress the sample. Constant head pressure is maintained throughout the analysis by controlling the flow rate with a mass flow controller (MFC). After passing through the sample, the gas passes through a flow restrictor to maintain some back pressure. Particle size is calculated from the differential pressure across the sample according to the Kozeny-Carman equation. Ambient temperature is used to calculate air viscosity, which is used in the particle size calculation.

The emergency stop button powers off the stepper motor in case of an emergency.

A safety shield is placed around the piston and anvil area during operation.

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FRONT PANEL

A. Emergency stop button
B. Anvil
C. Piston
D. Safety shield
E. Touchscreen
F. USB port

Front Panel Components

Component	Description
Anvil	Supports and seals the bottom of the sample tube.
Emergency stop button	Powers off the stepper motor but leaves the computer and application running. The touchscreen will remain on. Use of this button requires a reset to restore power. To reset the instrument, gently pull the emergency stop button until a click is heard.
Piston	Seals the top of the sample tube.
Safety shield	Covers the exposed moving parts of the piston and anvil.
Touchscreen	Touchscreen to run analyses and review/edit records.
USB port	The USB ports on the front and back of the instrument can be used interchangeably, however, to prevent wires from interfering with the operation of the instrument, use the USB port on the back for devices with cords. The USB ports can be used to connect a printer or keyboard, export and import data, and update software.

REAR PANEL
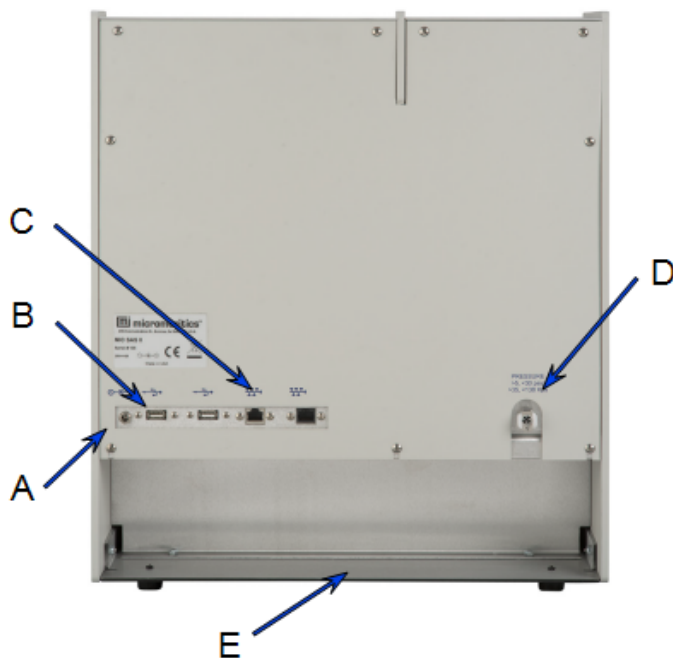
A. 5 mm DC power jack
B. USB Ports (2)
C. Ethernet Ports (2)
D. Gas inlet
E. Shelf for external power sup-
   ply

Rear Panel Components

Component	Description
5 mm DC power jack	For an external power supply.
USB ports (2)	The USB ports on the front and back of the instrument can be used interchangeably, however, to prevent wires from interfering with the operation of the instrument, use the USB port on the back for devices with cords. The USB ports can be used to connect a printer or keyboard, export and import data, and update software.
Ethernet ports (2)	Connect the instrument to a network or directly to a computer using the left port Connect to other devices on the same network or to share an internet connection between devices using the right port.
Gas inlet	For attaching the analysis gas.
Shelf for external power supply	For external power supply storage.

SAFETY PRECAUTIONS

SAMPLES

The instrument was designed for nonhazardous samples only.

> ⚠️ Do not attempt to use the instrument to analyze any sample material whose safety has not been verified. During normal operation, fine particles may become airborne or skin contact may occur with the sample.

POWER SUPPLY

> ⚠️ Use of a power cord or power supply not provided with the instrument could cause personal injury or damage to the equipment. If a replacement is needed, contact your Micromeritics Service Representative. Detachable power supply cords with an inadequate rating could cause significant instrument damage or physical harm.
>
> Do not add anything between the power cord and the power source that would compromise the earth ground.
>
> Do not remove or disable the grounding prong on the instrument power cord.
>
> 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.
>
> Replacement power supply cords must be rated for the stated specifications.
>
> If the instrument does not have a power switch and must be disconnected from the wall outlet when powering off, position the instrument where the wall outlet is easily accessible.

SAFETY SHIELD INTERLOCK

> ⚠️ Bypassing the safety shield interlock could cause personal injury or damage the instrument.

MENU SELECTIONS

Menu Selections

Menu Selection	Description
MIC SAS	Use to run an analysis. See*MIC SAS Menu Selection on page 2 - 1*.
Records	Displays a list of reports from completed analyses. See *Records Menu Selection on page 3 - 1*
SOP	Displays a list of saved standard operating procedures used to define analyses. See*SOP Menu Selection on page 4 - 1*.
Instrument	Use for manual operation and monitoring the state of the instrument. See *Instrument Menu Selection on page 5 - 1*
Maintenance	Use to perform maintenance functions on the instrument. See.*Maintenance Menu Selection on page 6 - 1*
Help	Use to display instrument help. Click the **Online Help** button, scan the QR code, or go to the specified web page.

INSTRUMENT STATUS

The instrument status is displayed on the touchscreen title bar.

Instrument Status

File Status	Description
Analyzing	An analysis is in progress.
Paused	Displays when the **Pause** button has been tapped during an analysis.
Power Off	Displays when the emergency stop button has been used.
Ready	No analysis is running.
Readying	Displays at the end of an analysis when the piston is moving towards the disengage position.

REMOTE BROWSERS

Remote browser sessions can be used to perform the same functions as the touchscreen on the instrument.

SPECIFICATIONS

Measurement range	0.5 - 75 μm
Porosity range	20% to 90%
Compression accuracy	< 0.05 mm
Repeatability	± 3%
Precision	± 3%

Electrical

Voltage	Input: 100 to 240 VAC ±10%, 50-60 Hz Output: 24 VDC Overvoltage Category II
Power	120 W
Current	Input: 1.6 A Output: 5 A
External Power Adapter	Phihong PSA120U-240L6

Environment

Temperature	15 to 35 °C (59 to 95 °F), operating 0 to 50 °C (32 to 122 °F), non-operating
Humidity	20 to 80% non-condensing
Indoor or Outdoor use	Indoor only (not suitable for wet locations) Altitude: 4000 max (13000 ft) Pollution degree of the intended environment: 2
Degree of Ingress Protection	IPX0

Physical

Height	50 cm (19.7 in)
Width	44 cm (17 in)
Depth	27 cm (10.6 in)
Weight	16 kg (35 lbs)

Due to continuous improvements, specifications are subject to change without notice.

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2 MIC SAS MENU SELECTION

MIC SAS > [SOP Selection]

Use to start and monitor analyses. The MIC SAS II performs two types of analyses:

- Organic — mainly pharmaceuticals
- Inorganic — mainly for heavy metal powders such as tungsten

When **START** is tapped, the button changes to **CANCEL**. When **CANCEL** is tapped, the button changes to **START**.

Select an SOP from the drop-down box to display the SOP details.

> ✏️ Some items listed in the MIC SAS table display only during an analysis.

MIC SAS

Selections	Description
Absolute density [*text box*]	The sample density excluding the volume of pores and cavities.
Analysis steps	✔ Indicates a completed step. ➡ Indicates the step in progress. **Inorganic:** **Organic:** ■ Engage piston ■ Compress sample ■ Establish flow ■ Stabilize ■ Measure particle size ■ Measure particle size ■ Disengage piston ■ Disengage piston
Batch name [*text box*]	Name of the analysis batch.
Cancel [*button*]	Cancels the analysis and disengages the piston.
Collate results [*check box*]	Produces a table in the *Summary* report. All analyses with the same batch name and the *Collate* option enabled appear in the *Summary* report.
Mass [*text box*]	The sample mass.
Material [*text box*]	Type of sample material used for analysis.
Operator [*text box*]	Person running the analysis.
Pause [*button*]	Pauses the analysis in progress.
Resume [*button*]	Displays when an analysis is paused. Tap to restart the analysis.
Sample name [*text box*]	Description of the sample used for analysis.
SOP [*drop-down box*]	Select the SOP to be used to run the analysis. After an SOP is created and saved, it will appear in the SOP drop-down box.
Start [*button*]	Starts the analysis. This button is disabled if the safety shield is not in place (a *Safety shield is required* warning is displayed) or if the emergency stop button is activated (a *Motor Off* message is displayed).

