Aqua Master®
FOUNTAINS AND AERATORS
A DIVISION OF NIGRELLI INC.

Solar AquaAir® Ultra Aeration Systems
Owner's Manual

Solar AquaAir® Ultra 1-2
Piston Compressor
24V

Every **AquaMaster®** Solar AquaAir® Ultra Diffused Air Aeration system is fully inspected and produced in accordance with applicable standards for safety. Our commitment to excellence ensures superior aquatic management systems. All **AquaMaster®** products are designed and built to be installed as a complete system. Any alterations to or substitution for items in this system, unless allowed by these installation instructions, will void the product warranty. It may also create a hazardous installation. Read these instructions thoroughly before starting your installation and follow them carefully throughout.

WARNING

NOTICE: These installation and operation instructions should be kept in a safe place. Make sure to pass these installation and operating instructions to subsequent owners. The information provided is intended to notify and warn them about making unsafe modifications, repairs or using unauthorized parts or repair facilities.

- Read the entire manual before attempting to install, service or operate any Solar AquaAir® Ultra Diffused Air Aeration system.
- Improper installation, operation, service, repair, maintenance or alteration of this product may result in property damage or bodily injury.
- Disconnect electrical power before servicing this unit.
- Use only parts that are supplied or approved by **AquaMaster®**. Use of other parts may result in poor performance, void warranty and could create a hazardous situation.

NOTICE: In the event of a motor thermal overload the load fuse will blow and the compressor unit will stop. The compressor unit will not restart until the load fuse is replaced.

NOTICE: DO NOT carry this unit while it is in use.

Please read the following instructions thoroughly before operating your Solar AquaAir® Ultra system.

Failure to follow the recommendations may result in personal injury or voiding of the product warranty. For additional safety information or supplied materials concerning your Solar AquaAir® Ultra system call **AquaMaster®** at 800-693-3144 or 920-693-3121.

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SHIPPING CLAIMS

When you receive your **AquaMaster®** unit, examine the package for any signs of external damage it may have sustained enroute. If there is apparent damage either outside the box or to its contents, make a claim with the shipper immediately. Save the original shipping carton and the packing material if a claim is to be filed.

SOLAR AQUAAIR® ULTRA AERATION SYSTEM
SOLAR AQUAAIR® ULTRA 1-2

The **AquaMaster®** Solar AquaAir® Ultra Diffused Air Aeration system is the most efficient, durable, state of the art sub-surface aeration system in the industry today. Our revolutionary, stainless steel compressor enclosure will provide a lifetime of rust and corrosion protection, and provides superior cooling and performance.

Solar AquaAir® Ultra 1 - 2

Your **24 Volt** Solar AquaAir® Ultra Diffused Air Aeration system information is as follows:

- Solar AquaAir® Ultra 1 - (1) Single Head Compressor - 1.2 Running Amps
- Solar AquaAir® Ultra 2 - (1) Single Head Compressor - 3.2 Running Amps

SYSTEM MATERIALS AND PARTS LIST

Failure to remove foam packing material from between compressor and housing will result of overheating of the compressor.

Verify that the following was received:

Rectangular Compressor Enclosure:
The rectangular compressor enclosure constructed of stainless steel. The enclosure is assembled complete with the compressor, air intake filter, cooling fan and air discharge hose.

Diffusers with Single Round Hollow Base and Vent Plug:

Single 9” diameter membrane flexible diffuser disc for higher fouling resistance.

Selected Length of Weighted Super Sink Air Discharge Tubing:
Used to supply air from the compressor enclosure on shore, along the lake bottom to the diffuser. Additional lengths connect with PVC insert fittings and PVC glue. Heavy, .275”, wall thickness provides protection from puncture or kinking.

Parts:
Stainless steel hose clamps, one for each diffuser and for each compressor brass hose barbs or insert fittings. Also included is one PVC insert fitting per 100 feet of Super Sink tubing.

Solar Panels:
Used to supply power to the Solar AquaAir® system. One (1) Solar AquaAir® Ultra 1 or two (2) Solar AquaAir® Ultra 2 panels are used to supply power.

Batteries:
Sealed Lead Acid batteries provide backup power for continuous operation. Two (2) Solar AquaAir® Ultra 1 or four (4) Solar AquaAir® Ultra 2 batteries are used for storage.

SOLAR AQUAAIR® ULTRA ASSEMBLY INSTRUCTIONS

Equipment and Supplies Needed:

- Concrete
- 4” schedule 40 steel pole
- Shovel or Post Hole Digger
- 1/4”, 3/8”, 5/16”, 9/16”, and 1/2” open end wrenches
- Socket set with 7/16”, 1/2” (8 or 12 point), and 9/16” sockets
- Torque wrench(s) for sockets above (range up to 84 to 480 in-lbs.)
- Angle Gauge (720101, included with kit)
- Flat Head Screwdriver
- Tubing Cutter
- 3” schedule 40 steel crossbeam (3006138 Single Panel, 3006139 Dual Panel, included with kit)

PREPARATION FOR INSTALLATION

1. Determine an installation location for the solar panel and compressor enclosure. The solar panel must have an unobstructed view of the sun (solar south for northern hemisphere; solar north for southern hemisphere) and be free from shadows of nearby objects throughout the day. The compressor enclosure will need a level site away from everyday activity. If you desire to hide the compressor enclosure with landscape bushes, shrubs, or plantings, it is necessary to provide adequate clearance between these and the compressor enclosure for proper cooling. **DO NOT block the air intake louvers.**

   CAUTION: The compressor enclosure must be located a safe distance from the pond’s edge, standing water, flooding, and irrigation sprinklers.

