

AP SERIES INSTALL MANUAL



hydro-action[®]
green from the ground up



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Hydro-Action AP Series Wastewater Treatment Plant

Introduction

By following the instructions in this manual, you will be providing yourself with the best on-site wastewater treatment and service. We invite you to share in our pride of the **Hydro-Action®** AP Series Treatment Units.

This manual includes installation procedures on the AP-500, LPA-500, AP-600, AP-750, AP-1000G & AP-1500G wastewater treatment plants. These units may be installed with either a platform mounted OPS® (operations/control center) or a Remotely Located OPS®.

Installation needs vary, so your on-site wastewater system may contain some of the following auxiliary components along with the treatment plant:

- Pretreatment tank
- Pump/holding tank
- Alarm systems
- Equipment for chosen effluent disposal method (drip irrigation, spray irrigation, gravel-filled drain field, pressure dosing, etc.)
- Chlorinator / UV Disinfection Unit

The certified **Hydro-Action®** dealer or installer of the **Hydro-Action®** AP Series wastewater treatment plant is responsible for completing and submitting to us the Installation Warranty Information to properly activate the **Hydro-Action®** Product Warranty.

We are eager to assist with any questions or problems. Please contact **Hydro-Action®** at 800.370.3749 to request assistance from our Customer Service or Engineering Departments.

Off-Loading & Unpacking Instructions

Off-loading Instructions:

1. Insure that the system is un-strapped from the delivery vehicle. Inspect to insure no mooring points were damaged during delivery.
2. Mount the T-Bar assembly if Set-N-Go™ System, otherwise insure proper off-loading by means of forklift or machine capable of removing without damage. Strap and chain works well. Evenly distribute the weight so that the system is level when lifted.
3. When system is off-loaded, inspect exterior components for damage. OPS®, Lids, tank, and loose pallets should not have any evidence of shipping damage.
4. Remove covers and inspect the interior of the units for damage. Report these or any damage to the dealer or distributor.

Unpacking Instructions:

1. Remove all components that are shipped on loose pallets. Open boxes and containers.
2. Inventory components, and inspect for damage during shipping. Pay special attention to the diffusers, drops, and components as they are fragile and susceptible to shipping damage.
3. If a pump tank is included, inspect interior and inventory components. Effluent pump, water line, and wiring should all be intact and free of defects.
4. Inspect OPS® for any interior damage, and check all connections to the control panel. Vibration from shipping may cause wires and airlines to become loose.
5. Once completed close all covers and prepare tank for installation.

INSTALLATION INSTRUCTIONS:

To ensure proper installation of all components of the **Hydro-Action**[®] AP Series wastewater treatment plant, please read and follow all instructions included in the following sections. The AP Series WWTP with OPS[®] must be installed according to these instructions. Any modifications to the plant or OPS[®] will result in loss of warranty and invalidation of the plant's NSF std. 40 certification.

Tank Installation

Locate plant in an area that provides good ventilation and rainwater run-off. To decrease the likelihood of hydraulic displacement (tank flotation), choose a site that will minimize possible groundwater saturation. Consider seasonal water table and soil conditions in the area of installation. Do not locate the plant in a low spot in the ground where water tends to pool or at the edge of any natural body of water. If such a location cannot be avoided, call **Hydro-Action**[®] for technical advice.

Prepare an excavation with a width and a depth that will allow any and all auxiliary tank inlets/outlets to align with the plant inlet/outlet. The plant access cover should extend above the final surface grade in such a way to prevent surface watershed from entering the plant access riser. Riser extensions may be required and are added to provide adequate elevation for at-grade access. For plant dimensions see drawings in **Hydro-Action**[®] Design Manual.

Since the treatment plant must be level to operate properly, using a transit leveling instrument is recommended. If leveling instrument is not available, a four (4) foot level may be used. Use four (4) inches of sand or fine-grained gradable material in the bottom of the excavation to provide a solid flat base. Be sure bottom of excavation is level before lowering tanks.

