

HYDRO-ACTION[®] **INDUSTRIES**

AK/HA Manufacturing LLC.

AP Series Wastewater Treatment Plant



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Hydro-Action AP Series Wastewater Treatment Plant

The AP Series Aerobic Treatment Units (ATUs) are now available through **Hydro-Action® Industries**. Please read this introduction before reviewing this manual.

Earth's environment has purified water through natural processes since the beginning of time. Only recently, beginning in the Twentieth Century, has man developed a system to accelerate the processes that Mother Nature uses. **Hydro-Action® Industries'** AP Series ATUs is just such systems.

In 1916, the City of Houston, Texas, was the first to use the activated sludge wastewater treatment process as an accepted, full-scale system process to purify domestic wastewater. Since that time, the United States and many other nations have utilized this process and variations to properly treat sewage. Federal Law 92-500 supports our nation's commitment to provide secondary treatment for all domestic wastewater.

This commitment is presently being extended to on-site sewage treatment facilities. **Hydro-Action® Industries** has been a visible part of this effort since 1989. We have manufactured numerous products to provide individuals with a means of proper, effective, efficient, and affordable on-site wastewater treatment. Our professional commitment to market needs and customer service have enabled us to reach our goal of providing effective products that assure a safe, reusable effluent. We are helping Mother Nature protect our environment and our most valuable natural resource: water.

Our continuing mission is to develop and manufacture individual on-site wastewater

treatment facilities that meet society's needs in the field. This manual is a part of that dedication to customer service.

Hydro-Action® Industries' AP Series Aerobic Treatment Units are among the most advanced on-site products available today. They are state-of-the-art extended aeration, activated sludge wastewater treatment facilities. The improvements in these units make them not only extremely efficient operational units but also the most easily maintainable system in the industry.

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 AP Series Treatment Units.

This manual includes information on the AP-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® Industries** dealer who installs your **Hydro-Action® Industries** AP Series wastewater treatment plant is responsible for completing and submitting to us the Installation Warranty Sheet found in this manual to properly activate your **Hydro-Action® Industries** Product Warranty.

Off-Loading & Unpacking Instructions

Off-loading Instructions:

1. Insure that the system is un-strapped from the delivery vehicle.
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.
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 for unpacking instructions.

Unpacking Instructions:

1. Remove all components that are shipped on loose pallets.
2. Inventory components, and inspect for damage during shipping. Pay special attention to the diffusers, drops, and diffuser weights 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. Close all covers and prepare tank to place online.

HYDRO-ACTION® AP SERIES WASTEWATER TREATMENT PLANT

INSTALLATION INSTRUCTIONS

To ensure proper installation of all components of the **Hydro-Action® Industries** AP Series wastewater treatment plant, please read and follow all instructions included in the following sections. The AP Series WWTP with OPS®

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

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 certification. See Off-loading and Unpacking Instructions for the **Hydro-Action® Industries** AP Series WWTP from its delivery means.

SECTION 1.0: Tank Installation

1.1: 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® Industries** 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 drawing.

1.2: 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 gradeable material in the bottom of the excavation to provide a solid flat base. Be sure bottom of excavation is level before lowering tanks.

1.3: When bottom of excavation is to grade, smooth, tamped and level, gently place all auxiliary tanks (if included) and plant into excavation. Eyebolts are provided on plant for this purpose. While lowering treatment plant into excavation, turn tank so four (4) inch building outlet plumbing aligns with four (4) inch SDR 35 inlet of treatment plant and the four (4) inch treatment plant discharge line aligns with effluent outfall plumbing.

1.4: 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.

1.5: 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.

1.6: 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 SDR 35 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.

1.7: Hydro-Action® Industries OPS® (operations/control center) installation can be accomplished at this time. Follow the instruction given in section 2.0, OPS® (Operations/Control Center) Installation.

1.8: Hydro-Action® Industries diffuser assembly installation can be accomplished at this time. Follow the instructions given in section 3.0, Anchored Diffuser Assembly Installation.

1.9: For installation below normal grades **Hydro-Action® Industries'** 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 **Hydro-Action® Industries** access 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.

1.10: 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.

1.11: Before installation is complete, the **Hydro-**

Action® Industries access cover and the Platform Mounted OPS® enclosure must be in place and the tamper-resistant screws, provided by **Hydro-Action® Industries**, 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 saturation (see Section 1.1).
- 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.

SECTION 2.0: OPS® (Operations/Control Center) Installation

2.1: Following are all parts needed to complete the installation of model AP-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 or with the above listed parts, call the **Hydro-Action® Industries** Customer Service Department at 1-800-462-6072 for assistance.

