

DEALER MANUAL

Compact CoAg Water Treatment System



Patent Pending

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| Part Number |
|--|
| Serial Number |
| Date of Purchase |
| The part and serial numbers will be found on a decal attached to |
| the machine. You should record both serial number and date of |

purchase and keep in a safe place for future reference.

Water Maze Compact CoAg • 9.801-506.0 • Rev. 1/14

INTRODUCTION & IMPORTANT SAFETY INSTRUCTIONS

Your owner's manual has been prepared to provide you with a simple and understandable guide, for equipment operation and maintenance, based on the latest product information available at the time of printing. To keep your machine in top running condition follow the specific maintenance and troubleshooting procedures given in this manual. When ordering parts please specify model and serial number.

NOTE: *Water Maze* reserves the right to make changes at anytime without incurring any obligations.

Owner/User Responsibility:

The owner and/or user must have an understanding of the manufacturer's operating instructions and warnings before using this equipment. Warning information should be emphasized and understood. If the operator is not fluent in English, the manufacturer's instructions and warnings shall be read to and discussed with the operator in the operator's native language by the purchaser/owner, making sure that the operator comprehends its contents.

Owner and/or user must study and maintain for future reference the manufacturers' instructions.

SAVE THESE INSTRUCTIONS

This manual should be considered a permanent part of the machine and should remain with it if machine is resold.

When ordering parts, please specify model and serial number. Use only identical replacement parts.

This machine is to be used only by trained operators.

GENERAL SAFETY INFORMATION



READ OPERATOR'S

MANUAL THOROUGHLY

PRIOR TO USE.

WARNING: When using this machine basic precautions should always be followed, including the following:

- 1. Read all the instructions before using the product.
- 2. To reduce the risk of injury, close supervision is necessary when a product is used near children.
- 3. Know how to stop the product and bleed pressures quickly. Be thoroughly familiar with the controls.
- 4. Stay alert watch what you are doing.
- 5. Do not operate the product when fatigued or under the influence of alcohol or drugs.
- 6. Keep operating area clear of all persons.
- 7. Do not overreach or stand on unstable support. Keep good footing and balance at all times.

8. Follow the maintenance instructions specified in the manual.



ELECTRICAL WIRING.

WARNING: Wire the system for correct voltage. Refer to the information located on the serial plate.

WARNING: All wiring must be performed by a qualified electrician.

WARNING: Risk of Electric Shock

DANGER – Improper connection of the equipmentgrounding conductor can result in a risk of electrocution. Check with a qualified electrician or service personnel if you are in doubt as to whether the machine is properly grounded. Have proper power connections installed by a qualified electrician. Do not use any type of adaptor with this product.

GROUNDING INSTRUCTIONS

This product must be connected to a grounded, metal, permanent wiring system; or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment-grounding terminal located on the product.

GROUND FAULT CIRCUIT INTERRUPTER PROTECTION

To comply with the National Electrical Code (NFPA 70) and to provide additional protection from the risk of electric shock, this machine should only be connected to a circuit protected by a ground fault circuit interrupter (GFCI).

9. Know the system application, limitations, and potential hazards.



WARNING: Do not use near concentrations of flammable or explosive fluids such as gasoline, fuel oil, kerosene, solvents, etc. Do not use in explosive atmospheres. Liquids compatible with component materials should only be used. Failure to follow this warning can result in personal injury and/or property damage.

10. The main power must be brought from the circuit breaker and wired into the electrical box on the Compact CoAg. This power supply must be run through conduit in compliance with local and national electrical codes. A power disconnect should

IMPORTANT SAFETY INSTRUCTIONS

be located near the machine for maintenance and emergency purposes.

11. Protect all electrical cords from sharp objects, hot surfaces, oil, sunlight, and chemicals. Avoid kinking the cords.

WARNING: If any cords or electrical wires appear to be frayed, damaged, or in poor condition, proceed with caution and immediately take steps to have the cords repaired or replaced.

- 12. Never make adjustments on the machine while it is in operation, except for those prescribed in this manual.
- 13. Follow the maintenance instructions specified in this manual.
- 14. Before servicing the machine, refer to all the MS-DS's on the material identified in the waste stream. You must comply with all warnings and wear all protective clothing as stated on the MSDS's.
- 15. Inlet water temperature must not exceed 85°F.
- 16. The best insurance against an accident is precaution and knowledge of the equipment.
- 17. *Water Maze* is not liable for modifications or use of components not purchased from *Water Maze*.



- 18. Personal Safety:
- a. Wear safety glasses and other applicable protective clothing at all times when working on this machine.

Refer to item #14 under Important Safety Information.

- Keep your work area clean, uncluttered and properly lighted
- c. Replace all unused tools and equipment.
- d. Keep visitors at a safe distance from work area.
- 19. Running the system without water will damage the pumps and will void the warranty.
- 20. Release all pressure within the system before servicing any component.

- 21. Drain all liquids from the component before servicing.
- 22. Check hoses for weak or worn conditions before each use, making certain that all connections are secure.
- 23. Periodically inspect pump and system components. Perform routine maintenance as required.
- 24. Do not touch an operating motor. Modern motors are designed to operate at high temperatures.
- 25. Do not touch any electrical component with wet hands, when standing on a wet or damp surface, or in water.
- 26. The pump motors are equipped with a thermal protector. Tripping is an indication of motor overloading as a result of operating at excessively high or low voltage, inadequate wiring, incorrect motor connections, or a defective motor or pump.
- 27. Keep machine from freezing.
- 28. Do not spray water directly at machine.

WARNING: This system contains moving parts in the control center and in the pumps. Follow safe practices when performing maintenance and when troubleshooting. Disconnect the power before servicing this machine. If the power disconnect is out of sight, lock it in the open position and tag it to prevent unexpected application of power.

WARNING: Make sure to take precautions when performing maintenance on the pump in the catch basin. Turn off the power to the pump and make sure electrical cords are well maintained.

APPLICATION AND INTENDED USE

Compact CoAg Water Treatment Unit:

The Compact CoAg water treatment unit can be installed as a **recycle or a treat & discharge water system**. The Compact CoAg may also be installed as a component of a system that incorporates multiple water treatment technologies. In certain applications the constituents in the water may require additional pre-treatment or post treatment of the fluid stream.

To assure the best processed water quality, pretreatment of the waste water should be applied to address the following waste water characteristics:

- **Heavy solids:** Excessive amounts of heavy solids (especially solids that quickly fall out) should be removed prior to entering the Compact CoAg system.
- Free-oils (oils that are floating on the surface of the water): Although the Compact CoAg will typically address both free-oils and emulsified oils, excessive amounts of free-oils should be removed prior to entering the system.
- **pH of the water:** Typically, the Compact CoAg system performs best when the pH of the influent waste water is between 7 and 8. If the pH is outside these limits, pH adjustment will be necessary. Consult Water Maze for recommendation.
- **Post-treatment:** Subject to the application requirements, additional water treatment may be required.

Consult a Water Maze representative prior to combining the Compact CoAg with other pre-treating and post treating equipment.

TCLP Testing:

TCLP is one of the Federal EPA test methods that are used to characterize waste as either hazardous or non-hazardous for the purpose of disposal. TCLP is an acronym for Toxicity Characteristic Leaching Procedure. A TCLP test may be required prior to disposal of your solid waste. Consult a Water Maze representative for details.

Site Preparation:

The installation site surface should be of compacted materials, such as concrete, asphalt or pavement and capable of supporting the Compact CoAg treatment system.

Typical Applications

This section outlines some of the common configurations for the Compact CoAg module.

As a treatment & discharge system:

- 1. Compact CoAg unit receives pretreated water and applies pH control (if required); applies chemical coagulant and chemical flocculent.
- 2. A small cone-bottom reactor tank is positioned immediately after the Compact CoAg unit, which allows for mixing of the chemical flocculent and provides additional processing dwell time.
 - a. This is the most (highly) recommended configuration. (See special note* below).
 - b. Maximum estimated flow rate = up to 20 gpm
- 3. An IPF2-20D Indexing Polishing Filter (standard unit, or High-boy unit), along with a lower water retention container is positioned after the above reactor tank. The IPF2-20D unit provides for separation and dewatering of the gathered (flocculated) matter.



The above shows a typical (most common) configuration for treatment & discharge (to sewer) applications.

SPECIAL NOTE*- Configuring the 150-gallon tank (as shown), or another size of cone-bottom tank.

This tank receives the CoAg+ coagulated water (CoAg+ chemical injected in the 1st mixing tube) immediately after the EC+ flocculent is injected in the 4th mixing tube. Please take note of the pipe on the inside of the tank. It must be positioned near where the slopedbottom begins and it should have an elbow (45 or 90 degree) at the bottom that releases the water on an oblique angle, which effectively allows the water to swirl and to complete the mixing of the EC+ coagulant. Also note the vertically oriented PVC Tee on the opposite

APPLICATION AND INTENDED USE

side of the tank. Its orientation limits the release of floating matter. As the flocked matter settles to the bottom of the tank, the AMC-1000D auto-purge valve will occasionally purge the matter to the IPF2-20A Indexing Polishing Filter.

As a treatment and recycle system:

- Typically, above items (1, 2, and 3) will be incorporated as pretreatment to the following components.
- 5. A REC2-20A recycle control center module draws water from the water retention container and pumps it into a clean water storage tank where ozone or bioremediation can be applied. Please refer to the Water Maze product catalog for additional information.
- 6. A clean water storage tank (size to be determined) will be required.



The above shows a typical (most common) configuration for treatment & recycle applications.

As pretreatment to, or as a supplement to an existing water treatment system:

- As a pretreatment (in line) module to an existing water treatment system that is struggling with emulsified oils and / or suspended solids.
- 8. Configured as a "side-car" (e.g., pulls a partial slip stream) from the main process water where the existing water treatment system is struggling with emulsified oils and / or suspended solids.



The above shows a typical (most common) configuration for treatment & recycle with clarifier applied for pretreatment to remove excessive amounts of free-floating oils and settleable solids.



The above shows how a Compact CoAg can be installed in conjuction with another treatment system.

Available Options

- AMC-1000D Auto-Purge system—factory installed control cabinet. Includes control center with timer control, air solenoid and 1.5 inch air actuated/spring shut purge valve (to be installed on a cone-bottom reactor tank positioned immediately after the Compact CoAg unit).
- pH (only) controller with chemical injector pump.



Typical Recycle Components With Optional PM-1000D Biosystem

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INSTALLATION & OPERATING INSTRUCTIONS

The following instructions will provide adequate information to fully install your Water Maze Treatment and Recycling System. Please follow these instructions step by step to ensure proper installation.

Equipment and Supplies Needed for Installation

Aside from having a general assembly of tools on hand, you will need to supply a few additional items to complete the installation of your system.

- Forklift Tape Measure
- Level
- Hose Clamps
- Grey Flex Hose Pipe • #8.711-813.0 Sold by Ft.

UTILITY USAGE

Water: 30-90 PSI Electrical: 120 Volts, 1 PH, 20 Amps

General Notations: Compact Coag System

- 1. Inlet from pretreatment pit system to tank: a. Flooded suction is most desirable.
 - When drawing water up from a pit, a foot valve (check valve) may be required.
 - b. Cam lock (male and female) supplied with system.
- 2. Typical pretreatment considerations may include:
 - Settling of heavy solids a.
 - b. Removal of free floating oils
 - pH adjustment c.
- 3. Outlet Indexing Paper Filter or another dewatering device:
 - a. Cam lock (male and female) supplied with system
 - Hose (1.5 inch diameter) is not included. b.



STEP 1: The Compact CoAg water treatment system must be installed on a level surface. If surface is not level, shimming is required.

STEP 2: Connect the inlet piping from either the above ground feed tank to the optional infeed pump installed on the chassis of the Compact CoAg. Or, connect the inlet piping from a sump pump to the inlet manifold on the Compact CoAg unit.



STEP 3: An electrician will connect incoming electrical power to the power block in the electrical box. When connecting to the power supply, follow all electrical and safety codes as well as the most recent National Electric Code (NEC) and Occupational Safety and Health Act (OSHA). Ground system before connecting power supply.



STEP 4: Assemble a flex hose with cam-lock fittings and connect from your waste water source to the waste water inlet connection on the left side of the machine.

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INSTALLATION & START-UP INSTRUCTIONS





STEP 5: Fill the sump pit with (waste water source) water.

STEP 6: Press and hold power switch in ON position for 3 seconds then release.

STEP 7: With the (optional) infeed pump/sump pump running, adjust the incoming flow rate with the flow control valve supplied as part of the inlet manifold on the Compact CoAg unit.

- For applications with the IPF unit immediately downstream, the maximum flow rate will likely be less than 5 or 6 GPM
- For applications with a conebottom receiver tank immediatley after the Compact CoAg unit, the flow rates may be up to 20 GPM.

NOTE: Until you are actually treating water (with chemical pumps turned on), the pumped water should be directed back to the sump pit.

NOTE: Refer to Process Objectives on next page.



STEP 8: Unplug the float level switch connector. Add the 5 gallon container with EC+ Flocculent. Install EC+ pump tubing into the 5 gallon container. Reconnect the level switch connection. **NOTE:** Dial may be readjusted to produce the desired flocculent.



STEP 9: Add the 5 gallon container with CoAg+ solution to its location under the CoAg+ metering pump. Install the conductivity pump tubing into the 5 gallon container. **NOTE:** Dial may be readjusted to produce the desired conductivity and flocculant.



STEP 10: Turn "On" both metering pumps. The switches are located on the side of each pump. You will need to "prime" each line (with CoAG+ or EC+ chemicals) by holding each metering pump switch in it "prime postion". Release the switch to its normal "run" position.

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INSTALLATION & STARTUP INSTRUCTIONS



STEP 11: Assemble a flex hose with cam-lock fittings and install from the treated water outlet connection to the inlet connection on the indexing polishing filter (IPF) (optional). We recommend you install a 1.5 inch ball valve inline with this connection to regulate the flow into the IPF.

If you are not using an IPF, this hose would connect to a treated water holding tank or go to discharge.

STEP 12: Adjust the flow rates of the in-feed water and the chemical injection pumps based on the following *Process Objectives*:

- 1. As the influent water enters into the in-feed tank, the in-feed pump control float will rise and signal the in-feed pump to turn on and begin to pump water into the Compact CoAg unit.
- 2. Initial settings:
 - a. Set the flow control as noted in Step #7.
 - b. Set each peristaltic pumps (coagulant and flocculant) based on the designated settings for this application. Refer to the bench scale testing procedures conducted on a new water sample for this application (as noted on page #17 of this manual).
 - c. Turn the CoAg+ (coagulant) pump on.
 - d. Turn the EC+ (flocculant) pump off (until step 4 below is completed).
- 3 Locate the water sampling tap located between the upper portion of the mixing tubes (between the 2nd and 3rd tubes. Refer to component identification page). As water is flowing, drain water sample(s) into clear sided container to confirm if coagulation is taking effect.
 - a. Compare the sample to an untreated water sample. You are looking for small formations of "pin-flocc"or globlets of matter forming within the body of water.
 - b. Normally, it is easier to see the pin-flocc forming near the top portion of the cup.

- Adjust the influent flow control valve up or down and/or the feed speed of the coagulant pump up or down until the "pin-flocc" is acheived.
 NOTE - the objectives are to:
 - i. Maximize the influent water flow rate.
 - **ii.** Minimize the speed (eg., consumption) of chemical injection.
- 5. Turn on the EC+ chemical flocculant pump. Take samples of water (as noted in #4 above). Adjust the EC+ pump speed until you see large gathering of matter forming within the body of water. As noted above, the objective is to minimize the consumption of chemical flocculant, and create a tight gathering of "pin-flocc".
- STEP 13 : The pH controller must be programmed before start up. Press the up and down arrows at the same time, then let go to enter programming. "AC" stands for acid injection and "bA" stands for caustic injection. To toggle between the two, just press the up or down arrow one time. The controller will now show the flow switch setting (*FLO*). "FO" stands for flow switch OFF and F1 stands for flow switch ON. Set to F1. To toggle between the two, press the up or down arrow one time. Leave controller alone till the pH is showing on LED screen.

STEP 14 : To calibrate pH:

- Press (CALIBRATION) button
- Press (*pH*) button: display flashes
- Use the (UP) or (DOWN) arrows to adjust the value
- Press (CALIBRATION) button to again save value

STEP 15 : To change the setpoint:

- Press (SETPOINT)
- Press (pH) button: display flashes
- Press (UP) or (DOWN) arrows to adjust the setpoint
- Press (SETPOINT) button to again save value

MAINTENANCE INSTRUCTIONS

OPERATING ENVIRONMENT

The Compact CoAg is designed to work in a wide variety of operating conditions. In normal operating environments, the system should perform as specified. In extremely hot or cold environments certain precautions need to be taken.

Operating Conditions

Air Temperature Range 40° - 120°F Water pH 6.5 - 8.0

water pn

Cold Weather



Protect the Compact CoAg from damage that can occur when freezing water expands. Freezing water may cause pipes to burst.

DRAIN SYSTEM WHEN TEMPERATURES DROP BELOW FREEZING

Drain all pipes if a prolonged hard freeze is expected. Make sure all valves are open so water can completely drain from the system.

Cold Climate Conditions

In locations where freezing temperatures will be experienced on a regular basis or where very cold temperatures will be incurred, the water treatment system should be drained when the outside ambient temperature drops below freezing and/or the water treatment system (Compact CoAg) should be housed in a heated structure. The warranty on the water treatment system does not provide for repair due to freezing conditions.

Hot Weather

The Compact CoAg may encounter minor problems, such as a slight increase in odor, when operating in extremely hot temperatures in excess of 100° F.

Environmental

To reduce deterioration of equipment it is recommended that the Compact CoAg Water Treatment System be protected from environmental elements such as rain, snow, hail, direct sunlight, as well as freezing temperatures.

MAINTENANCE INSTRUCTIONS

Daily and weekly maintenance is important for your system to function consistently and properly. Maintenance frequency depends on many factors, such as usage, volume of sludge, etc. On-site personnel should be trained and be aware of the daily and weekly maintenance that is required to meet these performance factors. We recommend the following:

Daily Schedule:

(Performed by customer personnel)

- 1. Become familiar with the control panel and make sure that the electrical switch is in the ON positions. This will allow your system to operate automatically.
- 2. While operating the system, observe and repair any water leaks.
- 3. Check level of CoAg solution.
- Weekly Maintenance Schedule:

(Performed by customer personnel)

- 1. Refill CoAg+ chemical container when level is low.
- 2. Fill EC+ flocculant solution container when level is low.
- 3. Lock or secure Water Treatment System.

COMPACT COAG COMPONENT IDENTIFICATION



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IATER TREATMENT SYSTEM

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COMPACT COAG+ SYSTEM



♦ pH adjustment

Outlet to Indexing Paper Filter or another dewatering device.

- ♦ Cam lock (male and female) supplied with system
- ♦ Hose (1.5 inch dia) is not included.

CONTROL PANEL VIEW



METERING PUMPS

(Variable Speed Peristaltic)

TECHNICAL INFORMATION

Materials:

| Squeeze Tubing | Special synthetic rubber |
|---|--------------------------|
| Strainer and Injection Point Fitting | PVC |
| Feed Rate: | 1-7 or 8-45 GPD |
| Tubing Size: | 1-7 or 8-45 GPD |
| Dimensions: | Height = 5" |
| | Width = $4"$ |
| | Depth = 4 1/4" |

Standard Accessories Provided with Pump:

- Squeeze Tubing
- Check Valve Assembly
- Strainer with weight
- Bulkhead fitting with elbow

Electrical Rating:

- 20-265 VAC
- 7 W
- 50/60 Hz

Maximum System Pressure: 45 PSI



INSTALLATION

1. **SUCTION TUBING:** Take the 5 ft. length of 1/4" O.D. tubing included, measure and cut the lengths needed to run from pump head to the chemical tank. Cut the tubing ends square. 2. **CONNECT SUCTION TUBING TO PUMP:** Remove compression fitting. Feed tube through fitting. Push end of the tube on fitting. Tighten fitting firmly.

NOTE: To soften the end of the tubing, immerse it in hot water.



3. CONNECT SUCTION TUBING TO STRAINER:

Install strainer so it's off the bottom of the chemical container. Cut the suction tubing to the length needed. Put weight on tubing. Push strainer end into tubing.

METERING PUMP OPERATION

If not already done, put the end of the suction tubing into the chemical container, near the bottom.

Move the "ON-OFF" switch to ON.

PRIME: To prime the pump and lines push the 3-way switch to full speed.

FEED ADJUSTMENT: (ONLY A QUALIFIED *WATER MAZE* SERVICE TECHNICIAN SHOULD MAKE THIS ADJUSTMENT.) The feed adjustment is under the cover plate. Remove the plate and turn the adjusting screws clockwise to increase feed or counterclockwise to decrease feed.



METERING PUMP MAINTENANCE

<u>DANGER:</u> DO NOT ATTEMPT TO USE CHEM-ICALS WITHOUT CONSULTING YOUR CHEMICAL DEALER OR CHEMICAL SUPPLIER. READ MSDS BEFORE HANDLING.



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CAUTION: Wear protective gloves, goggles, and other adequate protection for the chemical hazard.

Before replacing the pump head, remove chemical from tubing as follows:

- 1. Remove strainer from chemical tank.
- 2. Run pump until all chemical is removed from the tubing.

FILL THE CHEMICAL TANK: To avoid running out, of chemical, follow a regular schedule of monitoring chemical supply. Also inspect and clean the strainer by flushing with a compatible liquid, as needed.

INSPECT SQUEEZE TUBING: Inspect tubing regularly and replace it if it is deteriorating.

REPLACE SQUEEZE TUBING:

- 1. Remove compression fittings from the tubing at the pump head.
- 2. Pull the suction and discharge tubing from the pump head.
- 3. Remove the front cover from the pump.
- 4. Rotate the pump rollers to a vertical position.
- 5. Lift the inlet fitting out of the housing.

