**SDMI**

# "AQUARISER"

# Installation and Operation Manual

## Swimming Pool Water Level Maintenance System

**Manufactured By**
**SDMI**
**Dallas, Texas**

April 2001

## IMPORTANT INFORMATION TO THE USER.

To the users of this manual and electronic equipment:

FCC ID:  PDXAQUA-R2000.

This device complies with part 15 of the FCC Rules.  Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Additionally, changes or modifications made to the unit not expressly approved by the manufacturer for compliance to the FCC Rules, could void the user's authority to operate the equipment.  What this means is the equipment, as delivered from the factory, meets all FCC requirements and regulations.  This allows the purchaser to operate the system without a special license from the FCC (Federal Communication Commission).  If modifications are made to the radio system that altered its emissions or power output, the equipment may no longer meet the FCC Rules, and the person operating the equipment may be in violation of the law.

# IMPORTANT

Dear Customer:

Thank you for your purchase of a SDMI product. Completing this Product Registration Card is an important first step in your new ownership.

Here are three reasons for registering now:

- WARRANTY SERVICE

Filling out this card will help you obtain more efficient warranty service, and its return confirms that you have read and understood your warranty.

- PROTECT YOUR PRODUCT

By returning this registration, we can confirm your purchase in case of theft or other loss.

- FOR YOUR SAFETY

Filling out the attached card is our only method of ensuring that we can contact you in the event of any product issues that may arise.

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## PRODUCT REGISTRATION

**Date of Purchase:**_____ **Serial No.** _____

**Type of Equipment:**_____ **Model No.** _____

**Your Name and Address:** **Dealer's Name and Address:**

_____ _____

_____ _____

_____ _____

# PRODUCT REGISTRATION

**RETURN IMMEDIATELY**

**IMPORTANT**

PRODUCT REGISTRATION
SDMI
PO BOX 29175
DALLAS, TX 75229

SDMI
PO BOX 29175
DALLAS, TX 75229

# WARRANTY

SDMI garrantys the components of the “Aquariser” water level maintenance system to be free of defects in materials and workmanship for one year from the date of purchase.

SDMI SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. ITS SOLE LIABILITY SHALL BE LIMITED TO REPAIR AND/OR REPLACEMENT.

THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED.

WARRANTY CLAIMS WITHIN THE FIRST YEAR OF OWNERSHIP PERTAINING TO THE BATTERIES SHALL BE HANDLED ON AN EXCHANGE BASIS.

MODIFICATIONS TO THE SYSTEM NOT AUTHORIZED AND/OR APPROVED BY SDMI SHALL VOID THIS WARRANTY.

**RECIEVER**

**SOLENOID VALVE ASSEMBLY**

**TRANSMITTER AND FLOAT ASSEMBLY**

**Figure 1. “AQUARISER” Water Level Maintenance System**

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# Section 1 - GENERAL INFORMATION

## DESCRIPTION.

The AQUARISER pool level maintenance system consists of the three major component assemblies shown in figure 1.

**RECEIVER –** The receiver consists of the control box, containing an electronic radio signal receiver, a battery to power both the receiver and a solenoid operated flow control valve and a solar panel to maintain the battery charge.

**TRANSMITTER –** The transmitter consists of a plastic body that supports the float sensors, an electronic radio transmitter and a battery to power the transmitter.

**SOLENOID VALVE ASSEMBLY –** The solenoid valve assembly consists of the mounting collar, and electrically operated flow control valve, a check valve, a connector union to attach to the home water supply and pipe fittings to connect the major pieces together.

## HOW IT WORKS.

The transmitter assembly, attached to the bottom of one of the pool skimmer chamber lids, uses the floats to sense the level of the water within the skimmer chamber. Since the skimmer chamber water level is the same as the pool water level, the transmitter is sensing pool water level.

As the water level lowers, the primary float, lowers. This causes the transmitter to send a signal to the receiver. The receiver sends electrical power to the solenoid valve causing the valve to open and allow water from the home supply to enter the pool's filter system.

As the water level rises and the floats rise to a preset level, the transmitter signals the receiver that the water level is correct. After a short time delay the receiver shuts off power to the solenoid valve. This causes the solenoid valve to close and shut off water flow from the house supply. The check valve prevents water from the pool filter system from being pumped back into the home supply.

The solar panel, which must be in positioned to receive direct sunlight for at least 6 hours each day, recharges the battery that powers the receiver and the solenoid valve.

## SPECIFICATIONS

Receiver Operating Voltage.....12 VDC

Transmitter Operating Voltage.....6 VDC

# Section 2 – INSTALLATION

## INTRODUCTION.

The following paragraphs outline the procedures to install and test the various components of the “Aquariser” water level maintenance system. Read **ALL** the instructions before performing any of the installation procedures to make certain you have the skills and tools necessary to complete the installation.

## TOOLS AND MATERIALS REQUIRED FOR INSTALLATION.

The following tools and materials (not supplied) are required to install the Aquariser:

1. Electric Drill (Preferably cordless)

2. ½” Dia. Drill bit.

3. 1/8” Dia. Drill bit.

4. 9/16” box end or adjustable wrench.

5. A small amount of vaseline.

6. Felt tip pen to mark piping.

7. Reinforced, industrial grade water hose.

## PRE-INSTALLATION CHECKS.

1. Refer to figure 2-1 and check the following when selecting locations for the various components of the system:

a. Make certain there is a section of exposed pipe, upstream of the pool pump that is wide enough to attach the solenoid valve assembly collar.

- If there is no section of pipe long enough to allow installation of the attaching collar, then the piping system must be modified**.**

**CAUTION**

**Modifications of this nature to the existing pool plumbing system are best performed by trained, certified pool servicing technicians and are not covered by this manual.**

b. Make certain there is room for the entire solenoid valve assembly.

c. Make certain the attaching collar is the correct size for the pipe at the chosen location.