2. Consult top pole mount installation instructions to determine what length of 4” SCH 40 steel pole will be needed. The solar panel mounting pole should be secured with concrete. Allow 24 hours for the concrete to cure before assembling the solar panel mount to the pole.

3. Locate the enclosure assembly on a solid, level surface. If building an additional support structure, make sure it is adequate to support the weight of the Solar AquaAir® Ultra system. The Solar AquaAir® Ultra 1-2 are mounted on a polyethylene base. Also, make sure there is enough space between the support pad and the poly base to connect the weighted Super Sink tubing to the high-temperature discharge hose from the compressor.

4. Attach the panel mount and solar panels to the pole. Refer to the instructions shown on the subsequent pages. The panel mount will include all the hardware needed. The solar panels come prewired with MC4 connectors for easy electrical hookup.

SOLAR PANEL TOP POLE MOUNT
ASSEMBLY INSTRUCTIONS

INTRODUCTION

The top of pole mount is a very sturdy and universal pole mounting solution for small area solar photovoltaic (PV) needs. With its user-adjustable angle settings from 0° to 60°, the Top of Pole Mount can support installations in a wide range of locations. Panel and pole support varies with the model.

TOOLS REQUIRED

See page 6 for a list of tools required for assembly. Anti-seize compound should be used on all threads of stainless steel hardware to prevent galling when tightening. Torque values listed below are “dry”. Subtract 20% if using anti-seize lubricant.

1/2” = 480\40 In\Ft Lbs
3/8” = 240\20 In\Ft Lbs
5/16” = 144\12 In\Ft Lbs
1/4 “ = 84\7 In\Ft Lb

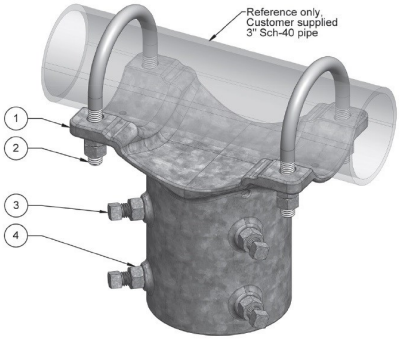
COMPONENTS LIST

The following parts are used for top of pole mounts and ships with necessary hardware.

One (1) pole cap per assembly.

POLE CAP

Item	Description	Qty
1	Cap, 4" Pipe rev E	1
2	U-Bolt 1/2-13 for 3" Pipe	2
3	Set Screw 1/2-13 x 1.5"	4
4	Nut, Jam 1/2-13	12



SOLAR PANEL TOP POLE MOUNT
ASSEMBLY INSTRUCTIONS

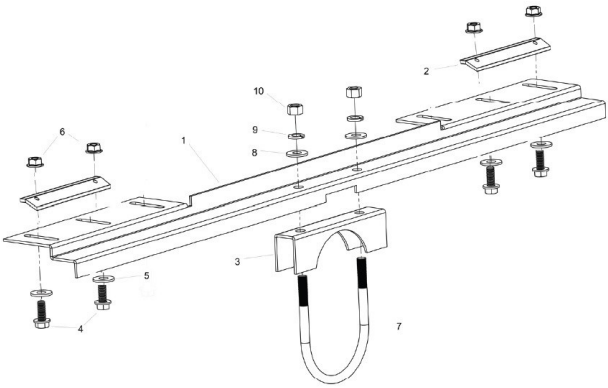
COMPONENTS LIST (CONT.)

Two (2) end clamps per assembly

No matter if building a single or dual panel kit, there will be two (2) end clamps per kit. One (1) clamp for each end of the mount. End clamps are designed to grab the flange on he underside of the solar module frame.

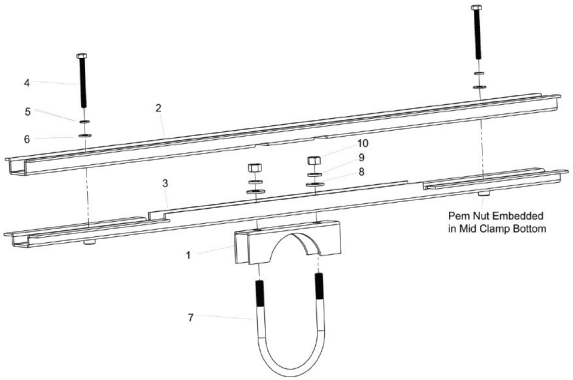
END CLAMP

Item	Description	Qty
1	End Clamp Base	1
2	Panel Frame Clamp	2
3	U-Bolt Clamp	1
4	Bolt, 5/16-18 x .875	4
5	Washer, Flat 5/16"	4
6	Nut, Flange 5/16"	4
7	U-Bolt for 3" Pipe	1
8	Washer, Flat 5/16"	2
9	Washer, Lock 3.8"	2
10	Nut. 3/8-16	2