LOAD A SAMPLE

A. Brass plug
B. Preparation tool
C. Spacer
D. Sample tube with collar

1. Place the sample preparation tool on a flat surface.
2. Insert a brass sample plug into the sample preparation tool.
3. Place a paper filter on top of the brass sample plug.
4. Insert the sample tube on top of the paper filter and press down until the sample tube is firmly seated around the brass plug.
5. Insert the sample into the sample tube and weigh the sample tube assembly with the sample. Make a note of the mass.
6. Place a paper filter on the open end of the sample tube.
7. Insert a brass plug on top of the paper filter.
8. Firmly press the paper filter and brass plug into the sample tube.
9. For Inorganic analysis only, place the open end of the sample tool spacer onto the anvil. The spacer tool is used for the first compression only.
10. Place the lower end of the sample tube onto the anvil.
11. Install the sample tube collar and adjust the collar when the sample tube is in place.
12. Install the safety shield over the anvil, sample tube, and piston assembly.

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REMOVE THE BRASS SAMPLE PLUG

Extraction tool

1. Remove the sample tube from the instrument.
2. Insert the extraction tool into one sample brass plug and screw the extraction tool into the brass plug.
3. Remove the brass plug from the bottom of sample tube.
4. Pour out the sample, or, if necessary, push the sample out by pushing the remaining plug with the extraction tool.

3 RECORDS MENU SELECTION

Displays a list of all records from completed analyses.

- Multiple checkboxes can be selected.
- Columns are sortable by tapping the column header.
- The report is displayed by tapping the record.
- Tapping a link in a table row displays the report.

Additional reports are available via links at the bottom of the window.

Fisher Number Map Report on page 3 - 6
Calibration Report on page 3 - 5
Log Report on page 3 - 8
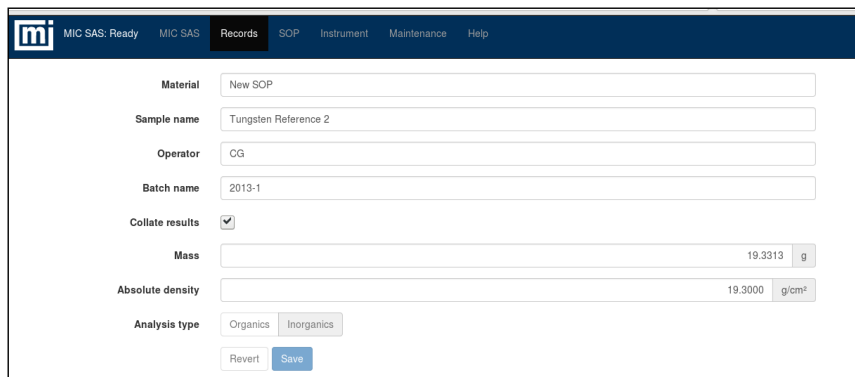
Records

Selections	Description
Batch Name	Name of the analysis batch.
Control icons	⬛ Use to select or deselect record.
	✏️ Opens a record for editing. Tap **Save** to save changes.
	↻ Tap to run an analysis with this record's conditions. Tapping it switches to the *MIC SAS* view and uses the record's conditions as the SOP.

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Records (continued)

Selections	Description
Last Modified	The date and time the record was last modified.
Material	Type of sample material used for analysis.
Particle Size (µm)	Particle size of the analysis sample.
Sample Name	Description of the sample used for analysis.
Surface Area (cm^3/g)	Surface area of the analysis sample.
Toolbar	<table><tr><td>🗑</td><td>Deletes the selected records.</td></tr><tr><td>🖨</td><td>Prints the selected record.</td></tr><tr><td>⊕↓</td><td>Downloads the selected record(s) as a ZIP file (file format is *MICSAS.YYYY-MM-DD.zip* where *YYYY-MM-DD* is the download date) to a USB device. If using a remote browser, a directory selector is opened for exporting the selected record(s) in a ZIP file.</td></tr><tr><td>⊕↑</td><td>Select and upload a single record as an XML file or multiple records in a ZIP file. After uploading, a popup window displays the number of records added and/or rejected.</td></tr><tr><td>📊</td><td>Displays the *Size Control Chart* report or the *Surface Area Control Chart* for the selected records. There may be multiple selections.</td></tr></table>

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EDIT A RECORD

Tap the edit icon to the left of the record. Sample mass, absolute density, and text fields can be edited. Analysis parameters are shown but cannot be changed.

MIC SAS: Ready MIC SAS **Records** SOP Instrument Maintenance Help	
Material	New SOP
Sample name	Tungsten Reference 2
Operator	CG
Batch name	2013-1
Collate results	☑
Mass	19.3313 g
Absolute density	19.3000 g/cm²
Analysis type	Organics Inorganics
	Revert Save

Records

Selections	Description
Absolute density [*text box*]	The sample density excluding the volume of pores and cavities.
Batch name [*text box*]	Name of the analysis batch.
Collate results [*check box*]	Produces a table in the *Summary* report. All analyses with the same batch name and the *Collate* option enabled appear in the *Summary* report.
Mass [*text box*]	The sample mass.
Material [*text box*]	Type of sample material used for analysis.
Operator [*text box*]	Person running the analysis.
Revert [*button*]	Returns fields to the currently saved values.
Sample name [*text box*]	Description of the sample used for analysis.
Save [*button*]	Saves screen changes.

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VIEW A RECORD

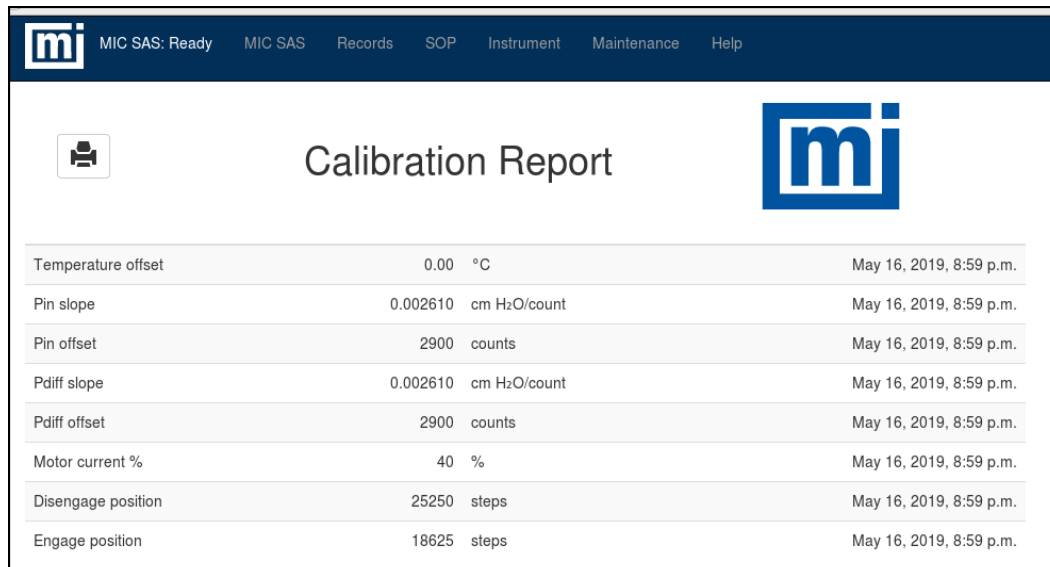Tap a blue link on the *Records* list to view a record.

REPORTS

CALIBRATION REPORT

To run the *Calibration Report*, scroll to the bottom of the *Records* window and tap *Calibration Report*.

The *Calibration Report* lists:

- Temperature offset
- Pin slope
- Pin offset
- Pdiff slope
- Motor current percent
- Disengage position
- Engage position

The date and time are shown for each entry.

MIC SAS: Ready	MIC SAS Records SOP Instrument Maintenance Help		

Calibration Report

Temperature offset	0.00	°C	May 16, 2019, 8:59 p.m.
Pin slope	0.002610	cm H$_2$O/count	May 16, 2019, 8:59 p.m.
Pin offset	2900	counts	May 16, 2019, 8:59 p.m.
Pdiff slope	0.002610	cm H$_2$O/count	May 16, 2019, 8:59 p.m.
Pdiff offset	2900	counts	May 16, 2019, 8:59 p.m.
Motor current %	40	%	May 16, 2019, 8:59 p.m.
Disengage position	25250	steps	May 16, 2019, 8:59 p.m.
Engage position	18625	steps	May 16, 2019, 8:59 p.m.

