

norweco[®]

HYDRO-KINETIC[®]

WASTEWATER TREATMENT SYSTEM WITH SERVICE PRO[®] CONTROL CENTER

MODELS 600 AND 600 FEU OWNER'S MANUAL

INTRODUCTION

The Hydro-Kinetic system is the finest wastewater treatment technology available. It is a sound investment that protects you and the environment. Please take the time to familiarize yourself with the contents of this manual.

HOW THE SYSTEM WORKS

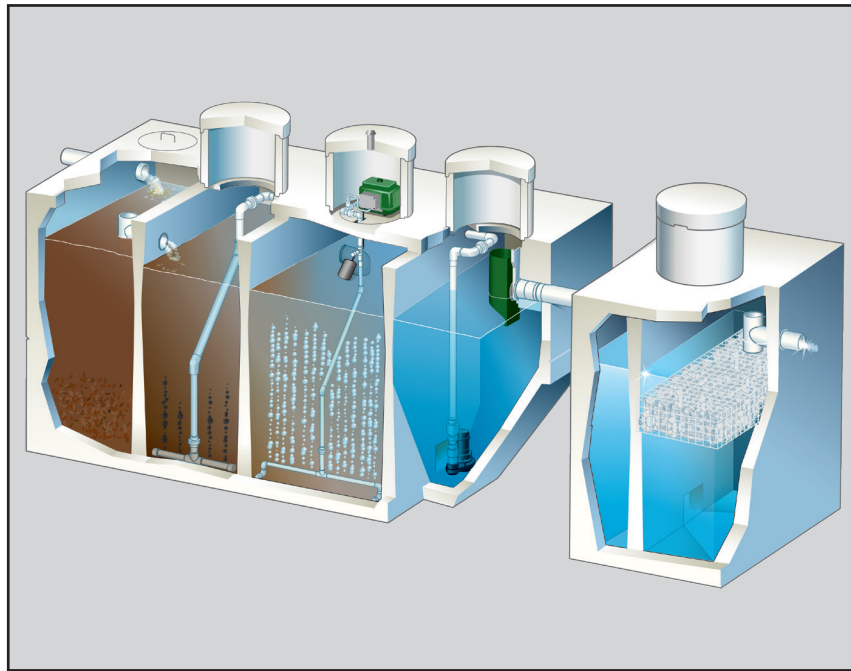
Developed to serve homes and small businesses outside of city sewers, the Hydro-Kinetic system uses the extended aeration process to treat wastewater and features innovative nitrification-denitrification technology.

Wastewater enters the pretreatment chamber where gravity combines with anaerobic bacterial action to precondition the waste before it flows into the anoxic chamber. Once in the anoxic chamber, facultative anaerobes digest organic matter. Flow then enters the aeration chamber where aerobic bacteria biologically convert the waste into stable substances and oxidize ammonia into nitrite and nitrate. Following aeration, liquids flow to the clarification chamber where gravity settles out biologically active material. A recirculation pump in the clarifier transfers a portion of the wastewater back to the anoxic chamber where nitrogen compounds are converted to harmless nitrogen gas which escapes into the atmosphere. From the clarifier, treated liquids pass through the flow equalization device and into the disposal system. In the Model 600 FEU, effluent passes through the Hydro-Kinetic Bio-Film Reactor, treating the liquid to a near pristine state. As a result, complete pretreatment, aeration, clarification, denitrification and effluent polishing are assured. The Hydro-Kinetic system reliably protects you, your property and the environment.

FEATURES AND ADVANTAGES

All Hydro-Kinetic tanks are constructed of reinforced precast concrete or high-density polyethylene (HDPE). Internal walls and baffles are cast-in-place or integrally molded to insure uniformity and strength. Risers and covers are either precast concrete, HDPE or heavy duty, glass-filled polypropylene. All components that will contact the wastewater are constructed entirely of molded plastic, stainless steel, cast iron or rubber.

The Model A100 air pump has been designed specifically for the Hydro-Kinetic system. Delivering a continuous supply of air to insure proper mixing and oxidation of the organic material, this 100 watt air pump uses 50% to 78% less energy than most major appliances. The recirculation pump operates on a preset run cycle to assure proper system operation.



