



Making Every Drop Count.



H₂Orb
User Manual
Installation Guide



H2Orb Installation and Operation

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Tools and Parts List

Tools

Small crescent wrench
Pliers or channel locks
Large, flat-head screwdriver
Small bucket or bowl

Wire coat hanger (optional)
1 :4- Bleach:H₂O bleach wipes
Disposable gloves

Parts List

1 ea. H₂Orb Control Unit
1 ea. Junction Box Assembly
 1 ea. Junction Box
 2 ea. Nylon Bolt
 1 ea. Nylon Nut with Wing
 1 ea. Nylon Nut Extension

Reduction Nuts

2 ea. 1/2" pipe to 3/8" compression
2 ea. 1/2" pipe to 1/2" compression
1 ea. 1/2" pipe to 5/16" compression

1 ea. Bowl Sensor Assembly*
 1 ea. Donut Float Level Sensor w/housing
 1 ea. Flat Bracket
 1 ea. Seat Spacer
1 ea. Tank Sensor Assembly*
 1 ea. Tank Sensor Float Level Sensor w/housing
 1 ea. Tank Sensor Adjustable Bracket
1 ea. Custom 5/5 USB type cable. (This is NOT a USB cable)
3 ea. Cable Ties

* The H₂Orb may be ordered or used with one or both Tank or Bowl Sensors.



Introduction

The H2Orb is a sophisticated water control valve developed to greatly reduce the risk of property damage and/or control water waste associated with leaking and/or improperly functioning toilets. In order for the H₂Orb to function properly, installation instructions must be followed.

Below is a checklist of things to do **BEFORE** you begin installation.

1. **Main Water Shut Off Valve** - Know where your main water shut off valve is and have access and the tool to turn it off. Older valves can break. Don't assume your plumbing is perfect, always plan for emergencies.
2. **Water Valve Check** - Shut off the water supply valve by turning it clockwise. This is to be sure you CAN turn it off. Older valves may be difficult to turn so be careful.
3. **Supply Line Check** - Check the supply line. There are two types of supply lines: rigid and flexible.
 - a. If your supply line is **rigid tubing**, we recommend that it be replaced with flexible supply line. Bending the tubing without proper tools can, and likely will, cause stress fractures in the line and greatly increase the potential for failure.
 - b. If your supply line is flexible hose, check to insure it is still flexible and no discoloration in the lines is visible. If there is any question about its quality, replace it. Supply line made specifically for toilets is inexpensive and readily available at most home repair or plumbing supply stores. Measure the distance between the water valve and the water inlet for the toilet before you buy one to insure you have the correct length of hose for your specific need: 16 to 20 inches is typical. The H₂Orb has a 3/8" compression outlet but including in the kit is a 1/2" pipe thread to 3/8" compression reducer.
4. **Parts List Check** - Before beginning your installation, check the Tools and Parts list to insure you have ALL of the parts and tools necessary to complete the task.
5. **Cleaning** - To prevent the spread of disease, thoroughly clean the work area with a strong disinfectant or bleach water. Wear disposable gloves at all times and be careful to NOT wipe your face or other parts of your body until after you have completed the installation, removed the gloves, and thoroughly washed your hands.

