AccuPore CFP®

Capillary Flow Porometer

micromeritics®

Pre-installation Instructions and Checklist

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(Rev A)

micromeritics®

TRADEMARKS

ACCUPORE is a registered trademark of Micromeritics Instrument Corporation.
Micromeritics is a registered trademark of Micromeritics Instrument Corporation.

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.

CONTACT US

Micromeritics Instrument Corporation
4356 Communications Drive
Norcross, GA 30093-2901 USA
Phone: 1-770-662-3636
www.Micromeritics.com

Instrument Service or Repair
Phone: 1-770-662-3636
International: Contact your local distributor or call 1-770-662-3636
Service.Helpdesk@Micromeritics.com

Micromeritics Application Support
Support@Micromeritics.com

ABOUT THIS MANUAL

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 piece of laboratory equipment can become dangerous to personnel when improperly operated or poorly maintained. All personnel operating and maintaining Micromeritics instruments should be familiar with its operation and should be thoroughly trained and instructed on safety.

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

- Wear the appropriate personal protective equipment when operating this instrument — such as eye protection, lab coat, protective gloves, etc.
- 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 AccuPore CFP weighs approximately 41.5kg (92 lb).
- Always pay attention to the safety instructions provided on each label affixed to the instrument and do not alter or remove the labels. When inspecting the instrument, ensure that the safety labels have not become worn or damaged.
- Proper maintenance is critical to personnel safety and smooth instrument operation and performance. Instruments require regular maintenance to help promote safety, provide an optimum end test result, and prevent costly down time. Failure to practice proper maintenance procedures can lead to unsafe conditions and shorten the life 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 SDS when working with hazardous substances. Safe operation and handling of the instrument, supplies, and accessories are the responsibility of the operator.

HANDLING OF HIGH PRESSURE AND GAS CYLINDERS

- Ensure the cylinder is placed in a permanent location where it can be securely attached using a cylinder restraint (such as a wall- or floor-mounted bracket).
- Do not attach the cylinder to a movable object, such as a rolling workbench.
- Transporting a cylinder must be done using the proper equipment, such as a gas cylinder transfer cart. Ensure that the cylinder is securely strapped in an upright position to prevent it from falling over or rolling around during transport.

SOLVENTS/WETTING LIQUIDS

- Flammable solvents can only be used in the determination of bubble point. They should not be used beyond bubble point when gas begins to flow through the sample membrane.
- Alcohol can be used as a wetting liquid for determination of bubble point. Consult the Safety Data Sheet (SDS) for wetting liquids.
- The flammable solvent and membrane must be removed at the completion of the experiment.
- Do not leave flammable solvents in the chamber when not in use.
- Ensure adequate ventilation when using solvents.

VENTILATION

Either air or nitrogen can be used, however, air is recommended.

Proper ventilation is required for both flammable vapors (from use of alcohols as wetting fluid) or when using nitrogen instead of air.

O_2 monitoring may be required if using nitrogen instead of air. When using nitrogen, refer to the OSHA requirement or your local regulations for O_2 monitoring.

ASPHYXIATION HAZARD

Air is recommended. Refer to Ventilation requirements if using nitrogen.

INTENDED USE

The **AccuPore CFP** is an easy-to-use, accurate system for determination of through-pore size and distribution of filters, membranes, and sheet goods. This high-accuracy system delivers reliable through-pore size and distribution measurements by minimizing internal pressure-drop and providing the most accurate measurement of pressure and gas flow rate through the sample. The automated system is quick to use and easy to learn with an intuitive touchscreen interface for method definition analysis and data reporting. Innovative gas switching reduces overall cost of operation and ownership by intelligently switching between gas sources during experiments.

The instrument is intended to be operated by trained personnel familiar with the proper operation of the equipment as recommended by the manufacturer as well as relevant hazards involved and measures for hazard prevention. 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.

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)
Cover	o	o	o	o	o	o
Power Supplies	o	o	o	o	o	o
Printed Circuit Boards	o	o	o	o	o	o
Cables, Connectors & Transducers	x	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.

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:

When working on the instrument where this symbol is displayed, refer to the Operator Manual for additional information.

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1 PRE-INSTALLATION DOCUMENT OVERVIEW

If a Micromeritics Service Technician performs this installation, additional charges apply. Please see *Contact Us on page iii* for information on how to contact Micromeritics.

