

norweco® **SINGULAIR**®

BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

TAKING THE ORDER

Each Singulair Bio-Kinetic wastewater treatment system is sold complete including: delivery and installation of the tank and Bio-Static sludge return; installation and start-up of the mechanical aerator, control center and Bio-Kinetic system; three-year limited warranty with four prescheduled service inspections at six month intervals; and lifetime aerator exchange program. It is important that the Singulair order be taken and recorded carefully to insure that all federal, state and local regulations are met. A clear outline of responsibilities when the order is taken will simplify installation of the system and establish a sound working relationship with your customer and local health department.

INSTALLATION PROCEDURE

Installation of the Singulair system normally occurs in two phases. First, the precast concrete tankage is delivered and installed at the contractor's convenience. Each electrical control center, underground electrical service cable and Bio-Static sludge return is also installed at this time. Only when the system is ready for start-up are the Singulair aerators and Bio-Kinetic systems delivered and installed. When the Singulair installer has completed equipment installation, he should also start-up and test the entire system and familiarize the owner with its operation. This installation procedure will assure efficient use of the contractor's and installer's time and protect equipment from possible damage or unauthorized start-up.

CONTACT THE LOCAL HEALTH DEPARTMENT

The contractor must contact the local health department prior to installation of the Singulair system and apply for an installation permit. The local Singulair distributor will have drawings, specifications and performance data for the system on file with the health department. Normally, the contractor will not be required to supply this information to receive the installation permit. The health department may request a drawing showing the proposed method of effluent disposal and location of the Singulair system in relation to the building, property lines and potable water supply. The health department may wish to inspect the site and proposed point of discharge, take soil samples or run percolation tests before issuing an installation permit. The contractor must find out if an inspection of the Singulair tank and sewer line will be required before backfilling is allowed.

DELIVERY TRUCK ACCESSIBILITY

Inform the contractor of the dimensions and weight of the delivery truck. The excavation must be accessible without interference from trees, shrubbery, power lines or other obstacles. Earth from the excavation must be piled outside the working area needed to operate the truck. Remind the contractor that extra charges will apply if the excavation is not complete and readily accessible.

POSITIONING THE EXCAVATION

The Singulair tankage has three potential inlet locations. They are located on the inlet end wall and both inlet sidewalls at the same elevation. Any one of these inlets may be used. The position of the system with respect to the building, inlet sewer line and point of discharge will dictate the best inlet choice. It is not necessary to position the system with the inlet end wall facing the building. Singulair systems larger than 750 GPD require an external pretreatment tank. The pretreatment tank should be located in-line with the Singulair tank and the excavation should be sized approximately one foot wider and one foot longer than the pretreatment tank dimensions. Allow for a short distance between the tanks for installation of the submerged transfer port.

EXCAVATION SIZE AND DEPTH

The Singulair tank is 9' 3" long and 5' 6" wide. To allow adequate room for tank installation, the excavation should be at least 10' 6" long by 6' 6" wide. Additional overdig will be required on deeper installations or for safety where the excavation side walls are unstable. If the system requires an external pretreatment chamber, the excavation size must be increased accordingly.

The excavation depth is calculated using two factors. First, note the elevation of the sewer line as it leaves the building. From this sewer line elevation, subtract $\frac{1}{8}$ " per foot from the building to the system location. Next, subtract the dimension from the outside bottom of the tank to the inlet invert of the system as determined from the following chart:

SYSTEM SIZE	INLET INVERT
500 GPD	5' 0"
750 GPD	6' 0"
1000 GPD	5' 0"
1250 GPD	6' 0"
1500 GPD	7' 0"

The 1000, 1250, and 1500 GPD systems require an external pretreatment chamber. The dimension given is

TAKING THE ORDER (Cont.)

based on industry standards. Confirm the dimension from your pretreatment tank before excavation takes place. The remainder is the finished excavation depth. Fall through the system from inlet invert to outlet invert is 0' 4". Therefore, the outlet line from the system must be installed four inches lower than the point where the inlet sewer line joins the system.

TANK LEVELING PAD

To insure that the tank bottom will be bearing the weight evenly, all tanks should be set on a four inch thick pad of gravel, sand or fine crushed stone. The pad should be installed and leveled by the contractor before delivery and setting of any tank takes place. The tank pad must be leveled to within 1/4" from side to side and end to end.

BACKFILLING THE TANKAGE

CAUTION: Do not allow dirt, debris or other material to enter the Singulair system during installation or backfilling. The Singulair system must be backfilled immediately after installation. Any fine, granular jobsite material or backfill may be used. Large clumps of earth, rocks or debris should never be used to backfill around the system. The slanted endwall beneath the clarifier must be backfilled with particular care. Be sure it is completely backfilled so that future settling will not cause a low spot in the finished lawn or place an undue strain on the outlet line.

FILLING THE SYSTEM WITH WATER

The Singulair system should be filled with clean water immediately after installation. Water should be added as the tank is being backfilled to equalize internal and external tank pressure. Fresh water is preferred but water from a nearby pond may be used if it is free of silt and other debris. A septic tank pumping service should never be used to fill the Singulair system. If this is done, large amounts of biologically untreatable materials may be deposited in the system and they could interfere with system operation and performance.

INLET SEWER LINES

Only domestic wastewater must be allowed to enter the Singulair system. It is not intended to handle flows from roofing down spouts, basement footer drains, sump pump piping or garage and basement floor drains. If the sanitary sewer system must be used for disposal of these liquids, it must be connected downstream of the Singulair system. Water softener backwash will affect system performance and must not flow into the Singulair system.

EFFLUENT DISPOSAL LINE

Due to the high level of treatment provided by the Singulair Bio-Kinetic wastewater treatment system, its effluent may be discharged in a number of acceptable fashions. There

must always be a ground water relief point installed in the discharge line that provides an outlet no higher in elevation than the outlet invert of the Singulair tank. This will prevent tank contents from backing up in cases where the normal discharge point is temporarily under water or the effluent disposal field is saturated.

ELECTRICAL POWER SUPPLY

A dedicated 115 volt AC single-phase, 10 amp (minimum) 60 Hertz circuit must be provided in the main electrical service panel for each Service Pro control center.

FINISH GRADING AND LANDSCAPING

A precast concrete aerator mounting casting with vented cover is provided for each aerator and extends twenty inches above the top of the Singulair tank. The top of each cover must project a minimum of 6" above finished grade. Individual precast concrete riser castings may be added in 12" increments when necessary. If possible, determine if riser sections will be needed before tank installation is scheduled.

A precast concrete system mounting casting with non-vented cover is provided for each Bio-Kinetic system. The top of each cover must project a minimum of 6" above finished grade. Individual precast Bio-Kinetic system riser castings may be added in 12" increments when necessary. If possible, determine if riser sections will be needed before tank installation is scheduled.

PRETREATMENT CHAMBER ACCESS

Normally, the removable cover in the tank top is all that will be needed for pretreatment chamber access. On deeper installations, the removable cover in the tank top must always be developed to within twelve inches of grade. Some owners and regulatory officials require that access to the pretreatment chamber must be at finished grade. These conditions should be determined when the order is being taken so that the appropriate riser castings and cover may be delivered with the tank.

SCHEDULING TANK DELIVERY

When all points have been fully explained, find out the customer's preferred installation date and make preliminary scheduling with your dispatcher. Take the customer's telephone number to call and confirm the actual date and time of tank delivery.

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BIO-KINETIC® WASTEWATER TREATMENT SYSTEM TANK DELIVERY AND SETTING

To insure that all work proceeds safely and efficiently, check these items prior to delivery of the Singulair tankage.

- ✓ Does the driver have complete and accurate directions to the installation?
- ✓ Does the driver have the Singulair installer's tool kit?
- ✓ Are the appropriate number of aerator mounting castings, Bio-Kinetic system mounting castings, extension riser castings and vented and non-vented access covers included?
- ✓ Is there an adequate supply of sealing material for the tank and all plumbing connections?
- ✓ Does the truck have the proper pick-up bar and cable (or chain)?
- ✓ Are the proper quantity and size of Bio-Static sludge returns installed?
- ✓ Are the proper quantity of Service Pro control centers available for delivery with the tanks?
- ✓ Is there sufficient underground electrical cable to reach from the control center location to the tank?

PLEASE NOTE: *The Singulair tank is constructed of monolithic castings and, if possible, the joints should be sealed at your plant before setting. This will minimize tank loading, unloading and setting time at the site. The castings may be set individually and sealed at the site if necessary. These instructions are written as if the castings will be installed separately and sealed at the site. However, the tank should be assembled and sealed in your plant if your tank handling and delivery equipment will allow it. Otherwise, proceed with tank setting as outlined herein.*

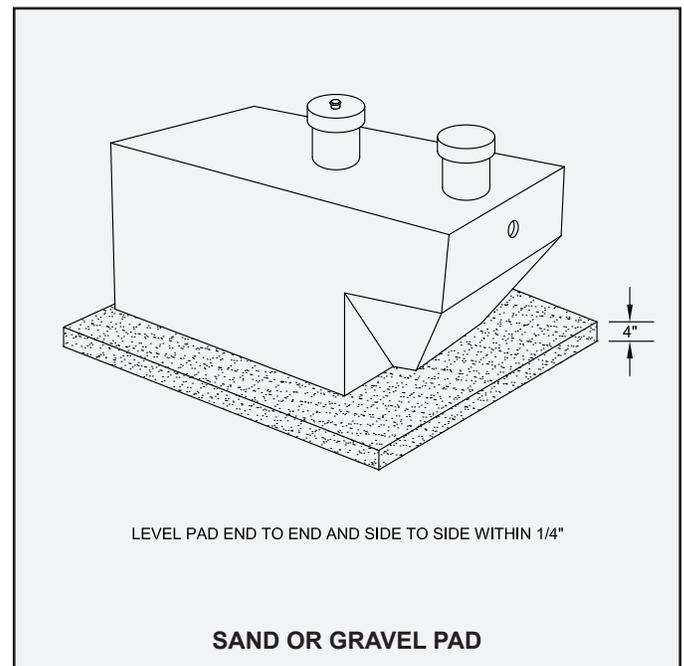
CHECKING THE EXCAVATION

Before tank setting begins, the length, width and depth of the excavation should be checked. The excavation should have sufficient overdig to allow for a minimum of 6" of clearance around the entire perimeter of the Singulair system. Additional overdig will be required on deep installations or where unstable soil conditions exist. Safe working conditions must be established and maintained during the entire installation procedure.

Check the influent and effluent sewer line trenches. The depth should correspond with the Singulair system inlet and outlet connections and the trenches should be smooth to prevent damage to the sewer lines.

A tank leveling pad should be installed in the bottom of the excavation. The pad should be a minimum of 4" thick and leveled to within 1/4" from side to side and end to end. The elevation of the top of the leveling pad should correspond to the outside bottom of the Singulair precast concrete tankage when installed.

Extreme care should be used any time personnel or equipment are in the vicinity of any excavation. A delivery truck can place excessive loading on excavation sidewalls and care must be taken in its positioning. Unstable soil



conditions require constant monitoring of the site to insure safety. Construction and installation procedures, equipment, tools, materials and personnel should always comply with applicable safety regulations and federal, state and local codes.

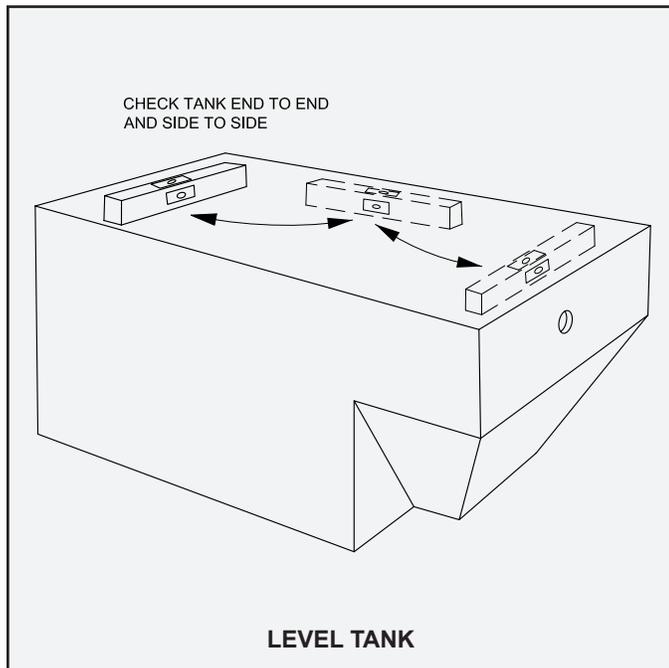
TANK DELIVERY AND SETTING (Cont.)

SINGULAIR TANK SEALING

While the tank bottom is still on the delivery truck, remove any concrete chips, stones, mud or debris from the groove in the casting and from the floor of the pretreatment and aeration chambers. Be sure the transfer port is clean and unrestricted. Apply a good quality mastic sealant into the groove of the bottom casting around the entire perimeter and fully across both internal baffles. Inspect the sealant after application to eliminate any gaps or uneven spots. A non-shrinking grout sealant may be used in place of mastic, but mastic will allow the tank to be filled with water immediately after its installation.

TANK SETTING AND SAFETY

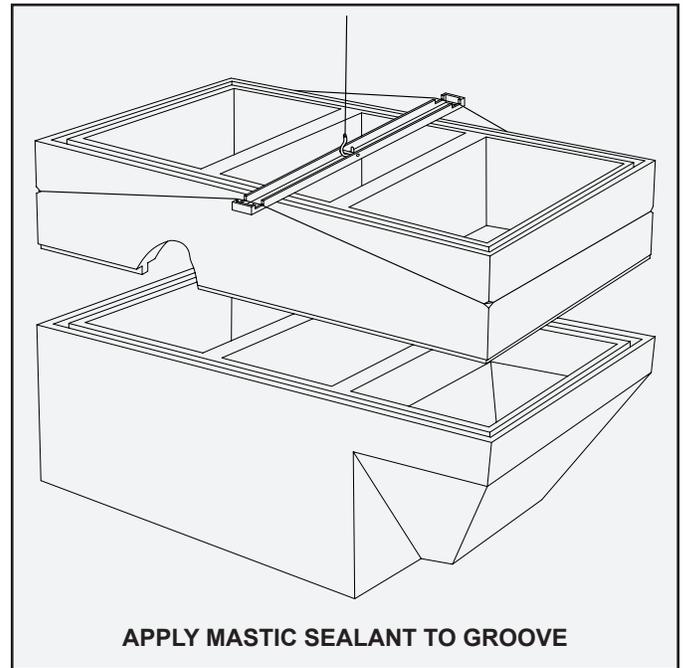
With the delivery truck in position at the excavation, make sure that its outriggers are firmly placed on stable soil. All personnel must be out of the excavation and a safe distance from the tank. Before lifting the tank, check all lifting chains to be sure they are properly seated in the casting pick-up grooves. Lift the tank bottom section and place it directly into the excavation. Do not set it down. Stop the casting several inches above the excavation floor and position it in the desired location. Now lower it carefully until all tension is off the lifting cable or chain.



Place a level on the exposed joint and check the casting for level from end to end and side to side (if the tank is set as one piece, check for level on the top). It must be level within $\frac{1}{4}$ " from end to end and from side to side. The casting may need to be raised slightly so additional leveling pad material can be applied before level is achieved. If the casting needs to be raised more than six inches to apply leveling material, the contractor's personnel should move to a safe location so the casting can be fully returned to the

bed of the delivery truck. The casting should then be reset after the excavation has been properly leveled.

For 750 GPD, 1250 GPD and 1500 GPD systems, the tank ring casting should now be prepared to be set in position. Care must be used to insure the ring casting is not damaged in shipment, handling or setting. While the tank ring is still on the delivery truck, clean the groove in the casting to remove concrete chips, stones, mud or debris. Apply mastic sealant into the groove of the casting around the entire perimeter and fully across both internal baffles. Inspect the sealant after application and smooth out any bubbles or gaps. Remove all debris from the bottom of the casting along the tongue sealing section. Do not reach under or get under any portion of the casting. Carefully position the ring and lower one corner into the groove of the bottom casting. Align the sides of the ring and bottom sections and lower the ring into position.



The top casting may now be set. Remove all debris from the bottom of the casting along the tongue sealing section. Do not reach or get under any portion of the casting. Carefully position the top and lower one corner into the groove. Align the sides of the casting and lower the top into position. Before proceeding with Bio-Static sludge return assembly and installation, recheck the tank for level from side to side and end to end.

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SINGULAIR® BIO-KINETIC®

WASTEWATER TREATMENT SYSTEM

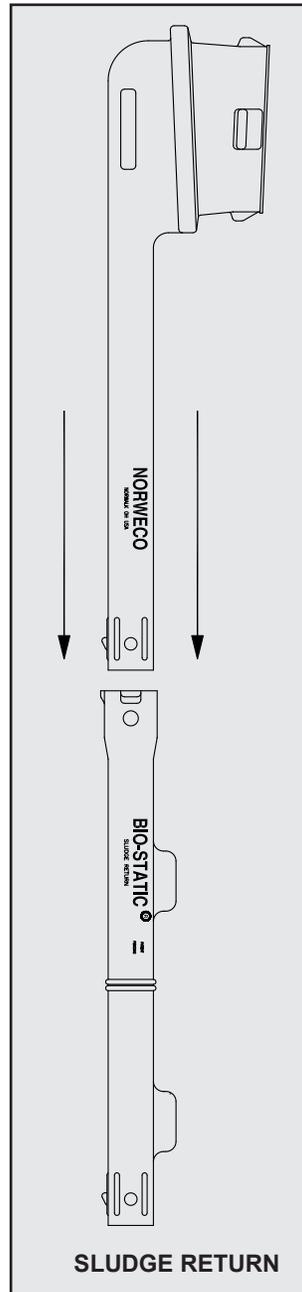
TANK DELIVERY AND SETTING (Cont.)

BIO-STATIC SLUDGE RETURN ASSEMBLY

Bio-Static sludge returns consist of inlet and extension sections and must be assembled prior to installation in the Singulair tank. Insert the small end of the inlet section into the socket end of the extension section until the retainer pins snap into position. A two piece assembly is used for 500 GPD and 1000 GPD systems.

A three piece assembly is used for 750 GPD, 1250 GPD and 1500 GPD systems. For 750 GPD and 1250 GPD systems the second extension section must be cut-off at the double line near the center of the extension. This cut can be made with a carpenter's saw or other suitable tool. After cutting the extension, de-burr the inside and outside perimeter of the extension with a router or sharp knife.

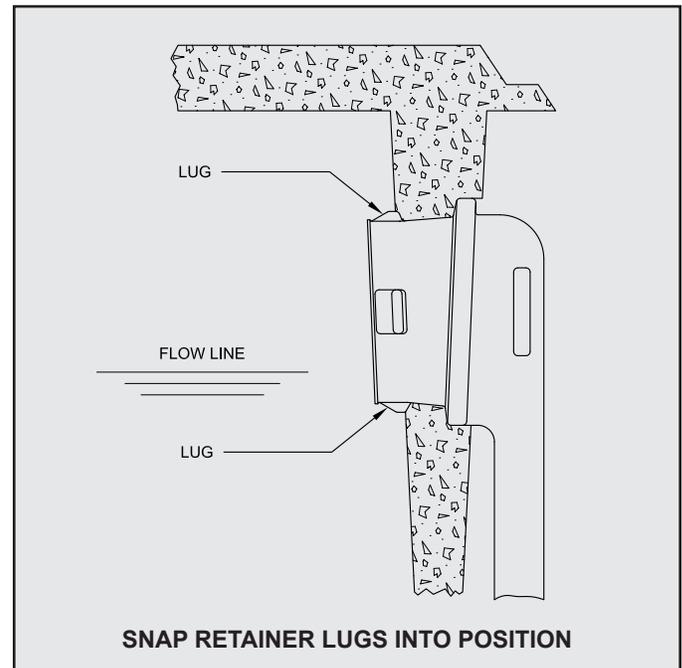
NOTE: Failure to de-burr may cause sludge return plugging. Install the cut-off extension on the bottom of the first extension section until the retainer pins of the first extension snap into place. The 1500 GPD system uses an assembly of one sludge return inlet with two full extensions and no cut-off is required.



BIO-STATIC SLUDGE RETURN INSTALLATION

All Bio-Static sludge returns must be installed through the openings in the top of the clarification chamber, prior to installation of the Bio-Kinetic system mounting castings. A single Bio-Static sludge return assembly is installed in 500 GPD, 750 GPD and 1000 GPD systems. Two sludge return assemblies are installed in 1250 GPD and 1500 GPD systems. After the sludge return has been assembled to the correct length, it should be installed into the opening in the

clarification chamber wall. Securely grasp the assembled sludge return by the inlet with the opening facing away from you. Lower the assembly through the clarification chamber access opening in the top of the tank. Firmly push the inlet of the sludge return through the opening in the clarification chamber wall until the four retainer lugs snap into position and the assembly is securely mounted. The standoff on the lower most extension piece should be touching the clarification chamber wall just above the transfer port. Repeat these steps when two Bio-Static sludge returns are required.



MOUNTING CASTING AND OPTIONAL EXTENSION RISER INSTALLATION

Locate the power cable entrance in each aerator mounting casting. It should be inspected for flash or sharp edges. Be sure it extends all the way through the casting side wall. Remove the cast-in access cover from the top of each aeration chamber. Apply a strip of mastic sealant around the perimeter of each access opening. Position and install each aerator mounting casting with the power cable entrance facing the tank side wall that is closest to the building. Be sure that each mounting casting is properly seated on the tank top and evenly sealed with mastic. If extension riser castings are required, install them above each aerator mounting casting. Apply mastic sealant to all joints between castings. Do not apply sealant to the top of the mounting casting or riser that will receive the vented access cover.

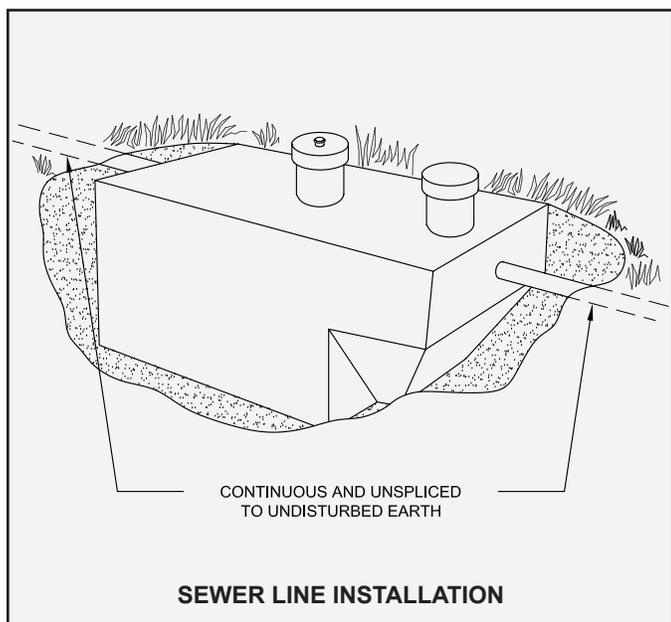
The pretreatment chamber can be made accessible at grade or left below grade, as required by local regulation or owner preference. The inspection cover on the pretreatment

TANK DELIVERY AND SETTING (Cont.)

chamber must at least be developed to within twelve inches of finished grade. Pretreatment chamber access covers should never be vented and should be sealed with mastic. Be sure all cast-in access opening covers that are not extended to grade are properly aligned, seated and secured in place. Tank covers which have been replaced by Bio-Kinetic or aerator mounting castings should be returned to your plant with the delivery truck. Install all covers for aerator mounting castings, Bio-Kinetic system mounting castings, risers and inspection ports before backfilling begins. **DANGER: Never allow access risers to be left uncovered or partially covered. Failure to secure access covers and safety nets could result in bodily injury, illness or death. Riser safety nets are available from Norweco for concrete or plastic risers.**

SEWER LINE INSTALLATION

Sewer lines may be installed as soon as the concrete tankage has been leveled and sealed. Sewer line trenches must be smoothly excavated and free of debris or sharp-pointed objects that could damage the installation. The trenches must allow sewer lines to be laid with $\frac{1}{8}$ " of fall per lineal foot of run along the entire length of the line. Influent and effluent sewer lines must be at least four inches in diameter. The influent line should be grouted into the Singulair system tank inlet. The effluent line should be PVC pipe, solvent welded into the Singulair outlet coupling. Inlet and outlet lines must be laid continuously and unspliced from the tank to undisturbed earth beyond the limits of the



tank excavation. High quality PVC or other similar materials may be used for sewer lines, subject to the approval of local codes. Be sure the sewer lines are constructed with compatible fittings and joining materials throughout. Underground electrical cable for electrical service to each Singulair aerator should be installed in the sewer line trench before backfilling. Refer to Electrical Wiring and Control Center Installation instructions for complete details.

GROUND WATER RELIEF POINT

The effluent sewer line should be installed with a ground water relief point to prevent back-up into the system if the effluent discharge point is blocked or flooded. This device can be constructed by installing a pipe tee in the effluent sewer line and extending it to grade. The outlet must be at a lower elevation than the outlet invert of the Singulair system. The extension to grade should be installed with a suitable grate to prevent access to the sewer line.

BACKFILLING

The Singulair tankage should be backfilled immediately after sewer lines and underground electrical cable are installed. Fine, loose earth should be used to backfill the tank excavation and sewer line trenches. Be sure it is completely free of rocks, large clumps of earth and construction debris. Backfill evenly around the entire perimeter of the tank rather than all at once on each side. Take care to completely fill in the cavity beneath the slanted clarifier end wall. Final grading should be six inches below the top of each access cover and should slope away from the tank so surface runoff will drain away from the Singulair system. Use extreme care in backfilling. Do not allow dirt or mud to enter any part of the Singulair system or sewer lines. If dirt or mud enters any portion of the system, it must be removed to insure proper system operation. Removing the dirt or mud may require repeated flushing and tank pumping.

TANK HOLD DOWN WATER

Each compartment in the Singulair system must be filled with clean water. The water should be free of leaves, mud, grit, oils or other materials that might possibly interfere with system operation. The tankage should be filled with water as it is backfilled to reduce stress on the precast concrete tank. Do not fill the Singulair tank with water through the opening in the top of the clarification chamber. The clarification chamber will be filled by adding water to the aeration chamber. In systems with more than one aeration chamber, each aeration chamber should be filled separately. In all systems, pretreatment chambers should be filled through their access openings.

This completes the portion of the installation that requires a delivery truck for tank lifting and setting. Installation of the electrical control center and underground electrical cable are normally completed by the delivery truck driver before leaving the site. Refer to Electrical Wiring and Control Center Installation instructions for details.

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CONTROL CENTER WITH MCD TECHNOLOGY

ELECTRICAL WIRING & CONTROL CENTER INSTALLATION

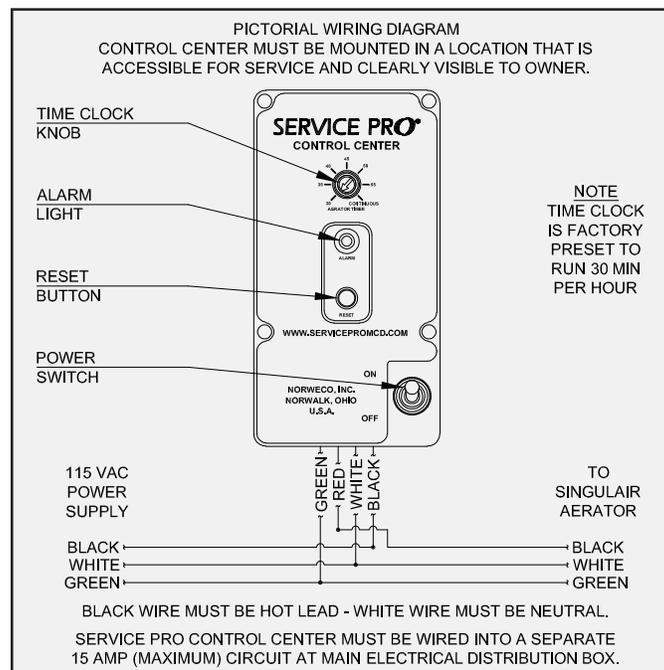
The underground electrical service cable for the Service Pro control center should be installed by the tank delivery truck driver or electrician as soon as the Singlair tankage has been installed in the prepared excavation. Usually it is best to begin with the underground service cable so that backfilling of the Singlair tankage and influent sewer line is not delayed. The information contained in these instructions is not intended to be a complete electrical installation reference, as code requirements vary according to geographic area. Always insure safe working procedures are followed whenever electrical work is performed on the Singlair system.

UNDERGROUND ELECTRICAL CABLE INSTALLATION

To insure proper electrical system protection and uninterrupted service to the Singlair aerator and control center, be sure to follow these instructions carefully. Always double check all work before leaving the job site.

1. Electrical work must be performed in accordance with the latest edition of the National Electrical Code as well as all applicable local codes.
2. Underground electrical service cable used with the Singlair system must be UL and CSA approved, type UF, #14/2 AWG minimum and must have a full-size center ground. Larger cable is required if the underground service needs to be run more than 80 feet. Consult your electrician for details.
3. The underground cable installation must be unspliced from the location of the Service Pro control center into the aerator mounting riser above the aeration chamber of the Singlair tank.
4. Install a watertight conduit fitting into the power cable entrance in the side of the aerator mounting riser. Insert the free end of the power cable through a pre-formed two foot by one foot conduit ell, then into the watertight conduit fitting in the power cable entrance of the aerator mounting riser. Guide the power cable up into the aerator mounting riser. Pull enough cable through the riser to reach thirty-six inches above the riser opening. Coil and secure the cable in the mounting riser so that it will not hang down into the tank while the system is being filled with water.

5. Lay the conduit ell with cable directly across the top and down the tank side. Do not allow the power cable to be laid across the end of the tank or any removable access cover. Insure the conduit and cable entrance openings are sealed.
6. Check the excavation and sewer line trench to be sure they are free of debris, rocks and any sharp or abrasive objects.