When bottom of excavation is to grade, smooth, tamped and level, gently place all auxiliary tanks (if included) and plant into excavation. While lowering treatment plant into excavation, turn tank so four (4) inch building outlet plumbing aligns with four (4) inch inlet of treatment plant and the four (4) inch treatment plant discharge line aligns with effluent outfall plumbing.

The treatment plant and any other associated tanks must be level to ensure proper functioning. The connector pipe between any and all tanks and plant should be between level and one-eighth (1/8) inch per/foot-grade fall toward plant outlet.

Once all tanks are level and properly positioned, start filling them with clean water, checking periodically for leaks. If a leak is detected, stop filling and pump water level down below leaking area and repair hole. When leaking area has been repaired resume filling. Continue this procedure until tanks are filled to overflow and there are no leaks. During the filling procedure, check periodically to make certain tanks remain level.

While the tank is filling, run the incoming sewage lines from a properly trapped and vented building to the pretreatment tank first (if used); then run plumbing from pretreatment tank (if used) to the treatment plant tank inlet, or from building directly to treatment plant tank. Make sure that all plumbing meets building codes. Also run the four (4) inch plant outlet pipe to proper piping and/or equipment to remove the treated effluent from the immediate area. Once treatment tank is full and leak free, make final connections to inlet and outlet piping on plant.

For installation below normal grades **Hydro-Action**[®] twenty-four (24) inch (20" for models AP-1000G and AP-1500G) diameter extension riser(s) must be used to bring access above grade. Riser must be above grade to provide plant ventilation. Extension risers on AP Series units may be any reasonable depth. Under no circumstances shall the cover be buried. If installing Platform Mounted OPS[®], add an equal number of OPS[®] base risers to bring it to the same grade as the access risers.

After all tanks and plant have been filled to outlet overflow, backfill the excavation using a material that will settle well around the tanks. Do not use large rocks or heavy clay. Place the material around the tanks in layers, tamping and watering each layer.

Before installation is complete, the access cover and the Platform Mounted OPS[®] enclosure must be in place and the tamper-resistant screws, provided by **Hydro-Action**[®], must be installed and properly tightened to prevent unauthorized personnel from gaining entry inside plant.

Note: Any tank and plant must be filled to overflow with water during and after installation to prevent hydrostatic displacement (floating of tanks).

Hydraulic displacement and tank flotation may occur whenever water and solids are removed from the tank when high groundwater conditions exist. Any source of water in the soil around the plant installation could cause the tank to float.

Water sources may include rainfall, springs, creeks, bayous, rivers, lakes, and coastal areas. Proper precautions are therefore required to prevent tank flotation due to hydraulic displacement. These precautions include, but are not limited to, the following:

- Plant location — choose a site that will minimize possible groundwater.
- Use mooring devices such as cable, grounding rod, concrete, or some sort of weight.
- Whenever a tank is pumped, do not remove more than one-half of the capacity of the tank. It is recommended that you pump the tank during dry seasons only. However, if tank must be pumped during the wet season, watch for upward movement of the tank while pumping is being done. If upward movement is detected during pumping, **immediately stop pumping water out of the tank and refill the tank to stop flotation.** Each site must be evaluated on a case by case basis to determine the best time to remove water from the tank and prevent flotation.

OPS® Installation

Following are all parts needed to complete the installation of model AP-500, LPA-500, AP-600, AP-750, AP-1000G, and AP-1500G WWTP using the Platform Mounted or Remotely Located OPS®. Should any part(s) be missing or off specification, or if you encounter any problems in completion of installation of the unit call the **Hydro-Action®** Customer Service Department at 800.370.3749 for assistance.

The AP-500, AP-600 and AP-750 plant may be installed with either a Platform Mounted OPS® or Remotely Located OPS®. The parts provided assume a typical installation. If site conditions are not normal and additional parts are necessary for correct installation, be sure that you have all necessary additional parts before beginning installation of the AP Series unit.