The treatment system is supplied with a prewired electrical control center contained in a NEMA rated enclosure. The control center contains a power switch and factory programmed logic to monitor and control air pump and recirculation pump operation. The

local distributor's name, address and telephone number are displayed on the control center cover. All system controls and necessary owner information are conveniently located at your fingertips.

Non-mechanical flow equalization is provided in the clarifier by the patented flow equalization device. Effluent polishing, ultraviolet disinfection and chemical treatment are available options. All Hydro-Kinetic components work together to assure complete pretreatment, aeration, clarification, denitrification and effluent polishing.

SYSTEM PERFORMANCE

The Hydro-Kinetic Model 600 FEU treatment system is the first and only wastewater treatment technology to complete two consecutive NSF/ANSI Standard 40 and 245 certifications without routine service. The Model 600 without the Hydro-Kinetic Bio-Film Reactor is rated Class I, averaging effluent of 4.0 mg/L CBOD and 7.0 mg/L TSS the first 6 month evaluation. The second 6 month averages are 4.0 mg/L CBOD and 7.0 mg/L for an overall 12 month test average of 4.0 mg/L CBOD and 7.0 mg/L TSS.

In ecologically sensitive areas, the most stringent effluent standards are 10 mg/L CBOD, 10 mg/L TSS and 10 mg/L TN. The Model 600 FEU system with Hydro-Kinetic filter is also rated Class I, averaging of 2.0 mg/L CBOD, 2.0 mg/L TSS and 8.7 mg/L TN for the first 6 month evaluation. The second 6 month averages are 1.8 mg/L CBOD, 1.6 mg/L TSS and 7.05 mg/L TN, for an overall 12 month test average of 2.0 mg/L CBOD, 2.0 mg/L TSS and 7.9 mg/L TN.

OPERATIONAL REQUIREMENTS

The Hydro-Kinetic system is designed to treat only domestic wastewater. Domestic wastewater is defined as the waste generated from a typical residence. This includes flows originating from: bathtubs, clothes washers, dishwashers, drinking fountains, water coolers, food grinders, kitchen sinks, lavatories, mop basins, service sinks, shower stalls, sinks, wash sinks, water closets and whirlpool baths. While the use of bio-degradable detergents is recommended, the Hydro-Kinetic system has been designed to handle any reasonable amount of bathroom, kitchen or laundry waste. However, some care should be exercised to insure that non-biodegradable and/or toxic materials are not disposed of via the domestic wastewater plumbing. Do not use the plumbing system for disposal of lint, cooking grease, scouring pads, diapers, sanitary napkins, cotton balls, cotton swabs, cleaning rags, dental floss, strings, cigarette filters, rubber or plastic products, paints and thinning agents, gasoline, motor oil, drain cleaners or other harsh chemicals. These items could plug portions of the plumbing and/or adversely affect system performance. Never connect roofing down spouts, footer drains, sump pump piping, garage and basement floor drains or water softener backwash to the domestic wastewater plumbing or the treatment system. Water softener backwash will interfere with biological treatment and must be disposed of separately.

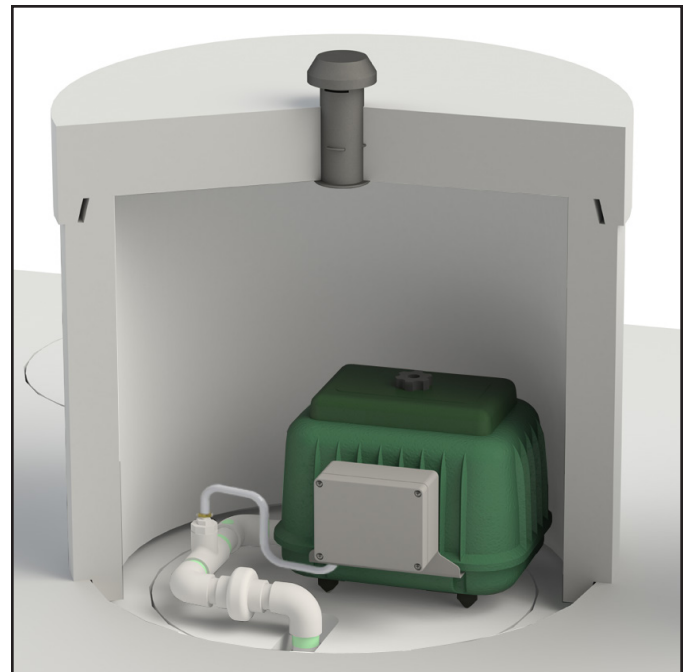
ELECTRICAL REQUIREMENTS

Each Hydro-Kinetic system must be wired to a dedicated 115 volt, single phase circuit at the main electrical service panel. A 15 amp circuit is recommended (10 amp minimum). A pictorial wiring diagram is provided inside the control center enclosure. All electrical work must be performed in accordance with the requirements of the National Electrical Code and all applicable local codes. Electrical connections should be made only by a qualified electrician following proper procedures and using safe tools.

