



SINGULAIR GREEN® BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

MODELS 960 AND TNT WITH SERVICE PRO® CONTROL CENTER

OWNER'S MANUAL

INTRODUCTION

The Singlair Green unit is the finest system available and utilizes the most up-to-date wastewater treatment technology. 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 SINGULAIR GREEN® SYSTEM WORKS

Developed to serve homes and small businesses beyond the reach of city sewers, the Singlair Green system employs the extended aeration process. Similar to the treatment method used by most municipal wastewater treatment facilities, this process involves a natural, biological breakdown of the organic matter in wastewater.

Wastewater enters the pretreatment chamber where anaerobic bacterial action combines with the effects of gravity to precondition the waste before it flows into the aeration chamber. Once in the aeration chamber, aerobic bacteria utilize the organic matter in the wastewater to biologically convert the waste into stable substances. Following aeration, flow is transferred to the clarification chamber where the effects of gravity settle out biologically active material. The Bio-Static sludge return, located in the clarification chamber, creates hydraulic currents that gently transfer settled particles back to the aeration chamber. As clarified liquids pass through the Bio-Kinetic system, they are filtered, settled and flow equalized. As a result, complete pretreatment, aeration, clarification and final filtration are assured. The Singlair Green system reliably protects you, your property and the environment.

FEATURES AND ADVANTAGES

Singlair Green tanks are constructed of rotationally molded, UV stabilized, high density polyethylene. Integrally molded treatment chamber walls and structural support ribs insure durability and maximum strength. Risers and lids are injection molded, heavy duty, glass-filled polypropylene. All components within the system that will contact the wastewater are constructed entirely of molded plastic, stainless steel or rubber.

The Singlair aerator is powered by a 1725 RPM, 115 volt, 60 hertz, single phase, fractional horsepower motor. It is the only electrically powered component in the Singlair Green

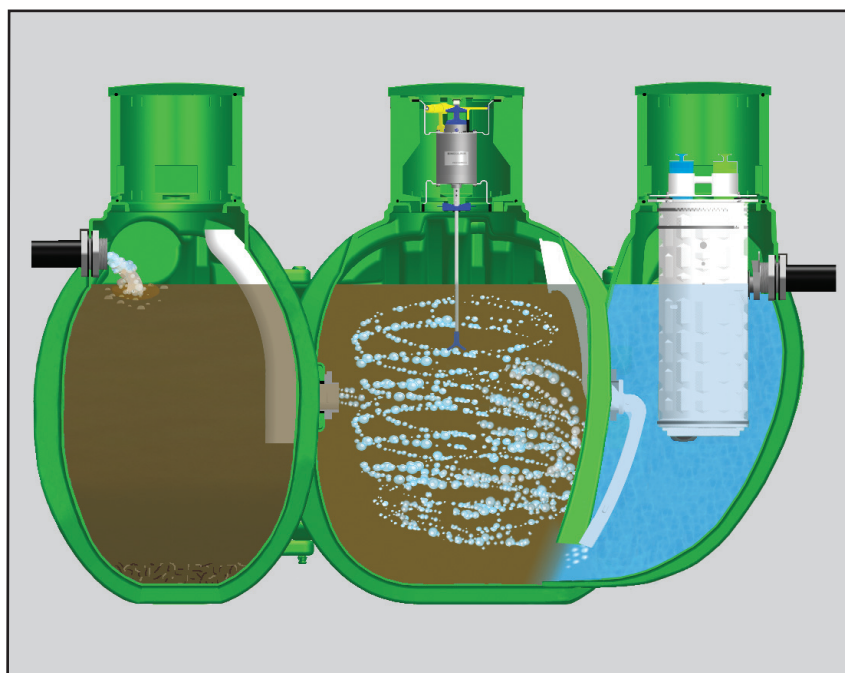
system. The aerator has been designed specifically for use in the Singlair system. It costs less to operate and consumes fewer kilowatt hours of electricity than most major appliances.

The Singlair aerator is supplied with a prewired electrical control center contained in a NEMA rated enclosure. The control center contains a power switch and time clock that control aerator operation. The local dealer'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 and final filtration is accomplished within the Singlair Green tank by the Bio-Kinetic system. This revolutionary device is installed in the clarification chamber and connected to the system outlet. Optional chlorination and dechlorination may be included in the Bio-Kinetic system if required. All Singlair Green components work together to assure complete pretreatment, aeration, clarification and final filtration.