7. Uncoil the electrical service cable into the excavation and influent sewer line trench. Leave sufficient slack in the cable so that it will not be stressed or pulled tight during backfilling or settling.
8. Backfill around the underground electrical cable with fine granular material.
9. The underground electrical cable should have at least two feet of earth cover. If the proposed finished grade will not permit this coverage, the cable should be installed in approved conduit from the tank to the building foundation.
10. Always encase the electrical cable in conduit any time it is above finished grade. Route the conduit and cable as directly as possible to the control center mounting location.

INSTALLATION OF ELECTRICAL CONTROL CENTER

Although the aerator is not installed until system start-up, the control center should be wired for operation when the tank and underground electrical cable are installed. The control center should be located so the red warning light can be seen and the audible alarm heard. The mounting location should minimize exposure to direct sunlight,

ELECTRICAL WIRING & CONTROL CENTER INSTALLATION (Cont.)

freezing rain or conditions that might prevent routine inspection or access. The control center should always be mounted out of the reach of children.

Detach the control center cover from the enclosure and remove the insert from the mounting posts. Set the control center insert aside. Remove two of the three $\frac{1}{2}$ " knockouts in the bottom of the control center enclosure. Install a conduit connector into each of the openings. For installations requiring a NEMA 3R rated enclosure, remove the $\frac{1}{8}$ " drain opening knockout to vent moisture from the enclosure. Exposed wiring to or from the control center should always be enclosed in conduit. NOTE: Be sure to assemble the hub to the conduit before connecting the hub to the enclosure. Mount the enclosure securely using masonry nails, wood screws or common nails as appropriate. The following steps should be performed by the installing electrician to complete system wiring:

1. Use a dedicated 115 volt AC, single-phase, 15 amp (maximum) circuit breaker in the main electrical panel for service to the Singulair aerator.

CAUTION: Make sure the circuit supplying power to the Singulair system is de-energized. Check it with an electrician's test light before proceeding. Remember that other circuits in the main electrical service panel may remain energized as you are working. Use only tools with insulated handles, stand in a dry location and work with extreme care.

2. Run the black wire from the dedicated breaker in the main electrical service panel to the black wire attached to the Service Pro control center. Use at least #14 AWG black solid copper wire. To connect the wire leads, strip off the insulation jacket $\frac{7}{16}$ " from the end of each insulated wire lead. Twist the stripped leads together and secure the connection with a yellow wire nut connector.
3. Wire from the neutral in the main service panel to both the white wire in the underground electrical cable from the Singulair aerator and the white wire attached to the Service Pro control center. Use at least #14 AWG white solid copper wire. Strip off the insulation jacket $\frac{7}{16}$ " from the end of each insulated wire lead. Twist the three stripped leads together and secure the connection with a yellow wire nut connector.
4. Install a grounding conductor from the ground lug in the main service panel to the control center. This wire must be attached to the non-insulated ground lead in the aerator underground electrical cable and the green wire attached to the Service Pro control center. Strip off the insulation jacket $\frac{7}{16}$ " from the end of the insulated wire lead. Twist the three stripped leads together and secure the connection with a yellow wire nut connector.

CAUTION: Never allow the white neutral leads and ground leads to be spliced together or connected to common terminals. Failure to connect the Service Pro

control center to a proper ground will void the Singulair system warranty.

5. Connect the black lead of the underground electrical cable from the aerator to the red wire attached to the Service Pro control center. Use at least #14 AWG black solid copper wire. To connect the wire leads, strip off the insulated jacket $\frac{7}{16}$ " from the end of each insulated wire lead. Twist the stripped leads together and secure the connection with a yellow wire nut connector.
6. Inspect your work to make sure all wires are connected to the appropriate locations, there are no breaks in the wiring insulation and that all connections are secure.
7. Before installing the control center insert, energize the circuit breaker in the main electrical service panel and, with your electrical multi-meter, test the voltage being supplied. It should read between 109 volts and 121 volts supplied between the black and white wires attached to the control center. Once the voltage has been confirmed, place the dedicated circuit breaker in the main service panel in the "off" position. The conduit openings in the control center must now be sealed using duct seal. **IMPORTANT:** The conduit openings must be sealed to prevent corrosive gas from entering the control center enclosure which could result in a fire or explosion. Failure to properly seal all conduit openings will void the warranty.
8. Close the insulator and snap into position.
9. Clearly label the dedicated circuit used for the Singulair system on the door of the main service panel. Replace the service panel dead front and enclosure cover.
10. Make sure the selector switch in the control center is in the "off" position.

BEFORE LEAVING

Tear off the bottom portion of the three-part Warranty Registration Card entitled Singulair Bio-Kinetic System Service and Warranty Record. Record the tank setting date and owner's name, address and telephone number. Fill in the contractor's name, directions to and description of the job site, optional equipment installed and location of the Singulair tank and control center. On the back side of the card list the date the owner and/or contractor anticipates the system will be ready for start-up. Take this portion of the card with you for your permanent record of this installation, leaving the remaining two portions intact and attached to the control center. Place the remaining portions of the Warranty Registration Card and Owner's Manual in a secure location inside the facility.

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CONTROL CENTER WITH MCD TECHNOLOGY

INSTALLATION AND OPERATION INSTRUCTIONS

The advanced integrated circuitry of the Service Pro control center simplifies the Singulair installation, improves system performance and allows for communication with the Service Pro website. The control center insert and enclosure provide space for power and communication wiring connections. The integrated circuitry continually monitors both motor over current and under current conditions and minimizes nuisance alarm conditions using the automatic restart feature. To reduce unnecessary service calls, the control center shuts down the Singulair aerator in the event of an over current or an under current alarm condition, illuminates the alarm light and begins an automatic two hour aerator restart attempt sequence before activating the audible alarm and telemetry system.

Service Pro MCD and TNT control centers are equipped with an automatic telemetry system designed to communicate through a toll free telephone number or an Internet connection. In the event of an alarm condition that cannot be corrected by the control center's self-diagnostic sequence, the telemetry system contacts the Service Pro remote monitoring center. The monitoring center identifies the alarming control center and logs the time that the message was received and specific alarm condition reported. The monitoring center then automatically updates the website and notifies the responsible Norweco distributor or service provider by email, fax or telephone. In addition to documenting alarm conditions, the website tracks the date, time and duration of service visits, service contract renewals and maintains a complete database for every Singulair system registered. Access to the information is password protected and available to licensed distributors, sponsored service providers, health departments and system owners.

These instructions are not intended to be a complete electrical, telecommunication or network system installation reference. Telecommunication and network system policies as well as electrical code requirements vary according to geographic area. Consult your local policies and regulations prior to installing the Service Pro control center. Refer to the Electrical Wiring and Control Center Installation instructions for additional details.

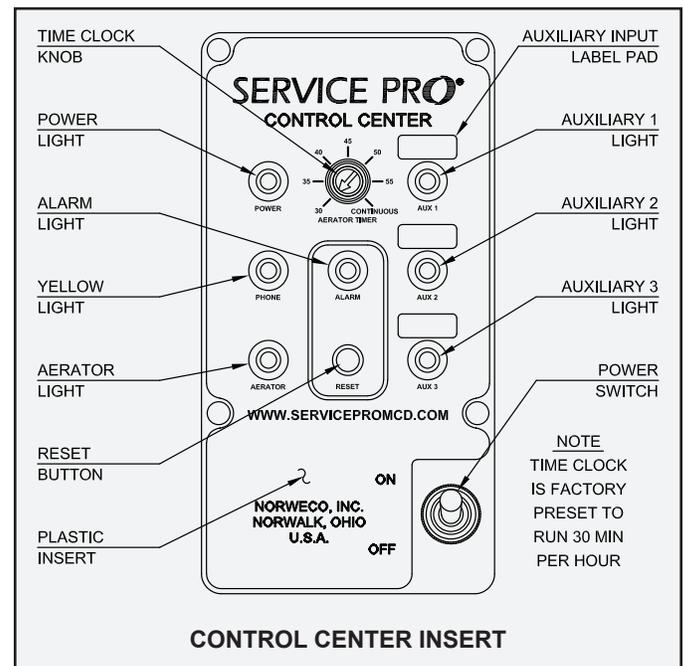
INSTALLATION OF ELECTRICAL CONTROL CENTER

Although the aerator is not installed until system start-up, the Service Pro control center should be wired for operation when the tank and underground electrical cable are installed. Complete steps 1 through 10 of the "Underground Electrical Cable Installation" section of the Electrical Wiring and Control Center Installation instructions. The control center should be located so the warning light can be seen and the audible alarm heard. The mounting location should minimize exposure to direct sunlight, freezing rain or conditions that might prevent routine inspection or access. The control center should always be mounted out of the reach of children. If the Singulair system is to be remotely monitored, the steps in the Getting Started Website Instructions can be completed either before or after Service Pro control center installation.

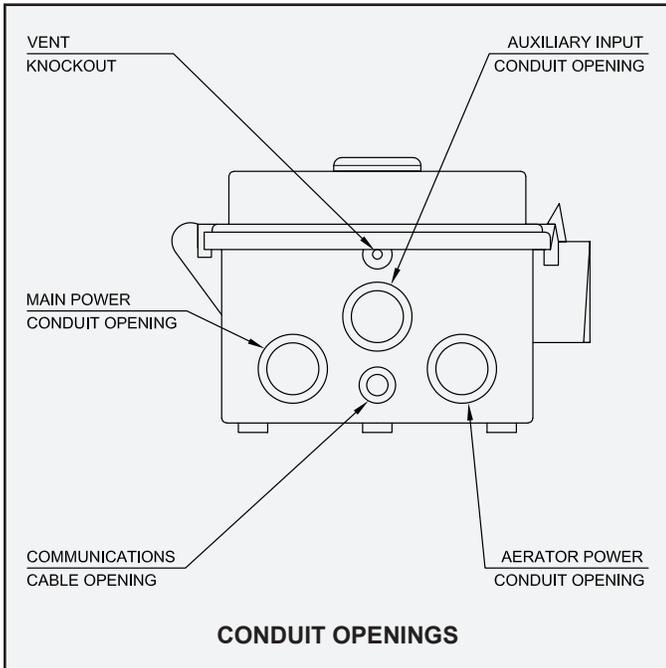
Detach the control center cover from the enclosure, remove the insert from the mounting posts and set the control center insert aside. Remove two of the three 1/2" knockouts in the bottom of the control center enclosure if you are not using any auxiliary alarm inputs. Remove all three of the knockouts in the bottom of the control center enclosure if you are using the auxiliary alarm inputs. **NOTE:** All alarm wires must be in a conduit separate from the power lines. Install a conduit connector into each of the openings. Remove the knockout for the communications cable only if the communication

grommet will be used. For installations requiring a NEMA 3R rated enclosure, remove the 1/8" drain opening knockout to vent moisture from the enclosure. Exposed wiring to or from the control center should always be enclosed in conduit.

NOTE: Be sure to assemble the hub to the conduit before



SERVICE PRO® CONTROL CENTER INSTRUCTIONS (Page 2 of 6)



connecting the hub to the enclosure. Mount the enclosure securely. The following steps should be performed by the installing electrician to complete system wiring:

1. Use a dedicated 115 volt AC, single-phase, 15 amp (maximum) circuit breaker in the main electrical panel for service to each Singlair aerator.

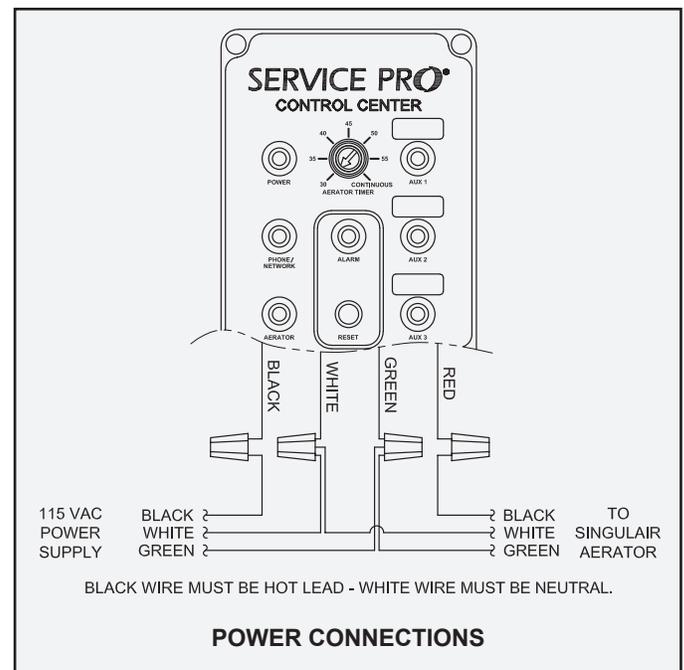
CAUTION: Make sure the circuit is de-energized. Check it with an electrician's test light before proceeding. Remember that other circuits in the service panel may remain energized as you are working. Use only tools with insulated handles, stand in a dry location and work with extreme care.

2. Connect the black wire from the dedicated breaker in the main service panel to the black wire provided on the circuit board. Use at least #14 AWG black solid copper wire. To connect to the wire leads, strip off the insulation jacket $\frac{7}{16}$ " from the end of each insulated wire lead. Twist the stripped leads together and secure the connection with a yellow wire nut connector.
3. Wire from the neutral in the main service panel to both the neutral wire in the underground electrical cable from the Singlair aerator and the white wire provided on the circuit board. Use at least #14 AWG white solid copper wire. Strip off the insulation jacket $\frac{7}{16}$ " from the end of each insulated wire lead. Twist the three stripped leads together and secure the connection with a yellow wire nut connector.
4. Install a grounding conductor from the ground lug in the main service panel to the control center. This wire, along with the non-insulated ground lead in the aerator underground electrical cable and the green ground wire attached to the optional telephone communications module, if equipped, must all be connected to the green wire provided on the circuit board. Strip off the

insulation jacket $\frac{7}{16}$ " from the end of the insulated wire lead. Twist the four ground leads together and secure the connection with a yellow wire nut connector.

CAUTION: Never allow the white neutral leads and ground leads to be spliced together or connected to common terminals. Failure to connect the Service Pro control center to a proper ground will void the Singlair system warranty.

5. Connect the black lead of the underground electrical cable from the aerator to the red wire provided on the circuit board. Use at least #14 AWG black solid copper wire. To connect to the power connector lead, strip off the insulation jacket $\frac{7}{16}$ " from the end of each wire lead. Twist the stripped leads together and secure the connection with a yellow wire nut connector.
6. If auxiliary alarm inputs are being used, skip to AUXILIARY ALARM INPUTS.
7. Inspect your work to make sure there are no breaks in the wiring insulation and that all connections are secure.
8. Before installing the control center insert, energize the circuit breaker in the main electrical service panel and, with your electrical multi-meter, test the voltage being supplied. Set up the meter to read AC voltage on the 0-150 volt scale. Place one probe of the meter into the yellow wire nut connector attached to the black lead and one probe into the yellow wire nut connector attached to the white lead. It should read between 109 volts and 121



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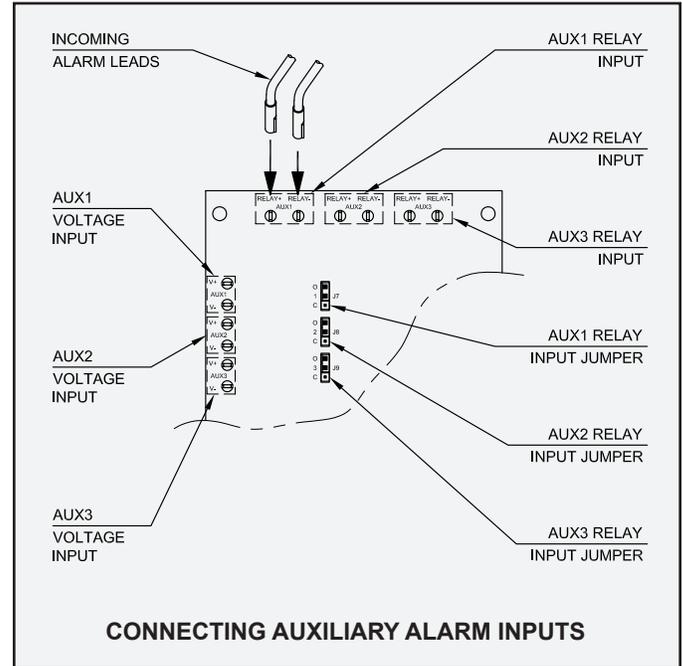
SERVICE PRO®

CONTROL CENTER WITH MCD TECHNOLOGY

INSTALLATION AND OPERATION (Page 3 of 6)

volts. If it is within these limits, place one probe of the multi-meter into the yellow wire nut connector attached to the red lead and one probe on the power connector pin attached to the white lead. The meter should read zero volts. Once these readings are confirmed, place the dedicated circuit breaker in the main service panel in the "off" position.

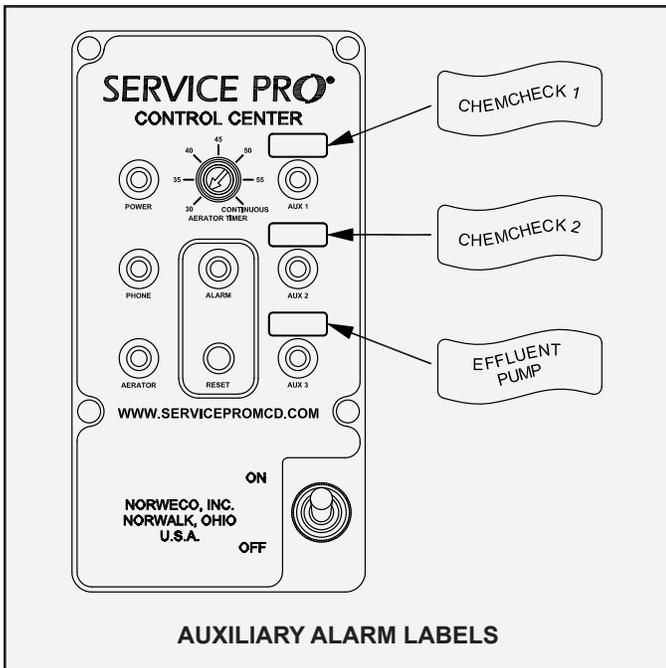
9. The conduit openings in the control center must now be sealed. Expanding foam sealant is recommended for this purpose. Insure sealant complies with local code requirements. Follow manufacturer's instruction when adding expanding foam sealant into the conduits. **IMPORTANT:** The conduit openings must be sealed to prevent moisture and corrosive gas from entering the control center enclosure which could result in a fire, explosion or damage to the control center. Failure to properly seal all conduit openings will void the Singlair system warranty.
10. Close the insulator and snap the insert into position.
11. When the auxiliary inputs are used, label the corresponding auxiliary alarm light located on the front of the Service Pro control center insert using the labels provided.



AUXILIARY ALARM INPUTS

The Service Pro control center will accept alarm inputs that generate several different types of output: a 5 to 120 volt AC or DC signal, a normally open relay circuit or a normally closed relay circuit. The inputs on the control center are male 0.110" quick connect terminals and accept standard female 0.110" insulated quick connect receptacles. When connecting to the three auxiliary alarm inputs:

1. Determine the type of output that is generated by the alarm device you wish to connect.
2. Route the leads through one of the conduits not being used for power lines into the bottom of the enclosure. Be sure to pull enough wire to comfortably reach the two auxiliary terminals you will be connecting to on the back of the control center insert.
3. Crimp the insulated female 0.110" quick connect receptacles to the ends of the alarm leads.
4. Connect the leads to the corresponding auxiliary alarm inputs. When connecting a relay circuit, connect to the "RELAY +" and "RELAY -" terminals. For a voltage input, connect the leads to the auxiliary alarm terminals marked "V+" and "V-".
5. When connecting a device that uses a relay contact setting, you will need to set the jumper for the correct relay configuration. If the alarm circuit is normally closed, place the jumper over the bottom two jumper pins closest to the 'C' label. If the alarm circuit is normally open, place the jumper over the top two jumper pins closest to the 'O' label (see CONNECTING AUXILIARY ALARM INPUTS on Page 3 for reference).



12. Clearly label the dedicated circuit used for each Singlair aerator on the door of the main electrical service panel in the home. Replace the service panel dead front and enclosure cover.
13. Make sure the selector switch in the control center is in the "off" position.
14. Complete the steps outlined in the "Before Leaving" section of the Electrical Wiring and Control Center Installation instructions.

SERVICE PRO® CONTROL CENTER INSTRUCTIONS (Page 4 of 6)

COMMUNICATION CABLE INSTALLATION REQUIREMENTS

If a telephone connection will be utilized, a telephone line must be installed unspliced from the telephone box to the Service Pro control center. Before installing the telephone line, familiarize yourself with the equipment and policies of the local telephone service provider. The Service Pro control center is not compatible with digital telephone service. With DSL internet service, a DSL filter will need to be connected to the telephone jack on the Service Pro controls to insure proper operation of the monitoring feature. If a telephone line is not available, one will need to be installed by the local telephone service provider or an internet communication module should be utilized.

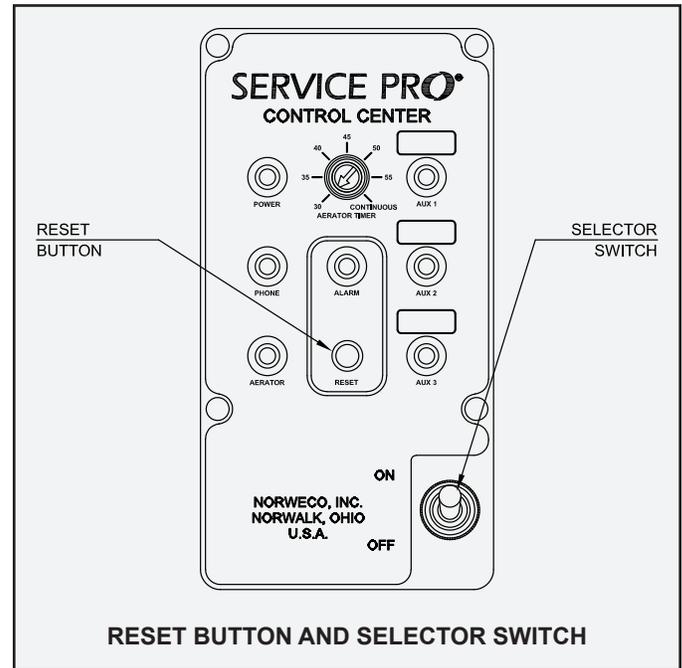
If an internet connection will be utilized, a network cable must be installed unspliced from the home internet connection to the Service Pro control center. The network cable will typically be plugged into a switch or router that distributes internet service in the home. Regardless of whether the communications will take place through a telephone line or the internet, the following steps must be performed to complete system wiring:

1. Make sure the dedicated circuit breaker in the main service panel is in the "off" position. Using the auxiliary input conduit or one of the grommets provided, run the telephone or network cable into the bottom of the enclosure. **NOTE:** The telephone or network cable cannot be installed into a conduit with any power lines. Crimp the appropriate telephone or network jack on the communications cable in the control center.
2. Connect the telephone or network cable into the jack provided on the control panel. Connect the other end of the communications cable to the existing telephone system or home internet service.
3. Snap the control center insert into position. Close the control center cover.

RESET BUTTON

The reset button on the Service Pro control center is used to perform multiple tasks during installation and operation. To activate the reset button, apply pressure with your index finger. The button is activated when a "click" is heard. The reset button can be used to silence the audible alarm, turn on the aerator when it is in an off cycle or restart the run cycle when the aerator is currently running. The reset button is also used to test the control center audible and visual alarms and telemetry system. **NOTE:** Excessive pressure on the reset button should be avoided.

To test the alarms, press and hold the reset button for approximately five seconds until the alarms activate and then release. After five seconds, the panel will call out and deliver an alarm test message to the Service Pro monitoring system. Once the communication is complete, the control center will return to normal operation.



The reset button can also be used to record service visits. When arriving on site, press and hold the reset button for five seconds until the alarm test feature activates, then release the button. After the control panel has completed the alarm test call, routine service should be performed on the Singulair system. Once system service has been completed, press and hold the reset button again for five seconds until the alarm test feature activates. The Service Pro control center will register two alarm test calls received within a four hour period as a service visit. The date, time and duration of the service visit will be logged in the database for future reference.

TELEMETRY SYSTEM COMMISSIONING

Each control center is shipped with the integrated telemetry system disabled. All other monitoring, diagnostic and local alarm functions will operate as designed. The reset button is used to enable the integrated telemetry system once the communications cable has been connected. This process is referred to as commissioning the control center. Commissioning notifies the Service Pro monitoring center that the control center is functional and ready to transmit information.

To commission the control center, insure the dedicated circuit breaker in the main service panel is in the "on" position and the communications cable is properly installed. Place the control center selector switch in the "off" position.

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CONTROL CENTER WITH MCD TECHNOLOGY

INSTALLATION AND OPERATION (Page 5 of 6)

While holding in the reset button, place the selector switch in the “on” position. Continue to hold the reset button until the red alarm light illuminates. Release the reset button and allow the telemetry system up to sixty seconds to call out and complete the commissioning process. The yellow light will illuminate during the call out process.

If commissioning is successful, the alarm light will flash 5 short flashes and stop as verification. If commissioning is unsuccessful, the alarm light will flash a pattern that indicates the cause of the failed communication. The pattern will display repeatedly. If the commissioning is not successful, refer to the table below for troubleshooting information. Conduct an alarm test to confirm commissioning was successful. If the yellow light does not illuminate during the alarm test, recommission the panel and refer to the table below for troubleshooting information.

AERATOR TIMER

Each control center is supplied with an adjustable timer that determines the run time of the aerator. The timer is adjustable in 5 minute increments up to continuous operation and will not permit the aerator to run less than 30 minutes out of each hour. Full time operation is

achieved by turning the dial so that the arrow points to the “continuous” position. Use a small blade screwdriver to rotate the adjustment dial to the desired position. The timer is factory preset and should only be adjusted after carefully reviewing the Time Clock Setting and Service Instructions.

ALARM CONDITION OPERATING SEQUENCE

When the control center detects an over current or an under current alarm condition, the alarm light will activate and flash a code that specifies the alarm condition that was detected. If an under current or open motor condition is detected, the alarm light will flash two short flashes. If a high water or over current condition is detected, the alarm light will flash steadily. If either an over current or an under current alarm condition is detected, the Singulair aerator is shut down and an automatic system restart sequence begins. With the alarm light flashing, the control center will automatically attempt to restart the aerator every five minutes for a period of two hours (24 restart attempts). The control center monitors motor current during each restart attempt. If the proper level of current is detected, the control center returns the aerator to normal operation and turns off the alarm light. Pressing the reset button while the alarm light is flashing causes the control center

RED ALARM DIAGNOSTIC CODES	
CONDITION	RED ALARM LIGHT FLASH PATTERN
Successful commissioning	Flash 5 short and stop
Alarm test	Flash 10 short and stop
Service visit start	
Service visit end	
Communications cable not plugged in	Flash 1 short, 1 long - pause 3 seconds & repeat
Telephone line in use in home	Flash 2 short, 1 long - pause 3 seconds & repeat
Number called is busy	Flash 3 short, 1 long - pause 3 seconds & repeat
Remote monitoring center error	Flash 4 short, 1 long - pause 3 seconds & repeat
Telephone service terminated	
Service Pro panel communication error	Flash 5 short, 1 long - pause 3 seconds & repeat
Control failure	Illuminate continuous
Aerator under current	Flash 2 short - pause 3 seconds & repeat
Aerator open motor	Flash 2 short - pause 3 seconds & repeat
Aerator over current	Flash evenly until serviced
Auxiliary one, two and three	

SERVICE PRO® CONTROL CENTER INSTRUCTIONS (Page 6 of 6)

to attempt to restart the aerator and counts toward the 24 restart attempts. If the aerator does not restart after 24 attempts, the audible alarm and the alarm light activate.

After both audible and visual alarms are activated, press the reset button and the control center will attempt to restart the aerator again. If the proper current level is not detected, the audible alarm beeps three times, then silences. The alarm light continues to flash and the control center interrupts power to the aerator. If the alarm condition is not corrected and the control center resets after 48 hours, the audible alarm will automatically reactivate. If a control failure is detected, the alarm light will illuminate continuously and the audible alarm will activate. If an auxiliary alarm condition is detected, the audible alarm and the corresponding auxiliary alarm light will activate.

If the telemetry system on the Service Pro control center has been commissioned, the system will then attempt to call out after a five minute delay and deliver an alarm message. The system will call the Service Pro monitoring center every 48 hours until the alarm condition is corrected and the control center is reset. The Service Pro control center uses advanced diagnostic technology to monitor the Singulair system for proper operation. In the event an alarm condition is encountered, the control center will display a series of flashes from the alarm light located in the center of the control panel (refer to the Red Alarm Light Diagnostic Codes chart on Page 5 for further reference).

SYSTEM HEARTBEAT FEATURE

The Service Pro control center contains a system heartbeat feature that will call out every 30 days to inform the monitoring center that the Singulair system is functioning as designed. If the heartbeat call is not received, the monitoring center will notify the distributor or service provider that service is required at that location.

FCC COMPLIANCE

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. The label on the inside of the control center cover contains, among other information, a product identifier in the format US:S2KMM00BMCD. If requested, this number must be provided to the telephone company.

If the Service Pro control center causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the

operations of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with the Service Pro control center, for repair or warranty information, please contact Norweco, Inc. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

SERVICE PRO WEBSITE & REGISTRATION

The telemetry system, standard with Service Pro MCD and TNT control centers, is engineered to interface with the Service Pro monitoring center. The Service Pro monitoring center allows the homeowner, service provider, licensed Norweco distributor and authorized regulatory entities online access to Singulair wastewater treatment system records. Records generated by the Service Pro control center (heartbeat record, alarm conditions, service records) can be accessed at www.servicepromcd.com. For access to the website, contact your local distributor or Norweco, Inc.

Permanent record retention and remote monitoring of the Singulair system will begin when the following steps have been completed:

- The "Add New Subscriber" section of the website has been completed by the Singulair distributor or service provider
- The system is started up and the Service Pro control center is commissioned
- Three copies of the signed Service Pro Subscriber Monitoring Agreement are received by Norweco

A control center can be commissioned either before or after the new account has been registered with the Service Pro monitoring center. However, if the commissioning step is performed first, the registration of the new account must be completed within 30 days of commissioning.