**NOTE**

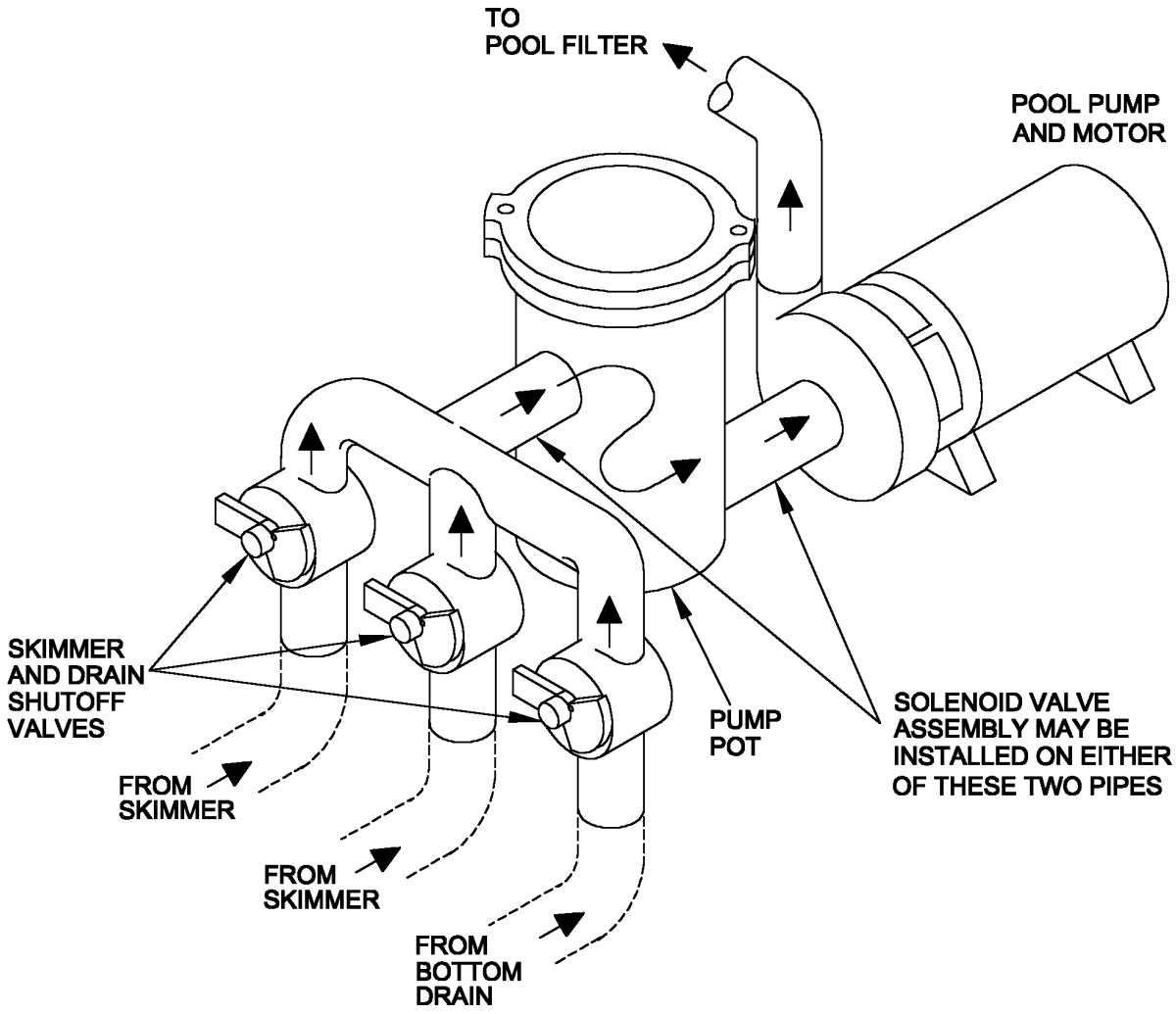
If the attaching collar is not the correct size, determine the pipe size and contact your dealer or the factory. A correct size collar will be substituted.

d. Choose a location, if possible, with sufficient room that will allow the solenoid valve to be unscrewed from the collar if it becomes necessary in the future.

2. Choose a mounting site for the receiver that meets the following conditions:

a. The reciever must be within 10 feet of the solenoid valve. The electrical cable used to connect the receiver to the solenoid valve is 10 ft. long.

b. To maintain the receiver battery charge, choose a location that ensures the solar panel, on top of the receiver is in direct sunlight at least 6 hours daily throughout the year.




***IMPORTANT!***

When choosing a location for the solenoid valve assembly, make certain of the following:

- The pipe is the correct size for the solenoid valve attaching collar to fit.
- There is room for the entire solenoid valve assembly.
- The section of pipe is long enough for the width of the attaching collar.

**Figure 2-1. Choosing Location for Solenoid Valve**

c. The system is supplied with lag screws to mount the receiver to a wooden fence. If the receiver must be mounted to masonry or any material other than wood, the installer must supply alternate mounting hardware.

3. If there are no problems meeting all the conditions outlined in the paragraphs above, refer to the following paragraph and perform the communication test.

## COMMUNICATION TEST.

Verify that the transmitter and receiver are sending and receiving signals by performing the following:

1. Refer to figure 2-2. Open the receiver control box. Observe and record which address switches are set to the left and which are set to the right then, set all three address switches to the right side.

2. Set the power switch to the ON position. This will cause the power indicator light to glow red.

3. Refer to figure 2-3 and raise the secondary float to the top of its travel and allow primary float to rest at the bottom of its travel.

4. Place test magnet (supplied) in location shown on top of the transmitter and float assembly. This should cause the red test light to flicker indicating that the transmitter and receiver are communicating.

- If the system passes the above test, shut off the power switch. The system is operating normally.

- If the system fails the communication test, recheck the switch settings and repeat test. If system still fails test, return the system to the dealer.

