

# Maintenance

Diamond High Efficiency Filter Systems are designed for low maintenance. The following maintenance procedures outline recommended minimum frequency to help ensure continued trouble-free operation of your filter system. **Refer to component information sheets for individual component maintenance instructions specific to your equipment.**

**NOTE:** Keep a daily record of pressures, backwash count, performed maintenance, and unusual occurrences on the provided log sheet. This system log provides valuable information should factory service assistance be required. Contact Diamond Water Systems, Inc. (800-245-6601) if log sheets are needed.

## Recommended minimum maintenance

### 1) Weekly

- a) Check automatic pump oilers (if applicable)
- b) Check pump strainer and clean as necessary

### 2) Monthly:

- a) Grease pump motors (if applicable)
- b) Check air/water cartridge filter, if equipped.
  - i) Replace as necessary

### 3) Quarterly:

- a) Change pump oil (if applicable)
- b) Check all control functions

### 4) Annually:

- a) Rebuild diaphragm valves, if equipped.
  - For internal metal components follow replacement schedule in OEM cut sheets.
- b) Check pressure differential switch for proper operation
- c) Inspect pump and pump motor for bearing wear
- d) Inspect pump for seal wear
- e) Inspect media.
  - Clean, add, or replace as necessary.
- f) Rebuild backwash flow control device, if necessary.

**NOTE:** Wear life for pump seal is approximately two years. This may vary due to site-specific operating conditions.

### 5) Check Control Functions

- a) Actuate manual backwash by depressing and holding manual backwash button until backwash light illuminates.
- b) Watch system through backwash cycle for smooth valve actuation and water flow.
  - Differential pressure should be 6 - 12 psig when system returns to filter mode.
  - See Start-up data sheet for pressure.

## 6) Rebuild Diaphragm Valves, if equipped.

- a) Follow instructions contained in rebuild kits.

**NOTE:** When ordering rebuild kits, be sure to note filter system serial number, valve model number (found on body of valve) and if valve is normally open or normally closed (see metal tag attached to valve).

- b) Special wrench may be needed to remove internal o-ring retainer.
  - i) Wrench may be ordered with rebuild kits.

## 7) Check Media Level and Condition

- a) Manually force backwash the filter system.
- b) Set filter pump switch to 'OFF' position.
- c) Isolate filter system from all water sources.
- d) De-energize power supply.
- e) Drain water from system.
- f) Remove vessel flanged closure and gasket.
- g) Inspect sand.
  - Sand should be loose and clean.
  - Remove any loose debris or small amount of accumulated cake.
  - Top of sand should be approximately 8" – 12" inches below bottom of inlet manifold.
    - Add or replace sand as necessary.
- h) Replace vessel flanged closure gasket and secure flanged closure.
- i) Close filter system drain.
- j) Open all water supply valves.
- k) Energize power supply.
- l) Return system to service with manual forced backwash.

## 8) Service Air/Water Cartridge

- a) Air Cartridge, if equipped:
  - Follow instructions contained in cut sheets.
- b) Water Cartridge, if equipped:
  - Isolate cartridge assembly with quarter-turn ball valves provided.
  - Relieve pressure and drain the sump by opening petcock on bottom of housing.
  - Remove cap nut with wrench and remove sump.
  - Empty liquid from sump and remove/discard old cartridge.
  - Clean all parts and replace gasket if necessary.
  - Install new cartridge.
  - Lubricate gasket lightly and reinstall sump.
    - Do not over-tighten cap.
  - Close petcock and open inlet isolation valve.
  - Check for leaks.
    - If leaks appear, close inlet valve and relieve pressure by opening drain.
      - Repeat procedure until leaks stop.
  - Open outlet isolation valve.

## 9) Pump Service

- a) Follow instructions contained in pump manufacturer cut sheets located at end of manual.

## Trouble Shooting Guide

| Symptom   | Possible Cause                            | Remedy  |
|---|---|---|
| <b>No Water to Filter Pump</b>                  | Isolation valves closed                   | Open all isolation valves                                 |
|   | Pump strainer plugged                     | Clean strainer  |
|   |   |   |
| <b>No Water to Filter (Filter Mode)</b>         | Valve #1 closed                           | Check control pressure to valves                          |
|   | Pump rotation reversed                    | Rewire service to pump                                    |
|   |   |   |
| <b>No Water to Filter (Backwash Mode)</b>       | Backwash water isolation valve closed     | Open valve  |
|   | Valve #3 closed                           | Check control pressure to valves                          |
|   | Pump rotation reversed                    | Rewire service to pump                                    |
| <b>No Pressure Differential Across Filter</b>   | Filter in backwash mode                   | Normal Operation  |
|   | #1 and/or #2 valve closed                 | Check control pressure to valves                          |
|   | Isolation valve(s) closed                 | Open all isolation valves                                 |
|   | Pump rotation reversed                    | Rewire service to pump                                    |
|   | Pump strainer plugged                     | Clean strainer  |
|   | Pump not operating                        | See pump section  |
|   | Filtered water returning to high line psi | Check system installation                                 |
|   |   |   |
| <b>High Pressure Differential Across Filter</b> | Filter needs backwash                     | Initiate manual backwash                                  |
|   | Sand contaminated                         | Check sand for caking<br>(consult factory representative) |
|   |   |   |
|   | Flow through filter too high              | Adjust filter outlet throttle valve                       |
| <b>Valves Do Not Actuate</b>                    | Low control pressure                      | Check control pressure to valves                          |
|   | Jammed valve                              | Consult factory representative                            |
|   | Air leaking by valve diaphragm            | Rebuild valves  |
|   | Air or water filter clogged               | Change filter   |
|   | Faulty Actuator, fuse or wiring           | Check electrical connections/ fuses                       |
| <b>Water Leaking From Diaphragm Valve Vent</b>  | Valve shaft 'O' ring failure              | Rebuild valves  |
|   | Diaphragm failure                         | Rebuild valves  |
|   | Shaft guide failure                       | Rebuild valves  |