The Getting Started Website Instructions provide details on registering a new account on the Service Pro website. Add each new account by using the information recorded on the Monitoring Agreement form.

The Monitoring Agreement is completed with the owner of each system to be monitored by the website. The top three copies of the Agreement should be submitted to Norweco. This activates monitoring and satisfies Norweco's warranty registration procedure. Refer to the Subscriber Monitoring Agreement Guide for further information.

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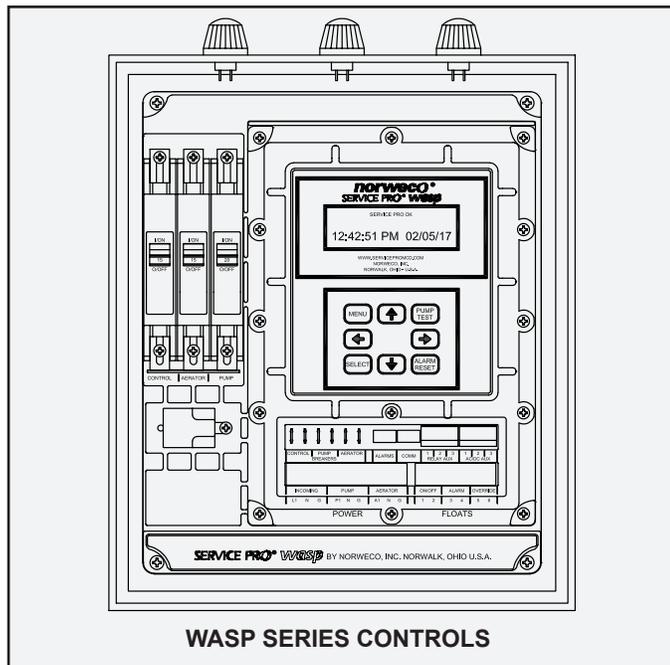
WASP SERIES INTEGRATED SYSTEM CONTROLS

ELECTRICAL WIRING AND CONTROL CENTER INSTALLATION

The information contained in these instructions is not intended to be a complete electrical installation reference, as code requirements vary according to geographic area. These instructions focus only on the specific requirements for the Service Pro WASP controls. They do not cover all installation aspects of the underground electrical cable and control center, preliminary inspection, testing and service of the control center or troubleshooting. More instructions are contained in the Bio-Kinetic Wastewater Treatment System Electrical Wiring and Control Center Installation yellow sheet. All electrical work must be performed in accordance with the latest edition of the National Electrical Code and all applicable local codes.

UNDERGROUND ELECTRICAL CABLE INSTALLATION

1. A separate underground electrical service cable must be installed from the main electrical panel in the home to the Service Pro WASP control center. The electrical service cable must be UL or CSA approved, type UF, #12/2 AWG minimum and must have a full-size center ground. Larger cable is required if the underground service needs to be run more than 80 feet.
2. A separate underground electrical service cable must be installed for each aerator within the Singularir system. The electrical service cable must be UL or CSA approved, type UF, #14/2 AWG minimum and must have a full-size center ground. Larger cable is required if the underground service needs to be run more than 80 feet.



WASP SERIES CONTROLS

3. A separate underground electrical service cable must also be installed for the effluent pump and each float switch. The electrical service cable supplying power to the pump must be UL or CSA approved, type UF, #12/2 AWG minimum and must have a full-size center ground. Larger cable is required if the underground service

needs to be run more than 80 feet. **NOTE:** The float switch cables carry low voltage for controls only and do not carry the full electrical load of the pump. Float switch cables should be #16 AWG minimum.

4. Each underground cable must be continuous and unspliced from the Service Pro WASP control center to the main electrical panel in the home, aerator, pump and float switches. Underground cable must be protected in conduit anytime the cable path passes directly across a tank or underground structure.
5. Uncoil the electrical service cables into the influent sewer line trench. Extend the aerator cable to the aerator mounting casting. Extend the pump and float switch electrical service cables to the pump station chamber. **NOTE:** Leave sufficient slack in the cables so they will not be stressed during backfilling or settling.
6. All underground cables should have at least two feet of earth cover to prevent damage from landscaping, trenches, etc. or be installed in an approved conduit.

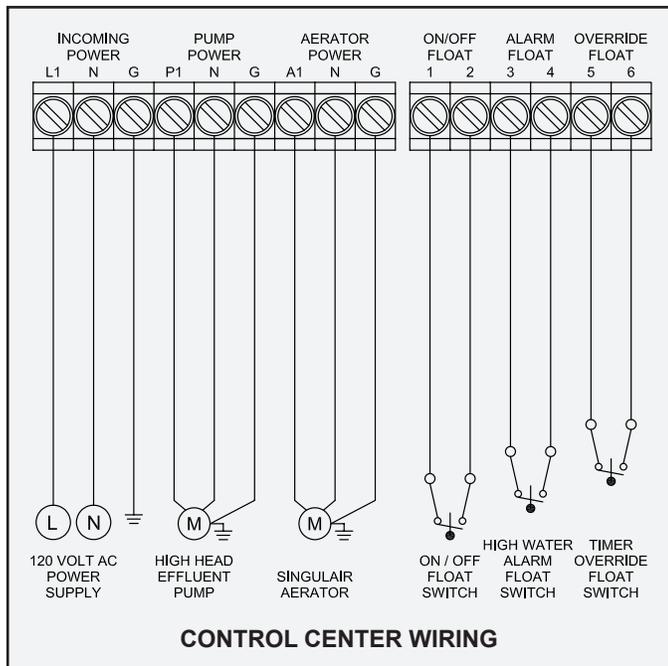
INSTALLATION OF ELECTRICAL CONTROL CENTER

The control center should be wired for operation when the tankage and underground electrical cables are installed. The Service Pro WASP controls should be located so that all warning lights can be readily seen and the audible alarm heard. The mounting location should minimize exposure to direct sunlight, freezing rain or conditions that might prevent routine inspection or access. The control center should always be mounted out of the reach of children.

Remove the control center insert and all packaging from the enclosure. Drill the appropriate openings in the bottom of the enclosure and install a conduit connector in each opening. Exposed wiring to or from the control center should always be encased in conduit. Mount the control center securely using masonry nails, wood screws or common nails as appropriate. Install the control center insert into the enclosure and secure with the four screws provided. The alarm light wires on the insert must now be connected to the alarm lights. Connect the yellow wires to the yellow light, the blue wires to the blue light, and the red wires to the red light.

SERVICE PRO® WASP WIRING AND INSTALLATION (Cont.)

- Use a dedicated 120 volt AC, 20 amp, single-phase circuit breaker in the main electrical panel for service to the Service Pro WASP control center. **CAUTION: Make sure the breaker is de-energized. Check it with an electrical multi-meter before proceeding with installation of the control center. Remember that other circuits in the service panel may remain energized as you are working. Use only tools with insulated handles, stand in a dry location and work with extreme care.**
- Wire from a dedicated breaker in the main service panel to the "INCOMING" power terminal marked "L1" in the control center using copper wire with black insulation.
- Wire from the neutral in the main service panel to the "INCOMING" power terminal marked "N" in the control center using copper wire with white insulation.
- Connect the ground conductor from the main service panel to the "INCOMING" power terminal marked "G" in the control center using bare copper wire. **IMPORTANT:** Never allow the white neutral leads and ground leads to be spliced together or connected to common terminals.
- Connect the power wire from the pump to the "PUMP" power terminal marked "P1" in the control center using copper wire with black insulation.
- Connect the neutral wire from the pump to the "PUMP" power terminal marked "N" in the control center using copper wire with white insulation.
- Connect the ground wire from the pump to the "PUMP POWER" terminal marked "G".



- Connect the power wire from the aerator to the "AERATOR" power terminal marked "A1" in the control center using copper wire with black insulation.
- Connect the neutral wire from the aerator to the "AERATOR" power terminal marked "N" in the control center using copper wire with white insulation.
- Connect the ground wire from the aerator to the "AERATOR" power terminal marked "G".

- Connect the wires from the float switches into the terminal blocks marked "FLOATS" in the Service Pro WASP control center.
- Connect the wires from the on/off float switch to the two float terminals marked "ON/OFF".
- Connect the wires from the high water alarm float switch to the two float terminals marked "ALARM".
- If a timer override float switch is being installed, connect the wires from the timer override float switch to the float terminals marked "OVERRIDE".
- If auxiliary inputs are being connected to the Service Pro WASP control center, push button style terminals are provided for the auxiliary input connections. Use #16 AWG or smaller wires in the push button terminals.
- If the auxiliary device uses dry contact (no voltage supplied) to signal an alarm condition, connect the wires from the auxiliary device to the "1", "2" or "3" terminals marked "RELAY AUX" on the blue push button terminal block.
- If the auxiliary device supplies a voltage (5 to 120 volts) to signal an alarm condition, connect the wires from the auxiliary device to the "1", "2" or "3" terminals marked "AC/DC AUX" on the red push button terminal block. **CAUTION: Do not connect devices to both the "RELAY AUX" and "AC/DC AUX" terminals for a single auxiliary input. Doing so may damage the circuit board.**
- Inspect your work to make sure that there are no breaks in wiring insulation and that all connections are secure. Tighten all screws on the terminal blocks.
- Carefully form all wiring neatly into the lower part of the Service Pro WASP control center. Do not allow the wires to make contact with other electrical components.
- IMPORTANT:** Seal all conduit openings with duct seal compound or similar appropriate material.
- Clearly label the dedicated circuit breaker used for the Service Pro WASP control center inside the door of the main service panel.
- Place all three circuit breakers in the Service Pro WASP control center in the "off" position. Close and secure the control center cover.

BEFORE LEAVING

Complete all of the remaining steps outlined in the Bio-Kinetic Wastewater Treatment System Electrical Wiring and Control Center Installation yellow sheet. Check to insure that all electrical controls, circuits and wiring for the Singlair system are de-energized. Be sure the red warning tag and distributor identification label are attached to the control center.

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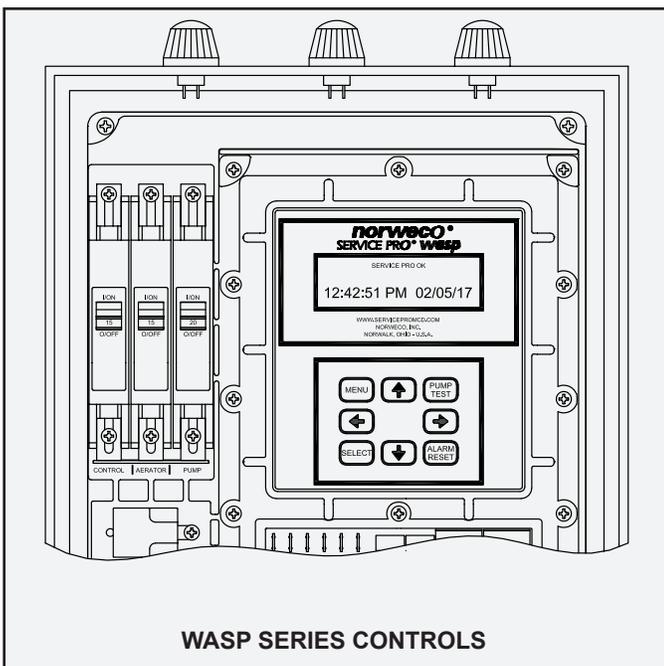
START-UP AND OPERATION INSTRUCTIONS

The information contained in these instructions is not intended to be a complete electrical installation reference, as code requirements vary according to geographic area. These instructions focus only on the specific requirements for the Service Pro WASP controls. They do not cover all installation aspects of the underground electrical cable and control center, preliminary inspection, testing and service of the control center or troubleshooting. More instructions are contained in the Bio-Kinetic Wastewater Treatment System Electrical Wiring and Control Center Installation yellow sheet. All electrical work must be performed in accordance with the latest edition of the National Electrical Code and all applicable local codes.

PROGRAMMING THE PANEL

1. After wiring has been completed, the Service Pro WASP control center must be programmed to operate the Singulair system. Make sure the breakers in the home and in the panel are both in the “on” position and the display in the control center reads “SERVICE PRO OK” on the top line.
2. Press the “MENU” button on the touchpad to access the programming menu of the control center. “SET CLOCK” and “SET HOURS” will be displayed on the screen. Press the up or down arrow button on the touchpad to set the correct hours value.
3. Once the correct hours value is displayed, press the right arrow button on the touchpad to advance to the minutes, seconds, month, day and year values. Press the up or down arrow button on the touchpad to set the correct digit for each of the corresponding values. Setting the correct time and date will aid in maintaining accurate error history logs for use when troubleshooting alarm conditions that are present with the panel.

4. Once the correct year value is displayed, press the right arrow button on the touchpad to set the aerator run time. The display will read “AERATOR RUN TIME”. Press the up or down arrow button to change the aerator run time in one minute increments. This value can be set from 30 minutes up to continuous operation.
5. Once the aerator run time has been set, press the right arrow button on the touchpad to set the pump timer mode. The display will read “PUMP TIMER MODE”. Press the up or down arrow button to change the timer mode. Available options include NO TIMER mode, TIME OF DAY mode and CYCLE TIMER mode. NO TIMER mode operates the pump on a demand use basis controlled by the float switches. TIME OF DAY mode enables the pump to operate at a set time range during the day and works in conjunction with the float switches. CYCLE TIMER mode enables pump operation on a repeat cycle and works in conjunction with the float switches. For TIME OF DAY mode, proceed to step 7 below. For CYCLE TIMER mode, proceed to step 8 below.
6. If the TIME OF DAY mode has been selected, press the right arrow button on the touchpad to set the pump on time. This is the time of day that the pump will begin operating.
 - a. “PUMP ON TIME” and “SET HOURS” will be displayed on the screen. Press the up or down arrow button to set the desired hours value.
 - b. Once the correct hours value has been set, press the right arrow button to set the minutes value. The display will read “SET MINUTES”. Press the up or down arrow button to set the desired minutes value.
 - c. Once the correct minutes value has been set, press the right arrow button to set the pump off time. This is the time of day that the pump will be disabled. “PUMP OFF TIME” and “SET HOURS” will be displayed on the screen. Press the up or down arrow button to set the desired hours value.
 - d. Once the correct hours value has been set, press the right arrow button to set the minutes value. The display will read “SET MINUTES”. Press the up or down arrow button to set the desired minutes value.
 - e. Proceed to step 9 below.



WASP SERIES CONTROLS

SERVICE PRO® WASP START-UP AND OPERATION (Cont.)

7. If the CYCLE TIMER mode has been selected, press the right arrow button on the touchpad to set the pump on time. This is the length of time that the pump will operate each cycle.
 - a. "PUMP CYCLE ON TIME" and "SET HOURS" will be displayed on the screen. Press the up or down arrow button to set the desired hours value.
 - b. Once the correct hours value has been set, press the right arrow button to set the minutes value. The display will read "SET MINUTES". Press the up or down arrow button to set the desired minutes value.
 - c. Once the correct minutes value has been set, press the right arrow button to set the seconds value. The display will read "SET SECONDS". Press the up or down arrow button to set the desired seconds value.
 - d. Once the correct seconds value has been set, press the right arrow button to set the pump off time. "PUMP CYCLE OFF TIME" and "SET HOURS" will be displayed on the screen. Press the up or down arrow button to set the desired hours value.
 - e. Once the correct hours value has been set, press the right arrow button to set the minutes value. The display will read "SET MINUTES". Press the up or down arrow button to set the desired minutes value.
 - f. Once the correct minutes value has been set, press the right arrow button to set the seconds value. The display will read "SET SECONDS". Press the up or down arrow button to set the desired seconds value.
8. Press the right arrow button on the touchpad to enter the auxiliary input alarms configuration screen. The display will read "AUXILIARY ALARMS" and the AUX1 value should be selected. Press the up or down arrow button to change the auxiliary 1 input from N-OP (normally open) to N-CL (normally closed) if required. If auxiliary input 1 will not be used, leave AUX1 set to N-OP.
9. Once auxiliary input 1 has been configured, press the right arrow button on the touchpad to configure auxiliary input 2. The AUX2 value should be selected. Press the up or down arrow button to change the auxiliary 2 input from N-OP (normally open) to N-CL (normally closed) if required. If auxiliary input 2 will not be used, leave AUX2 set to N-OP.
10. Once auxiliary input 2 has been configured, press the right arrow button on the touchpad to configure auxiliary input 3. The AUX3 value should be selected. Press the up or down arrow button to change the auxiliary 3 input from N-OP (normally open) to N-CL (normally closed) if required. If auxiliary input 3 will not be used, leave AUX3 set to N-OP.
11. Press the right arrow button on the touchpad to exit the programming menu. The display should read "SERVICE PRO OK" on the top line. The Service Pro WASP control center programming is complete and the system is now ready for operation.

VIEW SYSTEM STATUS AND CONFIGURATION

The Service Pro WASP control center records parameters regarding the Singulair system that can be reviewed at any time. Adjustments to the programming can be made as required. To review recorded data and system parameters:

1. Press the "SELECT" button on the touchpad. The screen should display the elapsed pump run time.
2. Press the right arrow button to review the pump cycle count.
3. Press the right arrow button to review the aerator elapsed run time.
4. Press the right arrow button to review the aerator cycle count.
5. Press the right arrow button to review the auxiliary input configurations.
6. Press the right arrow button to review failsafe mode status, software version and panel serial number.
7. Press the right arrow button to review the panel alarm history.
8. Press the right arrow button to exit the system parameters menu.

PUMP TEST

The Service Pro WASP control center has a built-in pump test feature. To start a pump test, hold the "PUMP TEST" button for five seconds. The screen will display "PUMP TEST" and the pump will turn on. The pump will operate for five minutes and then will turn off.

ALARM TEST

The Service Pro WASP control center has a built-in alarm test feature. To start an alarm test, hold the "ALARM RESET" button for five seconds. The screen will display "ALARM TEST" and the audible and visual alarms will turn on for five seconds. After five seconds, the alarms will turn off.

ALARM CONDITIONS

If the Service Pro WASP control center detects an abnormal condition, the display will indicate the specific problem the system is experiencing. For example, if the aerator is drawing high amps, the display will read "AERATOR HIGH CURRENT." To silence the alarms and attempt to clear the alarm condition, press the "ALARM RESET" button. If the issue has been corrected, the system will turn off the alarms and resume normal operation. If a problem still exists, the audible alarm will be silenced for 48 hours, but the visual alarm will continue to light. In addition, detailed information regarding the specific problem will be displayed on the screen.

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WASP SERIES CONTROL CENTER WITH MCD TECHNOLOGY

TELEMETRY COMMISSIONING AND OPERATION

The advanced integrated circuitry of the Service Pro WASP control center simplifies the Singulair installation, improves system performance and allows for communication with the Service Pro website. The integrated circuitry continually monitors both motor over current and under current conditions and minimizes nuisance alarm conditions through an automatic restart feature. To reduce unnecessary service calls, the control center shuts down the Singulair aerator in the event of an over current or an under current alarm condition, or the effluent pump in the event of an over current condition. The Service Pro WASP control center illuminates the appropriate alarm light and begins an automatic two hour aerator or pump restart attempt sequence before activating the audible alarm and telemetry system.

Service Pro WASP control centers are equipped with an automatic telemetry system designed to communicate through a toll free telephone number, Internet connection or cellular connection. In the event of an alarm condition that cannot be corrected by the control center's self-diagnostic sequence, the telemetry system contacts the Service Pro remote monitoring center. The monitoring center identifies the alarming control center and logs the time that the message was received and the specific alarm condition reported. The monitoring center then automatically updates the website and notifies the responsible Norweco distributor or service provider by email, fax or telephone. In addition to documenting alarm conditions, the website tracks the date, time and duration of service visits, service contract renewals and maintains a complete database for every Singulair system registered. Access to the information is password protected and available to licensed distributors, sponsored service providers, health departments and system owners.

These instructions are not intended to be a complete electrical, telecommunication or network system installation reference. Telecommunication and network system policies as well as electrical code requirements vary according to geographic area. Consult your local policies and regulations prior to installing the Service Pro WASP control center. Refer to the Electrical Wiring and Control Center Installation instructions for additional details.

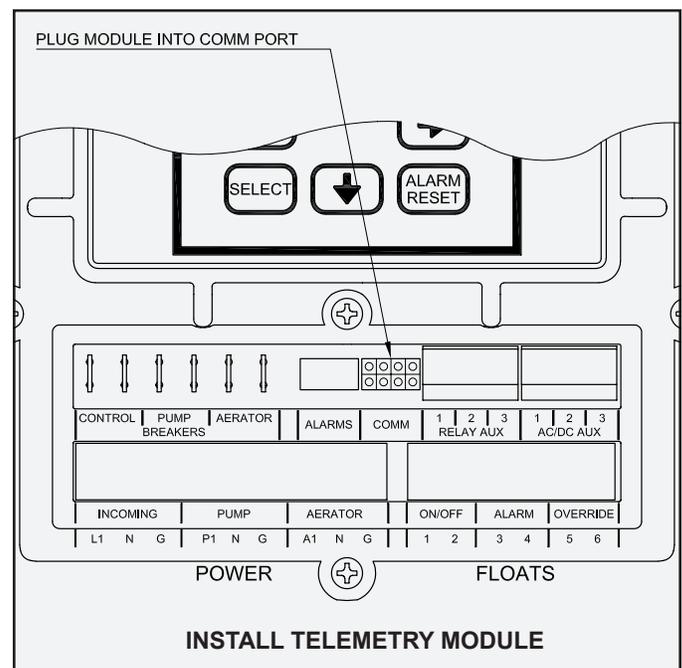
INSTALLATION OF TELEMETRY MODULE

The Service Pro WASP control center is compatible with phone, Internet and cellular communication modules. If a telephone connection will be utilized, a telephone line must be installed unspliced from the telephone box to the control center. Before installing the telephone line, familiarize yourself with the equipment and policies of the local telephone service provider. The Service Pro WASP control center is not compatible with digital telephone service. With DSL Internet service, a DSL filter will need to be connected to the telephone jack to insure proper operation. If a telephone line is not available, one will need to be installed or an Internet or cellular communication module should be utilized. If an Internet connection will be utilized, a network cable must be installed from the switch or router that distributes Internet service in the home.

The following steps must be performed to complete the installation of the telemetry module:

1. Attach the telemetry module to the right interior side of the enclosure with the Velcro strips provided.
2. If a telephone module is being installed, connect the ground wire from the module to the "INCOMING" power terminal marked "G".

3. Plug the black connector from the telemetry module into the port marked "COMM" on the control center.
4. Plug the telephone or network line into the appropriate jack on the telemetry module.



SERVICE PRO® WASP CONTROL CENTER INSTRUCTIONS

COMMISSIONING THE TELEMETRY SYSTEM

The commissioning process electronically registers the Service Pro WASP control center with the web based remote monitoring center at www.servicepromcd.com. Once commissioned, the panel is capable of automatically placing calls to the remote monitoring center. First, turn the breaker in the household power panel to the on position and verify that the control breaker in the Service Pro WASP control center is in the off position. Next, press the "ALARM RESET" button and keep it depressed while turning the control circuit breaker in the Service Pro WASP panel to the "on" position. Continue to hold in until the display reads 'LET GO TO COMMISSION'. Release the "ALARM RESET" button. The display will read 'CALLING...' indicating the Service Pro WASP control center is calling the remote monitoring center to commission the panel. When the display reads 'CALL SUCCESSFUL', the unit has been commissioned. If commissioning is unsuccessful, the display will indicate why the communications failed. Correct the problem and recommission the panel.

Conduct an alarm test to verify the Service Pro WASP control panel has been successfully commissioned. To conduct an alarm test, press and hold in the "ALARM RESET" button for at least 5 seconds. After the alarm lights on the control center illuminate and the alarm buzzer sounds, release the "ALARM RESET" button. The display will read 'ALARM TEST' and the panel will call the remote monitoring center to record the manual alarm test. If the display reads 'CALLING...' during the alarm test, this confirms that the panel has been successfully commissioned. Otherwise, it will be necessary to recommission the panel.

RECORDING SERVICE VISITS AND TESTING ALARMS

Time spent on a service visit is important to all parties involved. This includes, but is not limited to builders, licensed distributors, installers, service providers, regulatory personnel and homeowners. The control center will record the duration of each service visit and provide a permanent record (on the Service Pro website) of the time spent at each service visit.

To record the beginning of each service visit:

1. Press and hold in the "ALARM RESET" button for at least 5 seconds.
2. After the alarm lights on the control center illuminate and the alarm buzzer sounds, release the "ALARM RESET" button. The display will read 'ALARM TEST'. Testing of the alarm lights and alarm buzzer is now complete.
3. The panel now calls the remote monitoring center to record the time the service visit started.
4. The display will read 'CALL SUCCESSFUL' when the call is complete.

5. Conduct the normal Singulair system service as outlined in the "Singulair System Service Manual" and any other service that may be needed on auxiliary equipment.

To record the end of each service visit:

6. Press and hold in the "ALARM RESET" button for at least 5 seconds.
7. After the alarm lights on the control center illuminate and the alarm buzzer sounds, release the "ALARM RESET" button. The display will read 'ALARM TEST'. Testing of the alarm lights and alarm buzzer is now complete.
8. The panel now calls the remote monitoring center to record the time the service visit ended.
9. The display will read 'CALL SUCCESSFUL' when the call is complete.

Upon completion of service work, fill out the door hanger service record and deliver it to the homeowner or hang the service record form on the door.

SERVICE PRO WEBSITE & REGISTRATION

The telemetry system is engineered to interface with the Service Pro monitoring center. The Service Pro monitoring center allows online access to Singulair wastewater treatment system records. Records generated by the Service Pro control center (heartbeat record, alarm conditions, service records) can be accessed at www.servicepromcd.com. For access to the website, contact your local distributor or Norweco, Inc.

Permanent record retention and remote monitoring of the Singulair system will begin when the following steps have been completed:

- The "Add New Subscriber" section of the website has been completed by the Singulair distributor or service provider
- The system is started up and the Service Pro control center is commissioned
- Three copies of the signed Service Pro Subscriber Monitoring Agreement are received by Norweco

A control center can be commissioned either before or after the new account has been registered with the Service Pro monitoring center. However, if the commissioning step is performed first, the registration of the new account must be completed within 30 days of commissioning.

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BIO-KINETIC® WASTEWATER TREATMENT SYSTEM AERATOR INSTALLATION

Installation of the aerator and Bio-Kinetic system should take place when the Singulair system is ready for start-up. Refer to the Bio-Kinetic System Installation instructions for additional details. Your delivery truck driver should have instructed the contractor or owner to contact your office and make arrangements for equipment installation to coincide with occupancy and sanitary sewer use. Review your Singulair tank setting records weekly to insure that you do not have equipment installations that are overdue. If you suspect that adequate time has passed for system start-up and you have not yet heard from the owners, contact them to schedule equipment installation. For Singulair Bio-Kinetic wastewater treatment systems requiring more than one aerator installation, follow these instructions for each aerator to be installed.

PRE-INSTALLATION CHECKLIST

- ✓ The installer should have accurate directions to the facility and a list of service inspections due at other installations in the vicinity.
- ✓ The service vehicle should carry the Bio-Kinetic Tool Kaddy fully stocked with tools, spare parts and test equipment for use during installation.
- ✓ Someone should be present at the location to allow installer access to the control center and electrical service panel.
- ✓ The main electrical service panel wiring must be complete so each aerator may be started-up and tested.
- ✓ All chambers of the Singulair tankage should be full to the flow line.
- ✓ A Bio-Static sludge return should have been installed in each opening in the aeration/clarification chamber wall.
- ✓ The installer must have the proper model and quantity of aerators for the installation.
- ✓ The serial number on each aerator must match the service and warranty record card.

AERATOR START-UP PROCEDURE

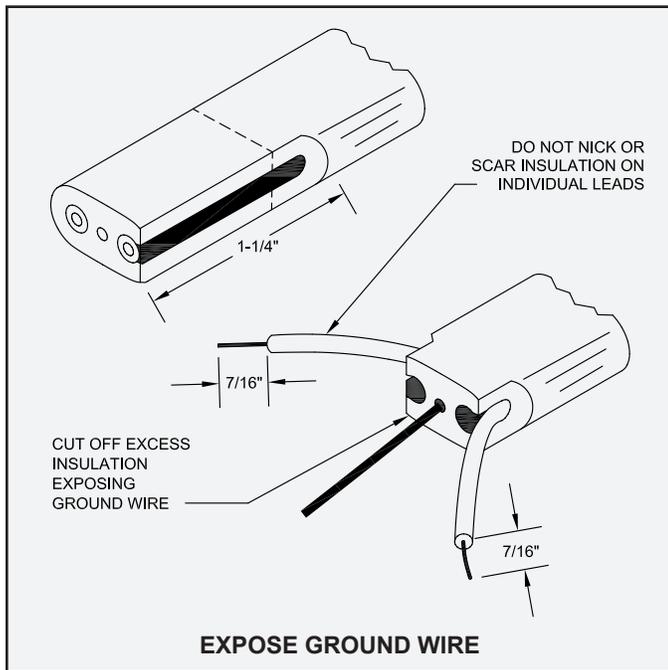
When you arrive on site, introduce yourself to the owner and ask to see the main electrical service panel and Singulair control center. Be certain each circuit for the Singulair system in the main electrical service panel is de-energized and that the selector switch in the Service Pro control center is placed in the "off" position. Explain to the owner that you will be installing the aerator in the tank and you will need access to the main electrical service panel for system start-up after the aerator has been installed. Carry the aerator in its shipping carton to the tank site. Place the Singulair Bio-Kinetic Tool Kaddy nearby for easy access to tools and test equipment. Remove the vented cover from the aerator mounting casting. Carefully remove the aspirator shaft from the shipping carton. Do not bump or bend the aspirator shaft. Lay the shaft on the vented cover. Grip the outside bottom of the shipping carton with your feet and lift the aerator to remove it. Lay the aerator on its side with the brackets resting on the vented cover near the aerator mounting casting. Uncoil the underground electrical service cable from inside the aerator mounting casting and extend it out of the casting. Test the exposed leads with the electrical multi-meter from the Tool Kaddy before proceeding. The circuit should not be energized and voltage should not be evident when the leads are tested with the multi-meter.

