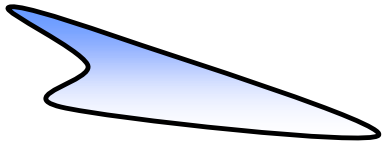
LEVEL WATERS

AUTOMATIC WATER LEVELING SYSTEMS



XPS-3411

Automatic Water Leveling System

Installation Manual

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Safety Overview

The XPS-3411 Pond Filling System is designed to be installed by an experienced installer familiar with wiring practices and the codes of their local governing bodies. When installed as described in this manual, the system presents no unsafe shock hazards. However, altering any of the components may present an unsafe circumstance.

Some other considerations to keep in mind during installation and operations are as follows:

Do not insert metal objects into sensor probes while unit is turned on.

Do not break seals on controller. Doing so may expose the user to potentially dangerous voltages when unit is turned on and will void the warranty.

Always mount the controller out of the reach of small children.

Always use safety equipment, such as eye protection, and dust mask when cutting PVC piping along with other normal safety precautions.

Always carefully follow all installation instructions.

Installation

The XPS-3411 Automatic Pond Filling System is simple to install, requiring simple pipe installation, wiring the controller to 115 or 230VAC line power, mounting the controller, connecting the fill valve and mounting the Pro-Mount and sensor. All controller electrical connections are done by way of screw down terminal blocks. The system must be plumbed from the water supply to the fill valve and then to the pond or water garden.

Preparing for Installation

Open the package and ensure that all of the components are present and have not been damaged in shipping. Items included in the system are:

- LCX-1101 Controller
- ¾" Fill Valve
- 25 feet of solid 2-conducter zone wire
- WLS-901P Sensor Unit w/50' cable
- MNT-P Pro-Mount
- Mounting and Wiring Accessory Kit

Identify where the WLS-901P Sensor Unit and the controller will be mounted. The WLS-901P Sensor Unit must be mounted at a point where a true representation of water level can be determined, such as the side of the pond or inside the skimmer. The MNT-P Pro-Mount provides mounting for the sensor so it should be considered when determining sensor location.

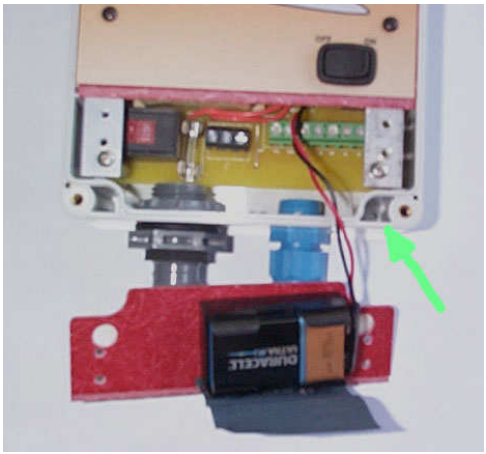
Identify where the plumbing and fill valve will be installed and lay out the 2-conductor control cable so that it extends from the controller to the fill valve. Run the sensor wire from the sensor to the controller.

Note: The control cable can be direct buried, however, running it through conduit is recommended.

Installing the Controller

Make sure that the power switch is in the OFF position. Remove clear front cover. Remove the four screws in the access panel on the controller. Using ½" liquidtite conduit, run 14/2 Romex through the liquidtite panel connector and wire to power terminal block as shown in figures 1 & 2. Run control and sensor cables through the 3/8" watertight fitting and wire to control terminal block as shown in figures 1 & 2.

(Note: Ensure that excess wires are flattened toward the back of controller to allow room for the battery.)



Install the battery provided into the battery housing and attach connector. Replace access cover. Mount controller on wall using the #6 screws provided in the four holes in corner indicated by the green arrow (Left) (*do not make holes in controller housing****!). Or mount on the optional pole mount using the hardware provided.***