CAUTION: Any time service is required, first shut off the dedicated circuit breaker in the main electrical service panel. Next, shut off the power switch in the Service Pro control center. Failure to do so could result in personal injury or equipment damage.

MODEL A100 AIR PUMP

The Model A100 air pump has been specifically designed for use in the Hydro-Kinetic treatment system and includes impact-resistant rubber diaphragms and valves to prolong air pump life. The unique design provides excellent cooling and quiet operation. The Model A100 air pump can be remotely mounted or installed in the access riser above the aeration chamber. Fresh air enters the air pump through a filter located under the cover of the pump housing. The air is introduced below the liquid surface through a prefabricated diffuser assembly. Only the plastic diffuser assembly and the air piping are submerged. Each Model



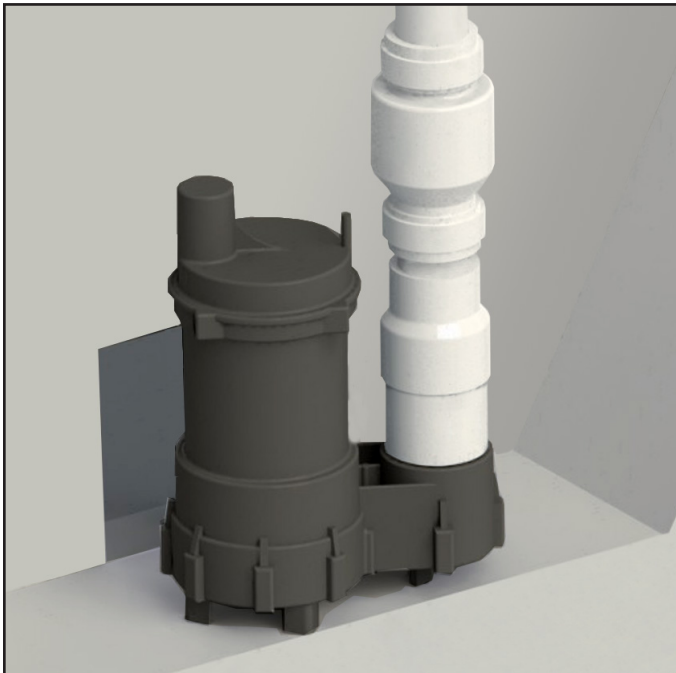
A100 air pump is a precision engineered electro-mechanical device. Do not remove it from its installed position. Do not attempt any type of repair. Contact your local Hydro-Kinetic distributor if service is needed. Unauthorized tampering or repair of the air pump will void important provisions of the two year limited warranty.

FRESH AIR VENTING SYSTEM

A fresh air vent assembly is cast into the concrete access cover above each air pump, or designed into the perimeter of the polypropylene lid. The perimeter vent or assembly supplies fresh air to the air pump, which is delivered through the diffuser assembly and into the wastewater. Finished landscaping should be maintained six inches below the top of the vented access cover and graded to drain runoff away from the cover. Do not allow plants, shrubbery, mulch or landscaping of any type to restrict the flow of air to the vent assembly or obstruct the access cover.

MODEL SD103 RECIRCULATION PUMP

The Model SD103 recirculation pump includes a durable electric motor and corrosion resistant pump housing. The pump features a 2" discharge connection and is capable of handling up to $\frac{3}{4}$ " solids. Permanently lubricated ball bearings insure quiet operation and long life. The recirculation pump is installed in the bottom of the clarification chamber and delivers liquid to the anoxic chamber through a prefabricated mixing bar assembly. Each Model SD103 pump is a precision engineered electro-mechanical device. Do not remove it from its installed position. Do not attempt any type of repair. Contact your Hydro-Kinetic distributor if service is needed. Unauthorized tampering or repair of the recirculation pump will void important provisions of the two year limited warranty.

