

# Thermo Scientific Bantam Deionizer

Type D0800, Series 494

Operating Manual and Parts List 60119 Rev. 0



<b>Models covered in this manual</b>	
<b>Model number</b>	<b>Voltage</b>
D0800 (7107)	120V
D0805 (7108)	240V

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**Important** Read this instruction manual. Failure to read, understand and follow the instructions in this manual may result in damage to the unit, injury to operating personnel, and poor equipment performance. ▲

**Caution** All internal adjustments and maintenance must be performed by qualified service personnel. ▲

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Potential electrical hazards. Only qualified persons should perform procedures associated with this symbol.



Equipment being maintained or serviced must be turned off and locked off to prevent possible injury.



Hot surface(s) present which may cause burns to unprotected skin, or to materials which may be damaged by elevated temperatures.



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- ✓ Always use the proper protective equipment (clothing, gloves, goggles, etc.)
- ✓ Always dissipate extreme cold or heat and wear protective clothing.
- ✓ Always follow good hygiene practices.
- ✓ Each individual is responsible for his or her own safety.

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# Section 1 **Safety Information**

This manual contains important operating and safety information. The user must carefully read and understand the contents of this manual prior to the use of this equipment.

Your Thermo Scientific Bantam Deionizer has been designed with function, reliability, and safety in mind. It is the user's responsibility to install it in conformance with local electrical codes. For safe operation, pay attention to Notes, Cautions, and Warnings throughout the manual.

## **Warnings**

To avoid electrical shock, always:

1. Use a properly grounded electrical outlet of correct voltage and current handling capacity.
2. Disconnect from the power supply prior to maintenance and servicing.

To avoid personal injury:

1. Do not use in the presence of flammable or combustible materials; fire or explosion may result. This device contains components which may ignite such materials.
2. Refer servicing to qualified personnel.





## Section 2 General Specifications

**Note** Pure water exposed to the atmosphere will absorb CO<sub>2</sub>. This will lower resistivity and pH. ▲

	SI Units	English
Maximum flow rate	38 LPH <sup>1</sup>	10 GPH <sup>1</sup>
Temperature range	4-49° C	40-120° F
Exchange capacity	see below	see below
<b>Plumbing service connections</b>		
Inlet	~	1/4" OD tubing
Outlet	~	1/4" OD tubing
Drain	~	1/4" OD tubing
<b>Overall dimensions</b>		
Width	152 mm	6"
Depth	213 mm	8-3/8"
Height	724 mm	28-1/2"
<b>Electrical requirements</b>		
Model D0800	120V, 50/60 Hz, 1 phase <sup>2</sup>	120V, 50/60 Hz, 1 phase <sup>2</sup>
Model D0805	240V, 50/60 Hz, 1 phase <sup>2</sup>	240V, 50/60 Hz, 1 phase <sup>2</sup>

<sup>1</sup> Using average tap water. Delivers deionized water in continuous flow at atmospheric pressure. Although the cartridge holder can be operated at inlet pressures up to 700 kPa (100 psig), the cartridge holder cannot without any back pressure. Ensure that maximum flow rate is not exceeded, the outlet is open to atmosphere, and there are no tubing restrictions.

<sup>2</sup> Provided with 1.7 m (5-1/2") electrical cord and plug.



## Section 3 Cartridge Specifications

	<b>Overall Dimensions W x H x D in. (cm)</b>	<b>Feed Water Pressure (psi)</b>	<b>Electrical</b>	<b>Model Number</b>
Thermo Scientific Deionizer	6 x 28.5 x 8.75 (15.2 x 72.4 x 22.2)	5-70	120 VAC 240 VAC	D0800 D0805

<b>Required Accessories</b>			
<b>Choose the cartridge based on your application needs.</b>	<b>Resin Type(s)</b>	<b>Capacity</b>	<b>Model Number</b>
Anion Removal - Effective removal of weakly ionized impurities, raises the pH of solutions, recovers precious metal complex.	Strong Anion Exchange	1680 grains	D0760
Cation Removal - Converts ionized salts to the acid form resulting in a product water that is low in pH, ideal for precious metal or isotope recovery.	Strong Cation Exchange	3170 grains	D0815
High Capacity - Removes ionized impurities, produces a larger quantity of water than that of the Ultrapure (D0809), however at a lower resistivity.	Two Bed Ion Exchange	1760 grains	D0803
Organic Removal - Removes organics and chlorine.	Activated Carbon	5000 gal	D0813
Ultrapure - Removes ionized impurities to produce high resistivity water with a neutral pH.	Mixed Bed	875 grains	D0809
Ultrapure and Organic Removal (Pretreatment) - Commonly used as still pretreatment. Removes ionized impurities and has a layer of activated carbon to remove chlorine and organics.	Mixed Bed, Activated Carbon	785 grains / 1000 gal	D0832