WIRING THE ELECTRICAL CONNECTOR

The moisture resistant electrical connector must be properly wired to insure system operation and protect components. Carefully follow these steps for wiring:

1. Uncouple the two halves of the electrical connector on the Singulair aerator. Unscrew the three captive stainless steel screws from the face of the female half of the assembly. They will stay in the body of the receptacle. Lift out the rigid internal receptacle body.
2. Unscrew the compression nut on the strain relief connector assembly at the small end of the female half of the connector. Do not misplace the compression ring. Insert the electrical service cable through the compression nut, compression ring and neoprene grommet, which is contained in the molded plastic sleeve of the female connector.
3. Strip the outer insulation back 1¹/₄" on the underground electrical service cable and expose the three individual leads. Use extreme care to be sure the insulation jackets on the individual black and white leads are not scarred or damaged while stripping the outer jacket. Check carefully. If even slight damage is noticed, cut off the end of the cable just below your work and begin again.
4. Strip off the insulation jackets ⁷/₁₆" from the ends of the black and white leads.

AERATOR INSTALLATION (Cont.)



5. Insert the black lead end into the hole adjacent to the brass-colored screw and tighten the screw securely.
6. Insert the white lead end into the hole adjacent to the silver-colored screw and tighten the screw securely.
7. Insert the bare copper ground lead into the hole adjacent to the green screw and tighten screw securely.
8. Inspect your work to see that no two uninsulated leads are in contact with each other and that all screws are tight. Also be sure the wire insulation is not captured in the terminal. All power cable leads must be connected to the correct terminals in the female receptacle for proper aerator operation. The back of the insert body is clear, making it easy to verify that each wire is in place before tightening the terminal screws. Improper wiring or electrical hook-up will void the warranty.
9. Locate the insert key above the grounding pole on the side of the rigid receptacle body and align it with the keyway molded on the inside of the rubber receptacle sleeve. Grasp the connector and insert the receptacle body fully into the sleeve.
10. Engage the three captive stainless steel screws on the face of the receptacle body and tighten them.
11. Press the neoprene grommet onto the small end of the female half of the electrical connector. Tighten the compression nut and clear plastic compression ring against the grommet. The compression nut achieves maximum torque by hand-tightening. Do not over-tighten the compression nut. **NOTE:** Any time the female connector is not in use, secure the closure cap in the end of the receptacle.

ASPIRATOR SHAFT INSTALLATION

Each Singulair aerator is manufactured and tested to a critical straightness tolerance from the aerator motor to the aspirator. Remember that the operating life of the aerator often depends on the straightness of the aspirator shaft. It

must not be bumped or allowed to contact anything except the aeration tank liquid.

1. With the Singulair aerator lying on its side and the brackets propped up on the vented cover, rotate the foam restrictor until the stainless steel set screws in the intermediate shaft are facing up.
2. Loosen the two set screws that are located closest to the foam restrictor.
3. Examine the upper end of the aspirator shaft and locate the alignment mark permanently affixed during factory testing. Insert the aspirator shaft into the intermediate shaft so that the alignment mark on the aspirator shaft meets the corresponding mark on the intermediate shaft. Be sure both set screws have been loosened before inserting the aspirator shaft. The aspirator shaft must be fully inserted to the depth of the stop shoulder machined into the aspirator shaft. Use a tee-handle allen wrench to tighten both set screws finger tight only. Overtightening may dish the side of the aspirator shaft and compromise the straightness tolerance.

INSTALLATION IN THE MOUNTING CASTING

1. Lower the aerator into the aerator mounting casting carefully to avoid any contact between the aspirator shaft, aspirator tip and concrete side walls.
2. Make sure that the weight of the aerator is evenly distributed on all four mounting brackets and that the brackets are seated in the four precast grooves on the top of the aerator mounting casting.
3. Arrange the underground power cable in the mounting casting so that it does not touch or come into contact with the side of the Singulair aerator.
4. Make sure the blades on the male half of the electrical connector are clean and dry. Plug the two halves of the watertight electrical connector together making sure the multiple lip seal is securely engaged. Arrange the aerator power cord, electrical connector and underground electrical cable around the aerator, and secure them into the mounting clips attached to the aerator upper brackets. Before replacing the aerator mounting casting lid, make sure these electrical connections are not resting against the top of the aerator. **DANGER: Make sure the system access cover is in good condition and securely installed on the mounting casting. Never allow access risers to be left uncovered or partially covered. Failure to secure access covers and safety nets could result in bodily injury, illness or death. Riser safety nets are available from Norweco for concrete or plastic risers.**

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BIO-KINETIC® WASTEWATER TREATMENT SYSTEM USING THE UNIVERSAL TOOL

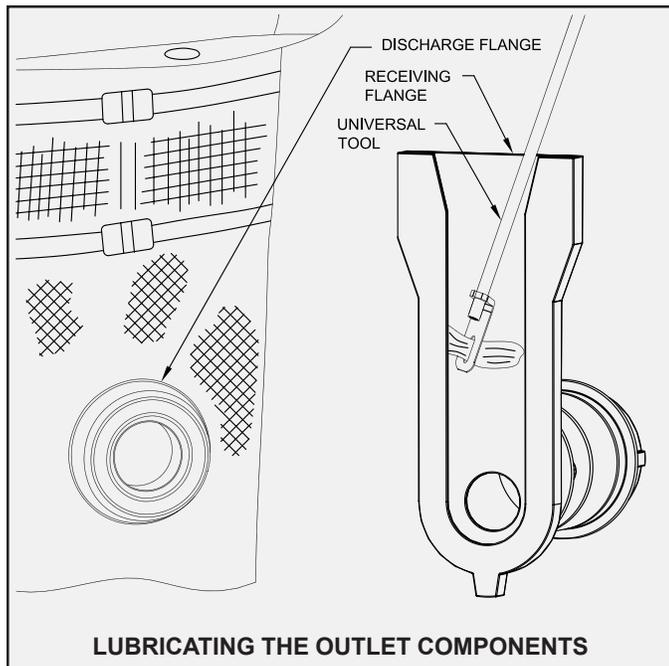
The universal tool is available to assist in the installation and service of the Bio-Kinetic system. This device incorporates a swab tool, locking lug tool, lifting tool and disassembly tool into one convenient package. The swab tool simplifies the application of Bio-Kinetic lubricant to the outlet components of the Singulair tank. The locking lug tool engages and disengages the locking lugs of the Bio-Kinetic system beneath the concrete lip of the mounting casting. The lifting tool assists in the installation and removal of the Bio-Kinetic system from the Singulair tank. The disassembly tool allows the inner components of the Bio-Kinetic system to be removed and reinstalled without removing the entire assembly.

USING THE SWAB TOOL

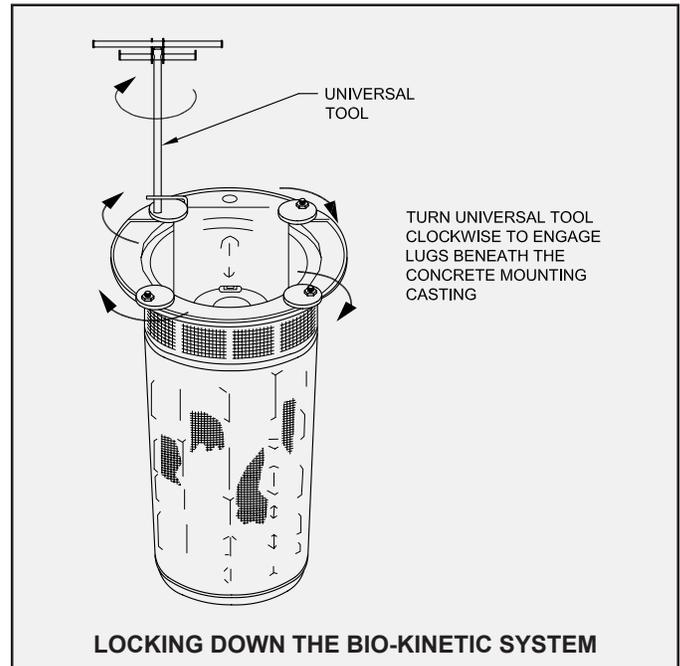
The swab tool is used to apply Bio-Kinetic lubricant to the rubber and plastic outlet connection components. Proper lubrication will insure the outlet connection engages easily without leaks. To prepare the swab tool for use, place a clean cloth through the eyelet of the swab tool and apply Bio-Kinetic lubricant to the cloth.

Examine the receiving flange cast into the outlet of the Singulair tank. The grooves and face of the receiving flange should be free from debris. Using the swab tool, apply a liberal amount of Bio-Kinetic lubricant to the grooves and face of the receiving flange. Locate the gasketed discharge flange assembly installed in the outlet of the Bio-Kinetic system. Remove any debris from the gasket with a clean cloth. Lubricate the gasket using the swab tool.

CAUTION: Bio-Kinetic lubricant has been specially formulated. Use of other lubricants, especially petroleum based lubricants, can cause degradation of the rubber components and will void the warranty.



LUBRICATING THE OUTLET COMPONENTS



LOCKING DOWN THE BIO-KINETIC SYSTEM

USING THE LOCKING LUG TOOL

The locking lug tool engages and disengages the locking lugs beneath the concrete lip of the mounting casting. When locked into position, the locking lugs hold the Bio-Kinetic system in place. The locking lugs must be disengaged to allow the Bio-Kinetic system to be removed from the Singulair tank for service.

To engage or disengage the locking lugs, remove the clarification chamber access cover and place it upside down next to the mounting casting. If the system is equipped with Blue Crystal or Bio-Neutralizer feed tubes, carefully remove each tube, one at a time. Lay each feed tube on the inverted access cover. Do not allow the feed tubes to touch each other. Remove the service cover from the Bio-Kinetic system. Place the locking lug tool, located opposite the fixed handle, over one of the locking lug bolts of the Bio-Kinetic system. Turn the locking lug tool clockwise to engage or disengage lugs beneath the concrete lip of the mounting casting.

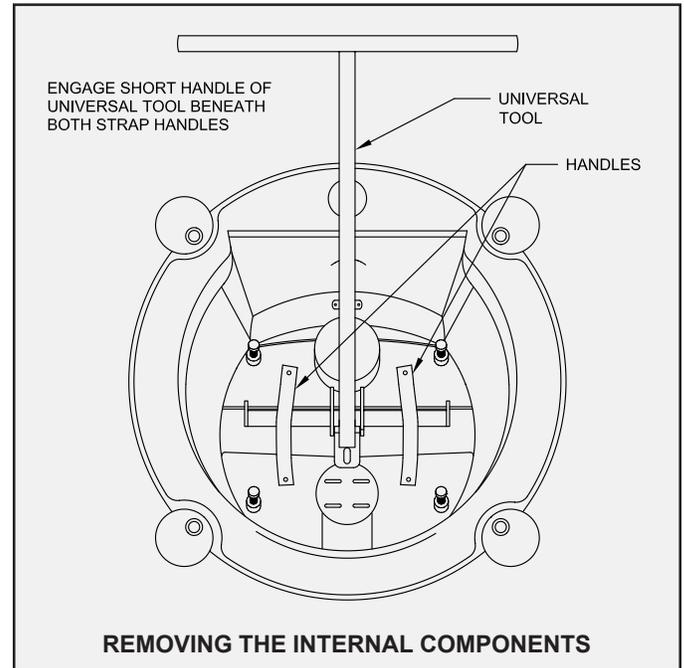
USING THE UNIVERSAL TOOL (Cont.)

USING THE LIFTING TOOL

The lifting tool assists in the installation and removal of the Bio-Kinetic system from the Singulair tank. The Bio-Kinetic system will need to be removed from the clarification chamber periodically for cleaning and service.

To remove the Bio-Kinetic system, remove the clarification chamber access cover and place it upside down on the ground near the mounting casting. If the system is equipped with Blue Crystal or Bio-Neutralizer feed tubes, carefully remove each tube, one at a time. Lay each feed tube on the inverted access cover. Do not allow the feed tubes to touch each other. Remove the service cover from the Bio-Kinetic system. Follow the instructions on the previous page to disengage the locking lugs.

The universal tool is equipped with a fixed handle and a movable handle. Lower the fixed handle into the open top of the Bio-Kinetic system. The fixed handle of the lifting tool should be aligned with two opposing locking lugs to allow the tool to drop into the lifting rib on the Bio-Kinetic system. Insert the end of the fixed handle that is opposite the flat area on the Bio-Kinetic system into the lifting rib. Lower the other end of the fixed handle down by the side of the flat area and into the lifting rib. Turn the handle until the lifting tool is engaged into the lifting rib. Guide the Bio-Kinetic system out of the mounting casting as it is being dewatered. Once completely dewatered, remove the Bio-Kinetic system from the mounting casting.

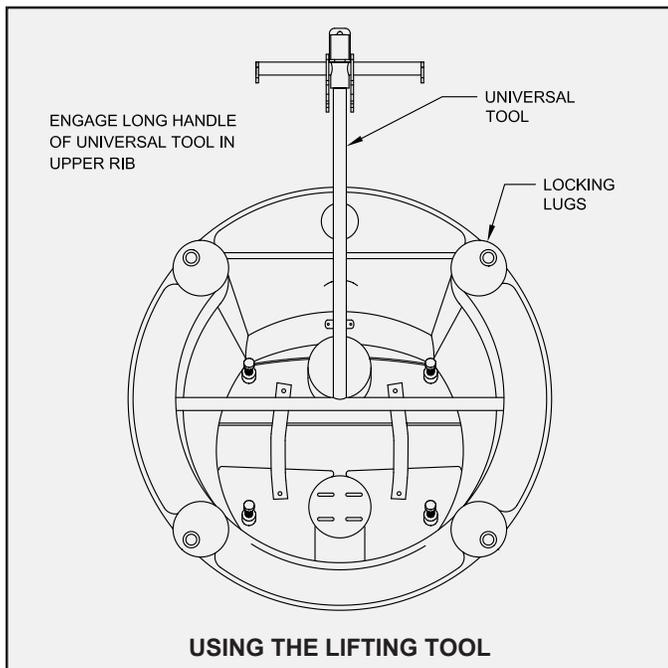


USING THE DISASSEMBLY TOOL

The disassembly tool allows the deck plates, flow deck, and inner baffle of the Bio-Kinetic system to be removed for service without removing the entire system from the clarification chamber. It is not necessary to dewater the Bio-Kinetic system before removing the internal components.

To remove the internal components, remove the Bio-Kinetic system access cover and place it upside down on the ground near the mounting casting. If the system is equipped with Blue Crystal or Bio-Neutralizer feed tubes, carefully remove each tube, one at a time. Lay each feed tube on the inverted access cover. Do not allow the feed tubes to touch each other. Remove the service cover from the Bio-Kinetic system. Do not disengage the locking lugs.

The universal tool is equipped with a fixed handle and a movable handle. Lower the movable handle into the open top of the Bio-Kinetic system. The movable handle of the disassembly tool should be positioned so that each end of the movable handle is beneath the plastic handles on top of the flow deck. Lift the internal components with the disassembly tool to remove them from the Bio-Kinetic system. When service has been completed, use the disassembly tool to lower the internal components back into the Bio-Kinetic system.



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BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

INSTALLATION OF THE BIO-KINETIC® SYSTEM

The Bio-Kinetic system is installed in the final clarification chamber of the Singulair tank. This unique device accomplishes tertiary treatment, flow equalization and, if required by local regulations, effluent disinfection and dechlorination in one compact assembly. The Bio-Kinetic system is recommended for use in direct off-lot discharge applications and any other application where extremely high quality effluent is desirable. Installation of the Bio-Kinetic system can take place as soon as the tank is ready for storage or immediately after the tank is installed in a prepared excavation.

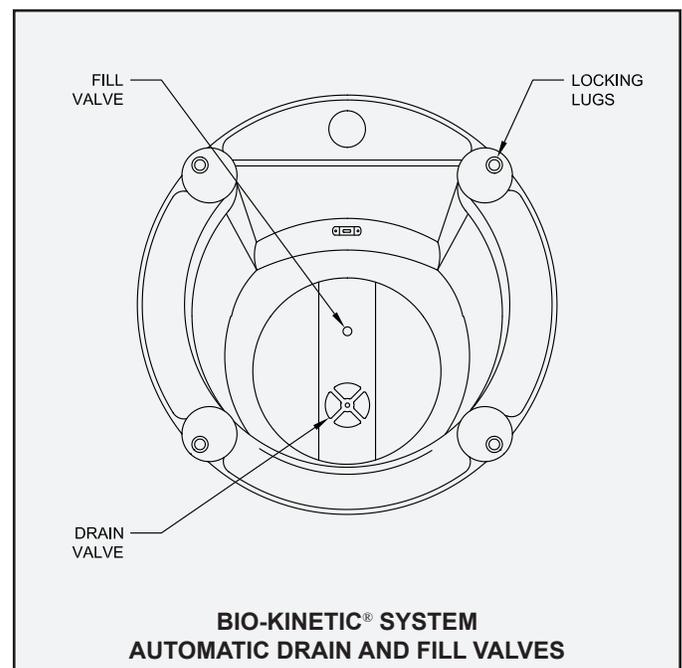
Drain and fill valves built into the Bio-Kinetic system allow it to be installed within the Singulair tank any time after the tank has been poured and stripped. This allows faster Singulair system installation and less time at the installation site. When installing the Bio-Kinetic system before tank delivery, make sure the tank is stored in a level position to avoid stress on the cast-in-place receiving flange, the Bio-Kinetic discharge flange or to prevent damage to the outer chamber filter media.

BIO-KINETIC® SYSTEM PRE-INSTALLATION CHECKLIST

- ✓ All chambers of the Singulair tank should be full to the flow line with clean hold down water as soon as the tank is placed in the excavation and backfilling begins. When the owner calls for start-up, ask him to check the liquid level in the Singulair system. If the liquid level has not reached the outlet invert, have the owner add clean water until full.
- ✓ These instructions consider the use of concrete as well as plastic risers and lids. The Bio-Kinetic system access opening pan, designed to accommodate the locking lugs into the tank top, must be used when installing plastic risers over the clarification chamber access opening.
- ✓ The service vehicle should be fully stocked, including the Norweco Tool Kaddy, Bio-Kinetic lubricant, Blue Crystal disinfecting tablets and Bio-Neutralizer dechlorination tablets.
- ✓ Make sure the proper quantity and model number of Bio-Kinetic systems for the installation are in the service vehicle. Bio-Kinetic systems may be supplied with or without Blue Crystal and Bio-Neutralizer chemical feed systems. Therefore, check your order and Distributor Service and Warranty Record Card carefully to be sure you have selected the proper quantity of Bio-Kinetic systems with the correct service cover, flow distribution deck and feed tube(s), and that they are properly labeled for the correct model Singulair system.
- ✓ For Singulair systems requiring multiple Bio-Kinetic tertiary treatment devices, follow these instructions for each Bio-Kinetic system to be installed.

PREPARING THE SINGULAIR TANK

1. Bio-Kinetic system mounting castings or plastic risers should be used for access to the clarification chamber. Additional riser castings or plastic risers may be added as necessary to reach finished grade.
2. When a mounting casting is used, it must be carefully sealed to allow the locking lugs of the Bio-Kinetic system to engage into the groove created when the mounting casting is installed on the tank top. Excess sealant in this groove may prevent the locking lugs from properly engaging. Other sealing procedures for the tank, mounting castings and risers are detailed in Singulair Tank Delivery and Setting instructions.
3. When plastic risers and lids are used to replace the concrete system mounting castings, make sure that the proper access opening pan has been used to create the grooves that are necessary for securing the locking lugs. Seal and secure the plastic risers to the manufacturer's specifications.
4. The Bio-Kinetic system should only be installed in a



INSTALLATION THE OF BIO-KINETIC® SYSTEM (Cont.)

concrete mounting casting or plastic riser with a non-vented concrete or plastic cover above it. Do not seal the cover to the mounting casting or plastic riser. All mounting castings, risers and covers must be in place before backfilling the tank to prevent fill material from entering the Singulair tank.

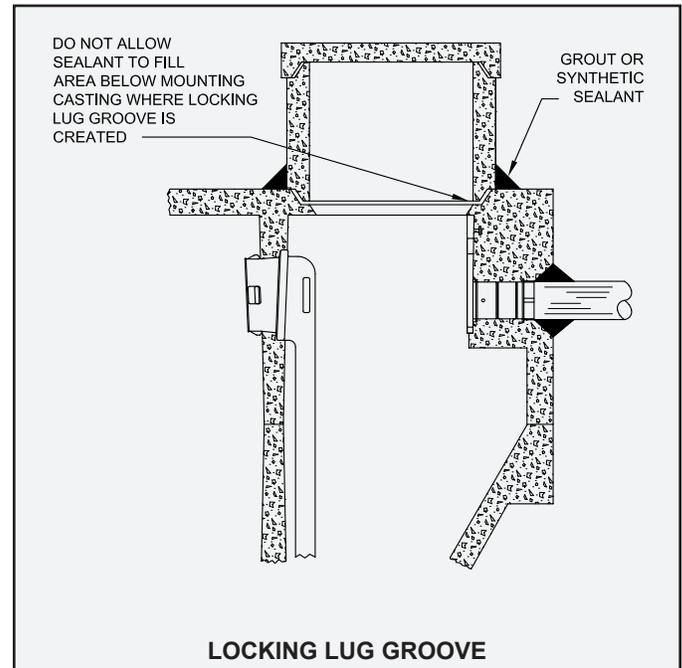
5. The proper quantity of Bio-Static sludge returns should have been installed in the aeration/clarification chamber wall when tank delivery and setting was completed. Check to be sure that a Bio-Static sludge return is installed in each of the cast-in opening(s) in the aeration/clarification chamber wall.
6. If the Singulair tank is in an excavation, it should already be filled with clean water. The water should be free of dirt, mud, leaves, grit, oils or other materials that might possibly interfere with operation of the system. The tank should be filled with water inside, at the same time it is backfilled outside, to reduce stress on the precast tank. The aeration and clarification chambers will both be filled if the hose is installed in the aeration chamber access opening. The pretreatment chamber should be filled separately through its access opening.
7. Influent and effluent sewer lines must be installed and connected to the system as soon as it is set and before backfilling to prevent entry of mud or debris.
8. When a Singulair system is being installed to replace a failed onsite wastewater treatment system, the old septic tank need not be abandoned. However, be sure the Singulair system is installed downstream of the old septic tank and that the entire obsolete system is completely pumped and cleaned before the Singulair tank is installed. If the owner prefers, the obsolete system may be totally removed or filled in and abandoned in the ground.
9. Check to see that roofing down spouts, footer drains, sump pump piping or garage and basement floor drains are not connected to the sanitary sewer. The Singulair system may not operate properly if hydraulic flows greatly exceed the rated treatment capacity. If the facility is equipped with a water softener, locate the backwash discharge line. The backwash line must not be connected to the Singulair system.

BIO-KINETIC SYSTEM INSTALLATION PROCEDURE

Remove the Bio-Kinetic system from the shipping carton. Lift off the Bio-Kinetic system service cover and set it aside. Rotate the round, black locking lugs inward to allow installation.

The Bio-Kinetic system discharge flange must engage the plastic receiving flange that has been cast into the outlet of the Singulair tank. Carefully examine the condition of the outlet coupling and receiving flange. Any concrete residue or aggregate that has accumulated in the grooves of the receiving flange or inside of the outlet coupling must be removed and the grooves and face of the receiving flange should be wiped clean. Use the swab tool to apply

a liberal amount of Bio-Kinetic lubricant to the entire face of the receiving flange and the inside of the grooves. Apply the lubricant evenly until all interior surfaces of the receiving flange and the grooves are thoroughly coated. Locate the gasketed discharge flange assembly installed in the outlet of the Bio-Kinetic system. Make sure that the assembly is tight and fully engages the discharge opening of the Bio-Kinetic system. Using the swab tool, apply a liberal amount of lubricant to the exterior surfaces of the gasketed discharge flange. Apply the lubricant evenly over the entire face of both sides and along the edges of the discharge flange.



CAUTION: Bio-Kinetic lubricant has been specially formulated. Use of other lubricants, especially petroleum based lubricants, can cause degradation of the rubber components and will void the warranty.

SELF FILL VALVE

Use the lifting tool to lower the Bio-Kinetic system into the mounting casting. Be careful to align the discharge flange with the receiving flange cast into the tank. The Bio-Kinetic system is equipped with a pressure sensitive valve to aid in the filling process for new systems that are not yet filled and the draining process during service or removal. The fill valve is engineered to open when the pressure outside the Bio-Kinetic system reaches 16" of head. When the tank water level reaches 16" on the outer chamber of an empty

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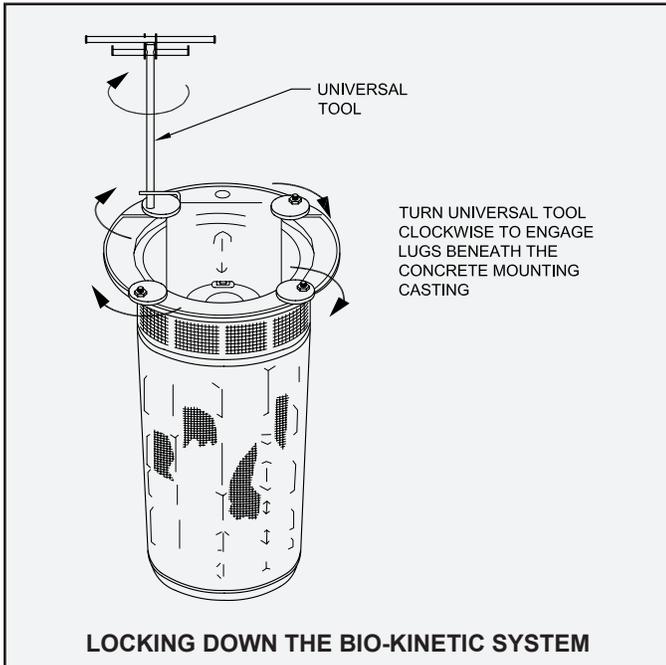
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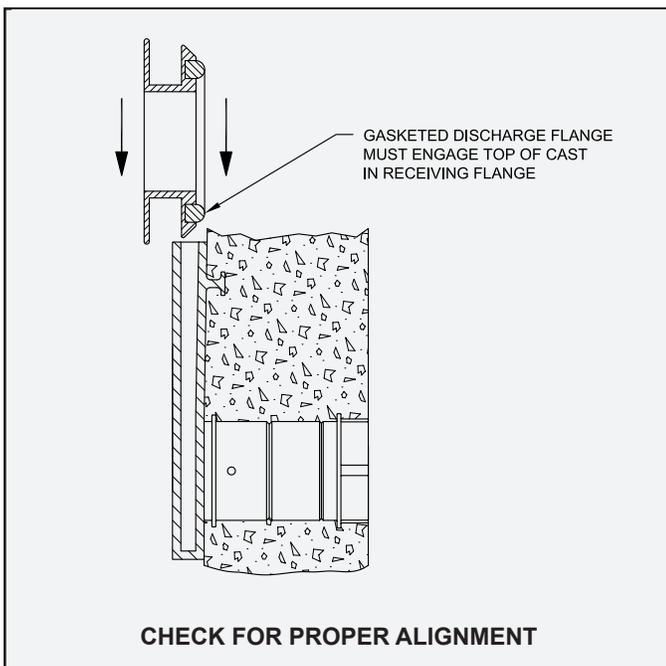
SINGULAIR® BIO-KINETIC®

WASTEWATER TREATMENT SYSTEM

INSTALLATION OF THE BIO-KINETIC® SYSTEM (Cont.)

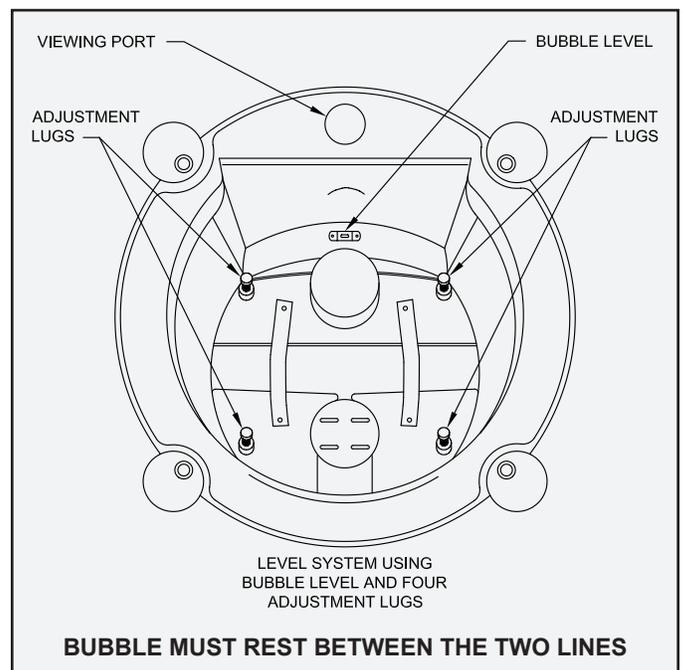


Bio-Kinetic system, the fill valve will open. The valve will remain open until the water level inside the filter reaches 4" below the water level outside the filter. At this point, the valve will close. For instructions on the drain valve system, refer to "Clarification Chamber and Bio-Kinetic Service." Carefully guide the system through the center of the opening using the lifting tool. Be sure to maintain the Bio-Kinetic system in a vertical position. If tilted, the system could rub the edge of the concrete opening and be damaged. **NOTE:** Use the viewing port to insure proper alignment and engagement of



the outlet connection. The discharge flange must engage the top of the cast-in-place receiving flange.

Continue to lower the system until the discharge flange fully engages the receiving flange and the top collar of the Bio-Kinetic system rests on the concrete ledge of the clarification chamber access opening. To confirm that the discharge flange and receiving flange are fully engaged, look through the viewing port in the top collar. Use the locking lug tool to twist each of the round, black locking lugs clockwise, so that each locking lug is positioned directly beneath the concrete lip of the mounting casting.



