



Pump Powered Water Supplies - Operation & Maintenance Manual

For Model:

BA-MS-100

BA-MS-105

BA-MS-106

BA-MS-200

BA-MS-205

BA-MS-604J

BA-MS-606

BA-MS-627



General Information & Precautions

This publication provides detailed instructions for installing the single point watering system kit and/or related water supply. Thoroughly review this document before any installation procedures are performed.



The following safety statements relate to specific safety issues and must be read, understood, and heeded before a kit is installed. Failure to do so could result in personal injury and/or property damage.

DANGER

- Battery – Explosive gases! Do not smoke. Keep sparks and flames away from the vehicle and service area. Ventilate when charging or operating vehicle in an enclosed space. Wear a full face shield and rubber gloves when working on or near batteries.
- Battery – Poison! Contains acid! Causes severe burns. Avoid contact with skin, eyes, or clothing. Antidotes:
 - External: Flush with water. Call a physician immediately.
 - Internal: Drink large quantities of milk or water. Follow with milk of magnesia or vegetable oil. Call a physician immediately.
 - Eyes: Flush with water for 15 minutes. Call a physician immediately.

WARNING

- Follow the procedures exactly as stated in this instruction, and heed all DANGER, WARNING, and CAUTION statements in this instruction as well as those on the vehicle and battery charger.
- Only trained technicians should service or repair the single point watering system. Anyone doing even simple repairs or service should have knowledge and experience in plumbing, electrical and mechanical repair. The appropriate instructions must be used when performing maintenance, service, or accessory installation.
- Prior to servicing the vehicle or leaving the vehicle unattended, turn the key switch OFF, remove the key, and chock the wheels when servicing the vehicle.
- Wear safety glasses or approved eye protection when servicing any part of the watering system. Wear a full face shield and rubber gloves when working on or near batteries.
- Do not wear loose clothing or jewelry such as rings, watches, chains, etc., when servicing the vehicle or battery charger.
- Moving parts! Do not attempt to service the vehicle while it is running.
- Hot! Do not attempt to service hot engine, exhaust system, or motor. Failure to heed this warning could result in severe burns.
- Use insulated tools when working near batteries or electrical connections. Use extreme caution to avoid shorting of components or wiring.
- If wires are removed or replaced, make sure wiring and wire harness are properly routed and secured. Failure to properly route and secure wiring could result in vehicle malfunction, property damage, personal injury, or death.

Battery Maintenance

Deep cycle batteries need water. More importantly, water must be added at the right time and in the right amount or the battery's performance and longevity suffers.

Checking and maintaining the electrolyte levels in your batteries can save thousands of dollars by preventing early battery failure due to cell dilution and imbalance. Although adding water to battery cells is considered a tedious job, it is a necessity.

Electrolyte levels drop during discharge and rise during charge. Therefore, it is imperative that electrolyte levels be checked and adjusted after the batteries are fully charged. Adding water correctly using a Flow-Rite Single Point Watering system helps maintain the electrolyte level among the battery cells.

Water must be added after fully charging the battery. Prior to charging, there should be sufficient water to cover the plates. If the battery has been discharged (partially or fully), the water level should still be above the plates.

Subsequent watering intervals are dependent on the local climate, charging methods, application, and age of batteries. Flow-Rite recommends that new batteries be checked once a month and older batteries be checked weekly until you get a feel for your water consumption rate.

Package Contents

Millennium Pump
 Powered Water Supply
 QTY x 1



BA-MS-100 & 200 differ in appearance from cart pictured above

Model Number	Power Requirement	Battery Requirements
BA-MS-100	115 VAC	12 VDC Group 27 Customer Supplied
BA-MS-105	100-115 VAC	12 VDC (sealed) Included
BA-MS-106	100-240 VAC	12 VDC (sealed) Included
BA-MS-200	115 VAC	Not Applicable
BA-MS-205	115 VAC	Not Applicable
BA-MS-604J	115VAC	Not Applicable
BA-MS-606	115 VAC	Not Applicable
BA-MS-627	220 VAC	Not Applicable

Watering Procedures

1. Water After Charge

- Electrolyte levels drop during discharge and rise during charge. In addition, charging generates heat, fluid expansion and explosive gases. Watering a battery before charge (or with a low charge level) can lead to boil over resulting in potential damage of the watering system, battery and vehicle.

Water must always be added after fully charging the battery. Prior to charging, there must be sufficient water to cover the plates. If the battery has been discharged (partially or fully), the water level should still be above the plates.

2. Watering Intervals

- Watering intervals are dependent on the local climate, charging methods, application, and age of batteries. Flow-Rite recommends that new batteries be checked once a month and older batteries be checked weekly until you get a feel for your water consumption rate.