This document describes how to prepare a site for installation of the AccuPore CFP. 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 1 - 3*. 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 - 3*.

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 - 3* 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 *Dates and Signatures on the facing page* to Micromeritics. Micromeritics will contact you to confirm an installation date.

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
4356 Communications Drive
Norcross, GA / USA / 30093-2901

Email: Service.Helpdesk@Micromeritics.com

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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.

SPECIFICATIONS

Environment

Temperature	10 °C to 35 °C (50 °F to 95 °F), operating 0 °C to 50 °C (32 °F to 122 °F), non-operating Maximum rate of change of 2 °C per hour
Humidity	20% to 80% relative, non-condensing
Indoor or Outdoor use	Indoor only (not suitable for wet locations) Altitude: 2000 m max (6500 ft) Pollution degree of the intended environment: 2
Location	Instrument should be located in a dust-free, vibration free environment, away from exposure to direct sunlight and direct air drafts.
Degree of Ingress Protection	IPX0

Physical

Height	635 mm (25 in)
Width	560 mm (22 in)
Depth	510 mm (20.1 in)
Weight	41.5kg (92 lb)

Electrical

Voltage	Input: 100-240 VAC (± 10%), 345 VA Output: 24 V, 11.7A (280 W) Overvoltage Category II	
Power	280 W	
Frequency	50-60 Hz	
External Power Adapter	Manufacturer: Part Number	Mean Well GST280A24-C6P

Gases

Gas Supply Low Pressure	Minimum of 85 psig (590 kPag) Maximum of 125 psig (860 kPag) Typically supplied by air compressor
Gas Supply High Pressure	Minimum of 60 psig (410 kPag) Maximum of 500-650 psig (3800-4480 kPag) Typically supplied by air tank  When measuring pore sizes larger than ~0.1um (~100 psig/690 kPag), then it is acceptable to run without gas input to the high-pressure side.
Gas Type	Dry air from compressor or gas cylinder. Clean/dry nitrogen (e.g., from LN_2 boil-off) can also be used.
Gas Cleanliness	■ Particles: Up to 10 particles of 1 to 5 µm per cubic meter of compressed air. ■ Water: Dewpoint -20 °C or lower ■ Oil: ≤ 0.01 mg of oil per cubic meter of compressed air. If using an air compressor, it should be capable of supplying at least 200 slpm (7 cfpm) continuously at a pressure at least 5 psig (35 kPag) above the working pressure. Normally, this requires a minimum 5 HP (3.7 kW) compressor.
Flow Rate	0 - 200 L/min
Pore Size Range	0.013 µm to 500 µm
Sample Size	Supported sample diameters are 13 mm, 25 mm, 47 mm. Standard sample tray supports samples from 10 um to 2 mm thickness. Contact the factory for other sample diameters and thicknesses.
Pressurizing Gas	Filtered and dried compressed air.
Pressure Range	0 - 500 psig (3450 kPag)

Physical Location

The instrument must be placed at least 10 cm (4 in) from any wall or bulkhead behind the instrument to allow for clearance.

INSTALLATION CONFIGURATION

Standard installation requires the use of 1/8 in. copper or stainless steel gas supply lines, located in the instrument accessories kit. A nonstandard installation will be created if another gas supply line is used or if the gas cylinders cannot be placed within 6 ft (2 m) of the analyzer. There may be additional costs associated with a nonstandard installation. Please contact the Micromeritics Service Department at 1-770-662-3636 to discuss a nonstandard installation.

ENVIRONMENTAL FACTORS

POWER

The AccuPore CFP uses a 24 V, 11.7 amp power supply with an input range of 100-240 VAC (±10%), 345 VA, 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. There should also be sufficient outlets for all devices.

The external power adapter required for the AccuPore CFP is Micromeritics' part number 003-40001-02. Use of any other power adapter could damage equipment and/or cause harm to the operator. The AccuPore CFP is intended to be powered from the output of the approved power adapter rated Class I, manufactured by Mean Well, P/N GST280A24-C6P. Micromeritics supplies a suitably rated approved power supply cord appropriate for the applicable country with the power adapter.

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

The instrument should be placed so that the power switch and jack are easily accessible. It should not be necessary to move the instrument to make a power connection. The wall outlet should not be blocked, and there should be sufficient space around the outlet and in the immediate area so the instrument can establish a safe and secure power connection and is easily accessible to disconnect the equipment from the AC main power supply.