## Section 4 Installation

Unpack the Bantam Deionizer carefully so that none of the parts are marred or damaged. Ensure that any loose parts - such as tubing and fittings for the plumbing service connections - are not discarded with the packing materials.

### Choosing a Site

Move the Deionizer to the desired operating location. The holder should be installed in a location accessible to a water supply (raw water faucet). Also, the unit should be accessible to an electrical outlet. The holder is equipped with a 1.7m (5-1/2') electrical cord.

### Mounting

The Deionizer is shipped assembled for bench mounting. Four screws are provided for wall mounting if desired.

### Plumbing Service Connections

The Bantam Deionizers are supplied with polypropylene elbows, inlet and drain tubing, and straight connectors. The plumbing service connections are accomplished as follows:

1. Remove the fitting and screen from the raw water faucet opening.
2. Install a customer-supplied 3/8" NPT x 1/8" NPT brass bushing in the faucet opening. The 1/8" NPT portion of the brass bushing is used to connect the 1/8" NPT x 1/4" OD straight connector provided to connect the Deionizer inlet to the raw water supply. If the raw water supply service connection is not 3/8" NPT, use another brass fitting as required.

**Note** It is suggested that the Deionizer inlet be connected to a raw water faucet. Other means of connecting the holder inlet to a raw water supply can be used, if desired. ▲

3. Cut a piece of tubing from the 2.1m (7') of 1/4" OD tubing (part no. TU1494X1) provided to make the plumbing service connection between the raw water faucet and the plumbing service connection marked "inlet" on the Deionizer. Ensure that sufficient tubing is left to drain the holder through the plumbing service connection marked "drain" on the Deionizer to the sink and to make the plumbing service connection between the holder effluent connection at the top of the unit and the point of distribution.

## Plumbing Service Connections

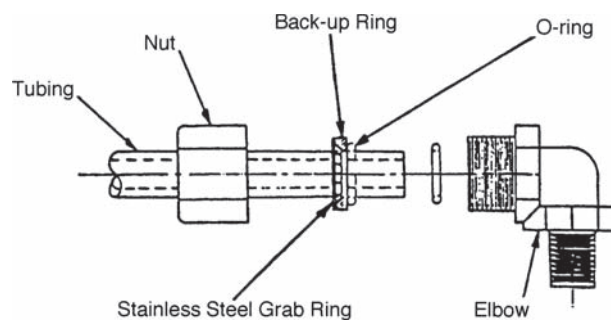
4. Thread the 1/8" NPT x 1/4" OD straight connector provided (part no. 15451) into the brass bushing at the faucet opening and connect the tubing between this connection and the plumbing service connection marked "inlet" on the holder.
5. Ensure that the 1/8" NPT x 1/4" OD polypropylene elbow (part no. 15847) is threaded into the effluent connection at the top of the holder and connect tubing between this connection and the point of distribution. See Elbow-Tubing Assembly in this manual to ensure that the connection is made properly to prevent leakage.
6. Connect the remaining tubing to the plumbing service connection marked "drain" and extend the tubing into the sink to allow the holder to be drained in an unrestricted manner.

**Caution** Do not restrict the tubing and run the tubing in an upward direction from the top of the unit. Any restriction on the outlet can result in a cartridge bursting and flooding. ▲

## Elbow-Tubing Assembly

Assembling the tubing and polypropylene elbow is accomplished as follows to ensure against leakage.

1. Remove the adapter nut, being careful not to lose the o-ring, backup ring, and stainless steel grab ring.
2. Remove the o-ring from the elbow.
3. Install the metal grab ring and backup ring in the adapter nut, and install the nut on the elbow. Do not install the o-ring at this time.



**Figure 4-1.** Elbow Tubing Installation

## Elbow-Tubing Assembly (continued)

4. Push the tubing through the nut until it bottoms out in the elbow.
5. Remove the adapter nut, then install the o-ring on the tubing. Do not push the backup or metal grab rings back on the tubing when installing the o-ring on the tubing.
6. Install the adapter nut on the elbow and hand-tighten the nut.