PLACING THE BIO-KINETIC SYSTEM ON LINE

Locate the level indicator mounted above the outlet of the Bio-Kinetic system flow distribution deck. The bubble should be resting squarely between the two lines in the clear plastic case. If the location of the bubble indicates the system is not installed in a level position, the flow distribution deck should be leveled using the four adjustment lugs provided for this purpose. With the ratchet drive, extension and $\frac{7}{16}$ " socket from the Tool Kaddy, turn each of the adjustment lugs the minimum amount necessary for the bubble to rest squarely between the two lines in the clear plastic case. Leveling of the flow distribution deck is essential for proper operation of the flow equalization ports, chemical feed tubes and effluent weir within the Bio-Kinetic system.

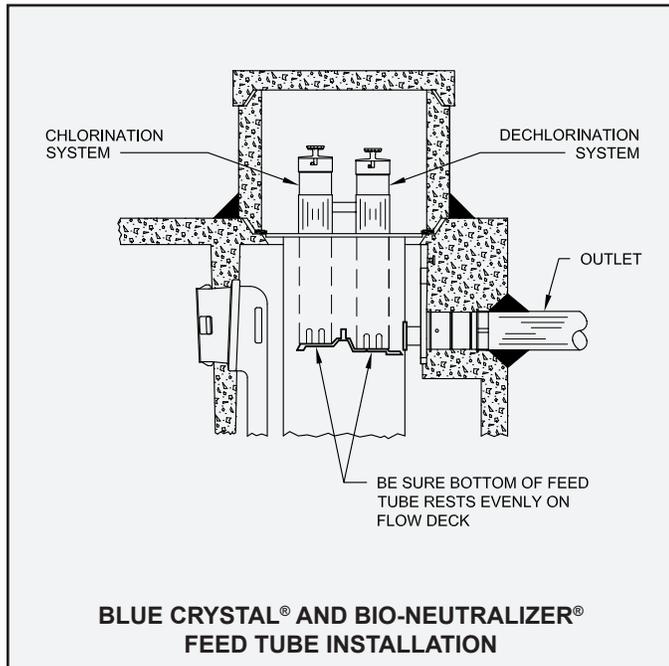
The system service cover can now be placed into position. Install the cover, handle side up, aligning the four holes in the cover with the four locking lug bolts. Be sure the optional chlorination and dechlorination feed tube access

INSTALLATION OF THE BIO-KINETIC® SYSTEM (Cont.)

openings are in the proper position. The cover will come to rest on the collar of the Bio-Kinetic system. There is no need to add fasteners to the locking lug bolts.

If the installation requires a Blue Crystal disinfection system, the chlorine feed tube opening in the service cover must be positioned on the inlet side of the system nearest the aerator mounting casting. Before handling Blue Crystal tablets, carefully read the container label and the "Warning" section of these instructions. To fill the chlorine feed tube, remove the cap, hold the tube (open end down) with one hand and insert Blue Crystal disinfecting tablets, one tablet at a time, until the tube is filled. Each tablet must lie flat in the stack. When the tube has been completely filled, replace the cap. Install the feed tube, slotted end down, through the plastic collar molded into the top of the Bio-Kinetic system service cover. The feed tube will begin to engage the round recess in the flow distribution deck. Rotate the tube clockwise until it locks into position.

NOTE: The chlorine feed tube must always be installed through the mounting collar nearest the aerator mounting casting. If the installation requires disinfection and dechlorination, there will be two openings in the protective cover. The dechlorination feed tube must be installed nearest the system outlet.



WARNING

Blue Crystal disinfecting tablets are a strong oxidizing agent and highly corrosive. Tablets should be stored in a cool, dry, well-ventilated area away from combustible materials such as paper, petroleum products, chemicals, rags or cardboard. Contact with other liquids or chemicals may cause fire. Wear proper protective equipment when handling Blue Crystal disinfecting tablets or working with the chlorine feed tube. Keep tablets out of the reach of

children, as they can cause skin and eye damage, irritate the nose and throat, and may be fatal if swallowed. If on skin, wash with plenty of soap and water for fifteen minutes, call a doctor if irritation persists. If swallowed, immediately drink large quantities of water, do not induce vomiting, avoid alcohol and get medical attention immediately. If inhaled, immediately remove victim to fresh air. In the case of fire, apply liberal quantities of water. It is a violation of Federal Law to use Blue Crystal tablets in a manner inconsistent with the instructions printed on the storage container label.

If the installation requires a Bio-Neutralizer dechlorination system, the Bio-Kinetic system will be supplied with a dechlorination feed tube. Before handling Bio-Neutralizer dechlorination tablets, carefully read the container label and the "Warning" section of these instructions. To fill the dechlorination feed tube, remove the cap, hold the tube (open end down) with one hand and insert the Bio-Neutralizer dechlorination tablets, one tablet at a time, until the tube is filled. Each tablet must lie flat in the stack. When the tube has been completely filled, replace the cap. Insert the dechlorination feed tube, slotted end down, into the mounting collar closest to the system outlet. The bottom of the tube must come to rest evenly on the floor of the flow deck.

WARNING

Bio-Neutralizer dechlorination tablets must be stored in a cool, dry place away from acids and oxidizers. Do not allow Bio-Neutralizer tablets to come into contact with chlorine tablets. Although not rated a hazardous material by the USEPA, exercise caution when handling and wash skin thoroughly with soap and water if contact occurs.

Reinstall the Bio-Kinetic system access cover. If a plastic riser and lid are used, secure the plastic lid to the riser using the fasteners provided. Now proceed with the steps outlined in the Singulair System Final Check and System Start-Up instructions. **DANGER: Make sure the system access cover is in good condition and securely installed on the mounting casting. Never allow access risers to be left uncovered or partially covered. Failure to secure access covers and safety nets could result in bodily injury, illness or death. Riser safety nets are available from Norweco for concrete or plastic risers.**

SERVICING THE BIO-KINETIC SYSTEM

Each installation equipped with the Bio-Kinetic system should be inspected and serviced during each six-month service inspection. Refer to the Bio-Kinetic System Service instructions for service and recordkeeping procedures.

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RISER SAFETY NET ASSEMBLY INSTALLATION INSTRUCTIONS

Norweco's riser safety net assembly has been designed to protect the access openings of the treatment system against accidental entry from unauthorized or untrained personnel, in the unlikely event that the primary access cover is missing or unsecured. The safety net can be installed in both plastic and concrete risers that are up to 24" in diameter. The riser safety net includes a polyethylene net with pre-installed carabiners, stainless steel D-ring fasteners, stainless steel screws, stainless steel locking nuts, EPDM rubber washers and concrete screw anchors.

When fully installed, the riser safety net covers the riser access opening and prevents accidental entrance into the system. The safety net is rated for a maximum weight of 500 lbs. Polyethylene and stainless steel construction insure the durability and reliability of this device in a wastewater environment. **DANGER: Never allow access risers to be left uncovered or partially covered. Failure to secure access covers could result in bodily injury, illness or death. Safety nets are available from Norweco for concrete and plastic risers.**

COMPONENTS

The riser safety net assembly consists of the following:

1. Polyethylene safety net
2. (8) stainless steel D-ring fasteners
3. (8) stainless steel carabiners
4. (8) #10-32 stainless steel screws
5. (8) #10-32 stainless steel locking nuts
6. (8) EPDM rubber washers
7. (8) 3/16" x 1 1/4" concrete screw anchors (optional for concrete risers)

Tools required for plastic riser installation:

- | | |
|--------------------|------------------------------|
| 1. Electric drill | 4. Marker |
| 2. 7/32" Drill bit | 5. Adjustable wrench |
| 3. Tape measure | 6. Phillips head screwdriver |

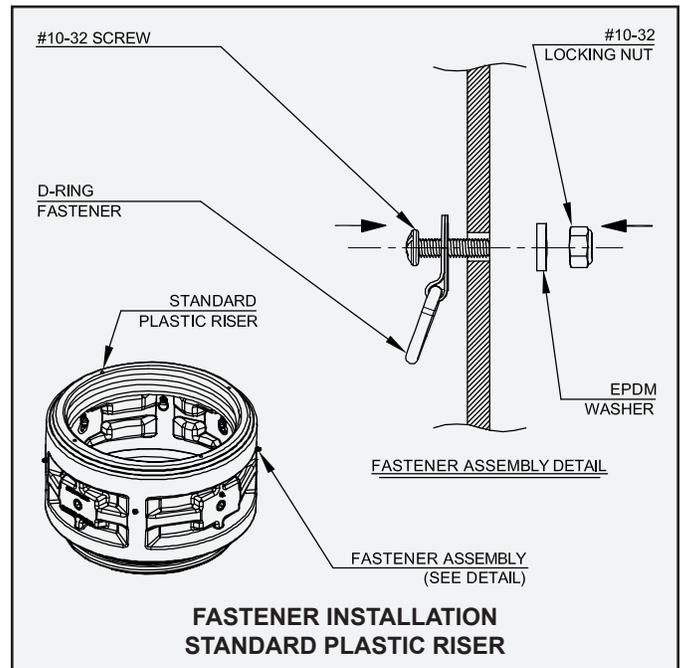
Tools required for concrete riser installation:

- | | |
|----------------------------|------------------|
| 1. Hammer drill | 4. Marker |
| 2. 5/32" Carbide drill bit | 5. Socket wrench |
| 3. Tape measure | |

INSTALLATION IN STANDARD PLASTIC RISERS

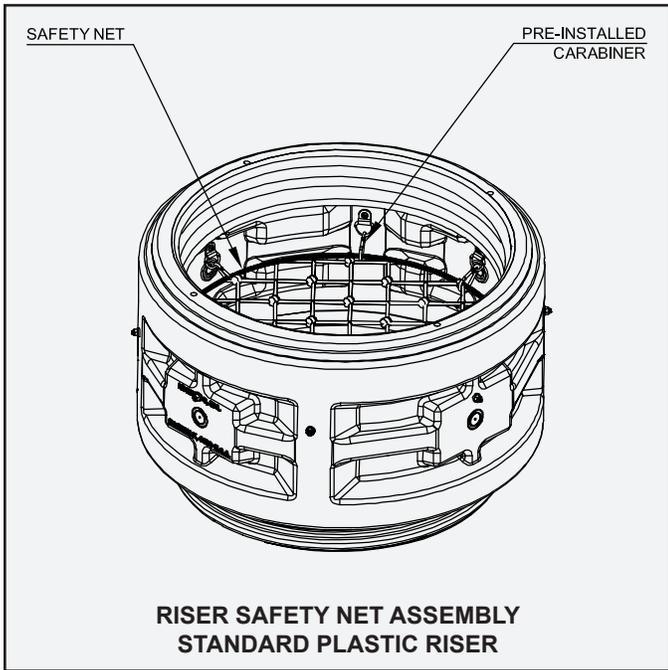
Follow these instructions to install the riser safety net assembly into a standard Norweco plastic riser. Other plastic risers with similar dimensions and profiles can follow the same procedures.

1. Place the riser on a clean level surface. Mark eight evenly spaced drill locations around the outside of the riser. The holes must be located 5 1/2" below the top of the riser to be free of obstructions. For non-Norweco plastic risers, make sure the holes are located within reachable distance and free of obstruction. Drill each hole with a 7/32" drill bit.



2. Insert the #10-32 screw into the D-ring fastener mounting hole and then insert the threaded end of the screw into the hole from the inside of the riser. Secure the connection with an EPDM rubber washer and locking nut on the outside of the riser. Tighten the locking nut with an adjustable wrench while holding the #10-32 screw stationary with a screwdriver. Repeat for the remaining D-ring fasteners. Verify that the locking nuts are fully engaged with the screws and all connections are securely fastened.
3. Unfold the safety net and attach it to the D-ring fasteners using the pre-installed carabiners. Insure the correct orientation of each carabiner to prevent twisting of the net. The spring loaded carabiner will stay affixed to the net assembly and provide convenient engagement and disengagement between the riser safety net and the riser during regular service.

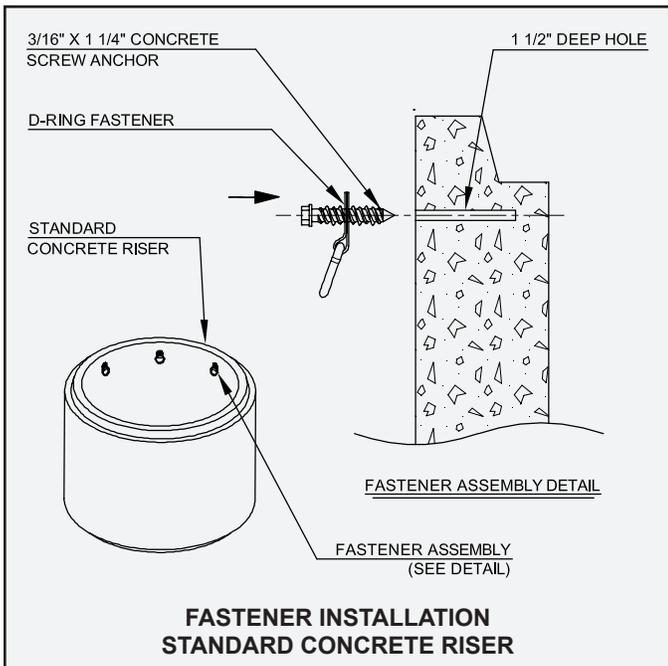
RISER SAFETY NET ASSEMBLY INSTRUCTIONS (Cont.)



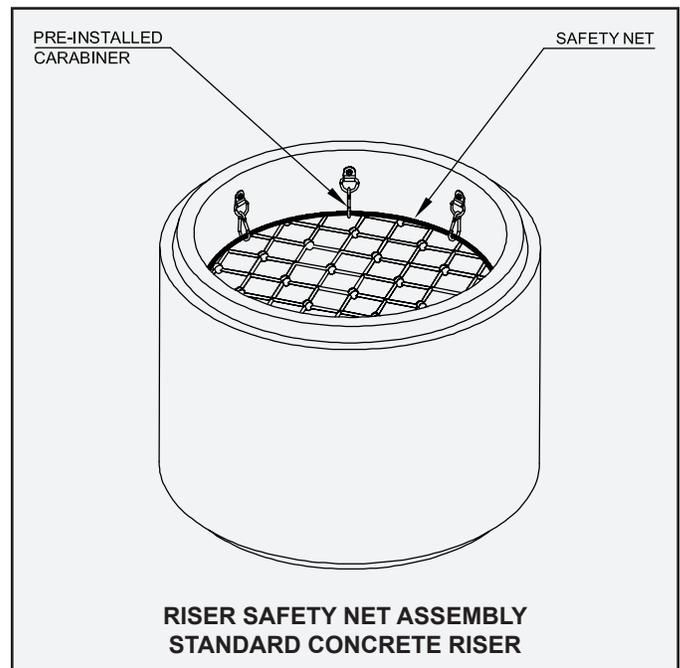
4. The holding capacity of the riser safety net is governed by the connection of the D-ring fasteners to the riser and the strength of the polyethylene net. It is critical to install all D-ring fasteners properly and securely to the riser. Failure to do so will severely compromise the functionality of the safety net.

INSTALLATION IN STANDARD CONCRETE RISERS

Follow these instructions to install the riser safety net assembly into a standard Norweco concrete riser. For installation in an aeration chamber riser, see the appropriate section of this document. Other non-Norweco concrete risers with similar dimensions and profiles can follow the same procedure.



1. To install the riser safety net assembly in a standard concrete riser, mark eight evenly spaced drill locations around the inside of the concrete riser. Use a hammer drill to insure that the holes have the proper tolerance. A hammer drill has a specially designed clutch that allows it to not only spin the drill bit, but also to punch in and out. This action breaks up the concrete and removes dust from the holes.
2. Use a $\frac{5}{32}$ " carbide tipped bit to drill insertion holes to insure proper hole tolerance for the $\frac{3}{16}$ " concrete screw anchors. Drilling the holes to the proper depth is critical. Set the depth gauge provided with the hammer drill to the required depth. If a depth gauge is not available, wrap tape around the bit at the correct hole depth. When setting the depth gauge or using tape, make sure that the bit is in the most protracted position in the chuck. For this application we recommend a $1\frac{1}{2}$ " hole depth for the $1\frac{1}{4}$ " long concrete screw anchors.
3. Before inserting the concrete screw anchors, clean the holes of all dust and debris that may have accumulated during the drilling process. Use a wire brush or vacuum to effectively clean the holes. Compressed air can be used to clean the holes, but this will create dust and may not be suitable for all situations. It is critical that the holes are cleaned of debris to insure proper installation of the safety net.



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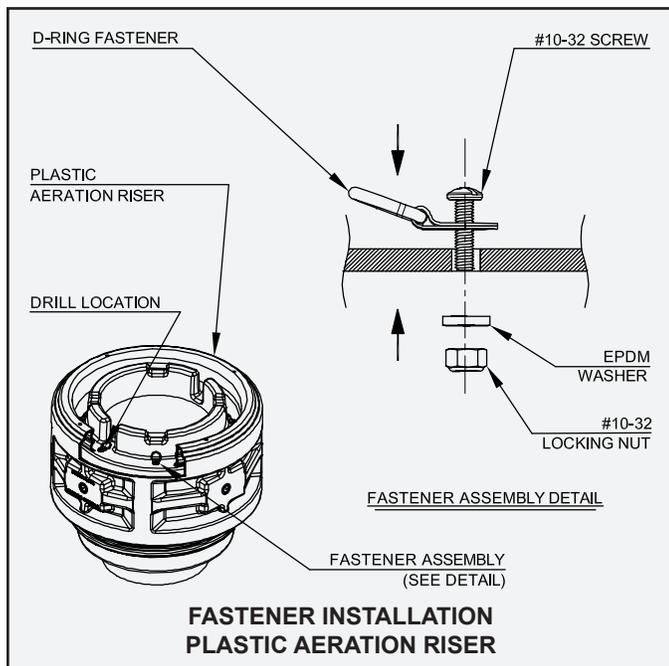
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RISER SAFETY NET ASSEMBLY INSTRUCTIONS (Cont.)

4. Insert a concrete screw anchor into the D-ring fastener mounting hole and install the screw anchor into the pre-drilled hole. Do not over torque the concrete screw anchor, as this may cause it to spin in the hole and will reduce its anchoring strength. During installation, make sure that the anchor and D-ring fastener are tight against the surface of the concrete and the D-ring fastener is lying flat pointed in the direction shown in the drawing. Repeat for the remaining D-ring fasteners.
5. Unfold the safety net and attach it to the D-ring fasteners using the pre-installed carabiners. Insure the correct orientation of each carabiner to prevent twisting of the net. The spring loaded carabiner will stay affixed to the net assembly and provide convenient engagement and disengagement between the riser safety net and the riser.
6. The holding capacity of the riser safety net is governed by the concrete screw anchors, D-ring fasteners and the strength of the polyethylene net. It is critical to insure the concrete screw anchors are securely engaged into the concrete riser and the connections between the concrete screw anchors and D-ring fasteners are secured. Failure to do so will severely compromise the functionality of the riser safety net.

INSTALLATION IN PLASTIC AERATION RISERS

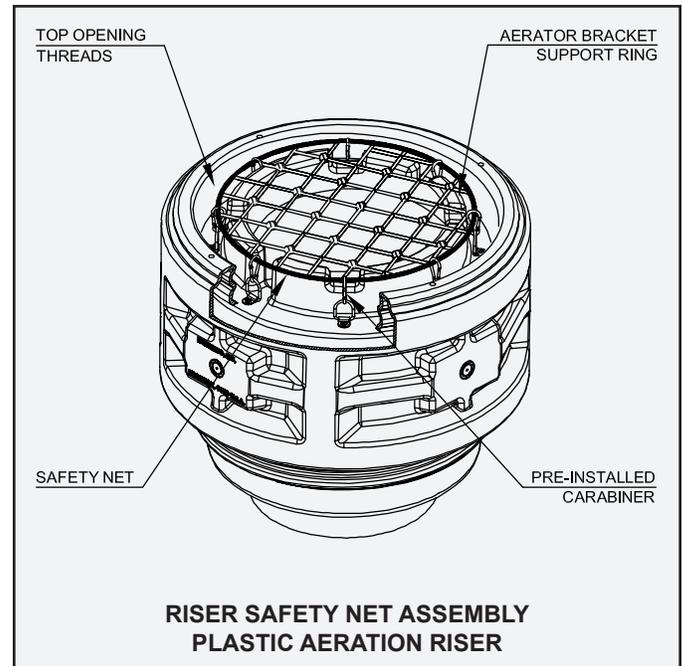
Follow these instructions to install the riser safety net assembly into a plastic Norweco aeration riser. Other plastic risers with similar dimensions and profiles can follow the same procedures.



1. Place the plastic aeration riser on a clean level surface. The top portion of the riser is constructed with a flat recessed area located between the aerator bracket

support ring and the top opening threads. Mark eight evenly spaced drill locations in the flat recessed area as shown. When marking drill locations, center the drill marks in the recess between the aerator bracket support ring and the threads.

2. The holes must be centered between the bracket support ring and the threads to insure adequate material for support and to be free of obstruction. For non-Norweco plastic risers, make sure the holes are located within reachable distance and free of obstruction. Drill each hole with a $\frac{7}{32}$ " drill bit.

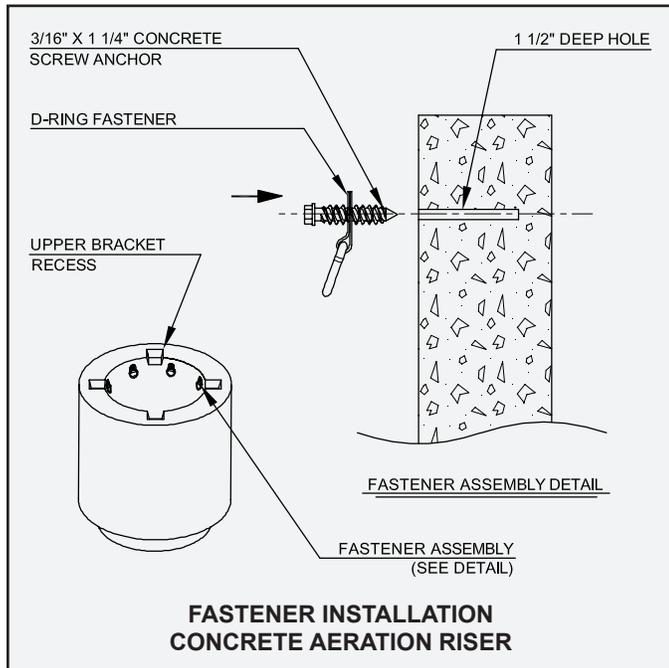


3. Insert the #10-32 screw into the D-ring fastener mounting hole and then insert the threaded end of the screw into the hole as shown in the drawing. Secure the connection with an EPDM rubber washer and locking nut. Tighten the locking nut with an adjustable wrench while holding the #10-32 screw stationary with a screwdriver. Repeat for the remaining D-ring fasteners. Make sure all D-ring fasteners are oriented as shown. Verify that the locking nuts are securely fastened.
4. Unfold the safety net and attach it to the D-ring fasteners using the pre-installed carabiners. Insure the correct orientation of each carabiner to prevent twisting of the net. The spring loaded carabiner will stay affixed to the net assembly and provide convenient engagement and disengagement between the riser safety net and the riser during regular service.
5. The holding capacity of the riser safety net is governed by the connection of the D-ring fasteners to the riser and the strength of the polyethylene net. It is critical to install all D-ring fasteners properly and securely to the riser. Failure to do so will severely compromise the functionality of the safety net.

RISER SAFETY NET ASSEMBLY INSTRUCTIONS (Cont.)

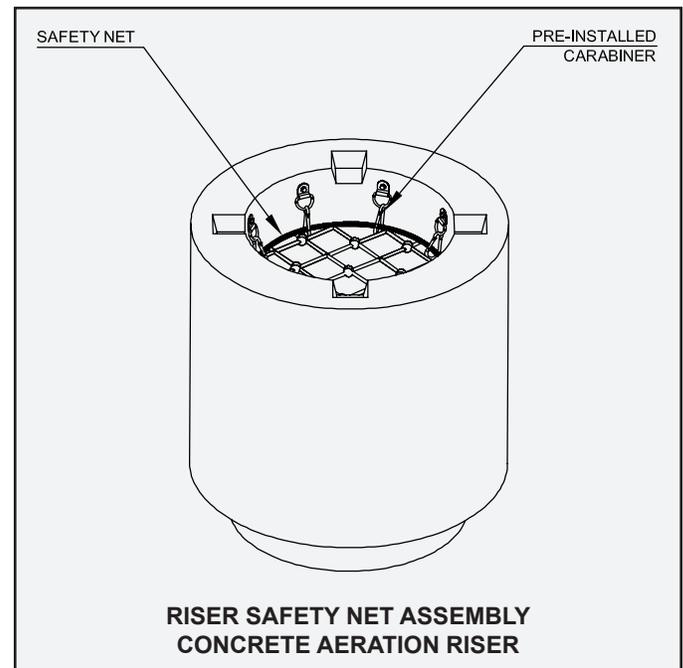
INSTALLATION IN CONCRETE AERATION RISERS

Follow these instructions to install the riser safety net assembly into a Norweco concrete aeration riser. Other non-Norweco concrete risers with similar dimensions and profiles can follow the same procedure.



1. To install the riser safety net assembly in a concrete aeration riser, first mark eight evenly spaced drill locations around the inside of the riser. Use a hammer drill to insure that the holes have the proper tolerance. A hammer drill has a specially designed clutch that allows it to not only spin the drill bit, but also to punch in and out. This action breaks up the concrete and removes dust from the holes.
2. Unlike standard concrete risers, the aeration chamber riser has four cast-in top recesses that are designed to hold the upper brackets of the aerator. Offset the drill locations to avoid interference with the recesses of the aerator upper brackets. The through holes must be located 1½" below the top of the riser to insure adequate material for support and be free of obstruction. For non-Norweco concrete risers, make sure the through holes are located within reachable distance and free of obstruction.
3. Use a 5/32" carbide tipped bit to drill insertion holes to insure proper hole tolerance for the 3/16" concrete screw anchors. Drilling the holes to the proper depth is critical. Set the depth gauge provided with the hammer drill to the required depth. If a depth gauge is not available, wrap tape around the bit at the correct hole depth. When setting the depth gauge or using tape, make sure that the bit is in the most protracted position in the chuck. For this application we recommend 1½" hole depth for the 1¼" long concrete screw anchors.

4. Before inserting the concrete screw anchors, clean the holes of all dust and debris that may have accumulated during the drilling process. Use a wire brush or vacuum to effectively clean the holes. It is critical that the holes are cleaned of debris to insure proper installation of the safety net.
5. Insert a concrete screw anchor into the D-ring fastener mounting hole and install the screw anchor into the pre-drilled hole. Do not over torque the concrete screw anchor, as this may cause it to spin in the hole, which will reduce its anchoring strength. During installation, make sure that the anchor and D-ring fastener are tight against the surface of the concrete and the D-ring fastener is lying flat pointed in the direction as shown. Repeat for the remaining D-ring fasteners.
6. Unfold the safety net and attach it to the D-ring fasteners using the pre-installed carabiners. Insure the correct orientation of each carabiner to prevent twisting.
7. The holding capacity of the riser safety net is governed by the concrete screw anchors, D-ring fasteners and the strength of the polyethylene net. It is critical to insure the concrete screw anchors are securely engaged into the concrete riser and the connections between the concrete screw anchors and D-ring fasteners are secured. Failure to do so will severely compromise the functionality of the riser safety net.