MID CLAMP

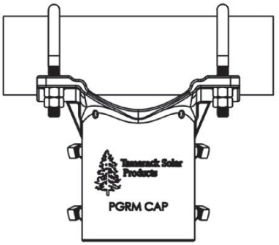
Item	Description	Qty
1	U-Bolt Clamp	1
2	Mid Clamp Top	1
3	Mid Clamp Bottom	1
4	Bolt, 1/4-20 x 2.5 all thread	2
5	Washer, Flat 1/4"	2
6	Washer, Lock 1/4"	2
7	U-Bolt for 3" Pipe	1
8	Washer, Flat 5/16"	2
9	Washer, Lock 3.8"	2
10	Nut. 3/8-16	2



Dual module kits only — One (1) mid clamp

SOLAR PANEL TOP POLE MOUNT ASSEMBLY

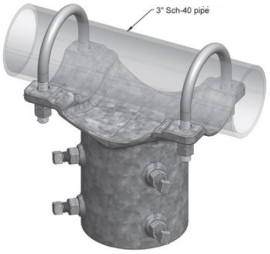
Step 1. Assemble Pipe Cap and Horizontal Beam



A. Install 1/2-13 hex jam nuts on square head set screws. Thread screws into top cap.

B. Place top cap on 4” schedule 40 vertical post but do not tighten the screws.

C. Place provided 3” schedule 40 horizontal beam on top of cap. Place the 1/2” U-bolts over horizontal beam and into top cap and secure loosely with 1/2” nuts, only (2) nuts per U-bolt.



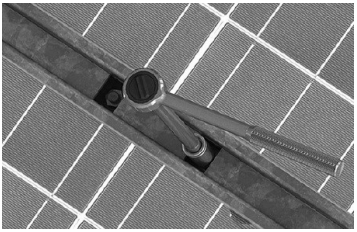
D. Align beam east to west, centered on cap, and then torque set screws to 84 in-lbs (dry). Tighten jam nuts.

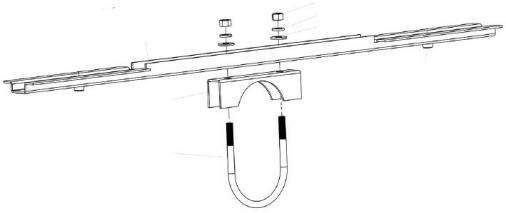
E. Tighten nuts on U-bolts temporarily to aid in panel installation. Do not torque at this time.

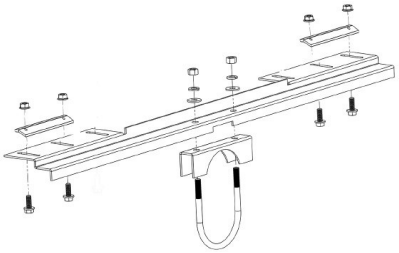
Step 2. Install Module Clamps

For dual or single panel setups, use both end clamps. If installing a single panel kit, ignore references to mid clamp.

A. Assemble all brackets, U-bolts, and hardware to both end clamps and mid clamp. Position and place the mid clamp in the center of the horizontal beam, over the end cap. Place end clamps at each end of horizontal beam. Mid clamp nuts should be torqued to 20 ft-lbs (dry).

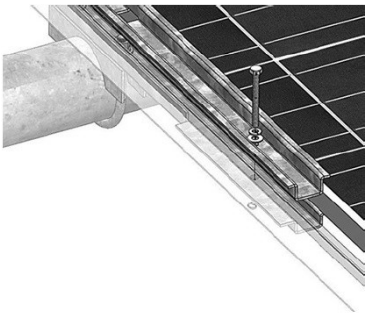






Step 2. Install Module Clamps (Continued)

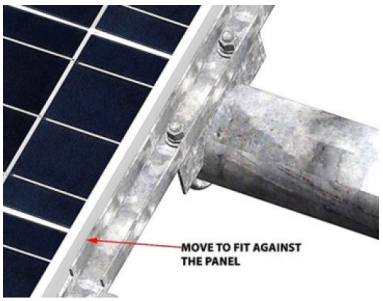
B. Use a level to put the mid and end clamps in a horizontal position before tightening their U -bolts. End brackets should be placed leaving 1/4" more than the width of the PV module. Tighten U-bolts just enough to hold the horizontal position. Clamp positions will need to be adjusted when panels are installed



Step 3 Install Modules

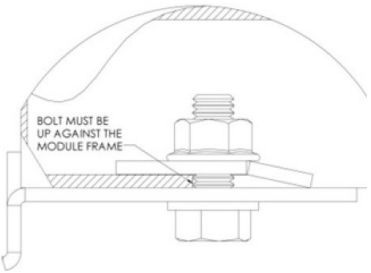
A. Lay a module tight against the mid clamp and on the bottom tabs of the end clamp.

B. Install mid clamp top with 1/4-20 x 2.5" hex bolt, flat washer, and lock washer. Start the bolts by hand far enough to be sure they are not cross threaded and then torque to 84 in-lbs (dry). To avoid damage to bolt and fastener, do not overtighten. The flanges on the top part of the clamp will pull downward on the top part of the module frames when the bolts are tightened.



C. If required, loosen the end clamp U-bolts and move it to fit firmly against the solar module frame. Retighten to hold position.

D. Attach panel frame clamps to end clamp with 5/16-18 x 7/8 bolt, flanged nut, and lock washer as shown. There are slots in the end clamp base to use for the module clamp. Choose two of the slots that place the frame clamp closest to the mounting hole in the solar module frame. There are two possible positions for the module clamps because some modules have crossbraces that interfere with placing the clamp.