Installation

H₂Orb

1. Shut off the water supply valve by turning it clockwise Most toilets are fitted with a anti-back-flow fitting into the tank so it should not be necessary to drain the tank as only a small amount of excess water may be left in the fill valve and supply line. However it is always a good idea to be prepared if the anti-back-flow fitting is not working. To drain your tank, after turning off the water at the water supply valve, flush the toilet and hold the handle down until all the water is drained.
2. Place a small bowl or towel underneath the water supply line to catch any excess water that may remain in the line. Disconnect the water supply line from the angle stop. Make sure the fill valve assembly does not loosen, which could cause a leak.
3. If you have an older toilet, this may be a good time to replace the water line connector hose.
4. Open the small bag containing the reduction nuts. Choose the one that fits on your angle stop.
5. Screw the proper reduction nut into one end (water inlet) of the L-Adaptor first checking to be sure a rubber cone washer is inside the nut. Make sure that you have a snug fit. It may be necessary to use a wrench or pliers. **Do not over tighten.** For water valves that are straight attach the long end of the L-adaptor and for water valves that are at a 90° angle, attach the short end of the L-Adaptor.
6. Next attach the L Adaptor with the reduction nut to the angle stop using a small crescent wrench. **Do not over tighten.**
7. Then, connect and tighten the H₂Orb to the L Adaptor. Be sure the threads are seated properly to avoid stripping or cross threading – it should thread and turn easily by hand. Improper threading will cause leaks. *Note: As with all threaded plumbing connections of this type, it is recommended to use a plumbing threaded connector sealer such as Teflon Tape to help seal the fitting*
8. Connect and tighten the water supply line to the H₂Orb using a small crescent wrench. **Note: The water supply line hose connector MUST HAVE a washer in it or it will leak.**
9. Reopen your water supply line and check that no water is leaking from the connections at the top and bottom of H₂Orb or the L-Adaptor.
10. Check the supply line fitting at the toilet for leaks.

Junction Box Installation

1. Choose the seat bolt closest to your angle valve. Loosen the bolt and remove it. (If a Bowl Sensor is to be installed, please go to the Bowl Sensor Installation Section for additional installation instructions). Use the Nylon Bolt to replace the one that was removed screw and attach using the Nylon Nut with Wing. NOTE: It may be necessary to use the bolt extender to lower the Nylon Nut with Wing below the rim of the bowl. Tighten



by holding the bolt in place with your hand and using a large flat head screwdriver to tighten. The wing should extend toward the back of the bowl.

2. The Junction box is now ready to be slid onto the wing. Slide it on to check for clearance and fit. Remove it and set it aside.

Tank Sensor Installation

1. Gently remove the toilet tank cover and set it aside.
2. A properly setup toilet should have at least 1" between the water level and the top of the overflow tube. Adjust the water level accordingly. You may want to adjust your fill valve to allow more or less water in the tank. See the fill valve manufacturer's instructions for details.
3. Hang the tank sensor so that the sensor can fit into the tank without interfering with the flush or fill valve.
4. Adjust tank sensor to waterline by moving it up or down until the Waterline mark is level with the actual water level in the tank.
5. Once the **H₂Orb** installation is complete, flush the toilet several times to verify that sensor doesn't affect the functions of other tank parts.

Bowl Sensor Installation

1. Choose the seat bolt closest to your angle valve. Loosen the bolt and pull it out of the bowl.
2. Slide the Bowl Sensor Mount (Flat Bracket) under the seat and use the special Nylon Bolt (given) to replace the current one and slide the sensor cable thru and refasten using the Nylon Nut w/ Wing. See **Junction Box Installation** for additional important details.
3. Loosen the other seat bolt, lift of the seat and slide the Seat Spacer in between the seat and the bowl so that the seat is level.
4. Tighten both seat bolts.
5. Attach the bowl antenna to the special adapter bolt and plug in the sensor wire. (See also Installation Diagrams).

Final Connections

1. If not already removed, slide the Junction Box off the wing nut.
2. Plug the Tank and/or Bowl sensors and H2Orb cable into the bottom of the Junction Box.
3. Plug the **H₂Orb** cable into the **H₂Orb**
4. Insert the battery if it is not already inserted.
5. Once battery is placed in holder, **H₂Orb** will sound off "okay" with three beeps. If no sound is made, re-check the battery to make sure it is installed correctly. If it still doesn't work pull the battery out and flip it over and make sure the smooth surface (+) side is to the inside of the **H₂Orb**.
6. Choose the correct profile. See Table 3.
7. Complete a System Test.