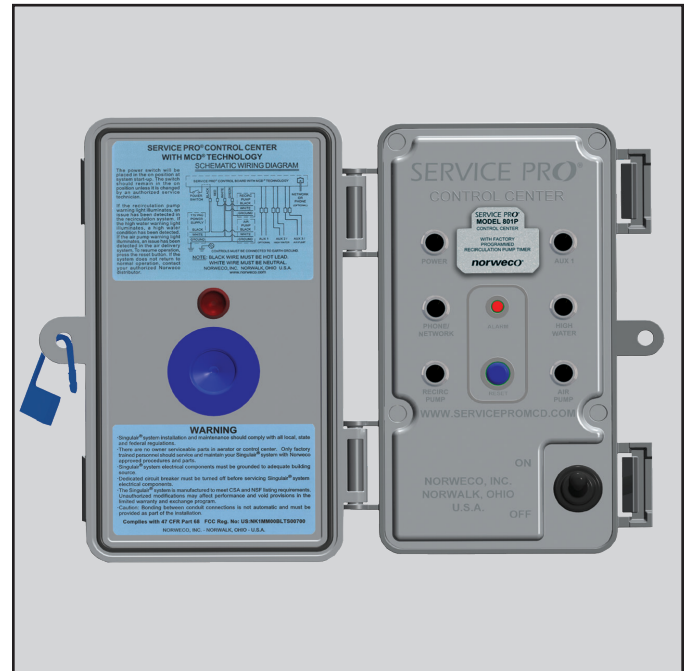


SERVICE PRO® MODEL 801P CONTROL CENTER

The system includes a prewired Service Pro Model 801P control center with MCD technology to permit fully automatic operation. The control center is UL listed and provides MONITORING, COMPLIANCE and DIAGNOSTIC functions complete with telemetry, cellular transmission or network connection to communicate with the Service Pro remote monitoring center. If recirculation pump operation has been interrupted, the Model 801P control center will activate the visual alarm and attempt to restart the pump every five minutes for two hours. If the pump does not restart after two hours, the audible alarm will sound. If an air pump, high water or auxiliary alarm condition occurs, both visual and audible alarms will activate. When the system is covered by a Service Pro monitoring agreement, the distributor will be automatically notified and the alarm condition will be displayed on the monitoring center website, www.servicepromcd.com. Each control center is factory preset to run the recirculation pump at the proper interval. This programmed time cycle insures that the correct dose is delivered to the anoxic chamber for denitrification.

SERVICE PRO® MONITORING CENTER

When connected to a telephone line, cellular transmission device or network cable, the control center will automatically notify the Service Pro monitoring center of any service required to the treatment system or accessory components.

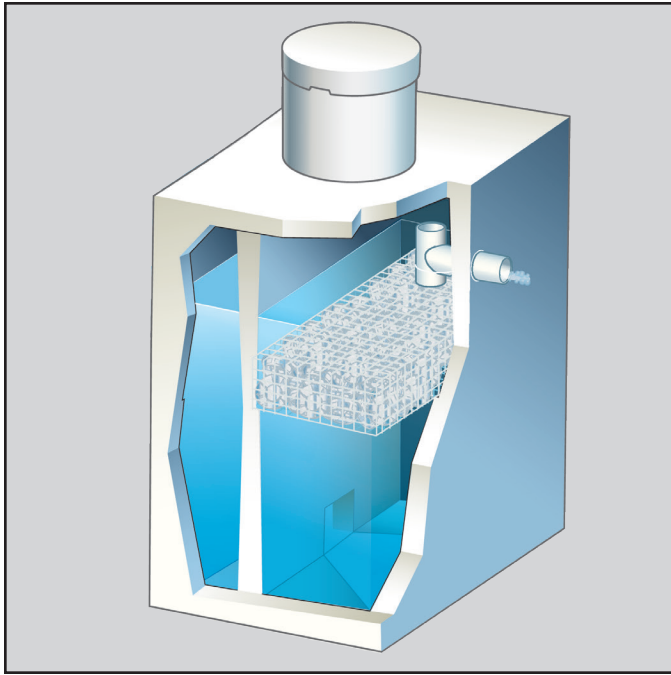


The monitoring center automatically records the time and date of any alarm condition, as well as service performed, and posts this information to your system's history record accessible at www.servicepromcd.com. All information regarding your system is available to you on the secure, password protected Service Pro website. Contact your Hydro-Kinetic distributor for your user name and password.

