FW-1200-M

Operation Manual

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1 Introduction

The Operator's Manual has been prepared to acquaint the owner/operator with this water filtration unit, its various controls, maintenance, and safety instructions. It is valuable for the proper use of The FW-1200-M and should be kept with the unit at all times.

Make sure you read and understand the content of the Operator's Manual.

First Water Systems offers water treatment experts to assist you in your water operation plans. You may contact us at any time to discuss your needs. The FW-1200-M is designed to provide microbiologically safe water for human consumption from fresh water sources.

Used in conjunction with the Supply Station, Filling Station and Aqua Bags, The FW-1200-M provides a complete water solution to a variety of applications.

1.1 Style Conventions

The following style conventions will be used throughout this operation manual.

Note: Notes present information that will enhance operator experience.

Warning: Warnings present information that is critical to the safety of the operator and equipment.

2 Unpacking

Upon delivery of your FW-1200-M, please inspect for damage and inventory all components.

2.1 Inventory

The FW-1200-M includes the following components:

- (1) Water Purification Unit
- (1) Pump
- (1) Operation Manual
- (1) Maintenance Kit (0.5oz silicone grease & 4 x Canister O-Rings)
- (1) Filter Wrench
- (1) Filter Set, installed in canisters
- (1) Filter Set, spare (FW-1200-M Bundle Only)
- (2) UV/Quartz Sleeve sets, (1) installed/(1) spare
- (1) 20’ Source Water Hose (green / with foot valve)
- (1) 20’ Transfer Hose (green)
- (1) 20’ Clean Water Hose (clear / food grade)
- (1) Cam Lock to Female Garden Hose fitting
- (1) Cam Lock to Male Garden Hose fitting
- (2) 25’ Power Cords
- (1) GFCI Pigtail

2.2 Storage

The FW-1200-M should be stored ready for deployment. The following checklist will ensure that your FW-1200-M is properly stored.

- ✓ Used filters discarded
- ✓ New filters installed
- ✓ Unit clean and dry
- ✓ Canister O-Rings lubricated and in place
- ✓ UV Lamp operational
- ✓ Hoses and Accessories accounted for
- ✓ Replacement filters re-ordered

3 Startup and Operation

3.1 Water Source

The FW-1200-M produces microbiologically safe water from fresh (non-saltwater) water sources. The Virus Media Filtration utilizes adsorption properties to remove microbiology to an effective size of 0.2 microns. Microbiology removed includes viruses, bacteria, and cysts.

Source water can come from a variety of locations. Ideal water sources are free of sediment and turbidity and come from a relatively known environment. As the scope of an event escalates, less ideal water sources may be utilized.

Example water sources, from most ideal to least ideal:

1. Facility plumbing under boil water advisory.
2. Swimming or therapy pools.
3. Irrigation wells.
4. Shuttled water from fire trucks or tankers.
5. Rain water collected from roof runoff.
6. Surface water from retention ponds, lakes or streams.

The FW-1200-M does not remove chemical contaminants from water sources. Care should be taken in using a water source from unknown locations or uncontrolled environments.

Water supplies with known chemical additives should never be used. Examples include water from boilers and chillers.

Water sources with high turbidity, sediment or tannin levels will cause filters to be expended more rapidly. There is no impact on the quality of clean water produced.

3.2 Component Layout

Arrange components in the following order, flowing from source water to water outlet:

1 Water Source
2 Source Water Hose (green w/ foot valve)
3 Pump (Remove from Purification Unit mount and place as close to water source as possible)
4 Transfer Hose (green)
5 Water Purification Unit
6 Clean Water Hose (clear/food grade)
7 Clean water distribution

Included Cam Lock to Garden Hose Thread adaptors may be used to convert to conventional garden hoses at the inlet and outlet. See section 3.3

3.3 Connections

The FW-1200-M uses 1" Cam Lock fittings as standard. Adaptors are provided to convert to standard garden hose fittings.

- Cam Lock to Female Garden Hose Thread (GHT) Fitting
  - Used on the end on the Transfer Hose (green). Using this fitting to treat water from a pressurized source, bypassing the pump.
- Cam Lock to Male Garden Hose Thread (GHT) Fitting
  - Used at the end of the Clean Water Hose (clear). Adapts the system outlet to standard garden hose thread.

You may bypass the pump and treat water from existing building pressure when under a boil water advisory or similar circumstance.

3.4 Startup

- **Power**
  - Supply 120 volt power to the Pump.
  - Supply 120 volt power to the UV Lamp at the Water Purification Unit.
  - The Pump has several buttons and lights:
    - Power Switch: Turns Pump on and off.
    - Reset Button: Restarts Pump after it has gone into alarm mode. In some cases, it may be necessary to disconnect power to reset Pump.
    - Line Voltage Indicator: Illuminates when Pump is receiving power.
    - Pump Operation Indicator: Illuminates when Pump is operating.
    - Water Flow Alarm: Illuminates when Pump stops due to water flow interruption.

