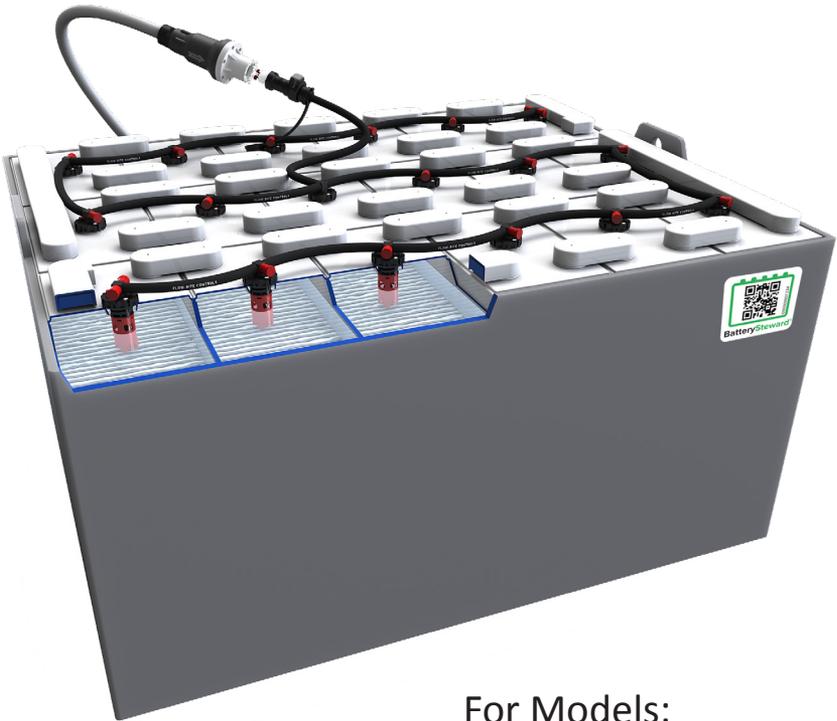




Millennium Series Installation, Operation, and Maintenance Manual



For Models:
Clamless Millennium
SPW Systems

General Information & Precautions

This publication provides detailed instructions for installing a Millennium watering system. 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 watering system 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.

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.

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.

Package Contents

| | | | |
|---|---|---|--|
|  |  |  |  |
| Millennium Valve | Male Coupler | Tubing | Red End Caps |
|  |  |  |  |
| Quick Start Guide | Battery Refill Record | Spanner Tool | Battery Steward |

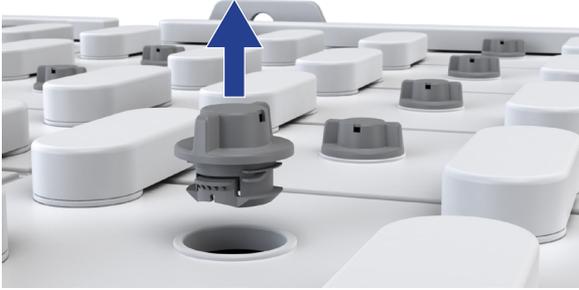
| | 6 Cell Kit | 12 Cell Kit | 18 Cell Kit | 24 Cell Kit | 36 Cell | 40 Cell Kit | Master Pack |
|----------------------------|------------|-------------|-------------|-------------|---------|-------------|-------------|
| Millennium Valves | 6 | 12 | 18 | 24 | 36 | 40 | 60 |
| Clampless Tubing (in feet) | 4.8 | 9.6 | 13.5 | 17.25 | 25 | 29 | 40 |
| Red End Caps | 9 | 18 | 27 | 36 | 54 | 54 | 70 |
| Coupler w/ Feed Tube | 1 | 1 | 1 | 1 | 2 | 2 | 0 |
| Spanner Tool | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Battery Refill Record | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Instruction Manual | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Installation

Step 1

Clean Battery & Remove Vent Caps

Wipe down battery top and remove any loose debris. Remove existing vent caps from battery.



Step 2

Install Valves

Insert and secure Millennium valve into each battery cell by turning valve in a clockwise direction. Use the spanner tool to tighten. To secure the 35 mm DIN style cap, simply push in by hand.