FISHER NUMBER MAP REPORT

To run the *Fisher Number Map Report*, scroll to the bottom of the *Records* window and tap *Fisher Number Map*. A Fisher number map is a polynomial that relates SAS particle size to Fisher number for a particular material. The Fisher particle size shown in reports is the Fisher number displayed with units of μm.

Fisher Number Map
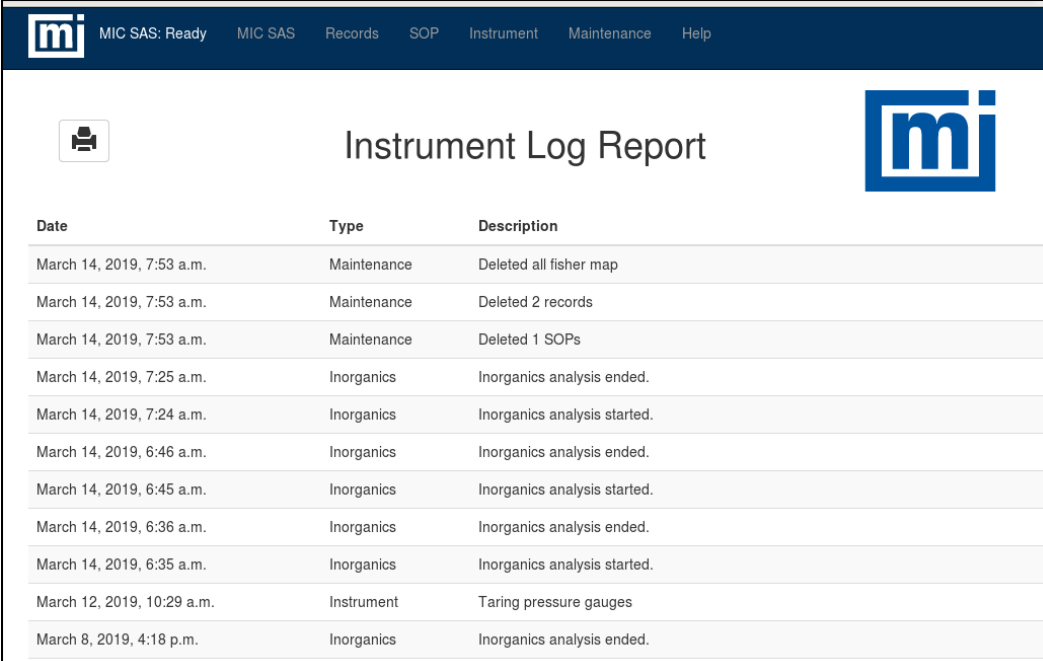
Selections	Description
Cancel [*button***]**	Discards any changes.
Coefficients	The coefficients used in the equation.
Degree [*button***]**	The coefficients give the nth order term from a polynomial fit. Coefficients higher than the degree of the polynomial are not displayed. Zero is shown for coefficients that are not determined because of an insufficient number of included points. R^2 is the usual R-squared statistic.
Fisher Number [*column***]**	The Fisher number from an analysis run on an instrument that uses Fisher number.
Include [*check box***]**	Select to include in the fit. Errors are indicated for SAS particle sizes in enabled rows that are not greater than zero and strictly increasing. The graph is not updated, and **Save** is disabled when any fields have errors. Selecting a row or focusing the Fisher number field highlights the corresponding point in the graph. Changing the selections or the Fisher number for a selected point updates the coefficients, R^2, and the graph.
Include origin [*check box***]**	If selected, a point at 0, 0 is included in the line fit.
Material [*drop-down box***]**	Comes from the SOPs, records, and other maps. This map will be used to determine the Fisher number for all records with the selected material.
SAS Particle Size (µm) [*column***]**	Enter the particle size from the analysis run on the MIC SAS II.
Save [*button***]**	Saves changes.
x-axis y-axis	The x-axis is *SAS Particle Size (µm)* and the y-axis is *Fisher Number*. The lower axis limits are zero; the upper limits are autoscaled. The fit is shown as a smooth curve without points in orange. A legend identifies the two data sets.

LOG REPORT

To run the *Log Report*, scroll to the bottom of the *Records* window and tap *Log Report*.

The *Log Report* lists :

- Start and end of analysis and home operation. Home end entry shows the new home position.
- Analysis started with mass not within ±5% of density
- Pause, resume, and cancel
- Shield placement and removal during analysis
- Emergency stop and reset
- Temperature calibration
- Pressure gauge tare
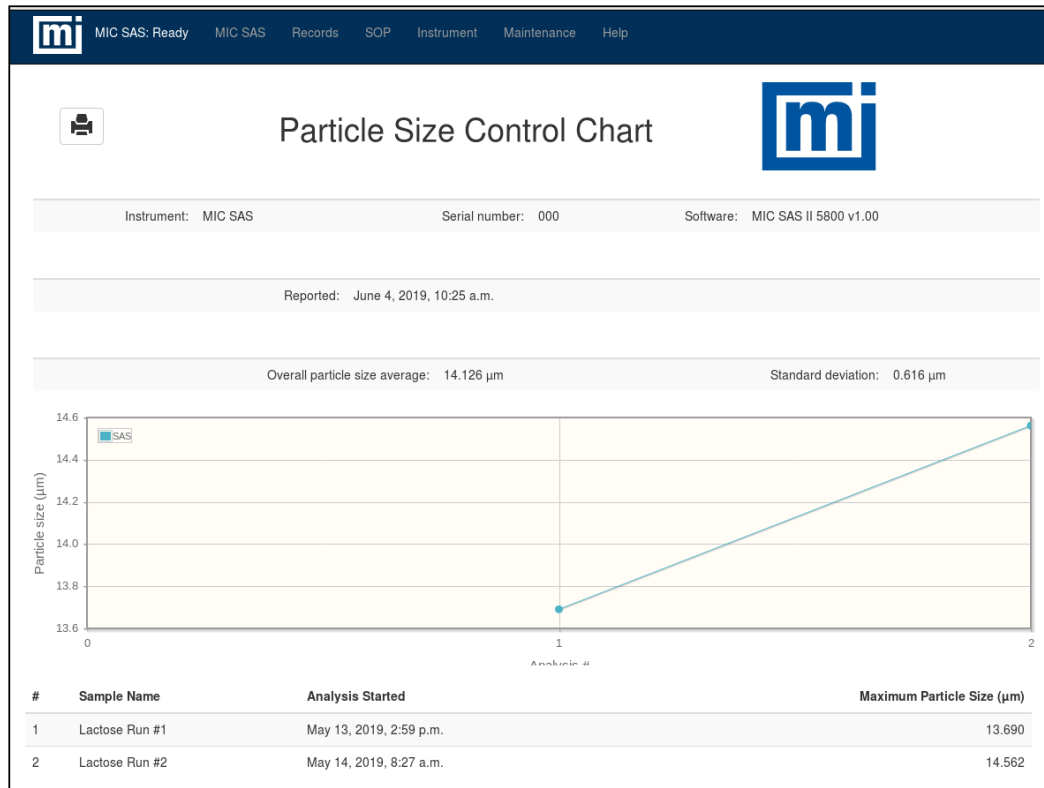- Pressure calibration
- Motor current set (including number of cycles)

CONTROL CHARTS

1. On the *Records* menu, select one or more records, then tap the Report icon ( ).
2. Select either *Size Control Chart* or *Surface Area Control Chart*.