- 6. Pull the tube out while rotating the pump rollers clockwise.
- 7. Remove the outlet fitting.
- 8. Install the inlet fitting for the new tube assembly.
- 9. Press the tube into place in front of a roller while rotating the roller assembly clockwise.
- 10. Install the outlet fittings.
- 11. Reconnect the suction and discharge lines.
- 12. Install the front cover.

CAUTION: DO NOT LOSE THE BEARING FROM THE CENTER HOLE IN THE BACK COVER.

TUBE REPLACEMENT:

Clear or transparent plastic tubing should be replaced at least every three months if exposed to the sun. Replace tubing yearly if feeder is installed indoors.

INSPECT FOR LEAKAGE:

Inspect the chemical system daily for any signs of leakage. If leaking occurs at tubing connections, tighten fitting compression nut finger tight. If leakage continues, remove pressure from the system. Disconnect the tubing, trim ends square and reconnect.

INSPECT FOR BLOCKED FLOW:

Precipitates or other chemical reactions cause injection points to clog. If the type of chemical being fed eliminates the use of flushing solution, the injection point must be inspected at regular intervals. Strainers must be kept clean with periodic back-flushing.

METERING PUMP AND PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|---------------|--------------------------------|-----|
| 1 | 8.749-856.0 | Pump, Peristaltic, PRS-1, | |
| | | 1-7 gpd | 2 |
| 2 | 8.749-862.0 | Tube, Squeeze, Santoprene, | * |
| | | PR-7, 8-45 gpd | 1 |
| | 8.749-864.0 | Tube, Squeeze, Santoprene, | * |
| | | PRS-1, 1-7 gpd | 1 |
| 3 | 8.749-860.0 | Check Valve, PVC | 1 |
| 4 | 8.749-857.0 | Tubing, 1/4", PE, Black | AR |
| 5 | 8.749-863.0 | Strainer, w/Weight | 1 |
| 6 | 8.711-737.0 | Tubing, 1/8", ID, | |
| | | Norprene | AR |
| 7 | 8.751-801.0 | Faceplate, PRS-1/PR-7 | 1 |
| 8 | 8.751-376.0 | Roller Assembly, PRS-1 | 1 |
| | * Alternative | tubing materials are available | |

CENTRIFUGAL PUMP

Your centrifugal pump has been quality-built and engineered to give you efficient, dependable service. It is equipped with union connectors to make installation and future service easier.

The advanced design uses a single speed motor which reduces operation and maintenance to simple, common-sense procedures.

PUMP OPERATION

(Infeed Pump)



WARNING: Do not touch pumps, pump motors, water or discharge piping when the pumps are connected to electrical power. Do not handle a pump or pump motor with wet hands or when standing on a wet or damp surface or in water. Never touch a pump or discharge piping when a unit is operating or fails

to operate. Always disconnect the pump cord (power) before handling.

- 1. The shaft seal depends on water for lubrication. Do not operate the pump unless there is water. Dry running (pump not pumping water) will cause seal damage and eventual pump failure.
- 2. The motor is equipped with an automatic reset thermal protector. This means if the temperature in the motor should rise unduly, the switch will cut off all power before damage can be done to the motor. When the motor has cooled sufficiently, the switch will reset automatically and restart the motor. If the protector trips repeatedly (cycling on protector) the pump should be removed and checked as to the cause of the difficulty. Low voltage, long extension cords, clogged impeller, very low head or lift, etc., could cause cycling. Cycling of the protector will cause eventual motor burnout.

INFEED PUMP MAINTENANCE



WARNING: Before attempting to service, disconnect power from unit. Do not handle the pump with wet hands or when standing on a wet or damp surface or in water. Failure to follow precautions can result in personal injury and /or property damage. NOTE: Only qualified electricians

or servicemen should attempt to repair this unit. Improper repair and/or assembly can cause an electrical shock hazard.

- 1. Bearings in this unit are pre-lubricated. No additional lubrication is necessary.
- 2. Cleaning Occasionally clean the Transfer pit and pump if dirt or foreign matter accumulate. Small stones, gravel, sand, dirt, silt, etc. can clog and damage the pump and pump seal, eventually causing pump failure.
- 3. Disassembly of the motor prior to expiration of the warranty will void the warranty. It may also cause internal leakage and damage to the unit. If repairs are required, return the pump to a local service station or return to dealer.
- 4. If the motor has been disassembled or the switch chamber opened after the warranty expiration date, the O-rings and gaskets must be replaced. Care must be taken to assure that the seals, the switch cover and air tube gaskets do not leak.
- 5. The pump should be checked for proper operation weekly or monthly by watching the operation of the pump. If anything has changed since the pump was new, the pump should be examined, and repaired if necessary.

CONFIGURING AND TUNING PERISTALTIC PUMPS

The following is a set of guidelines to be used when configuring the peristaltic pumps that inject Coag and EC chemicals into the WaterMaze water treatment system. Materials required for this process are included in the WaterMaze CoAg Test Kit. Materials include:



- Small quantity (4oz ea) of CoAg+ and EC+ chemicals to be used in system
- 500 ml capacity test sample containers
- Clean standard sized plastic transfer pipettes (20 drops/ml, 3.2 ml draw)
- Filter Paper (50, 20 and 5 micron)

Determining Required Chemical Concentrations:

1. Obtain a **representative water sample** of the waste stream (1-2 gallons).

NOTE: Sampling is highly important. The sample should be representative of what will be processed by the CoAg treatment system. In other words, proper pretreatment should be applied to remove

heavy solids (e.g., those that settle quickly within say 10 to 15 minutes) and to remove free oils (e.g., oils that can be skimmed from the surface of the water).

- 2. Pour a **500 ml sample** into a clear container (beaker, cup, etc.)
- 3. Test the pH of the sample.
- 4. Adjust pH to 6.5 to 8. In many cases, pH adjustment should be considered as part of the pretreatment process. Adjusting the pH may allow for additional separation of oils and solids.
- 5. Add 2 drops (.1 ml) of CoAg+ coagulant to the sample.
- 6. Mix vigorously for at least 45 seconds.
- 7. **Observe the reaction** noting the start of coagulation (clumping together of solids).
- 8. Add 3 drops (.15 ml) of EC+ polymer and gently mix (slowly) for 30 seconds.
- 9. If successful, a separation of the solids should occur with the majority of the solids falling to the bottom of the sample container with clear phase of liquid on the top of the sample.
- 10. This sample can then be **filtered through 50 micron paper** to remove the flocculated solids.
- 11. If a separation does not occur, repeat the above steps with a new sample and add one additional drop (.05 ml) of CoAg+. Unsuccessful results after further adjustments may indicate that a different treatment technology is required other than Chemical treatment.



Water before (left) and after EC polymer is added to increase clumping.

CONFIGURING AND TUNING PERISTALTIC PUMPS

Calibrating Peristaltic Pumps:

- Collect the ppm concentration values for the Coag and EC polymer injections. Use the chart on the last page to determine the correct setting for each peristaltic pump. Align the ppm requirements with the desired processing rate, in gallons per minute (GPM), and obtain an estimate for the pump setting from the continuum along bottom of the figure.
- 2. The pump settings reference the spaces between hash marks on the pump's flow rate adjustment dial. Figure 1 on the last page shows the notation for these markings. A small screw driver can be used to adjust the pump to match the setting that was estimated by the configuration chart.



Pump Configuration Chart for WaterMaze Coag/EC Water Treatment System.

Figure 1. Peristaltic pump dial. This figure is a reference for the pump settings determined from the above chart . The dial in the image is currently at the "Lowest" setting.



Table 1. PPM concentration per
drop of chemical. To be used
with 20drops/ml transfer pipets
and 500 ml of sample water.

| # of | PPM of |
|-------|----------|
| Drops | Chemical |
| 1 | 100 |
| 2 | 200 |
| 3 | 300 |
| 4 | 400 |
| 5 | 500 |
| 6 | 600 |
| 7 | 700 |
| 8 | 800 |
| 9 | 900 |
| 10 | 1000 |

| Number of Drops | Observation |
|-----------------|-------------|
| | |
| | |
| | |

TROUBLESHOOTING - PUMP

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|-------------------------------|--|--|
| PUMP | Circuit breaker shut "OFF | Turn "ON" circuit breaker. |
| DOES NOT | Accumulation of trash on float | Clean float. |
| | Float obstruction | Check float path and provide clearance. |
| | Defective switch Have pump serviced by authorized service ce | |
| | Defective motor | Have pump serviced by authorized service center. |
| | Low line voltage | If voltage under recommended minimum, check size of wiring from main switch on property. If OK, contact power company. |
| PUMP | Float obstruction | Check float and float rod path. Provide clearance. |
| SHUT OFF | Pump is air locked (Infeed Pump) | Shut power off for approximately 1 minute, then restart. Repeat several times to clear air from pump. |
| | Defective float switch | Disconnect switch, check with ohmmeter. |
| PUMP | Lift too high for pump | Check rating table. |
| RUNS BUT | Inlet to impeller plugged | Pull pump and clean. |
| DISCHARGE | Low line voltage | If voltage under recommended minimum, check size of wiring from main switch on property. If OK, contact power company. |
| | Clogged impeller | Remove housing, unclog. |
| | Faulty motor protector | Replace pump. |
| PUMP DOES NOT | Low voltage, speed too slow | Check for proper supply voltage to make certain it corresponds to nameplate voltage. |
| DELIVER RATED | Impeller or discharge pipe is clogged | Pull pump and clean. Check pipe for scale or corrosion. |
| | Impeller wear due to abrasives | Replace worn impeller. |
| PUMP CYCLES CONTINUALLY | Low line voltage | If voltage under recommended minimum, check size of wiring from main switch on property. If OK, contact power company. |
| | Worn or defective pump parts or plugged impeller | Replace worn parts or entire pump. Clean parts if required. |
| | Pump air locked | Turn pump "ON" and "OFF" several times. Fill hose manually with water. |

TROUBLESHOOTING - INFEED PUMP

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|-------------------------|--|---|
| INFEED PUMP DOES NOT | Sump or pre-treatment tank has low water level | Raise level in sump or pre-treatment tank. |
| UPERALE | Control panel pump switch is in the OFF position | Confirm that control panel pump switch is in the ON position. |

WATER TREATMENT SYSTEM Troubleshooting Guide

TROUBLESHOOTING - PUMP MOTOR

| PROBLEM | POSSIBLE CAUSE | SOLUTION | |
|---|---|--|--|
| MOTOR | Disconnect switch is "OFF" | Be sure switch is on. | |
| WILL NOT RUN | Breaker is tripped | Reset breaker. | |
| | Starting switch is defective | Replace starting switch. | |
| | Wires at motor are loose, disconnected or wired incorrectly | Refer to instructions on wiring. Check and tighten all wiring. | |
| MOTOR | Motor is wired incorrectly | Refer to instructions on wiring. | |
| AND OVERLOAD KICKS OFF | Voltage is too low | Check with power company. Install heavier wiring if wire size is too small. See wiring instructions. | |
| | Defective float switch | Disconnect switch, check with ohmmeter. | |
| MOTOR RUNS BUT NO WATER IS DELIVERED | Pump in a new installation did not pick up prime through: a. Improper priming | Re-prime (3 or 4 times may be needed) by stopping and starting motor several times. | |
| | b. Air leaks | b. Check all connections on suction line. | |
| | Pump has lost its prime through: | | |
| | a. Air leaks | a. Check all connections on suction line, air volume control, jet and shaft seal | |
| | b. Water level below suction of pump | Lower suction line into water and re-prime. | |
| | Check valve is stuck in closed position | Replace check valve | |
| | Pipes are frozen | Thaw pipes. Bury pipes below the frost line. Heat pipes below frost line. Heat pit or pump house. | |

TROUBLESHOOTING - WATER SOLENOID

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|----------------|--|---|
| VALVE LEAKS | Dirt or debris on diaphragm seat | Clean diaphragm seat. |
| WHEN "OFF" | Solenoid not fully closed after manual operation | Turn solenoid clockwise to fully seated position. |
| | Solenoid O-ring damaged or twisted | Turn off water, inspect O-ring. Reseat if twisted, replace if damaged. |
| | Diaphragm damaged | Turn off water, remove bonnet screws and inspect diaphragm for nicks or damage NOTE: Diaphragm has one bleed hole molded into it. Replace, if necessary, with diaphragm kit. |
| | Dirt interfering with solenoid operation | Turn off water, remove solenoid and flush seating surface in bonnet and at bottom of solenoid with water. |
| | Solenoid damaged | Turn off water supply and replace solenoid. |
| WATER | Valve in manual "ON" position | Turn solenoid clockwise to "OFF" position. |
| SHUT OFF | Diaphragm bleed hole blocked | Use Manual Flush Mode. Turn water supply "OFF" and immediately back "ON" to clear blockage. If still blocked, turn off water and inspect diaphragm looking for blockage. |
| | Damaged solenoid | Turn off water supply and replace solenoid. |
| | Gate valve not fully open | Open gate valve fully. |
| FLOW CONDITION | Pipeline blockage | Clear pipeline. |
| VALVE WON'T | No power to solenoid | Make sure solenoid has power. |
| ELECTRICALLY | Low voltage | Check for proper voltage to unit. |
| | No water pressure | Make sure water pressure is available to valve. Turn off water, without cutting wires, unscrew and swap solenoids between valves. Turn on water and test again. If problem stems from the solenoid, replace solenoid. |

TROUBLESHOOTING - WATER SEALS

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|---|---|--|
| CRACKED OR BROKEN STATIONARY SEAT (CERAMIC) | Seal ran dry and heated up. When liquid reached seal faces it was cooler, causing thermal cracks | Check to insure seal chamber is full of liquid before starting pump. On high temperature ap- plication insure proper flushing at seal faces. |
| CARBON WASHER SCORED AND GROOVED | Dirty system | Have system cleaned and flushed. Consider use of Tungsten Carbide or Silicon Carbide Rings. |
| CARBON WASHER WORN UNEVENLY | Seal improperly installed | Check installation instructions for proper as- sembly. |
| BUNA DIAPHRAGM HARD OR BRITTLE. RAPID CARBON WEAR. | Air leak on suction side of pump | Check cover gasket, hand knobs, hose, clamps, etc. Replace or tighten as necessary. |
| DIAPHRAGM SOFT AND STICKY; APPEARS TO BE DISSOLVING. | Bellows not compatible with material being pumped | Consult dealer for recommendation advising of pumpage and temperature. |

PUMP & PLUMBING EXPLODED VIEW

Shown with Options



PUMP & PLUMBING PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|--------------|---|-----|
| 1 | 8.750-270.0 | Fitting, Comp 1-1/2" S x 1-1/2" MBT, Blk | 1 |
| 2 | 8.706-367.0 | Pipe, 1.5", PVC 80, 3" | 3 |
| 3 | 8.706-374.0 | Elbow, 1.5", S x S PVC 80, 90° | 3 |
| 4 | 8.707-344.0 | Valve, PVC, 1-1/2" Slip x Slip Gate | 1 |
| 5 | 8.706-409.0 | Adapter, 1" MT x Slip, PVC 80 | 3 |
| 6 | 8.706-398.0 | Bushing, 1" FIPT x 1-1/2" SP PVC 80 | 4 |
| 7 | 8.706-366.0 | Pipe, 1", PVC 80, 2" | 5 |
| 8 | 8.750-189.0 | Flow Switch, 1" SCH 40 | 1 |
| 9 | 8.706-469.0 | Union, 1-1/2" Slip x Slip PVC 80-, SPEA | 1 |
| 10 | 8.706-360.0 | Pipe, 1-1/2" PVC Clear, 6" | 1 |
| 11 | 8.706-426.0 | Tee, 2" x 2" x 1/2" SCH 80 | 1 |
| 12 | 8.706-406.0 | Bushing, 1/2" x 1/2" SPGXFT PVC 80, SPEARO | 1 |
| 13 | 8.716-156.0 | Switch, Pressure PM11120A-1PF, 1-PSI | 1 |
| 14 | 8.706-914.0 | Bushing, 1/2" x 1/8" Pipe | 1 |
| 15 | 8.706-373.0 | Elbow, 1", S x S, PVC 80, 90° | 3 |
| 16 | 8.706-597.0 | Union, 1", S x S, PVC 80 Spears | 1 |
| 17 | 8.917-759.0 | Pump, 3/4HP, 115V Center Discharge | 1 |
| 18 | 8.707-169.0 | Adapter, 1-1/2" x Male x 1-1/2" Male Third C | 1 |
| 19 | 8.706-432.0 | Tee, 1" FPT x Slip x Slip PCV 80 | 1 |
| 20 | 8.706-928.0 | Bushing, 1" x 1/2" Blk Poly Reducer | 1 |
| 21 | 8.706-387.0 | Plug, 1/2" MIPT, PVC 80 | 1 |
| 22 | 8.706-367.0 | Pipe, 1-1/2" PVC, 80, 7" | 1 |
| 23 | 8.706-366.0 | Pipe, 1", PVC 80, 10" | 1 |
| 24 | 8.706-366.0 | Pipe, 1", PVC 80, 6.5" | 1 |
| 25 | 8.706-366.0 | Pipe, 1", PVC 80, 3" | 1 |
| 26 | 8.706-393.0 | Coupling, 1/2", PVC Pipe SCH 80, TXT | 1 |
| 27 | 9.802-514.0 | Strain Relief, LT, Str, 1/2 NPT .2345D | 1 |
| 28 | 8.712-136.0. | Gauge, Flowmeter, 1-1/2" | 1 |
| 29 | 8.716-157.0 | Protector, Pressure Switch | 1 |
| 30 | 8.706-421.0 | Hanger, Pipe,, 1-1/2", #47 | 2 |
| 31 | 9.802-798.0 | Screw, #10 x 1/2", Tek HH | 2 |
| 32 | 8.719-528.0 | Bolt, 3/8" x 1" NC, Blk | 4 |
| 33 | 9.802-807.0 | Washer, 3/8" SAE, Flat Zinc | 4 |
| 34 | 9.802-779.0 | Nut, 3/8", ESNA, NC | 4 |

ELECTRICAL BOX EXPLODED VIEW

Shown with Options



ELECTRICAL BOX PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|---|--------|
| 1 | 8.752-153.0 | Relay, 24VDC, RH2B-ULDC24V, IDEC | 1 |
| 2 | 9.802-467.0 | Base, Relay, SH2B-05, IDEC | 1 |
| 3 | 9.802-457.0 | DIN Rail, 35mm | 1 |
| 4 | 9.802-105.0 | Plug, 7/8', Hole | 5 |
| 5 | 9.802-514.0 | Strain Relief, LT, Str, 1/2 NPT .2345 D | 5 |
| 6 | 9.803-663.0 | Fuse, KTK-R2(amp) 600V Midget Fuse | 2 |
| 7 | 8.713-078.0 | Fuse, 2 Amp FNM-2 | 1 |
| 8 | 9.804-595.0 | End Bracket, (Standard) AMC Option | 4 6 |
| 9 | 9.802-553.0 | Transformer 120-24V 0.050KVA | 1 |
| 10 | 8.716-396.0 | Terminal Block, ENTRELEC 115-116-07M4/6 (Standard) AMC Option | 7 9 |

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|-------------------------------------|-----|
| 11 | 8.724-269.0 | Contactor, DP, 25 Amp | 1 |
| 12 | 8.921-705.0 | Stand Off PH Stand | 1 |
| 13 | 9.802-778.0 | Nut, 5/16" Whiz Loc Flange | 4 |
| 14 | 8.751-306.0 | Timer, Multi Function AMC Option | 1 |
| 15 | 9.802-793.0 | Nut Cage, 1/4" X 16 GA | 3 |
| 16 | 8.718-936.0 | Screw, #8 x 1/2" | 11 |
| 17 | 8.716-253.0 | Timer, 24 Hour Pin AMC Option | 1 |
| 18 | 8.716-121.0 | Power Block, 1 Pole | 1 |
| 19 | 8.716-120.0 | Power Block, Adder | 1 |
| 20 | 8.716-460.0 | Terminal, Grounding Lug | 1 |
| 21 | 8.716-317.0 | Plug, Housing | 2 |
| 22 | 8.716-318.0 | Housing, Cap | 2 |



CONTROL PANEL PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|------------------------------|-----|
| 1 | 8.749-856.0 | Pump, Peristaltic, 1-7 GPD | 2 |
| 2 | 8.900-803.0 | Label, Watermaze, Logo Sma | 1 |
| 3 | 9.800-347.0 | Label, Warning | 1 |
| 4 | 9.802455.0 | Light, Indicator, Green 125V | 1 |
| 5 | 9.803-650.0 | Light, Indicator, Blue 28V | 1 |
| 6 | 8.716-037.0 | Switch, Rocker | |
| | | 10A/250V-15A/125V, 24VLT | 1 |
| | | | |

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|-----------------------------|-----|
| 7 | 9.802-514.0 | Strain Relief, LT, Str | |
| | | 1/2 NPT,.2345D | 3 |
| 8 | 9.807-597.0 | Label, Control Panel | |
| | | Compact CoAg | 1 |
| 9 | 8.716-989.0 | Controller w/Probe | 1 |
| 10 | 9.921-708.0 | Cover, Panel | 1 |
| 11 | 8.749-855.0 | Pump, Peristaltic, 8-45 GPD | |
| | | (pH Option) | 1 |
| 12 | 9.802-453.0 | Switch, Curvette | 1 |