System Test

1. All tests should be done with the tank lid OFF.
 - a. Bowl Sensor Test. (Coat Hanger Test)
 - i. Push the bowl sensor float up using your hand or the hook end of the hanger. The valve will close, the alert will sound and the bowl overflow icon will appear.
 - ii. Push the Open Valve Key.
 - iii. Repeat the above except this time flush the toilet and then push the Bowl Sensor Float up. The valve should close and NO WATER should be entering the tank through the fill valve.
 - iv. Push the Open Valve Key. Water should begin to enter the tank.
 - b. Tank Sensor Test
 - i. Look inside the tank and flush the toilet. Two seconds after flushing, the valve should open and water will begin to enter the tank.
 - ii. Using your hand, gently raise the Tank Sensor Float to the top of the sensor. The water should immediately shut off.
 - iii. Release the float and within 2 seconds, the water should turn on.

H₂Orb Operations

The **H₂Orb** is set to maximum protection and alerting by default. If a problem is detected it will shut off the water supply and alert you by sounding an alarm and chirping every two seconds for up to a minute and a half. After that time, the **H₂Orb** changes to an advanced battery save mode and the audible alert is sounded once each hour for the first 24 hours and then the **H₂Orb** becomes silent until the toilet becomes active. At that time, the **H₂Orb** will again alert to any pre-existing fault conditions.

Specific alerts and water shut-off conditions can be changed using a simple set of key presses to select one of six different profiles. (Overflow detection cannot be disabled.) Use the tables below to determine which profile (Table 3) best suits your needs.



Table 1: Keys and Resets

Profile Selection	Press the Open Valve key for 5 seconds. Use the Alarm Silence key to select your profile. Then, press the Open Valve key to set. If the Open Valve key is not pressed, the profile will revert to the last active profile.
Alarm Silence	Press the Alarm Silence key, fix your problem and the press Open Valve .
Recalibrate Tank Signal	If your tank does not fill to the water line simply recalibrate the tank sensor. First remove the tank cover, drop the Tank Sensor along the rail and adjust the mark on the sensor to the line. Flush the toilet once or twice to see if the tank fills to the water line. If it does not, simply adjust the tank sensor to the water line and repeat the process.
Memory Retention	In order to insure the H ₂ Orb is set to the correct Profile, when the battery is removed the default profile is Profile 1.
Diagnostic	Press both keys down and hold for ten seconds. The H ₂ Orb will go through a self diagnostic check. The H ₂ Orb will run a program to check for full operation. At the end to diagnosis you will hear a click that opens the valve and 3 beeps to let you know the H ₂ Orb is ready to be set. To set the H₂Orb after a diagnostic, the Open Valve key must be pressed.
Alarm Silence	Press once to silence the alarm. Certain conditions will not allow you to open the valve without fixing the problem.
Reset the Open Valve	Push the Open Valve key one time. If 3 beeps occur, the H₂Orb as no active alerts. Certain conditions will not allow you to open the valve without fixing the problem.
System Re-Boot	Remove the battery to re-boot the system. The system assumes and always open valve condition until a sensor is detected. Re-Boot may be necessary after removing a sensor from the system without replacement.

Table 2a: Conditions, Alerts, and Water Shut-Offs, Bowl Sensor

Bowl Sensor Conditions.	
Bowl Overflow	The H₂Orb shuts off the water supply immediately when a properly placed and installed BOWL SENSOR senses an abnormal water level. The Open Valve key will NOT open the valve until the high water condition has been eliminated.

