

# **AquaPrep™ II 056**

## **Operator's Manual**

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# 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.

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**4356 Communications Drive • Norcross, GA 30093-1877 • Fax (770) 662-3696**

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Domestic Sales - (770) 662-3633  
International Sales - (770) 662-3660

Domestic Repair Service - (770) 662-3666  
Customer Service - (770) 662-3636



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# 1. GENERAL INFORMATION

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## Organization of the Manual

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This manual describes the installation and operation of the AquaPrep; its contents are organized as follows:

- |                  |   |
|------------------|---|
| <b>Chapter 1</b> | <b>GENERAL INFORMATION</b><br>Provides a general description of the AquaPrep, safety precautions, and specifications. |
| <b>Chapter 2</b> | <b>INSTALLATION</b><br>Describes how to unpack, inspect, and install the AquaPrep.                                    |
| <b>Chapter 3</b> | <b>OPERATION</b><br>Provides instructions for operating the AquaPrep.   |
| <b>Chapter 4</b> | <b>TROUBLESHOOTING</b><br>Provides troubleshooting information.   |
| <b>Chapter 5</b> | <b>ORDERING INFORMATION</b><br>Provides ordering information for AquaPrep accessories.                                |

## Conventions

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This manual uses the symbols shown below to identify notes of importance, warnings, and cautions.



**Notes contain important information pertinent to the subject matter.**



**Warnings contain information that help you prevent actions that may cause personal injury.**



**Cautions contain information that help you prevent actions that may damage the analyzer.**

## Precautions and Intended Use

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The AquaPrep is designed to remove dissolved air from water for subsequent use in particle size analysis with Micromeritics' Saturn DigiSizer®. If not removed, dissolved air can generate tiny bubbles which will distort the precision of the DigiSizer analysis.



**The AquaPrep only works with water; do not use any other liquid. Do not use water that contains a detergent or wetting solution.**

Tap water varies greatly in its dissolved air content and the presence of debris. This water must be deionized and well filtered before using with the AquaPrep. Filtering the water through (at least) a 1-micron filter will greatly extend the life of the hydrophobic capsule by means of which air is removed.



**Use the AquaPrep only with deionized water that is final-filtered through, at least, a 1-micron filter.**



## Description

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The AquaPrep recirculates water through a hydrophobic capsule consisting of many thin-walled capillaries. A vacuum pump provides suction on the outside of the capillaries. The result is a diffusion of dissolved air from the water through the capillary walls and into the ambient air.

The AquaPrep has a water inlet connector on the hydrophobic capsule and an outlet connector on the front panel. The switch for turning it on and off is located on the rear panel just left of the power card entrance.



The air removed from the water is exhausted through a small tube also at the front of the instrument. Placing a small beaker of water around the tube so that its vent is submerged reveals by its bubbling the rate of air removal. This guides you in assessing when sufficient air has been extracted from the water. Not all dissolved air has to be removed for satisfactory use with the DigiSizer.

## Specifications

Characteristic	Specification
<b>———— OPERATING PARAMETERS ————</b>	
Typically degasses 5 liters/hr	
<b>———— UTILITIES/SUPPLIES ————</b>	
Accommodates to standard power mains worldwide.	
Voltage:	100/120, 220/240 VAC $\pm$ 10%
Current:	2.0 A (100/120 VAC); 1.0 A (220/240 VAC)
Frequency:	50/60 Hz
Water:	Filtered and deionized
<b>———— EXPOSED MATERIALS ————</b>	
Polypropylene, nylon, Tygon <sup>®</sup> , stainless steel, brass	
<b>———— ENVIRONMENT ————</b>	
Temperature:	15-30 °C, operating; -10 to 55 °C, storing or shipping
<b>———— CABINET ————</b>	
Physical:	28W x 10H x 28D cm (11W x 4H x 11D in.)
Weight:	5.3 kg (11.6 lbs)

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## 2. INSTALLATION

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This chapter describes how to unpack, inspect, and install the AquaPrep.

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### Unpacking and Inspecting the Equipment

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The AquaPrep and its accessories should be visually inspected as soon as unpacked to ensure that all items have been received and none has sustained physical damage.

When you unpack the shipping cartons, carefully compare the packing list with the equipment actually received, while checking for equipment damaged during shipment. Be sure to sift through all packing materials before declaring equipment missing.



**It is important to save the shipping cartons when equipment is to be declared as damaged or lost. The inspector (or claim investigator) must examine the cartons prior to completion of the inspection report.**

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### Equipment Damage or Loss During Shipment

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When equipment is damaged or lost in transit, you are required to make note of the damage or loss on the freight bill. The carrier, not the shipper, is responsible for all damage or loss. In the event of equipment damage or loss during shipment, contact the carrier of the equipment immediately.