NOTE: If using a telephone line, the control center regularly communicates with the monitoring center via a toll free number. If the control center is using the line when you attempt to place a call, a high pitched digital communication signal will be heard. Hang up all telephones sharing the line and wait a few seconds. This will automatically disconnect the control center and make the line available for use.

NON-MECHANICAL FLOW EQUALIZATION

The Hydro-Kinetic system provides non-mechanical flow equalization for the treatment process. Equalization reduces hydraulic surges (e.g. typical shower of 10 minutes duration, bathtub discharge of 5 minutes duration, clothes washer discharge of 2 minutes duration and dishwasher discharge of 2 minutes duration) throughout the system. The flow equalization causes wastewater to be held upstream of the final outlet during hydraulic surges, which preserves treatment integrity and enhances system operation. The actual rate of equalization varies and depends upon specific loading patterns and the duration of each flow surge. At the Standard 40/245 design loading pattern, the system equalizes all flow an average of 50%. As a result, hydraulic surges and periods of high flow are automatically reduced on a demand use, as needed, basis.



HYDRO-KINETIC BIO-FILM REACTOR®

A Hydro-Kinetic Bio-Film Reactor is included with the Model 600 FEU system. Proven in a 12 month NSF/ANSI Standard 40/245 evaluation, this innovative, non-mechanical device reduces CBOD and TSS by up to 75%. Flow equalized liquid from the clarifier enters the influent chamber, travels down and is evenly distributed beneath the filtration media. As liquid travels up through the proprietary attached growth media, further reduction of the organic matter takes place. After passing through the Bio-Film Reactor elements for final polishing, the highly treated liquid flows into the final effluent zone before exiting the Hydro-Kinetic Bio-Film Reactor and being safely returned to the environment. The Hydro-Kinetic Bio-Film Reactor is the most simple and efficient final polishing device to insure compliance with the most stringent regulations.

AT 1500 ULTRAVIOLET DISINFECTION SYSTEM

If local regulations require, the AT 1500 ultraviolet (UV) disinfection system can be installed to meet strict water quality standards. The Model AT 1500 is the only UV treatment system listed by Underwriters Laboratories to Standard UL 979 for residential applications. All electrical components are contained in a NEMA 4X weatherproof enclosure which incorporates a built-in safety interlock switch to disable power and prevent UV exposure. The dual-pass contact chamber design insures treatment integrity, rendering bacteria completely harmless by the reliable performance of the AT 1500 system.

CAUTION: *Ultraviolet rays can cause permanent eye and skin damage. UV blocking safety glasses and protective clothing must be worn during installation, service or any time the bulb may be illuminated. Do not modify or bypass the safety interlock switch. Disconnect power prior to service.*

PHOS-4-FADE® FILTER

If local regulations require, a Phos-4-Fade filter can be installed to meet strict phosphorus removal standards. Proven in both the 12 month NSF and the 12 month BNQ evaluations, this innovative, non-mechanical device reduces phosphorus levels to less than 0.3 mg/L. Flow equalized liquid from the Hydro-Kinetic system enters the influent chamber, travels down and is evenly distributed beneath the filtration media. As liquid travels up through the media, removal of phosphorus by adsorption takes place. After passing through the media zone, the highly treated liquid flows into the final effluent zone before exiting the filter and being safely returned to the environment.

ACCESS RISERS AND COVERS

Concrete access covers are recommended and must be secured after each service visit. A concrete plug should be installed in the access openings of the tank to prevent accidental entry. Access covers should be inspected during service visits and replaced as necessary. If plastic risers and/or covers are utilized, they must be approved for your application and secured as instructed by the manufacturer. Refer to state and local regulations for applicable codes that may apply to your installation.