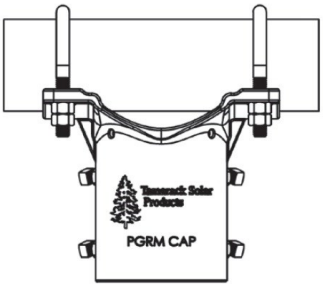
E. Panel frame clamp must be resting on the inside of the solar module frame with bolt against the solar module frame. Torque to 12 ft-lbs (dry).

SOLAR PANEL TOP POLE MOUNT ASSEMBLY (CONT.)

Step 3 (Continued)

F. Repeat module installation with second module.

G. Tighten U-bolt nuts on end clamps to 20 ft-lbs. (dry).



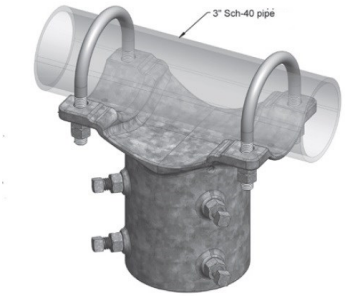
Step 4. Set Final Angle

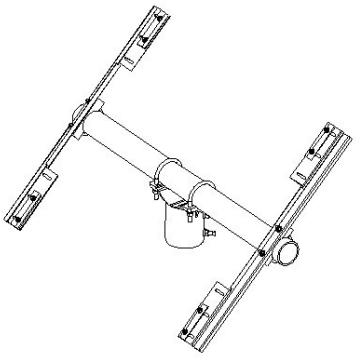
A. See page 12 for suggested angle settings.

B. All the modules should be horizontal at this point. Check to make sure that all the module clamp bolts and U-bolts are tightened to their proper torque specifications before proceeding.

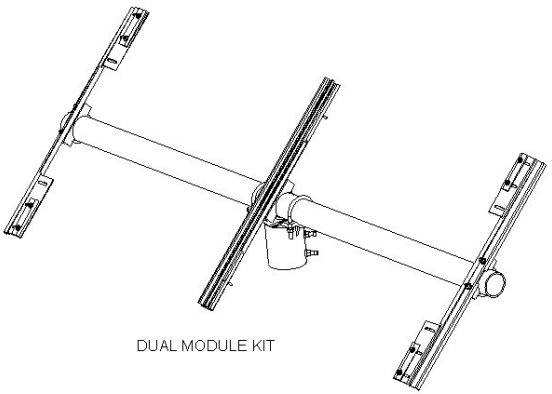
C. Loosen all the U-bolt nuts on the pole cap while supporting the panels. Use both hands to rotate the entire array to the desired angle.

D. Re-tighten the U-bolt nuts on the pole cap. Torque nuts to 40 ft-lbs (dry) to lock angle. Install second set of on nuts and tighten.





SINGLE MODULE KIT



DUAL MODULE KIT

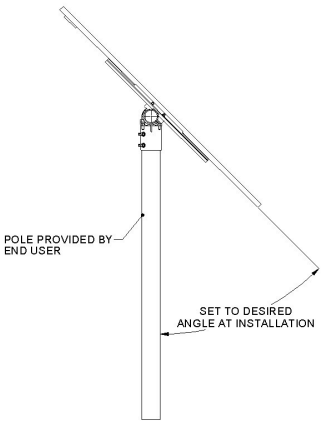
SOLAR PANEL TOP POLE MOUNT ASSEMBLY (CONT.)

Set the solar panel tilt angle using the formulas below. The panel tilt angle is measured between the solar panels and the pole. There are multiple methods (fixed angle, twice a year tilt, and four times a year tilt) of setting your solar panel tilt angle with increased system efficiency the more it is adjusted. **AquaMaster®** recommends adjusting the tilt angle at least twice a year. The below table details the formula used to find your tilt angle.

Fixed Angle	
Latitude (deg)	Angle Calculation
0-25	90 - (Latitude * 0.87)
25+	87 - (Latitude * 0.76)

Twice a Year Tilt Angle		
Latitude (deg)	Summer Angle Calculation	Winter Angle Calculation
All	105 - Latitude	75 - Latitude

Four Times a Year Tilt Angle			
Latitude (deg)	Summer Angle Calculation	Spring/Fall Angle Calculation	Winter Angle Calculation
All	113.5 - (Latitude * 0.9)	92.5 - Latitude	61 - (Latitude *



INSTALLER RESPONSIBILITY

The installer is solely responsible for:

- Complying with all applicable local or national building codes, including any that may supersede this manual.
- Ensuring that parts and other products are appropriate for the particular installation and the installation environment.
- Using only installer-supplied parts as specified by **AquaMaster®**. Substitution parts may void the warranty
- Ensuring safe installation of all electrical aspects of the PV array.
- Ensuring correct and appropriate design parameters are used in determining the design loading used for the specific installation.

FOUNDATION RECOMMENDATION ADDENDUM

NOTE: The suggestions below are recommendations only. It is the installer's responsibility to validate foundation parameters prior to installation, as a local geotechnical report may be required to assess ground conditions. We recommend consulting with a local engineer familiar with local regulations and build site requirements, including soil conditions, terrain and load criteria (wind, snow, seismic). These parameters may impact foundation requirements.