Typically for a heavy use application, we recommend watering a maximum of once per week, and for light use applications once per month. Generally it is best to water on Wednesdays for most applications. Specifically you should not water a battery that has been sitting for an extended period of time with no activity (non use or not on charge) such as a battery that has sat over the weekend. It is best to water a warm battery that has just been fully charged.

Important: Water quality is important to maintain the life of your battery and watering system. Always use water that meets the quality requirements of your batteries' manufacturer.

Operation

For continued successful operation of your Single Point Watering system always:

1. Only use Flow-Rite approved equipment
Warning! Use of unapproved equipment or modification of approved equipment can lead to system failure and will void your warranty
2. Always follow Flow-Rite's required watering procedures.
3. Perform regular scheduled maintenance!
4. For indoor use only!

Warning! Only fill batteries after they have been fully charged.

Step 1 - Fill Tank

- Ensure the water supply has ample water to fill battery. If necessary, remove lid and fill cart / holding tank with water. All pump powered water supplies are compatible with deionized water.

Step 2 - Power Up Water Supply

- For AC powered water supplies first plug into a GFCI outlet. See power requirements of your specific models on page 4. Turn on rocker switch.

- For DC powered (100 series) carts turn on rocker switch, and check voltage meter to ensure battery is charged. The cart should not be operated once the voltage falls below 12 volts.

Recharging Battery: Plug in battery charger (to a GFCI outlet) when cart is not in use to ensure the battery is fully charged. The on-board charger will maintain charge levels as necessary. See page 4 for charger power requirements.

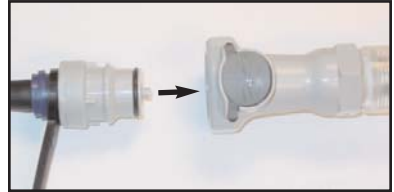
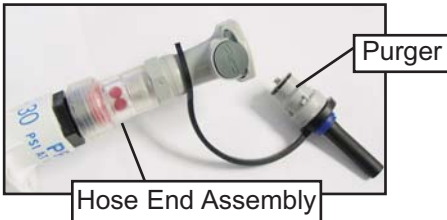
NOTE: Once the water supply has been powered on, the pump will turn on briefly to develop pressure in the supply hose and then will turn off. The power switch can be left on in between refilling batteries. The pumps will turn on occasionally to maintain pressure in supply hose. This occasional cycling will not damage the water supply, although it is recommended that the water supply be powered down if it will be inactive for 1 hour or more.

Operation Continued

Step 3 - Qualify Water Supply

- Check flow rate through included purger by mating purger with hose end assembly. Verify that a minimum of 2 GPM (Gallons per minute) is achieved. This can be measured with a bucket and a stop watch or a watch with a second hand.

Note: Should a 2 GPM flow rate not be produced refer to the troubleshooting guide in your water supply's instruction booklet.

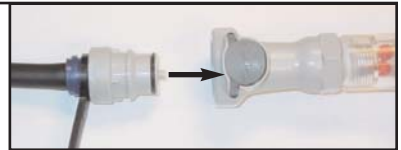


Step 4 - Remove Dust Cover



Step 5 - Mate Couplers

- Insert the male coupler on the spw system into the female coupler on the end of the water supply.



Step 6 - Observe Flow Indicator

- The red balls inside the flow indicator will begin to spin indicating that water is flowing into the battery. As the cells fill and the valves shut off, the balls will begin to spin slower until they come to a stop. This indicates that all valves have shut off and filling is complete.



Step 7 - Disconnect

- When the balls stop spinning, immediately disconnect the couplers by depressing the push button on the female coupler. If the water supply is left connected after the filling process is finished it could lead to an overflow.

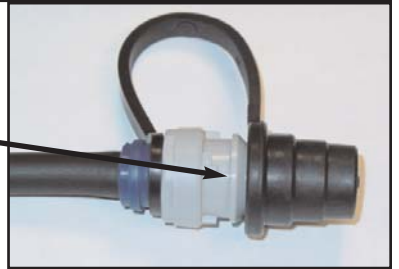


- **CAUTION:** If at any time during the filling process you have a valve failure disconnect immediately.

Step 8 - Replace Dust Cover

- Place dust cover back over the male coupler. Do not push cover past the large barb on the coupler.

Tip: If you slightly squeeze the dust cover when sliding it over the coupler it will create a vacuum allowing it to hold tightly.