MIXING TUBE ASSEMBLY EXPLODED VIEW



MIXING TUBE ASSEMBLY PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY | |
|------|-------------|--|-----|--|
| 1 | 8.730-407.0 | Pipe, 4" Dia, ABS Black, 4' | 4 | |
| 2 | 9.800-343.0 | Label, Flow Arrow Up Blue Outline | 2 | |
| 3 | 9.800-344.0 | Label, Flow Arrow Down Blue Outline | 2 | |
| 4 | 8.730-410.0 | Cap, Flat, 4' Slip, Black ABS | 8 | |
| 5 | 8.706-484.0 | Bulkhead, 1", Polypro | 8 | |
| 6 | 8.706-439.0 | Nipple, PVC 80, Close | 7 | |
| 7 | 8.706-378.0 | Elbow, 1" Slip x FPT PVC 80, 90° | 8 | |
| 8 | 8.706-366.0 | Pipe, 1", PVC 80 3" Length | 4 | |
| 9 | 8.706-366.0 | Pipe, 1", PVC 80, 2" Length | 3 | |
| 10 | 8.706-597.0 | Union, 1", S x S, PVC 80 Spears | 4 | |
| 11 | 8.706-373.0 | Elbow, 1" S x S PVC 80, 90° | 1 | |
| 12 | 8.706-366.0 | Pipe, PVC 80, 2" Length | 2 | |
| 13 | 8.706-444.0 | Adapter, Female,1" Slip x FT | 1 | |
| 14 | 8.706-366.0 | Pipe, 1", PVC 80, 55" Length | 1 | |
| 15 | 9.802-035.0 | Plug, 1/8" Square Head, Blk | 6 | |
| 16 | 8.706-366.0 | Pipe, 1" PVC 80, 3" Length | 1 | |
| 17 | 8.706-398.0 | Bushing, 1 FIPT x 1-1/2" SP, PVC 80 | 1 | |

ASSEMBLY EXPLODED VIEW



ASSEMBLY PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|--|-----|
| 1 | 8.706-588.0 | Connector, 3/8' x 1/4', Male Elbow, POL | 3 |
| 2 | 8.707-321.0 | Valve, Ozone Meter, 1/4' PLA | S 1 |
| 3 | 8.706-587.0 | Nipple, 1/2' x 1/4', HEX | 1 |
| 4 | 9.802-775.0 | Nut, 1/4" Flange, ZN | 4 |
| 5 | 8.916-873.0 | WLMT, Brace, Stealth Tube | 2 |
| 6 | 9.802-778.0 | Nut, 5/16" Whiz Loc Flange | 20 |
| 7 | 8.916-867.0 | Bracket, Stealth Tube | 8 |
| 8 | 8.706-366.0 | Pipe, 1" PVC | 1 |
| 9 | 8.706-597.0 | Union, 1" , S x S, PVC 80 Spears | 4 |
| 10 | 8.913-227.0 | Stand, Welded ASSY, PH | 1 |
| 11 | 8.730-407.0 | Pipe. 4" DIA, ABS Black | 4 |
| 12 | 8.706-373.0 | Elbow, 1" S x S PVC 80, 90° | 2 |
| 13 | 8.730-410.0 | Cap, Flat, 4' Slip, Black ABS | 8 |
| 14 | 8.706-366.0 | Pipe, 1', PVC 80, 55" Length | 1 |
| 15 | 8.706-444.0 | Adapter, Female,1" Slip x FT | 1 |
| 16 | 9.802-798.0 | Screw, # 10 x 1/2", TEK HEX Head | 3 |
| 17 | 8.706-423.0 | Hanger, Pipe,1' Click # 32 | 2 |

INFEED PUMP EXPLODED VIEW



OZONE PUMP EXPLODED VIEW PARTS LIST

| ITEM QTY | PART NO. | DESCRIPTION | |
|-------------|-------------|-----------------------|---|
| 1 | 8.726-025.0 | Motor, 3/4 HP, 115V | 1 |
| 2 | NA | Slinger | 1 |
| 3 | 8.726-024.0 | Pump, 3/4 HP, Wet End | 1 |
| 4 | NA | Drain Plug | 1 |
| 5 | NA | O-Ring, Drain Plug | 1 |

| ITEM QTY | PART NO. | DESCRIPTION | |
|-------------|-------------|------------------------------|--------|
| 6 | NA | O-Ring | 1 |
| 7 | NA | Adapter, Union 1-1/2" Slip | 1 |
| 8 | NA | Collar, Union | 1 |
| Kit: | | | |
| 6-8 | 8.750-270.0 | Fitting, Compression, 1-1/2" | Slip 2 |

| НР | Volts | Phase | Si Inlet | ze Outlet | Running Amps | Max. Pressure | Max. Water Temp. |
|-----|-------|-------|---------------------------|--------------------------|-----------------|------------------|---------------------|
| 3/4 | 230V | 1 | 1-1/2" FPT/ 1-1/2" MBT | 1-1/2"FPT/ 1-1/2" MBT | 10.0 | 40 PSI | 104°F/40° |



LIMITED NEW PRODUCT WARRANTY WASH WATER / WATER TREATMENT SYSTEMS

WHAT THIS WARRANTY COVERS

All WATER MAZE water treatment systems are warranted by to the original purchaser to be free from defects in materials and workmanship under normal use, for the periods specified below. This Limited Warranty, subject to the exclusions shown below, is calculated from the date of the original purchase, and applies to the original components only. Any parts replaced under this warranty will assume the remainder of the part's warranty period. A 60 day grace period will be given for installation.

ONE YEAR PARTS AND 30 DAY LABOR WARRANTY:

All components excluding normal wear items as described below.

WARRANTY PROVIDED BY OTHER MANUFACTURERS:

Motors, which are warranted by their respective manufacturers, are serviced through these manufacturers' local authorized service centers. *WATER MAZE* cannot provide warranty on these items.

WHAT THIS WARRANTY DOES NOT COVER

This warranty does not cover the following items:

- 1. Normal wear items, such as seals, filters, gaskets, O-rings, packings, pistons, brushes, filtering media, ozone bulbs, sensors, UV scanners, oil-skimmer belt, impedance sensor. Minor leaks covered first time on original startup only.
- Damage or malfunctions resulting from accidents, abuse, modifications, alterations, incorrect installation, improper servicing, failure to follow <u>manufacturer's maintenance instructions</u>, or use of the equipment beyond its stated usage specifications as contained in the operator's manual.
- 3. Damage due to freezing, sludge build-up, chemical deterioration (oxidation, chloride or fluoride corrosion), and rust.
- 4. Damage to components from fluctuations in electrical or water supply.
- 5. Normal maintenance service, including adjustments.
- 6. Transportation to service center, field labor charges, or freight damage.
- 7. Consumables and water quality.

WHAT YOU MUST DO TO OBTAIN WARRANTY SERVICE

While not required for warranty service, we request that you register your WATER MAZE Product by returning the completed registration card. In order to obtain warranty service on items warranted by WATER MAZE, you must return the product to your Authorized WATER MAZE Dealer, freight prepaid, with proof of purchase, within the applicable warranty period. If the product is permanently installed, you must notify your Authorized WATER MAZE Dealer of the defect. Your Authorized WATER MAZE Dealer will file a claim with WATER MAZE, who must subsequently verify the defect. In most cases, the part must be returned to WATER MAZE freight prepaid with the claim. For warranty service on components warranted by other manufacturer's, your Authorized WATER MAZE Dealer can help you obtain warranty service through these manufacturers' local authorized service centers.

LIMITATION OF LIABILITY

WATER MAZE'S liability for special, incidental, or consequential damages is expressly disclaimed. In no event shall WATER MAZE'S liability exceed the purchase price of the product in question. WATER MAZE makes every effort to ensure that all illustrations and specifications are correct, however, these do not imply a warranty that the product is merchantable or fit for a particular purpose, or that the product will actually conform to the illustrations and specifications. Our obligation under this warranty is expressly limited at our option to the replacement or repair at a service facility or factory designated by us, of such part or parts as inspection shall disclose to have been defective. THE WARRANTY CONTAINED HEREIN IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY WATER QUALITY, MERCHANTABLIITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY LIMITED TO THE DURATION OF THIS WARRANTY. This warranty gives you specific legal rights and you may also have other rights which vary from state to state. WATER MAZE does not authorize any other party, including authorized WATER MAZE Distributors, to make any representation or promise on behalf of WATER MAZE, or to modify the terms, conditions, or limitations in any way. It is the buyer's responsibility to ensure that the installation and use of WATER MAZE products conforms to local codes. While WATER MAZE attempts to assure that its products meet national codes, it cannot be responsible for how the customer chooses to use or install the product. Some states do not allow limitations or exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.



Form #9.801-506.0 • Revised 1/14 • Printed in U.S.A.



OPERATOR'S MANUAL

IPF2-20 Water Treatment System



For the dealer nearest you, consult our web page at www.wmaze.com
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Part Number _____

Serial Number _____

Date of Purchase _____

The part and serial numbers will be found on a decal attached to the machine. You should record both serial number and date of purchase and keep in a safe place for future reference.

INTRODUCTION & IMPORTANT SAFETY INSTRUCTIONS

Your owner's manual has been prepared to provide you with a simple and understandable guide, for equipment operation and maintenance, based on the latest product information available at the time of printing. To keep your machine in top running condition follow the specific maintenance and troubleshooting procedures given in this manual. When ordering parts please specify model and serial number.

NOTE: *Water Maze* reserves the right to make changes at anytime without incurring any obligations.

Owner/User Responsibility:

The owner and/or user must have an understanding of the manufacturer's operating instructions and warnings before using this equipment. Warning information should be emphasized and understood. If the operator is not fluent in English, the manufacturer's instructions and warnings shall be read to and discussed with the operator in the operator's native language by the purchaser/owner, making sure that the operator comprehends its contents.

Owner and/or user must study and maintain for future reference the manufacturers' instructions.

SAVE THESE INSTRUCTIONS

This manual should be considered a permanent part of the machine and should remain with it if machine is resold.

When ordering parts, please specify model and serial number. Use only identical replacement parts.

This machine is to be used only by trained operators.

GENERAL SAFETY INFORMATION



4

WARNING: When using this machine basic precautions should always be followed, including the following:

- 1. Read all the instructions before using the product.
 - To reduce the risk of injury, close supervision is necessary when a product is used near children.
- 3. Know how to stop the product quickly. Be thoroughly familiar with the controls.
- 4. Stay alert watch what you are doing.

2.

- 5. Do not operate the product when fatigued or under the influence of alcohol or drugs.
- 6. Keep operating area clear of all persons.
- 7. Do not overreach or stand on unstable support. Keep good footing and balance at all times.

8. Follow the maintenance instructions specified in the manual.



WARNING: Wire the system for correct voltage. Refer to the information located on the serial plate.

WARNING: All wiring must be performed by a qualified electrician.

WARNING: Risk of Electric Shock

DANGER – Improper connection of the equipmentgrounding conductor can result in a risk of electrocution. Check with a qualified electrician or service personnel if you are in doubt as to whether the outlet is properly grounded.

GROUNDING INSTRUCTIONS

This product must be connected to a grounded, metal, permanent wiring system; or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment-grounding terminal or lead on the product.

GROUND FAULT CIRCUIT INTERRUPTER PROTECTION

To comply with the National Electrical Code (NFPA 70) and to provide additional protection from the risk of electric shock, this machine should only be connected to a circuit protected by a ground fault circuit interrupter (GFCI).

9. Know the system application, limitations, and potential hazards.



LIQUIDS.

WARNING: Do not use near concentrations of flammable or explosive fluids such as gasoline, fuel oil, kerosene, etc. Do not use in explosive atmospheres. Liquids compatible with component materials should only be used. Failure to follow this warning can result in personal injury and/or property damage.

- 10. The main power must be brought from the circuit breaker and wired into the electrical box on the IPF2-20. This line must be run through conduit to protect it from damage. A power disconnect should be located next to the machine for maintenance purposes.
- 11. Protect all electrical cords from sharp objects, hot surfaces, oil, sunlight, and chemicals. Avoid kinking the cords. Replace or repair damaged or worn cords immediately.

VATER TREATMENT SYSTEM OPERATOR'S MANUAL

IMPORTANT SAFETY INSTRUCTIONS

- 12. Never make adjustments on the machine while it is in operation.
- 13. Follow the maintenance instructions specified in this manual.
- 14. Before servicing the machine, refer to all the MS-DS's on the material identified in the waste stream. You must comply with all warnings and wear all protective clothing as stated on the MSDS's.
- 15. Inlet water temperature must not exceed 85°F.
- 16. The best insurance against an accident is precaution and knowledge of the equipment.
- 17. Water Maze is not liable for modifications or use of components not purchased from Water Maze.



- 18. Personal Safety:
- a. Wear safety glasses and other applicable protective clothing at all times when working on this machine.

Refer to item #14 under Important Safety Information.

- Keep your work area clean, uncluttered and properly lighted
- c. Keep visitors at a safe distance from work area.
- 19. Drain all liquids from the component before servicing.
- 20. Check hoses for weak or worn conditions before each use, making certain that all connections are secure.
- 21. Periodically inspect system components. Perform routine maintenance as required.
- 22. Do not touch an operating motor. Modern motors are designed to operate at high temperatures.
- 23. Do not touch any electrical component with wet hands, when standing on a wet or damp surface, or in water.

- 24. Keep machine from freezing.
- 25. Do not spray water directly at machine.

WARNING: This system contains moving parts. Follow safe practices when performing maintenance and when troubleshooting. Disconnect the power before servicing this machine. If the power disconnect is out of sight, lock it in the open position and tag it to prevent unexpected application of power.

WARNING: If any cords or electrical wires appear to be frayed, damaged, or in poor condition, proceed with caution and immediately take steps to have the cords repaired or replaced.

WARNING: Make sure to take precautions when performing maintenance on the IPF2-20 and make sure electrical cords are well maintained.

APPLICATION AND INTENDED USE

IPF2-20 Water Treatment Unit:

The IPF2-20 can be installed as a component of a system that incorporates multiple water treatment technologies. In certain applications the constituents in the water may require additional pre-treatment or post treatment of the fluid stream. The IPF2-20 is effective in removing a wide range of constituents from water including:

- · Oils (emulsified and free-oils)
- Suspended solids
- Heavy metals

As in all water treatment technologies, and without additional complementary technologies, the IPF2-20 has its limitations. It does not and/or is less effective in removing the following from industrial waste water:

- Dissolved solids: (i.e., salts, sugars, etc.)
- Some miscible liquids: (i.e., milk and water)
- Chelated solutions (e.g., metal ions held in solution using chemical agents) – typically found in metal plating applications
- Water soluble liquids (i.e., machining coolants)

To assure the best processed water quality, pretreatment of the waste water should be applied to address the following waste water characteristics:

- Heavy solids: Excessive amounts of heavy solids (especially solids that quickly fall out) should be removed prior to entering the IPF2-20 system.
- Free-oils (oils that are floating on the surface of the water): Although the IPF2-20 will typically address both free-oils and emulsified oils, excessive amounts of free-oils should be removed prior to entering the EC system.
- pH of the water: Typically, the IPF2-20 system performs best when the pH of the influent waste water is between 6 and 8. If the pH is outside these limits, pH adjustment will be necessary. Consult Water Maze for recommendation.
- Post-treatment: Subject to the application requirements, additional water treatment may be required.

Consult a Water Maze representative prior to combining the IPF2-20 with other pre-treating and post treating equipment.

TCLP Testing:

TCLP is one of the Federal EPA test methods that are used to characterize waste as either hazardous or non-hazardous for the purpose of disposal. TCLP is an acronym for Toxicity Characteristic Leaching Procedure. A TCLP test may be required prior to disposal of your solid waste. Consult a Water Maze representative for details.

Site Preparation:

The installation site surface should be of compacted materials, such as concrete, asphalt or pavement and capable of supporting the IPF2-20 treatment system.

IPF2-20 COMPONENT IDENTIFICATION



INSTALLATION & OPERATING INSTRUCTIONS

The following instructions will provide adequate information to fully install your Water Maze IPF2-20 System. Please follow these instructions step by step to ensure proper installation.

Equipment and Supplies Needed for Installation

Aside from having a general assembly of tools on hand, you will need to supply a few additional items to complete the installation of your system.

- Forklift
 Tape Measure
- Level
 Chalk

Equipment Installation

The model IPF2-20 water treatment system must be installed on a level surface.

If surface is not level, shimming may be required.

Installation Checklist

- □ Are all piping and electrical float switches connected as shown on the "Water Panel View"
- □ Is electrical wiring connected as shown on the Electrical Connection Diagram?
- □ Is the voltage correct?

START-UP

- 1. Make sure that all equipment is level.
- 2. Attach incoming water hose to connection located on side of polishing filter.
- 3. Connect electrical power to control panel: When connecting to the power supply, follow all electrical and safety codes as well as the most recent National Electric Code (NEC) and Occupational Safety and Health Act (OSHA). Ground system before connecting to the power supply.

WARNING: All wiring must be performed by a qualified electrician.

UTILITY USAGE

Electrical: 120 Volts, 3 Amps

OPERATING ENVIRONMENT

The IPF2-20 is designed to work in a wide variety of operating conditions. In normal operating environments, the system should perform as specified. In extremely hot or cold environments certain precautions need to be taken.

6.0 - 8.0

Operating Conditions

Air Temperature Range 40° - 120°F

Water pH

Cold Weather



Protect The IPF2-20 from damage that can occur when freezing water expands. Freezing water may cause pipes to burst.

Drain all pipes if a prolonged hard freeze is expected. Make sure all valves are open so water can completely drain from the system.

TEMPERATURES DROP BELOW FREEZING

Environmental

To reduce deterioration of equipment it is recommended that the IPF2-20 Water Treatment System be protected from environmental elements such as rain, snow, hail, direct sunlight, as well as freezing temperatures.

IPF PAPER INSTALLATION

- 1. Remove the metal paper cover.
- 2. Remove the two 5/8" collars from one side to the paper axle.
- 3. Slide the axle into the paper roll. Re-attach the two 5/8" collars.
- Lift the paper roll onto the U-shape brackets on the tank assembly. NOTE: The paper MUST roll off to the backside of the IPF.
- Loosen the 5/8" collars to align and center the paper over the conveyor belt and tighten the collars. NOTE: the outer collars are to be located to the outside of each U-shaped bracket.
- Unroll approximately two feet of paper. Fold over a 3 inch section and crease on the loose end. NOTE: paper MUST go around the paper guide bar located just above the conveyor belt (back of IPF).
- 7. From the back of the unit, work one side of the folded paper section under the white paper guide that rides on top of the grey conveyor belt. Insert one inch under the white paper guide, then do the same procedure on the other side.

Π Ś Ś N <u>n</u> Π **OPERATOR'S MANUAL**

MAINTENANCE INSTRUCTIONS

- 8. With the machine wired up, turn on the power switch. Move to the right hand side to the IPF. With the right hand, press down in the middle of the paper that is on the conveyor belt to keep the paper aligned under the white paper guides. With the left hand, lift up on the liquid level switch located under the metal float switch cover. This will cause the conveyor belt to index forward.
- 9. Once the paper had indexed to the end of the conveyor belt, let the float drop.
 - If needed, realign to center the paper that is under the white paper guides.
 - Reattach the metal paper cover.

MAINTENANCE INSTRUCTIONS

Daily and weekly maintenance is important for your system to function consistently and properly. Maintenance frequency depends on many factors, such as usage, volume of sludge, etc. On-site personnel should be trained and be aware of the daily and weekly maintenance that is required to meet these performance factors. We recommend the following:

Daily Schedule:

(Performed by customer personnel)

- 1. Become familiar with the IPF2-20 and make sure the electrical switch is in the ON position. When the switch is in the ON position, your system can operate automatically.
- 2. While operating the system, observe and repair any water leaks.