Controller Wiring

Figure 1

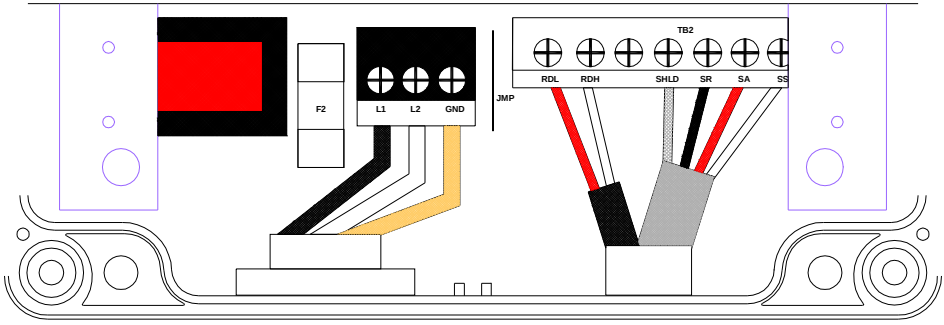


Figure 2

Installing the Sensor

Mount the MNT-P Pro-mount with the two screw holes to the top so that the extended tab is at the top of the pond or skimmer using the two #6 screws provided.

Position the sensor so that the probe window faces down toward the water with the dimple of the sensor at the desired level of the pond waterline. The bottom of the sensor probes should fall approximately 1-½ - 2 inches below the pond edge. The sensor height will need to be adjusted (covered later in this manual) to take into account ancillary water systems such as fountains and waterfalls. Screw the two captive screws into the face of the pro-mount alternating between the two every third turn for a snug seat. **DO NOT over-tighten the screws!**

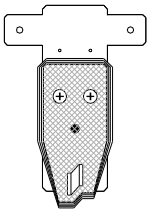


Figure 3

Wiring the Sensor

Wire the sensor to the controller as shown in figures 1 & 2 (gray cable on right). Sensor wires come tinned for installation to the control terminal block TB2. If excess cable is trimmed, be sure to tin the wires before installing on the terminal block. Table 1 outlines which terminals the sensor wires are connected to.

Table 1

Control TB2 (Green)	Sensor Cable
Shld	Shield wire (bare wire)
SR	Red
SA	Black
SS	White

Connecting the Fill Valve

Plumb from water supply to valve and from the valve to the pond using appropriate PVC pipe. Connect the valve control cable's red and white wires to the wires on the valve using wire nuts as shown in figure 4. The order that they are connected does not matter. Ensure that the valve is oriented with the solenoid facing up. The valve uses gravity to form pressure to cut the valve off when not engaged. Wrap the wire nuts with vulcanizing tape to seal them from moisture.

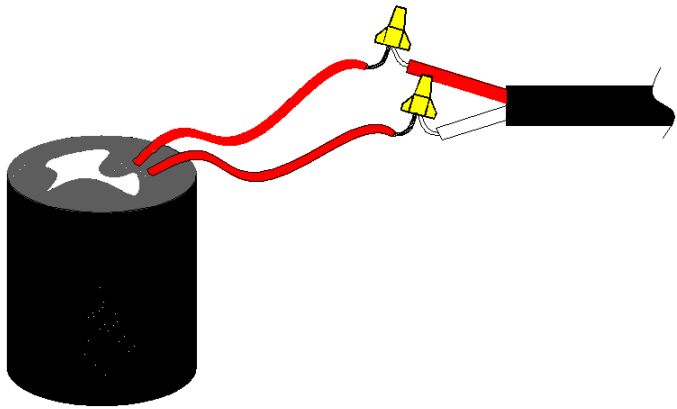


Figure 4

Test Plumbing Installation

Slowly turn the water feed on to the pond and look for leaks. If there are any leaks, turn the feed off and repair the leak. Once the plumbing is sound and has no leaks, increase pressure slowly until full feed pressure is on the plumbing.

Verify Control Cable Installation

Take a few minutes and look over the controller, cable, valve and sensor installation, Note any issues and correct them. It is important to make sure connections and mountings are secure before applying power to the system.

Connect System Power

Warning! Disconnect power at the breaker prior to connecting system power leads! Not doing so will result in serious shock.

(Note: It is recommended that an experienced electrician connect the power line to the LCX-1101 controller to the main power breaker to ensure adherence to local electrical code.)

Connect power to a circuit breaker with a rating of no less than 15 amps. The XLP-3401 system will normally draw a maximum of only 350ma. However, precautions must be taken for inadvertent short circuits in the line.