Item:

Quantity

1. AP Series Class I Aerobic WWTP 1 ea.
2. AP Series Hydro-Action® air pump..... 1 ea.
3. Airline seal gasket, 1" diameter 1 ea.
4. Air diffuser assembly w/3 sm. diffusers... 2 ea.
5. Airline drops, std. Length..... 2 ea.
6. Airline drops extension(s) 2 ea.
7. Airline drops retainer clamp..... 2 ea.
8. Airline drops anchor 2 ea.
9. Electrical enclosure 1 ea.
10. Air pressure-tubing kit 1 ea.
11. Effluent Tee assembly, 4" diameter 1 ea.

12. High-level alarm float 2 ea.
13. Unilet and coupling, ½" diameter..... 1 ea.
14. OPS® enclosure 1 ea.
15. OPS® base screws, 7" long 3 ea.
16. PVC airline header, ½" with fittings..... 1 ea.
17. Remote alarm box (optional)..... 1 ea.

Note: Refer to section 8.0, **Hydro-Action® Industries AP Series Plant Specifications**, for additional details.

2.1.1: The parts listed above include all the parts necessary for completion of the **Hydro-Action® Industries AP Series Class I Aerobic WWTP**. By following these simple instructions, your assembly of the AP Series unit will be completed in minimum time and with assurance of a properly functional unit.

2.2: 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.

2.3: Properly install the AP Series WWTP in the chosen site being sure that the plant is level and backfilled correctly. Assemble all the component parts per instructions in section 1.0, Tank Installation. 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.

2.4: If installing a Platform Mounted OPS® that has been shipped separately, remove OPS® enclosure and glue 5 5/8"-long ½" PVC pipe into airline coupling on platform. Set OPS® base on top of platform aligning airline hole with ½" PVC pipe. Align vapor and moisture sealing assemblies on OPS® base with pre-drilled gasketed holes in platform and push the four 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.

2.4.1: Glue 5 5/8"-long ½" PVC pipe to 90-degree PVC fitting that is connected to air pump.

2.4.2: Connect electrical jacketed SO cables from high-level float in plant and floats and pump (if included) in pump tank by using fishwire 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 fiberglass neck above the level of clarification cone, either directly above outlet or above clarification compartment. This keeps SO cables from interfering with removal of anchored diffuser assemblies. Connect cables through compression fittings into electrical enclosure as shown on electrical schematics for each model. See Appendix 2. **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.

2.5: 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.

2.6: 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 Appendix 2.

2.7: An optional remote alarm may be mounted on the exterior of a house or garage, if desired. This alarm, model EC-11, is equipped with audible and visible alarms.

2.8: When required, OPS® risers can be stacked below OPS® base. The OPS® enclosure is attached by four security screws. Do not kink cables inside OPS® when attaching the enclosure.

2.9: 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).

SECTION 3.0: Anchored Diffuser Assembly Installation

3.1: Remove anchored diffuser assemblies with attached flexible air hoses from OPS® shipping box or OPS® enclosure.

Note: Before installing flexible air hoses with anchored diffuser assemblies, air hoses and plant air header must be purged of all debris. This is accomplished by turning air pump on for a few minutes. Air hoses must be free of debris to ensure proper operation of the diffusers, check valve, and aeration system.

3.2: Connect air hose to air header tee by pushing hose securely onto barb fitting. Lower anchored diffuser assembly to bottom of aeration compartment through access opening.

3.3: Lift anchor a few inches off tank bottom and bring air hose into retainer clamp. Steady diffuser assembly and lower it to tank bottom, making sure that diffuser assembly rests outside circumference of access riser. See plant detail drawings. Secure retainer clamp. Allow minimum slack in the air hose. The air hose should not be supporting the anchor. When correctly installed, the anchor rests on the bottom of the tank with a light tension on the attached air hose at the point of the retainer clamp.

Note: Diffuser stones are to be replaced on the AP Series plants whenever the pressure reading at the Schrader valve on the discharge side of the air pump equals or exceeds a reading of 3.5 psig.

SECTION 4.0: Hydro-Action® Air Pump

4.1: Hydro-Action® air pump models are preinstalled in the OPS® (operations/control center). See section 2.0 for instructions on making electrical and airline connections to the air pump.

4.2: Located in Appendix 3 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 troubleshooting, operating, and maintaining the air pump.

SECTION 5.0: OPS® Controls/Alarm System Testing

5.1: The alarms supplied with this wastewater treatment plant provide the owner with a secure, reliable, dependable, 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.

5.2: 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.

5.3: The switch indicated “normal/silence” on OPS® models 50-11, 50-20, 50-30, & 50-32 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.