Size Control Chart

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Surface Area Control Chart
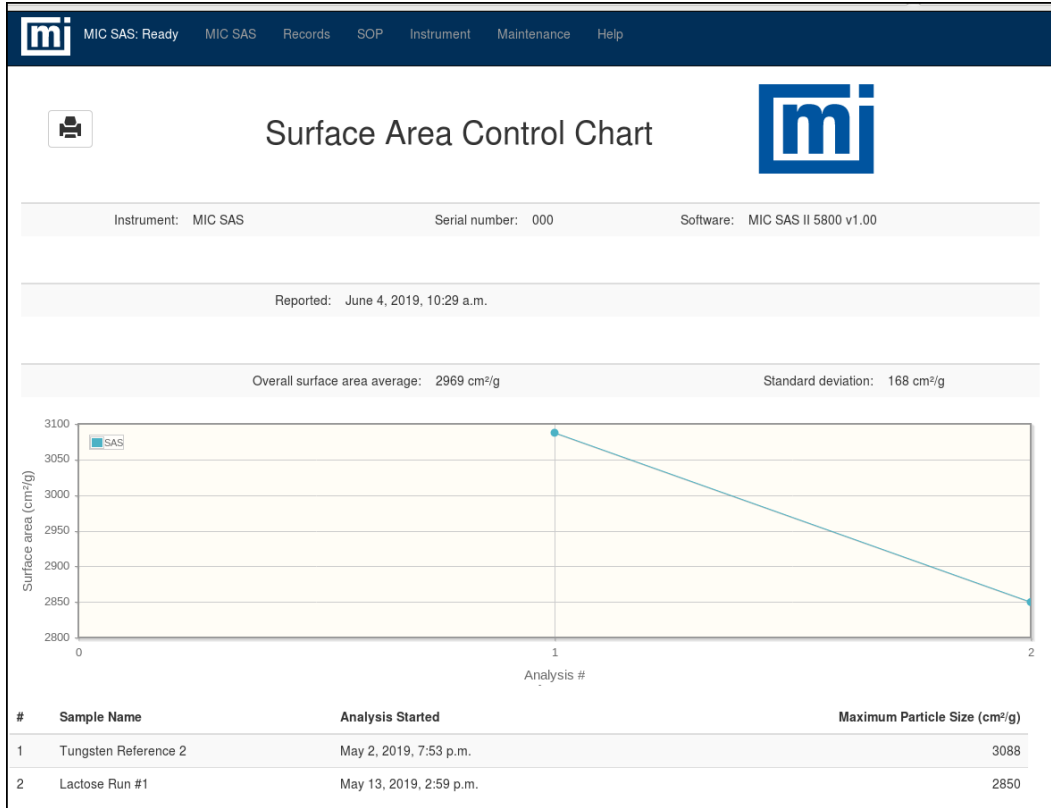
PRINT OR EXPORT RECORDS

PRINT RECORDS

> 🖊 The printer must be attached to the instrument. See *Printer Installation on page 6 - 6*.

USE A PRINTER ATTACHED TO THE INSTRUMENT:

- Tap the *Records* menu item.
- Select one or more records to print.
- Tap the printer icon. A single record will be generated for all selected records. Tap the printer icon at the top of the page to send the report to an attached printer.

USE A REMOTE COMPUTER:

- Click the *Records* menu item.
- Select one or more records to print.
- Click the printer icon. A single import will be generated for all selected records. Click the printer icon at the top of the page to send the report to an attached printer.

EXPORT RECORDS

> 🖊 If performed locally, insert a USB media into a USB port.

1. Insert the USB media into a USB port of the instrument.
2. Tap the *Records* menu item.
3. Select one or more records to export.
4. Tap the download icon. A success message displays upon successful download:

   Successfully saved to <USB-location>.zip. Please remove USB.

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4 SOP MENU SELECTION

Use to define analysis conditions.

- Multiple checkboxes can be selected.
- Columns are sortable by tapping the column header.
- Tapping a link in a table row displays the SOP.

Tap a blue link in the SOP list to view or edit SOP details. Tap the plus icon on the toolbar to create a new SOP.

Organics SOP

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Inorganics SOP

SOP

Selections	Description
Absolute density [*text box*]	The sample density excluding the volume of pores and cavities.
Analysis Type [*button*]	The type of analysis. ■ Organics — mainly pharmaceuticals ■ Inorganics — mainly for heavy metal powders such as tungsten
Batch name [*text box*]	Name of the analysis batch.

SOP (continued)

Selections	Description
Collate results [*check box*]	Produces a table in the *Summary* report. All analyses with the same batch name and the *Collate* option enabled appear in the *Summary* report.

Control icons	Tap to select or deselect an SOP. When selected, a check appears in the box.
	
	    Tap to edit the selected SOP.
	
	    Creates a duplicate of the SOP and opens it for editing.

Decompression [*button*]	*[Inorganics].* Select the decompression speed. ▪ **Slow.** The piston is retracted in 0.005 cm increments. ▪ **Fast.** The piston is retracted in 0.01 cm increments.
Final Porosity [*button*]	*[Organics].* Select the final porosity for the analysis.
Initial Porosity [*button*]	*Organics].*Select the initial porosity for the analysis.
Last Modified	The date and time the record was last modified.
Mass [*text box*]	The sample mass.
Material [*text box*]	Type of sample material used for analysis.
Number of compressions [*button*]	*[Inorganics].* Select the number of compressions to perform before data collection.
Operator [*text box*]	Person running the analysis.
Revert [*button*]	Returns fields to the currently saved values.
Sample name [*text box*]	Description of the sample used for analysis.
Save [*button*]	Saves changes.
Step Size	*[Organics].* Select the step size.
Termination threshold [*button*]	*[Inorganics].* Analysis terminates after: ▪ **Low.** 3 decreasing particle sizes or 25 cycles ▪ **High.** 5 decreasing particle sizes or 40 cycles

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SOP (continued)

| Selections	Description
Toolbar	🗑 Deletes the selected SOPs from the list. Tap the box to the left of the record to select it, then tap the **Delete** icon to delete the selected SOPs.
	✚ Tap to create a new SOP.

5 INSTRUMENT MENU SELECTION

Use for manual operation and monitoring the state of the instrument.
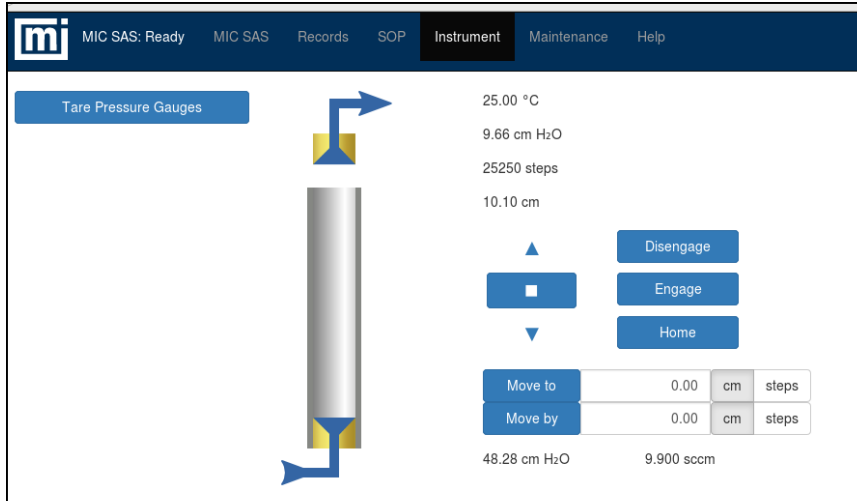
> **CAUTION**
>
> Additional controls are present when *Allow calibration* is selected in the **Maintenance > Advanced** view. Changing calibrations can affect the performance of the instrument. Make changes only under the direction of a Micromeritics Service Representative.
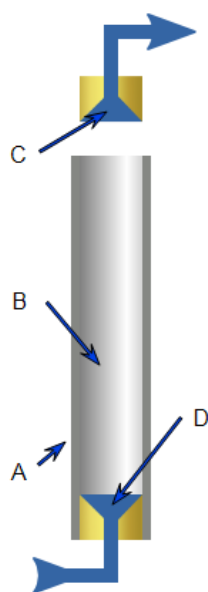
A. Sample tube
B. Sample material inside sample tube (sample not shown)
C. Piston
D. Anvil

Instrument Schematic

Component	Description
Anvil	Anvil with O-ring inside sample tube. A brass plug with filter paper is placed between the sample material and the anvil.
Piston	Piston with O-ring inside sample tube. A brass plug with filter paper is placed between the sample material and the piston.
Sample tube	Steel, open-ended sample tube.