10

EXPLODED VIEW

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|--|--------|
| 1 | 8.749-948.0 | Belting, 1" Pitch, Conveyer, Plastic | 1 |
| 2 | 8.749-949.0 | Sprocket, 1" Pitch, 2.6 Diam x 1" Bore | 8 |
| 3 | 8.749-950.0 | Motor, 90°, 115V AC/DC, 1/15 | HP1 |
| 4 | 8.749-952.0 | Sprocket, Drive Belt | 1 |
| 5 | 8.749-953.0 | Sprocket, Shaft Motor | 1 |
| 6 | 8.749-954.0 | Bearing, UHMW S.S. Base Mounted | 4 |
| 7 | 8.749-956.0 | ▲ Link, Chain, Single Strand | 1 |
| 8 | 8.749-957.0 | Guide, Paper, Tank, Micron FP | 2 |
| 9 | 8.749-958.0 | Spacer, Guide, Belt, UHMW | 4 |
| 10 | 8.916-851.0 | Filter Pan, Tank Assy, Micron F | -P 1 |
| 11 | 8.916-902.0 | Bracket, Float Switch | 1 |
| 12 | 8.916-903.0 | Adjustable Bracket, Float Swite | ch 1 |
| 13 | 8.916-853.0 | Wlmt, Tank, Micron FP | 1 |
| 14 | 8.916-854.0 | Wlmt, Leg, Micron FP | 4 |
| 15 | 8.916-855.0 | Wlmt, Guide, Tank, Micron FP | 1 |
| 16 | 8.916-856.0 | Wlmt, Right, Splash Pan, Micron FP | 1 |
| 17 | 8.916-857.0 | Wlmt, Left, Splash Pan, Micron FP | 1 |
| 18 | 8.916-858.0 | Wlmt, Cover, Motor, Micron FF | · 1 |
| 19 | 8.706-403.0 | Bushing, 2" x 1-1/2" MT x FT, PVC 80, Spearso | 2 |
| 20 | 8.706-583.0 | Pipe, 2" Gray, PVC 80" Cut | to Fit |
| 21 | 9.802-782.0 | Collar, 5/8" Bore | 4 |
| 22 | 9.802-754.0 | Screw, 1/4" x 1/2" HH, NC, Whiz Loc | 10 |
| 23 | 9.802-767.0 | Bolt, 3/8" x 3/4" Whiz | 8 |
| 24 | 9.802-781.0 | Nut, 3/8" Whiz | 16 |
| 25 | 9.802-072.0 | Trim, 6100 B3 x 1/16" A. w/Sponge 10.1 | 25 ft. |
| 26 | 8.716-088.0 | Relay, 120V-5A SPDT | 1 |
| 27 | 9.802-487.0 | ▲ Wire, Nut, Brown, Twister, 8.22 AWG | 2 |
| 28 | 8.716-294.0 | Switch, Liquid Level, M-5000 | 1 |
| 29 | 9.802-486.0 | ▲ Wire Nut, Orange 73B | 1 |
| 30 | 9.802-695.0 | Nut, 10/32" Keps | 4 |
| 31 | 8.911-371.0 | Axle, 5/8" x 31.625" | 1 |
| 32 | 9.802-753.0 | Screw, 1/4" x 3/4" | 3 |
| 33 | 9.802-775.0 | Nut, 1/4" Flange, Zn | 7 |
| 34 | 9.802-771.0 | Screw, 10/32" x 3/4" BHSOC B | lk 2 |
| 35 | 9.802-733.0 | Bolt, 3/8" x 3-1/2" | 8 |
| 36 | 8.706-479.0 | Bulkhead, 2" NPT, Polypro | 2 |
| 37 | 8.706-466.0 | Nipple, 2" Close | 2 |
| 38 | 8.706-395.0 | Plug, 2" PVC 80" | 1 |
| 39 | 8.707-169.0 | Adapter, 1.5" Male x 1.5" Male THRD C | 1 |
| 40 | 8.716-547.0 | Connector, 1/2" L/T, Straight, Black | 2 |
| 41 | 8.750-743.0 | Bulkhead, 1/2" PVC | 1 |
| 42 | 8.706-914.0 | Bushing, 1/2" x 1/8" Pipe | 1 |

| TEM | PART NO. | DESCRIPTION | QTY |
|----------------|----------------------------|--|----------|
| 43 | 9.802-448.0 | Conduit, Wtr Tight, Flex, 1/2, | |
| | | 100' / Box | 2.5 ft |
| 44 | 9.802-807.0 | Washer, Flat 3/8" | 8 |
| 45 | 8.731-131.0 | Screw, 1/4" x 1-3/4" Whiz | 10 |
| 46 | 9.803-541.0 | ▲ Screw, 5/16"-18 x 1/2" CS S BH NC ZN | SOC 4 |
| 47 | 8.716-524.0 | ▲ Terminal, Female, Socket | 2 |
| 48 | 8.716-706.0 | ▲ Tubing, .25 ID Blk Shrink, 48" 25/ | 3 in |
| 49 | 9.804-120.0 | Magnet, Reed Sensor Target | 1 |
| 50 | 8.707-168.0 | ▲ Coupler, 1.5" Fem x 1.5" Ho | ose 1 |
| 51 | 9 017 157 0 | Wimt Bapar Cover | - 1 |
| 50 | 0.917-137.0 | Deper Filter 50 Mieron | - 1 |
| 52 | 0.732-171.0 | (Option Not Included) | 1 |
| | 8.752-173.0 | Paper, Filter 20 micron | 1 |
| | 8.752-172.0 | Paper, Filter 5 micron | 1 |
| | 8.719-179.0 | ▲ Tub, Black Sludge, Rectangular w/Lid | 1 |
| 53 | 9.802-451.0 | Switch, Rocker, Carling | |
| | | w/Green Lens | 1 |
| 54 | 9.804-118.0 | Switch, Magnetic Sensor, NC | 4 |
| | 9.804-119.0 | Switch, Magnetic Sensor, NC (Supplied for CoAg 2-20/EC2-2 | 20)1 |
| 55 | 9 802-514 0 | Strain Belief 1/2" | 1 |
| 56 | 8 917-360 0 | Switch Bod | 1 |
| 57 | 8 917-154 0 | Bracket Left | 1 |
| 58 | 9 802-805 0 | Washer 5/16" | 10 |
| 59 | 8 718-817 0 | Nut 1/4" x 20 | 10 |
| <u>60</u> | 8 917-039 0 | | 1 |
| 61 | 8 917-040 0 | Wint, Axle, Hont | 1 |
| 62 | 9 725 517 0 | Sorapor Eiltor | - 1 |
| 62 | 0.902.740.0 | | <u>ו</u> |
| 64 | 9.802-749.0 | Nut 9/22" | 2 |
| 65 | 9.002-705.0 | Cutout Background | |
| 66 | 9 721 124 0 | Sorow 4.40 | - 1 |
| 67 | 0.731-134.0 | Nut 4 40 | |
| 69 | 9 705 540 0 | Rolt Chidr 5/16" | ו ס |
| 60 | 0.120-048.0 | | 2 |
| 70 | 0./10-524.0 | | _+ |
| 70 | 0./10-31/.0 | | 10" |
| 71 | 8.749-955.0 | Chain, Single Strand | 13" |
| 72 | 8./16-51/.0 | | 4 |
| 73 | 8./16-473.0 | Connector, Butt | 1 |
| 74 | 9.804-069.0 | ▲ Disconnect, Female | 5 |
| 75 | 8.716-377.0 | ▲ Ierminal Ring | 4 |
| 76 | 8.712-861.0 | ▲ Edge Trim | 6 ft |
| 77 | 9.802-073.0 | ▲ Weatherstrip | 2 ft |
| 78 | 8.706-384.0 | Elbow, 2" S x T | 2 |
| | 8.706-382.0 | Elbow, 2" S x S | 2 |
| 79 | | | |
| 79 80 | 8.750-629.0 | Pipe, Machined, 2" Gray PVC | 1 |
| 79 80 81 | 8.750-629.0 8.716-714.0 | Pipe, Machined, 2" Gray PVC ▲ Fuse 2.5 Amp | 1 1 |

EXPLODED VIEW - SUMP PIT. OPTION



EXPLODED VIEW PARTS LIST- SUMP PIT. 8.917-279.0

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|--------------------------|-----|
| 1 | 8.725-513.0 | Switch, Level | 2 |
| 2 | 8.752-144.0 | Sump Tank | 1 |
| 3 | 8.707-169.0 | Adapter, 1.5 Male x 1.5 | 1 |
| 4 | 8.750-743.0 | Bulkhead, 1/2" PVC | 2 |
| 5 | 8.706-490.0 | Bulkhead, 1-1/2" Polypro | 1 |

OPERATOR'S MANUAL WATER TREATMENT SYSTEM



LIMITED NEW PRODUCT WARRANTY WASH WATER / WATER TREATMENT SYSTEMS

WHAT THIS WARRANTY COVERS

All WATER MAZE water treatment systems are warranted by to the original purchaser to be free from defects in materials and workmanship under normal use, for the periods specified below. This Limited Warranty, subject to the exclusions shown below, is calculated from the date of the original purchase, and applies to the original components only. Any parts replaced under this warranty will assume the remainder of the part's warranty period. A 60 day grace period will be given for installation.

ONE YEAR PARTS AND 30 DAY LABOR WARRANTY:

All components excluding normal wear items as described below.

WARRANTY PROVIDED BY OTHER MANUFACTURERS:

Motors, which are warranted by their respective manufacturers, are serviced through these manufacturers' local authorized service centers. *WATER MAZE* cannot provide warranty on these items.

WHAT THIS WARRANTY DOES NOT COVER

This warranty does not cover the following items:

- 1. Normal wear items, such as seals, filters, gaskets, O-rings, packings, pistons, brushes, filtering media, ozone bulbs, sensors, UV scanners, oil-skimmer belt, impedance sensor. Minor leaks covered first time on original startup only.
- Damage or malfunctions resulting from accidents, abuse, modifications, alterations, incorrect installation, improper servicing, failure to follow <u>manufacturer's maintenance instructions</u>, or use of the equipment beyond its stated usage specifications as contained in the operator's manual.
- 3. Damage due to freezing, sludge build-up, chemical deterioration (oxidation, chloride or fluoride corrosion), and rust.
- 4. Damage to components from fluctuations in electrical or water supply.
- 5. Normal maintenance service, including adjustments.
- 6. Transportation to service center, field labor charges, or freight damage.
- 7. Consumables and water quality.

WHAT YOU MUST DO TO OBTAIN WARRANTY SERVICE

While not required for warranty service, we request that you register your WATER MAZE Product by returning the completed registration card. In order to obtain warranty service on items warranted by WATER MAZE, you must return the product to your Authorized WATER MAZE Dealer, freight prepaid, with proof of purchase, within the applicable warranty period. If the product is permanently installed, you must notify your Authorized WATER MAZE Dealer of the defect. Your Authorized WATER MAZE Dealer will file a claim with WATER MAZE, who must subsequently verify the defect. In most cases, the part must be returned to WATER MAZE freight prepaid with the claim. For warranty service on components warranted by other manufacturer's, your Authorized WATER MAZE Dealer can help you obtain warranty service through these manufacturers' local authorized service centers.

LIMITATION OF LIABILITY

WATER MAZE'S liability for special, incidental, or consequential damages is expressly disclaimed. In no event shall WATER MAZE'S liability exceed the purchase price of the product in question. WATER MAZE makes every effort to ensure that all illustrations and specifications are correct, however, these do not imply a warranty that the product is merchantable or fit for a particular purpose, or that the product will actually conform to the illustrations and specifications. Our obligation under this warranty is expressly limited at our option to the replacement or repair at a service facility or factory designated by us, of such part or parts as inspection shall disclose to have been defective. THE WARRANTY CONTAINED HEREIN IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY WATER QUALITY, MERCHANTABLIITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY LIMITED TO THE DURATION OF THIS WARRANTY. This warranty gives you specific legal rights and you may also have other rights which vary from state to state. WATER MAZE does not authorize any other party, including authorized WATER MAZE Distributors, to make any representation or promise on behalf of WATER MAZE, or to modify the terms, conditions, or limitations in any way. It is the buyer's responsibility to ensure that the installation and use of WATER MAZE products conforms to local codes. While WATER MAZE attempts to assure that its products meet national codes, it cannot be responsible for how the customer chooses to use or install the product. Some states do not allow limitations or exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.



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pH PERMISSIVE CONTROL SYSTEM OPERATOR'S MANUAL 7

8. If the pH of the fluid in the holding tank is not within the set points of 6.5 and 7.5, pH adjustment will take place. Which chemical feed pump is turned on depends on whether the pH in the tank needs to be raised or lowered. The needed chemical feed pump will draw up the pH adjust chemical and inject it into the outlet plumbing of the mix pump. The pH adjustment in the tank should happen quickly. If adjustment takes longer than one (1) hour, the controller will lock out the system and give you an error code of E5 or E6. If this happens, shut off power to the machine. Check to see if you have chemical, if the chemical filter screen is plugged or the injector is plugged. Also check tubing for a blockage, kinks, leaks, etc. You may have to increase the speed on the effected pump (See page 9 and 10 for pump instructions.) and start at the beginning or step 1 of Operating Instructions. While this is happening, the HGB or other external devices will not be allowed to turn on until the pH set points are met.

DIGITAL pH CONTROLLER

The pH controller is a microprocessor-based device that accepts the signal sent by the sensor. The pH controller then displays that signal digitally, and sends a signal to the feed pump telling it to turn on or off. The pH controller also sends a signal to the HBG, or other external device, telling it to turn on or off its method of drawing fluid. The controller is pre-programmed to maintain a pH level of 6.5 to 7.5. No additional programming is necessary. When the pH Permissive Control System is started up it is ready to go. Please call the factory before attempting any customizing of the pH controller.

pH Permissive Control System Keypad

KEY FUNCTIONS:





This key is used to setup the control profile for the acid dosing pump. Holding this key for five (5) seconds will allow priming of Pump A. Factory Set — Unless customizing or priming pump, don't touch this key.



This key is used to setup the control profile for the base (alkali) dosing pump. Holding this key for five (5) seconds will allow priming of Pump B. Factory Set — Unless customizing or priming pump, don't touch this key.

This key is used to program the high and low alarm points and hysteresis (ON/OFF mode). Factory Set — Unless customizing, don't touch this key.



ALARMS

mA

This key is used to program 'run times' for Pumps A and B. This key also allows setting of the 'manual temperature' and the controller response rate Δ pH. Factory Set — Unless customizing, don't touch this key.

CALIBRATE HOLD 5 SEC

This key, when pressed, will display details of the last successful electrode calibration. (Holding this key for five (5) seconds will allow entry into a new calibration procedure. (See page 8 for calibration procedure.)



Pressing this key will cause the display to alternate showing various settings. (Holding the key for five (5) seconds will allow entry to the 'advanced features' menu. **Factory Set**.

RUN EDIT

This key is used for starting and stopping (run or edit) the pumps and changing set points in the controller. It changes the mode of the controller from 'RUN' to 'OFF'.



These keys are used to change values on the display.

Simultaneously pressing these two (2) keys will lock the keypad to prevent casual tampering. Pressing them a second time will unlock the keypad. (Wait five (5) seconds between locking and unlocking).

DIGITAL DISPLAY SCREEN

pH PERMISSIVE CONTROL SYSTEM operator's manual

The controller display screen will show a large digital

DFF

reading of the attached tank's pH level. Every few seconds the display alternates, showing the pH reading and 'OFF'. (A small digital reading of 'RUN' or 'OFF' will appear in the lower left of the display screen.)



Tap the 'RUN/EDIT' key until 'RUN' is displayed in lower RUN left corner of the display screen.

If the pH level drops below or rises above the set points either 'PUMP A', for acid pump, or 'PUMP B', for base pump, will begin to flash in the upper left corner of the display screen and the affected pump will turn on. Above the 'RUN' display, in the lower left corner, a timer will come on and start to time-out until the pH level is reached. (Refer to Operating Instructions on page 7, step 8.) Once the pH level is reached timer will stop and reset to zero.

PUMP R CALIBRATION Viewing Last Calibration Data 1:00 RUN MANUAL

Press the Calibrate/Hold 5 Sec key once.



EDIT

'CALIBRATE' will be visible in the upper right corner of the display screen. Also displayed will be the 'pH' and '%' (slope) of the

previous calibration. The display will alternate between 'pH' and '°C'. CALIBRATE

'2 Point' indicates that the previous calibration was a two-point calibration.

'1 Point' indicates the

previous calibration was

a one-point calibration.



Re-Calibrating

Calibration must take place weekly. For two-point calibration, the default settings are Buffer 1 = 7.00 pH and Buffer 2 = 4.00 pH.

- CALIBRATE Hold the 'CALIBRATE/HOLD 5 SEC key 1. HOLD 5 SEC down for five (5) seconds. 'CALIBRATE', on the display screen, CALIBRATE will start flashing.
- 2. Press the

CALIBRATE key again. HOLD 5 SEC

'2 point' will start flashing. The 🎮 or kev can be used to toggle between '1 point' and '2 point'. Display should be set to '2 point'.



CALIBRATE key again. 3. Press the

'MANUAL', in the lower right corner will begin to flash. The 🔊 or 🗑 key can be used to toggle between 'MANUAL' and 'ACT'. Display



should be set to 'MANUAL'.

CALIBRATE key again. 4. Press the

Temperature will begin to flash. Use the kevs to program desired buffer solution temperature.



key again. 5. Press the CALIBRATE

HOLD 5 SEC



pH PERMISSIVE CONTROL SYSTEM OPERATOR'S MANUAL 9

The symbol will prompt you to put the probe in 'Buffer 1'. Wait for the mV value to settle.



CALIBRATE

MANUAL

CALIBRATE

MANUAL

CALIBRATE

2 Point

2 Point

.

Buffer 2

Buffer 2

40

4.0

pН

рH

This will accept the first calibration value and will display the 'Buffer 2' pH. Use the Regional Weys to program 'Buffer 2' to 4.0 pH.

Theはsymbol will prompt you to put the probe in 'Buffer 2'. Wait for the mV value to settle.



CALIBRATE

This will accept the second calibration value and will display the mV/pH (and the '%' Slope) result of the calibration.



10. Press the HOLD 5 SEC key again to accept this

calibration and exit calibration mode. Press any other key to abort calibration

If the calibration is unsuccessful (slope<70% or offset < \pm 30 mV) an 'ERROR CALIBRATE' and 'E7' are dis-

played; the calibration should be repeated or else the controller reverts to using the 'last successful' calibration performed.



A slope of less than 70%

indicates a dirty/faulty probe or contaminated buffer. (Refer to page 20 for other error messages.)

FEED RATE ADJUSTMENT

Even though the controller is designed to automatically maintain the proper chemical levels, there may be some underfeeding or overfeeding if the feed rates are set too low or high. This is due to the lag time between the beginning of chemical feeding and the sensing of those chemicals by the sensors after recirculation through the unit and the tank.

If the chemical levels tends to be systematically on the high side, you should reduce the feed rate of the chemical feed pump. This is done by removing the enclosure cap on the front of the pump and turning the screw counterclockwise to slow the pump down. If the chemical level is too low or takes longer than one (1) hour to adjust, raise pump speed up by turning screw clockwise.

SENSOR MAINTENANCE

To test the sensor, carefully add a very small amount of white vinegar or a dilute acid solution to the water and test the probes. The pH reading should go down. If not, clean or replace the sensor.

Cleaning The pH Sensor

The cleaning of the pH sensor must be done on a weekly maintenance schedule if used in a moderate to heavy oil and dirt load; on a monthly maintenance schedule if used in a low oil and dirt level.

To clean the sensor, do the following:

• Loosen the sensor from the compression tee. With a Q-Tip and any household degreaser (i.e. 409) spray and wipe the sensor probe clean. Rinse with clean water. Dip the probes into a 5% hydrochloric acid solution (muriatic acid). This solution is effective for solubilizing hard water deposits that may occur on the probe.

WINTERIZING AND SHIPPING

NOTICE: For winterizing and shipping, always keep the sensor above freezing temperature. Make sure to place the plastic cap on the tip of the sensor and to add a few drops of water inside the cap to prevent the sensor from drying out. Shipping and storing a sensor without plastic cap will void its warranty.

ERROR MESSAGES

Turn System off to clear error message.



PREVENTATIVE MAINTENANCE

| MAINTENANCE SCHEDULE | | | | |
|--|------------------|--|--|--|
| Check plumbing for leaks. | Check Daily | | | |
| Check chemical tubing for leaks and deterioration. | Check Daily | | | |
| Drain cone bottom on tank. | Drain Daily | | | |
| Clean and calibrate probe.* | Maintain Weekly | | | |
| Suction out pit.* | Maintain Monthly | | | |
| Clean sump pump and float.* | Clean Monthly | | | |
| Check and clean chemical strainers.* | Maintain Monthly | | | |

*NOTE: This is a guide. Depending on your wash load, these items may have to be done more or less often.



PM-1000 Bio Treatment System OPERATOR'S MANUAL





Part # 1.103-467.0

For technical assistance or the Water Maze Dealer nearest you, consult our web page at **www.wmaze.com**

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| Part Number |
|--|
| Serial Number |
| Date of Purchase |
| The part and serial numbers will be found on a decal attached to the machine. You should record both serial number and date of purchase and keep in a safe place for future reference. |

INTRODUCTION & IMPORTANT SAFETY INSTRUCTIONS

INTRODUCTION

Your owner's manual has been prepared to provide you with a simple and understandable guide for equipment operation and maintenance, based on the latest product information available at the time of printing. To keep your unit in top running condition, follow the specific maintenance and troubleshooting procedures given in this manual.

Owner/User Responsibility:

The owner and/or user must have an understanding of the manufacturer's operating instructions and warnings before using this equipment. Warning information should be emphasized and understood. If the operator is not fluent in English, the manufacturer's instructions and warnings shall be read to and discussed with the operator in the operator's native language by the purchaser/owner, making sure that the operator comprehends its contents.

Owner and/or user must study and maintain the manufacturers' instructions for future reference.

SAVE THESE INSTRUCTIONS

This manual should be considered a permanent part of the machine and should remain with it if machine is resold.

When ordering parts, please specify model and serial number. Use only identical replacement parts.

This machine is to be used only by trained operators.

UNPACKING

- 1. PM-1000
- 2. Operator's Manual

SAFETY INSTRUCTIONS



READ OPERATOR'S MANUAL THOROUGHLY PRIOR TO USE.



HAZARDOUS VOLTAGE CAN SHOCK, BURN OR CAUSE DEATH WARNING: To reduce the risk of injury, read operating instructions carefully before using.

1. Read the owner's manual thoroughly. Failure to follow instructions could cause malfunction of the unit and result in death, serious bodily injury and/or property damage.

DANGER: Wire the system for correct voltage. See "Electrical" section of this manual and motor nameplate. WARNING: Follow the wiring instructions in this manual when connecting the system to the power lines.

WARNING: All wiring must be performed by a qualified electrician.

WARNING: Meet the National Electrical Code and local codes for all wiring.

1. The installation of the unit must comply with local and/or national codes.

WARNING: Ground system before connecting to the power supply. "Use Copper Conductors only"

2. Connect only to a circuit that is protected by a ground fault circuit interrupter (GFCI). Do not spray water near electrical components.



RISK OF EXPLOSION: DO NOT USE WITH FLAMMABLE LIQUIDS.



- 3. Never make adjustments on the unit while it is in operation, except for those described in this manual.
- 4. Do not discharge gasoline or other volatile hydrocarbons into the PM-1000. This could cause a gas vapor build up under the lid which could become an explosive mixture.
- 5. Before servicing the unit, refer to all the MSDS's on the material identified in the waste stream. You must comply with all warnings and wear all protective clothing as stated on the MSDS's.
- 6. Protect from freezing and UV light.
- 7. Protect aeration lines from vehicle traffic and sharp objects.
- 8. When making repairs disconnect unit from electrical source.
- 9. The best insurance against an accident is precaution and knowledge of the equipment.
- 10. Water Maze is not liable for any modifications or the use of components not purchased from Water Maze.
- 11. The Ozone Generator will freeze, and must be located in a heated enclosure in cold climates.
- 12. The PM-1000 should be installed and started by an authorized Water Maze dealer.
- 13. The PM-1000 and its components must be protected from weather, i.e. wind, rain, direct sun, etc.