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### Equipment Return

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Micromeritics strives to ensure that all items arrive safely and in working order. Occasionally, due to circumstances beyond our control, equipment is received which is not in working condition. When it is necessary to return equipment (damaged either during shipment or while in use) to Micromeritics for repair or replacement, the following procedure should be followed:

1. Pack the instrument in its original shipping carton if possible. If the original carton is unavailable, for a nominal fee Micromeritics can provide another carton for your use.



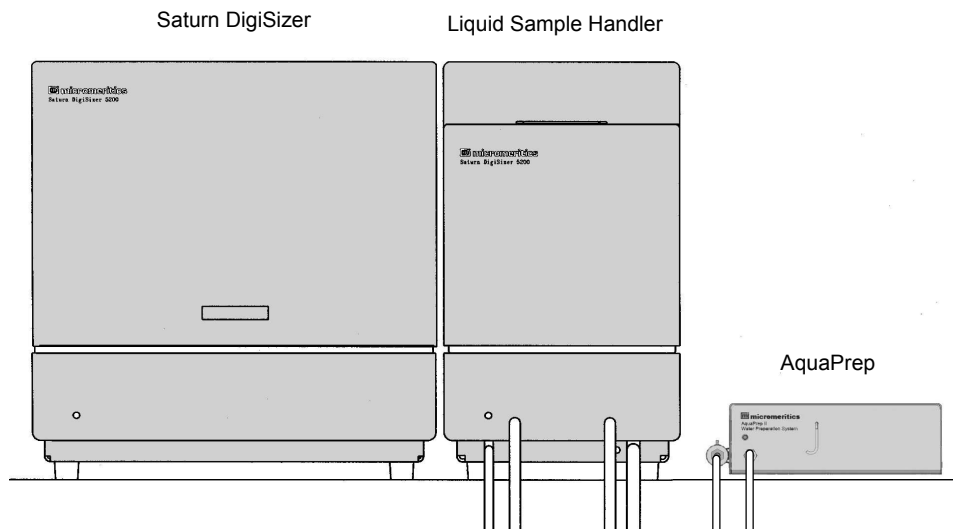
**Failure to package your instrument properly may result in shipping damage.**

2. Tag or identify the defective equipment, noting the defect and circumstances, if any, under which the defect is observed.
3. Reference the sales order or purchase order, and provide the date that the equipment was received.

- Notify the Micromeritics Service Department of the defect and request shipping instructions. The service department will assign a Returned Materials Authorization (RMA) number. Write the RMA number on the outside of the shipping carton.

## Installing the AquaPrep

Ideally, the AquaPrep should be placed next to the liquid sample handling module of the DigiSizer (illustrated below). This allows for easy transfer of the container of deaerated water from the AquaPrep to the sample handling module.



## Selecting the Input Power

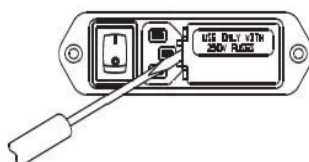
All instruments leave the factory set for 120 VAC and with the line fuse removed. The correct setting of the universal power entrance must be checked and the appropriate fuse(s) installed before the AquaPrep can be operated. The AquaPrep is designed to operate with 100, 120, 220, or 240 VAC at 50 or 60 Hz. Voltage selection and fusing are made at the power connector, which is located on the rear panel of the unit.

Do not connect the power cord until after you have verified the input power.

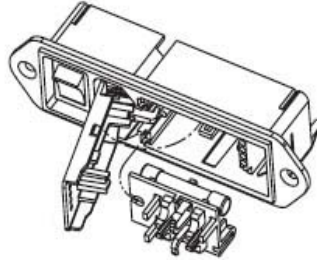


**The power cord should be disconnected from the AquaPrep before removing the cover from the input power connector. Failure to disconnect the power cord could result in electrical shock.**

- Insert the tip of a small pocket screwdriver (or pointed object) into the left side of the power module located on the rear panel of the AquaPrep.



2. Gently lift up until the cover lifts up approximately 6 mm, then swing the cover to the left; the cover is hinged and cannot be removed.
3. Remove the fuse block (you may have to use needle-nose pliers to grasp the fuse block).