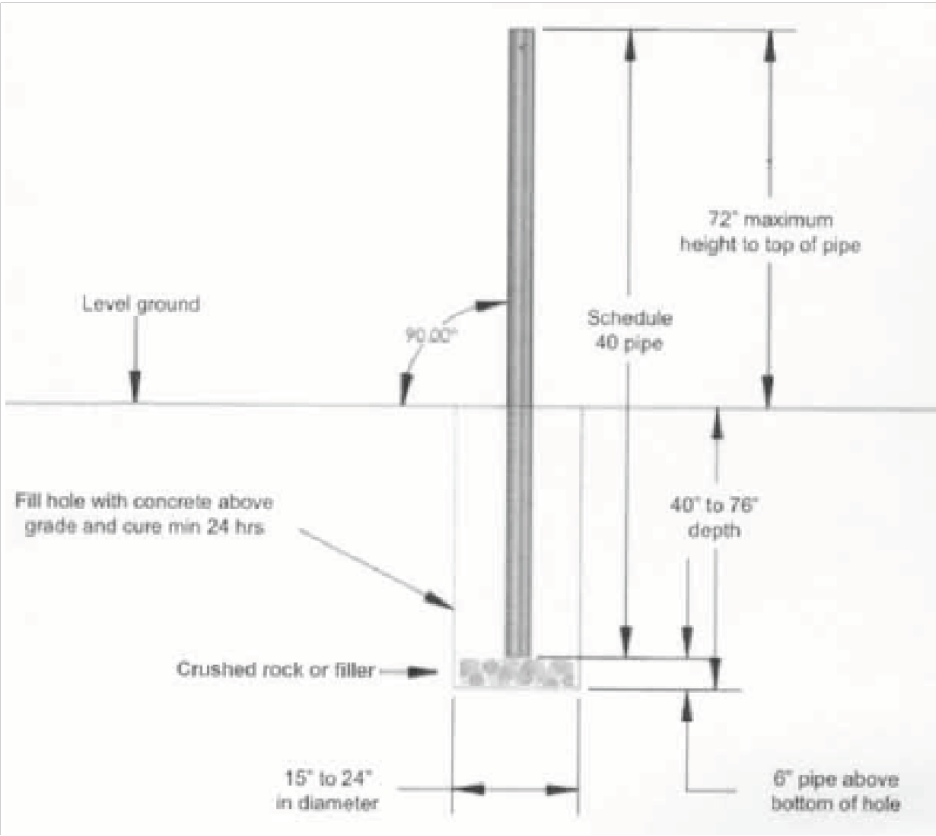
Foundation Hole Parameters and Length of 4" SCH 40 Steel Pole					
Model	MAX. Wind Speed	MIN. Post Hole Diameter	MIN. Post Hole Depth	MIN. Pole Depth	MAX. Length of Steel Pole*
Solar AAU 1	90 MPH	15"	46"	40"	9.33 ft.
Solar AAU 2	90 MPH	18"	60"	54"	10.5 ft.

* Steel Pole MUST NOT be taller than 72" (6 feet) above the ground.

INSTALLATION RECOMMENDATIONS

- Auger hole to minimum depth shown in table on Page 13.
- 6" of hole should be filled with crushed rock or blocking. This will prevent the pipe from touching the base of the hole, insuring complete encapsulation of the pipe when concrete is poured, as well as allowing for water drainage. See Figure 1.
- Pipe should be installed vertically no matter the slope of the install site.
- Make arrangements to prevent the pipe from twisting prior to pouring concrete.
- Pipe should be braced to remain plumb until concrete has cured (at least 24 hours).

FIGURE 1: Top of Pole Foundation Guideline Diagram



BATTERY INSTALLATION INSTRUCTIONS

1. Make sure the disconnect switch for the batteries is switched in the off position and the load fuse block is open.

   CAUTION: Read and follow all safety information below before connecting batteries.

   - Wear eye protection when working with batteries. Have water available to wash and clean any contact with battery acid.
   - Charge only lead-acid batteries that are properly sized for the system.
   - Explosive battery gasses can be present during charging. Make sure there is proper ventilation to release any battery gasses.
   - Only use insulated tools near batteries. Avoid metal objects near batteries.

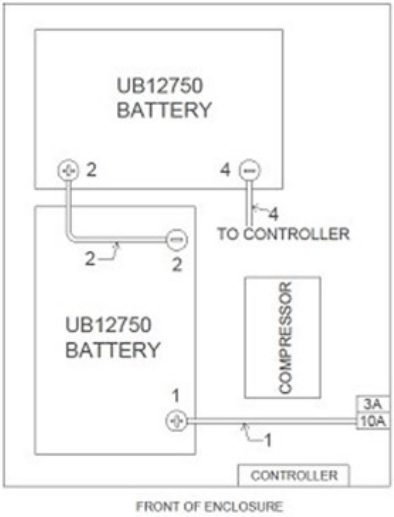
2. Thread the included threaded rod into each of the threaded inserts in the base of the compressor enclosure. Place batteries into the compressor enclosure in between the threaded rod and on the inside of the compressor enclosure cover. Place the compressor hold down bars over the batteries and through the threaded rod. Fasten the bar using the supplied wing nuts.

BATTERY INSTALLATION INSTRUCTIONS (CONT.)