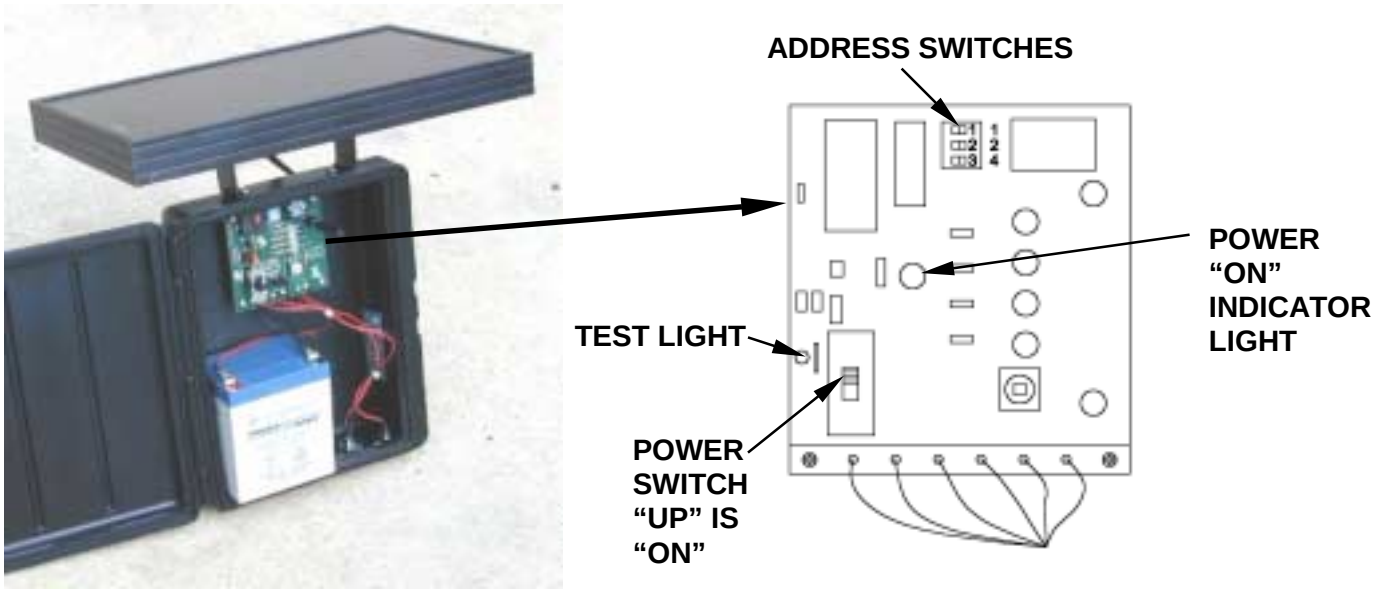



**Figure 2-2. Setting Receiver for Communication Test**

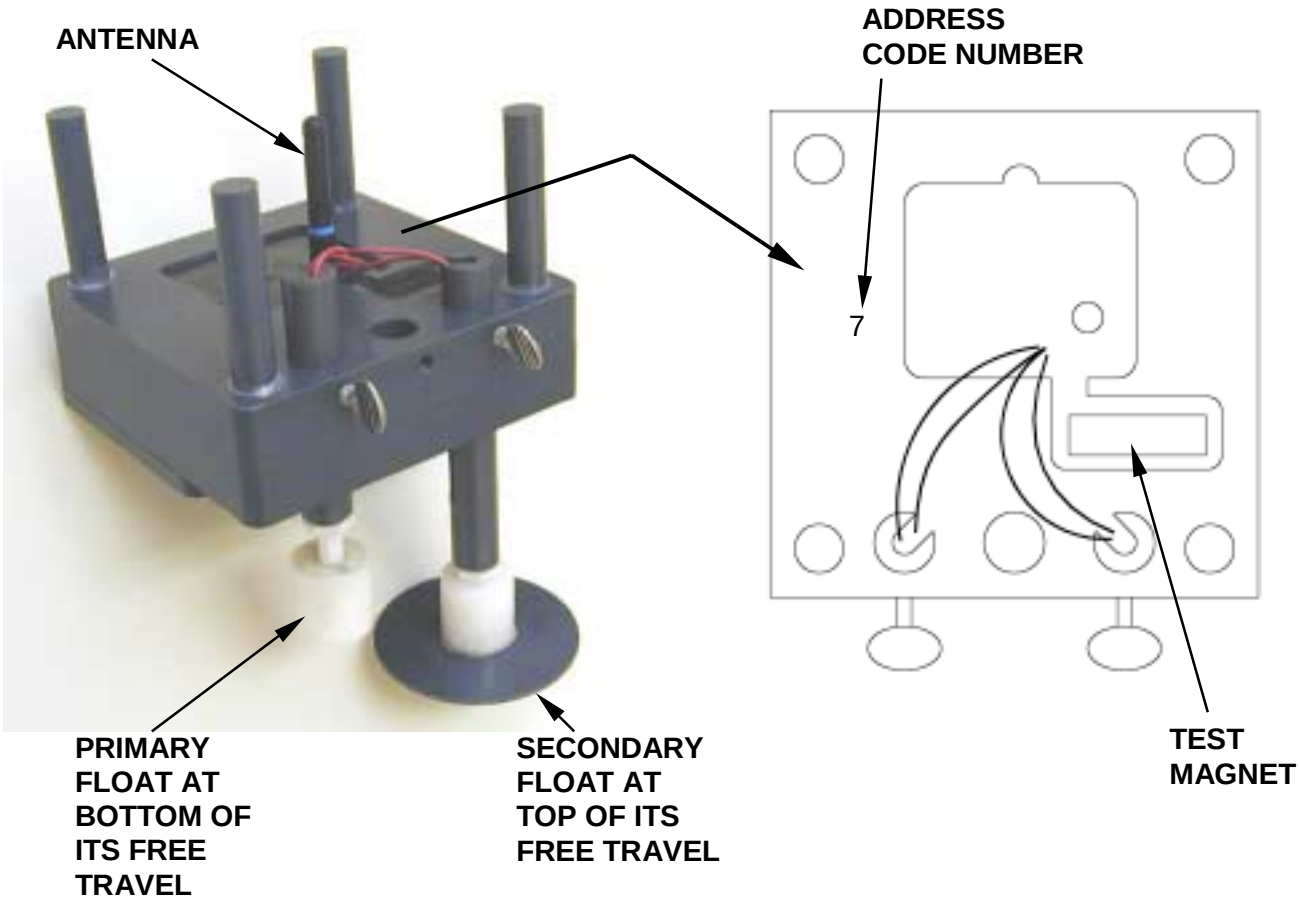



**Figure 2-3. Preparing Transmitter for Communication Test**

## INSTALLING THE TRANSMITTER FLOAT ASSEMBLY.

1. Choose the skimmer chamber closest to the location where the receiver will be mounted and remove skimmer lid.

2. Turn the lid upside down and make certain the bottom of the lid is clean and dry for bonding agent to make a strong bond.

3. Refer to figure 2-4 and test fit the transmitter float assembly to the skimmer lid.

- Position the transmitter assembly upside down with the legs of the transmitter positioned between the ribs of the lid.
- The transmitter assembly should be centered (as well as possible) on the lid.

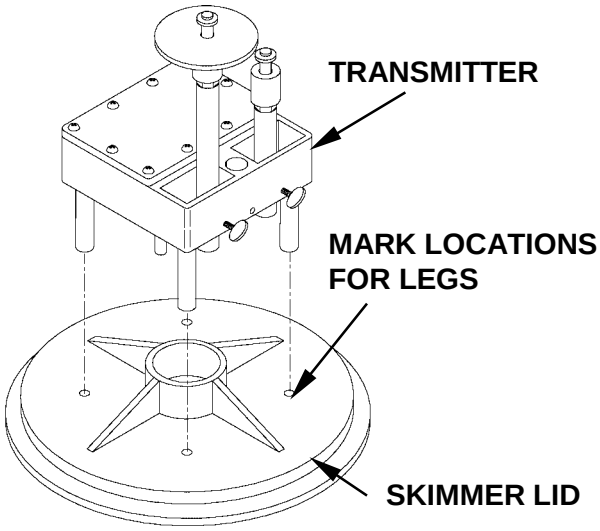



**Figure 2-4. Test fitting Transmitter to Skimmer Lid**

**NOTE**

Skimmer lids differ in design. Some have more ribs than others. If the antenna contacts one of the ribs, the antenna may be bent slightly to allow the transmitter legs to clear the ribs.

4. Mark the location of the legs on the skimmer lid using the felt tip pen.

5. Liberally apply bonding agent to the end of each transmitter leg and attach transmitter float assembly to skimmer lid. Set the assembly aside and allow bonding agent to cure for at least one full hour before moving transmitter. Full curing of bonding agent will take 24 hours.

## INSTALLING THE RECEIVER.

1. Refer to figure 2-5. Hold the receiver in the desired position and mark the locations of the two mounting holes using a pencil.