Power must be supplied through a Ground Fault Circuit Interrupter (GFCI) that is properly grounded. If a GFCI circuit is not available, use the included GFCI Pigtail.

- **Prime**
  - Drop Foot Valve into water source.
  - Fill Source Water Hose with water from open end opposite Foot Valve.
  - Attach filled Source Water Hose to Pump Inlet.
  - Attach Transfer Hose to Pump Outlet.
  - Open Pump Priming Port and fill with water.
  - Turn Pump on and ensure that water flows at full pressure.
  - You will need to repeat the Hose/Pump filling process until a sufficient prime is established.

The Foot Valve must not rest on the surface of the source water container, especially if you are drawing from a location with heavy sediment. Ideally, the Foot Valve is suspended several inches below the surface of the water.

If the water source is depleted and the pump is allowed to run dry, it will be necessary to repeat the priming process.

- **Water Flow**
  - Turn off Pump.
  - Connect Transfer Hose to the Water Purification Unit Inlet.
  - Open Main Valve and any down stream valves.
  - Ensure that UV Lamp is operating by visually inspecting the indicator light on the UV Control Box (located in the Top Storage Compartment).
  - Turn Pump on.
  - Wait for system to fill and water to flow from Outlet.
  - Loosen each Filter Canister slightly, allowing air to escape. Use Filter Wrench if necessary. Do Not remove Canisters completely.
  - When water flows from Canister threads, tighten just enough to stop the flow (hand tight only).

Allow the system to run for 5 to 10 minutes prior to distributing clean water. This will ensure all carbon particles are flushed and the UV lamp has the proper contact time with water.

Water coming from the Outlet is clean, but any down stream distribution components may be compromised. Any components beyond the FW-1200-M should be cleaned with a 3:1 bleach solution or other appropriate disinfectant then thoroughly rinsed before clean water is distributed.

3.5 Operation

Once water is flowing, very little maintenance is required. Someone should be present to monitor the following:

- Source water does not deplete.
- Clean water storage does not overflow.
- Water flow does not stop.
- Filters needing to be changed.

Pausing Operation

The FW-1200-M may be turned off and on throughout an event. To stop the flow of water, turn Main Valve to the off position. The Pressure Switch on the Pump will automatically stop the pump motor. If desired, you may turn off the power to the Filtration Unit to shut off the UV Lamp.

If the system will be down for more than 4 hours, flush with clean water for 1 minute before turning off. Do not leave standing water in the unit for more than 36 hours.

Resuming Operation

After a pause in operation, the system may be restarted by turning all power back on and opening the Main Valve. It may be necessary to re-prime the Pump and bleed air from the system. It may be necessary to reset the Pump by pressing the Reset button on the Pump.

Filter Maintenance During Operation

Filter life will vary greatly based on the turbidity of source water. Under optimal water conditions, a complete filter set should be replaced every 50,000 gallons. Optimal water conditions are defined as micro-biologically contaminated water sources with low levels of sediment, turbidity or tannins. Increased levels of sediment,

turbidity or tannins will require more frequent changes of the sediment filter identified by observable drops in water flow. When you notice the flow rate decrease, follow the steps below to check filters:

- Disconnect all power from the unit.
- Check Foot Valve and Pump Strainer Basket for debris.
- Replace the Sediment Filter in housing #1.
- Restart unit and observe flow rate. If flow rate has not improved, replace the Carbon Block Filter and Virus Media Filter.

4 Post Operation Care

4.1 Flushing System

- As soon as possible after an event, flush the system by pumping clean water for at least 5 minutes.
- Remove the Source Water Hose from the source and allow the system to pump until no water is flowing.
- Disconnect all power from the Filtration Unit and Pump.

4.2 Removing Filters

- Open Main Valve to relieve pressure on the Canisters.
- Unscrew each Canister, using the Filter Wrench where necessary.
- Retain Canister O-Ring.
- Remove and discard used Filters.
- Drain water from Canisters and dry.

4.3 Cleaning System

- Follow instructions above to flush and drain the system.
- If sediment remains in the system, replace empty Canisters and flush with clean water from a garden hose. Note: The UV Lamp must be powered on for water to flow through.
- Follow steps above to remove and dry filter Canisters.
- Remove and drain all hoses.
- Drain the UV Chamber by opening the Drain Valve located next to Canister #4, tilt unit slightly to allow water to flow out of the UV Chamber.

- Drain Pump:
    - Remove Pump Strainer Basket
    - Remove Pump Drain Port.
    - Remove Pump Priming Port.
- Discard used filters.
- Rinse and dry all components.
- Leaving Canisters open, allow system to air dry for at least 8 hours, longer if necessary to ensure the unit is completely dry.