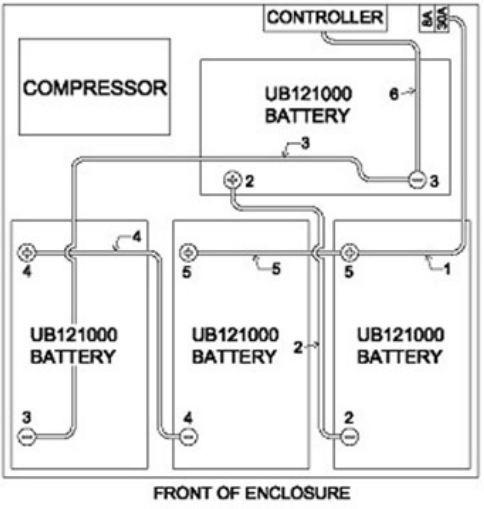
WARNING: Incorrectly connecting batteries can result in shock, explosion, or death. Please follow all safety information below.

- **When working with batteries, wear eye protection and have clean water available to wash and clean any area that had contact with battery acid.**
- **Charge only batteries that are properly sized for the system.**
- **Use insulated tools and avoid contact with metal objects when working around batteries.**

3. Connect the batteries to the charge controller using the provided wiring harness in the compressor housing. Each wire is numbered for proper connection. A wiring diagram is provided below and inside the lid of the compressor housing. The connections to the batteries can be secured using 7/16" tools. After each connection is made, place the provided terminal boots over the terminals to reduce the risk of accidental shock.



Solar AquaAir Ultra 1



Solar AquaAir Ultra 2

DIFFUSER ASSEMBLY AND PLACEMENT

CAUTION: When in or around water always wear a Coast Guard approved life jacket and follow all water safety guidelines.

1. Fill the diffuser base completely with pea gravel or sand, if applicable, and insert the vent plug. Apply silicone grease (provided in packet) to the diffuser threads. Screw the membrane diffuser(s) discs onto the base riser pipes.

2. Determine the placement of the diffuser(s). It is recommended to install a marking buoy in the general location of where the diffuser(s) will be installed to act as a reference point. The diffuser(s) should be close to, but not centered in, the deepest portion of the waterway where the bottom is level and solid.

   When fish are present, **DO NOT** place the diffuser(s) in water deeper than 35 feet. At depths greater than 35 feet mixing can cause dissolved nitrogen levels to rise becoming hazardous to fish.

3. Uncoil the roll(s) of air supply tubing along the shoreline. It is imperative that tubing not be twisted or tangled for proper installation. If more Super Sink tubing is needed, glue a PVC insert fitting between the required lengths of tubing. Let the PVC cement dry before pulling the tubing into the water.

4. Before installing the Super Sink tubing in the water, tie several feet of tubing to the compressor enclosure, post or wall. This will ensure you will have enough tubing to connect to the compressor and will not pull the free end of the tubing into the water.

5. Tie the free end of the tubing to the boat and head towards the marking buoy.

6. Connect the free end of the tubing to the diffuser assembly and secure it with a stainless steel hose clamp.

NOTE: PVC glue can also be used if additional tubing will not be added or diffuser location will not be changed in the future.

7. Thread one end of rope through the two eyelets of the diffuser base – these are the larger diameter holes. Pull through until the base is at the midway point of total rope length.

8. Hold the two ends of the rope in your hand and lower the diffuser assembly slowly into the water. Air in the diffuser base will begin to vent causing unit to sink to the bottom of the lake.

9. Once the diffuser assembly is situated on the lake bottom, release **one end** of the rope and pull the rope back into the boat.

Following the above installation guidelines will help ensure that the diffuser assembly does not invert during installation.

NOTE: The ropes on the diffuser assembly can be left attached to a float or buoy for future repositioning or removal of the diffuser assembly only if it is not a liability to boaters, fisherman and swimmers if they are present.

DIFFUSER ASSEMBLY AND PLACEMENT (CONT.)

10. On systems with multiple diffusers, repeat the previous procedures.

11. (In pond) installation is now complete.

12. Trench and bury the weighted Super Sink tubing from the water line to the compressor enclosure. This will need to be buried 4 – 6" below the surface.

13. Attach the open end of the Super Sink tubing to the brass hose barbs or insert fittings coming out of the compressor enclosure. Secure and tighten the stainless steel hose clamp(s).

COMPRESSOR START-UP PROCEDURES

CAUTION: Remove foam packing and other packaging material from between the compressor and housing and dispose of properly. Failure to do this will result in overheating of the compressor.

13. When all installation is complete, flip the fused disconnect switch inside the compressor enclosure to on. The compressor should start within a few seconds.

14. (For Solar AAU1 only) Connect the solar panel positive (+) lead to the in-line fuse included with your unit. Connect the solar panels to the compressor enclosure using the male and female MC4 connectors preinstalled on your solar panel and compressor enclosure.

15. (For Solar AAU2 only) Connect the 2 solar panel positive (+) leads to the included wye connector with an in-line fuse. Connect the 2 solar panel negative (-) leads to the remaining wye connector. Connect the wye connectors to the compressor enclosure using the male and female MC4 connectors preinstalled on your solar panel(s) and compressor enclosure.

16. On systems with multiple diffusers, adjust the air flow valves so the surface boil is approximately the same for all diffusers.

17. If upon startup or during operation, unusual noises or odors are detected in the compressor enclosure, unplug the compressor immediately until the problem is rectified. Call your representative or **AquaMaster®** to resolve any problems.

DANGER: To prevent severe shock or electrocution, always turn the power OFF at the disconnect switch before working with electricity. All maintenance and troubleshooting should be performed by a qualified electrician or technician.

SYSTEM STARTUP PROCEDURES

Circulating the entire water column will aid in eliminating drastic temperature layering while maintaining or increasing dissolved oxygen levels.