4

IMPORTANT SAFETY INSTRUCTIONS

HOW THE BIO-SYSTEM WORKS

The PM-1000 is an industrial grade microbial treatment system, with modular components, that employs naturally occurring microbes to treat waste water with characteristics that include organic compounds (i.e., emulsified oils and hydrocarbons). A typical application may include treatment of wash water generated from equipment washing (i.e., washing golf course maintenance equipment, fork lift repair, truck wash etc.).

As compared to other water treatment technologies, microbial treatment is highly dependent on maintaining a healthy environment for the microbes that perform the job of digesting organic substances and converting them to carbon dioxide and water. Some of these life sustaining considerations are:

- pH of the water (should be between 6.0 and 9.0)
- water temperature (should be above 40°F/5°C and below 120°F/49°C)
- adequate nutrient & food supply within the water (consult with Water Maze) and
- adequate levels of dissolved oxygen (enough disolved oxygen to overcome the consumption rate / oxygen demand).

In addition to the above considerations, the effluent water quality from a Bio-System will be subject to the concentration levels of the organic matter in the untreated water and the relative dwell time required for microbial digestion. Based on these factors, waste waters with consistent concentration levels of organic matter will be more predictable in terms of effluent water quality. Conversely, waste waters with fluctuating concentration levels of organic matter may vary in terms of effluent water quality.

IMPORTANT NOTE: Subject to the application and desired water quality requirements, processed water from a Bio-System may require additional post-treatment.

IMPORTANT NOTE: Recycled water quality is dependent upon many factors, including, but limited to the above considerations and should be tested to assure that the water quality meets the intended reuse.

IMPORTANT NOTE: Local regulations may limit what you can do with water that is discharged from the Bio-System or may require specific permits. Check with local authorities if you are unsure about the uses or disposition of the water discharged by the Bio-System. Regulations may also limit the use of a wash pad as a mix and load station.

WARNING: The Bio-System is not designed to produce potable water. Do not use water from the Bio-System for drinking or washing humans or animals. A typical Bio-System may be configured as a Treat & Discharge System, or as a Treat & Recycle System. In either case, a properly configured system may consist of one or more components (See Bio-System Component Identification pages). As in all properly designed water treatment systems, Water Maze highly recommends that appropriate pretreatment technologies be applied to the waste water for the purpose of enhancing the performance of the Bio-System. Some typical pretreatment technologies may include: oil -skimming to remove "free-oils", heavy solids removal; pH control; water temperature control; grass clipping removal; inorganic material removal (i.e., heavy metals); etc. The PM-1000 (for recycle applications) typically works as follows:

- The waste water collection pit is the primary digester that houses the microbial colony.
- The two feed pumps introduce microbes and nutrients into the collection pit to circulate water. Pin-type timers allows the operator to control the frequency and duration of injection.
- During the timed injection, an air pump provides oxygen rick aeration to the collection pit to stimulate growth of the microbe colony.
- On a routine basis (once each day) microbes and nutrients are automatically injected into the collection pit. This is done to assure that the microbe population is maintained at maximum levels.
- Dissolved oxygen is maintained using a unique delivery system.

CONSUMABLES

Microbes and Nutrients

BioStax 1800: Liquid Bacteria Concentrate

Part # 8.718-919.0 Biostax, 1800, 8oz. vials, 2 part mix, part A & B. It is an environmentally friendly, non-toxic and non-pathogenic liquid concentrate. Controls odor, reduces oils and greases, other hydrocarbons, animal fats and vegetable oils. Two 8 oz. bottle makes 5 gals.

BioStax 100: Hawaiian Blend Liquid Bacteria Concentrate

Part # 8.718-917.0 comes in an 8 oz. bottle and works the same as BioStax 1800 except that it is for use in Hawaii. One 8 oz. bottle makes 5 gallons.

Bio Nutrient: Powder Bacteria Nutrient Source

Part # 8.718-916.0 comes in an 8 oz. bottle and easily mixes in water to make 5 gallons. It is introduced into the Bio-System along with the bacteria to enhance the growth and effectiveness of the biology.

OPERATING ENVIRONMENT

The PM-1000 is designed to work in a wide variety of operating conditions. In normal operating environments, the Bio-System should perform as specified. In extremely hot or cold environments certain precautions need to be taken.

Operating Conditions

Air Temperature Range 40° - 120°F (5-49°C)

Treatable WasteWater contaminated with

hydrocarbons and organic material. Water pH 6.0 - 9.0

Cold Weather

Protect the Bio-System from damage that can occur when freezing water expands. Freezing water may cause tubing leading from the collection pit to your PM-1000 to burst. Plus, the microbes in the BioStax 1800 may not survive if they are frozen.

Drain all external hoses if a prolonged hard freeze is expected.

In order to restart your Bio-System, you will need to reinoculate your system with BioStax 1800 at start-up. The recommended amount of BioStax 1800 for start-up is five 8 oz. bottle sets, part A & B, for a Bio-System system. Contact *WATER MAZE* for specific instructions to restart your Bio-System.

Hot Weather

Your Bio-System may encounter minor problems, such as a slight increase in odor, when operating in extremely hot temperatures in excess of 100°F/38°C. If odor is a problem, add water to the system on a daily basis by running tap water into the collection pit.

OPERATING TIPS

Your Bio-System is extremely simple to operate. Simply wash your equipment or vehicles as you would normally.

- In extremely dirty environments, you may want to "pre-clean" your equipment with air or with a brush, and deposit grass or dirt into a designated dumpster or to a collection area.
- Use hose end sprayers with automatic shutoffs when washing equipment so as to not exceed the peak capacity your Bio-System can process.
- Perform the daily, weekly and monthly service as described on the maintenance pages.

INSTALLATION INSTRUCTIONS

The following instructions will provide adequate information to fully install your Water Maze Bio-System. Please follow these instructions step by step to ensure proper installation.

Installation Instructions

1. Placing the Bio-System

Place the Bio-System on a level concrete pad similar to what is shown on the Installation Views and the Installation and Piping Diagrams.

2. Plumbing the System

Connect feed line and aeration tubing following the Installation and Piping diagrams. **NOTE:** Plumbing may vary depending on placement of equipment.

3. Wiring the System

Before beginning work refer to Safety Instructions in front portion of manual. Confirm that there is a 120V electrical power source connected to the control box.

a. Connect wiring as shown on Electrical Connection Diagram.

4. Microbe and Nutrient Injection

- a. Mix microbes and nutrient in separate five gallon containers supplied.
- b. Install tubing to pumps and insert into collection pit as shown in diagram.

5. Set Timers

There are two timers in your control panel enclosure that need to be set. Open control box door to set timers. Timers are 24 hour and each pin represents half an hour. **NOTE:** Always remove electrical power from control panel prior to opening the door. Rotate each timer until the hour at the center of the dial meets the actual time of day (a.m. or p.m.). After each timer is set for the time of day, proceed to instructions below to set timers to actuate equipment.

a. Air Pump: Pull Several Pins

The air pump controls the amount of time the pump operates. The pump provides aeration to the pit or tank. Pulling pins will allow for automatic aeration. During the times cleaning takes place pull every other pin. During off hours pull 4 pins, 1 pin in, 4 pins out, 1 pin in and continue through all off hours. If you have high BOD loading the air may need to be longer, check with the factory for instructions.

b. Microbe / Nutrient Timer: Pull 3 Pins

This timer determines the amount of microbes and nutrients that are added to the collection pit <u>The microbe / nutrient timer should be</u> <u>set to inject during system non-use hours.</u> Pulling a pin on this timer will cause the Microbe and Nutrient pump to operate automatically when their hand switches are on.

Installation Checklist

- □ Is all tubing connected as shown on the Installation and Piping Diagrams?
- □ Is electrical wiring connected as shown on the Electrical Connection Diagram?
- □ Are air lines connected as shown on the Air Connection Diagram?
- □ Is the voltage correct?

START-UP

- 1. Make sure that equipment is level.
- 2. Turn on the fresh water inlet hose.
- 3. Fill the collection pit with water and check that the water level does not drop. This would indicate that the sump pit is not sealed.
- 4. Connect Electrical Power to Control Panel: When connecting to the power supply, follow all electrical and safety codes as well as the most recent National Electric Code (NEC) and Occupational Safety and Health Act (OSHA). Ground system before connecting to the power supply. *WARNING: All wiring must be connected by a qualified electrician.*
- 5. Control Panel Switches:

There are two hand switches located on the front of the control box. Turn on both switches. Turning on these switches will allow the entire system to operate in an automatic mode. Normally switches are left on. The following is the functional description of these switches.

a. Aerator Hand Switch

The aerator (air pump) provides dissolved oxygen for bio-digestion of waste products by microbial action. Turning this switch off may cause an unhealthy environment for the microbes.

d. Nutrient/Microbe Pump

Turn "ON" the nutrient/microbe pump switch. The pump is on timer control and will not operate if switch is in the "off" position. Feed adjustment must be at the Number 4 Knotch setting. Refer to Metering Pump Operation. To fill lines with nutrient solution press the switch to full speed. Release the switch when the lines are full.

6. Look over the entire machine for leaks. The machine was hydrostatically tested at the factory but may have been damaged in shipment.

PM-1000 INSTALLATION AND PLUMBING DIAGRAM



METERING PUMPS

(Variable Speed Peristaltic)

TECHNICAL INFORMATION

Materials:

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OPERATOR'S MANUAL

| Squeeze Tubing | Special synthetic rubber |
|-------------------------|--------------------------|
| Injection Point Fitting | PVC |
| Feed Rate: | 1-7 or 8-45 GPD |
| Tubing Size: | 1-7 or 8-45 GPD |
| Dimensions: | Height = 5" |
| | Width = $4"$ |
| | Depth = 4 1/4" |

Standard Accessories Provided with Pump:

- Squeeze Tubing
- Check Valve Assembly
- Strainer with weight
- Bulkhead fitting with elbow

Electrical Rating:

- 20-265 VAC
- 7 W
- 50/60 Hz

Maximum System Pressure: 45 PSI



INSTALLATION

1. **SUCTION TUBING:** Take the 5 ft. length of 1/4" O.D. tubing included, measure and cut the lengths needed to run from pump head to the chemical tank. Cut the tubing ends square.

- 2. **CONNECT SUCTION TUBING TO PUMP:** Remove compression fitting. Feed tube through fitting. Push end of the tube on fitting. Tighten fitting firmly.
- __NOTE: To soften the end of the tubing, immerse it in hot water.



3. **CONNECT SUCTION TUBING TO STRAINER:** Install strainer so it's off the bottom of the chemical container. Cut the suction tubing to the length needed. Put weight on tubing. Push strainer end into tubing.

METERING PUMP OPERATION

If not already done, put the end of the suction tubing into the containers near the bottom.

Move the "ON-OFF" switch to ON.

PRIME: To prime the pump and lines push the 3-way switch to full speed.

FEED ADJUSTMENT: (ONLY A QUALIFIED *WATER MAZE* SERVICE TECHNICIAN SHOULD MAKE THIS ADJUSTMENT.) The feed adjustment is under the cover plate. Remove the plate and turn the adjusting screws clockwise to increase feed or counterclockwise to decrease feed.



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METERING PUMP MAINTENANCE

<u>DANGER:</u> DO NOT ATTEMPT TO FEED CHEMI-CALS WITHOUT CONSULTING YOUR CHEMICAL FEEDER DEALER OR CHEMICAL SUPPLIER.



CAUTION: Wear protective gloves, goggles, and other adequate protection for the chemical hazard.

Before replacing the pump head, remove chemical from tubing as follows:

1. Remove tubing from the supply buckets.

2. Run pump until all fluid is removed from the tubing.

FILLING THE NUTRIENT/MICROBE: To avoid running out, follow a regular schedule of monitoring supply. Also inspect and clean the strainer by flushing with a compatible liquid, as needed.

SQUEEZE TUBING INSPECTION: Inspect tubing regularly and replace it if it is deteriorating.

REPLACING SQUEEZE TUBING:

- 1. Remove compression fittings from the tubing at the pump head.
- 2. Pull the suction and discharge tubing from the pump head.
- 3. Remove the front cover from the pump.
- 4. Rotate the pump rollers to a vertical position.
- 5. Lift the inlet fitting out of the housing.
- 6. Pull the tube out while rotating the pump rollers clockwise.
- 7. Remove the outlet fitting.
- 8. Install the inlet fitting for the new tube assembly.
- 9. Press the tube into place in front of a roller while rotating the roller assembly clockwise.
- 10. Install the outlet fittings.
- 11. Reconnect the suction and discharge lines.
- 12. Install the front cover.

CAUTION: DO NOT LOSE THE BEARING FROM THE CENTER HOLE IN THE BACK COVER.

CAUTION: Clear or transparent plastic tubing should be replaced at least every three months if exposed to the sun. Replace tubing yearly if feeder is installed indoors.

INSPECT FOR LEAKAGE:

Inspect the chemical system daily for any signs of leakage. If leaking occurs at tubing connections, tighten fitting compression nut finger tight. If leakage continues, remove pressure from the system. Disconnect the tubing, trim ends square and reconnect.

INSPECT FOR BLOCKED FLOW:

Precipitates or other chemical reactions cause injection points to clog. If the type of chemical being fed eliminates the use of flushing solution, the injection point must be inspected at regular intervals. Strainers must be kept clean with periodic back-flushing.

METERING PUMP AND PARTS LIST



| ITEM | PART NO. | DESCRIPTION | QTY | | | | |
|------|---|---|-----|--|--|--|--|
| 1 | 8.749-855.0 | Pump, Peristaltic, PR-7, 8-45 gpd | 1 | | | | |
| | 8.749-856.0 | Pump, Peristalitic, PRS-1, 1-7 gpd | 1 | | | | |
| 2 | 2 8.749-862.0 Tube, Squeeze, Stantoprene, PR-7, * 8-45 gpd | | | | | | |
| | 8.749-864.0 | Tube, Squeeze, Stantoprene, PRS-1,* 1-7 | 1 | | | | |
| 3 | 8.749-860.0 | Check Valve, PVC | 1 | | | | |
| 4 | 8.749-857.0 | Tubing, 1/4", PE, Black | AR | | | | |
| 5 | 8.749-863.0 | Strainer, Strainer, w/welght | 1 | | | | |
| 6 | 8.711-737.0 | Tubing, 1/8", ID, Norprene | AR | | | | |
| 7 | 8.751-801.0 | Faceplate, PRS-1/PR-7 | 1 | | | | |
| 8 | 8.751-375.0 | Roller Assembly, PR-7 | 1 | | | | |
| | 8.751-376.0 | Roller Assembly, PR-7 | 1 | | | | |
| | * Alternetive tubine meteriale eve evidence | | | | | | |

* Alternative tubing materials are available

PM-1000 MAINTENANCE

DAILY MAINTENANCE

To keep your Bio-System in peak performance you need to perform minimal daily maintenance. This service is best performed each morning before using the wash area..

- Check and clean catch basin and trench.
- □ Empty the debris dumpster.
- Wash down front and back of hydro-screen, preferably with a pressure washer.

WEEKLY MAINTENANCE

- Check that purge drain valves work properly.
- Check that timers are set properly.

MONTHLY MAINTENANCE

Monthly maintenance for the Bio-System and replenishment of BioStax 1800 is required. Schedule a regular day and time each month to perform the maintenance. Record your maintenance in the monthly log to provide a record in the event of an inspection.

- □ Replenish BioStax 1800.
- □ Replenish BioNutrient.
- Check the automatic microbe dispenser pump and make sure the tubing is not cracked or worn. Replace tubing if required (every 6-12 months). Clean screen in tubing going in microbe bucket.
- □ Visually inspect external hoses and fittings.
- □ Confirm pressure switch setting on transfer pump.

COMPONENT IDENTIFICATION



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PM-1000 CABINET ASSEMBLY EXPLODED VIEW



PM-1000 CABINET ASSEMBLY PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY | ITEN | I PART NO. | DESCRIPTION | QTY |
|------|-------------|-------------------------|-----|------|-------------|------------------------|-----|
| 1 | 8.706-648.0 | Handle | 4 | 13 | 8.901-223.0 | Label, Nutrient Pump | 1 |
| 2 | 8.913-347.0 | Cabinet Cover | 1 | 14 | 8.901-222.0 | Label, Microbe Pump | 1 |
| 3 | 8.913-350.0 | Cabinet | 1 | 15 | 9.800-034.0 | Label, Clear Lexan | 1 |
| 4 | 8.749-856.0 | Pump, Peristaltic | 2 | 16 | 8.711-943.0 | Pail, 6 Gal | 2 |
| 5 | 8.719-188.0 | Pump, Air 1/4 HP | 1 | 17 | 8.711-944.0 | Lid, Pail | 2 |
| 6 | 9.802-066.0 | Pad | 4 | 18 | 9.841-665.0 | Label, Bio Stax 1800 | 1 |
| 7 | 8.913-348.0 | Foot Bar | 2 | 19 | 8.900-615.0 | Label, Nutrient | 1 |
| 8 | 8.900-847.0 | Lablel, PM-1000 | 1 | 20 | 9.800-013.0 | Label, USA, Indoor Use | 1 |
| 9 | 8.900-848.0 | Label, Control Panel | 1 | 21 | 8.719-189.0 | Filter, Inlet Muffler | 1 |
| 10 | 8.900-313.0 | Label, USA | 2 | 22 | 8.707-326.0 | Adapter, Stem | 1 |
| 11 | 9.800-016.0 | Label, Disconnect Power | 2 | 23 | 8.707-325.0 | Elbow | 1 |
| 12 | 9.900-522.0 | Label, Do Not Stand | 1 | | | | |

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PM-1000 CONTROL PANEL EXPLODED VIEW



CONTROL PANEL PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY | ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|----------------------|-----|------|-------------|-----------------------------|-------|
| 1 | 8.716-272.0 | Box, Electrical | 1 | 10 | 8.716-396.0 | Terminal Block, Grey | 4 |
| 2 | 9.802-455.0 | Light, Green | 3 | 11 | 8.900-843.0 | Label, Air Pump Timer | 1 |
| 3 | 8.716-052.0 | Switch, Curvette | 2 | 12 | 8.900-842.0 | Label, Microbe Pump Timer | 1 |
| 4 | 9.802-514.0 | Strain Relief | 5 | 13 | 9.800-040.0 | Label, Ground Symbol | 1 |
| 5 | 8.706-648.0 | Handle | 4 | 14 | 8.716-402.0 | Bridge, Electrical | 4 |
| 6 | 8.716-253.0 | Timer, 24 Hour | 2 | 15 | 9.804-595.0 | End Bracket | 2 |
| 7 | 8.716-460.0 | Grounding Lug | 1 | 16 | 8.716-400.0 | End Cover | 2 |
| 8 | 9.802-457.0 | Din Rain, 35 mm | 1 | 17 | 9.802-525.0 | Locknut, 1/2" | 4 |
| 9 | 8.716-398.0 | Terminal Block, Blue | 4 | 18 | 8.920-278.0 | Plate, Mount, Control Panel | 1 |
| | | | | 19 | 8.920-795.0 | Label, Use Copper Conducto | ors 1 |

DIFFUSER STONE ASSEMBLY EXPLODED VIEW PARTS LIST



DIFFUSER STONE PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|--|------|
| 1 | 8.712-417.0 | Diffuser Stone, 6-1/2" NPT SS | 32 |
| 2 | 8.706-027.0 | Coupler, 1/2" SS | 2 |
| 3 | 8.706-291.0 | Fitting, Compression, 1/2" MPT x 3/8" | 2 |
| 4 | 8.707-325.0 | Elbow, Reducing, Water Stax | 1 |
| 5 | 8.707-330.0 | Tee, 1/2" x 1/4" | 1 |
| 6 | 8.711-731.0 | Tubing, 1/4" ID | 20ft |
| 7 | 8.777-732.0 | Tubing, 1/2" OD x 3/8" IN | 20ft |





WARRANTY ACCESSORIES AND PARTS WARRANTY

LIMITED MINIMUM 90 DAY WARRANTY

We warrant to the original consumer that each new part and accessory sold by Watermaze will be free from manufacturing defects in materials or workmanship in normal service for the duration specified by the original component manufacturer with a 90 day minimum from date of purchase, provided it is installed properly and the equipment is maintained in accordance with Watermaze instructions and manuals. Components manufactured by Watermaze such as frames, and handles have a 2 year warranty from date of purchase.

Our obligation under this warranty is expressly limited as to the replacement or repair, at our option, at Watermaze Camas, Washington 98607, or at a service facility designated by us, for such part or parts as inspection shall disclose to have been defective.

EXCLUSIONS:

This warranty does not apply to defects caused by casualty or unreasonable use, including faulty repairs by others and failure to provide reasonable and necessary maintenance.

LIMITATION OF LIABILITY

Watermaze's liability for special, incidental, or consequential damages is expressly disclaimed. In no event shall Watermaze liability exceed the purchase price of the product in question. Watermaze makes every effort to ensure that all illustrations and specifications are correct, however, these do not imply a warranty that the product is merchantable or fit for a particular purpose, or that the product will actually conform to the illustrations and specifications. Our obligation under this warranty is expressly limited at our option to the replacement or repair at a service facility or factory designated by us, of such part or parts as inspection shall disclose to have been defective. THE WARRANTY CONTAINED HEREIN IS IN LIEU OF ALL OTHER WARRANTIES. EXPRESS OR IMPLIED. INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY LIMITED TO THE DURATION OF THIS WRITTEN WARRANTY. This warranty gives you specific legal rights and you may also have other rights which vary from state to state. Watermaze does not authorize any other party, including authorized Watermaze Distributors, to make any representation or promise on behalf of Watermaze, or to modify the terms, products conforms to local codes, While Watermaze attempts to assure that its products meet national codes, it cannot be responsible for how the customer chooses to use or install the product. Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

TO OBTAIN WARRANTY SERVICE:

Purchaser must bring the accessory parts to an authorized Watermaze Distributor. For the distributor nearest you consult our web page: www.wmaze.com or write: Watermaze, 4275 NW Pacific Rim Blvd, Camas, WA 98607.