DANGER: *Make sure your service provider does not leave access risers uncovered or partially covered. Failure to properly secure access covers and safety nets could result in bodily injury, illness or death. Do not allow children to play on or around the treatment system. Riser safety nets are available from Norweco for concrete or plastic risers.*

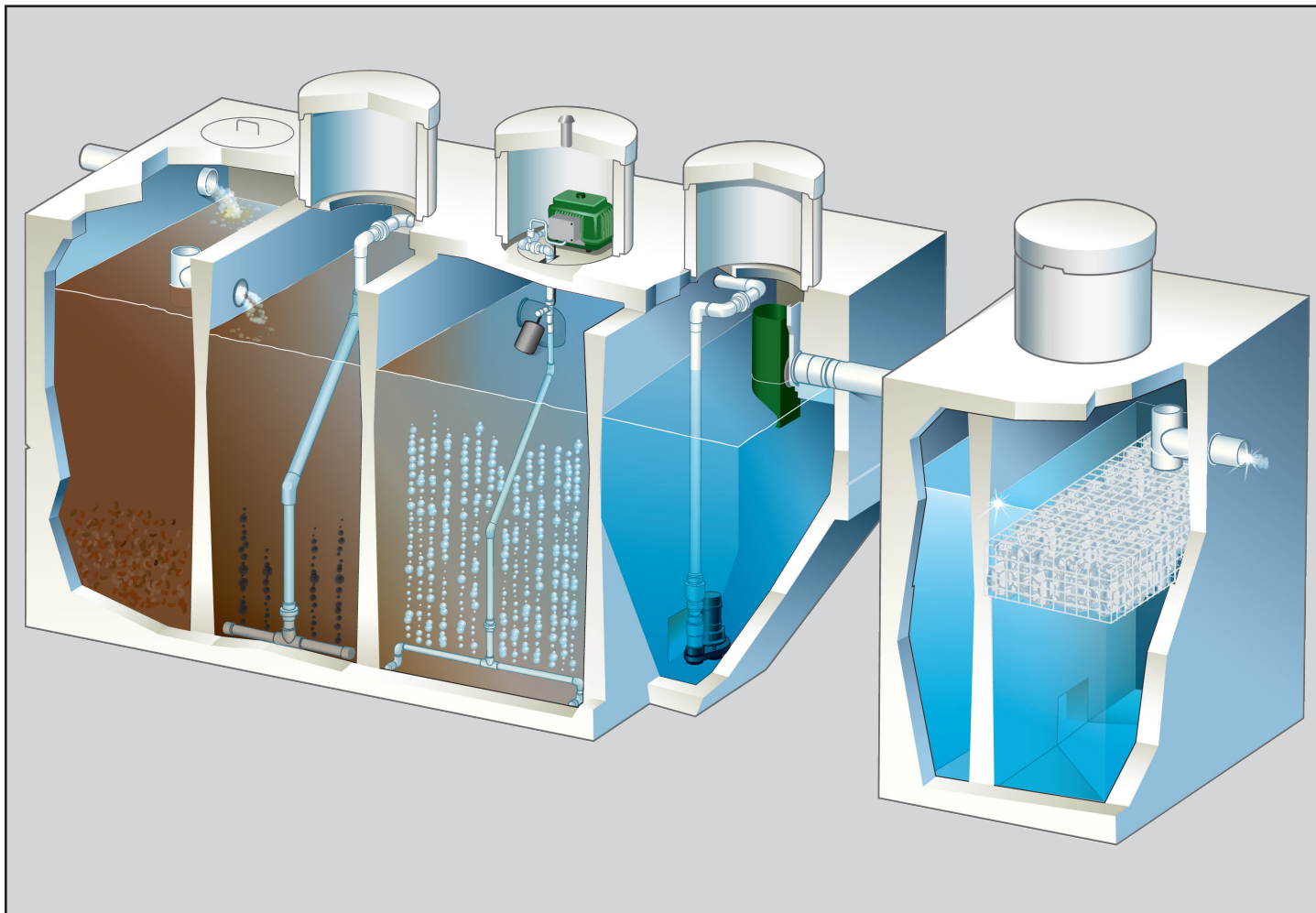
NO OWNER MAINTENANCE

The Hydro-Kinetic system should be inspected and serviced by a qualified service provider, therefore, no owner maintenance is required during the warranty period. The system does not use a septic tank and therefore is not regulated by septic tank maintenance requirements. How often pumping is necessary depends on system use. The local distributor will inspect the system during the warranty period to determine if pumping is required. Pumping will normally be required at three to five year intervals. Contact your local distributor prior to pumping for complete instructions. A properly licensed tank pumping service must be used for removal and disposal of tank contents. The tank pumper should consult with local authorities to determine the proper disposal method. **NOTE:** *Make sure the system is refilled to capacity with clean water after pumping.*

If a period of intermittent use or an extended period of non-use of the system is anticipated, contact your service provider for instructions. Your service provider has detailed system service instructions and has been factory-trained in troubleshooting procedures. Contact your service provider if you require service or tank pumping information.