TEMPERATURE AND HUMIDITY

Temperature and humidity must be controlled.

Temperature:	10 °C to 35 °C (50 °F to 95 °F), operating 0 °C to 50 °C (32 °F to 122 °F), non-operating Maximum rate of change of 2 °C per hour
Humidity:	20% to 80% relative, non-condensing

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

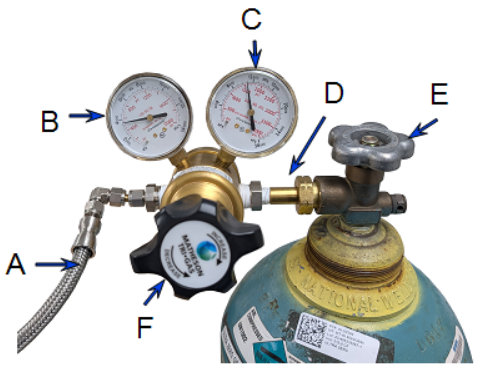
GAS CYLINDERS AND GAS SUPPLY LINES

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

- **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.

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.



A. Gas tubing to instrument
B. Low pressure gauge
C. High pressure gauge
D. Regulator connecter nut
E. Gas cylinder shut-off valve
F. Regulator control knob

If purchased from a source other than Micromeritics, please keep in mind that many commercially available gas regulators do not maintain output pressure at very high flow. These vital criteria must be met:

- **Cleanliness**. Other regulators may contain oils which can contaminate the gas.
- **High stability**.Standard regulators can not maintain output pressure when flows change rapidly (e.g, from no flow when the pressure is below the bubblepoint pressure to 200slpm flow for a very small change in output pressure (often just a few psig).

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

LABORATORY EQUIPMENT AND SUPPLIES

- For gases, have the following:
  - House air up to 125 psig or air/nitrogen cylinder up to 125 psig
  - Air/nitrogen gas cylinder up to 650 psig

3 PRE-INSTALLATION CHECKLISTS

For each question, circle **Y** if the condition applies to your laboratory or **N** if it does not. When this *Pre-installation Checklist* has been completed, see *Dates and Signatures on page 1 - 3*. Sign and date the form, then send it along with all completed checklists to Micromeritics.

UNPACKING AND INSPECTION CHECKLIST

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

INSTRUMENT SPACE CHECKLIST

Analyzer Space			Initial / Date
Will there be adequate space to easily access the gas lines, power supply lines, and sufficient clearance for maintenance and inspection?	**Y**	**N**	

INSTALLATION CONFIGURATION CHECKLIST

Gas and Gas Supply Lines			Initial / Date
Will a compressed air outlet with stable pressure of at least 90 psig be available within 6 ft (2 m) of the instrument?	**Y**	**N**	
Will an air or nitrogen cylinder that can supply at least 550 psig be available within 6 ft (2 m) of the instrument?	**Y**	**N**	

ENVIRONMENTAL FACTORS CHECKLIST

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

Laboratory Equipment and Supplies Checklist

Laboratory Equipment and Supplies			Initial / Date
Are all items listed in the BOM available for use?	**Y**	**N**	
Gases: Is house air at 125 psig stable or an air/nitrogen cylinder at 100 psig available? (A minimum of 90 psig stable is recommended.)	**Y**	**N**	
Gases: Is an air/nitrogen gas cylinder up to 550 psig (maximum recommended is 650 psig) available?	**Y**	**N**	

Application Related Issues Checklist

Application Related Issues			Initial / Date
What types of samples will be tested?			
Initial / Date:			
Will these samples require pretreatment?	**Y**	**N**	
Will any application assistance from Micromeritics Particle Testing Authority be required?	**Y**	**N**	

Personnel Security Clearance Checklist

Security Clearance		
Are there any special arrangements required concerning security clearance?	**Y**	**N**
■ If **Yes**, please explain:		
Initial / Date:		

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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:

AccuPore CFP

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 ≤ 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.

Title: Vice President, R & D

Signature: _____

Date of issue: 08/19/2024

Location: Norcross, GA USA

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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:

AccuPore CFP

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 ≤ 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
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.

Title: Vice President, R & D

Signature:

Date of issue: 08/19/2024

Location: Norcross, GA USA