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MODEL AT 1500

UV DISINFECTION SYSTEM

INSTALLATION AND OPERATION MANUAL

The Model AT 1500 UV disinfection system is listed with Underwriters Laboratories (UL) under Standard 979 as a residential treatment device. The installer should provide a power disconnect switch mounted to the exterior of the facility being served to de-energize power to the unit during maintenance. Electrical work must be performed in accordance with the latest edition of the National Electrical Code, as well as all applicable local codes. The Model AT 1500 UV disinfection system conforms to the applicable provisions of the Code of Federal Regulations (CFR) requirements including Title 21, Chapter 1, Subchapter J, Radiological Health. **CAUTION: DO NOT LOOK DIRECTLY AT THE UV LAMP OR EXPOSE SKIN DURING OPERATION. PERMANENT EYE DAMAGE AND SKIN BURNS WILL OCCUR FROM UV RADIATION EXPOSURE. UV BLOCKING SAFETY GLASSES MUST BE WORN DURING INSTALLATION, SERVICE OR ANY TIME THE LAMP MAY BE ILLUMINATED. UV BLOCKING SAFETY GLASSES ARE AVAILABLE FROM NORWECO.**

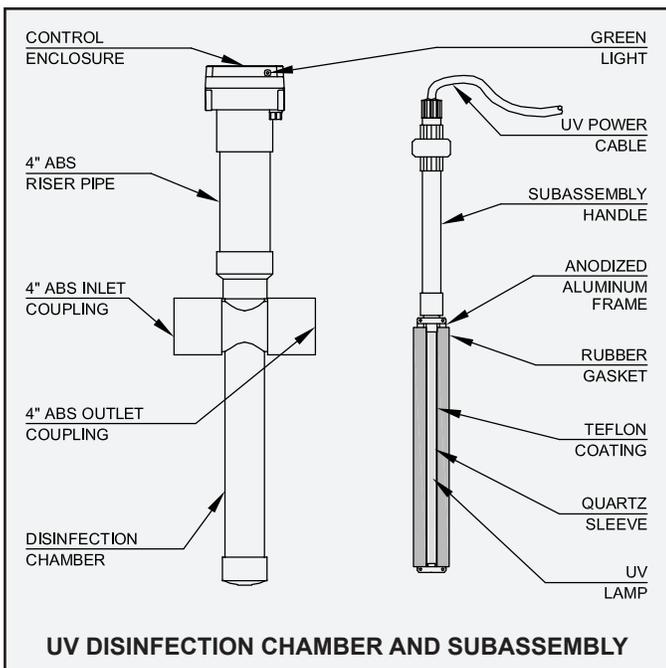
COMPONENTS

The Model AT 1500 UV disinfection system consists of the following components:

- | | |
|---------------------------------------|---------------------------------------------------------|
| 1) Control enclosure | 7) Power cable with female twist lock connector |
| 2) 4" ABS riser pipe | 8) UV subassembly with quartz sleeve and Teflon coating |
| 3) 4" ABS inlet coupling | 9) Subassembly handle |
| 4) 4" ABS outlet coupling | 10) Turbulence inducer |
| 5) Disinfection chamber | |
| 6) UV lamp (bulb) with male connector | |

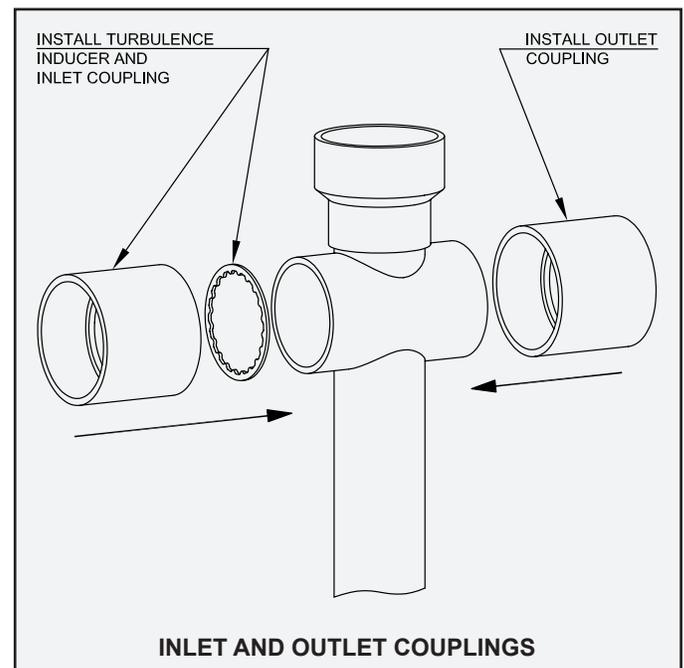
These components should be supplied by the installer:

- | | |
|------------------------|-------------------------------|
| 1) Disconnect switch | 6) Isopropyl alcohol |
| 2) Solvent cement | 7) #14/2 AWG cable |
| 3) Hacksaw | 8) Conduit and fittings |
| 4) Glycerin (optional) | 9) Flat head screwdriver |
| 5) Clean, soft cloth | 10) Phillips head screwdriver |



INSTALLATION INSTRUCTIONS

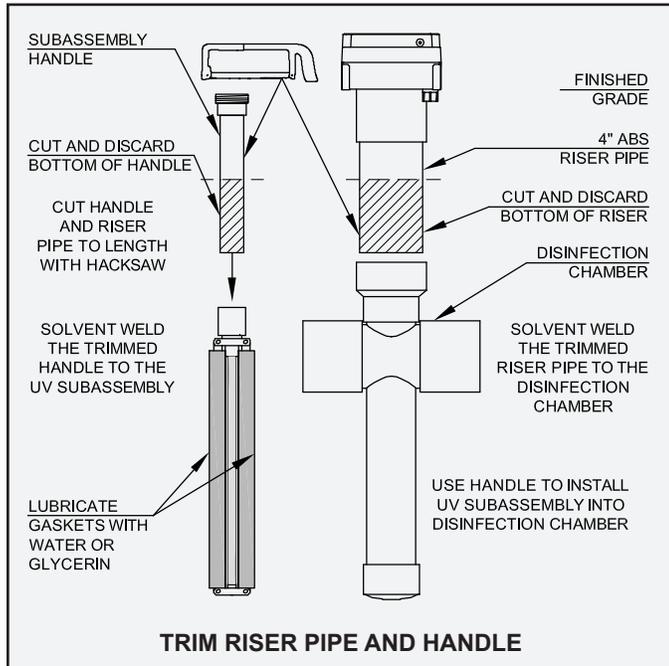
1. The excavation for the upstream wastewater treatment system should include an additional 3 feet of length to allow for installation of the Model AT 1500.
2. Carefully unpack the Model AT 1500 system. Remove and properly discard all packaging materials from the system components. The UV lamp should remain in the protective shipping sleeve until it is installed.
3. Insert the turbulence inducer into the 4" inlet coupling. Solvent weld the inlet coupling to the disinfection chamber with the turbulence inducer towards the chamber. Solvent weld the 4" outlet coupling to the disinfection chamber.



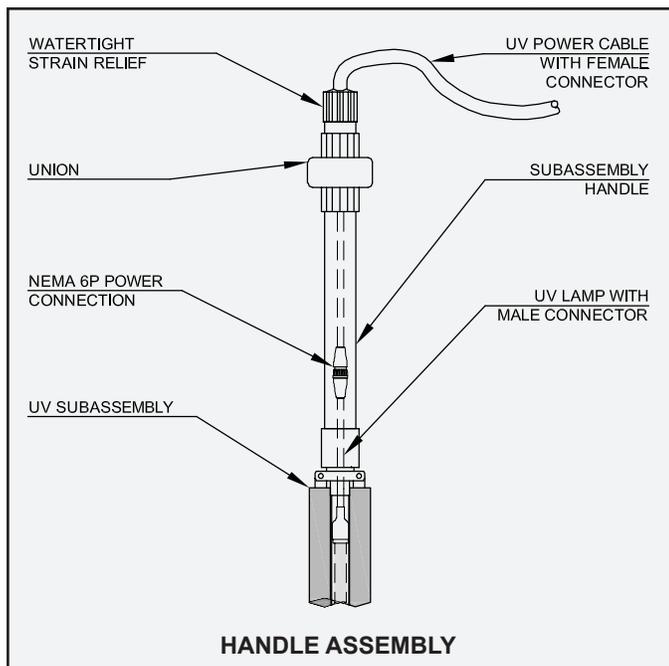
4. Solvent weld the effluent line of the upstream treatment system to the 4" inlet coupling of the Model AT 1500. Next, solvent weld the 4" outlet coupling to the final effluent line. Cover the open top of the disinfection chamber and backfill up to the bottom of the plumbing.

AT 1500 UV DISINFECTION INSTALLATION AND OPERATION (Cont.)

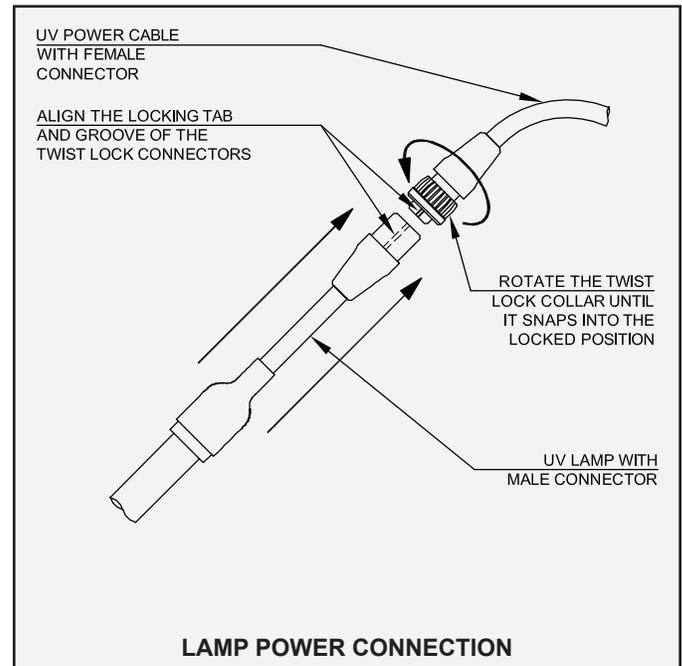
- The control enclosure should be completely above grade in the finished installation. The riser pipe and subassembly handle are purposely manufactured longer than necessary and must be trimmed. Fit the riser pipe into the top of the disinfection chamber and mark a trim line on the bottom. Mark the subassembly handle on the bottom to trim the same amount.



- Disassemble the union on subassembly handle and set aside the top portion with UV power cable.
- Use a hacksaw to cut along the trim line on both the riser pipe and handle to make them the proper length.
- Solvent weld the riser pipe to the disinfection chamber and solvent weld the handle to the UV subassembly.
- The Model AT 1500 is shipped with the UV power cable connected to the control enclosure. If this power cable



has become disconnected, it must be reconnected at this time. To do so, remove the gasketed cover from the control enclosure. Connect the lead labeled "ONE" on the UV power cable to the terminal block marked "1". Connect the lead labeled "TWO" to the terminal block marked "2". Connect the lead labeled "THREE" to the terminal block marked "3". Connect the yellow/green lead to the terminal marked "Y/G".



- Remove the threaded access plug from the riser pipe.
- Match the alignment tab on the male connector from the UV lamp to the alignment groove in the female twist lock connector on the 6 ft. UV power cable. Push the two connectors together until the male connector is fully seated in the female connector. Rotate the twist lock collar until it snaps into the locked position.
- Insert the UV lamp and power cable into the handle assembly until the base of the lamp is seated in the bottom of the quartz sleeve. Rotate the power cable if the lamp becomes misaligned.
- Lower the union onto the handle assembly, making sure to pull any slack cable through the strain relief connector. Assemble and tighten the union and strain relief to insure a watertight seal.
- Use water or glycerin to lubricate the rubber gaskets located on both sides of the UV subassembly.
- Do not touch the Teflon coating or allow excess glycerin to contact it. Use a clean, soft cloth and isopropyl alcohol to thoroughly clean the coating.
- Fill the disinfection chamber with clean water.

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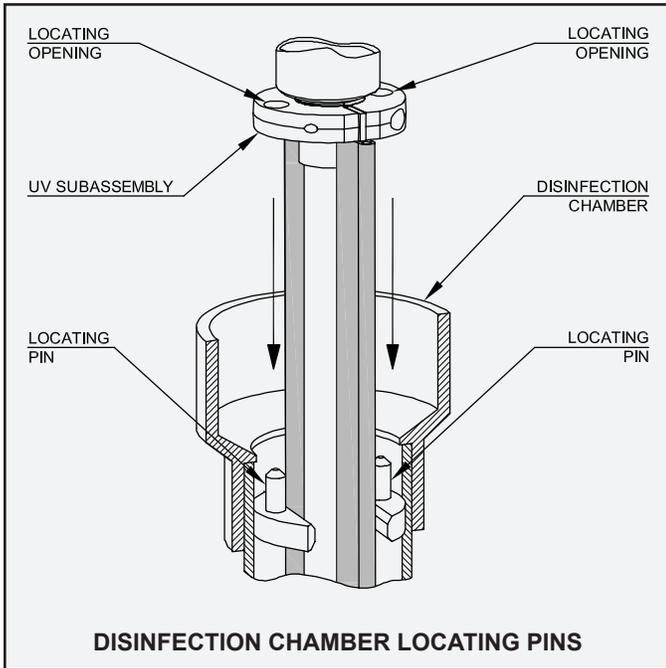
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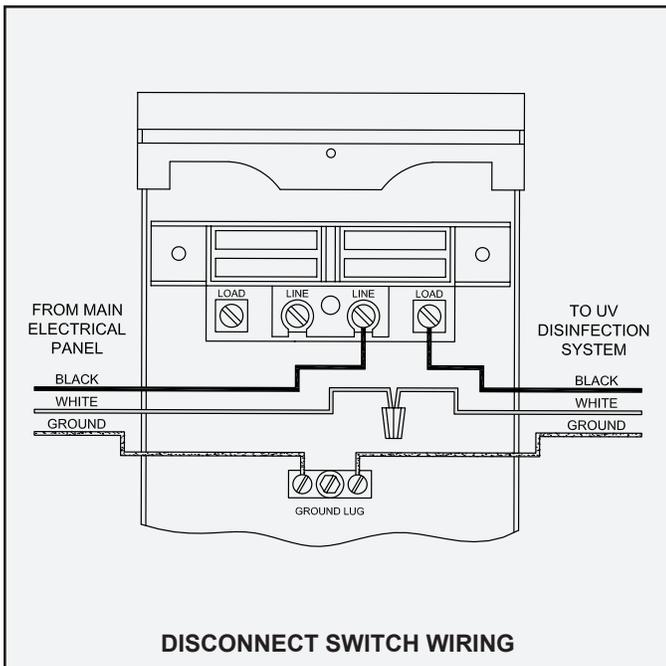
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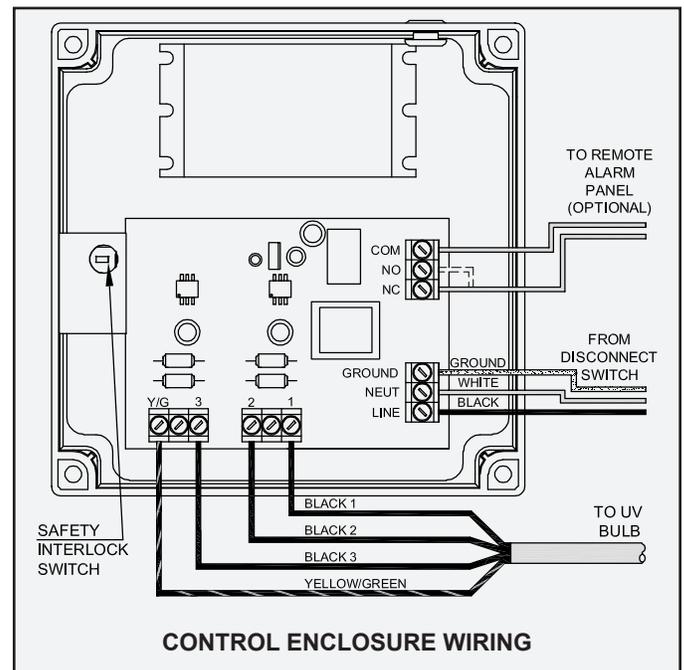
AT 1500 UV DISINFECTION INSTALLATION AND OPERATION (Cont.)



17. Insert UV subassembly into the disinfection chamber. Insure locating pins fully engage locating openings.
18. Tuck the excess power cable into the riser pipe.
19. Use a dedicated 115 volt AC single phase 15 amp circuit in the main electrical panel for the AT 1500. **NOTE:** Make sure the breaker is off before proceeding.
20. Use a disconnect switch to de-energize power during service. Mount directly to the facility being served.
21. Install a #14/2 AWG cable from the dedicated breaker in the main electrical panel to the disconnect switch.
22. In the disconnect switch enclosure, connect the hot (black) lead from the main electrical panel to the "LINE" terminal. Connect the black lead from the UV system to the "LOAD" terminal. Wire nut both white leads together. Connect ground leads to the ground lug.



23. Remove the control enclosure cover and black electrical insulator. Install a #14/2 AWG cable from the disconnect switch to the control enclosure. Insure the connection to the UV system is made in conduit, solvent welded to the conduit fitting provided. A watertight connection is critical for proper operation and safety.
24. Attach the incoming hot (black) lead to the terminal block marked "LINE". Attach the common (white) lead to the terminal block marked "NEUT". Attach the incoming ground lead to the terminal block marked "GROUND".
25. If a remote alarm panel is required, the alarm leads should be installed in a separate conduit, solvent welded to the second conduit fitting provided. Connect one alarm lead to either the normally open (NO) terminal or the normally closed (NC) terminal. Choose the correct terminal for the type of signal required by the remote alarm panel. Connect the other lead to the common (COM) terminal.
26. Solvent weld a conduit plug into any unused fittings.
27. Apply thread sealant to the access plug and install plug in the riser opening. Tighten to insure a watertight seal.



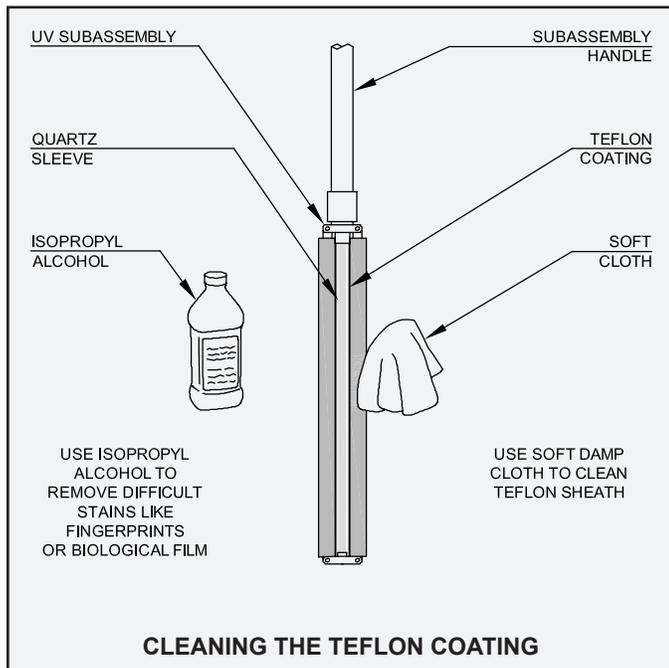
28. Reinstall the electrical insulator and four thumb screws. Make sure that the cutout for the safety interlock switch is positioned correctly over the switch.
29. Reinstall the control enclosure cover, insuring that the safety interlock post is aligned with the safety interlock switch. Tighten the four screws on the cover to insure a watertight seal. **NOTE:** If the switch is not aligned with the post, the UV lamp will not operate and the green light on the side of the enclosure will not illuminate.
30. Backfill around the disinfection chamber and riser pipe. Finished grade should be below the control enclosure to prevent the entry of surface water.
31. Turn on power at the disconnect switch and main service panel. Confirm the green light on the enclosure is illuminated indicating proper operation.

AT 1500 UV DISINFECTION INSTALLATION AND OPERATION (Cont.)

MAINTENANCE AND SERVICE

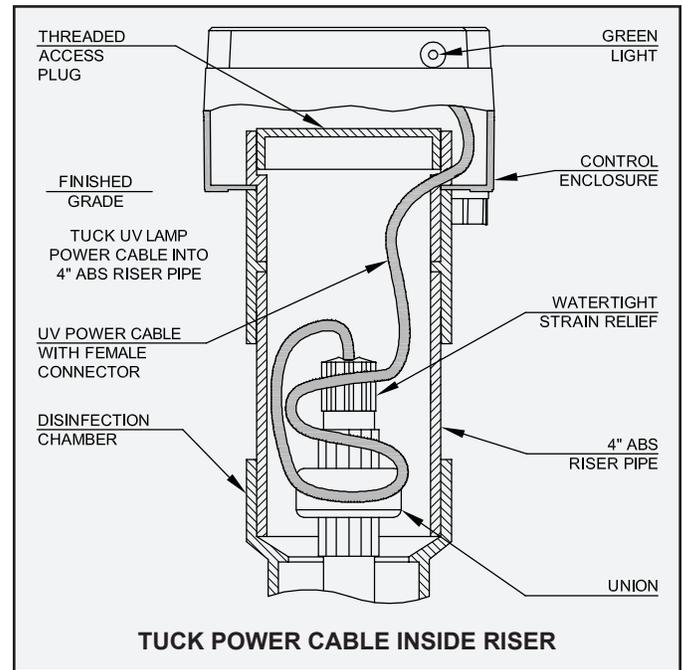
UV protective eyewear must be worn during service or any time the lamp may be illuminated. It is recommended that the subassembly be removed and serviced every six months to insure proper disinfection. To inspect and clean the Teflon coating:

1. Turn off power to the UV system at the disconnect switch and/or main service panel. Confirm that the green light on the side of the enclosure is off.
2. Remove the control enclosure cover and access plug.
3. Carefully remove the UV subassembly from the disinfection chamber
4. Inspect the Teflon coating for damage or biological film. If damaged or biological film is present between the coating and the quartz sleeve, the subassembly must be replaced. If biological film is present on the surface of the Teflon coating, the coating must be cleaned to insure proper disinfection.
5. Use a soft damp cloth to carefully and thoroughly clean the Teflon coating.
6. Use isopropyl alcohol on a soft cloth to carefully remove difficult stains like fingerprints or biological film.
7. Remove all accumulated solids from the disinfection chamber using a vacuum or service pump.



It is recommended that the UV lamp be replaced every two years to insure proper disinfection of the treatment system effluent. The green light on the side of the control enclosure will no longer illuminate when the lamp needs replaced. To replace the lamp:

1. Repeat steps 1, 2 and 3 above.
2. Disassemble the union on the subassembly handle and remove the UV lamp using the power cable.
3. Disconnect the UV lamp from the UV power cord by rotating the twist lock collar $\frac{1}{4}$ turn.



4. Connect new lamp and carefully lower into the UV subassembly. Make sure the lamp is fully seated in the quartz sleeve.
5. Reassemble union and tighten strain relief.
6. Lower the subassembly into the disinfection chamber.
7. Reinstall the threaded access plug into the riser.
8. Reinstall the enclosure cover, insuring that the safety interlock post is aligned with the safety interlock switch. Tighten the four screws to insure a watertight seal.
9. Turn on power at the disconnect switch or main service panel. Verify that the green light on the side of the control enclosure is illuminated.

NOTE: UV lamps contain mercury which is harmful to the environment. Recycle old UV lamps at an authorized center.

ALARM CIRCUIT

The Model AT 1500 system is equipped with a current sensing circuit to monitor the UV lamp performance. If the UV lamp output drops below an acceptable level for proper disinfection, the alarm circuit will turn off the green light on the enclosure. When connected to the Service Pro control center, the service provider can be immediately notified that maintenance to the UV system is required. For more information regarding connection of the Model AT 1500 UV disinfection system alarm to a Service Pro control center, please refer to the Service Pro Control Center with MCD Technology Installation and Operation Instructions.

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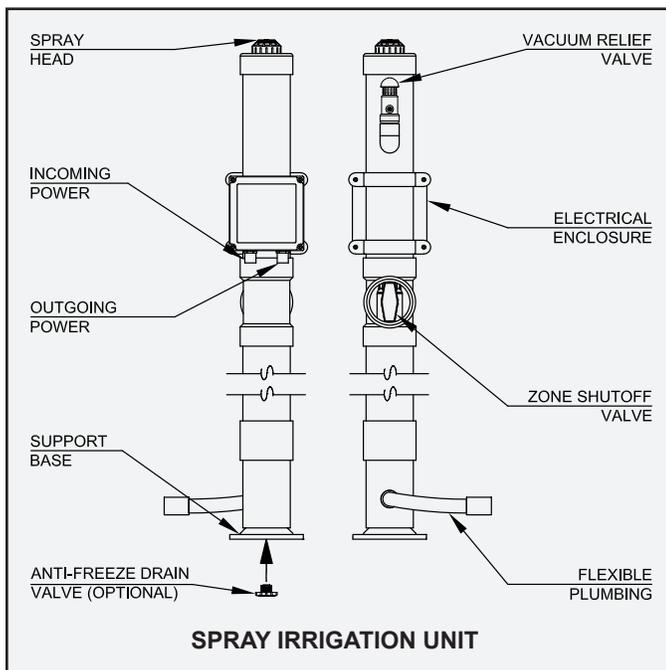
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SPRAY IRRIGATION SYSTEM INSTALLATION INSTRUCTIONS

These instructions focus on the specific requirements for the spray irrigation system. They do not cover all installation aspects of the underground electrical cable and control center, inspection, testing and service of the control center or troubleshooting. Electrical work must be performed in accordance with the latest edition of the National Electrical Code and local codes.

INSTALLATION INSTRUCTIONS

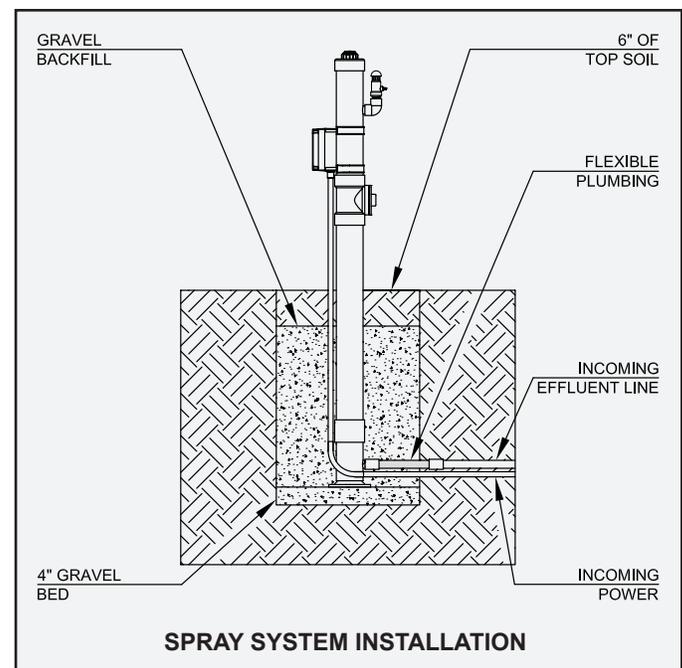
1. Dig a narrow trench 36" deep, extending from the outlet of the installed wastewater treatment system and pump tank to the designated areas where the spray irrigation units will be installed.
2. Install plumbing in the trench and extend it to each spray irrigation unit location. Install tees to split flow between multiple spray irrigation units.



3. Each spray unit is equipped with heat tape. For the heat tape to function, an underground electrical service cable must also be installed in the trench. The electrical service cable must be UL or CSA approved, type UF, #14/2 AWG minimum and must have a full-size center ground. Larger cable is required if the underground service needs to be run more than 80 feet. A dedicated 120 volt AC, single phase, 15 amp (maximum) circuit breaker in the main electrical panel should be provided for the spray system.
4. The underground cable must be continuous and unspliced from the main electrical panel to the spray irrigation system. Each additional unit will get power from the previous spray unit using the same cable that was installed in step 3. Underground cable must be protected

in conduit anytime the cable path passes directly across a tank or underground structure.

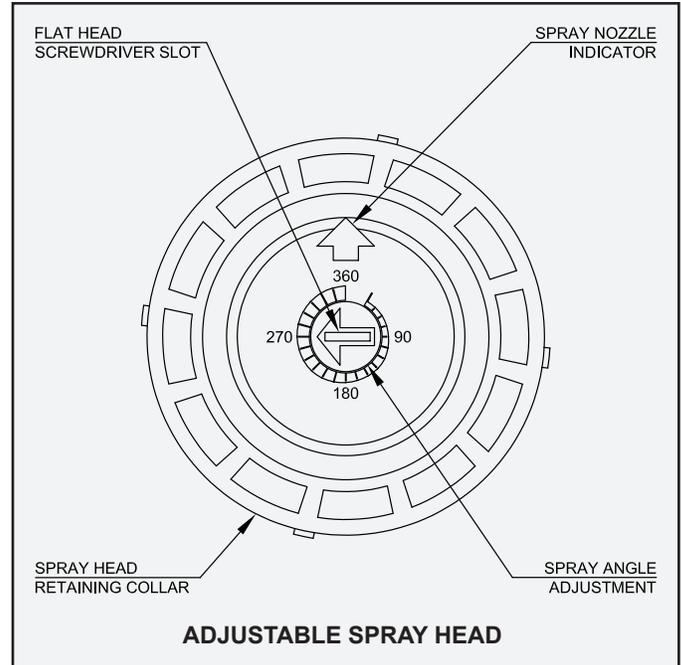
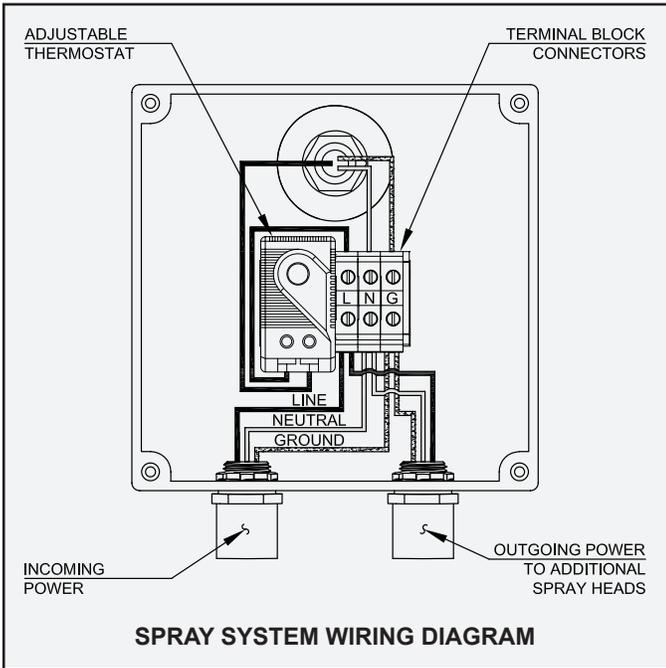
5. Dig a 24" diameter hole 36" deep at each location where a spray unit is to be installed. A 4" inch gravel bed should be laid in the bottom of each hole.



6. If the spray unit is lower than the pump tank, the 3/4" plug in the bottom of the spray unit can be removed and replaced with an anti-freeze drain valve (included), which assists draining during off cycles.
7. Lower the spray unit into the hole, keeping it centered on the gravel pad. Solvent weld the flexible plumbing to the bottom of the spray unit and to the plumbing that was installed in step 2.
8. Wiring to or from the spray system electrical enclosure should always be encased in conduit. Solvent weld the conduit into the pre-installed 1/2" conduit connector. Plug any unused conduit openings.
9. Backfill each spray unit with gravel, keeping the unit centered in the hole.
10. Once backfilling is complete, remove the control center cover to expose the wiring terminal block.
11. Wire from the main electrical panel to the terminal block connector marked "L" in the spray system enclosure using the copper wire with black insulation.

SPRAY IRRIGATION INSTALLATION INSTRUCTIONS (CONT.)

12. Wire from the neutral in the main electrical panel to the terminal block connector marked "N" in the spray system enclosure using the copper wire with white insulation.
13. Wire from the ground conductor in the main electrical panel to the terminal block connector marked "G" in the spray system enclosure using the bare copper wire.
14. The thermostat is preset to turn on the heat tape when temperatures drop below 40°F (5°C). The temperature setting can be adjusted as necessary.