CAUTION: The circulation of the ponds deep water which, is of poor quality and low in oxygen, can introduce harmful gases and by-products into the healthy upper regions of the body of water. If precautions are not taken when initial startup is implemented, the gases and harmful byproducts will be mixed with the upper water and may make it harmful and unfit for aquatic life and can result in a fish-kill.

PREVENTING INITIAL FISH-KILL

Implementing the following startup procedures that have been established can help in preventing a possible fish-kill.

NOTE: If fish and aquatic life are not present in the body of water, you can start up the system and let the system run continuously.

1. Turn on system and look for discolored water. Position yourself downwind of surface boil. If discolored water or a strong odor (i.e. rotten eggs) is present, do not operate the system for any longer than 15 minutes.

2. If fish are present in the body of water, a foul odor is not noticed and water is not discolored, let the compressor run for one hour the first day and then turn off the system for the remainder of the day.

3. Restart the system the next day and operate for 30 minutes. Turn the system off for the rest of the day.

4. Each day double the operating time from the previous day until the system is running continuously. This should take 8 days.

NOTE: The start-up procedures are to be used as a general guideline. If you should have any questions or concerns, contact your representative or **AquaMaster®** at 800-693-3144 or 920-693-3121 for technical assistance.

WINTER OPERATION & PRECAUTIONS

The Solar AquaAir® Ultra Diffused Air Aeration system has been designed to operate year-round and in all climates. In freezing weather and on ice covered bodies of water, certain precautions must be taken to prevent personal injury or fatalities.

NOTE: In extreme cold weather, the airflow may need to be decreased to keep the body of water open. The amount of open water vs. ice will be determined by the air and water temperature and the amount of air flowing to the diffuser(s).

DANGER THIN ICE

DANGER: When operating the Solar AquaAir® Ultra system on ice covered bodies of water, the ice around the open water will be dangerously thinner than the rest of the body of water. Signs such as **DANGER THIN ICE** need to be posted of this condition. Injury and/ or fatality may result if this danger is not posted. Owner assumes all responsibility.

To prevent freezing of the entire water column, the diffuser should be moved to a shallower portion of the pond (typically half the depth of original placement). Warmer water will remain in the lower regions. In extreme cold weather, the airflow may need to be decreased to keep the body of water open. The amount of open water vs ice will be determined by the air and water temperature and the amount of air flowing to the diffuser(s).

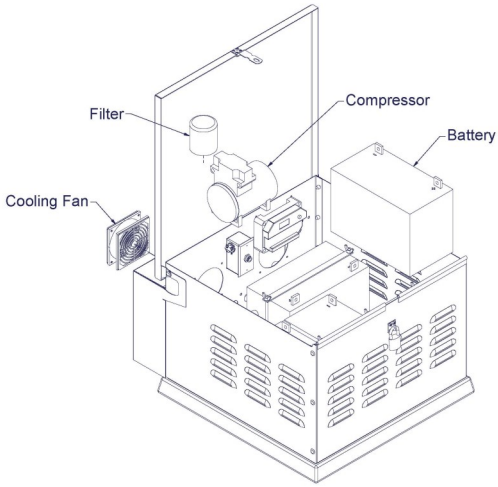
DECREASED SURFACE BOIL

If the surface boil has decreased from the initial installation, check the following:

1. Air filter: Replace air filter, **AquaMaster®** part number is 940017.

2. Compressor maintenance kits differ for unit size: Solar AquaAir® Ultra 1 use 3002693, Solar AquaAir® Ultra 2 use 940571. Complete maintenance and replacement instructions are included in each kit.

Diagram shown to the right is to be used for chart below as refence only and shows the Solar AquaAir Ultra® 2 system. Solar AquaAir® Ultra 1 systems will vary slightly in configuration.



		COMPRES-SOR KIT	FILTER	COOLING FAN	MAINTENANCE KIT
Solar AquaAir Ultra® 1	24V	(1) 3003426	(1) 940017	(1) 940563	(1) 3002693
Solar AquaAir Ultra® 2	24V	(1) 960009	(1) 940017	(1) 940563	(1) 940571

MAINTENANCE & TROUBLESHOOTING

Under normal conditions, an Air Filter change is required after approximately 12 months. It will be necessary to replace the Air Filter more often if dusty conditions exist. The Outdoor Enclosure air inlets and discharge ventilation holes need to be kept clean and free of debris and clear of weed and plant growth. If the circulation of air is prevented by debris, the compressor will overheat and reduce the life of the compressor.

CAUTION: Before performing any maintenance and troubleshooting, disconnect power from system. All maintenance and troubleshooting should be performed by a qualified electrician or serviceman.

PRODUCT DAMAGED IN DELIVERY

The Solar AquaAir® Ultra Diffused Air aeration system was properly packed and accepted by the freight carrier for shipment. It is therefore their responsibility to deliver the system in perfect condition.

APPARENT DAMAGE OR LOSS

When you receive your **AquaMaster®** unit, closely examine the package and inspect materials for any signs of external or internal damage it may have sustained enroute. If there is apparent damage save the original shipping carton and the packing material. If upon delivery the equipment or containers indicate DAMAGE IN TRANSIT, such goods should be refused or not accepted until the transportation company's agent has noted such on the freight bill. A copy of such bill will be given to you, noting the nature and extent of the damage. If any part of shipment is LOST IN TRANSIT, have shortage noted on freight bill by agent.