**⚠ DANGER**

***ELECTRIC SHOCK OR ELECTROCUTION HAZARD!***
**MAKE CERTAIN ELECTRICAL CORD FOR DRILL IS NOT IN OR NEAR POOL WATER OR ANY OTHER WATER! MAKE SURE YOU ARE NOT STANDING IN ANY WATER OR ON A WET SURFACE WHILE OPERATING ELECTRIC DRILL. FAILURE TO COMPLY CAN RESULT IN SERIOUS INJURY OR *DEATH!***

2. Use the 1/8” drill bit to drill pilot holes for the mounting screws.

3. Position the receiver and install the two mounting screws.

4. Plug the solar panel electrical plug into the receiver box receptacle.

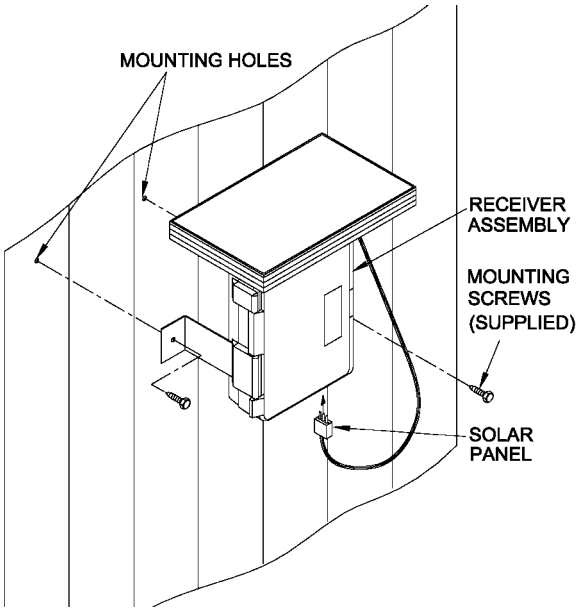



**Figure 2-5. Installing Receiver**

## INSTALLING SOLENOID VALVE ASSEMBLY.

1. The solenoid valve may be mounted on either a horizontal or vertical section of pipe however, make certain the chosen location meets all the conditions listed in the “Pre-installation Checks”.

2. Shut off power to the pool pump to prevent the pump from actuating while the installation hole is being drilled in the pipe.

3. Remove the collar bolt and open attaching coller.

4. Position solenoid valve assembly on pipe and check for obstacles that might cause removal difficulties later.

5. Once location is chosen, remove valve assembly and mark pool pipe for location of ½ " Dia. hole (figure 2-6).

**Figure 2-6. Marking Pipe**

***IMPORTANT!*** It is important that the pipe fragments from drilling are removed to prevent them from entering and possibly damaging the pump. Drill slowly and remove all drilling debris from inside the pipe before installing the solenoid valve assembly.