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OPERATOR'S MANUAL

REC2-20 Water Treatment System



Patent Pending

For the dealer nearest you, consult our web page at www.wmaze.com
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Warranty Water Treatment Systems Warranty

| Part Number Serial Number | Code |
|--|--|
| Date of Purchase The part and serial numbers will be found on the machine. You should record both serial n purchase and keep in a safe place for future n | a decal attached to number and date of eference. |

INTRODUCTION & IMPORTANT SAFETY INSTRUCTIONS

Your owner's manual has been prepared to provide you with a simple and understandable guide, for equipment operation and maintenance, based on the latest product information available at the time of printing. To keep your machine in top running condition follow the specific maintenance and troubleshooting procedures given in this manual.

NOTE: *Water Maze* reserves the right to make changes at anytime without incurring any obligations.

Owner/User Responsibility:

The owner and/or user must have an understanding of the manufacturer's operating instructions and warnings before using this equipment. Warning information should be emphasized and understood. If the operator is not fluent in English, the manufacturer's instructions and warnings shall be read to and discussed with the operator in the operator's native language by the purchaser/owner, making sure that the operator comprehends its contents.

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This manual should be considered a permanent part of the machine and should remain with it if machine is resold.

When ordering parts, please specify model and serial number. Use only identical replacement parts.

This machine is to be used only by trained operators.

GENERAL SAFETY **INFORMATION**



READ OPERATOR'S

MANUAL THOROUGHLY

PRIOR TO USE.

WARNING: When using this machine basic precautions should always be followed, including the following:

- Read all the instructions 1. before using the product.
- 2. To reduce the risk of injury, close supervision is necessary when a product is used near children.
- 3. Know how to stop the product and bleed pressures quickly. Be thoroughly familiar with the controls.
- 4. Stay alert watch what you are doing.
- 5. Do not operate the product when fatigued or under the influence of alcohol or drugs.
- 6. Keep operating area clear of all persons.
- 7. Do not overreach or stand on unstable support. Keep good footing and balance at all times.

- 8. Follow the maintenance instructions specified in the manual.
- 9. Know the system application, limitations, and potential hazards.



WARNING: This machine must be wired to the correct voltage. Refer to the information located on the serial plate.

WARNING: All wiring must be performed by a qualified electrician.

WARNING: Risk of Electric Shock DANGER – Improper connection of the equipment-grounding conductor can result in a risk of electro-cution. Check with a qualified electrician or service personnel if you are in doubt as to whether this machine is properly grounded. Have proper power connections installed by a qualified electrician. Do not use any type of adaptor with this product.

GROUNDING INSTRUCTIONS

This product must be connected to a grounded, metal. permanent wiring system; or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment-grounding terminal located on the product in compliance with National Electrical Codes (NEC).

GROUND FAULT CIRCUIT INTERRUPTER PROTECTION

To comply with the National Electrical Code (NFPA 70) and to provide additional protection from the risk of electric shock, this machine should only be connected to a circuit protected by a ground fault circuit interrupter (GFCI).



WARNING: Do not use near concentrations of flammable or explosive fluids such as gasoline, fuel oil, kerosene, solvents, etc. Do not use in explosive atmospheres. Liquids compatible with component materials should only be used. Failure to follow this warning can result in personal injury and/or property damage.

10. The main power must be brought from the circuit breaker and wired into the electrical box on the Rec 2-20. This power supply must be run through conduit in compliance with local and national electrical codes. A power disconnect should be located near the machine for maintenance and emergency purposes.

IMPORTANT SAFETY INSTRUCTIONS

11. Protect all electrical wiring from sharp objects, hot surfaces, oil, sunlight, and chemicals. Avoid kinking the cords.

WARNING: If any cords or electrical wires appear to be frayed, damaged, or in poor condition, proceed with caution and immediately take steps to have the cords repaired or replaced.

- 12. Never make adjustments on the machine while it is in operation, except for those prescribed in this manual.
- 13. Follow the maintenance instructions specified in this manual.
- 14. Before servicing the machine, refer to all the MS-DS's on the material identified in the waste stream. You must comply with all warnings and wear all protective clothing as stated on the MSDS's.
- 15. Inlet water temperature must not exceed 85°F.
- 16. The best insurance against an accident is precaution and knowledge of the equipment.
- 17. Water Maze is not liable for modifications or use of components not purchased from Water Maze.
 - 18. Personal Safety:



- a. Wear safety glasses and
- other applicable protective clothing at all times when working on this machine.

Refer to item #14 under Important Safety Information.

- Keep your work area clean, uncluttered and properly lighted
- c. Replace all unused tools and equipment.
- d. Keep visitors at a safe distance from work area.
- 19. Running the system without water will damage the pumps and will void the warranty.
- 20. Release all pressure within the system before servicing any component.
- 21. Drain all liquids from the component before servicing.

- 22. Check hoses for weak or worn conditions before each use, making certain that all connections are secure.
- 23. Periodically inspect pump and system components. Perform routine maintenance as required.
- 24. Do not touch an operating motor. Modern motors are designed to operate at high temperatures.
- 25. Do not touch any electrical component with wet hands, when standing on a wet or damp surface, or in water.
- 26. The pump motors are equipped with a thermal protector. Tripping is an indication of motor overloading as a result of operating at excessively high or low voltage, inadequate wiring, incorrect motor connections, or a defective motor or pump.
- 27. Keep machine from freezing.
- 28. Do not spray water directly at machine.

WARNING: This system contains moving parts in the control center and in the pumps. Follow safe practices when performing maintenance and when troubleshooting. Disconnect the power before servicing this machine. If the power disconnect is out of sight, lock it in the open position and tag it to prevent unexpected application of power.

WARNING: Make sure to take precautions when performing maintenance on the pump in the catch basin. Turn off the power to the pump and make sure electrical cords are well maintained.

APPLICATION AND INTENDED USE

Rec2-20 Water Management Unit:

The Rec2-20 water management unit should be installed as a recycler to transport water between a water treatment system and local storage tank. The Rec2-20 unit can then be used to circulate and refresh stored water. An optional Ozone generator can be added further sanitize and de-odor the water. The Rec2-20 unit can also maintain water levels in the local storage tank, to prevent overflows and draining. Auxiliary parts are also available for hose and pressure washers. The Rec2-20 should be installed as a component of a system that incorporates multiple water treatment technologies.

To assure the safety of the Rec2-20 unit, pretreatment of the waste water should be applied to remove as many solids and oils as possible prior to entering the Rec2-20.

Consult a Water Maze representative prior to combining the Rec2-20 with other pre-treating and post treating equipment.

TCLP Testing:

TCLP is one of the Federal EPA test methods that are used to characterize waste as either hazardous or non-hazardous for the purpose of disposal. TCLP is an acronym for Toxicity Characteristic Leaching Procedure. A TCLP test may be required prior to disposal of your solid waste. Consult a Water Maze representative for details.

Site Preparation:

The installation site surface should be of compacted materials, such as concrete, asphalt or pavement and capable of supporting the Rec2-20 treatment system.

INSTALLATION & OPERATING INSTRUCTIONS

The following instructions will provide adequate information to fully install your Water Maze Recycling System. Please follow these instructions step by step to ensure proper installation.

WARNING: A backflow preventer must be provided when connecting to a potable water supply to prevent back-siphonage into the water supply.

Equipment and Supplies Needed for Installation

Aside from having a general assembly of tools on hand, you will need to supply a few additional items to complete the installation of your system.

Tape Measure

- Forklift
- Level

Equipment Installation

The model Rec2-20 water treatment system must be installed on a level surface.

If surface is not level, shimming may be required.

Installation Checklist

- Are all piping and electrical float switches connected as shown on the Float piping and Connection Diagrams pages 10 and 11.
- □ Are floats connected as shown on the Junction Box wiring Diagram on page 34?
- □ Is the voltage correct?

START-UP

- 1. Make sure that all equipment is level.
- 2. Install float switches in infeed/sump tank and storage tank according to the Float Connection Diagram, page 11, included in this manual.
- 3. Connect piping according to Piping Connection Diagram, page 10, included with this manual.
- 4. Connect electrical power to electrical box: When connecting to the power supply, follow all electrical and safety codes as well as the most recent National Electric Code (NEC) and Occupational Safety and Health Act (OSHA). Ground system before connecting to the power supply.

WARNING: All wiring must be performed by a qualified electrician.

- 5. Use included Digital Timer Instructions, pages 12-13, to set clock and circulation/ozonating times.
- Fill infeed/sump tank with water and ensure storage tank's water level is above the "Low Water Float".
- 7. Fill all inlet lines (two inlets from storage tank on right side and one from infeed source on left side) with water.

- 8. Open any valves between Rec2-20 module and storage tank, infeed/sump tank, drain, and fresh water source.
- 9. Press "ON" switch on control panel to begin Rec2-20 operations. To complete priming of infeed and circulation/ozone pumps, hold "ON" switch down for three seconds until light begins flashing. The flashing "ON" light indicated the machine is in a flushing routine that forces fresh water through plumbing to prime pumps. Flushing routine will last fifteen seconds, however, pumps will need to continue running for approximately one minute before they complete priming and reach capacity water flow. If pumps do not reach a high flow rate within one minute of flushing, repeat rountine by holding down "ON" switch for three seconds, again.

UTILITY USAGE

Electrical: 230 Volts, 1 PH

Amps: 21.6 amps

OPERATING ENVIRONMENT

The Rec 2-20 is designed to work in a wide variety of operating conditions. In normal operating environments, the system should perform as specified. In extremely hot or cold environments certain precautions need to be taken.

Operating Conditions

Air Temperature Range 40° - 120°F

Cold Weather



DRAIN SYSTEM WHEN

TEMPERATURES DROP

BELOW FREEZING

Protect the Rec 2-20 from damage that can occur when freezing water expands. Freezing water may cause pipes to burst.

Drain all pipes if a prolonged hard freeze is expected. Make sure all valves are open so water can completely drain from the system.

Cold Climate Conditions

In locations where freezing temperatures will be experienced on a regular basis or where very cold temperatures will be incurred, the water treatment system should be drained when the outside ambient temperature drops below freezing and/or the water system (Rec 2-20) should be housed in a heated structure. The warranty on the water treatment system does not provide for repair due to freezing conditions.

6

PRESSURE SWITCH AND PRESSURE TANK OPERATION



WARNING: Live electrical contacts are exposed, so disconnect power first and have work performed by a qualified electrician.

Remove cover of the pump pressure control switch to allow access to the two nuts used to adjust the pump operating pres-

sure. The pressure switch on Water Maze equipment is set at the factory and should not have to be adjusted at start-up, but will need to be verified at start up and maintained regularly at least monthly.

- 1. The nut on the larger spring in the pump pressure switch, adjusts the pump cut in (cut on) and pump cut out (cut off) pressures simultaneously.
- 2. The nut atop the smaller spring in the pump pressure switch only controls the cut out range and is used to narrow or widen the gap between the pump cut in and cut out pressures.
- 3. To cycle the pump less frequently, the gap should be as wide as possible while still allowing the pump to shut off quickly when all outlets are closed. Adjust the smaller spring to widen the gap between pump in and out (on and off). 40-45 PSI (CLP, Rec2-20) or 30 PSI (EC1-300A) is desirable. Adjusting the larger spring should not be necessary.
- 4. When making pressure switch adjustments, make sure all pump outlets are off or closed, except for the one outlet valve used to relieve and build pressure while making pressure switch adjustments.



PRESSURE TANK OPERATION



CHANGING PRESSURE

WARNING! When the tank has been in service and a change to a higher pre-charge pressure is necessary because of a required change in the pressure switch setting, failure to follow instructions below can cause a rupture or explosion and could cause serious or fatal personal injury and/or property damage.

- Do not adjust or add pressure if there has been a loss of air.
- Do not adjust the pre-charge pressure if there is visible exterior corrosion.
- Do not adjust the pre-charge pressure if there has been a reduction of the pump cycle time or the pre-charge pressure compared to its initial setting. A reduction in pump cycle time can result from loss of tank corrosion and any re-pressurization or additional pressure could result in rupture or explosion.
- Pressure tank pressure is factory set but will have to be checked regularly (at least monthly). Use an air pressure (tire) gauge. Before checking air pressure on the pressure tank, purge all water out of the tank by turning the pump on and pumping all water out of the pressure tank.
- 1. Our transfer pump water systems use a water pressure tank and water pump with these two pressure operation ranges:

Cut in (start pumping): 20 PSI

Cut out (stop pumping): 30 PSI (EC1-300A) Cut out (stop pumping): 40-45 PSI (CLP, REC2-20)

2. Typical factory set air pressure on bladder-type residential water pressure tanks are shipped from the factory with a standard pre-charge of:

18 psig for models WX-101 and WX-102

18 psig for models WX-103 and WX-203

18 psig for models WX-205 and WX-350

3. Set the well tank air pressure to 2 PSI below the pump pressure switch cut-in pressure. This is usually 18 PSI.

Hot Weather

The Rec 2-20 may encounter minor problems, such as a slight increase in odor, when operating in extremely hot temperatures in excess of 100° F.

Environmental

To reduce deterioration of equipment it is recommended that the Rec 2-20 Water Treatment System be protected from environmental elements such as rain, snow, hail, direct sunlight, as well as freezing temperatures.

MAINTENANCE INSTRUCTIONS

Daily and weekly maintenance is important for your system to function consistently and properly. Maintenance frequency depends on many factors, such as usage, volume of sludge, etc. On-site personnel should be trained and be aware of the daily and weekly maintenance that is required to meet these performance factors. We recommend the following:

Daily Schedule:

(Performed by customer personnel)

- 1. Become familiar with the control panel and make sure that the electrical switch is in the ON position. This will allow your system to operate automatically.
- 2. While operating the system, observe and repair any water leaks.

Weekly Maintenance Schedule: (Performed by customer personnel)

- 1. Check pressure gauge inside of Rec2-20 to ensure it is operating between desired pressures of 20 and 40 psi.
- 2. Check storage tank water levels to ensure Rec2-20 is maintaining the desired quality of water.
- 3. Check all three pumps inside of Rec2-20 for any function abnormalities, ie: noise changes, increased vibrating, or rattling.

REC2-20 COMPONENT IDENTIFICATION





OPERATOR'S MANUAL WATER TREATMENT SYSTEM

PIPING CONNECTION TABLE

| | CONNECTION | SIZE | EXTERIOR CONNECTION TYPE | DESCRIPTION | INSTALLATION RECOMMENDATIONS |
|----|------------|------|---|------------------------------------|--|
| | A | 1" | CAMLOCK, 1" HOSE BARB (8.711-811.0) | DRAIN OUTLET | No valves should be placed between outlet and drain in case water overflow needs to be purged. |
| | B1, B2 | 1" | CAMLOCK, 1" HOSE BARB (8.711-811.0) | INLETS FROM STORAGE TANK | Valves should be installed inline for ease of maintenance. |
| | С | 1" | CAMLOCK, 1" HOSE BARB (8.711-811.0) | STORAGE TANK OUTLET | |
| | D | 1" | 3/4" GARDEN HOSE, MALE | FRESH WATER INLET | Inlet should be directly connected to fresh water and should always be left open. |
| | E | 1" | 3/4" GARDEN HOSE, FEMALE | PRESSURE WASHER OUTLET | |
| | F | 1" | 3/4" GARDEN HOSE, FEMALE | AUXILIARY FRESH WATER OUTLET | Outlet is directly connected to fresh water inlet and can be used as normal wall faucet. |
| 10 | G | 1" | CAMLOCK, 1" HOSE BARB (8.711-811.0) | INFEED SOURCE INLET | Line from infeed /sump tank needs check valve (provided) installed near tank outlet, with flow directed away from tank. |

FLOAT CONNECTION DIAGRAM



FLOAT CONNECTION TABLE

| FLOAT NAME | FLOAT FUNCTION | PLACEMENT NOTES |
|---|---|---|
| INFEED TANK FLOAT (NOT PROVIDED) (WaterMaze # 8.716-143.0) | Signals REC2-20 module to remove water from infeed source. | Float needs to close (Lowered position) before infeed/sump tank water level drops below suction port to prevent dry running and loss of pump prim- ing. For convenience, a "Delay Off" function for the infeed pump is available. To fine tune pumps turn off timing. See digitial timer instructions to set function. |
| HIGH WATER FLOAT | Signals REC2-20 module to purge excess water from storage tank. | Float needs to open (raised position) before water reaches overflowing levels. |
| FRESH WATER FILL LEVEL FLOAT | Sets the water level that REC2-20 will fill to with fresh water. | Float will maintain a water level of at least its open or raised position. |
| LOW WATER FLOAT | Shuts off pumps if water level if too low for protection against dry running. | Float needs to close (lowered position) before storage tank level drops below suction ports to prevent dry running and loss of pump priming. |

*All floats are to be wired into REC2-20 module junction box, as indicated by junction box label. See included junction box wiring diagram, page 34, for float placement on terminal block. Junction box terminal block can be reached by removing four bolts and blue cover plate seen in the exploded view of junction box.

DIGITAL TIMER INSTRUCTIONS

PARAMETER SETTINGS

The following are instructions on how to set the parameters on the digital timer, located in the electrical box, in Programming Mode. To define these settings please follow the steps below.

Setting the Clock:

In order for the system to function properly you must accurately set the correct time-of-day and date.

1. Press the **ESC** key located next to the display window and under the arrow key pad (see figure below). Pressing the **ESC** key will access the Parameter Assignment Menu.



Using the up/down arrow keys ▲ or ▼, move the
 (>) cursor to 'Set' and press OK to accept.

Stop Set Param > Set.. Prg Name

3. Move the (>) cursor to 'Clock' and press OK to accept.

> Clock Contrast StartScreen

4. Move the (>) cursor to 'Set Clock' and press OK to accept 'Set Clock'.

> Set Clock S/W Time.. Sync

NOTE: When setting time on clock, use only military time. The cursor is now positioned on the weekday and shows the following on the display window (see figure below).



- Select the day of the week by using the up/down arrow keys ▲ or ▼.
- 6. Move the cursor to the next position by using the left/right arrow keys ◀ or ►.
- To change the value use the up/down arrow keys
 ▲ or ▼.
- 8. To set the correct time-of-day and date, repeat steps 6 and 7.
- 9. To accept your entries press OK.
- 10. To go back to the previous menu at anytime press **ESC**.

DIGITAL TIMER INSTRUCTIONS

Setting water circulation times and ozone treatment for machines with option:

1. Press the **ESC** key located next to the display window and under the arrow key pad (see figure below). Pressing the ESC key will access the Parameter Assignment Menu.



2. Using the up/down arrow key \blacktriangle or ∇ , move the (>) cursor to 'Set Param' and press OK to confirm. The display window shows the first parameter shown (see figure below). You can change the value of the parameter in the same way as you did in programming mode:



- 3. The display window shows CIRC/OZ1, CIRC/ OZ2, CIRC/OZ3, DELAY OFF AND ON DE-LAY. CIRC/OZ 1 comes factory set at 2 and 4, so water will circulate or be treated with Ozone, between 2 and 4 am Monday thru Friday. There are additional settings available, CIRC/OZ 2 and CIRC/OZ 3, if more circulating times are desired. Use the up/down arrow keys \blacktriangle or \blacksquare to toggle through the function screen you would like to edit.
- 4. Press OK to edit the parameter that shows in the display window.

CIRC/OZ 1 D = **MTWF** ON = 02:00OFF = 04:00

- 5. Using the left/right arrow key \triangleleft or \triangleright , move the
- Cursor to the desired field and use the up/down arrow key to change this value. Press **OK** to accept the value. The DELAY OFF function can be used to delay the shut off of the Infeed pump in cases when additional water removal is required after the infeed float is lowered. This function should be used with caution to prevent the pump from over drawing the infeed source and dry running. The DELAY OFF function is factory set at 0 seconds. The ON DELAY function can be used to delay the start-up of the Infeed pump when the upstream 6. The DELAY OFF function can be used to delay the
- 7. The ON DELAY function can be used to delay the start-up of the Infeed pump when the upstream water supply is not being fed quickly enough. This function should be used with caution so as not to allow the supply tank to overfill before letting the Infeed pump start up. The ON DELAY function is factory set at 3 seconds.

OPERATOR'S MANUAL

OPERATION AND MAINTENANCE

CENTRIFUGAL PUMP

Your centrifugal pumps have been quality-built and engineered to give you efficient, dependable service. They are equipped with union connectors to make installation and future service easier.

The advanced design uses a single speed motor which reduces operation and maintenance to simple, common-sense procedures.

PUMP OPERATION

(Infeed Transfer and Ozone Pumps)



WARNING: Do not touch pumps, pump motors, water or discharge piping when the pumps are connected to electrical power. Do not handle a pump or pump motor with wet hands or when standing on a wet or damp surface or in water. Never touch a pump or discharge piping when a unit is operating or fails

to operate. Always disconnect the pump cord (power) before handling.

- 1. The shaft seal depends on water for lubrication. Do not operate the pump unless there is water. Dry running (pump not pumping water) will cause seal damage and eventual pump failure.
- 2. The motor is equipped with an automatic reset thermal protector. This means if the temperature in the motor should rise unduly, the switch will cut off all power before damage can be done to the motor. When the motor has cooled sufficiently, the switch will reset automatically and restart the motor. If the protector trips repeatedly (cycling on protector) the pump should be removed and checked for the cause of the difficulty. Low voltage, long extension cords, clogged impeller, very low head or lift, etc., could cause cycling. Cycling of the protector will cause eventual motor burnout.