The AP-1000G and AP-1500G use the remotely located OPS®. Additional parts may include access risers and equipment base risers, flexible airline hose extensions, electrical wiring, conduit, PVC pipe, and other items.

Make all necessary hose connections, wiring connections, pipe connections, and alarm connections prior to testing with electrical power. If installing a Platform Mounted OPS® that has been factory mounted, OPS® is pre-installed on top of tank.

Note: Whenever riser extensions are added to bring the Platform Mounted OPS® base and plant access cover to grade, remember to provide enough length to all piping and wiring to meet the needs of raised installation.

If installing a Platform Mounted OPS® that has been shipped separately, remove OPS® enclosure and glue 5 5/8"-long 1/2" PVC pipe into airline coupling on platform. Set OPS® base on top of platform aligning airline hole with 1/2" PVC pipe. Align vapor and moisture sealing assemblies on OPS® base with pre-drilled gasket holes in platform and push the vapor and moisture sealing assemblies through holes in platform. Be sure base is centered on platform before proceeding.

Attach base to platform using three seven (7) inch screws; two of the screws will replace smaller screws holding air pump to OPS® base during shipping. Place the third screw at marked location (near corner of OPS® even with vapor and moisture sealing assemblies). Be sure to drill screws straight down.

Glue 5 5/8"-long 1/2" PVC pipe to 90-degree PVC fitting that is connected to air pump.

Connect electrical jacketed cables from high-level float in plant and floats and pump (if included) in pump tank by using fish wire to pull cables through conduit into base of OPS® enclosure and up through sealing assemblies. Conduit from pump tank to plant should enter plant in the riser assembly above the access, either directly above outlet or above clarification compartment. This keeps cables from interfering with components.

Connect cables through compression fitting into electrical enclosure as shown on electrical schematics for each model (see **Hydro-Action®** O&M or Design Manual).

Note: Electrical schematics are included inside each electrical enclosure and **must** remain in this location at all times to ensure that system is in compliance with required rules of certification. **Do not remove the schematic from electrical enclosure.**

Run electrical power in conduit from main supply to OPS® base. Thread wiring through base and into OPS® enclosure. Make connections through 3-wire compression fitting into electrical enclosure.

Electrical power connection to electrical controls in electrical enclosure is made by connecting the wiring to the electrical controls as shown in the electrical controls instructions. See **Hydro-Action®** O&M or Design Manual.

An optional remote alarm may be mounted on the exterior of a house or garage, if desired. This alarm is equipped with audible and visible alarms.

If the Remotely Located OPS® is being installed, the OPS® enclosure simply sits on top of a polyethylene base located away from the plant (no more than 55 feet from plant location).

Teflon Diffuser Assembly Inspection

Inspect Teflon diffuser assemblies through the access hole. Diffusers are extended down the sides of the tank and stop up to 6" from the bottom of the tank.

All PVC connections should be glued and tight connections. Inspect tubing for any breakage or air leaks. Diffusers should be threaded tight to the down pipes.

Test airflow by cycling the compressor on to insure an even bubbling of each diffuser and then cycle the compressor off.

Teflon diffusers are resistant to bacterial growth, however periodic inspection may be needed throughout the life of the system. See O&M Manual for details on service of the diffusers.

Hydro-Action® Air Pump

Hydro-Action® air pump models are preinstalled in the OPS®. Instructions on making electrical and airline connections to the air pump are simple. Connect the outlet air from the compressor to the PVC airline. Then connect the three wire electrical connection to the control panel while observing proper wiring diagram.

Located in **Hydro-Action®** Pump Manual is a copy of Operation & Maintenance Technical Manual for Hydro-Action® Air Pumps. It is recommended that you review this data, which includes important information for pump troubleshooting, operating, and maintaining the air pump.