4.4 Preparing for Storage

- Visually inspect the UV Bulb and Quartz Sleeve.
- Inspect and lubricate each (4) Canister O-Rings with Silicone Grease or other food grade lubricant.
- Place new filters in each Canister and screw the Canisters back on the unit.
    - Tighten Canisters hand tight only.
- Coil and store all hoses and accessories.

The FW-1200-M should be stored ready for deployment. The following checklist will ensure that your FW-1200-M is properly stored.

- ✓ Used filters discarded
- ✓ New filters installed
- ✓ Unit clean and dry
- ✓ Canister O-Rings lubricated and in place
- ✓ UV Lamp operational
- ✓ Hoses and Accessories accounted for
- ✓ Replacement filters re-ordered

5 Special Procedures

5.1 Maintenance Intervals

- During Operation
  - Clean Foot Valve and Pump Strainer Basket as needed.
  - Replace Sediment Filter as needed.
  - Replace Filter Set every 50,000 gallons, or as needed based on flow rate.
- During Storage
  - Every 6 Months: Visually inspect UV Lamp operation.
  - Every 6 Months: Open Canisters to ensure unit is stored dry.

5.2 Replacing Filters

- Disconnect power from the Pump and Filtration Unit.
- Open Main Valve to relieve pressure on the Canisters.
- Unscrew each Canister, using the Filter Wrench where necessary.
- Retain Canister O-Ring.
- Remove and discard used Filters.
- Insert new Filters into Canisters.
  - Canister 1: White, Solid, Sediment Filter.
  - Canister 2: White, Solid, Carbon Block Filter. (Heaver than Sediment Filter)
  - Canister 3: Black, Pleated, Virus Media Filter.
  - Canister 4: Empty. Specialized filter optional.
- Inspect and lubricate each (4) Canister O-Rings with Silicone Grease or other food grade lubricant.
- Tighten Canisters hand tight only

5.3 Replacing UV Lamp

- Disconnect power from the Pump and Filtration Unit.
- Loosen nut and remove PVC End Cap from UV Lamp Chamber.
- Withdraw UV Lamp approximately 2 inches.
- While holding Lamp end, carefully remove Lamp socket.
- Remove Lamp from Chamber.
- Reinstall Lamp in reverse order.

Lamp and Quartz Sleeve are easily damaged. Exercise care when removing or replacing lamp.

Never look directly at an illuminated UV Lamp.

5.3 Replacing Quartz Sleeve

- Disconnect power from the Pump and Filtration Unit.
- Shut off water supply.
- Follow steps in "Replacing the UV Lamp" to remove lamp.
- Unscrew Chamber Cap from each end of Chamber.
- Remove Washer from both ends of the Quartz Sleeve.
- Carefully remove Quartz Sleeve from Chamber. NOTE: It is advisable to support the quartz sleeve on the opposite end with your finger so that it does not drop to the bottom of the chamber as it slides into the chamber.
- If removing a broken Quartz Sleeve, follow the steps below:
    - Carefully remove as much of the broken quartz sleeve as possible, from each end of the chamber.
    - To remove fragments of quartz sleeve, position the Purification Unit vertically and shake. The quartz fragments will break and drop out of the Chamber.
    - Flush water through chamber being careful to remove all quartz fragments from the interior of the chamber

- Once the quartz sleeve is removed, clean with alcohol or a mild, non-abrasive detergent. Stubborn stains usually can be removed with a diluted hydrochloric acid.
- Reassemble in reverse order. Make sure the quartz sleeve protrudes an equal distance past each threaded nipple.
- Tighten End Caps firmly by hand only, DO NOT USE HAND TOOLS. Tightening with hand tools is likely to cause Quartz Sleeve to break.
- Slowly restore water supply and check for leaks.
- If no leaks occur, reinstall lamp.

5.4 UV Lamp Disposal

Germicidal ultraviolet lamps, like standard fluorescent lamps contain small amounts of mercury. Mercury added lamps should not be placed in the trash. Dispose of properly.
For further information regarding the disposal and recycling of lamps containing mercury, along with Federal and State requirements visit http://www.lamprecycle.org.

6 Troubleshooting

6.1 Pump will not move water

- Check the 120 volt power source
- Check the Pump Strainer Basket for debris
- Check that the Pump is primed

6.2 Water not flowing from Clean Water Hose

- Follow troubleshooting steps for “Pump will not move water”
- Check that Main Valve is open
- Check power source to Purification Unit
- Check Foot Valve for excessive debris
- Check the UV Lamp and replace if necessary (The FW-1200-M will not allow water through the system if the UV Lamp is not operating)

6.3 Water leaks from top of Canisters

- Check that each Canister O-Ring is in place and lubricated
- Hand tighten Canister
- A small, dripping leak is not abnormal

6.4 Water leaks UV Chamber

- Inspect Quartz Sleeve for damage
- Inspect Quarts Sleeve O-Rings and Washers (See “Replacing Quartz Sleeve”)
- Tighten UV Canister End Cap