SINGULAIR GREEN® SYSTEM PERFORMANCE

Rivalling the performance of the most advanced wastewater treatment plants in the world, the Singulair Green system complies with USEPA wastewater treatment guidelines for secondary treatment systems and meets all requirements of NSF/ANSI Standards 40 and 245. In ecologically sensitive areas, the most stringent effluent standards are 10 mg/L CBOD and 10 mg/L TSS. Rated Class I after successfully completing the 7 month Standard 40 test protocol, the Model 960 system averaged effluent of 6 mg/L CBOD and 10 mg/L TSS. The Model TNT system averaged effluent of 4 mg/L CBOD, 9 mg/L TSS and 12 mg/L Total Nitrogen.

OPERATIONAL REQUIREMENTS

The Singulair Green 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 Singulair Green 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, interfere with biological treatment, accumulate in the treatment system and 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

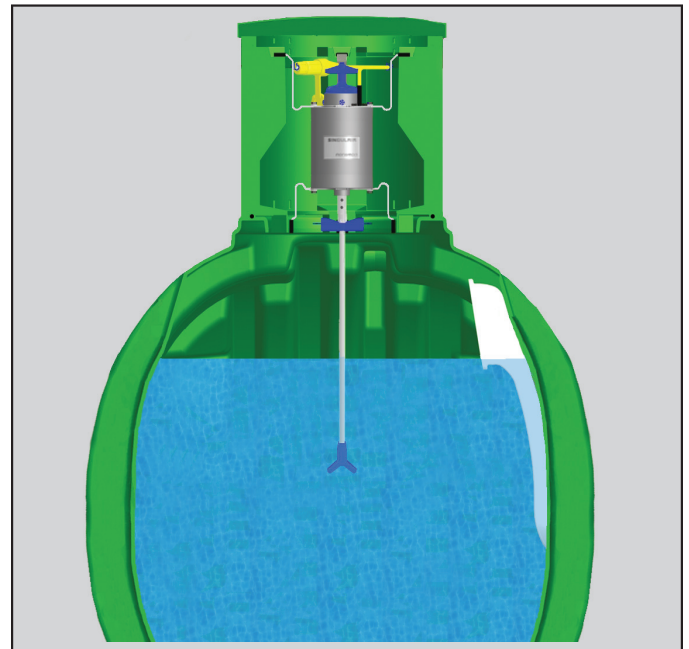
The Service Pro control center must be wired to a dedicated 115 VAC, single phase circuit at the main electrical service panel. A 15 amp circuit is recommended (10 amp minimum). A pictorial wiring diagram is provided inside the control center enclosure. All electrical work must be performed in accordance 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.

SINGULAIR® AERATOR

The aerator has been specifically designed for use in the Singulair system and includes special alloy and molded plastic parts to prolong aerator life. Aerator bearings are pre-lubricated and sealed. The Singulair aerator is installed in a plastic mounting riser above the aeration chamber. Fresh air enters the aerator through four intake ports located under the aerator handle. Air is drawn down the hollow aspirator shaft where it is introduced below the liquid surface. Only the molded plastic aspirator and the lower portion of the stainless steel aspirator shaft are submerged.

The aerator is not designed to run under water and will automatically shut off if a high water condition occurs. If the liquid rises to the level of the foam restrictor, the control center will shut off power to the aerator. Next, an automatic diagnostic sequence begins, as outlined in the section titled Service Pro Control Center.



The Singulair aerator 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 dealer if service is needed. Unauthorized tampering or repair will void important provisions of the lifetime warranty and exchange program.

FRESH AIR VENTING SYSTEM

A fresh air vent is designed into the perimeter of the access cover above the Singulair aerator. The perimeter vent supplies fresh air to the aerator, which is drawn through the aspirator 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 obstruct the vented access cover or allow plants, shrubbery, mulch or landscaping of any type to restrict the flow of air to the perimeter vent.



SERVICE PRO® CONTROL CENTER

To permit fully automatic operation, prewired electrical controls are supplied in a sealed NEMA rated enclosure for your safety and the protection of components and wiring. The control center should be located so the red warning light can be seen and the audible alarm heard, while minimizing exposure to harsh weather or conditions that might prevent routine access. If an issue with the aerator is detected, the red alarm light will flash and the control center will attempt to restart the aerator every five minutes for two hours. For an open motor or under current condition, the alarm light will display a repeating pattern of two short flashes followed by a three second pause. For an over current condition, the alarm light will flash evenly until serviced. If the aerator does not restart after two hours, the audible alarm will sound. To silence the audible alarm and attempt to restart the aerator, push the reset button on the control center cover. This should allow the aerator to resume normal operation. If the alarm condition is not resolved, the audible alarm will be silenced for 48 hours, but the alarm light will continue to flash. In this case, contact your local Singulair Green dealer.