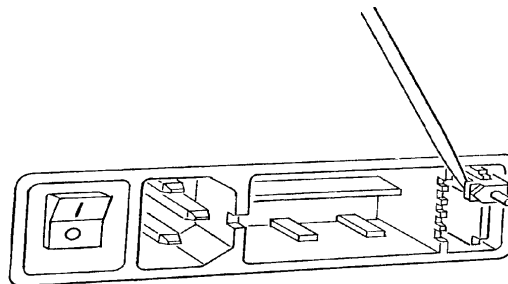
4. The input power connector can be used with either a single-fuse arrangement (100-120 VAC) or a double-fuse arrangement (200-240 VAC). Insert the appropriate fuse(s) for the input power source.



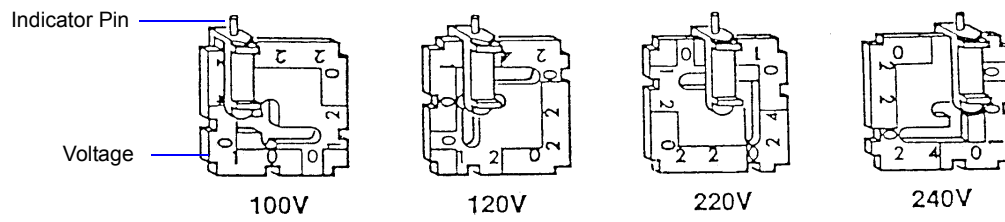
**The fuses used in the AquaPrep must be identical in type and rating to that specified. Use of other fuses could result in electrical shock and/or damage to the analyzer.**

Power Source	Fuse
100-120 VAC	2.0 Amp, slow blow (requires one)
200-240 VAC	1.0 Amp, 5x20 mm, slow blow (requires two)

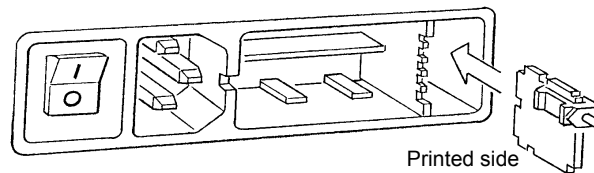
5. Position the fuse block so that the side containing the fuse(s) is facing the power module and insert it into the connector. Do not close the cover.
6. Pull the voltage selector card straight out of the power connector housing.



7. Orient the voltage selector card so that the desired voltage is indicated at the bottom. Orient the indicator pin so that it points upward as shown in the following illustration.



8. Insert the voltage selector card into the power connector housing with the edge containing the desired voltage first and with the printed side facing the power ON/OFF switch.

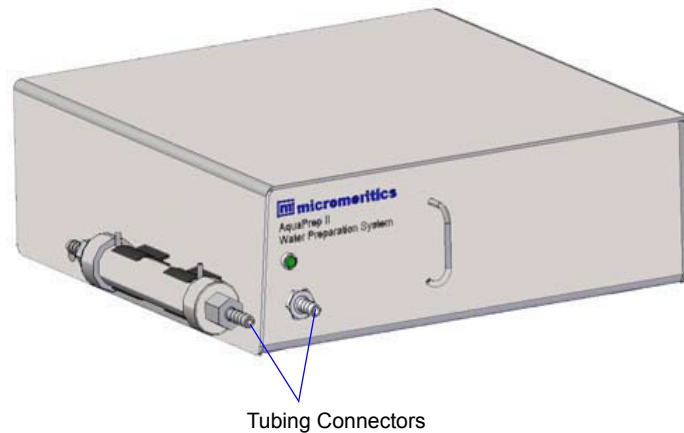


9. Close the cover to the power entry module; ensure that the indicator pin is in the correct position.

## Installing the Tubing

The AquaPrep has inlet and outlet connectors onto which tubing is installed for circulating the water through the AquaPrep for degassing.

Install the two pieces of tubing and hose clamps (supplied in the accessories kit) onto the connectors; one located on the left side of the front panel and the other on the end of the capsule. Squeeze the clamps until 2 to 3 teeth are engaged.



## Connecting the Power Cord

Insert one end of the power cord into the input power connector on the rear panel of the AquaPrep and the other end into an appropriate power source.

Do not turn the AquaPrep on until you have prepared the water container and are ready to begin operation. Refer to Chapter 3 for complete operating instructions.



**Do not turn the AquaPrep on until the water is prepared and ready for deaeration. Failure to have water circulating while the unit is turned on may damage the unit.**





### 3. OPERATION

The AquaPrep is simple and easy to operate; perform the following steps to begin the deaeration process:

1. Fill a 10-liter, plastic container with deionized water which has been filtered with a 1-micron filter. Place the container on the floor directly below the AquaPrep.