PUMP MAINTENANCE



WARNING: Before attempting to service, disconnect power from unit. Do not handle the pump with wet hands or when standing on a wet or damp surface or in water. Failure to follow precautions can result in personal injury and /or property damage.

NOTE: Only qualified electricians or servicemen should attempt to repair this unit. Improper repair and/ or assembly can cause an electrical shock hazard.

- 1. Bearings in this unit are pre-lubricated. No additional lubrication is necessary.
- 2. Cleaning Occasionally clean the transfer pit and pump if dirt or foreign matter accumulate. Small stones, gravel, sand, dirt, silt, etc. can clog and damage the pump and pump seal, eventually causing pump failure.
- 3. Disassembly of the motor prior to expiration of the warranty will void the warranty. It may also cause internal leakage and damage to the unit. If repairs are required, return the pump to a local service station.
- 4. If the motor has been disassembled or the switch chamber opened after the warranty expiration date, the O-rings and gaskets must be replaced. Care must be taken to assure that the seals, the switch cover and air tube gaskets do not leak.
- 5. The pump should be checked for proper operation weekly or monthly by watching the operation of the pump. If anything has changed since the pump was new, the pump should be examined, and repaired if necessary.

TROUBLESHOOTING - PUMP

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|---|--|---|
| INFEED PUMP DOES NOT OPERATE | Sump or pre-treatment tank has low water level | Raise level in sump or pre-treatment tank. |
| | Control panel pump switch is in the OFF position | Confirm that control panel pump switch is in the ON position. |
| TRANSFER PUMP DOES NOT OPERATE | Storage has low water level | Ensure tank is filling with fresh water and wait. |
| | Pressure limit has been achieved | Need water demand for pump to start. |
| | Control panel pump switch is in the OFF position | Confirm that control panel pump switch is in the ON position. |
| PUMP DOES NOT OPERATE | Program timer is not set for current time | See Digital Timer Instructions page to reset circulation times. |
| | Storage tank has low water level | Ensure tank is filling with fresh water and wait. |

TROUBLESHOOTING - PUMP

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|--|---|--|
| ONE OF THE | Circuit breaker shut "OFF | Turn "ON" circuit breaker. |
| PUMPS DOES | Accumulation of trash on float | Clean float. |
| | Float obstruction/defective float | Check float path and provide clearance. |
| | Defective switch | Have pump serviced by authorized service center. |
| | Defective motor | Have pump serviced by authorized service center. |
| | Low line voltage | If voltage under recommended minimum, check size of wiring from main switch on property. If OK, contact power company. |
| ONE OF THE | Float obstruction | Check float and float rod path. Provide clearance. |
| NOT SHUT OFF | Pump is air locked (Infeed pump) | Shut power off for approximately 1 minute, then restart. Repeat several times to clear air from pump. |
| | Defective float switch | Disconnect switch, check with ohmmeter. |
| ONE OF THE | Lift too high for pump | Check rating table. See pages 32 and 33. |
| PUMPS RUNS | Inlet to impeller plugged | Pull pump and clean. |
| DISCHARGE | Low line voltage | If voltage under recommended minimum, check size of wiring from main switch on property. If OK, contact power company. |
| | Clogged impeller | Remove housing, unclog. |
| | Faulty motor protector | Replace pump. |
| ONE OF THE PUMPS DOES NOT DELIVER RATED | Low voltage, speed too slow | Check for proper supply voltage to make certain it corresponds to nameplate voltage. |
| | Impeller or discharge pipe is clogged | Pull pump and clean. Check pipe for scale or corrosion. |
| | Impeller wear due to abrasives | Replace worn impeller. |
| ONE OF THE PUMPS CYCLES | Low line voltage | If voltage under recommended minimum, check size of wiring from main switch on property. If OK, contact power company. |
| CONTINUALLY | Worn or defective pump parts or plugged impeller | Replace worn parts or entire pump. Clean parts if required. |
| | Pump air locked | Turn pump "ON" and "OFF" several times. Fill hose manually with water. |
| TRANSFER PUMP | Lack of water in tank | Add water |
| DOES NOT STARTUP | Bad low water protection float in tank | Replace float |
| | Pump switch off | Turn on main switch |
| TRANSFER PUMP | Surge tank pressure too high | Lower air pressure to 18 psi |
| DOES NOT SHUT OFF | Pressure switch cut off, setting too high | Lower cut off pressure to 40 psi Adjust small spring - rotate counterclockwise |

TROUBLESHOOTING - PUMP MOTOR

| 1 | ROUBLESHOOTING | - PUMP MOTOR |
|--|---|--|
| | | |
| PROBLEM | POSSIBLE CAUSE | SOLUTION |
| MOTOR WILL | Disconnect switch is "OFF" | Be sure switch is on. |
| NOTRUN | Breaker is tripped | Reset breaker. |
| | Starting switch is defective | Replace starting switch. |
| | Wires at motor are loose, disconnected or wired incorrectly | Refer to wiring instructions. Check and tighten all wiring. |
| MOTOR RUNS HOT | Motor is wired incorrectly | Refer to wiring instructions |
| AND OVERLOAD KICKS OFF | Voltage is too low | Check with power company. Install heavier wiring if wire size is too small. See wiring instructions. |
| | Defective float switch | Disconnect switch, check with ohmmeter. |
| MOTOR RUNS BUT NO WATER IS DELIVERED | Pump in a new installation did not pick up prime through: a. Improper priming | a. Re-prime (3 or 4 times may be needed) |
| | | times. |
| | b. Air leaks | b. Check all connections on suction line. |
| | Pump has lost its prime through: | |
| | a. Air leaks | a. Check all connections on suction line, air volume control, jet and shaft seal. |
| | b. Water level below suction of pump | b. Lower suction line into water and re-prime. |
| | Check valve is stuck in closed position | Replace check valve. |
| | Pipes are frozen | Thaw pipes. Bury pipes below the frost line. Heat pipes below frost line. Heat pit or pump house. |

TROUBLESHOOTING - WATER SOLENOID

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|---------------------------|--|---|
| VALVE LEAKS WHEN "OFF" | Dirt or debris on diaphragm seat | Clean diaphragm seat. |
| | Solenoid not fully closed after manual operation | Turn solenoid clockwise to fully seated position. |
| | Solenoid O-ring damaged or twisted | Turn off water, inspect O-ring. Reseat if twisted, replace solenoid value. |
| | Diaphragm damaged | Turn off water, remove bonnet screws and inspect diaphragm for nicks or damage NOTE: Diaphragm has one bleed hole molded into it. Replace solenoid valve. |
| | Dirt interfering with solenoid operation | Turn off water, remove solenoid and flush seating surface in bonnet and at bottom of solenoid with water. |
| | Solenoid damaged | Turn off water supply and replace solenoid. |
| WATER WON'T SHUT OFF | Valve in manual "ON" position | Turn solenoid clockwise to "OFF" position. |
| | Diaphragm bleed hole blocked | Use Manual Flush Mode. Turn water supply "OFF" and immediately back "ON" to clear blockage. If still blocked, turn off water and inspect diaphragm looking for blockage. |
| | Damaged solenoid | Turn off water supply and replace solenoid. |
| | Gate valve not fully open | Open gate valve fully. |
| FLOW CONDITION | Pipeline blockage | Clear pipeline. |
| VALVE WON'T | No power to solenoid | Check floats in tank |
| ELECTRICALLY | Low voltage | Check for proper voltage to unit. |
| | No water pressure | Make sure water pressure is available to valve. Turn off water, without cutting wires, unscrew and swap solenoids between valves. Turn on water and test again. If problem stems from the solenoid, replace solenoid. |

TROUBLESHOOTING - WATER SEALS

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|--|---|---|
| CRACKED OR BROKEN STATIONARY SEAT (CERAMIC) | Seal ran dry and heated up. When liquid reached seal faces it was cooler, causing thermal cracks | Check to insure seal chamber is full of liquid before starting pump. On high temperature application insure proper flushing at seal faces. |
| CARBON WASHER SCORED AND GROOVED | Dirty system | Have system cleaned and flushed. Consider use of Tungsten Carbide or Silicon Carbide Rings. |
| CARBON WASHER WORN UNEVENLY | Seal improperly installed | Check installation instructions for proper assembly. |
| BUNA DIAPHRAGM HARD OR BRITTLE. RAPID CARBON WEAR. | Air leak on suction side of pump | Check cover gasket, hand knobs, hose, clamps, etc. Replace or tighten as necessary. |
| DIAPHRAGM SOFT AND STICKY; APPEARS TO BE DISSOLVING. | Bellows not compatible with material being pumped | Consult dealer for recommendation advising of pumpage and temperature. |
| "OPTIONAL" OZONE GENERATOR DOES NOT TURN ON | Time or <u>Ozone</u> program is not set correctly | Consult manual for proper setting on add- ing additional ozone/recirculation time. |
| DURING PROGRAMMED CIRCULATION TIME (INDICATED BY GREEN | Ozone generator power switch is not on | Turn on ozone power switch on cabinet. |
| INSIDE REC2-20 CABINET) | Green lights on ozone generator start off green then go dim, bright | Proper operation-If lights stay bright green, then problem with ozone bulb or ballast - refer to manual. |

WATER TREATMENT SYSTEM Troubleshooting Guide



EXPLODED VIEW PARTS LIST-BODY

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|---|---------|
| 1 | 8.917-450.0 | WLMT, Base Recycle | 1 |
| 2 | 8.917-452.0 | WLMT, Panel, Back, Recycle | 1 |
| 3 | 8.917-457.0 | WLMT, Tank Stand Frame, Recycle | 1 |
| 4 | 8.917-435.0 | WLMT, Top, Tank Stand, Recycle | 1 |
| 5 | 8.917-438.0 | Panel, Left, Tank Stand, Recycle | 1 |
| 6 | 8.917-444.0 | Panel, Right, Tank Stand, Recycle | 1 |
| 7 | 8.917-449.0 | Bracket, Tank Base, Recycle | 3 |
| 8 | 8.719-178.0 | Tank, 20 Gal Prepressurizd, Blue, WTRSTX-202 | 1 |
| 9 | 9.803-277.0 | Screw, 5/16" x 1/2", Whiz Loc Flange | ; 19 |
| | | | |

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|-------------------------------|-----|
| 10 | 9.802-778.0 | Nut, 5/16" Whiz Loc Flange | 8 |
| 11 | 9.802-754.0 | Screw, 1/4" x 1/2" NC, Whiz | Loc |
| | | Flange | 3 |
| 12 | 9.802-775.0 | Nut, 1/4" Flange, ZN | 3 |
| 13 | 8.706-484.0 | Bulkhead, 1" Polypro | 8 |
| 14 | 9.800-348.0 | Label, Do not stand on Frame | e 2 |
| 15 | 9.800-016.0 | Label, Disconnect | |
| | | Power supply | 1 |
| 16 | 9.800-347.0 | Label, Warnings | 1 |
| | | | |

Not Shown



CABINET EXPLODED VIEW PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|--|-----|
| 1 | 8.917-456.0 | Wlmt, Door, Recycle | 1 |
| 2 | 8.917-536.0 | WImt, Junction Box, Recycle | 1 |
| 3 | 8.917-431.0 | Panel, Right Side, Cabinet, Recycle | 1 |
| 4 | 8.917-432.0 | Panel, Left, Cabinet, Recycle | 1 |
| 5 | 8.917-428.0 | Top, Cabinet, Recycle | 1 |
| 6 | 8.917-430.0 | Base, Cabinet, Recycle | 1 |
| 7 | 8.719-087.0 | Latch, Paddle Handle w/Key | 1 |
| 8 | 8.917-455.0 | Wimt, Control Panel, Rec2-20 |) 1 |
| 9 | 9.803-277.0 | Screw, 5/16" x 1/2", Whiz Loc Flange | 9 |
| 10 | 9.802-754.0 | Screw, 1/4" x 1/2" NC, Whiz Loc Flange | 12 |
| 11 | 9.802-775.0 | Nut, 1/4" Flange, ZN | 12 |
| 12 | 8.718-980.0 | Washer, 5/16", Flat, SAE | 4 |
| 13 | 9.803-541.0 | Screw, 5/16-18 x 1/2 CS SOC BH NC ZN | 20 |
| 14 | 8.718-753.0 | Screw, 1/4"-20 x 3/4" PHIL PH SS M/S | 4 |
| 15 | 8.718-882.0 | Nut, 1/4-20 NC KEPS SS | 4 |
| 16 | 8.905-717.0 | Ozone Generator, Series 400 (Option only) | 1 |

EXPLODED VIEW ELECTRICAL BOX



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OPERATOR'S MANUAL WATER TREATMENT SYSTEM

ELECTRICAL BOX EXPLODED VIEW PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|--|----------|
| 1 | 8.716-180.0 | Fuse, KTK-R4 600V Midget Fuse (4 AMP) | 2 |
| 2 | 8.716-883.0 | Transformer, 208/230/460V- 24/115V, .050 KVA | 1 |
| 3 | 8.716-460.0 | Terminal, Grounding Lug, LAMA6-14Q | 1 |
| 4 | 9.802-457.0 | DIN Rail, 35 MM Cut t | o Fit |
| 5 | 9.800-040.0 | Label, Ground Symbol | 2 |
| 6 | 9.802-762.0 | Screw, 10/32" x 1-1/4" RH, SL, BLK | 2 |
| 7 | 9.802-695.0 | Nut, 10/32" Keps | 12 |
| 8 | 8.714-164.0 | Terminal Block- 2 Position (Surface) BL-BL | 1 |
| 9 | 8.718-937.0 | Screw, #8 x 3/4", Phillips, Zind PLTD, HEX, T | ; 2 |
| 10 | 9.802-759.0 | Screw, 10/32" x 1/2" BHSOC BLK | 5 |
| 11 | 8.718-936.0 | Screw, #8 x 1/2"" Phillips, Zind PLAT TEK | с 9 |
| 12 | 8.755-622.0 | Relay, Smart, 24V, 8I/4O | 1 |
| 13 | 8.755-623.0 | Logo Expansion Module 4I/40 |) 1 |
| 14 | 8.716-199.0 | Fuse, FNM-6.25 | 1 |
| 15 | 8.724-267.0 | Contractor, DP C25DNY151T 15 AMP | L, 3 |
| 16 | 8.749-976.0 | Terminal Block, Feed- through Phoenix | n, 25 |
| 17 | 9.804-595.0 | End Bracket, Entrelec, 103-002-26 | 4 |
| 18 | 8.716-281.0 | Box, Plastic, 14" x 16" x 6.75" W/Hinged Lid | 1 |
| 19 | 9.802-518.0 | Strain Relief, LT, STR, 3/4 NPT .4971D | 4 |
| 20 | 8.917-612.0 | Electrical Standoff, Recycle | 1 |
| 21 | 8.921-217.0 | ▲ I BAR, PLC with two expansions | 2 |
| 22 | 8.712-861.0 | ▲ Edge Trim | 0.66' |
| 23 | 8.921-222.0 | A Q BAR, Dual expansion To | p 1 |
| 24 | 8.921-221.0 | ▲ Q BAR, PLC with two expansions | 1 |
| 25 | 9.803-470.0 | ▲ PLC Logic, REC2-20 | 1 |
| | | Not Shown | |

CONTROL PANEL EXPLODED VIEW



CONTROL PANEL EXPLODED VIEW PARTS LIST

QTY

6 4

1

1

| ITEM | I PART NO. | DESCRIPTION | QTY | ITEI | M PART NO. | DESCRIPTION |
|------|-------------|------------------------------|-----|------|-------------|---|
| 1 | 8.917-455.0 | WImt, Control Panel, Rec2-20 |) 1 | 10 | 9.803-277.0 | Screw, 5/16" x 1/2", |
| 2 | 8.706-745.0 | Plug, Plastic 0.812 | 1 | | | Whiz Loc Flange |
| 3 | 9.802-518.0 | Strain Relief 3/4" | 3 | 11 | 9.802-778.0 | Nut, 5/16" Whiz Loc Flange |
| 4 | 8.716-547.0 | Strain Relief 1/2", Conduit | 4 | 12 | 9.802-514.0 | Strain Relief 1/2" (Only On |
| 5 | 9.803-651.0 | Lamp Indicator, Red 28V | 2 | _ | | Machines With Ozone Generator. In Place Of Plug) |
| 6 | 9.803-650.0 | Lamp Indicator, Blue 28V | 4 | 13 | 8 917-620 0 | Label Becycle Control Panel |
| 7 | 8.716-037.0 | Switch, Rocker 24V | 1 | | 0.017 601 0 | |
| 8 | 9.802-283.0 | Hour Meter | 1 | - 14 | 0.917-021.0 | Descriptive Label |
| 9 | 8.917-445.0 | Cover, Control, Rec2-20 | 1 | | | ▲ Not Shown |
| | | | | | | |

JUNCTION BOX EXPLODED VIEW



JUNCTION BOX EXPLODED VIEW PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|--|---------|
| 1 | 8.917-536.0 | WImt, Junction Box, Recycle | 1 |
| 2 | 8.917-540.0 | Cover, Junction Box, Recycle | 1 |
| 3 | 8.716-547.0 | Connector, 1/2" L/T, Straight, Black | 2 |
| 4 | 9.802-514.0 | Strain Relief, L/T, Str, 1/2 NPT .2345D | Г, 6 |
| 5 | 9.802-749.0 | Screw, 8/32" x 3/4" BHSOC | 2 |
| 6 | 9.802-785.0 | Nut, 8/32" KEPS | 2 |
| 7 | 9.802-493.0 | Block, Terminal, 16 Pole | 1 |

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|-----------------------------------|-------|
| 8 | 9.802-759.0 | Screw, 10/32" x 1/2" BHSOC BLK | 1 |
| 9 | 9.802-695.0 | Nut, 10/32" KEPS | 2 |
| 10 | 9.803-277.0 | Screw, 5/6" x 1/2", Whiz Loc | |
| | | Flange | 4 |
| 11 | 9.802-778.0 | Nut, 5/16" Whiz Loc Flange | 4 |
| 12 | 8.917-622.0 | Label, Recycle Junction E | Box 1 |
| | | Not Shown | |

WATER TREATMENT SYSTEM OPERATOR'S MANUAL

RIGHT SIDE WATER CONTROL PANEL EXPLODED VIEW



RIGHT SIDE PANEL EXPLODED VIEW PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|---|-----------|
| 1 | 8.706-707.0 | Adapter, 1" Male x 1" Male Th Camlock | hrd. 5 |
| 2 | 8.706-709.0 | Coupler, 1" FEM x 1" Hose B Camlock | arb 5 |
| 3 | 9.802-146.0 | Swivel, 1/2" MP x 3/4" GHF w/Strainer | 1 |
| 4 | 8.706-926.0 | Bushing, 1" x 1/2" Pipe, Bras | ss 3 |
| 5 | 8.706-790.0 | Nipple, 1/2" Close | 2 |
| 6 | 8.707.211.0 | Valve, 1/2" 8201 Brass Ball 400 PSI | 2 |
| 7 | 8.711-811.0 | Hose, 1" Gray Spiralite, per fo Not Provided | oot |
| 8 | 8.917-624.0 | Label, Recycle Outlet To Drai | in 1 |
| 9 | 8.917-625.0 | Label, Recycle Outlet To Storage | 1 |
| 10 | 8.917-626.0 | Label, Recycle Inlets From Storage | 1 |
| 11 | 8.917-627.0 | ▲ Label, Recycle Infeed Source Inlet | 1 |
| 12 | 8.706-968.0 | Nipple, 1/2" x 3/4" GH | 2 |
| | | ▲ Not Shown | |

WATER TREATMENT SYSTEM OPERATOR'S MANUAL

Water Maze REC2-20 • 8.917-436.0 - B



PLUMBING PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|---|--------|
| 1 | 8.716-154.0 | Switch, Pres SQ D, N/C Use W/2-10893, 2-1072 | 1 |
| 2 | 8.712-154.0 | Gauge, Pressure 0-100 1/4" Bottom PG1- | 1 |
| 3 | 8.716-697.0 | Solenoid, Water Maze, PVC 24V P/N 100DVF | 2 |
| 4 | 8.706-404.0 | Bushing, 1 1/2" x 1" MT x FT, PVC 80 | 1 |
| 5 | 8.706-405.0 | Bushing, 1 1/4" x 1" MT x FT, PVC 80 | 3 |
| 6 | 8.706-376.0 | Elbow, 1" FIPT x FIPT, PVC 8 | 01 |
| 7 | 8.706-373.0 | Elbow, 1" S x S, PVC 80, 90° | 8 |
| 8 | 8.706-378.0 | Elbow, 1" SLIP x FIPT, PVC 80, 90° | 1 |
| 9 | 8.706-409.0 | Adapter, 1" MT x SLIP, PVC 8 | 06 |
| 10 | 8.706-447.0 | Adapter, 1" , 3/4" S x FIPT, PVC 80 | 1 |
| 11 | 8.706-439.0 | Nipple, 1", PVC, Close | 13 |
| 12 | 8.706-430.0 | Tee, 1" S x S, PVC 80 | 5 |
| 13 | 8.706-432.0 | Tee, 1" FT x SLIP x SLIP, PVC 80 | 1 |
| 14 | 8.706-471.0 | Union, 1" SLIP x FMLE THRED, PVC 80 SPEA | 11 |
| 15 | 8.706-597.0 | Union, 1" S x S, PVC 80 "SPEARS" | 1 |
| 16 | 8.707-300.0 | Valve, 1" PVC Ball Check | 1 |
| 17 | 8.706-366.0 | Pipe, 1", PVC 80, /FT Cut | to fit |
| 18 | 8.706-827.0 | Elbow, 1/4" Street | 1 |
| 19 | 8.706-854.0 | Tee, 1/4" Branch Male | 1 |
| 20 | 8.706-777.0 | Nipple, 1/4", Close | 1 |
| 21 | 8.706-923.0 | Bushing, 3/4" x 1/4" Pipe | 1 |
| 22 | 8.709-431.0 | Injector | 1 |
| 23 | 8.706-370.0 | Elbow, 1/2" FIPT x FIPT | 1 |
| 24 | 8.706-587.0 | Nipple, 1/2" x 1/2" | 1 |
| 25 | 8.707-321.0 | Valve, 1/4" | 1 |
| 26 | 8.706-588.0 | Connector, 3/8" x 1/4" Male Elbow | 1 |
| 27 | 8.707-355.0 | Check Valve | 1 |
| 28 | 8.711-733.0 | Tubing, 3/8" Vinyl | 3 in |
| 29 | 8.755-986.0 | PUMP, SCOT 11, 3/4HP 230V 1PH 4.88DIA | 2 |
| 30 | 8.715-394.0 | Pump, 1.5 HP 1 PH | 1 |
| 31 | 8.917-454.0 | WLMT, Pump Base | 3 |
| 32 | 9.802-277.0 | Screw, 5/16" x 1/2" Whiz Loc Flange | 6 |
| 33 | 9.802-778.0 | Nut, 5/16" Whiz Loc Flange | 6 |
| | | | |