## Trouble Shooting Guide

| Symptom   | Possible Cause                        | Remedy                                |
|---|---------------------------------------|---------------------------------------|
| <b>Water Running To Waste</b>                     | Low valve control pressure            | Check control pressure                |
|   | Valve failure                         | Rebuild valves                        |
|   | Valve failed open                     | Inspect valve diaphragm and seat      |
|   | Normal pump discharge                 | 5 gallons/hour water lubricated pump  |
|   |                                       |                                       |
| <b>Filter Pump not Operating</b>                  | Filter in backwash mode               | Normal Operation                      |
|   | Pump starter tripped                  | Reset starter                         |
|   | Pump fuse blown                       | Replace fuse                          |
|   | Service disconnect or pump switch off | Reset to 'On' position                |
|   | Solenoid failure                      | Rebuild solenoid                      |
| <b>Pump Seal Leaks</b>                            | Normal wear                           | Replace pump seal                     |
|   | Abrasive material entering seal       | Check pump strainer                   |
|   | Excessive pressure on pump discharge  | Open all valves                       |
|   | Excessive pressure on pump suction    | Check pressure to pump against rating |
|   | Water lubricated seal                 | Normal 5 gallons per hour             |
|   |                                       |                                       |
| <b>System Does Not Backwash</b>                   | Control power failure                 | Energize control panel                |
|   | Blown control panel fuse              | Replace fuse                          |
|   | PLC fault or failure                  | Consult factory representative        |
|   | Differential switch failure           | Consult factory representative        |
|   | Micro switch failure                  | Consult factory representative        |
| <b>Improper Control Sequencing</b>                | Solenoid failure                      | Rebuild solenoid                      |
|   | Power interruption/surge mid-cycle    | Consult factory representative        |
|   | Low voltage to panel                  | Check power supply                    |
| <b>Filter Pump keeps tripping Circuit Breaker</b> | Wrong voltage to panel                | Check power supply                    |
|   | Short Circuit                         | Check wiring                          |
|   | Wrong size fuse(s)                    | Check fuse rating                     |
|   | Thermal Overload Set Wrong            | Adjust Thermal Overload Set Point     |
| <b>Fuses Blowing</b>                              | High voltage to panel                 | Check power supply                    |
|   | Short Circuit                         | Check wiring                          |
|   | Wrong size fuse                       | Check fuse rating                     |
|   |                                       |                                       |



## HELPFUL HINTS

### ON THIS PAGE ARE SOME HELPFUL AND TIME-SAVING HINTS:

FOR THE FOLLOWING HINTS, THE SYSTEM MUST BE OFF-LINE FOR SERVICE...

#### **VALVES:**

1. If it takes all your effort and the valve tool still bends out of useful shape, it may be time to change the valve before the manifold cracks.
2. Removing disc assembly from shaft assembly - Use the nut supplied in the valve kit and double-nut the slotted end of the shaft. Then, you can remove the smaller nut on the opposite end of the shaft.
3. Greasing the O-rings - Grease all o-rings, including the one that goes around the shaft guide/o-ring retainer.
4. Reassembly of valve guts - Don't over-tighten the nut and please take care that the screwdriver doesn't slip out of the shaft slot and puncture the diaphragm.
5. Putting cover back on valve - Line up the cover and diaphragm contours with the shape of the valve body and make sure each bolt goes through the holes in the diaphragm. This ensures the valve doesn't leak and the diaphragm isn't pinched.

#### **MEDIA:**

1. Inspecting the media - Backwash the system before you drain water from the system and open the cover. Use a flashlight to look inside the tank: You should see beige, clean-looking sand. If the media looks like old pudding or contains mud balls, it's a sign that it's time to change the media.
2. Removing the old media - Use a wet-dry shop vacuum to suck the media out of the vessel. You may have to work around the top distributor. When you work your way down to the bottom 1/3 of the vessel, work your way around the bottom distributor to keep from hitting it. Try to get as much of the old media out of the tank. If you wash down the inside of the tank, the media breaks up and the task is easier. A little bit of sand and gravel on the bottom of the filter is okay.
3. Adding new media - Place a funnel with a large opening on the vessel opening and put some water in the tank to keep the dust levels down. After each layer is installed, spread the media around so it's as level as possible.