**DANGER**

***ELECTRIC SHOCK OR ELECTROCUTION HAZARD!***
**MAKE CERTAIN THE ELECTRICAL CORD FOR DRILL IS NOT IN OR NEAR POOL WATER OR ANY OTHER WATER! MAKE SURE YOU ARE NOT STANDING IN ANY WATER OR ON A WET SURFACE WHILE OPERATING ELECTRIC DRILL. FAILURE TO COMPLY CAN RESULT IN SERIOUS INJURY OR *DEATH!***

6. Drill ½ " Dia. hole in pipe (figure 2-7).

7. Make certain surface area around hole is clean and smooth.

**Figure 2-7. Drilling Pool Pipe**

8. Apply a small amount of vaseline to the rubber seal of the attaching collar (figure 2-8).


**Figure 2-8. Apply Vaseline to Seal**

**CAUTION**

**DO NOT OVER TIGHTEN COLLAR BOLT! FAILURE TO COMPLY MAY CAUSE PIPE TO FRACTURE!**

9. Position the solenoid valve assembly on the pipe with the collar centered over the hole. Close the collar and install the collar bolt. Tighten bolt until no clearance exists between the collar and the pipe. If a torque wrench is available, tighten bolt to 10 – 12 ft.lbs. torque (figure 2-9).

**Figure 2-9. Attaching Solenoid Valve Assembly**

10. Refer to figure 2-10. Make certain there is a gasket within the union.

**CAUTION**

**DO NOT USE PLAIN GARDEN HOSE!** Inexpensive plain garden hose may burst under pressure when left in direct sunlight for long periods of time. Use only industrial grade, reinforced hose.

11. Connect the water supply hose to the union. Hand tighten firmly.

12. If the solenoid valve assembly is positioned close to the ground in a location where it may be stepped on, place a support block under the check valve as shown in figure 2-10.

13. Connect the solenoid valve electrical plug to the bottom of the receiver control box.

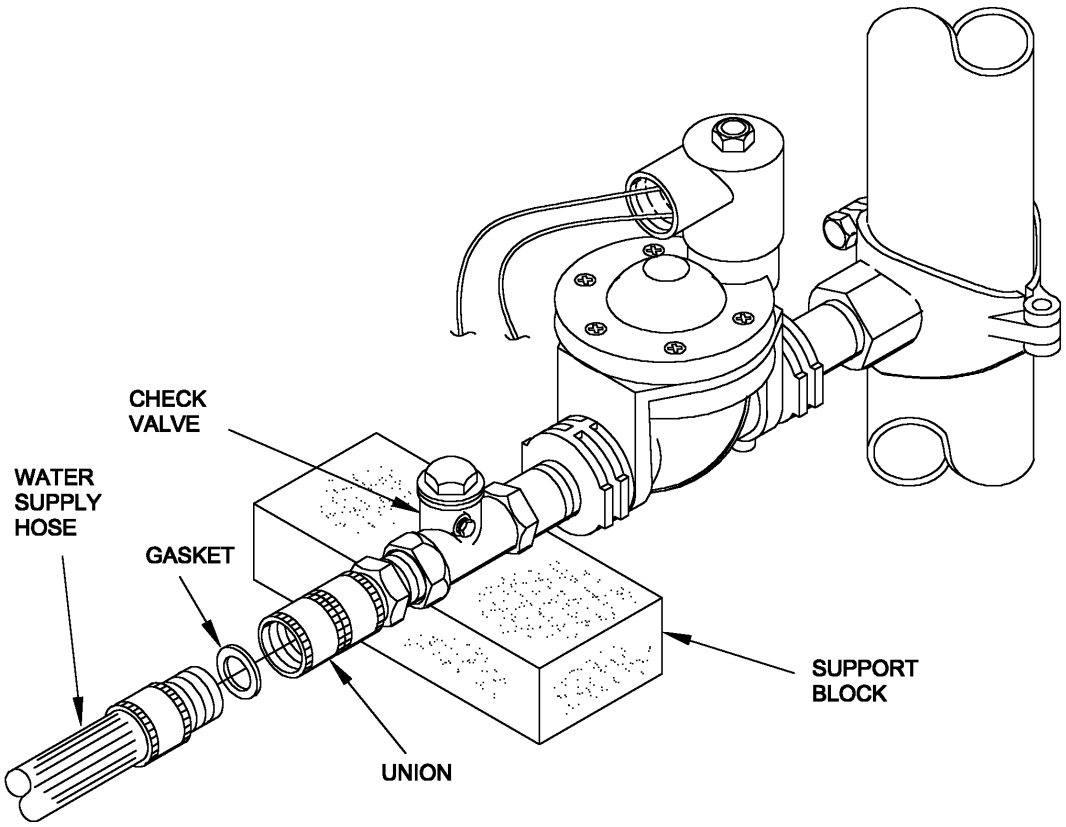



**Figure 2-10. Connecting Water Supply and Supporting Solenoid Valve Assembly**

# Section 3 - OPERATION

## GENERAL

The controls and indicators for operation of the “Aquariser” water level maintenance system are situated within the receiver control box and on the solenoid valve. The controls and indictors are shown in the three views of Figure 3-1. The number, name and function of each control and indicator are listed in Table 3-1. Using the number on the figure, find the same number in the table to identify the control or indicator and its function.