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Piston Controls

Selections	Description
Disengage [*button***]**	Tap to raise the piston head above the sample tube.
Engage [*button***]**	Tap to lower the piston head to inside the sample tube.
Home [*button***]**	Tap to lower the piston to the home position. Home position is where there is no gap between the plugs.
Move to [***button***] and [***text box***] **Move by** [***button***] and [***text box***]	Select units of steps or cm. Enter a position or increment. The piston moves when the **Move to** or **Move by** button is tapped.
Power Off	On-screen message that displays when power to the stepper motor has been powered off.
Shield Off	On-screen message that displays when the safety shield is not in place. All buttons are disabled until the safety shield is in place.
Tare Pressure Gauges [*button***]**	Use if either pressure reading is not close to zero when a sample tube is not installed and no gas is flowing. Tap to adjust the pressure offset. This button is disabled if gas is being flowed or the piston is not in the disengage position.
	Up arrow. Tap to move the piston up in increments. Stop button. Tap to stop the piston movement. Down arrow. Tap to move the piston down in increments.

HOME POSITION

Instrument > Home [button]

The Home position is where there is no gap between the plugs.
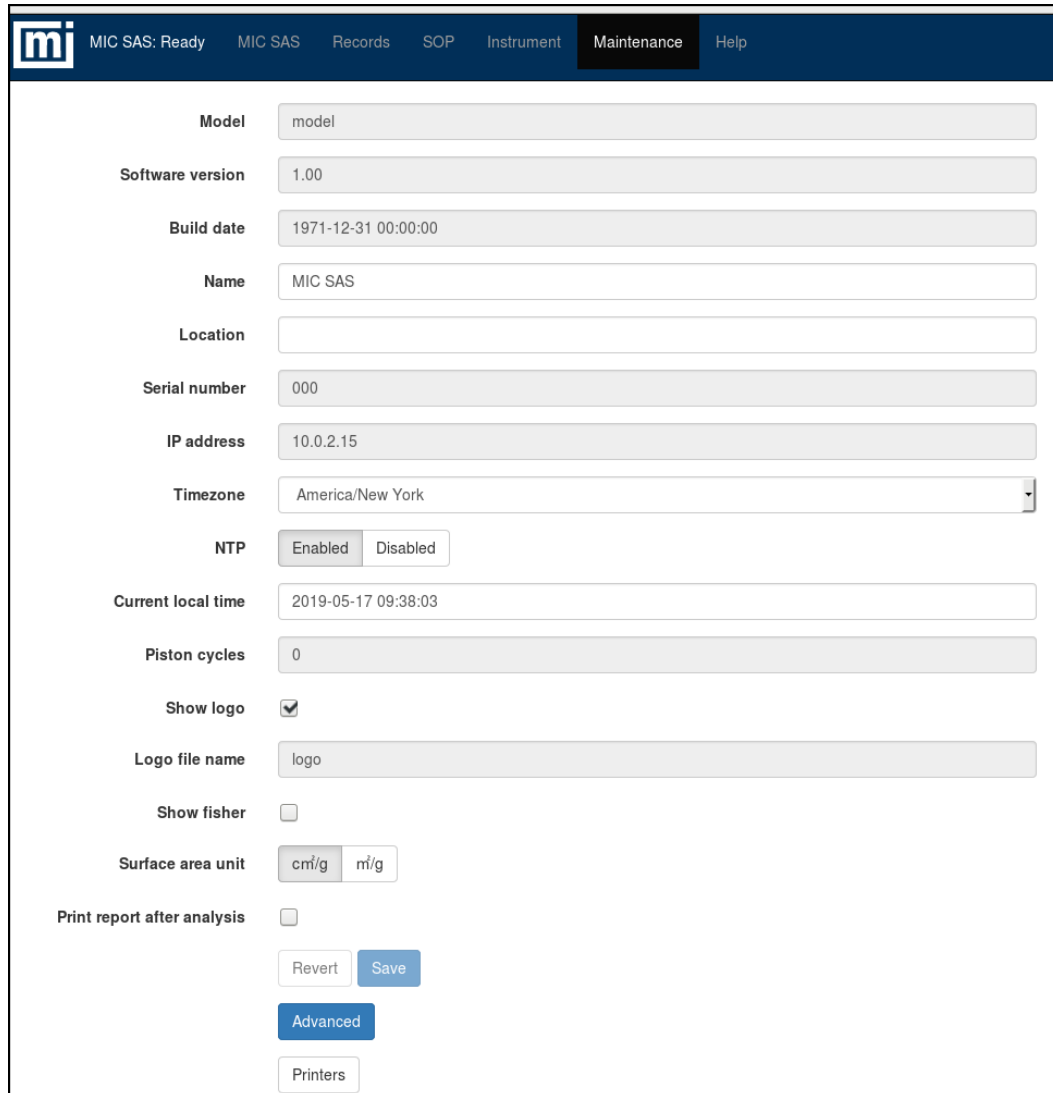
RETURN THE PISTON TO THE HOME POSITION

1. Tap *Instrument* on the menu.
2. Tap **Home**. The piston lowers to the home position.

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6 MAINTENANCE MENU SELECTION

Shows setup information about the instrument.

Maintenance

Selections	Description
Advanced [*button***]**	Administrator level configuration options — enabled only when the instrument is in the *Idle* state. **Delete all records** [*button*]. Tap to delete all records from the *Records* screen. **Delete all SOPs** [*button*]. Tap to delete all SOPs from the *SOP* screen. **Update application** [*button*]. Tap to perform a software update. **Reset to Nominal** [*button*]. Tap to reset the calibrations of the pressure transducers to the nominal values. Make changes only under the direction of a Micromeritics Service Representative. **Disk cleanup** [*button*]. Tap to clear the log file, and remove temporary and cached files from the disk. **Upload logo** [*button*]. Tap to select a logo to display on reports. *Allow calibration* [*check box*]. Enable to allow users to calibrate the instrument. These settings affect the instrument operation. Make changes only under the direction of a Micromeritics Service Representative. *Disk usage*.* Displays the percentage of disk space used . *Network* [*drop-down box*].

Maintenance (continued)

Selections	Description
	DHCP. Select to have the instrument's network settings configured automatically. The instrument must be connected to a network with a DHCP server. **Static.** Select to assign specific network settings. Network configuration is required for remote operation through a web browser, but not necessary for operating the instrument with the touchscreen. ■ *IP address* * [*text box*]. Use to change the IP address of the instrument. ■ *Subnet** [*text box*] . Use to change the Subnet setting of the instrument. ■ *Gateway* * [*text box*]. Use to change the Gateway setting of the instrument.
Build date **	Displays the software build date.
Current local time [*text box***]**	Set the instrument's clock by entering the current local date and time.
IP address ***	IP address of the instrument.
Location [*text box***]**	Location of the instrument.
Logo file name **	The file name of the uploaded logo.
Model **	Instrument model.
Name [*text box***]**	The name of the instrument (such as lab number, etc.).
NTP [*button***]**	Enable to use Network Time Protocol for setting the instrument's clock. The instrument must be attached to a network with NTP servers. If NTP is disabled, the instrument will keep time on a battery-backed internal clock.
Piston cycles **	Indicates the number of times the piston has gone to the disengage position after home or analysis. The number is set to zero when a force calibration is performed. The number before the reset is logged in the force calibration message.
Print report after analysis [*check box***]**	Enable to print a report after each analysis.
Printers [*button***]**	Click to configure a printer attached to the instrument.
Revert [*button***]**	Returns fields to the currently saved values.
Save [*button***]**	Saves screen changes.

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Maintenance (continued)

Selections	Description
Serial Number **	Serial number of the instrument.
Show fisher [*check box*]	Indicates if Fisher sizes and areas should be displayed and reported.
Show logo [*check box*]	Enable to display a logo on reports. This feature requires the upload of a PNG or BMP image. If this option is enabled, the image is displayed and printed to the right of the report title for all reports. To upload a logo, tap **Advanced** on the *Maintenance* window.
Software version **	Version of the installed software application.
Surface area unit [*button*]	Select whether surface areas are expressed as cm^2/g or m^2/g.
Timezone [*drop-down box*]	Select the local timezone. When the timezone is changed, the times displayed for records are changed to local times for the new timezone.

*   Applicable to *Static* networks only.
**   Field cannot be edited.
*** Field can be edited on the *Advanced* view only.

REMOTE COMPUTER CONFIGURATION

The remote computer and the instrument must be on the same network. The following is the recommended configuration:

- The IP addresses on both devices must have the same first three sets of 0-255 numbers (octets) and differ in their last octets.
- The subnet masks on both devices should be 255.255.255.0.
- The gateways on both devices must be the same, but must differ from the IP addresses in their last octets (optional).