Once power is on at the circuit breaker, the system is ready for operation. It is highly recommended that any trenches that were dug for cabling or plumbing not be filled until proper operation of the system has been verified.

Operation

Turn the power switch to the on position. The green power lamp should light. The red light may flash and the Amber fill lamp should light and stay lit for approximately twenty seconds. (If the amber fill light does not light, the sensor may be below the waterline.)

Note! Depending on the level of the water at the time of power up, the unit may go through several fill cycles before turning off.

Adjusting Water Level

Since each pond's water dynamic characteristics are different, the level of the pond will vary with changes in pump cycles for fountains and waterfalls since these units draw water in and lift it out of the pond.

If there are no pumps that lift water out of the pond (lifting pumps) and cycle on and off over time, or if the pumps remain on constantly, the pond's waterline will remain somewhat constant over time. Adjusting the WLS-901 sensor to the desired level should work well. The level will fluctuate slightly between the beginning and end of the fill cycle.

If there are lifting pumps, however, that cycle on a schedule, the water level will drop when the pumps are on and rise when they are off (Pumps that merely circulate water will have no effect). This will cause the waterline to fluctuate between what we term as the quiescent (no pumps on) and dynamic (any lifting pump on) level. The quiescent level will be lower than immediately after a dynamic cycle where the pumps have just turned off.
Sensor level adjustment must account for this and the installer will need to adjust for optimal level over a period of a few days. To do so, follow these steps:

1. Adjust the WLS-901sensor so that the bottom edge of the probe window is between 2 and 2 ½ “from the top edge of the pond with no lifting pumps on.
2. Observe the level of the water just after a dynamic cycle (a lifting pump has cycled on and turned off). This is the dynamic level.
3. Make a mark on the sensor and adjust the sensor to align the mark to approximately 1” below the top edge of the pond.
4. Observe the waterline in both quiescent and immediately after a dynamic cycle. Make minor adjustments to reach optimal water level. Take care not to raise the sensor too high. This will cause a possible overflow condition and will waste water. Generally, 1” from the top after a dynamic cycle and approximately 2” from the top of the pond for the quiescent level is sufficient.

Even though a pond with lifting pumps will have a dynamic range and a quiescent range, the quiescent range may never be observed depending on the frequency of the lifting pump cycles.

Fill Cycle

When the water level goes below the preset level (dynamic or quiescent), the LCX-1101 controller will begin a 20 second timed fill. The amber ‘FILL’ lamp will light and remain on during the fill cycle and will go out when the fill cycle ends. Depending on the size of the pond, the supply water pressure and how much water is needed, multiple fill cycles may occur.

Alarm Condition

The LCX-1101 controller provides an alarm notification in the event of loss of sensor connectivity or loss of power. During either of these conditions, the Red lamp will light and the piezo alarm will sound for the following conditions:

- Red Green – Sensor Loss alarm
- Red Green – Power Loss alarm

The piezo alarm will only sound for a period of time until the battery is exhausted. To silence the alarm and extend battery life, turn the LCX-1101 Controller power off until problem is resolved (see troubleshooting).

Maintenance

The XPS-3411 requires little regular maintenance. The following steps should be taken to ensure optimum operation of the system:

Battery - The battery should be changed every six months or after a prolonged period of alarm condition with a 9v alkaline battery.

Sensor – Periodically clean debris from probe slot to maintain optimum operation

Over time, the sensor probes will wear due to electrolytic reactions. This is normal and will not affect the operation of the unit. A probe that is ¾ of its original length or moderately pitted should be replaced. Replacements may be found at www.aquilitysystems.com.

Note! Most municipal areas add chemicals such as chlorine to the city water supply, which may harm or kill any fish living in the pond if not treated properly. Ensure that your water is suitable for fish before using the XPS-3411 or that an appropriate filter is used. The CLF-4S may be used for all systems to filter out chlorine for up to 1 year.