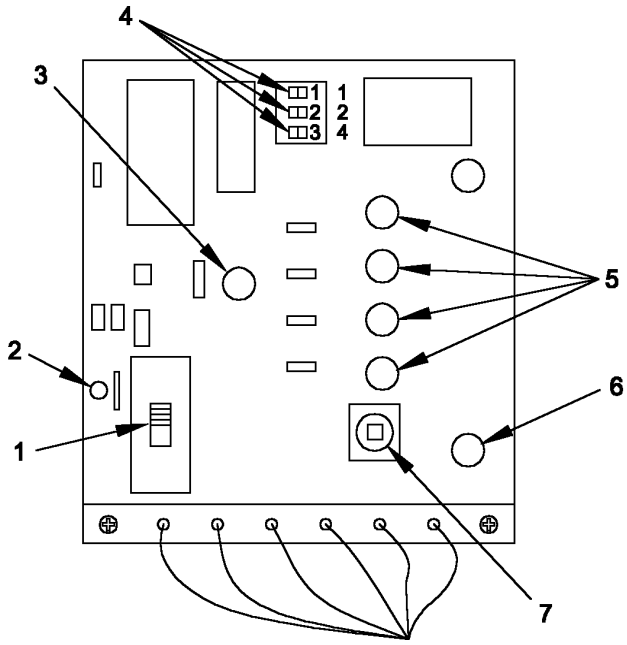



**Figure 3-1. Controls and Indicators (View 1 of 3)**

**Table 3-1. Controls and Indicators**

| ITEM NUMBER | NAME | FUNCTION |
|---|---|---|
| 1 | Power Switch | Two position sliding switch. Move switch UP to turn on receiver electrical power. Move switch DOWN to shut off electrical power. |
| 2 | Signal Test Indicator Light | Red Light flickers to indicate a radio signal from the transmitter is being received. |
| 3 | POWER ON Indicator Light | Light glows red to indicate power switch (item 1) is in the ON position. |
| 4 | Radio Signal Address Switches | Three sliding switches used to set the receiver radio frequency to match the transmitter radio frequency. |
| 5 | Troubleshooting Indicator Lights | Red indicator lights glow to indicate system problems when system test switch (item 7) is depressed. |
| 6 | VALVE OPEN Indicator Light | Light glows red when solenoid valve is open allowing outside source water to enter pool filter system. |
| 7 | System Test Switch | Push button switch used by trained technicians to aid in troubleshooting system. |

**Table 3-1. Controls and Indicators Continued**

| ITEM NUMBER | NAME | FUNCTION |
|---|---|---|
| 8 | Secondary Float Adjustment Screw | Thumbscrew used to hold secondary float mounting post in position. |
| 9 | Primary Float Adjustment Screw | Thumbscrew used to hold primary float mounting post in position. |
| 10 | Solenoid Valve Override Switch | Two position rotary switch used to manually open solenoid valve and add water to pool. |

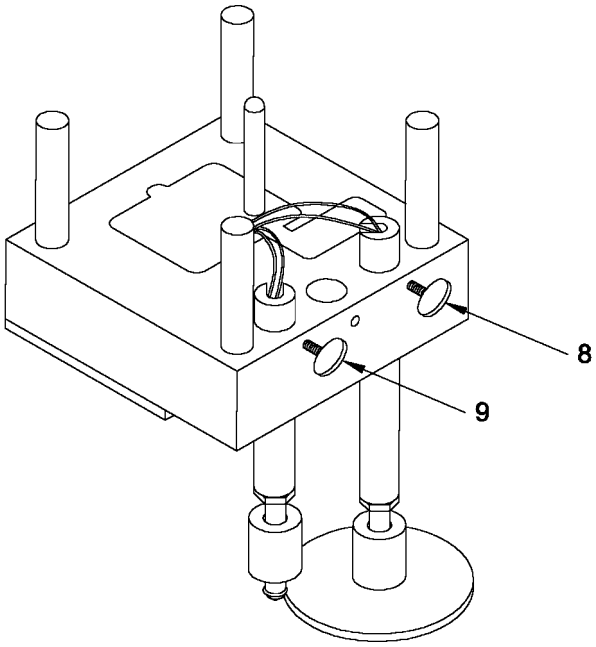



**Figure 3-1. Controls and Indicators (View 2 of 3)**

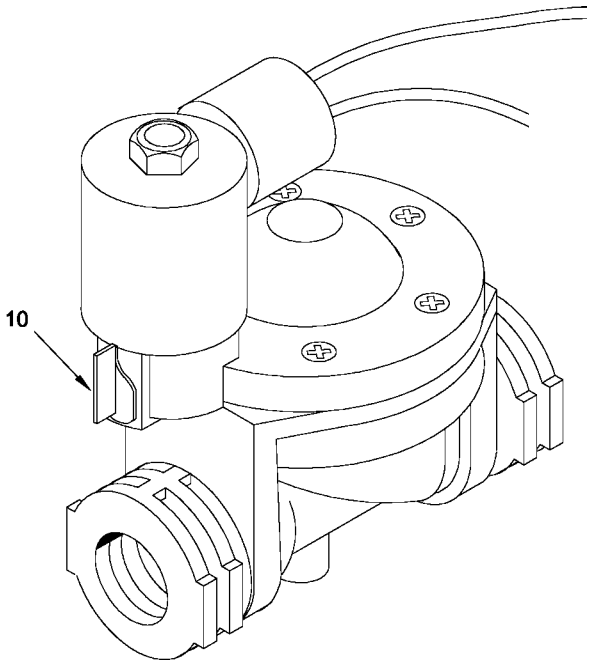



**Figure 3-1. Controls and Indicators (View 3 of 3)**

## PREPARING THE SYSTEM FOR OPERATION

To prepare the system for operation, float levels must be set and the receiver radio signal address must match the transmitter. Perform the following procedures to set the float levels and the radio signal address.

## SETTING FLOAT LEVEL

1. Add water to pool (if necessary) to bring water level to desired depth.

2. Open the receiver control box and set all three address switches (item 4, fig. 3-1) to the RIGHT.

3. Make certain the bonding agent has had a full hour to cure then, place the test magnet over the switch area of the transmitter as shown in figure 2-3. Tape the magnet in this position.