TIME CLOCK

The control center for the Model TNT system is supplied with a non-adjustable time clock. The non-adjustable time clock creates a 60 minute aeration cycle followed by a 60 minute anoxic cycle during which the aerator is off. All other control centers are supplied with an adjustable time clock that determines the operating cycle of the aerator. The time clock will not permit the aerator to run less than 30 minutes out of each hour and is adjustable in five minute increments up to continuous operation. The performance of the Singulair Green system has been certified to meet NSF/ANSI Standard 40 effluent quality requirements and USEPA secondary treatment guidelines at the minimum time clock setting. The time clock is factory preset and should not be adjusted by the owner. Your factory-trained Singulair Green dealer will make necessary adjustments under the specific direction and authorization of the local regulatory agency.

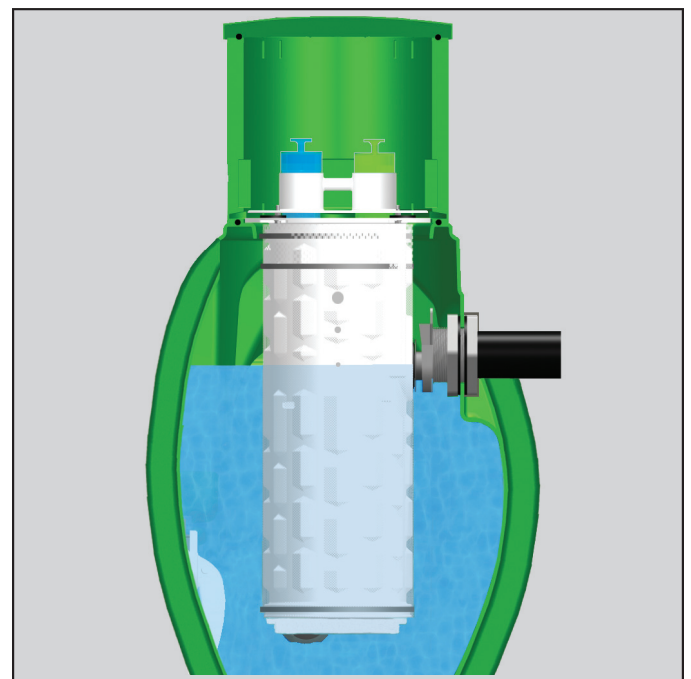
NOTE: The control center may regularly communicate with the Service Pro monitoring center using your telephone line and a toll free number. If the control center is using the line when you attempt to place a call, a high pitched digital communication signal will be heard. Hang up all telephones sharing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

BIO-STATIC® SLUDGE RETURN

A Bio-Static sludge return is installed in the aeration/clarification chamber wall. Aeration chamber hydraulic currents enter the sludge return and transfer solids from the clarification chamber back to the aeration chamber for additional treatment. The Bio-Static sludge return accomplishes resuspension and return of settled solids without disturbing the contents of the clarification chamber.

BIO-KINETIC® SYSTEM

The Bio-Kinetic system provides non-mechanical flow equalization through all plant processes. The Bio-Kinetic system contains 3 separate filtration zones, 8 independent settling zones, optional chlorination and dechlorination tablet feed systems and serves as its own chlorine contact chamber. When used with Blue Crystal residential disinfecting tablets, the performance of the Bio-Kinetic system as a chlorine dispenser is certified to NSF/ANSI Standard 46, Section 11. All components are manufactured from plastic or rubber. The Bio-Kinetic system is equipped with fill and drain valves which facilitate service to the filter. Your local dealer has the necessary training, tools and equipment for removal and cleaning. If your Bio-Kinetic system is in need of service, contact your local Singulair Green dealer. During each semi-annual service inspection, your local dealer will remove and clean the Bio-Kinetic system or replace it with a unit from their service stock.