CONCEALED DAMAGE

If damage is discovered that was not apparent upon delivery, notify the Transportation Company immediately to inspect damaged equipment. The inspector will be required to provide a "CONCEALED DAMAGE" report.

Inspections must be requested within 15 days of delivery. Do not move damaged goods from original point of delivery. Retain all original packing/ containers for inspection. File a "FULL VALUE REPLACEMENT" claim against the Transportation Company.

PRODUCT WARRANTY

All **AquaMaster®** Solar AquaAir® Ultra Diffused Air Aeration Systems have a Limited Lifetime Warranty on the enclosure against corrosion, 15 years on the tubing, 5 year parts and labor on the diffuser assembly, 3 year parts and labor on compressor and cooling fan, 5 year parts and labor on the solar panel and all other electrical components and batteries have a 1 year parts and labor warranty. Vanes & Pistons are considered "Wear Items" and are not covered under the factory warranty, consult factory for assistance.

Warranty is in effect from the date of shipment, when given normal and proper usage as determined by the seller upon examination, and when owned by the original user. The Customer is responsible for all shipping costs of any materials for warranty inspection back to **AquaMaster®**. After inspection, if product shows manufacturing defect, **AquaMaster®** will replace or repair it at no cost to the customer. Should inspection indicate non-warranty failure (incorrect voltage, faulty installation procedures, vandalism, customer negligence, etc.) warranty will be void.

AquaMaster® reserves the right to change this information without notice, and makes no warranty, express or implied, with respect to this information. **AquaMaster®** shall not be liable for any loss or damage, including consequential or special damages, resulting from the use of this information, even if **AquaMaster®** negligence or other fault causes loss or damage.

The warranty period for all warranty work is equal to the remaining time period of the original new equipment warranty. Warranty claims are based on the date you notify your representative or **AquaMaster®** at 800-693-3144 or 920-693-3121. All claims must be made to **AquaMaster®** Fountains and Aerators or an Authorized Distributor.

TROUBLESHOOTING GUIDE

Startup Procedure

1. Apply battery power to the charge controller by flipping the disconnect switch to the ON position.

2. Connect the Solar Panels to the charge controller using the MC4 connections.

3. Close the LOAD fuse holder to connect the load to the charge controller.

Shutdown Procedure

1. Open the LOAD fuse holder to disconnect the LOAD from the charge controller.

2. Separate the negative polarity MC4 connector from the Solar panel to disconnect them from the charge controller.

3. Flip the disconnect switch to the off position to remove battery power from the charge controller.

Troubleshooting Steps

1. Serial Number

2. Charging Status / Error LED
    - A Solid Green LED with intermittent flash indicates charging.
    - A non-illuminated indicator with intermittent flash indicates it is night time, or the solar panel may be disconnected. Check cable connections and 30A in-line fuse.
    - For any RED LED indication, contact **AquaMaster®** for further assistance.
    - Measure voltage across Solar terminals on Controller
        - ~24 – 30 VDC is normal
        - If zero, check 30A Solar Panel In-line fuse.
        - If 33VDC or higher, proceed to Step 4.

3. Battery Status / Fault LED Indicators

Condition	Indication
Absorption	Green flash – every second
Float	Green flash – every 2 seconds
Equalize	Green flash – 2/sec
SOC > 13.5V	Green solid
13.5V > SOC > 13.0V	Green/Yellow solid
13.0V > SOC > 12.5V	Yellow solid
SOC < 12.5V	Yellow/Red solid
Low Voltage Disconnect Warning	Red flash – every second
Low Voltage Disconnect	Red solid

- If battery status is anything other than SOLID RED, proceed to Step 5.
- For any indication not listed in the table above, contact Aquamaster for further assistance.

4. Battery Voltages

- Check voltage across V+ and V- on Controller.
  - Voltage should be similar to Solar voltage
  - If zero, check 30A fuse / disconnect “ON”
- To test individual batteries, turn disconnect OFF and measure the voltages of each battery across its positive and negative terminals. (measurement must be taken without a load or charge on the battery):
  - Should be between 11.8 VDC & 12.7 VDC

5. Is cooling fan and/or compressor motor running?
   - If not, check 8A Load fuse.
   - Measure DC voltage across LOAD terminals (should be approximately the same as the battery voltage at the Charge Controller)
   - If battery status LED is SOLID RED, the Low Voltage Disconnect has disconnected the load. Voltage will be zero at LOAD terminals.

6. Does the system return to normal operation at some point during the day?

7. Reset power to unit by cycling switched disconnect in the compressor enclosure. Are any changes seen?

8. List other observations.

Aqua Master®
FOUNTAINS AND AERATORS
A DIVISION OF ENQUATICS INC.

MASTER THE **POWER** AND **BEAUTY** OF WATER

Floating Fountains
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- Masters Decorative Series
- Celestial Fountains®

Fixed Base Fountains
- Fixed Base Fountains Series

Aeration
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- Ultimax® Subsurface Aeration Systems

Lighting and Accessories
- Night Glow Lighting and Control Panel
- LED Lighting System
- RGBW Lighting Systems

Please Contact Us For Additional Information

Address:

16024 County Road X
Kiel, WI 53042

Phone:

+1.920.693.3121

Fax:

+1.920.693.3634

Toll Free:

1.800.693.3144

Visit:

www.aquamasterfountains.com

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