4. Refer to figure 3-2 and adjust the secondary float mount until only ½ inch of the mount is above the top of the transmitter body. Tighten thumbscrew.

5. Remove the shipping clips from the float stems to allow both floats to move up and down freely on their stems.

6. Set the power switch (item 1, fig. 3-1) to the ON position.

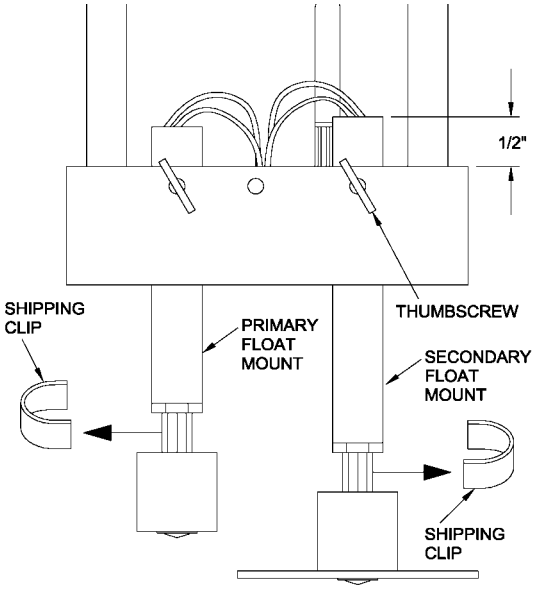



**Figure 3-2. Shipping Clips and Initial Positioning of Secondary Float**

7. SLOWLY lower the transmitter into the skimmer chamber while and assistant observes the test light (item 2, fig. 3-1). When the **secondary** float starts to float, the test light should start to flicker red.

8. Continue to lower the transmitter. When the **primary** float rises up approximately 2/3 of its travel range, the test light should go out.

- If the light does not go out with the skimmer lid fully down on the skimmer chamber, the **primary** float is positioned too high.

  a. Raise the transmitter out of the skimmer chamber. Loosen the thumbscrew and lower the **primary** float mount ¼ inch.

  b. Repeat this procedure lowering the primary float mount in ¼ inch increments until the test light goes out with the skimmer lid fully down.

- If the light goes before the skimmer lid is fully down on the skimmer chamber, the **primary** float is positioned too low.

  a. Raise the transmitter out of the skimmer chamber. Loosen the thumbscrew and raise the **primary** float mount ¼ inch.

  b. Repeat this procedure raising the primary float mount in ¼ inch increments until the test light goes out just as the skimmer lid drops into fully down position.

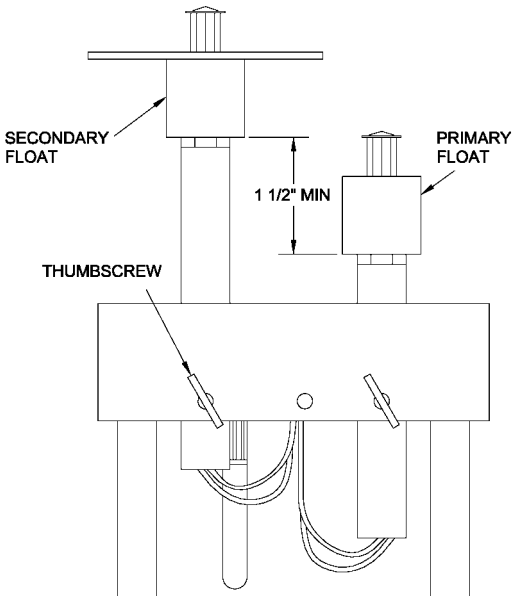



**Figure 3-3. Final Adjustment on Secondary Float**

9. Remove the transmitter from the skimmer chamber and adjust the **secondary** float mount to position secondary float 1 ½ inches below the primary float (figure 3-3).

10. Remove the magnet from the top of the transmitter. At this point, refer to the following paragraph and set the radio address switches to the proper positions.

## SETTING RECEIVER ADDRESS CODE SWITCHES.

1. Refer to figure 2-3 and check the top of the transmitter float assembly for a stamped-in number from 1 to 7. This is the transmitter radio address code number.

2. Refer to figure 3-1 and set the three address code switches (4) according to table 3-2.

Table 3-2 Address Switch Settings

| Address Code Number on Top of Transmitter | Set these switches to the LEFT. Leave remaining switches to the right. |
|---|---|
| 1 | 1 |
| 2 | 2 |
| 3 | 1 and 2 |
| 4 | 3 |
| 5 | 1 and 3 |
| 6 | 2 and 3 |
| 7 | 1, 2 and 3 |

3. Install the skimmer lid and transmitter in the skimmer chamber. The system is now set to maintain the water level within ± ¼ inch of its present level.

4. Turn on the supply hose water valve to send water to the solenoid valve assembly.

5. Observe the water level over the following few days.

- If the water level remains **too low**, adjust the **primary** float mount **upward** the exact amount that the water is low. For example: if the water is ½ inch too low, raise the primary float mount ½ inch.
- If the water level **is too high**, adjust the **primary** float mount **downward** the exact amount the water is high. If the water is ½ inch too high, lower the primary float mount ½ inch.

6. After adjusting the primary float mount, make certain the secondary float is still positioned at lease 1 ½ inches below the primary float (see figure 3-3).

7. Enjoy the freedom of hassle free water level maintenance!

## WINTERIZING SYSTEM

If you live in a climate where winter temperatures drop below freezing, perform the following procedures to protect your water level maintenance system from possible freeze damage:

1. Go to your pool service dealer and purchase a spare lid for the skimmer chamber and a ¾" NPT pipe plug, made of either PVC or brass.

2. Remove the skimmer lid with the transmitter attached and place it UPSIDE DOWN in a dry storage location. It must be upside down to stop the transmitter from sending signals to the receiver. If the transmitter is left right side up, it will discharge the battery.