NON-MECHANICAL FLOW EQUALIZATION

The patented design of the Bio-Kinetic system provides non-mechanical flow equalization for the Singulair Green wastewater treatment plant. Equalization reduces incoming 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 provided by the Bio-Kinetic system 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 600 GPD (gallons per day) NSF/ANSI Standard 40 design loading schedule, minimum performance of the Singulair Green system equalizes all flow an average of 50%. As a result, hydraulic surges and periods of high wastewater flow are automatically reduced to protect the environment and all treatment plant processes on a demand use, as needed, basis.

BLUE CRYSTAL® RESIDENTIAL DISINFECTING TABLETS

If local regulations require, an initial supply of Blue Crystal disinfecting tablets will be placed in the Bio-Kinetic system chlorine feed tube at system start-up. Specifically formulated for use in the Singulair system, Blue Crystal disinfecting tablets provide efficient and reliable disinfection when effluent chlorination is desirable. Manufactured from calcium hypochlorite, Blue Crystal disinfecting tablets provide effective, economical bacteria killing power. Liquid entering the Bio-Kinetic system contacts the installed Blue Crystal disinfecting tablets, just downstream of the equalization ports. A fully charged feed tube will last an average of three to six months. During each semi-annual inspection, your local dealer's service technician will check system operation, the rate of tablet consumption and install tablets to insure maximum system performance.

NOTE: USEPA guidelines state, "On the average, satisfactory disinfection of secondary wastewater effluent can be obtained when the chlorine residual is 0.5 ppm after 15 minutes contact." Retention time must comply with the controlling regulatory jurisdiction.

CAUTION: *The improper handling of Blue Crystal tablets may cause personal injury or property damage. Keep out of the reach of children and do not allow the tablets or feed tubes to contact skin, eyes or clothing. Tablets may be fatal if swallowed and tablet dust is irritating to the eyes, nose and throat. Do not handle the tablets or feed tube without first carefully reading the product container label, MSDS information and the handling and storage instructions. Mixing of chemicals may cause a violent reaction leading to fire or explosion. For additional information about Blue Crystal tablets contact your local authorized dealer.*

BIO-MAX® DECHLORINATION TABLETS

In ecologically sensitive areas, environmental standards or regulations may require the use of Bio-Max dechlorination tablets. Bio-Max tablets are formulated to remove chlorine residual to non-detectable levels for the protection of sensitive receiving environments. Containing 92% sodium sulfite as the active ingredient, the tablets are manufactured to neutralize both free and combined chlorine. Bio-Max dechlorination tablets dissolve slowly, releasing controlled amounts of chemical for the instantaneous removal of residual chlorine from the wastewater flow. As liquid passes through the final discharge zone of the Bio-Kinetic system, the flow contacts the installed Bio-Max tablets and residual chlorine is removed from the system effluent. A fully charged Bio-Max feed tube will last an average of three to six months. During each semi-annual inspection, your local dealer's service technician will check system operation, the rate of tablet consumption and install tablets to insure maximum system performance.

CAUTION: *Bio-Max tablets or feed tubes should not be mixed with Blue Crystal tablets. Do not handle the tablets or feed tube without first carefully reading the product container label, MSDS information and the handling and storage instructions. For additional information about Bio-Max tablets contact your local authorized dealer.*

NO OWNER MAINTENANCE

The Singulair Green system is inspected and serviced by a local licensed, factory-trained dealer, therefore, no owner maintenance is required during the warranty period. The Singulair Green system does not require pumping as often as a septic tank. Under normal use only the pretreatment chamber should be pumped. How often pumping is necessary depends on system use. The local Singulair Green dealer will inspect the aeration chamber contents and plant effluent at six month intervals to determine if the pretreatment chamber is discharging excessive solids. Every three years, the pretreatment chamber should be inspected. The pretreatment chamber will normally require pumping at three to five year intervals. Contact your local dealer prior to tank pumping for complete information on removal of equipment, access to individual chambers, coordination of services and proper disposal of tank contents. A tank pumping service licensed by the local regulatory agency must be used for removal and disposal of tank contents. The tank pumper should consult with local authorities to determine the proper disposal method.

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

SERVICE PRO® MONITORING CENTER

The Service Pro monitoring center is a maintenance tracking database that is free for use by all Singulair Green dealers and service providers. If your Singulair Green dealer uses the Service Pro website, a record for your system will be created at **www.servicepromcd.com** when the system is installed. The serial numbers for Singulair Green equipment and treatment plant information will be entered at that time. This proprietary website stores all relevant system information in one convenient, secure and password protected location. The Service Pro website keeps a detailed history of all maintenance visits that are made to your installation. The monitoring center will schedule future service inspections and notify your Singulair Green dealer when they are due. System owners can also use the Service Pro website to access information, track service

calls or monitor compliance with regulatory requirements. If you would like to use the Service Pro website, contact your Singulair Green dealer to receive a user name and password.