## Cartridge Installation

Install a cartridge in the holder as follows:

1. Install the large o-ring (part no. 06419) on the cartridge holder. A small o-ring should be on the bottom of the cell. The large o-ring is packaged separately during shipment.
2. Install the fresh cartridge in an upright position, the large opening toward the bottom. The lower tightening wheel should be turned down to allow the cartridge to be centered between the top and bottom o-ring.
3. Turn the lower tightening wheel until the cartridge seats against the top o-ring.

**Caution** Do not apply a wrench to the nut - the nut should be hand-tightened only enough to prevent leakage.

**Caution** Do not over-tighten the tightening wheel. ▲

**Note** Water purified by the ion-exchange method is not necessarily free from odor and color. In some instances, color or odor could be introduced by trace quantities of free amines or low molecular weight polymers which are present in fresh untreated resin. Generally, the amine odor lessens or disappears after passing a few gallons of water through the holder. ▲





## Section 5 Operation

Operate the Bantam Deionizer as follows:

1. Close the drain valve.
2. Open the inlet valve one to two turns and allow a couple of minutes for the cartridge to fill. If leakage occurs at an o-ring, close the inlet valve, loosen the lower tightening wheel enough to rotate the cartridge 90°, and retighten. Open the inlet valve and recheck for leakage.

**Caution** Do not over-tighten the tightening wheel. ▲

3. When water issues from the tubing, adjust the inlet valve to the desired flow rate (see Cartridge Technical Characteristics).

**Caution** Do not exceed a flow rate of 38 LPH (10 GPH). Leakage will occur if this flow is exceeded. ▲

### Purity Meter Operation

Operate the Direct Reading Meter by setting the on/off switch to the “on” position. When the purity meter drops below the acceptable minimum purity, or when the purity meter needle registers in the 0.05 to 0.025 megohm red range, the cartridge should be replaced. The meter provides a constant indication of the water purity. The meter scale is calibrated 0 to 19 PPM (ionizable impurities) with equivalent indications in megohms resistance from 0.025 to 18, making possible constant monitoring of the water purity. To stop the meter from operating, set the on/off switch to the “off” position.



## Section 6 Maintenance and Servicing

Maintenance of the Bantam Deionizer should be minimal, involving cartridge replacement and o-ring seal replacement. Also, an occasional calibration check of the purity meter might be necessary. Cartridges should be stored away from heat.