Troubleshooting

The XPS-3411 Automatic Pond Leveling system should maintain the level in your pond for many worry-free years. However, if you should experience problems with it, it may be caused by some of these common issues that can be resolved by the user:

- ✘ Pond overflows when filling
  - ✓ Readjust sensor height to lower water level
- ✘ Pond will not fill
  - ✓ Check to make sure power is on and green lamp on controller is lit.
  - ✓ Check for debris on sensor and clean per instructions
  - ✓ Check to ensure sensor connector has weatherproof tape installed. Allow connector to dry if necessary and install tape.
- ✘ Sensor alarm is sounding but sensor looks ok
  - ✓ Check sensor cable and connections.
  - ✓ Check control cable and connections.
- ✘ Power Loss/Over-cycling alarm is sounding
  - ✓ Check that power plug is in and plugged into the wall.
  - ✓ Check to verify that the pond does not have a large leak (see over-cycling).

Over-cycling

Overview

The frequency that the pond fills is an indication of how much water is being lost over time. Frequent cycling could be the indication of a leak that could become worse as time progresses. The owner should be aware of the pond cycling time so that, should the pond develop a leak, they can take corrective action before it becomes too severe for the XPS-3411 to compensate for.

Once a leak becomes larger than the flow into the pond from the XPS-3411, the system will cycle repeatedly and finally trip the fuse. The problem should be corrected prior to reaching this stage. Generally, if the pond is cycling more than a couple of times per day, there is a leak somewhere unless there is a water replenish system in use. The XPS-3411 will handle cycling as frequently as once every ten minutes. After this, depending on the ambient temperature that the controller is in, the unit will lose power and provide a power loss alarm.

To reset the system, the unit must be switched off, the problem repaired, the fuse replaced (if needed) and the pond refilled.

Strategy

The general belief in many circles is that a pond filling system should be turned off when a leak is detected thereby saving valuable water. However, many pond owners that keep fish might disagree. As expensive as fish are, using some water to save them is economical. As well, a small leak will act as a replenishment system. Therefore, the XPS-3411 will attempt to maintain level even though there is a leak and the owner will need to remain aware of how often the pond is filling. If the amount of water being used is too much, power the unit down and repair the leak.

Manufacturer's Statement

Thank you for purchasing the Level Waters XPS-3411 Pond Filling System. The system has taken many years of engineering and development and it is our wish that it will provide you, the customer, with years of trouble-free service.

As pond enthusiasts ourselves, we have found that while electronic sensing is more expensive than float-valves, it is far more dependable and less intrusive to the beauty of any pond because of the lower profile of the sensing unit. Other systems have tried a similar approach, although none have been successful in maintaining a proper level in turbulent water, as our Level Waters systems are capable of doing.

As well, other systems do not provide simplified installation. We think that you will find this feature to be superior to other supplier's systems that cost considerably more. The system is designed for professional installers, yet anyone having basic wiring experience will be able to install the system with ease and will never have to worry about floats getting clogged or filling with water again.

The XPS-3411 is made for medium to medium-large ponds and is designed for years of dependable service. The sensor is constructed from durable PVC. PVC provides for better endurance in sunlight and heat and will extend the life of the components over time than using other plastics would.

Using a single plane geometric sensor design along with delayed fill allows the Level Waters' filling technology to achieve an optimum level even though the water is turbulent and can be adapted for larger applications on a special order basis.

For more information on the XPS-3411 or custom orders visit us on the web at www.aquilitysystems.com.

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Notes

Notes

Warranty

Aquility Systems, Inc warrants this product to the original purchaser for a period of one year against defects in material or workmanship when used for normal residential or commercial purposes it is intended for. In order to obtain a replacement unit or repair the existing unit, you must return the complete unit, postage prepaid, to the place of purchase, or to the Aquility Systems facility.
(6949 SW 21st Lane, Gainesville, FL 32607)

This warranty is intended to cover product defects only. Aquility Systems, Inc. is not liable for indirect, incidental or consequential damages in connection with the use of the Level Waters product covered by this warranty. This warranty does not cover any cost or expense incurred by the purchaser in providing substitute equipment or service during reasonable periods of malfunction or non-use of this product, while waiting for completion of repairs under this warranty. Some states do not allow exclusions of incidental or consequential damages, so the above exclusions may not apply in all states. This warranty gives you specific legal rights in your state, which vary from state to state.

If you wish to contact Aquility Systems, Inc., please direct inquiries to:

Customer Service
Aquility Systems, Inc.
6949 SW 21st Ln.
Gainesville, FL 32607