Configuration Settings Examples

	Instrument Setting	**Remote Computer**
IP Address	192.168.77.101	192.168.77.100
Subnet Mask	255.255.255.0	255.255.255.0
Gateway	192.168.77.10	192.168.77.10

> If the remote computer has multiple Network Interface Cards (NICs), only change the settings of the NIC that is connected to the instrument. Refer to the computer's operating system manual or the internet for instructions on how to change the network settings of the NIC in use.
>
> Bridged instruments must have different IP addresses.

1. In the instrument application, tap the *Maintenance* menu, then tap **Advanced**.
2. In the *Network* field, tap *Static* and enter the details from the *MIC SAS* column in the table ***Configuration Settings Examples above***.
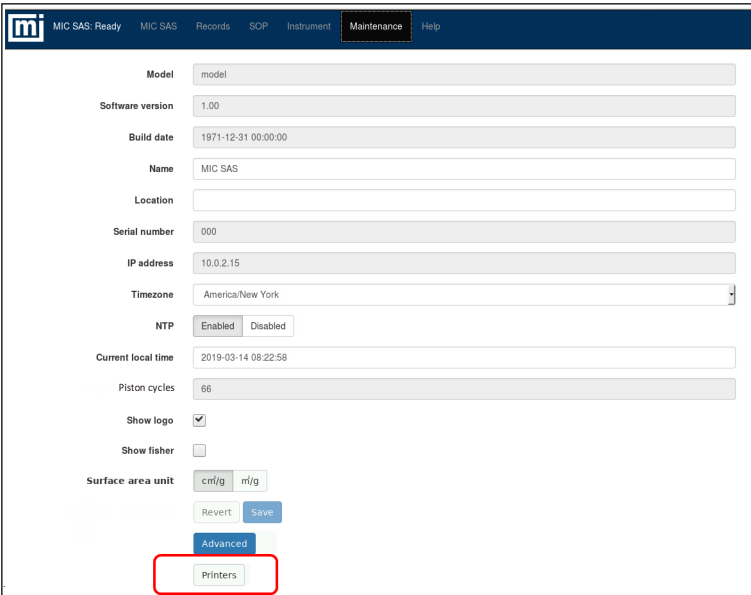
> If an error occurs regarding IP conflicts, contact your IT department to release IP addresses on the same subnet.

To access the instrument from the remote computer, enter the IP address of the instrument in a web browser on the remote computer. Firefox and Chrome are the recommended browsers.
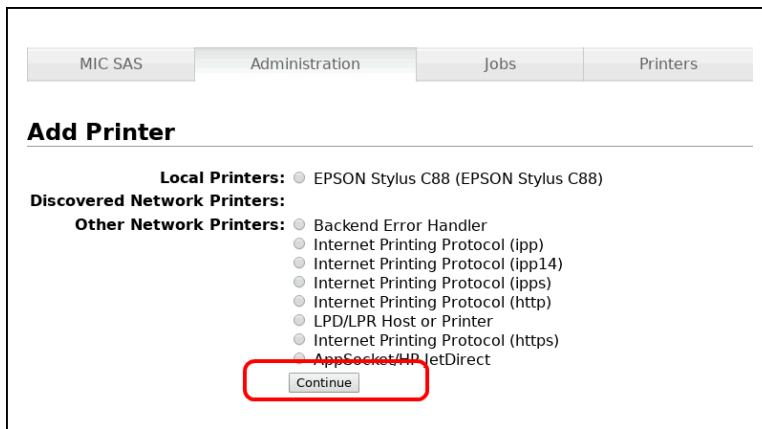
PRINTER INSTALLATION

These instructions are for configuring a printer attached to the instrument. When configuration is complete, use the *Jobs* tab to view queued print jobs.

1. Tap the *Maintenance* tab.
2. Tap **Printers** at the bottom of the window.

3. On the *Administration* tab, select the attached printer, then tap **Continue**.

4. On the *Add Printer* window, complete the fields to identify the attached printer. If the printer will be shared with other devices, select the *Share This Printer* option. Tap **Continue** when done.

5. Select the printer model from the *Model* drop-down list then tap **Add Printer**.

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6. Select printer settings from the drop-down lists then tap **Set Default Options**.

7. Tap the *Printers* tab. The installed printer displays.

8. Tap the *Administration* drop-down list and tap *Set as default printer*.
9. To specify additional printer options, tap the *Administration* drop-down list.
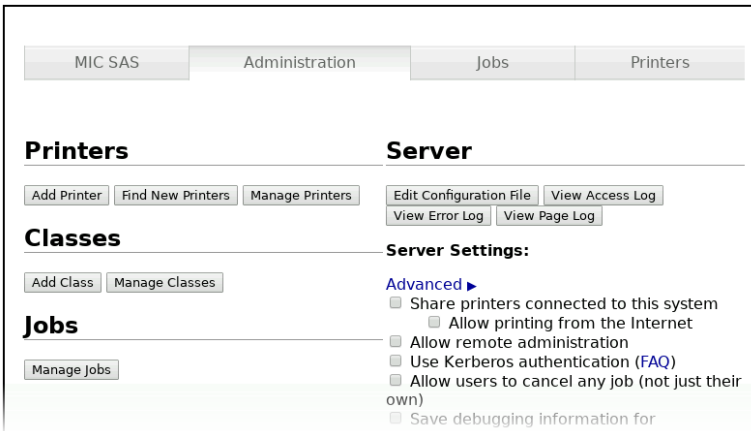
10. Tap *MIC SAS* to return to the application.

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CLEAN THE INSTRUMENT

The exterior casing of the instrument may be cleaned using a clean, lint-free cloth dampened with isopropyl alcohol (IPA), a mild detergent, or a 3% hydrogen peroxide solution. Do not use any type of abrasive cleaner. It is not necessary to remove knobs, screws, etc. while cleaning.

> **CAUTION** Do not allow liquid to penetrate the casing of the instrument. Doing so could result in damage to the unit.

REFRESH THE BROWSER

If a keyboard is attached or removed from the instrument, the browser will need to be refreshed.

> One method to refresh the browser is to power the instrument OFF, attach or remove the keyboard, then power the instrument back ON. Alternatively, use the following instructions.

Attach a keyboard and refresh the browser:

1. Attach the keyboard.
2. Press **F5** or **Ctrl+R** on the attached keyboard. When the browser completes the refresh process, the virtual keyboard will be disabled and the attached keyboard can be used.

Remove the keyboard and refresh the browser:

1. Press **Ctrl+W** on the attached keyboard.
2. Remove the keyboard before the browser refresh process completes. When the browser completes the refresh process, the virtual keyboard can be used.

*U*PLOAD *L*OGO

> ✏️ Administrator level access is required.

---

*U*PLOAD *A LOGO FROM THE INSTRUMENT*

1. Insert the USB device containing the logo file into a USB port of the instrument. Ensure the file name is either *MICSAS.PNG* or *MICSAS.BMP*. No other file names or file extensions are supported.
2. Tap the *Maintenance* menu, then tap **Advanced**.
3. Tap **Upload Logo**.
4. On the *Confirm Action* window, tap **Yes** to restart the application immediately or tap **No** to cancel the operation.

Confirm Action	✕
This requires an application restart. Any unsaved changes will be lost. Are you sure you want to continue?	
	Yes No

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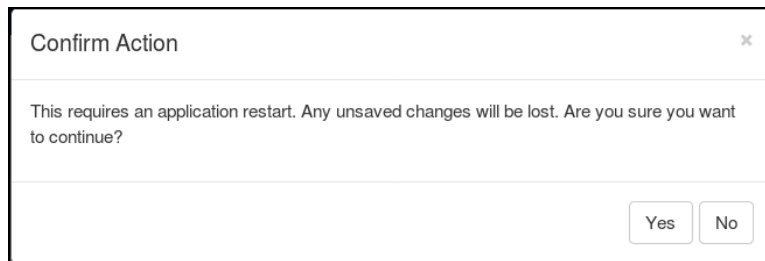
UPLOAD A LOGO FROM A REMOTE COMPUTER

1. Go to the *Maintenance* menu, then click **Advanced**.
2. Click **Upload Logo** and access the logo file. Ensure the file extension is either .PNG or .BMP. No other file extensions are supported.
3. Select the file in the list, then click **Upload**.

Select a file	×
Select file Upload	
MICSAS.png	

4. On the *Confirm Action* window, click **Yes** to restart the application immediately or click **No** to cancel the operation.