5.4: 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.

5.5: 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® Industries** 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.

5.6: If installing OPS® models 50-30 set the timer. The timer is a 24-hour time clock with 15-minute increment settings. The captive trippers change the SPDT 9 relay state when pushed toward the outside. This is a two-step process.

• **Setting time of day**

(a) Synchronize the timer by aligning arrow at the 2:00 position of inner face with the corresponding time of day printed on the outer ring.

Note: Power must be **on** to keep time synchronization.

• **Setting “on” time and duration**

Locate desired activation time(s) on outer ring (b) and push trippers to the outside (c). Each tripper represents 15-minutes activation time. Push as many trippers back as desired for duration time. When the timer reaches the first tripper, the timer SPDT contacts will change state and turn on. It will remain on for as long as the following trippers are pushed out. When timer goes past last tripper, the timer will return to the **OFF** mode. The timer has a selector for (d) **OFF (O)**, **AUTOMATIC (blank)** and **MANUAL OVERRIDE (I)** modes.

SECTION 6.0: Start-up Procedure

6.1: 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 earlier leak testing. After installation and checkout of the component parts, all that is required for start-up is to 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.

6.2: 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.

SECTION 7.0: Safety

7.1: Safety is an important issue when considering the nature of our business. We deal with one of the most potentially health hazardous materials known: raw sewage.

Domestic wastewater carries in it members of a specialized group of life known as microbes. Such microorganisms include 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 the 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.

7.2: 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.

7.3: Follow these simple safety precautions whenever exposed to wastewater:

- Always wash with soap and water after handling any contaminated item. The use of good bactericide soap is strongly recommended.
- Wear disposable rubber gloves when handling wastewater-contaminated items or chlorine tablets.
- 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.
- Protect any injury, wound, open cut, etc. from exposure to wastewater. Prevention is always better and easier than the curing of a disease.
- If an illness or disease is suspected of coming 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, be safe!

- Report all accidents relating to sewage exposure to the proper supervisory personnel.

SECTION 8.0: Hydro-Action® Industries AP Series Plant Specifications

Power Specifications by Pump Model

	Hi- Blow 100	Hi- Blow 120	Hi- Blow 150	Gast 1/4 HP	Gast 3/4 HP
Voltage (VAC)	120	120	120	115	115/220
Current (Amps)	1.55	2.1	2.1	3.9	7.8/3.9
Power (Watts)	186	252	252	120	120/560
Frequency (Hertz)	60	60	60	60	50
Flow (Cfm)	5.2	6.1	8.6	4.3	8.2
Max Pressure (Psi)	4.5	4.5	4.5	5.0	7.0

Design Flow by Model (Gallons Per Day)

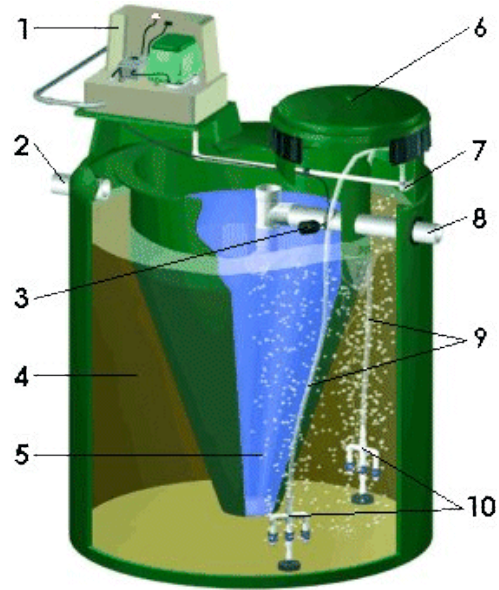
AP 500-----→500 Gal/Day
 AP 600-----→600 Gal/Day
 AP 750-----→750 Gal/Day
 AP 1000-----→1000 Gal/Day
 AP 1500-----→ 1500 Gal/Day

CBOD₅ (Pounds Per Day)

AP 500-----→1.25 Lbs/Day
 AP 600-----→ 1.5 Lbs/Day
 AP 750-----→ 1.88 Lbs/Day
 AP 1000-----→ 2.50 Lbs/Day
 AP 1500-----→ 3.75 Lbs/Day

Aeration Pump Choices by Model

AP 500--→(1) ¼ HP Rotary or (1) 100 Linear
 AP 600--→(1) ¼ HP Rotary or (1) 120 Linear
 AP 750--→(1) ¼ HP Rotary or (1) 150 Linear
 AP 1000→(1) ¾ HP Rotary or (2) 100 Linear
 AP 1500→(1) ¾ HP Rotary or (2) 120 Linear



AP Series System Components:

1. OPS® Control - Air and Alarms
2. Influent Inlet - from household
3. High-level Alarm Float
4. Mixing Chamber
5. Clarifier Chamber
6. Offset Service Access Riser
7. Air Deliver Header
8. Effluent Outlet - to disposal
9. Flexible Air Lines
10. Patented Triple Diffusers

AP Series Treatment Process:

Household waste (<250 CBOD₅) enters the system at the Influent Inlet (2) into the Mixing Chamber (4).