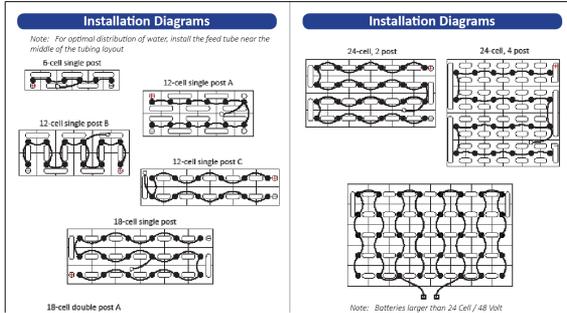


Installation

Step 3

Determine Tube Routing

Choose the proper tube routing for your battery. In general, the tubing will follow the electrical path. Batteries larger than 24 cells will be plumbed as two separate systems. For specific layouts, please refer to the installation diagrams on pages 9-10 or at www.flow-rite.com.



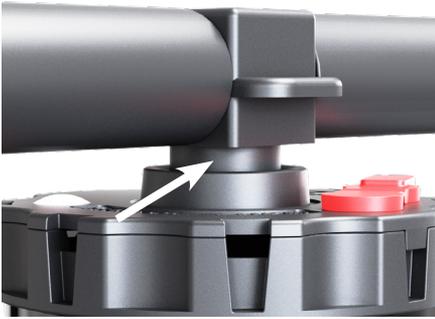
Step 4

Install Tubing Segments (Pre-Assembled Kits Only)

If kit does not include pre-assembled hose sections proceed to step 5. Snap each swivel tee into the top of your Millennium valves. Be sure to insert the swivel tees vertically to prevent o-ring damage. Press firmly until you hear an audible click. When installed correctly, the swivel tee will set flush with the port on the top of the valve as shown below.



Installation



INCORRECT



CORRECT

Step 5

Install Tubing Segments

If kit includes preassembled sections proceed to step 6. Push a tube segment onto a swivel connector, ensuring it has been pushed to the stop. If needed, trim the tube with a sharp pair of scissors or Flow-Rite tube cutter. When trimming, avoid cutting the tube too short. The tube should have a slight curve in it as shown to prevent kinking or stretching. Connect the tube to the adjacent valve. Repeat until all valves are connected.

Note: Extra tubing attached to the feed tube to connect the cell rows (in battery width direction).



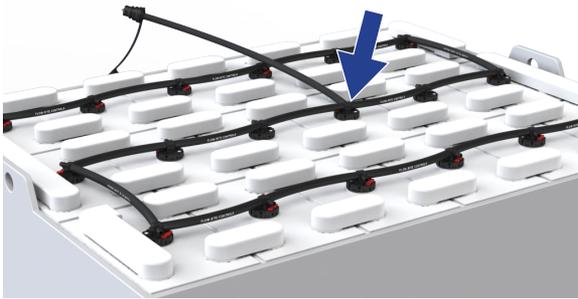
Installation

Step 6

Connect Feed Tube

Locate tube near the center of the plumbing layout and ensure that the water supply can be connected without kinking the tubing. Cut to the desired length and connect to the swivel connector. Connect the quick coupler if applicable.

Note: Coupler should rest on top of the battery and not hang over the side.



Step 7

Install Red End Caps

Press red caps onto all the unused swivel connector ports.



Step 8

Dust Cover

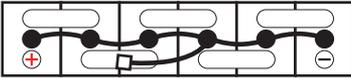
Slide the dust cover over the quick coupler.



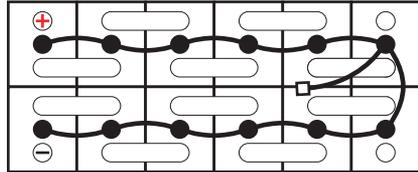
Installation Diagrams

Note: For optimal distribution of water, install the feed tube near the middle of the tubing layout