An optional Service Pro MCD control center or Service Pro TNT control center is available for use with the Singulair Green system. Designed to connect to a standard telephone line, these control centers provide MONITORING, COMPLIANCE and DIAGNOSTIC functions complete with telemetry for communication with the Service Pro monitoring center. Digital Subscriber Line (DSL) phone service requires the use of a low-cost DSL filter. Voice Over Internet Protocol (VOIP) is not reliable with any telemetry system and not recommended. Once your Service Pro control center is connected to a telephone line, commissioned, and covered by a remote monitoring agreement, your dealer will be immediately notified of any alarm condition. The Service Pro monitoring center will automatically log the time and date of alarm conditions, as well as service performed, and store them in your system history record for viewing at **www.servicepromcd.com**.

SINGULAIR GREEN® SERVICE PROGRAM

A minimum of four service inspections within the first two years of operation are provided by your local Singulair Green dealer and are included in your original purchase price. Costs for travel and labor are not charged to the owner. The exact frequency and scope of these visits are determined by the applicable regulatory agency. The obligation to provide these service inspections rests solely with your Singulair Green dealer or the authorized service provider, so it is important that you save a copy of your original purchase contract. To schedule service, learn more about maintenance requirements or report system malfunctions, contact your local Singulair Green dealer directly. Your dealer's name, address and phone number are conveniently located on the front of the control center. During an inspection, each Singulair aerator, Bio-Kinetic system and other plant components are serviced as outlined in the "SINGULAIR GREEN SERVICE MANUAL". Auxiliary equipment required in addition to the Singulair Green system, such as pumps, filters, valves, tankage, leach fields, chambers, mounds or irrigation components, are not part of the Singulair Green service program and should be covered by a separate maintenance agreement.

After the initial two year service program is completed, the Singulair Green dealer will offer to provide a continuing service agreement 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. Professional service is important to proper system operation and should not be allowed to lapse. Each of these items are important:

- ✓ Check aerator operation
- ✓ Check aerator power consumption
- ✓ Check aerator air delivery
- ✓ Clean stainless steel aspirator shaft
- ✓ Clean aspirator tip
- ✓ Clean perimeter air vent in aerator cover
- ✓ Inspect aeration chamber contents
- ✓ Check operation of control center
- ✓ Adjust time clock when required
- ✓ Remove the Bio-Kinetic system
- ✓ Scrape the clarification chamber
- ✓ Inspect the Bio-Static sludge return
- ✓ Inspect outlet coupling
- ✓ Install a clean Bio-Kinetic system
- ✓ Fill Blue Crystal feed tube
- ✓ Fill Bio-Max feed tube
- ✓ Inspect effluent quality
- ✓ Inspect outlet line
- ✓ Inspect ground water relief point
- ✓ Inspect effluent disposal system
- ✓ Complete 3-part service record
- ✓ Hang owner's record on front door
- ✓ Enter record into **www.servicepromcd.com**
- ✓ Mail health department notification

Your Singulair Green dealer will perform the services outlined above during each service inspection.

WARRANTY REGISTRATION

A Warranty Registration Card was attached to the Service Pro control center 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 three year limited warranty and lifetime aerator exchange program will begin on the date of component shipment from the factory.

If the Service Pro control center is mounted in an outdoor location, remove the aerator model number and serial number record card and store it safely for future reference. Otherwise, do not remove this card from the control center. If it is necessary to call your dealer for service, make note of the information on the control center data plate and the aerator serial number before calling. Warranty and service records are cross-indexed by owner name and aerator serial number. Supplying the aerator serial number with the service request will give the service provider a ready reference so that changes in system ownership will not delay service.

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*

220 REPUBLIC STREET
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SINGULAIR GREEN® LIFETIME PROTECTION

The Singulair aerator enjoys the distinction of being the only aerator on the market today backed by a lifetime warranty and exchange program. Each Singulair aerator, Service Pro control center and Bio-Kinetic system are warranted to be free from defects in material and workmanship, under normal use and service, for a period of three years. The local, licensed dealer or service center has detailed warranty and exchange information and should be contacted for service or replacement instructions.



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