OPS® Controls/Alarm System Testing

The alarms supplied with this wastewater treatment plant provide the owner with a secure, reliable, and economical means of notification for most malfunctions of the plant that would lead to producing an unsatisfactory effluent. These alarms include notification for problems of air pump failure, aeration piping malfunctions, and high water level. These alarms need to be inspected and tested after installation and during each plant operation and maintenance site visit. If an optional remote alarm has been installed, it should also be inspected and tested during each site visit.

To determine which model of OPS® is being used, see model number on outside of OPS® enclosure (example: OPS® model 50-20). To gain access to the electrical controls and air pump, remove the security screws holding the OPS® enclosure to the base. Remember that each model offers different control and alarm functions.

The switch indicated "normal/silence" on all OPS® models is used to test the alarms, silence an alarm condition, or is left in the normal on position. The normal position of the mode is for normal operation of the plant and silence is a mode that will disrupt the alarm horn. Move the switch to the left and hold to test the alarm. The switch will reset itself automatically.

Test the low air pressure alarm. This alarm will be activated whenever the air pump fails to provide sufficient air to the diffuser assembly. To test this alarm, remove the air tubing from the barbed fitting on the electrical enclosure. This loss of air pressure should cause the alarm to signal. Silence the alarm and return the air pressure tubing to original position. Another simple check is to turn off the air pump momentarily; the loss of air pressure should cause the alarm to signal. If the alarm is not activated whenever air pressure is low, check alarms and replace light bulb or audible horn as required.

Test the plant's high-level float switch and alarm. If the system also includes a pump/holding tank to remove effluent, the **Hydro-Action**[®] electrical controls can be equipped with a second high-level alarm. Test one or both of these alarms by manually raising each float and holding it up until you can see and hear the alarms.

If installing OPS[®] models 50-30 set the timer. The timer setting is covered in the O&M manual.

Start-up Procedure

Initial start-up of the AP Series WWTP is very simple. No special procedures are required for bringing the plant online. The unit should be full of water from leak testing after installation. Inspect the components and parts prior to start-up. Turn on electrical power and inform the owner that the plant is operational and he or she may commence use. There is no need to seed the plant.

If the unit is to remain idle for a period of time, please inform the owner that the unit is operational and that the only requirement for starting the plant is to turn on electrical power and begin using the facilities. If any mechanical or electrical problems are experienced when attempting start-up, the owner should call the dealer for service and assistance in start-up of the plant.

Safety

Safety is an important issue in our business since we deal with one of the more potentially health hazardous materials known: raw sewage. Domestic wastewater carries in it members of a specialized group of life known as microorganisms. Such microorganisms are

bacteria, viruses, algae, actinomycetes, protozoa, fungi, rotifers, crustaceans, and other members of both the plant and animal worlds.

The function of a wastewater treatment plant is to treat the water to a degree that the effluent is relatively free of pathogenic bacteria and nuisance microorganisms. Until the wastewater entering the plant has had sufficient time for treatment and disinfection, it may contain any number of the harmful organisms that cause disease.

As raw wastewater may and usually does contain some level of unsafe microorganisms, proper respect and care must be given to safety. When coming into contact with raw sewage, **do not fear** the contact, but **do take proper precautions** to avoid potential danger.

Follow these simple safety precautions whenever exposed to wastewater:

- Wear disposable rubber gloves when handling wastewater contaminated items or chlorine tablets.
- Always wash with soap and water after handling any contaminated item. The use of good bactericide soap is strongly recommended.
- Always dispose of scum, rags, trash, debris, or soiled material in a proper waste container.
- If a wastewater spill or leak occurs in a yard, flush area with plenty of clean water and disinfect. If a spill or leak occurs in the house, clean with a dilute solution of bleach.
- Treated effluent from a **Hydro-Action**[®] or other treatment unit may still contain harmful microorganisms. Careful attention must be used when dealing with any form of wastewater or effluent.
- If an illness or disease is suspected to have come from exposure to sewage, get proper medical attention immediately.

When proper treatment is given the remedy and cure will be rapid and less of a problem.

There are some serious diseases that could be transmitted by contact with raw sewage -take the proper precautions and be safe!



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