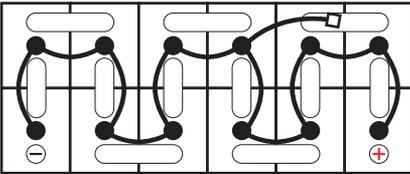
6-cell single post



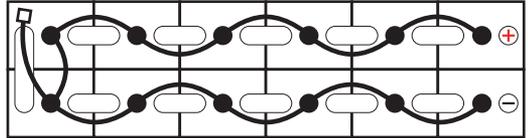
12-cell single post A



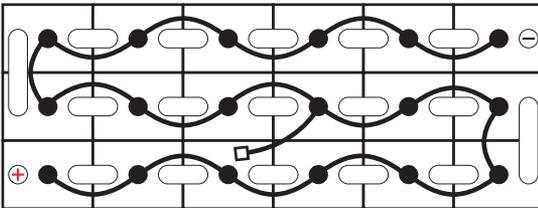
12-cell single post B



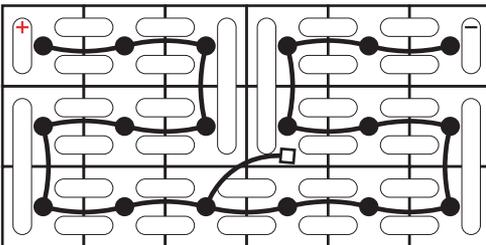
12-cell single post C



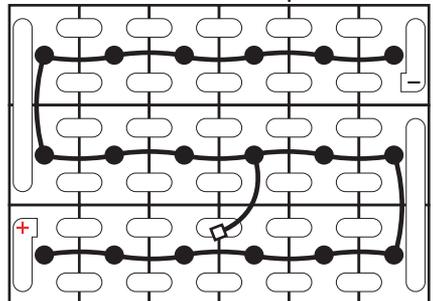
18-cell single post



18-cell double post A

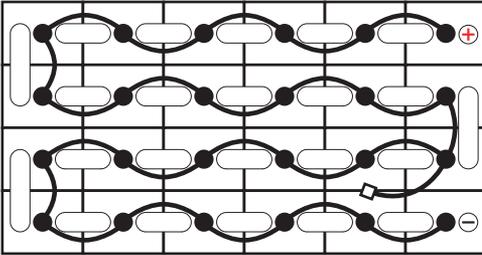


18-cell double post B

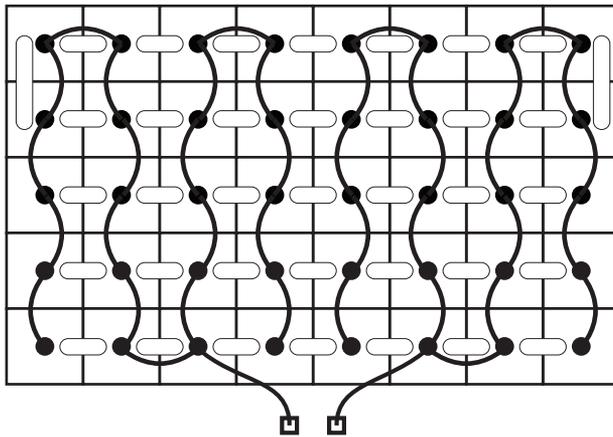
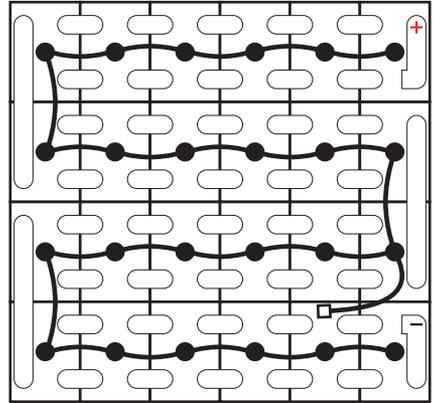


Installation Diagrams

24-cell, 2 post



24-cell, 4 post



Note: Batteries larger than 24 Cell / 48 Volt require two separate plumbing systems to be installed to ensure proper filling.

Watering Procedures

Water After Charge

Electrolyte levels drop during discharge and rise during charge. Watering a battery before charge (or with a low charge level) can lead to boil over, resulting in potential damage to the watering system, battery, and vehicle.

When needed, water must be only added to a fully charged battery. If the battery has been neglected and water levels have fallen below the plates, water should be manually added to just cover the plates. After the battery has been charged, use the watering system to finish filling the battery to ensure proper electrolyte levels.

Watering Intervals

Watering intervals are dependent on the local climate, charging methods, application, and age of batteries. Flow-Rite recommends checking consumption rates manually or with the optical indicator (when equipped). Batteries should be checked weekly until water consumption rates are known.

Typically, for a heavy use applications, watering a maximum of once per week is recommended, and for light use applications, once per month. Do not water a battery that has been sitting for an extended period of time with no activity (non-use or not charged).

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

Operation

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.

Always follow Flow-Rite's required watering procedures. Perform regular scheduled maintenance!

⚠ Warning! Only fill batteries after they have been fully charged and require water.

Step 1

Qualify Water Supply

Check flow rate through included purger by mating the purger with the hose end assembly. Verify that a flow rate of 2-5 gallons per minute is achieved. This can be measured with a bucket and a stop watch or watch with a second hand. This step is only required upon first use after installation.

Note: Should be a 2-5 GPM flow rate not be produced, refer to the troubleshooting guide in your water supply's instruction booklet.



Operation

Step 2

Remove Dust Cover



Step 3

Mate Couplers

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



Operation

Step 4

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 5

Disconnect

When the balls stop spinning, and not before, immediately disconnect the couplers by depressing the push button on the female coupler.