INFEED & CIRCULATION PUMP EXPLODED VIEW

#8.755-986.0 3/4 HP 1PH



INFEED & CIRCULATION PUMP EXPLODED VIEW PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY |
|------|--------------|-------------------------|-----|
| 1 | 104.000.171 | Flinger | 1 |
| 2 | 132.000.337X | Adapter | 1 |
| 3 | 101.000.239 | Seal VN-SIL/SIL | 1 |
| 4 | 131.000.763D | 4.88" Impeller | 1 |
| 5 | 104.000.168 | Washer | 1 |
| 6 | 105.000.465 | Nut | 1 |
| 7 | 137.002.664X | Case | 1 |
| 8 | | Motor, 3/4 HP 230V 1 PH | 1 |
| | | | |

| TOT. | AL H | EAD | PERFO | DRMAN | CE C | URVE | 350 | 00 | RPM | | 1.0 | S.G. 70°F | ΡU | MP | 1 | 1 | | | |
|--------------|-----------|-------|--------|-------|-------|--------|--------|------------|----------------|----|--------------|--------------|-----------------------|-------------------------|--------------------|-------------------|------------|----|--------------|
| | | | 1.CIND | | 40100 | | | | | | 60 | Hz | PUMP IMP | SIZE: TYPE: | 1.25 : E | < 1.0 > NCLOSE | 5.63 D | | |
| 55- | /8- | 180- | | | | | | | | | | | MAX. IMPEL MAX. | DIA.: LER N SPHER | 5 0.: 1 E: 1 | .63 850 /8 | | 5/ | 28/15 |
| 49- | 69- | 160- | | | | | | | | | | | | | | <u> </u> | STD. | | ELLERS |
| 43- | 61- | 140- | 5.63 | | | | | | | | | | | | | | H.P | | DIA. |
| 37- | 52- | 120- | 5 25 | | | | | 59 _ | 4 | | | | | | | | 1/: 3/- | 2 | 4.50 4.88 |
| 30- | 43- | 100- | 5.00 | | _ | _ | \geq | \square | F- | -6 | 9- | | | | | | 1.0 | | 5.00 5.25 |
| 24- | 35- | 80- | 4.88 | | // | | J | Ń | $ \downarrow $ | Ì | | 49 | - | Ļ | | | 2.0 | | 5.63 |
| 10- | 26. | £0. | 4.50 | 1 | | [] | Ŧ | \ddagger | 4 | T | | \int | $\sum_{i=1}^{n}$ | 4 | 4 | | | | |
| 10 | 20 | 00 | | | / | \sim | | Ħ. | I | Ŧ | | C | K | | | | | | N |
| 12- | 17- | 40- | | | | | | | 1 | * | \checkmark | | | | | Z | | | - 30 S |
| 6- | 9- | 20- | | | | | | | | Hp | | \prec | 3/4 | 1-4 | 57 | | 2 4/2 | • | -20 R |
| - | - | - | | | | N | PSH | REQ. | | | | | | Yo | | | | | 10 E |
| | | | | | | | | 1 | | | | | | | | | | | οĒ |
| U.S. PER | MINU | ITE | 0 | 1 | ò | 2 | 0 | 3 | 0 | 4 | 0 | 5 | 0 | 6 | 0 | 7 | 0 | | |
| LITER PER | RS MIN | UTE (| 5 | 3 | 8 | 7 | 6 | 1 | 14 | 1 | 52 | 1 | 90 | 2 | 28 | 28 | 66 | | ' |

| BRAND | MODEL NO. | SIZE INLET OUTLET | AMPS | VOLTS | PHASE | MAXGPM, PSI |
|-------|-----------|----------------------|------|-------|-------|-----------------|
| SCOT | 11 | 1-1/4" 1" | 5.5 | 230 | 1 | See Chart Above |

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TRANSFER PUMP EXPLODED VIEW PARTS LIST

#8.715-394.0 • 1.5 HP • 115/230V • 1PH



| ITEM | PART NO. | DESCRIPTION | QTY |
|------|-------------|-------------------------|-----|
| 1 | 8.718-520.0 | Washer | 1 |
| 2 | | Base | 1 |
| 3 | | Seal | 1 |
| 4 | 8.718-532.0 | 5.13 Impeller, | 1 |
| 5 | | Washer | 1 |
| 6 | | Nut | 1 |
| 7 | 8.718-529.0 | Head | 1 |
| 8 | | Motor, 1-1/2 HP 115/230 | |
| | | 1 PH | 1 |



| MODEL NO. | S INLET | IZE OUTLET | AMPS | VOLTS | PHASE | MAXGPM, PSI |
|-----------|------------|---------------|----------|---------|-------|--------------------|
| 60 | 1-1/2" | 1-1/4" | 6.8, 3.4 | 115/230 | 1 | See Chart Above |

WATER TREATMENT SYSTEM OPERATOR'S MANUAL



Bottom prewired by manufacturer

OZONE GENERATOR Ozone...Nature's Purification Agent

Ozone is produced in nature or artificially by man. In the Earth's atmosphere, ozone is formed when oxygen is exposed to ultraviolet light or an electrical charge as during thunderstorms. Ozone's primary function in nature is to purify the air we breathe and screen us from harmful rays of the sun. In a similar fashion, Water Maze systems use ozone to disinfect water because ozone has a number of characteristics that make it ideal for water treatment.

Ozone's Characteristics:

Ozone is well suited for water treatment and its unique characteristics are described below:

- Ozone works up to 3,000 times faster than chlorine to kill bacteria and destroy harmful microorganisms.
- Ozone is a more powerful oxidizing agent than chlorine and bromine and has a better ability to remove water contamination.
- Ozone will not form harmful by-products, like THM's (a problem with drinking water) or chloramines (by-product of chlorine responsible for odors, skin irritations and burning eyes).
- Ozone will not alter the water's pH, thereby reducing pH fluctuations.
- Ozone coagulates small particles in water so clarity is dramatically improved.
- Ozone acts as a deodorizer removing unpleasant odors from water.

How the Water Maze Ozone System Works:

Because ozone is unstable, it cannot be packaged and used at a later date. For this reason, ozone is always produced where utilized.

Point-of-use-ozone generation is simple. This powerful disinfectant is produced from ambient air surrounding the generator using special ultraviolet lamps located inside the system's cabinet. To generate the ozone, air movement is created through the use of an air compressor or water venturi. As air passes over these unique lamps, the oxygen contained in the air is converted. The resulting ozone gas is subsequently introduced to the water in the inlet pipeline, where oxidation and disinfection immediately take place.

ULTRAVIOLET LIGHT COMPLIANCE

Ultraviolet Light Safety Requirements

The device used in this product is a Class 1 certified ozone generator product. Operating this product outside specifications or altering its original design may result in hazardous radiation exposure, and may be considered an act of modifying or new manufacturing of a laser product under U.S. regulations contained in 21CFR Chapter 1, subchapter J.





DANGER: Connect only to a circuit that is protected by Ground Fault Circuit Interrupt (GFCI).

Instructions for disposing of your UV Light Tube

- 1. Do not break a UV Light Tube. Keep all tubes whole if possible. If a UV Light Tube is accidentally broken, wear gloves while picking up the pieces, and carefully dispose of them in a trash bag. Wipe the area with a wet wipe, and put the wet wipe in the same trash bag. Place the trash bag with broken pieces inside another trash bag. Mark the bag with a sign labeled, "Broken Mercury Light Bulb".
- 2. Remove the UV Light Tube from the Ozone Generator. Place the used tube in the trash bag, and place that bag inside another trash bag. Seal the openings and then tape a slip of paper on the outer bag labeled, "Mercury LIght Bulb."
- Take the used and /or broken mercury tube to your nearest recycling bin for mercury light bulbs..or take this tube to a state-approved recycling center.

OZONE GENERATOR OPERATOR'S MANUAL

OZONE GENERATOR MAINTENANCE:



WARNING: Never look at an unshielded ozone lamp while operating the unit. This lamp will cause severe eye and skin damage. There is a green indicator light which will dim when the unit is operating properly and will turn bright green if there is a malfunction. See product description for location

of the indicator light.

LAMP TESTING PROCEDURE



Lamp:

The light has a 9,000 hour life expectancy.

Testing the Lamp:

To test the ozone lamp use a voltmeter set on ohms. First, remove the ozone cover and unplug the lamp plug from the ozone lamp. **NOTE:** There are two filaments - an upper and a lower - inside the lamp. Place one of the voltmeter leads on one of the lamp prongs and, with the other lead, touch all of the three remaining prongs. If continuity is not achieved on both upper and lower filaments, replace the ozone lamp (Part #6-0534). (See figure 2 below.)

Testing the Ballast:

To test the power pack, use a voltmeter set on the correct voltage (230V). Place one of the voltmeter leads into the lamp plug where the white wire goes into it and plug the other voltmeter lead into the lamp plug where the blue wire goes into it. If no voltage is present, replace the ozone ballast (Part # 8.716-590.0) If the voltage tests out right and the bulb is good, but the bulb will still not turn on, replace the ballast. The internal starter in the ballast has gone bad.

Replacing the Lamp:

Lamps are available from your Water Maze Dealer should it need to be replaced. Simply turn off the power, remove the screws on the power pack cover and remove the cover. Disconnect the plug on the end of the ozone lamp. Now, loosen the lamp holder locking ring from around the end of the lamp by turning it counterclockwise and removing it. Remove the lamp by grabbing the rubber bushing around the end of the lamp and pulling it straight out. Remove the rubber bushing from the lamp and install it on your new lamp making sure the outer edge of the bushing is flush with the outer edge of the silver end cap on the lamp. Now, slide the lamp back into the reaction chamber. The lamp holder may now be reinstalled and tightened. Reinstall the plug onto the lamp and replace the power pack cover.

CAUTION: Keep the lamp free of fingerprints and dust particles by only handling the metal end caps on the lamp. You can clean the lamp with rubbing alcohol and a soft cloth. A dirty lamp will not allow maximum ozone output.

SPECIFICATIONS:

Energy required: 230VAC max., 800 Amp/Ballast Power Consumption: 20 Watts Average Lamp Life: 9,000 Hours Lamp Wavelength: 185nm

OZONE GENERATOR OPERATOR'S MANUAL

OZONE GENERATOR EXPLODED VIEW (8.905-715.0)


OZONE GENERATOR EXPLODED VIEW PARTS LIST

| ITEM | PART NO. DESCRIPTION | | QTY |
|------|----------------------|---|---------|
| 1 | 8.913-357.0 | Ozone Box, Back, 400 | 1 |
| 2 | 8.913-360.0 | Ozone Box, Front, 400 | 1 |
| 3 | 9.802-455.0 | Light, Indicator, Green | 4 |
| 4 | 9.802-523.0 | Locknut, 3/4" Conduit | 4 |
| 5 | 8.716-583.0 | Connector, Aluminum Cord SCH1037 | 4 |
| 6 | 8.707-355.0 | Ozone Check Valve | 1 |
| 7 | 8.716-600.0 | Lamp, Ozone Replacement | 4 |
| 8 | 8.900-455.0 | Label, Ozone Generator | 1 |
| 9 | 9.802-696.0 | Nut, 10/32", NF ST ST KEP | 12 |
| 10 | 8.706-570.0 | Locknut, 3/8", Nylon | 2 |
| 11 | 8.706-585.0 | Connector, 3/8" x 3/8", Male Elbow (Poly) | 2 |
| 12 | 8.706-594.0 | Tee, 3/8" Poly | 1 |
| 13 | 8.706-733.0 | Bushing, 1/2" Snap | 1 |
| 14 | 8.711-733.0 | Tubing, 3/8" x 1/2", Vinyl | 6 |
| 15 | 9.802-423.0 | Cord, Service, SEO, 16/3 /ft. | 8 |
| 16 | 9.802-453.0 | Switch, Curvette, 120V & 220 | / 1 |
| 17 | 9.802-515.0 | Strain Relief, 1/2" NPT Ozone Gen | 1 |
| 18 | 8.706-545.0 | Cushion, 1/2", 13-3/4" x 5-3/4 Rubber, 400 | ", 1 |
| 19 | 8.913-358.0 | Ozone Box, Top, 400 | 1 |
| 20 | 8.913-359.0 | Ozone Box, Bottom, 400 | 1 |
| 21 | 8-716-590.0 | Ballast, 120/240V, Ozone Generator | 4 |
| 22 | 9.804-566.0 | Screw, 10/32" x 1/2" Slot Pan MS ZN | 12 |
| 23 | 8.718-968.0 | Washer, 10 x SAE ZN | 12 |
| 24 | 9.802-798.0 | Screw, #10 x 1/2" Tek Hex Head | 8 |
| 25 | 8.900-511.0 | Label, 220V, Ozone Generator | 1 |





ACCESSORIES AND PARTS WARRANTY

LIMITED MINIMUM 90 DAY WARRANTY

We warrant to the original consumer that each new part and accessory sold by Watermaze will be free from manufacturing defects in materials or workmanship in normal service for the duration specified by the original component manufacturer with a 90 day minimum from date of purchase, provided it is installed properly and the equipment is maintained in accordance with Watermaze instructions and manuals. Components manufactured by Watermaze such as frames, and handles have a 2 year warranty from date of purchase.

Our obligation under this warranty is expressly limited as to the replacement or repair, at our option, at Watermaze Camas, Washington 98607, or at a service facility designated by us, for such part or parts as inspection shall disclose to have been defective.

EXCLUSIONS:

This warranty does not apply to defects caused by casualty or unreasonable use, including faulty repairs by others and failure to provide reasonable and necessary maintenance.

LIMITATION OF LIABILITY

Watermaze's liability for special, incidental, or consequential damages is expressly disclaimed. In no event shall Watermaze liability exceed the purchase price of the product in question. Watermaze makes every effort to ensure that all illustrations and specifications are correct, however, these do not imply a warranty that the product is merchantable or fit for a particular purpose, or that the product will actually conform to the illustrations and specifications. Our obligation under this warranty is expressly limited at our option to the replacement or repair at a service facility or factory designated by us, of such part or parts as inspection shall disclose to have been defective. THE WARRANTY CONTAINED HEREIN IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY LIMITED TO THE DURATION OF THIS WRITTEN WARRANTY. This warranty gives you specific legal rights and you may also have other rights which vary from state to state. Watermaze does not authorize any other party, including authorized Watermaze Distributors, to make any representation or promise on behalf of Watermaze, or to modify the terms, products conforms to local codes, While Watermaze attempts to assure that its products meet national codes, it cannot be responsible for how the customer chooses to use or install the product. Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

TO OBTAIN WARRANTY SERVICE:

Purchaser must bring the accessory parts to an authorized Watermaze Distributor. For the distributor nearest you consult our web page: www.wmaze.com or write: Watermaze, 4275 NW Pacific Rim Blvd, Camas, WA 98607.



LIMITED NEW PRODUCT WARRANTY WASH WATER / WATER TREATMENT SYSTEMS

WHAT THIS WARRANTY COVERS

All WATER MAZE water treatment systems are warranted by to the original purchaser to be free from defects in materials and workmanship under normal use, for the periods specified below. This Limited Warranty, subject to the exclusions shown below, is calculated from the date of the original purchase, and applies to the original components only. Any parts replaced under this warranty will assume the remainder of the part's warranty period. A 60 day grace period will be given for installation.

ONE YEAR PARTS AND 30 DAY LABOR WARRANTY:

All components excluding normal wear items as described below.

WARRANTY PROVIDED BY OTHER MANUFACTURERS:

Motors, which are warranted by their respective manufacturers, are serviced through these manufacturers' local authorized service centers. WATER MAZE cannot provide warranty on these items.

WHAT THIS WARRANTY DOES NOT COVER

This warranty does not cover the following items:

- 1. Normal wear items, such as seals, filters, gaskets, O-rings, packings, pistons, brushes, filtering media, ozone bulbs, sensors, UV scanners, oil-skimmer belt, impedance sensor. Minor leaks covered first time on original startup only.
- 2. Damage or malfunctions resulting from accidents, abuse, modifications, alterations, incorrect installation, improper servicing, failure to follow <u>manufacturer's maintenance instructions</u>, or use of the equipment beyond its stated usage specifications as contained in the operator's manual.
- 3. Damage due to freezing, sludge build-up, chemical deterioration (oxidation, chloride or fluoride corrosion), and rust.
- 4. Damage to components from fluctuations in electrical or water supply.
- 5. Normal maintenance service, including adjustments.
- 6. Transportation to service center, field labor charges, or freight damage.
- 7. Consumables and water quality.

WHAT YOU MUST DO TO OBTAIN WARRANTY SERVICE

While not required for warranty service, we request that you register your *WATER MAZE* Product by returning the completed registration card. In order to obtain warranty service on items warranted by *WATER MAZE*, you must return the product to your Authorized *WATER MAZE* Dealer, freight prepaid, with proof of purchase, within the applicable warranty period. If the product is permanently installed, you must notify your Authorized *WATER MAZE* Dealer of the defect. Your Authorized *WATER MAZE* Dealer will file a claim with *WATER MAZE*, who must subsequently verify the defect. In most cases, the part must be returned to *WATER MAZE* freight prepaid with the claim. For warranty service on components warranted by other manufacturer's, your Authorized *WATER MAZE* Dealer can help you obtain warranty service through these manufacturers' local authorized service centers.

LIMITATION OF LIABILITY

WATER MAZE'S liability for special, incidental, or consequential damages is expressly disclaimed. In no event shall WATER MAZE'S liability exceed the purchase price of the product in question. WATER MAZE makes every effort to ensure that all illustrations and specifications are correct, however, these do not imply a warranty that the product is merchantable or fit for a particular purpose, or that the product will actually conform to the illustrations and specifications. Our obligation under this warranty is expressly limited at our option to the replacement or repair at a service facility or factory designated by us, of such part or parts as inspection shall disclose to have been defective. THE WARRANTY CONTAINED HEREIN IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY WATER QUALITY, MERCHANTABLIITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY LIMITED TO THE DURATION OF THIS WARRANTY. This warranty gives you specific legal rights and you may also have other rights which vary from state to state. WATER MAZE does not authorize any other party, including authorized WATER MAZE Distributors, to make any representation or promise on behalf of WATER MAZE, or to modify the terms, conditions, or limitations in any way. It is the buyer's responsibility to ensure that the installation and use of WATER MAZE products conforms to local codes. While WATER MAZE attempts to assure that its products meet national codes, it cannot be responsible for how the customer chooses to use or install the product. Some states do not allow limitations or exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.



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Submersible Cap and Cable Assembly -S653/S653W Product Instructions

FIG.1

Mechanical Installation

CONDUIT CONNECTION. Submersible Combination Electrodes are mounted in the Threaded Cable Cap Assembly (see below for information about using the assembly with conduit). This cap assembly has a 1/2" NPT thread to which a coupling or reducing bushing and the needed length of supporting pipe can be attached. The pipe provides mechanical support for the electrode and protects the cable from contact with the liquid being measured. The coupling and pipe can be made of any material which is compatible with the chemicals and temperature in the system being measured. The upper end of the pipe should be sealed to prevent the entry of liquids. Refer to Figure 1 for installation details.

ELECTRODE INSTALLATION. The electrode mounts in the cable cap by a 1/4 turn which locks together the mating BNC-type connectors. Refer to Figure 2. It is important that the electrode be locked in position and the following stepwise procedure is suggested:

A. While pushing the electrode into the cap, rotate it clockwise until it slips into the notch of the mating connector. This step requires no real amount of force and, when completed, the cap will cover most of the electrode's top O-ring.

B. Now, without further rotation, push the electrode into the cap until the bottom O-ring is mostly covered and the black washer almost touches the cable cap.

C. Finally, again rotate the electrode clockwise until it "clicks" into the locking position (about ¼ turn). Now the bottom O-ring will be fully covered and the bottom of the cap will rest firmly against the electrode's black washer.

ELECTRODE REMOVAL. Simply reverse installtion procedure.

IMPORTANT NOTES: 1) As supplied the electrode's O-rings have a light coating of silicone grease. After several insertions and removals, it may be necessary to re-lubricate the O-rings. A stopcock or vacuum-type silicone grease should be used. 2) DO NOT IMMERSE CAP AND CABLE ASSEMBLY INTO SOLU-TION WITHOUT ELECTRODE ATTACHED!!!



Parts covered by this product data sheet include: S653, S653W

1/2" NPT Coupler and PVC Pipe **Use Pipe Thread** Sealing Tape to seal threads S653 FIG.2 MAKE SURE ELECTRODE **IS ORIENTED** AS SHOWN **BELOW WHEN** INSTALLING OR **REMOVING SO** THAT LIQUID GREASE ALL CANNOT FLOW **O-RINGS PRIOR BACK INTO THE** TO INSTALLATION 0 INTERNAL CON-NECTOR! Push up (after aligning tabs 1/4 TURN

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