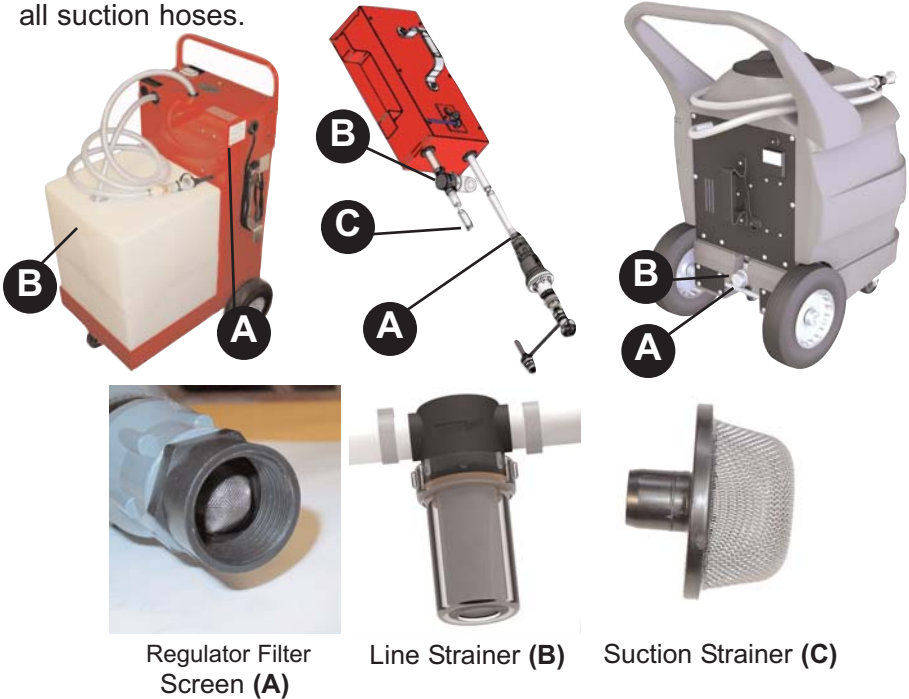


Regular Maintenance

Your single point watering system requires regular preventative maintenance on at least a quarterly basis.

1. Check all screens and/or filters on water supplies

Clean or replace all filters / line strainers as necessary. Failure to do so can cause a reduction in the water pressure and flow rates needed to operate the system properly. A filter screen can be found on the inlet of all regulators, a line strainer and/or suction strainer on all suction hoses.



Note: Pictures may differ slightly from your specific application. For Red Carts Suction Strainer is found inside of white holding tank and regulator is found inside of the red housing.

2. Inspect the condition of all tubing connections, red end caps, swivel T's, and couplers.

Make sure that all parts are in good working condition and are secure, leak free, and properly connected. The coupler must have an O-ring and dust cover properly attached.

3. Electrolyte Levels

Flow-Rite recommends checking the electrolyte level in each cell for accuracy after the system has been installed and operational for three months.

Seasonal Maintenance

Water Supplies

Water supplies must be drained and stored in an empty state if they will be exposed to freezing temperatures. Failure to do so can cause permanent damage.

Watering Systems

If you have vehicles that are taken out of service or put into storage for a period of 6 weeks or longer, your single point watering system will require seasonal maintenance. No special steps need to be taken for winterization of the SPW system that is mounted on the batteries; however, the following steps need to be followed when bringing your vehicle back into service:

1. After the batteries have been fully charged / equalized, connect the system to its water supply for 3-5 seconds then disconnect regardless of whether or not the batteries are completely full.
2. Return the vehicle to its regular service
3. Place the vehicle back into its regular watering schedule (waiting at least 1 week until next watering).

Operating Specifications

Operating Requirement of SPW system

Flow-Rate:	2-5 gallons per minute*
Pressure Range:	3-35 PSI (no flow, static)
Temp. Range:	Freezing - 150° F
	Freezing- 65.5° C

Water supply Operating Requirements

Inlet Pressure Range	40-100 PSI (no flow, static)
Temp. Range	33 - 150° F
	1 - 65.5° C

All product specifications should be met for proper operation of your Flow-Rite SPW system. Contact battery supplier or Flow-Rite Controls if you have any questions regarding product specifications or how to verify a water supply.

*Flow rate should be measured at the end of a purger (female / male coupler combination).

Troubleshooting

If you notice reduced run time on your vehicle check to see that each cell is filled to the proper level. In the event that a cell is not showing water, connect system to its water supply. Recheck the level of low cells. If they are still low call for service. In the event that a valve does not shut off, qualify water supply to ensure that it is producing 2GPM (measured through the purger). If the water supply qualifies, call for service. If it does not qualify, perform Maintenance procedures and requalify. If it does not qualify after performing Maintenance call for service.



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