- spray head to insure equal pressure. Varying pressure could indicate a blockage or break in the supply line.
21. The spray heads come with the nozzle number '3' preinstalled at the factory. Nozzles '1', '4' and '6' (also included) can be installed simply by removing the nozzle '3' and installing another. The pressure, radius and flow of each nozzle is outlined in the below chart:

SPRAY NOZZLE CHART			
Nozzle	Pressure (PSI)	Radius (Feet)	Flow (GPM)
1	30	22	1.1
	40	24	1.0
	50	26	0.9
	60	28	2.3
3	30	29	2.0
	40	32	1.6
	50	35	3.7
	60	37	3.2
4	30	31	2.7
	40	34	5.8
	50	37	5.0
	60	38	4.3
6	40	38	3.6
	50	40	2.5
	60	42	2.5
	70	44	2.5

15. A zone shutoff valve is located under a black threaded cap on the side of each unit. It can be used to adjust the pressure at each spray head, as well as to shut off particular zones while performing system maintenance or in the event of system malfunction.
16. Before system activation, the spray head angle of rotation must be set in order to direct spray to the designated areas of the yard. The angle can be adjusted between 40° and 360° by turning the black arrow on top of the spray head towards the desired angle of rotation using a flat head screwdriver.
17. The spray head starting point can be adjusted by removing the purple retaining collar and the spray head inner assembly from the spray head body. Align the spray nozzle indicator with the counterclockwise limit of the desired spray area.
18. Reinsert the spray head inner assembly into the spray head body, ensuring that the spray nozzle indicator is pointing in the desired direction.
19. Hand tighten the purple retaining collar to the spray head body.
20. A Schrader valve is located on the side of each vacuum relief valve for pressure testing during startup and routine inspections. To check the system pressure, turn on the pump supplying the spray heads and firmly press the female connection of the pressure gauge onto the male Schrader valve on the vacuum relief valve. Check each

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BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

SINGULAIR® SYSTEM FINAL CHECK & SYSTEM START-UP

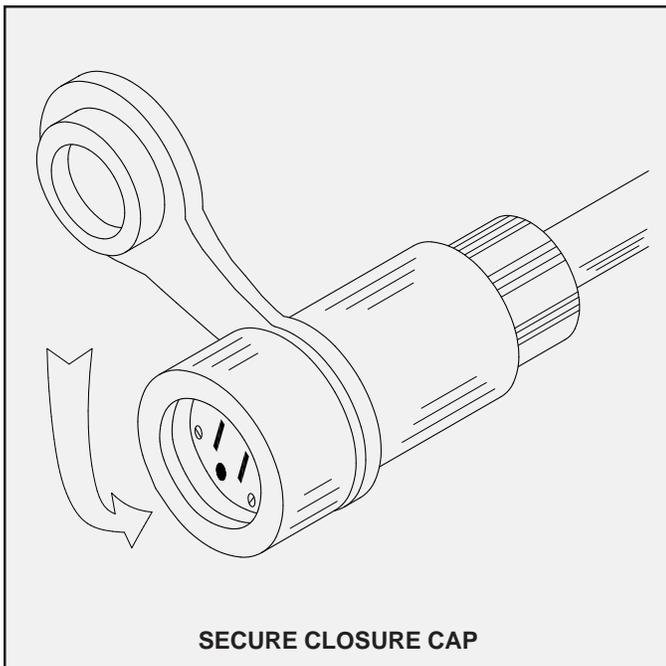
Immediately following installation of each Singulair aerator and Bio-Kinetic tertiary treatment device, the entire Singulair system should be given a final check and start-up. All tests should be performed to insure equipment is installed and operating properly. After all tests are satisfactorily completed, the selector switch in each control center should be set to the "automatic" position for electro-mechanical panels, or the "on" position for Service Pro control centers. Aerators should not be turned off, even during extended vacation periods. Some model Singulair systems require multiple aerators, control centers and Bio-Kinetic systems. Follow the instructions below for each aerator, control center and Bio-Kinetic system provided.

CAUTION: Any time an aerator or electrical test equipment is connected or disconnected, first shut off the selector switch in each control center. Failure to do so could result in personal injury or equipment damage.

PRELIMINARY ELECTRICAL INSPECTION

Inspect the control center for damage that might have occurred after its installation. Inspect all visible wiring to and from the control center. Report any damage to the owner at once; it must be corrected before proceeding with electrical testing.

Make sure the circuit breaker which supplies power to the Singulair system in the main electrical service panel is in the "off" position. Open the control center cover and place the selector switch in the "off" position. Proceed to the Singulair system and unplug the watertight electrical connector from the aerator power cord. Secure the closure cap in position on the electrical connector and return to the control center.



VOLTAGE TEST OF CONTROL CENTER

If the system is equipped with a Service Pro control center, unplug the power connector from the circuit board. For electro-mechanical control centers, remove the terminal strip insulator. Energize the circuit breaker in the main electrical service panel.

For Service Pro control centers, place one probe of the meter from the Tool Kaddy on the power connector terminal pin attached to the black wire and one probe on the pin attached to the white wire. It should read between 109 and 121 volts. Place one probe of the meter on the terminal pin connected to the red wire and one probe on the pin connected to the white wire. The meter should read zero volts.

For electro-mechanical control centers, place one probe of the meter on the terminal marked L1 and one probe on the terminal marked N. It should read between 109 and 121 volts. Place one probe of the meter on the terminal marked A1 and one probe on the terminal marked N. The meter should read zero volts. Once these readings are confirmed, place the selector switch in the "off" position, carefully reinstall the terminal strip insulator and proceed to the aerator.

VOLTAGE TEST OF AERATOR

Remove the polarity tester from the Tool Kaddy and insert it into the receptacle of the electrical connector. When the circuit is energized, the polarity tester should indicate proper wiring of the connector and control center. Remove the polarity tester and insert one probe of the multi-meter into each slot of the electrical connector. It should read between 109 and 121 volts. **CAUTION: Do not energize the Singulair system if an electrical problem is found.** Advise the owner and return only when the problem condition has been corrected by a qualified electrician.

SINGULAIR® SYSTEM FINAL CHECK & SYSTEM START-UP (Cont.)

AMPERAGE TEST

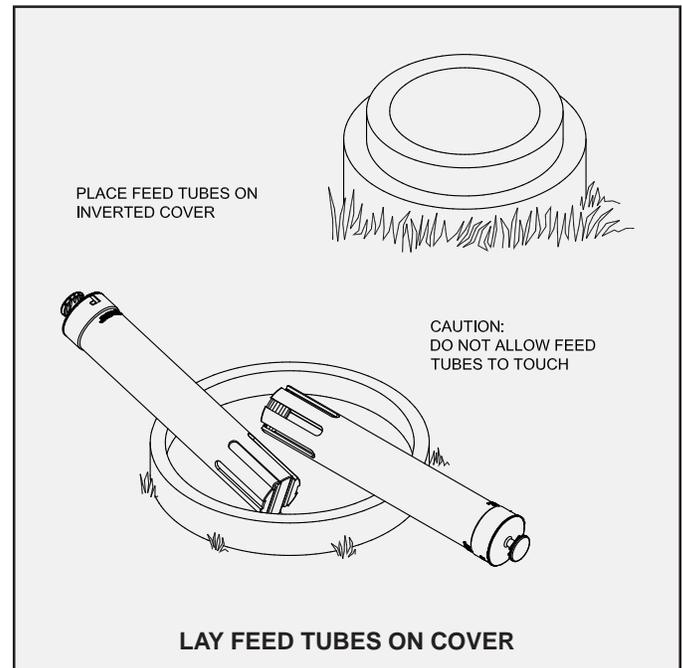
Remove the electrical test pigtail from the Tool Kaddy and place the current sensor of the multi-meter around the exposed black lead of the test pigtail. Plug the test pigtail in line between the two halves of the watertight electrical connector. When energized, read the current draw of the aerator. The initial reading should never be greater than 4.2 amps. After 48 hours of operation, break-in of the mechanical seals will allow the amp draw to drop to 3.8 amps or less. If an excessive current reading is obtained, de-energize the aerator immediately and do not re-energize it until the cause is found and corrected. When the test is complete, place the control center selector switch in the "off" position, unplug the test pigtail at both ends and plug the aerator directly into the receptacle on the underground electrical service cable. Make sure the two halves of the connector are firmly engaged to insure the integrity of the multiple lip seal for a moisture proof connection. Place the control center in "continuous" run operation.

AERATOR INSPECTION

Check the aerator to make sure it is running smoothly without vibration. Make sure the four brackets are properly seated in the four cast-in grooves. Arrange the power cord assembly and electrical connector so they are secured in the mounting clips and are not touching the top of the aerator. Confirm that the debris screens are in place in the air intake ports. Replace the vented cover over the aerator mounting casting and check for excessive noise. Listen for evidence of debris in the aeration chamber striking the aspirator shaft. Occasionally, discarded construction materials may enter the sewer line and Singulair tank. They must be removed at once so that the aspirator shaft straightness tolerance is not compromised. Inspect the vent cap openings to assure the unrestricted passage of air.

FINAL INSPECTION OF BIO-KINETIC SYSTEM

Remove the concrete cover from the clarification chamber access opening. Carefully lift out the optional Blue Crystal and Bio-Neutralizer feed tubes and inspect them to make sure they are filled. Carefully lay the feed tubes on the access cover. Remove the Bio-Kinetic system service cover. Inspect the black locking lugs to make sure they are fully engaged beneath the concrete mounting casting. Inspect the level indicator to be sure that the Bio-Kinetic system is installed in a level position to insure proper operation. Replace the system service cover and optional Blue Crystal and Bio-Neutralizer feed tubes, making certain they are correctly positioned. The Blue Crystal feed tube must be positioned in the mounting collar on the inlet side of the system nearest the aerator mounting casting. The Bio-Neutralizer feed tube must be installed in the mounting collar closest to the system outlet. Replace the concrete access cover.



INSPECTION OF EFFLUENT DISPOSAL SYSTEM

Inspect the final discharge point to make sure that the outlet is unrestricted. If you suspect any possibility of a drainage problem, report it to the owner and request that corrective action be taken immediately. The system could be subjected to high water and liquid may back up into the inlet sewer line if not corrected. Locate the ground water relief point and insure it is clean and unobstructed.

When an effluent lift pump or other accessory equipment has been installed as part of the Singulair system, these items must be started-up, and placed into operation at this time. Refer to the individual start-up instructions furnished with accessory equipment and test them accordingly.

WHEN YOUR INSPECTIONS ARE COMPLETE

Place the selector switch in the Service Pro control center in the "automatic" or "on" position, depending upon the model. Latch the control center cover and secure it with a tamper evident seal. Notify the owner that the Singulair system is operating properly. Ask if there are any questions regarding system operation. Most start-up problems are caused by improper or incomplete installation of the system or because of a misunderstanding on the part of the contractor or owner. Refer to the Singulair Troubleshooting guide for direction if a problem is discovered during start-up.

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BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

FINAL INSTRUCTIONS TO THE OWNER

When the initial start-up of the Singulair Bio-Kinetic system has been completed, take a few minutes to review the system and its operation with the owner. Although no owner maintenance is required, several precautions should be taken to insure maximum performance of the system. Emphasize the continued benefits and protection available through the three year limited warranty, prescheduled service inspections and lifetime aerator exchange program which have been included in the purchase of the Singulair system. These instructions, used with a review of the Owner's Manual, will give the owner a basic understanding of the Singulair Bio-Kinetic wastewater treatment system.

PRESCHEDULED SERVICE INSPECTIONS

During the initial two years after purchase, service inspections will be made on a semi-annual basis to insure proper system operation. Written reports on the condition of the equipment and quality of the effluent will automatically be made to the owner and to the local health department. Costs for travel and labor during this period are included in the purchase price of the Singulair system. If emergency service covered by the warranty is needed during the first two year period, it will also be provided at no additional owner expense.

CONTINUOUS OWNER PROTECTION PROGRAM

At the conclusion of the initial two year period, continued service inspections may be made semi-annually under a Singulair Service Contract available from the licensed distributor for a reasonable charge. Written reports will continue to be made automatically. Costs for travel and labor during service inspections are at no additional charge and emergency service is guaranteed within forty-eight hours. The owner will automatically be mailed a service contract with a letter outlining the advantages of continuing service and a fee quotation before the initial two year period is about to expire.

NO OWNER MAINTENANCE

No owner maintenance is required on the Singulair aerator, electrical controls or Bio-Kinetic tertiary treatment device. System operation and individual components will be thoroughly checked by the service technician during each routine service inspection. The aerator motor is factory lubricated for the life of the unit. The Bio-Kinetic system contains a six-month supply of Norweco Blue Crystal disinfecting tablets and Bio-Neutralizer dechlorination tablets, if local environmental regulations require these items. The Singulair control center has no user-serviceable parts inside and is secured with a tamper evident seal. Disassembly of any component part will void the limited warranty. The authorized distributor will stock Norweco factory replacement components to correct issues that inhibit proper function of the system. Instruct the owner to contact the local distributor with questions and service requests.



THREE YEAR LIMITED WARRANTY

The Singulair aerator, 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 from the date of system installation, provided the customer completes and returns the Warranty Registration Card to the factory. Registration is important: if the card is not received, the warranty will be recognized in effect for three years from the date the aerator, control center and Bio-Kinetic system were shipped from the factory. To qualify for service under warranty, the owner must not disassemble any component part. The defective component must be returned to the factory by the local distributor. It may not be returned directly to Norweco by the owner. The warranty is limited to the replacement of defective parts and does not cover damage resulting from accident, abuse, improper installation, unauthorized disassembly, faulty wiring or failure to follow operating instructions.

FINAL OWNER INSTRUCTIONS (Cont.)

The owner should be advised to make the following periodic checks of the system to insure that it continues to operate at maximum performance levels:

1. The Singulair control center should be checked daily. If the red warning light is glowing and the audible alarm sounding, depress the reset button on the control center cover. The light should go off and the audible alarm should be silenced. If the alarms activate again, call the local distributor for service.
2. Check the fresh air openings in each vented cover monthly to make sure the passage of air into the Singulair tank has not been restricted.
3. Inspect the effluent discharge point and ground water relief point monthly to make sure there are no restrictions to the effluent flow.
4. Make sure the pretreatment chamber is inspected at least every three years. Have it pumped only when necessary. See Singulair Tank Pumping instructions to determine when pretreatment chamber pumping is required.

FOR BEST RESULTS

Be sure the owner understands the system's capabilities and purpose. Discuss the importance of the following items with the owner to maximize system performance.

Always

1. *Repair any leaking faucets or toilets promptly.*
2. *Discharge only biodegradable wastes into the system.*
3. *Divert down spouts and other surface water away from the system.*
4. *Keep mounting casting and riser covers accessible for service and inspection.*
5. *Consult your Norweco distributor before using enzymes, tank activators or similar additives.*
6. *Call your Norweco distributor if you have problems or questions.*

Never

1. *Connect roofing down spouts, footer drains, sump pump piping or garage and basement floor drains into the sewer line of the Singulair system.*
2. *Allow backwash liquid from a water softener to enter the system.*
3. *Dispose of items such as 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, drain cleaners, gasoline, motor oil or other harsh chemicals in the domestic wastewater plumbing.*
4. *Dispose of disinfectants, pesticides, poisons or toxic materials down your drain.*
5. *Use the power supply to the aerator as a service receptacle for lawn and garden tools.*
6. *Interrupt power to the Singulair control center, even during extended periods of non-use. If you anticipate a long term vacancy, contact the local distributor for proper procedures.*

BEFORE LEAVING THE SITE

Remind the owner that the limited Warranty Registration Card must be filled in and mailed as soon as possible. Explain that your company's telephone number is found on the Service Pro control center. Offer to remove and return the Warranty Registration Card for the owner. Have them sign the card and return it to your office to be mailed to Norweco. As you leave, remind the owner to call your office if any questions arise.

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CONTROL CENTER WITH MCD TECHNOLOGY

GETTING STARTED WEBSITE INSTRUCTIONS

The Service Pro website is located at www.servicepromcd.com. Navigating through the Service Pro website is similar to browsing any other site found on the internet. To utilize all features of the website, pop ups must be allowed. Refer to your internet browser provider for specific instructions to allow pop ups. The computer mouse, on screen cursor and keyboard are the primary tools used to move through the website. To browse the Service Pro website, position the cursor over any hyperlink on the computer screen. A highlighted word is a hyperlink if the cursor changes from an arrow to a hand when it is positioned over the word. Information contained within the hyperlink can be accessed by clicking the left mouse button while the cursor is positioned over it. After pressing the left mouse button the computer screen will display the desired information.

Data fields are the primary building blocks of the Service Pro website. A data field is an area within the site where information can be entered and saved. The computer keyboard is used to enter the data into the fields. Many fields in the Service Pro website have pre-selected lists of options to choose from called drop down lists, identified by the arrow (▼) symbol beside the field. Drop down lists can be accessed by clicking the arrow. In order to select an item from the drop down list, position the cursor over the desired response and click the left mouse button.

SERVICE PRO SITE MAP

The website is broken down into five sections to manage the data. These five sections are as follows:

1) Accounts

This area is where specific account information is entered and accessed. The subsections of this area are:

- A) Add New Subscriber - Add new subscriber to the monitoring system by entering the subscriber's location, Singulair system, accessories, permit and service contract information.
- B) View/Edit Subscriber - View or edit subscriber's account and system information.

- C) Suspend/Restore/Archive - Stop and reactivate remote monitoring to a system or archive an account that is no longer needed.
- D) List Accounts - Search and sort subscribers by one of the account categories listed below:
 - Monitored Accounts - Accounts that are connected to a telephone line for remote monitoring.
 - Suspended Accounts - Accounts that are temporarily inactive.
 - Records Only - Active Accounts - Accounts that are not connected to a telephone line, but tracked for service.
 - Records Only - Inactive Accounts - Accounts that are not remotely monitored or under a service contract, but maintained for future reference.
 - Archived Accounts - Accounts that are marked for deletion.
 - All Accounts - All accounts regardless of status.

NOTE: The results will appear in a report format that can be sorted by any column header. Reports can be viewed, printed or downloaded.

2) History

This area is where historical information about an account is stored and accessed. At the request of the distributor, regulatory officials may gain access to this area for accounts that are within their jurisdiction. The subsections of this area are:

- A) Specific Account - Obtain information regarding a specific subscriber.
- B) All Active Accounts - View history information for all active subscribers.
- C) All Suspended Accounts - View history information for all suspended subscribers.

VIEW/EDIT SUBSCRIBER SCREEN

GETTING STARTED WEBSITE INSTRUCTIONS (Cont.)

NOTE: The information accessed in each of these categories can be specific to certain types of history by clicking on the circle next to 'Service History Only', 'Alarm History Only' or 'All History'. The account history can also be viewed for a specific time period by clicking on the circle next to 'Past Month', 'Past 6 Months', 'Past 24 Months' or 'Complete History'.

3) Reports

This area is where service information is entered, stored and accessed. Regulatory officials may be granted access to this area for accounts that are within their jurisdiction. The subsections of this area are:

- A) Add Service Report - Enter a service report for a specific subscriber account.
- B) Add Comment - Record a comment regarding the system.
- C) Alarm State - View list of all subscriber systems currently in alarm state including a description of the alarm condition.
- D) Systems Due for Service - View list of subscriber systems due for service. Select the accounts to list by clicking on the box next to 'Overdue', 'Due in 30 Days', 'Due in 60 Days' or 'Due in 90 Days'.
- E) Expiring Contracts - View list of service contracts due to expire. Select the accounts to list by clicking on the box next to 'Expired Contracts', 'Due in 30 Days', 'Due in 60 Days' or 'Due in 90 Days'.
- F) Missing Agreements - View list of subscriber systems that are missing monitoring agreements.

- A) Service Pro Instructions - Download the Service Pro Control Center Installation and Operation Instructions.
- B) Service Pro Specifications - Download the Service Pro Control Center Specifications.
- C) General Service Form - Download the pre-printed Singlair Bio-Kinetic Wastewater Treatment System Record of Service Performed form.
- D) Contract Renewal Form - Download the standard Singlair Service Contract.
- E) Service Pro Quick Start - Download the Service Pro Quick Start Guide for an overview of the control center functionality.
- F) TNT Service Pro Quick Start - Download the TNT Service Pro Quick Start Guide for an overview of the control center functionality.

5) Administration

This area is used to administer the various levels of the user groups. The subsections in this area are:

- A) Distributor - Edit and view distributor's contact information and Service Pro alarm notification method.
 - Edit Distributor
 - View Distributor
 - List System Status
- B) Service Provider - Enter, edit and view service provider's contact information and Service Pro alarm notification method.
 - Add New Service Provider
 - Edit Service Provider
 - View Service Provider
 - List Service Providers
 - List System Status
- C) User Internet Access - Enter, edit and view service provider and subscriber login name and passwords.
 - Service Provider Password
 - Subscriber Password

HORIZONTAL HEADER

The horizontal header is located below the Service Pro logo at the top of every page. The header provides hyperlinks for the most frequently used features of the Service Pro website. Click the left mouse button while the cursor is over the displayed hyperlink. The desired information will automatically be launched for the user. The hyperlinks in the horizontal header are:

- A) Search - Directs the user to the Search Accounts page. Provides user easy access to search and sort subscriber accounts.
- B) Service Due - Directs the user to a list of subscriber

ADD SERVICE REPORT SCREEN

4) Downloads

This area is where users can download and print documents relating to the Service Pro website. The subsections of this area are:

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and wastewater treatment

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NORWALK, OHIO
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SERVICE PRO®

CONTROL CENTER WITH MCD TECHNOLOGY

GETTING STARTED WEBSITE INSTRUCTIONS (Cont.)

- systems due for service within selected time periods. Results can be sorted by any column header.
- C) [Panel Info](#) - Directs the user to a brief synopsis of the Service Pro control center features. This information should be provided to regulatory officials, system designers and system owners.
 - D) [Alarm State](#) - Directs the user to a list of subscriber systems currently in alarm state. Results can be sorted by any column header.
 - E) [Frequently Asked Questions \(FAQ\)](#) - Directs the user to a list of questions frequently asked by distributors, regulators, service providers and system owners. Click the left mouse button while the cursor is over the desired question. The answer to the desired question will display.
 - F) [Norweco.com](#) - Directs the user to the Norweco website home page.

HORIZONTAL FOOTER

The horizontal footer is located at the bottom of every page. The footer provides hyperlinks for the most frequently used web browsing features. Click the left mouse button while the cursor is over the desired hyperlink. The desired result will automatically display. The hyperlinks in this area are:

- A) [Home](#) - Hyperlink which goes to the **www.servicepromcd.com** start up page.
- B) [Contact Us](#) - Automatically initiates an email correspondence direct to Norweco. Type in your desired question and send the email. A Customer Service representative will respond promptly.
- C) [Help](#) - Provides information about the Service Pro

website. Click the left mouse button while the cursor is over the desired topic. A brief description about the topic is displayed.

- D) [Log Off](#) - Formally exits the Service Pro website data fields. The login page will be displayed.

QUICK ACCOUNT SEARCH

The Quick Account Search box is located on the right side of every screen. The box displays the current account number selected, subscriber name, subscriber address and subscriber account status.

ACCESSING THE SERVICE PRO WEBSITE

1. Contact Norweco customer service to request a user name and password.
2. Open your internet browser in standard fashion and in the address bar at the top of the computer screen enter "<http://www.servicepromcd.com>".
3. Press the enter key. The Service Pro Log In page will be displayed.
4. Type the user name provided by Norweco in the 'User Name' field. Press the tab key or click in the 'Password' field.
5. Type the password provided by Norweco in the 'Password' field. Press the enter key or click the left mouse button while the cursor is over the blue [Log In](#) box on the computer screen. The home page will be displayed.

ADD NEW SUBSCRIBER

1. Click the left mouse button while the cursor is over the blue '[add new subscriber](#)' link. The Add New Subscriber page will be displayed.
2. Click the left mouse button while the cursor is over the black arrow located to the right of the 'select distributor/service provider' drop down list.
3. Click the left mouse button while the cursor is over the correct Distributor or Service Provider name.
4. Click the left mouse button while the cursor is over the blue [Submit](#) box. The Add New Subscriber detail screen will be displayed.

NOTE: All fields with a red asterisk are required and must be completed before moving to the next screen.

5. Enter the subscriber's name, address and contact information into the fields provided.
6. The Location Details data fields are optional fields for use in further identifying the location of the system.
7. Next, if the mailing address is the same as the installation address, click the check box titled 'Same as above'.

The screenshot shows the Service Pro website interface. At the top is the header with the Service Pro logo and 'powered by MCD technology'. Below the header is a navigation menu with links: search, service due, panel info, alarm state, faq, norweco.com. The main content area is divided into three sections. On the left is a sidebar with a list of links under categories: accounts, history, reports, downloads, aerator exchange, and administration. In the center is the 'Quick Account Search' form with fields for Account Number, Control Serial Number, Aerator Serial Number, Subscriber First Name, Subscriber Last Name, Street Address, and Home Phone. On the right is a 'quick account search' box showing 'User: distributorA', 'Distributor A', and 'email@distributora.com'. Below this is an image of a Service Pro control center unit and a link to learn more about its features. At the bottom of the page is the footer with links for home, contact us, help, and log off, and a copyright notice for 2010 Service Pro Monitoring Inc.

HEADER, FOOTER AND QUICK ACCOUNT SEARCH

GETTING STARTED WEBSITE INSTRUCTIONS (Cont.)

8. If the mailing address is different than the installation address, enter the correct mailing address in the data fields provided.
9. Next are data fields pertaining to the Singulair system. For the installation type, select 'Residential' or 'Commercial'. Select the installation date and system start-up date.
10. Indicate whether the Singulair system is remotely monitored by choosing 'Yes - phone line is connected' or 'No' and indicate if the monitoring agreement has been received. The monitoring start date and scheduled monitoring renewal dates are automatically displayed.

NOTE: Selecting 'Yes - phone line is connected' will initiate the start of the monitoring service billing period. For systems that will be monitored at a future date, select 'No'. Once monitoring should begin, use 'view/edit subscriber' to update the system to 'Yes - phone line is connected'.

11. Select the correct Singulair system model from the drop down list; '960-1000', '960-1250', '960-1500', '960-500', '960-600', '960-750' or 'Other'. If 'Other', key in the appropriate system model.
12. Key in the appropriate aerator serial number and select the correct model from the drop down list; '206C', '780', '93', '95', '96' or 'Other'. If 'Other', key in the appropriate aerator model. Enter the 'Control Serial Number' and select the correct 'Control Model' from the drop down list; 'Service Pro' or 'Other'. If 'Other', key in the appropriate control model.
13. Select up to three auxiliary alarms that are connected for remote monitoring. The drop down list includes 'ChemCheck', 'Effluent Pump', 'None', 'Post Air Pump', 'UV Disinfectant Device' and 'Other'. If 'Other', key in the type of auxiliary to be monitored.
14. Choose from the drop down lists any accessories used regarding 'Effluent Disposal Method', 'Disinfection', 'Dechlorination', 'Pump Station' or key in 'Other' if not available from the drop down menus.
15. Permit information data fields are used to enter the permit number and date.
16. Under Service Contract, select contract type 'Warranty' or 'Maintenance', enter the 'Contract Cost', 'Contract Start Date' and 'Contract Duration'.
17. Enter the duration, in months, between maintenance visits in the 'Maintenance due every months' field.
18. Record any additional notes in the last field.
19. Click the blue [Submit](#) button.
20. Adding the new subscriber is complete and remote monitoring will begin.

DOCUMENTATION

To initiate Service Pro remote monitoring, the Subscriber Monitoring Agreement must be completed and signed by the property owner. The agreement is a one page, five part carbonless form. Remote monitoring will begin when the new subscriber has been entered into the Service Pro

website, the Singulair system is started up and the Service Pro control center is commissioned and three copies of the signed agreement are received by Norweco. The information on the agreement should be used to complete the new subscriber account on the Service Pro website and register the aerator and control center warranty.

SERVICE PRO®		SERVICE PRO MONITORING, INC. SUBSCRIBER MONITORING AGREEMENT	
<small>This agreement must be completed, signed and three copies returned to Norweco before Service Pro monitoring will begin.</small>			
Subscriber Information			
Name: _____	Email Address: _____		
Street Address: _____	County: _____		
City: _____	State: _____	Survey: _____	Abstract: _____
Zip Code: _____	Country: _____	Tract: _____	Subdivision: _____
Home Phone: _____	Lot: _____		Block: _____
Cell Phone: _____	PCT: _____	Section: _____	
Mailing Address: _____	City: _____	State: _____	Zip Code: _____
System Information			
System Start-Up Date: _____	Installation Type: <input type="checkbox"/> Residential <input type="checkbox"/> Commercial		
Singulair System Model: <input type="checkbox"/> 960-500GPD <input type="checkbox"/> 960-750GPD <input type="checkbox"/> 960-1000GPD <input type="checkbox"/> 960-1250GPD <input type="checkbox"/> 960-1500GPD			
<input type="checkbox"/> TNT-500GPD <input type="checkbox"/> TNT-750GPD <input type="checkbox"/> TNT-1000GPD <input type="checkbox"/> TNT-1250GPD <input type="checkbox"/> TNT-1500GPD			
Aerator Serial Number: _____	Control Serial Number: _____		
Control Model: _____	Effluent Disposal Method: _____		
Pump Station: <input type="checkbox"/> yes <input type="checkbox"/> no	Disinfection: <input type="checkbox"/> yes <input type="checkbox"/> no	Dechlorination: <input type="checkbox"/> yes <input type="checkbox"/> no	
<input type="checkbox"/> Auxiliary One _____	<input type="checkbox"/> Auxiliary Two _____	<input type="checkbox"/> Auxiliary Three _____	
Inspection Frequency: <input type="checkbox"/> 1 month <input type="checkbox"/> 3 months <input type="checkbox"/> 4 months <input type="checkbox"/> 6 months <input type="checkbox"/> 12 months			
Service Provider Information			
Company Name: _____	Contact: _____		
Address: _____			
City: _____	State: _____	Zip Code: _____	Country: _____
Office Phone: _____	Cell Phone: _____		
Fax Number: _____	Email Address: _____		
Distributor Information			
Company Name: _____	Contact: _____		
Address: _____			
City: _____	State: _____	Zip Code: _____	Country: _____
Office Phone: _____	Cell Phone: _____		
Fax Number: _____	Email Address: _____		
TERMS AND CONDITIONS			
<small>Note to subscriber: You, the subscriber, may cancel this agreement at any time prior to midnight of the third business day after the date of this transaction.</small>			
<small>WHEREAS, the undersigned _____, hereinafter called SUBSCRIBER, has heretofore entered an agreement with its Installation Co. _____, hereinafter called SUBSCRIBER'S INSTALLATION CO., and has on this date entered into an agreement with SERVICE PRO MONITORING, INC. or its assigns herein called SERVICE PRO MONITORING, INC. the terms of which provide for monitoring of incoming signal from subscriber's local notification system located at above stated address and SERVICE PRO MONITORING, INC.'s monitoring receiving facility.</small>			
<small>PLEASE NOTE: The control center regularly communicates 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.</small>			
SUBJECT TO TERMS AND CONDITIONS ON REVERSE SIDE			
Subscriber _____	executed this _____ day of _____, 20____		
By _____	Title _____		
Subscriber's Installation Company _____			
By _____	Title _____		
By _____	Title _____		
<small>Original - Norweco Page 2 - Norweco Page 3 - Norweco Page 4 - Distributor Page 5 - Subscriber (Property Owner)</small>			

Each new subscriber must sign a 24 month monitoring agreement. If the monitoring agreement is not received by Norweco within 60 days of the new account being commissioned, the account will be suspended until the monitoring agreement is received. To insure continuous monitoring, agreements are automatically renewed. Initial and renewal Singulair service contracts should include the cost to provide the Service Pro monitoring service.