OPS Operations/Control Center (1) provides air from the air pump into the Air Header (7), through the Flexible Air Lines (9), exiting as fine bubbles through the Triple Diffusers (10).

Diffused air provides Dissolved Oxygen (DO) into the mixed liquor, promoting the growth of aerobic bacterial colony, and sets up mixing currents, agitating the mixed liquor.

Hydraulic action of the agitated mixed liquor causes digested mixed liquor to enter the Clarifier (5), where stillness and the slanted sides of the chamber cone promote the dropping out of remaining solids (TSS).

Clarified effluent is pushed through the system and out the Effluent Outlet (8) to the

chosen effluent dispersal method.

SECTION 9.0: Process Description

9.1: The **Hydro-Action® Industries** AP Series individual wastewater treatment plant is a self-contained, extended aeration, aerobic treatment facility utilizing the activated sludge process. The plant consists of a cylindrically shaped aeration tank with an offset service access, a unique cone shaped clarification compartment and an outlet tee-assembly. Two fine-bubble air diffuser assemblies with ceramic stone diffusers and **Hydro-Action® Industries'** efficient air pump are combined to provide effective, efficient, and economical aeration.

9.2: Domestic wastewater enters the aeration compartment and is mixed thoroughly with the already present mixed liquor suspended solids (MLSS) activated sludge. The injection of air through the porous ceramic air diffusers placed near the bottom of the aeration chamber is responsible for this complete mixing. The fine bubble diffusers and the vortex area between diffuser assemblies produce a high magnitude of air diffusion and therein provide ample mixing and a more than generous quantity of dissolved oxygen to maintain the aerobic environment even under extreme conditions.

9.3: Hydraulic displacement causes the mixed liquor to enter the clarification compartment and move upward toward the outlet tee-assembly. Due to the calm conditions in the clarifier, suspended solids settle to the bottom where they are remixed with the Mixed Liquor Suspended Solids (MLSS) for additional biological treatment. The remaining clarified effluent leaves the plant via the outlet tee assembly and discharge line.

9.4: The AP Series plant is operated by the new OPS® (operations/control center). The OPS® integrates the electrical controls, visible and audible alarms, and linear air pump in a protective polyethylene enclosure. The OPS® can be either platform mounted on the plant or remotely located. These features plus offset service access and flexible airhose anchored diffuser assemblies make the plant extremely reliable and easy to service and install. An additional optional alarm may be used to locate visible and audible alarms at a remote location.

9.5: The technology used in the **Hydro-Action® Industries** plant allows it to produce excellent effluent quality which thereby meets all NSF International Standard 40 Class I and

the Environmental Protection Agency's requirements of a secondary treatment process. NSF requires that a Class I plant shall be shown to meet EPA secondary treatment guidelines for BOD5, TSS, and pH. The **Hydro-Action® Industries** AP Series satisfies all these requirements.

Appendix 1: Drawings

- 1) AP Series PVC Air Header Tee Assembly
- 2) AP Series Schrader Air Pressure Valve & Pressure Gauge
- 3) AP Series Hydro-Action® Industries Air Pumps
- 4) AP Series WWTP Installation Details
- 5) AP Series OPS® Data Plate
- 6) AP Series Data Plate
- 7) Model AP Series Anchored Diffuser Assembly
- 8) AP Series 6" Riser
- 9) AP Series WWTP Process Flow Diagram
- 10) AP-500, AP-600, AP-750 Plant Detail
- 11) AP-1000G, AP-1500G Plant Detail
- 12) OPS® Models 50-30 & 50-32 timer

Appendix 2: Electrical Schematics

Model 50-11 Electrical Schematic EC-11/CP-11
Models 50-20 Electrical Schematic CP-20/EC-20
Models 50-30 Electrical Schematic CP-30/EC-30
Models 50-32 Electrical Schematic CP-32/ EC-32

Appendix 3: Installation & Service Checklists

Installation Checklist
Service Checklist

Appendix 4: Linear & RV Manuals

Hi-Blow Linear Air Pump Compressor
Gast Rotary Vane Air Pump Compressor

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