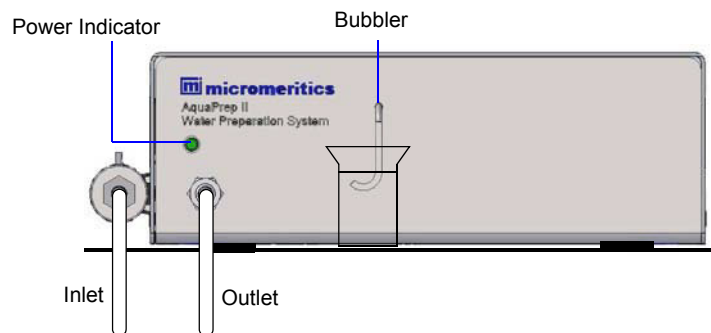
**The AquaPrep works only with water; do not use any other liquid. Do not use water that contains a detergent or wetting solution.**

The AquaPrep can aspirate water as high as 1-1/2 meters (5 feet); however the floor position is recommended.

2. Insert the ends of the tubing into the water. Orient the tubing as follows:
  - The end of the inlet tubing (supply) from the capsule should be close to the bottom of the container.
  - The end of the outlet tubing (return) from the front panel connector should be just below (approximately 5 cm, or 2 in.) the surface of the water so that splashing does not re-introduce air into the liquid.

It is important that the tubing is arranged at different levels. This promotes circulation and ensures that all the liquid is exposed during the deaeration process.

3. Fill the beaker (supplied in the accessories kit) with filtered deionized water and place it under the bubbler. Ensure that the end of the bubbler is submerged in the water approximately 0.32 to 0.64 cm (1/8 to 1/4 in.).



- Place the On/Off switch (on the rear panel) in the On position (O); the power indicator should illuminate.



**Be sure to turn off the AquaPrep when water is not being deaerated. Failure to have water circulating may damage the unit.**

- Allow the water to deaerate for two hours.



**Be sure circulation of the liquid being degassed is promoted.**

Water varies enormously in its dissolved air content depending on source, temperature, and time of year. Typically the AquaPrep adequately reduces the content of dissolved air from 10 liters of filtered and deionized water in two hours or less.

- Remove the tubes from the container of water

You may wish to observe and record the bubble rate per minute before removing the tubes. This value could be useful as a guide for the adequacy of deaeration. For example you may observe 20 bubbles per minute. If the background measurement you will perform next shows adequate deaeration, you can watch for approximately 20 bubbles per minute when deaerating a fresh supply of water.

- Move the container closer to the liquid sample handler. Then insert the analysis tubing from the liquid sample handler into the container.
- Perform a background measurement; first with a flow rate of approximately 3 L/min. and then at 15 L/min. There will be no difference in the two results when the water is sufficiently deaerated.



**Use bubble rate as a guide to aeration for fresh batches of water.**

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## 4. TROUBLESHOOTING

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There are only two components subject to failure or degradation that are amenable to user diagnosis and correction:

- Fuses
- Hydrophobic capsule

Contact your local service representative or Micromeritics directly for all other difficulties with the AquaPrep.

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### Fuses

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If the AquaPrep fails to respond when the unit is turned on, first unplug the power cord and check the fuse(s); replace if necessary. Refer to [Selecting the Input Power](#), page 2-2, steps 1 through 5 for instructions on replacing the fuse. Check the power receptacle for its voltage to prevent recurrence of the problem. Refer to Chapter 5 for ordering information.

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### Hydrophobic Capsule

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Replace the hydrophobic capsule when excessive deterioration is detected. Refer to Chapter 5 for ordering information.

1. Turn off the AquaPrep.
2. Remove all tubing and clamps from the capsule. The tubing on the top of the capsule is secured by a twist-lock fitting; turn the fitting counterclockwise to remove.
3. Pull the capsule from its retaining clips and discard.
4. Attach the tubes and clamps to their respective fittings on the new capsule. Squeeze the clamps until 2 to 3 teeth are engaged. It's usually easier to attach the tubes before installing the capsule on the AquaPrep.
5. Snap the new capsule into its retaining clips on the side of the AquaPrep.



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## 5. ORDERING INFORMATION

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Components and accessories can be ordered by:

- telephone: (770) 662-3636
- email: [customerservice@micromeritics.com](mailto:customerservice@micromeritics.com)
- internet: [www.micromeritics.com](http://www.micromeritics.com)

Part Number	Item and Description
003-51130-01	Fuse, 1.0 Amp, 5 x 20 mm, slow blow (T1 delay)
003-51131-00	Fuse, 2.0 Amp, 3 AG, slow blow
055-25600-01	Hydrophobic capsule, with fittings