Confirm Action	×
This requires an application restart. Any unsaved changes will be lost. Are you sure you want to continue?	
	Yes No
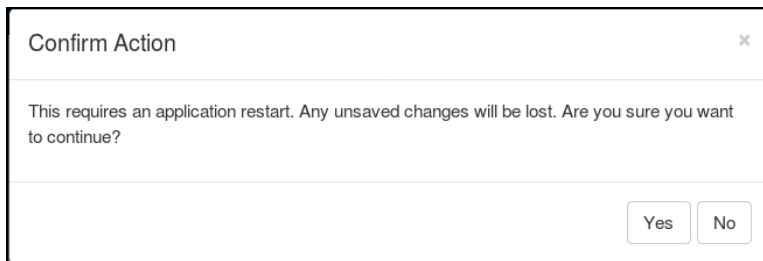
7 TROUBLESHOOTING AND MAINTENANCE

Sample tube rises when piston engages.

Cause: The retaining sample tube collar is missing or too loose.

Action: Fit the retaining collar tightly on the sample tube just below the bracket.

Unexpected test results.

Cause: No sample, or incorrect sample in the tube.

Action: Check that the correct sample has been loaded and the correct mass and density have been entered.

Cause: The top brass sample plug and filter paper are not in place.

Action: Install top brass sample plug and filter paper.

Cause: Sample has escaped the tube during the test.

Action: Repeat the test using two filter papers on each plug.

Cause: Inappropriate Fisher number mapping being applied

Action: Check that the Fisher number map for the material is correct.

Sample escapes top of sample tube when piston first engages.

Cause: The top O-ring is worn.

Action: Check the integrity of the O-rings. See *O-rings on page 7 - 10*.

Cause: The sample material contains very fine particles.

Action: The loss of a very small amount of sample may not require any action. A second filter paper on the top brass plug may reduce the amount of sample lost.

One or both pressures read close to zero during analysis.

Cause: No air supply.

Action: Ensure that the air cylinder valve, and any shut-off valves are open. Check that the regulator is set properly. Check that the air line is connected.

Cause: There is a leak or blockage in the system.

Action: Ensure the piston is engaged in the tube. Ensure the air outlet tube on the top of the moving piston mount is connected. Check the integrity of the O-rings. See *O-rings on page 7 - 10*.

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Piston does not move.

Cause: The piston may be stationary for minutes at a time during analyses, and some piston motions are barely large enough to see, but if analysis does not progress for a long time, it's possible that the piston motor has become overloaded.

Action: Go to the *Instrument* view and tap the stop icon (white square in a blue rectangle. If the piston is still unresponsive, cycle power on the instrument.

Cause: The emergency stop button was pressed.

Action: Reset the emergency stop. The button shuts off power to the motor, so a home operation must be performed.

Pressures are not steady during analysis.

Cause: O-rings are worn.

Action: Check the integrity of the O-rings. See *O-rings on page 7 - 10*.

Sample mass cannot be made equal to its absolute density.

Cause: A limited amount of sample is available, or the sample has a very low bulk density and very high absolute density.

Action: Some standards require mass and density to be equal, however accurate measurements may be possible with less sample. Be sure to enter the actual mass and density. A warning that mass and density differ by more than 5% is shown, but the analysis can still be started.

GAS CONNECTIONS

GUIDELINES FOR CONNECTING GASES

Regulator Pressure Settings

Analyzer	Gauge should indicate
MIC SAS II	15 - 20 psig (103-138 kPag)

⚠ Exceeding the maximum recommended pressure could cause personal injury or damage the instrument.

✏ These instructions refer to the installation of a gas line, regulator, and gas cylinder for each type of gas used. If expansion kits or other accessories are used in the lab, special consideration should be given to these configurations when installing the gas lines.

⚠ Improper handling, disposal, or transportation of potentially hazardous materials can result in serious injury or damage to the instrument. Always consult the MSDS when working with hazardous substances. Safe operation and handling of the instrument, supplies, and accessories are the responsibility of the operator.

- Ensure the gas cylinder is closed before connecting to the analyzer.
- Place gas cylinders within 6 feet (2 m) of the gas inlets of the analyzer. Place the cylinders close enough to allow for proper connection at the analyzer inlet. Using gas line extenders on gas cylinders located in remote areas may degrade gas quality and reduce pressure. Long gas lines, such as those used with gas cylinders placed in remote areas, must be purged for an extended period of time to remove ambient gases. When possible, avoid placing gas cylinders in remote locations. It is always best to have gas cylinders located near the analyzer.
- Use a retaining strap (or other appropriate tether) to secure the gas cylinder.
- Always use the gas lines provided with the analyzer. It is very important that proper gas lines are used with the analyzer.
- Carefully route the gas lines from the cylinder to the analyzer avoiding overlapping or entangling gas lines. This will help avoid confusion when maintenance is required.

■ Label the gas line at the analyzer inlet for proper identification and maintenance.

■ Replace gas cylinders before gas is depleted. It is best to replace a gas cylinder when the pressure reads approximately 600 psig (4140 kPag) on the high-pressure gauge. Contaminants adsorbed to the walls of the cylinder will desorb as the pressure decreases.

■ Input Air must be clean, dry and filtered. If using an air compressor, a secondary air filter is required. The air filter should be regularly checked for fluid buildup (and drained as required), and the filter element replaced as necessary. Particulates, water vapor and oil vapor can contaminate the instrument.

REPLACE A GAS CYLINDER

Regulator Pressure Settings

Analyzer	Gauge should indicate
MIC SAS II	15 - 20 psig (103-138 kPag)

⚠️ Exceeding the maximum recommended pressure could cause personal injury or damage the instrument.
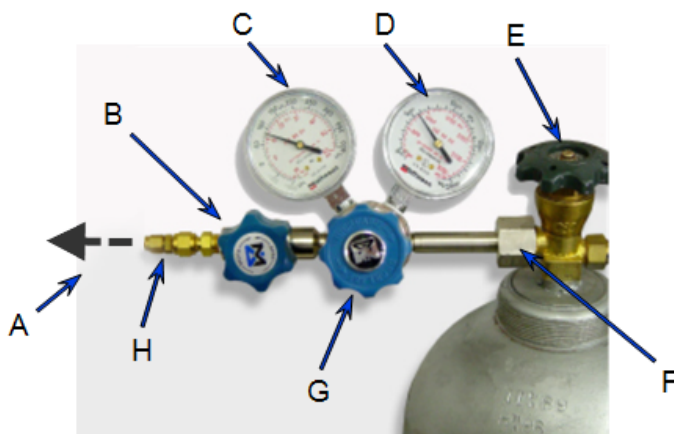
A. Gas tubing to instrument
B. Gas regulator shut-off valve
C. Low pressure gauge
D. High pressure gauge
E. Gas cylinder shut-off valve
F. Regulator connecter nut
G. Regulator control knob
H. Brass reducer fitting

Disconnect a Depleted Gas Cylinder

1. Close the regulator shut-off valve and gas cylinder shut-off valve by turning the knobs clockwise.
2. Disconnect the gas line from the regulator. Gas will be vented from the line. It is not necessary to disconnect the gas line from the analyzer inlet if the cylinder will be replaced immediately with one of the same type.
3. Open the gas regulator shut-off valve by turning the knob counter-clockwise. Gas will be vented from the regulator.
4. Turn the regulator control knob clockwise to open and vent any remaining gas. Both gauges should read at or near zero. If not, make sure the gas regulator shut-off valve is open.
5. Close the regulator by turning the control knob counter-clockwise.
6. Use an appropriate wrench to loosen the nut at the regulator connector nut then remove the regulator from the cylinder.
7. Replace the protective cap on the depleted cylinder. Disconnect the retaining strap and move the cylinder to an appropriate location.

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CONNECT GAS TO ANALYZER

Regulator Pressure Settings

Analyzer	Gauge should indicate
MIC SAS II	15 - 20 psig (103-138 kPag)

> ⚠️ Exceeding the maximum recommended pressure could cause personal injury or damage the instrument.

> ✏️ Ensure the gas cylinder is closed before connecting the gas line to the analyzer.

1. Ensure the gas is:

   ■ Dry grade compressed air cylinder, 19-24% oxygen, balance nitrogen

2. Loosen, then remove the plug from the gas port.
3. Insert the gas line into the port and hand tighten the connector nut. Use a 7/16 in. (11 mm) wrench to tighten the nut until very snug.