HYDRO-KINETIC® SERVICE PROGRAM

Service inspections, performed every 12 months (or as required by your local governing regulations) for the first two years of system operation, are provided by your local Norweco distributor and are included in the original purchase price of the Hydro-Kinetic system. Costs for travel and labor are not charged to the owner. During an inspection, the Model A100 air pump, Model SD103 recirculation pump and other plant components are serviced as outlined in the Hydro-Kinetic Service Instructions. After the initial two year service program is completed, the local service provider will offer continued service at the owner's option. In many areas, this continuing service agreement is required by the local regulatory agency. The service program should be renewed by the owner to insure maximum system performance.



Ask your Hydro-Kinetic service provider about a renewable service contract. If you allow service coverage to expire, you can still obtain the professional assistance of a local service provider. However, these special service calls will be performed on a time and materials basis. Professional service is important to proper system operation and should not be allowed to lapse. Be sure to consider the advantages of a renewable service contract.

The Hydro-Kinetic service provider will perform the following services during each service inspection:

- | | |
|--|---|
| ✓ Inspect pretreatment chamber | ✓ Clean flow equalization device |
| ✓ Check air pump operation | ✓ Inspect effluent quality |
| ✓ Check air pump power consumption | ✓ Inspect all transfer ports |
| ✓ Check air pump diaphragms | ✓ Inspect outlet line |
| ✓ Check air pump intake filter | ✓ Inspect optional Hydro-Kinetic Bio-Film Reactor |
| ✓ Check diffuser | ✓ Check optional disinfection system |
| ✓ Clean fresh air vent in aeration cover | ✓ Inspect ground water relief point |
| ✓ Check recirculation pump operation | ✓ Inspect effluent disposal system |
| ✓ Check recirculation pump power consumption | ✓ Complete 3-part service record |
| ✓ Check mixing bar | ✓ Hang owner's record on front door |
| ✓ Check operation of control center | ✓ Enter record into www.servicepromcd.com |
| ✓ Scrape the clarification chamber | ✓ Mail health department notification |

WARRANTY REGISTRATION

A Warranty Registration Card for the Hydro-Kinetic system was attached to the Model A100 air pump before it was shipped from the factory. If this card has not been returned to Norweco, complete and mail it immediately. If it is not returned within thirty days of the installation date, the two year limited warranty will begin on the date of component shipment from the factory.

Remove the Hydro-Kinetic system record card and store it in a safe location with this Owner's Manual for future reference. If it is necessary to call your service provider for service, make note of the information on the control center data plate and the air pump serial number before calling. Warranty and service records are cross-indexed by owner name, air pump serial number or control center serial number. Supplying the air pump serial number and control center serial number with the service request will give the service provider a ready reference so that changes in system ownership will not delay service.

TWO YEAR LIMITED WARRANTY

The Hydro-Kinetic system components are backed by a two year limited warranty. Each Model A100 air pump, Model SD103 submersible recirculation pump, Service Pro Model 801P control center and any other components manufactured by Norweco, are warranted to be free from defects in material and workmanship, under normal use and service, for a period of two years from the date of purchase. The two year limited warranty is included in the original purchase price of every Hydro-Kinetic system. If the air pump, recirculation pump or Service Pro control center fails, do not use or dismantle the unit. Do not remove it from its installed position. Do not attempt any type of repair. Unauthorized tampering or repair will void important provisions of the limited warranty. The local, licensed Hydro-Kinetic dealer or service center has detailed warranty information and should be contacted for service or replacement instructions.

SERVICE PRO® SECURITY LOG IN

For your convenience, record your www.servicepromcd.com access information here:

User name:	Password:
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SUPPLEMENTAL SERVICE RECORD

For your reference, please document service performed on the following chart:

DATE	DESCRIPTION

norweco®

*Engineering the future of water
and wastewater treatment*

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