3. Open the receiver control box and place the power switch in the OFF position (down).

4. Turn off the water supply hose valve then, disconnect the supply hose from both the supply valve and from the union of the solenoid valve assembly.

5. Drain all water from hose.

5. Turn off the switch that controls the filter pump.

6. Disconnect the solenoid valve electrical plug from the receiver control box.

7. Unscrew the solenoid valve assembly from the attaching collar. Apply thread sealing tape to threads of plug then, install the ¾" pipe plug in the attaching collar. If is not possible to unscrew the entire solenoid valve assembly from the attaching collar, perform the following.

- Remove the bolt securing the attaching collar to the piping system and remove the entire solenoid valve with the collar.
- Unscrew the collar from the pipe nipple.
- Apply pipe sealing tape to plug threads. Install the ¾" pipe plug in the collar opening and tighten.

**CAUTION**

**DO NOT OVER TIGHTEN COLLAR BOLT! FAILURE TO COMPLY MAY CAUSE PIPE TO FRACTURE!**

- Apply a thin film of vaseline to the sealing ring of the collar then, reinstall the attaching collar on the pipe in the original position. Tighten bolt to 10 – 12 ft.lbs. torque or until there is no clearance between collar and pipe.

8. Turn on the filter pump switch and check that pump has not lost head. If the pump has lost head, refer to pool pump operating instructions and perform air purging procedures.

9. Drain water from solenoid valve assembly and place it and the water supply hose in dry storage with transmitter.

## RETURNING SYSTEM TO OPERATION

Perform the following procedures to return a winterized system to normal operation:

1. Shut off electrical power to the pump.

2. Remove the pipe plug from the attaching collar.

3. Apply pipe sealing tape to the threads of the pipe nipple attached to the solenoid valve. Connect the valve assembly to the attaching collar. If it not possible to thread the valve assembly into the collar, perform the following:

- Remove bolt securing the collar to the pipe.
- Apply pipe sealing tape to the threads of the pipe nipple then, connect the valve assembly to the attaching collar.
- Make certain the sealing surface of the pipe around the hole is clean.

**CAUTION**

**DO NOT OVER TIGHTEN COLLAR BOLT! FAILURE TO COMPLY MAY CAUSE PIPE TO FRACTURE!**

- Apply a thin film of vaseline to the collar seal ring then, install the attaching collar on the pipe in the original position. Tighten collar bolt to 10 – 12 ft.lbs. torque or until there is no clearance between collar and pipe.

4. Connect solenoid valve electrical plug to receiver control box.

5. Connect supply hose to water supply valve and to solenoid valve union.

6. Turn on water supply hose and check for leaks. Tighten connections as necessary to stop leaks.

7. Remove winter skimmer lid and install skimmer lid with transmitter in skimmer chamber.

8. Turn on filter pump power switch and observe pump. If pump has lost head due to collar being removed, refer to pool pump instructions and perform air purging procedures.

9. Open receiver control box and place power switch in ON position (up).

# Section 4 – MAINTENANCE AND TROUBLESHOOTING

## MAINTENANCE

Perform the following procedures to ensure the "Aquariser" water level maintenance system operates properly.

1. Check and clean the skimmer chambers every 2 – 3 days or daily during seasons when trees drop debris and/or leaves. The floats must be able to move up and down freely.

2. Check the solar panel often to make certain it is not covered with leaves or debris.

3. Make certain the water supply valve is left open.

## TROUBLESHOOTING

Table 4-1 lists problems that can occur during operation. Following each problem is a probable cause and remedy. Troubleshooting charts can not cover every possible malfunction that may occur, but those most likely are listed. Corrective actions presented are based on the theory that all controls are in their proper operational positions. When a problem occurs, always check the position of the controls first.

Table 4-1. Troubleshooting

| PROBLEM | PROBABLE CAUSE | REMEDY |
|---|---|---|
| Water level remains too low | 1. Debris in skimmer chamber preventing floats from operating properly | 1. Remove debris from skimmer. ***IMPORTANT!*** Check skimmer daily during seasons that cause trees to drop debris and/or leaves. |
| | 2. Water supply valve shut off | 2. Turn on water supply hose and leave it on. |
| | 3. Kink in water supply hose or some heavy object resting on hose preventing water from traveling to solenoid valve assembly | 3. Remove object or kink from supply hose. |
| | 4. Solar panel covered with leaves allowing receiver battery to become discharged | 4. Remove leaves from solar panel.<br>a. Shut off power switch and allow battery to recharge for one or two days.<br>b. Turn power switch back on and observe system. Water level should rise to desired level. |

| | | |
|---|---|---|
| | | ***IMPORTANT!*** Check solar panel daily during seasons that cause trees to drop debris and/or leaves. |
| | 5. Solar panel electrical plug not connected properly | 5. Ensure electrical connection is tight. |
| | 6. Radio Address switches positions incorrect | 6. Refer to Section 3 and reset switches according to Table 3-2. |
| | 7. Check valve installed incorrectly | 7. Check that arrow on side of check valve is pointing toward solenoid valve. If it is not, perform the following:<br>a. Shut off water supply valve.<br>b. Disconnect water supply hose from union.<br>c. Remove check valve from piping.<br>d. Reinstall check valve with arrow pointing toward solenoid valve. |
| | 8. Transmitter or receiver battery dead | 8. Replace battery. |
| | 9. Solenoid valve defective | 9. Replace solenoid valve. |
| | 10. Receiver circuit board malfunction | 10. Replace receiver. |
| Water level too high | 1. Debris in skimmer chamber holding primary float down | 1. Remove debris from skimmer chamber. ***IMPORTANT!*** Check skimmer daily during seasons that cause trees to drop debris and/or leaves. |
| | 2. Solenoid valve defective | 2. Replace solenoid valve. |
| | 3. Receiver circuit board malfunction | 3. Replace receiver. |