CONNECT A REGULATOR AND A GAS LINE TO A GAS CYLINDER

> ✏️ The equipment images in this topic may differ slightly from your equipment; however, the instructions are the same unless otherwise noted.
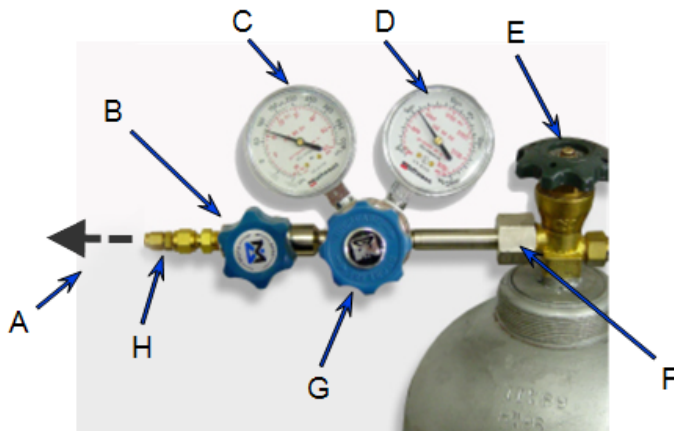
A. Gas tubing to instrument
B. Gas regulator shut-off valve
C. Low pressure gauge
D. High pressure gauge
E. Gas cylinder shut-off valve
F. Regulator connecter nut
G. Regulator control knob
H. Brass reducer fitting

1. Move the gas cylinder close to the analyzer.
2. Secure the cylinder in place using straps or chains connected to a wall bracket or other fixed surface, or use a cylinder stand.
3. Use an appropriate cylinder wrench to remove the protective cap from the cylinder by turning the protective cap counter-clockwise.
4. Attach the gas regulator to the connector on the gas cylinder. Hand tighten the nut, then use an appropriate wrench to tighten an additional 3/4 turn.
5. Check for leaks at the high pressure side of the regulator and in the connector.
    a. Turn the regulator control knob fully counter-clockwise.
    b. Slowly open the gas cylinder shut-off valve, then close it.
    c. Observe the pressure on the high pressure gauge.
    d. If pressure drops, repair the leak.
6. Connect the gas line to the regulator.
    a. Connect the gas line to the regulator connector.
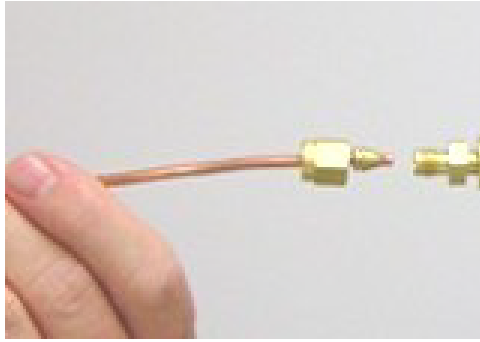
b. Use two 7/16 in. (11 mm) wrenches to tighten the gas line connection — one to hold the fitting steady and one to tighten the connector nut.

7. Purge the air from the gas line.

    a. Open the regulator shut-off valve.

    b. Open the gas cylinder shut-off valve and flow gas for 10 to 30 seconds.

    c. Close the gas cylinder shut-off valve and allow regulator pressure to go to zero.

POWER

The MIC SAS II 5800 is designed to operate with 100-240 VAC ±10% at 50-60 Hz. Noise-free power of the correct voltage and frequency, with a safety earth ground, should be available through a standard wall receptacle.

CAUTION	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.

✎	Replacement power supply cords must be rated for the specifications stated above.

✎	As the power jack is located on the back of the instrument, it should be placed so that the jack is easily accessible and the instrument does not have to be moved.

POWER INSTRUMENT ON AND OFF

CAUTION	**Do not** connect or disconnect cables when the instrument is powered ON.

✏️	To power off the instrument, disconnect the power cable.
	It is recommended that the instrument remain powered on. When the main power is disconnected, the piston loses the home position and will need to be reset. See ***Home Position on page 5 - 3***.

Power ON the equipment in the following order:

1. Plug in the instrument. (There is no **ON/OFF** power switch.)
2. Allow the instrument to run for approximately 60 minutes.

Power OFF the equipment in the following order:

1. Ensure the instrument status is *Idle*.
2. Disconnect the power plug from the instrument. (There is no **ON/OFF** power switch.)

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ROUTINE MAINTENANCE

The instrument should be serviced approximately once per year.

O-RINGS

O-rings on the piston and anvil are essential to the accurate operation of the instrument and should be checked regularly for signs of wear or damage. The O-rings will wear, especially on the piston, and hence should be replaced regularly.

To check for O-ring leaks:

1. Tap the *Maintenance* view, then tap **Advanced**.
2. Select *Allow calibration* and tap **Save**.
3. Tap the *Instrument* view.

> Changing calibrations will affect the performance of the instrument. The following steps do not change any calibrations. Pressing other buttons on the left side of the display may change calibrations.

4. Install an empty sample tube.
5. Enter a flow rate of 10 sccm and tap **Set Flow Rate**.
6. When pressure stabilizes, try to move the tube by hand. The O-rings should be replaced if the tube moves freely or the inlet or differential pressure vary by more than a few tenths of a cm H_2O.
7. Tap **Stop Flow**.
8. Tap the *Maintenance* view, then tap *Advanced*.
9. Deselect *Allow calibration* and tap **Save**.

AIR SUPPLY

Check that the cylinder has adequate pressure. Replace the cylinder when it is low. See *Replace a Gas Cylinder on page 7 - 5* .

8 HELP

Tap **Online Help** to access the online help files. Internet connection is required for online help. If internet connection is not available on the instrument, go to http://bit.ly/2PCKB7B on a device with internet access, or scan the QR code.

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EU DECLARATION OF CONFORMITY

This declaration of conformity is issued under the sole responsibility of the manufacturer:

Micromeritics Instrument Corporation
4356 Communications Drive
Norcross, GA 30093, USA

Hereby declares that the product:

MIC SAS II

is in conformity with the following **EU harmonization legislation**:

2014/35/EU - LVD Directive
2014/30/EU - EMC Directive
2011/65/EU - RoHS Directive

and that the equipment is in conformity with the following harmonized and other appropriate standards;

2014/35/EU (LVD)
IEC 61010-1:2010/AMD:2016 - *Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 1: General requirements.*
IEC 61010-2-081:2019 — *Particular requirements for automatic and semi-automatic laboratory equipment for analysis and other purposes.*

2014/30/EU (EMC)
IEC 61326-1:2020 Ed.3 - *Electrical equipment for measurement, control and laboratory use — EMC requirements — Part 1: General requirements*
IEC 61000-3-2:2018 /AMD1:2020 - *Part 3-2: Limits — Limits for harmonic current emissions (equipment input current* $\leq$ *16 A per phase)*
IEC 61000-3-3:2013 - *Part 3-3: Limits — Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection*

2011/65/EU (RoHS)
EN 63000:2018 - *Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances*

Name: **John McCaffrey, Ph.D.**

Signature: _____

Location: **Norcross, GA USA**

Title: **Vice President, R & D**

Date of issue: **10/23/2024**

mi micromeritics®

UK DECLARATION OF CONFORMITY

This declaration of conformity is issued under the sole responsibility of the manufacturer:

Micromeritics Instrument Corporation
4356 Communications Drive
Norcross, GA 30093, USA

Hereby declares that the product:

MIC SAS II

is in conformity with the following UK legislation:
    Electrical Equipment (Safety) Regulations 2016
    Electromagnetic Compatibility Regulations 2016
    Restriction of the Use of Certain Hazardous Substances in E&E Equipment Regulations 2012

and that the equipment is in conformity with the following designated and other appropriate standards;

Electrical Equipment (Safety) Regulations 2016
IEC 61010-1:2010/AMD1:2016 - *Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 1: General requirements.*
IEC 61010-2-081:2019 – *Particular requirements for automatic and semi-automatic laboratory equipment for analysis and other purposes.*

Electromagnetic Compatibility Regulations 2016
IEC 61326-1:2020 - *Electrical equipment for measurement, control and laboratory use — EMC requirements — Part 1: General requirements*
IEC 61000-3-2:2019 - *Part 3-2: Limits — Limits for harmonic current emissions (equipment input current $\leq$ 16 A per phase)*
IEC 61000-3-3:2013 - *Part 3-3: Limits — Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection*

Restriction of the Use of Certain Hazardous Substances in E&E Equipment Regulations 2012
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Name: **John McCaffrey, Ph.D.**   Title: **Vice President, R & D**

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