Table 2b: Conditions, Alerts, and Water Shut-Offs, Tank Sensor

Tank Sensor Conditions	IMPORTANT-These alerts and protections are ONLY available when a Tank Sensor is properly installed and the correct Profile selected. Different profiles allow different conditions to continue.
Flush	The H₂Orb will open the valve within 2 second after a flush. When the water level in the tank returns to the waterline, the valve will close within 1 minute. If the water does not return to the Waterline, see below for other conditions, alerts and water shut-offs.
Stuck Open Flapper	The H ₂ Orb will shut down the water after 4 minutes of continuous water flow into the toilet. Normal fill time for most toilets is from 1 ½ minutes to 3 ½minutes.
Fill Valve Leaks (Tank Overflow)	The H₂Orb will automatically open and clear the alert when the water level is lowered from a tank overflow condition. The Open Valve Key will also clear the alert.
Tank Leak (Leaky Flapper)	The H₂Orb detects pinhole leaks by sensing drops in the water lever without an active flush. When a profile is selected that allows leak detection, the system allow 3 leaks (not concurrently) before closing the water valve and or alerting. Rule of thumb: if the Leaky Flapper condition happens once, reset and ignore. If it happens consistently, replace the flapper.
Tank Sensor Waterline Adjustment Needed (ReCal)	To properly work, the Tank Sensor must be adjusted so the waterline on the sensor is consistently at the water level in the tank. When the ReCal alert is active (see Profiles) if the water level in the tank does not reach the Waterline on the sensor 3 times in a row, the ReCal alert will be activated.








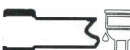







Table 3: Profiles**

To select a Profile see [Keys and Resets](#). IMPORTANT. Profile protection is strictly dependent on specific sensor selection and installation.

Profile 1	Maximum Protection. Water shuts off for all adverse conditions, after tank fills and Alerts are made for all events.
Profile 2	Same as Profile 1 with all audible alerts silenced.
Profile 3	Water shuts off for all events but does not alert for Tank Recal or Tank Leak
Profile 4	Same as Profile 3 with all audible alerts silenced.
Profile 5	Tank and/or Bowl Overflow for water shut-off. All others will silent alert but NOT shut off the water. An active alert can be determined by pressing the Open Valve key and noting the visible icon.
Profile 6	Same as Profile 5 with all audible alerts silenced.
Profiles 7-9	Inactive

****The H₂Orb features advanced technology and can be programmed for specific applications or custom Profiles. Please contact AquaOne Technologies for details and quotes.**

Table 4: Icon Description

<i>Alert Type</i>	<i>Icon</i>	<i>Alert Type</i>	<i>Icon</i>
Alarm Silence		Alarm Activated	
Flapper Leak		Tank Cable Disconnect	
Flapper Stuck Open		Bowl Cable Disconnect	
Bowl Overflow		H₂Orb Cable Disconnect	
Fill Valve Leak		Tank Sensor Waterline Adjustment Needed. (Recal)	
Active Profile		Low Battery	
Not Active			



Trouble Shooting the installation

No water enters the tank

- Supply line is kinked
- Water valve not turned on.

IMPORTANT TECHNICAL AND MAINTANACE INFORMATION; PLEASE READ BEFORE OPERATING

The H₂Orb is a technically advanced , sophisticated and well engineered product and, with proper care, is designed to give years of valuable service. Proper care is needed to maintain its performance and appearance.

Cleaning and Maintenance

General

The H₂Orb can be cleaned by wiping with a damp soft cloth using a mild non-abrasive cleaner. **DO NOT submerge the ORB.**

The front of the Bowl Sensor can be cleaned during regular toilet cleaning It can also be removed by sliding it off its mounting track for a more thorough cleaning.

DO NOT use a harsh acid based toilet bowl cleaner on any parts of the H₂Orb. Mild toilet bowl cleaners can be used.

After a Bowl Overflow

After an overflow, make sure the inside float moves freely up and down before opening the valve. Paper, human waste and other debris may get caught in the sensor during an overflow and cause the float stick.

Where to find additional information

Our website offers additional illustrations, technical information and helpful hints as well as links to toilet repair sites.

We do **NOT** recommend any product, manufacturers, procedures, etc. other than those manufactured and sold by AquaOne Technologies. However, we are pleased to direct you to links where we found useful information and helpful hints.

Contact Information

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