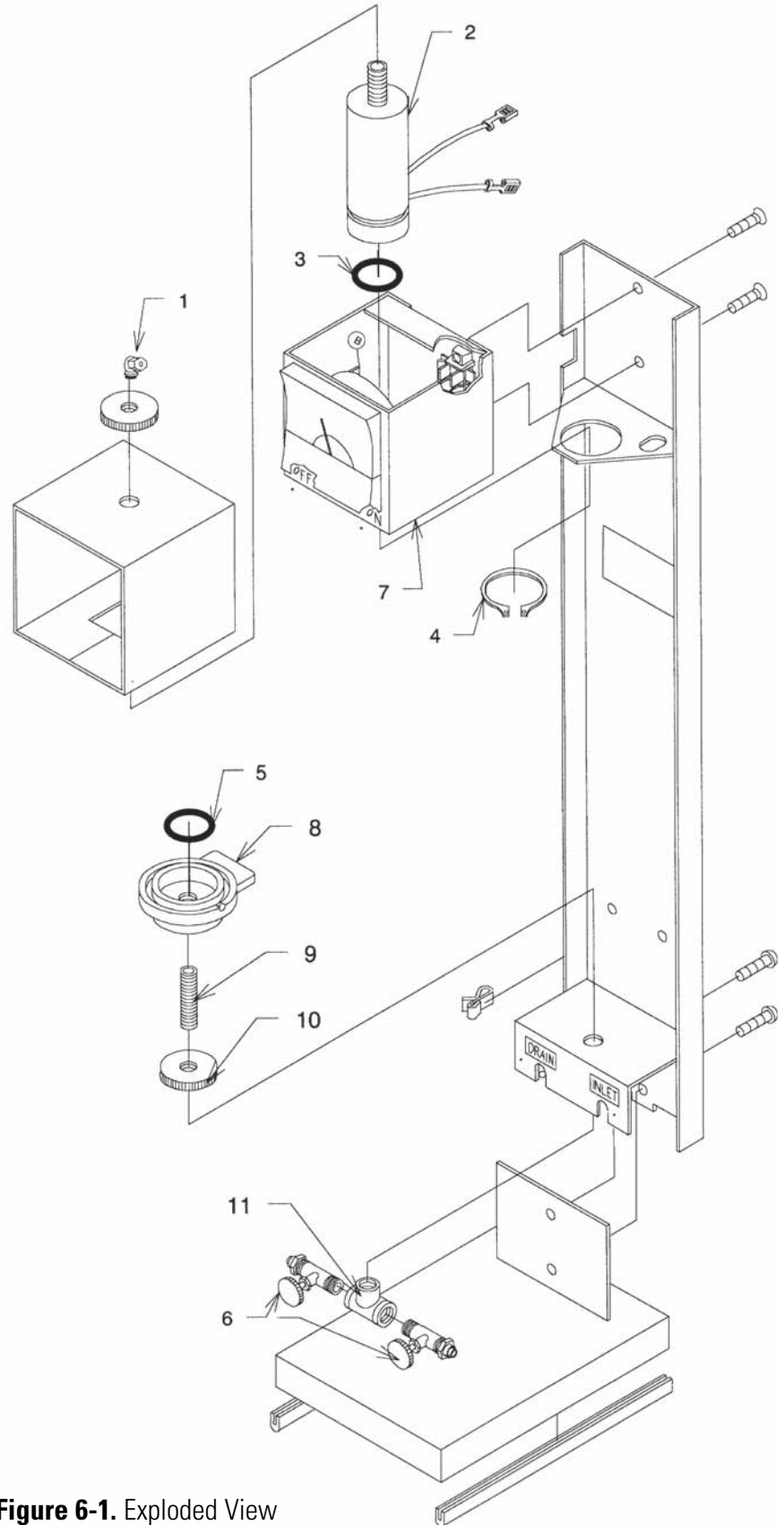
**Warning** To avoid electrical shock, always disconnect the power supply before maintenance and servicing. Refer servicing to qualified personnel. ▲

### Calibration

Calibrate the Direct Reading Meter as follows:

1. Set the on/off switch to the “off” position.
2. Check the zero alignment of the meter needle to the meter scale. If required, rotate the zero adjustment screw until the meter needle is aligned with the line indicating the beginning of the meter scale. The zero adjustment screw is located on the face of the meter below the scales.
3. To calibrate the meter further, connect a known resistance across the cell terminals. A 50,000 ohm resistance should correspond to “0.05” on the meter scale.
4. With the on/off switch set to “on,” adjust the potentiometer (screwdriver adjustment) at the bottom of the meter case to make the scale reading correspond to the simulated resistance.

**Section 6**  
Maintenance and Servicing



**Figure 6-1.** Exploded View

## Section 7 Replacement Parts

Model Type .....D0800

Product Name .....Bantam Deionizer

Series Number .....494

Key	Part # (Qty.)	Description
1	15847	Elbow, 1/8" NPT x 1/4" tube
2	15570BI	Cell, BD-1
3	06411	O-ring
4	15482BI	Ring, retaining
5	06419	O-ring
6	15477BI	Valve, brass, 1/4" OD x 1/8" NPT
7	21538 (115V)	Meter
8	15597	Cartridge holder
9	15896	Nipple
10	15502	Lower Tightening Wheel
11	05302	Tee
	D0803	Cartridge, high capacity
	D0760	Cartridge, anion removal
	D0815	Cartridge, cation removal
	D0809	Cartridge, Ultrapure
	D0813	Cartridge, organic removal
	D0832	Cartridge, Ultrapure & organic removal

## **Ordering Procedures**

Please refer to the Specification Plate for the complete model number, serial number, and series number when requesting service, replacement parts or in any correspondence concerning this unit.

All parts listed herein may be ordered from the Thermo Scientific dealer from whom you purchased this unit, or can be obtained promptly from the factory. When service or replacement parts are needed, check first with your dealer. If the dealer cannot process your request, then contact our Technical Services Department.

Prior to returning any materials, please contact our Technical Services Department for a “Return Materials Authorization” number (RMA). Material returned without an RMA number will be refused.

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