⚠ Very Important *If the water supply is left connected after the filling process is finished, it could lead to an overflow.*

Disconnecting before the balls come to a complete stop will lead to under-filled cells.



Operation

Step 6

Replace Dust Cover

Place dust cover back over the male coupler. Make sure to place feed tube on top of battery to avoid damage to the coupler



Regular Maintenance

Your water supply requires regular preventative maintenance on a quarterly basis.

Check All Screens

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 the regulator, inside line strainer and on the end of the inlet hose.



(A) Regulator Filter Screen



(B) Line Strainer



(C) Suction Strainer

Inspect

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.

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.

Clean Optical Indicators

If the optical indicators are dirty, they should be cleaned by wiping with a cloth.

Seasonal Maintenance

Storage & Winterizing

Watering Systems

To winterize the SPW system, place the feed tube on top of the battery so the tubing can self-drain.

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.

Bringing Back Into Service

If your battery/vehicle has been taken out of service or put into storage for 6 weeks or longer, follow these steps:

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 back to normal operation.
3. Place the vehicle back into its regular watering schedule (waiting at least one week until next watering).

Operating Specifications

| Operating Requirement of SPW system | |
|-------------------------------------|---|
| Flow-Rate: | 2.0-5.0 gallons per minute* 7.6-19.0 Liters per minute |
| Pressure Range: | 3.0 - 35.0 PSI (no flow, static) 0.21-2.4 bar |
| 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 |

If you have any questions, please contact Flow-Rite or your battery supplier.

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

Troubleshooting

In the event that a cell appears to be low, 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 2-5 GPM (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.

Warranty

5 Year Limited Warranty for Millennium SPW

Flow-Rite Controls Warranty Policy for Millennium SPW Systems as used on flooded lead acid batteries.

Flow-Rite Controls warrants to Purchaser that its product, the Millennium Single Point Watering (SPW) kit, will be free of all defects in material and workmanship for five (5) years after the date of purchase. If within five years of the date of purchase, the Millennium SPW kit, fails to perform due to a manufacturing defect, Flow-Rite Controls will repair or replace the Millennium SPW kit free of charge.

A Return Goods Authorization Number (RGA) must be obtained from Flow-Rite Controls (through your Millennium SPW supplier) prior to returning product for warranty consideration. Purchaser must send any product covered under this warranty, along with a copy of supplier's invoice and description of the problem to: Flow-Rite Controls, 960 74th St SW, Byron Center, MI 49315.

Flow-Rite Controls Replacement Plus +

Flow-Rite wants to ensure that your Millennium SPW watering system is always functioning properly. If a swivel tee, gasket or o-ring is ever damaged or broken during regular battery use, we will replace the parts at no charge. Please follow the normal return authorization process.

In addition, if the Millennium SPW kit is installed by an authorized representative in accordance with our installation instructions and a defect in this Millennium SPW system is the cause of a dry cell(s) resulting in permanent failure (unable to deliver 80% of rated capacity), Flow-Rite Controls will repair or replace the cell or battery at its option and at its expense.*

**Limited to cost of repair. Does not include travel or transportation. Covered costs are subject to Flow-Rite Controls warranty cost schedule.*

Warranty

This warranty is subject to the following terms and limitations:

- The SPW system must be installed in agreement with Flow-Rite's current installation and operation instructions.
- The user must follow the recommended watering and maintenance procedures as directed by the Flow-Rite Controls and battery manufacturer's operation and maintenance manuals.
- The user must only fill the Millennium SPW system from Flow-Rite Controls authorized or approved water supplies.
- The warranty is void if the product is subject to misuse, abuse, inadequate maintenance or physical damage other than normal wear and tear.
- The warranty applies to the original user of the product and is not transferable. It applies only to product located in North America.

Flow-Rite Controls, at its option, may require the following:

Documentation of who installed the SPW system, serial number of the battery, watering logs, photographs of installation or proof of purchase (copy of original invoice). Warranty claims must be submitted through your Millennium SPW supplier. Flow-Rite Controls, at its option, has the right to inspect the warranty claimant's facility for proper installation, operation and maintenance procedures of the battery watering system.

Disclaimer of Warranties:

It is expressly understood and agreed that Flow-Rite Controls shall not be liable for damages or injuries to persons or property. Failure to promptly report a malfunction in your system may limit your coverage. This limited warranty expressly excludes any incidental or consequential damages. Because Flow-Rite's warranty excludes any incidental or consequential damages, Flow Rite recommends for the first three months checking electrolyte levels once a month. Thereafter, check electrolyte level once per quarter.



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