NOTE: The Service Pro website should be book marked in all Internet browser programs to facilitate easy access.

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norweco® **SINGULAIR**®

BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

SERVICE PROGRAM AND RECORDKEEPING

Complete and detailed installation and service records must be kept on each Singulair system. Properly maintained records will enable you to determine, at a glance, the history and condition of each system sold. Keep all installation and service records filed as outlined herein so that you will have immediate access to this information. Following these procedures allows efficient organization of service inspection dates and service policy mailings. Their use will enable you to provide complete and professional service to your Singulair customers.

INITIAL ORDER RECORDS

When a Singulair order is received, record the following information on your delivery slip: customer's name, address and telephone number, equipment ordered (including system model number and optional equipment such as Blue Crystal disinfection system, Bio-Neutralizer dechlorination system or risers) directions to the site, delivery date and time requested. Give this information to the dispatcher for delivery truck scheduling.

ASSIGN COMPONENTS FROM STOCK

To begin processing the order, select the proper quantity of Norweco aerators from your stock. Open each aerator shipping carton at the top and remove the Singulair control center. Attached to the aerator is a copy of the three-part warranty registration card, an Owner's Manual and a red warning tag. Make sure that the model number and serial number on the outside of each aerator shipping carton matches the aerator nameplate and all three sections of the registration card. Give all control centers with attached literature to the tank delivery driver.

Remove the vent cap assembly from each aerator shipping carton and place it into your revolving stock. Do not remove the aerator or aspirator shaft from the shipping carton. Close each aerator carton and identify it on the outside with the name and address of your customer so that matching aerator and control centers will be installed. All aerators will remain in your plant until the customer requests installation and start-up.

Select the proper quantity of Bio-Kinetic systems and optional equipment from your stock. Make sure the model number for each Bio-Kinetic system matches the customer order. Identify the outside of each Bio-Kinetic system shipping carton with the customer's name and address.

TANK INSTALLATION RECORDS

When the Singulair tank and controls are installed, the contractor or owner should sign an itemized delivery slip.

Your driver should tear off the bottom portion of the three part card attached to each aerator. One service and warranty record card should be filled out with the tank setting date, owner's name, address and telephone number, contractor's name, directions to the jobsite, a description of the installation, optional equipment installed and location of the tank and control center. Other service and warranty record cards for the same system should be attached to the completed card. All service and warranty record cards should be returned to your office and kept until the system is ready for start-up. Leave the remaining two portions of the three part card intact and store them with the Singulair Owner's Manual.

RECORDS OF SYSTEM START-UP

When aerator and Bio-Kinetic system installation is scheduled, give all service and warranty record cards to your installer. These cards contain all information needed to perform start-up services. The date of aerator installation and start-up should be filled in and these cards returned to the office when each aerator and Bio-Kinetic system has been installed.

SINGULAIR CUSTOMER MASTER FILE

When system start-up is complete, transfer the owner's name, address, telephone number, system model number, serial number for each aerator and system installation date from the service and warranty record card to a standard 4 x 6 file card. Place all cards alphabetically by owner name in the Singulair master file. The file should contain one card for each Singulair installation. It must be updated whenever an exchange aerator is installed or system ownership changes.

SINGULAIR SERVICE FILE

File each original service and warranty record card in the Singulair service file. The service file should be set up on the first month you begin to install and start-up Singulair systems. Make a divider tab which has visible the number "1" on it. File the service and warranty record card for each

SERVICE PROGRAM AND RECORDKEEPING (Cont.)

system placed into operation this month ahead of this divider "1" tab. On the first day of the second month, make a new divider tab titled "2." File this divider behind the first one and move all registration cards filed last month to a new position in front of divider #2. Place all record cards for installations started-up in this, your second month, ahead of divider #1. On the first day of each succeeding month, a new divider must be placed at the end of the file, then all cards moved back one divider, then all new installation cards for the current month filed ahead of divider #1. Do not file current installation cards prior to advancing the previous month's cards.

SCHEDULING SINGULAIR SERVICE INSPECTIONS

Four semi-annual service inspections are to be completed after the system has been installed. They are scheduled after six, twelve, eighteen and twenty-four months. To determine which systems are due inspections each month, update the Singulair service file with a new month divider on the first day of the month and remove all cards from behind divider tabs 6, 12, 18, and 24. Fill out one three-part service inspection record card for each system with system model number, all aerator model and serial numbers, county, owner's name, address and directions to the site. Be sure this information is duplicated on all three sections of the card. The other side of the card will be filled out by the service technician at the site. If this is to be the 24th month inspection and the owner has not returned a service contract, check the box on all three portions of the card indicating that the service policy has expired. Give the service inspection record cards to the service manager.

Your service technicians must fill in the remaining items on both sides of each card as they make the inspections. The top portion is torn off and left with the owner. The lower two portions are returned to the office. The middle portion of the card is for health department notification. Most health departments prefer that these cards are collected by the distributor and mailed in monthly rather than individually.

The bottom portion of the service card is retained for your records. It should be filed behind the service and warranty record card for that installation. This allows all records of service inspections for each installation to be filed together. As you file the service inspection cards, you should update the service and warranty record card with the date and results of your service inspection.

EMERGENCY SERVICE CALLS

Occasionally you may be asked to service a Singulair system in advance of its next prescheduled inspection. When the service request is taken, look up the service and warranty record card in the service file. Use it to prepare a new three-part service inspection card and check the box for "Special Service Call." This service inspection card must

be completed by your service technician and returned to your office. When it is returned, the check for "Special Service Call" signifies that the service and warranty record card for this installation probably will not be found following a divider tab scheduled for service this month. When the record card is located, fill in the service call date for the next prescheduled inspection and file the service card in chronological order behind the service and warranty record card. When the next prescheduled inspection for this system is due, service will be considered complete.

MAILING SERVICE POLICIES

Initial Singulair service is in effect for the first twenty-four months of system operation. After that time the owner is invited to continue service on an annual basis. Service contracts should be mailed in the twenty-second month of system operation. After updating the service file at the beginning of each month, remove all service and warranty record cards from behind divider tab #22 and mail a service contract and cover letter to each. Follow-up each



mailing to owners who have not responded to your 22nd month notice by re-mailing to all service and warranty record cards behind divider tab #23 whose contracts have not been renewed. Record the dates of these mailings on the registration card.

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SINGULAIR® BIO-KINETIC®

WASTEWATER TREATMENT SYSTEM

SERVICE PROGRAM AND RECORDKEEPING (Cont.)

RENEWED SERVICE POLICIES

LAPSED SERVICE CONTRACT RENEWALS

If an executed service contract and fee are received by the end of the two year service period, the service and warranty record card (followed by four completed service inspection cards) is retained in the service file. Service policy inspections after the initial two year program are performed in the same fashion as initial inspections. Cards each month from behind divider tabs 6, 12, 18 and 24 and from behind tabs which are multiples of six: 30, 36, 42, 48, etc. are used to schedule routine service for the month. Fill out three-part service cards for each installation and continue to file completed service inspection cards chronologically behind individual service and warranty record cards. Remember to update the service and warranty record cards for each installation as service contract inspections are performed.

From time to time an owner may wish to renew a service contract which had been permitted to lapse. When the executed contract and fee are received, remove the service and warranty record card, with all service cards, from the alphabetical master file. Only the 4 x 6 master card should remain. Refile all other cards in the active service file behind the divider tab it would have been found in, according to system age as if the service policy had been continuously in force. This filing order will allow you to use the procedures already established for service scheduling and renewal policy mailings.

INSTALLATION OF EXCHANGE AERATORS

Continued service policies are renewed annually. Renewal service contracts should automatically be mailed in their tenth month. They should be done monthly when initial service contracts are mailed to owners in the twenty-second month of Singulair system operation. In any given month, service contracts due to expire in two months will be located behind divider tabs #34, 46, 58 and so forth. Second mailings may be made from cards located behind divider tabs #35, 47, 59, etc. excluding those whose renewal contracts have been returned.

When an owner uses the lifetime exchange program to receive a new aerator, the three year limited warranty begins again. However, the two year initial service program does not. No service is performed unless a service contract is in effect. When the exchange aerator is installed, a new warranty registration is included. The top portion, containing the new aerator serial number is to be kept with the Owner's Manual. The middle portion must be signed by the owner and returned to the factory. The lower portion is filed behind the original card in the Singulair customer master file or service file, whichever is appropriate. Note on the new card the aerator installation date and also mark the card that the six, twelve, eighteen and twenty-four month inspections will not apply. Record the exchange unit serial number and installation date on the 4 x 6 card in the alphabetical master file. It is important that service and warranty record cards be retained for installations with exchange aerators because future determinations of aerator age will be based upon the original system start-up date.

Executed service contracts should be filed alphabetically by owner's name in a separate file. Multiple copies for owners who consistently renew their contracts should be attached to each other and organized chronologically.

INACTIVE SINGULAIR INSTALLATIONS

If an executed service contract and fee are not returned by the end of the twenty-fourth month of system operation, the installation is considered inactive. Its service and warranty record cards and all service cards must be removed from the active service file. They are refiled behind the alphabetical listing card in the Singulair customer master file. Inactive cards remain in this file unless the owner executes a new service contract at a later date. All renewed service contract holders whose contracts lapse must also have their cards transferred to the alphabetical file. If an owner requests service on an out-of-warranty system, service should be performed on a time and materials basis. A three-part service card must be completed as usual and the distributor's copy should be returned to the office and filed in order behind the last service card for the installation.

DEAR OWNER:

SINGULAIR® BIO-KINETIC®
WASTEWATER TREATMENT SYSTEM

Dear Owner:

When you purchased your Norweco Singulair Bio-kinetic wastewater treatment system, a two year limited warranty and fifty year exchange program were included in the purchase price. The purchase also provided for a two year service inspection program at no additional cost to you.

We are pleased to be able to offer a continuing service program similar to the one originally included with your system, now that your initial service program and limited warranty have expired. Our continuing policy ranges of the way from routine inspections and emergency service to owner limitation on labor costs. We have enclosed a complete copy of our renewable service contract, with costs for your system, for your review and consideration.

We would be happy to answer any questions regarding the renewable service program or any other questions you may have regarding operation and maintenance of your Singulair wastewater treatment system. Please take the time to review and consider the advantages of the service contract we have enclosed. As in the past, our company also continues to offer service and repair for systems on an "as needed" basis in the area we serve. Thank you.

Sincerely yours,
Your Local Licensed Norweco Distributor.

NORWECO, INC. - NORMAN, OHIO - USA

norweco
SINGULAIR®
SERVICE CONTRACT

OWNER'S NAME: _____
ADDRESS: _____
TELEPHONE NO.: _____
DIRECTIONS: _____

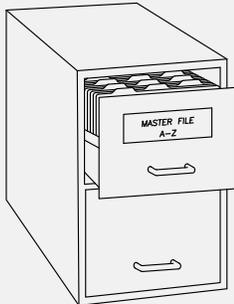
EFFECTIVE DATE: _____ 19__
EXPIRATION DATE: _____ 19__
SYSTEM INSTALLED ON: _____

The one year service contract for the Singulair Bio-kinetic wastewater treatment system located at the site described above, is intended to enable the owner to economically obtain regular service inspections for the Singulair unit, as well as to non-scheduled or special service which may be required by a qualified technician. When this contract is in force, the owner will not be charged for any routine service labor under the terms of this service agreement. A technician will regularly inspect the unit at four month intervals. It will also be inspected (known as a special owner service request) within a four month period. The contract will remain in effect for a period of one year, as specified in the effective and expiration dates listed above.

PLEASE CONSIDER

THREE SIMPLE FILES PROVIDE AUTOMATIC SERVICE SCHEDULING

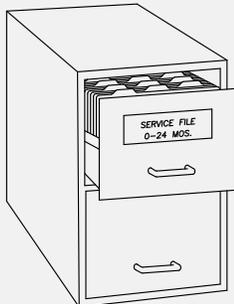
Detailed and accurate record keeping guarantees efficient service performance, reduced man-hours and increased profits.



MASTER FILE

Contains a 4 x 6 file card for each installation which:

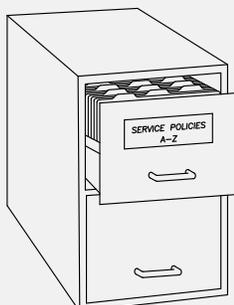
- Lists owner's name, address and telephone number
- Lists system installation date, model number and serial number
- Is updated when ownership changes
- Is updated when an exchange aerator is installed
- Is followed by service and warranty record card and all service inspection cards for inactive installations



SERVICE FILE

Contains monthly divider tabs used to:

- File service and warranty record cards by month of installation for in-warranty components
- File all service and warranty record cards for out-of-warranty systems with continued service policies



SERVICE POLICY FILE

Contains all executed service contracts for each Singulair installation filed:

- In alphabetical order by owner's name
- In chronological order by contract effective date

PROGRESS THROUGH

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SERVICE SINCE 1906

norweco® **SINGULAIR**®

BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

SINGULAIR® SYSTEM AND CONTROL CENTER SERVICE

To maximize owner protection, the Singulair Bio-Kinetic wastewater treatment system is backed by a three year limited warranty on system components and a lifetime aerator exchange program. The initial selling price includes a series of four prescheduled service inspections at six month intervals which cover the first two years of system operation. These inspections should completely familiarize the owner with the Singulair Bio-Kinetic wastewater treatment system and answer any questions that arise. Carefully check all component parts of the Singulair system to insure proper operation and overall wastewater treatment quality. Regular service inspections by qualified technicians establish an excellent relationship with the owner as well as with local health officials. They must be performed faithfully to keep you up-to-date on the performance of each Singulair system you have installed.

While making service inspections during the initial two year period, be sure to explain to the owner that they are being performed at no charge and that the same coverage can be renewed on a continuing basis at a nominal charge following the initial two year program. Point out the advantages of continuous protection with the service contract. Be sure to remember that service contract sales have advantages for the distributor as well. They result in more efficient service inspection scheduling with more actual "service time" and less "travel time" per day. These savings can be passed on to the owner through more attractive renewal contract fees in future years.

All of the equipment and tools needed for Singulair system service work are contained in the Singulair field service cart and Tool Kaddy. You will also need exchange Bio-Kinetic systems, a supply of Blue Crystal disinfecting tablets and a supply of Bio-Neutralizer dechlorination tablets. Bio-Kinetic systems may be supplied with or without Blue Crystal and Bio-Neutralizer chemical feed systems. Therefore, check your Distributor Service and Warranty Record Card carefully to be sure you have selected exchange Bio-Kinetic systems with correct flow distribution decks.

SINGULAIR SYSTEM SERVICE PROVIDES CONTINUOUS OWNER PROTECTION WITH THESE ADVANTAGES

- Travel and labor costs during service inspections are provided at no charge to the owner.
- Special service calls that may be necessary during the program are performed at no charge to the owner.
- Owner's investment, property and the environment are fully protected.
- Guaranteed response to emergency service requests is made within forty-eight hours.
- Local health department is automatically notified of system condition by the distributor.
- Owner has an up-to-date, written record of the condition of the Singulair aerator, control center and Bio-Kinetic system.
- Owner is continuously informed of the treatment quality provided by the system.
- Routine maintenance is performed by factory-trained service technicians; no owner maintenance is required.
- Owner can expect maximum aerator life and minimal power consumption costs due to regular, qualified service visits.

These instructions are designed to cover the important points of Singulair Bio-Kinetic system operation which should be checked during each service inspection. They have been arranged in normal service order to assure that you make the most efficient use of your time. While a visual check is normally sufficient to be certain that each item is in proper working order, several items listed in this manual are indications of potential problems. If anything unusual is encountered, refer to the Singulair Troubleshooting Guide.

NORWECO PRESCHEDULED SERVICE INSPECTIONS (Cont.)

Before you leave your plant

- Be sure you have a complete list of service needs in the area you are going to work.
- Check to see that you have detailed directions to each installation.
- Be sure your service vehicle is fully stocked.

When you arrive at the site

- Meet the owner. Introduce yourself and present your business card.
- Explain the service inspection program and outline what you will do. Mention that your services are at no charge.
- Ask for permission to inspect the Singulair control center and tankage.
- Make sure the owner has a copy of the Owner's Manual, serial number tag and previous Service Inspection Record Cards.
- Suggest that the owner record the information from the Service Inspection Record Card in the Supplemental Service Record Section of the Owner's Manual.
- Ask if there are any questions concerning the system or its operation.

CONTROL CENTER SERVICE

CAUTION: If your visual inspection of the Singulair control center reveals a problem, be sure to shut off the appropriate circuit breaker in the main service panel - then test all circuits with the electrical multi-meter to be sure they are de-energized before proceeding.

1. If there is no evidence of an electrical problem, check the main service panel to see that the circuit breaker for each Singulair system is turned on.
2. Make sure the panel is turned on and the power indicator light is on. If there are any alarm lights activated, refer to the Singulair quick start guide for further diagnostic instructions.
3. See that your company's identification label is affixed to the Singulair control center and is legible. Replace the label if necessary.
4. Make sure that the aerator model number and serial number tag is attached to the control center or has been stored by the owner in a secure location. If it has been misplaced, provide a new one and fill in the appropriate information.
5. See that the Owner's Manual has been stored by the owner in a secure location. If it has been misplaced, supply the owner with a new one.
6. Inspect the wiring from the control center to the aerator, as far as it is visible, and notify the owner if you see any damaged areas.
7. As you leave, make sure the Singulair control center is turned on and there are no active alarms. Secure the Singulair control center with a new tamper evident seal.
8. Make appropriate notations on the condition of the electrical control center on the Service Inspection Record Card.

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CONTROL CENTER WITH MCD TECHNOLOGY

TIME CLOCK SETTING AND SERVICE INSTRUCTIONS

The design of the Singulair system incorporates 48 hour retention and non-mechanical flow equalization to provide continuous treatment. The performance of the Singulair system has been tested and certified with the aerator operating on a minimum run cycle of 30 minutes per hour and no adjustment should be made to the factory preset time clock setting without following the detailed steps outlined in these instructions.

INTRODUCTION

The biological processes in the aeration chamber of the Singulair system convert wastewater to microorganisms, carbon dioxide and water. The Singulair system is designed so that the aerator will operate 30 minutes out of each hour. Under typical organic loading conditions, this run cycle will maintain a balance between organic loading and the level of microorganisms in the aeration chamber. If an increase in organic loading occurs, increasing the aerator run time will result in additional aerobic digestion and allow the biological balance to be maintained. Prior to adjusting the aerator run cycle, a complete Singulair system service inspection, including pretreatment chamber evaluation, aerator service and measurement of air delivery must be performed. Whenever the pretreatment chamber is pumped, the system should be given time to achieve a biological balance before considering time cycle adjustment. Adjustments to the aerator run cycle should not be made within one week of any other system process changes, including system pump out or extended vacation.

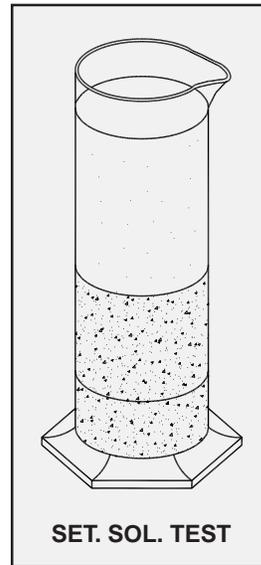
NITRIFICATION AND DENITRIFICATION

Nitrification is the oxidation of nitrogen compounds (primarily ammonia) that results in the production of nitrates. This process improves the quality of the effluent returned to the environment and is an important step in wastewater treatment. Nitrification is routinely performed by the Singulair system and the level of performance is directly linked to biological balance within the system.

Denitrification will only occur if nitrification has already taken place. Denitrification is the process of breaking down nitrates into oxygen and nitrogen. The Bio-Static sludge return prevents denitrification (sludge bulking) in the clarification chamber by continuously returning solids to the aeration chamber. Denitrification will occur in the aeration chamber if the aerator time cycle is properly adjusted. To accomplish denitrification, the aerator off cycle must be long enough to allow the aerobic bacteria to consume the available dissolved oxygen and the nitrate bound oxygen, thereby returning the nitrogen to its natural state. It is important that the aerator have a long enough off cycle to deplete dissolved oxygen levels in the aeration chamber in order to achieve partial or total denitrification.

SETTLABLE SOLIDS TEST

To determine if an adjustment to the aerator run cycle is required, a Settleable Solids Test must be conducted. See Singulair Tank Pumping Instructions for details on performing this test. Too much air being introduced to the system (overaeration) will negatively affect operating characteristics. This condition is indicated by finely divided particles and/or crisp, white foam floating in the Settleable Solids Test or aeration chamber. The supernatant will be turbid (cloudy) with fine suspended particles (pin floc). Solids will be lighter brown, almost white, in color. Overaeration will not allow proper settling of the treated wastewater and may adversely affect system performance. Likewise, too little air being introduced to the system (underaeration) will cause the system to operate at less than its maximum efficiency. Underaeration is indicated by darker and more coarse solids in the Settleable Solids Test or aeration chamber and may have a dark, thick foam or scum layer



on the top. This condition is similar in appearance to organic overloading and the system may have a foul or septic odor. The supernatant will have a grey, almost dishwater, appearance. Solids will have a grainy appearance and will settle more compactly due to their thickness and greater density.

To check for nitrification during the Settleable Solids Test, allow the sample to sit undisturbed for 2 to 3 hours. The nitrogen (fine bubbles) being released should cause all or a portion of the solids to float to the top. This process is called sludge bulking and is actually denitrification occurring in the sample container. The solids may then break up and settle to the bottom of the sample. For Singulair systems with more than one aerator, the Settleable Solids Test should be conducted on a sample from each aeration chamber. The results of all tests should be averaged to evaluate system operation.

TIME CLOCK SETTING AND SERVICE INSTRUCTIONS (Cont.)

The results of the Settleable Solids Test should be evaluated using the following chart:

Settleable Solids Test Result			Condition Indicated	Adjustment Required
Color of Solids and Liquids	Settled Solids Volume	Additional Observations		
Very light brown solids with gray cloudy liquid.	Less than 25%.	Some surface foam. Poor separation and settling of solids.	Hydraulic overloading, organic underloading, or system has not yet reached process maturity.	No adjustment until process maturity is reached. If mature and properly loaded, decrease aerator run time. DO NOT decrease run time to less than 30 minutes per hour.
Light to medium chocolate brown solids with clear liquid.	25% to 50%.	No foam.	Proper operation.	None.
Medium to dark chocolate brown solids with clear liquid.	50% to 75%.	No foam.	Proper operation.	None.
Very dark brown solids with cloudy brown liquid.	Greater than 75%.	Dense sludge with rapid settling.	Organic overloading.	Evaluate pretreatment chamber. Increase aerator run time if required.
Black solids with gray liquid.	In any volume.	Foul odor and finely divided particles.	Toxic material in influent.	Evaluate system per Singulair Service Manual. Review Owner's Manual with owner.

DISSOLVED OXYGEN TEST

A dissolved oxygen (DO) test can be conducted on the aeration chamber contents to confirm overaeration or underaeration. The DO test can be performed on site using a properly calibrated portable DO meter with probe. The DO level can also be accurately determined through the use of an inexpensive colorimetric test performed on a properly filtered sample from the aeration chamber. DO in the aeration chamber typically ranges from 0.5 mg/L to 9.5 mg/L and fluctuates according to cycle time and other factors including temperature and solids level. Comparison samples must be taken at the same point during the aerator run cycle because DO levels will vary according to cycle time. DO levels in the aeration chamber must be greater than 2.0 mg/L at the end of the aerator run cycle to accomplish nitrification and less than 0.5 mg/L at the end of the aerator off cycle to accomplish denitrification. A properly balanced system will have more than sufficient air during the run cycle to allow nitrification to take place and will deplete DO during the off cycle sufficiently to allow partial or complete denitrification.

Some areas have specific DO requirements for effluent returned to the environment and the same tests can be conducted on final effluent samples. The treatment processes of the Singulair system will cause effluent DO to differ from aeration chamber DO levels. Typical effluent DO will range from 1.0 mg/L to 6.0 mg/L depending on location, temperature and time of year.

HYDRAULIC OVERLOADING

Hydraulic overloading of the Singulair system is an indication that too much liquid is coming into the plant. This situation can adversely affect biological treatment and should be corrected immediately. Leak testing should be performed on toilets, faucets and other fixtures that discharge into the domestic wastewater plumbing to be sure that they shut off completely when not in use. Confirm that roofing down spouts, sump pump piping and other improper connections are not discharging into the Singulair system. Crushed or leaking influent sewer lines can cause groundwater to enter the system and should be thoroughly checked by a qualified contractor.

ORGANIC OVERLOADING

The Singulair system is designed to handle typical domestic waste. Occasionally, a specific application may result in excessive organic loading to the system. If you encounter an organic overload, the aerator run cycle can be adjusted in five minute increments up to continuous run. Instruct the owner regarding proper use of the system as described in the Singulair Owner's Manual.

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CONTROL CENTER WITH MCD TECHNOLOGY

TIME CLOCK SETTING AND SERVICE INSTRUCTIONS (Cont.)

HIGH ALTITUDE INSTALLATIONS

The Singlair aerator delivers more than 150% of the air required by nationally recognized wastewater treatment design standards. This abundant supply of air allows the Singlair system to be installed at high elevations without special consideration. At an elevation of 6,500 feet above sea level, the available oxygen is approximately 23% less than at sea level. In high altitude installations, adjustment to the aerator run cycle should be made based on the same evaluation procedures used for all Singlair systems.

INTERMITTENT USAGE

When the Singlair system is to be used intermittently (one day per week or a few days per month), the aerator run cycle should be adjusted to the minimum setting. When low usage or non-use periods are expected, precautions should be taken to insure the protection of system components. If an extended period of non-use (four months) is anticipated, the distributor should suggest complete system shut down and removal of components. This may only be done with the full knowledge and approval of the local regulatory agency. The final decision to shut down the system rests with the owner. The decision should be based on the same criteria as other seasonal or non-occupancy arrangements, such as care of hot water tanks, water pipes, refrigerators or freezers. The owner should arrange for the local distributor to remove and store the aerator and chemical feed tube(s) after vacancy. The service technician should place the control center selector switch in the "off" position. Arrangements must be made for the distributor to re-install Singlair system components before the site is to be re-occupied. Normal installation procedures, as outlined in the Singlair Service Manual, should be followed by the distributor when re-starting a system.

COMPLIANCE WITH REGULATIONS

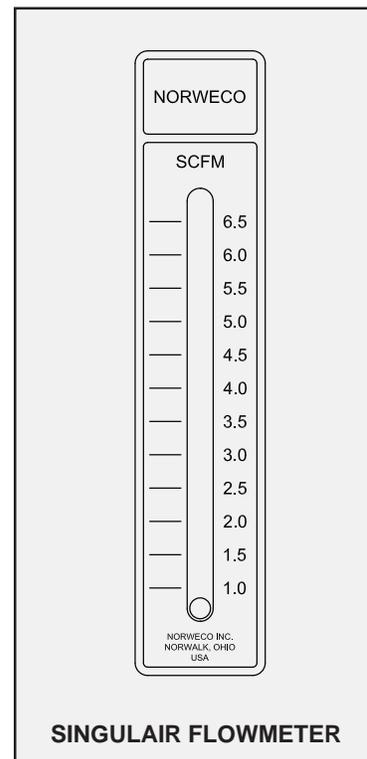
Local regulatory officials must be informed whenever a time cycle adjustment is made. Regulatory agencies should participate in the adjustment decision and standard procedures should include consultation with regulators before any adjustment is made. Norweco distributors and service personnel should attempt to build and maintain a close relationship with regulatory officials. Consulting with regulators and owners before adjusting a Singlair time clock should strengthen communication and keep all parties properly informed. In instances where a close working relationship already exists with local regulatory officials, regulators may allow service personnel to submit notification after an adjustment has been made. Such a practice should only occur when a strong relationship exists between distributor and regulator and with the full knowledge and approval of the regulatory agency.

PRIOR TO SYSTEM ADJUSTMENT

The Service Pro control center is designed and manufactured to provide an aerator run cycle of at least 30 minutes per hour. The aerator run cycle can be adjusted, but in no case can the aerator operate less than 30 minutes per hour.

Use the Singlair flowmeter to determine that the proper amount of air is being introduced into the system. If the

flowmeter confirms that the Singlair aerator is infusing the proper amount of air, proceed with the Settleable Solids test. Should the Settleable Solids or Dissolved Oxygen tests indicate that a time cycle increase is desirable, turn the Service Pro control center time clock dial to the "continuous" position. Allow the system to operate on "continuous" run for a few weeks until the service technician is available to check the system and speak with the owner. If the system has not returned to normal operation, the system is experiencing a problem other than with the time cycle and



alternatives must be investigated. Refer to the "Hydraulic Overloading" and "Organic Overloading" sections of these instructions.

If the change to "continuous" run has solved the operational problem, the time clock should be adjusted to bring the system into biological balance. When the service technician returns to the site, and operation has returned to normal, the technician should adjust the time clock to reflect the deviation in loading from the original time clock setting. Adjust the aerator run cycle to half way between "continuous" run and the original time clock setting (e.g. if the original setting was 30 minutes, adjust the time cycle to 45 minutes out of each hour). Instruct the owner to monitor the system and notify you of any problems. After at least one month, when a service technician is available and in the geographic area, check the system again. Additional adjustments may be necessary to completely balance the system.

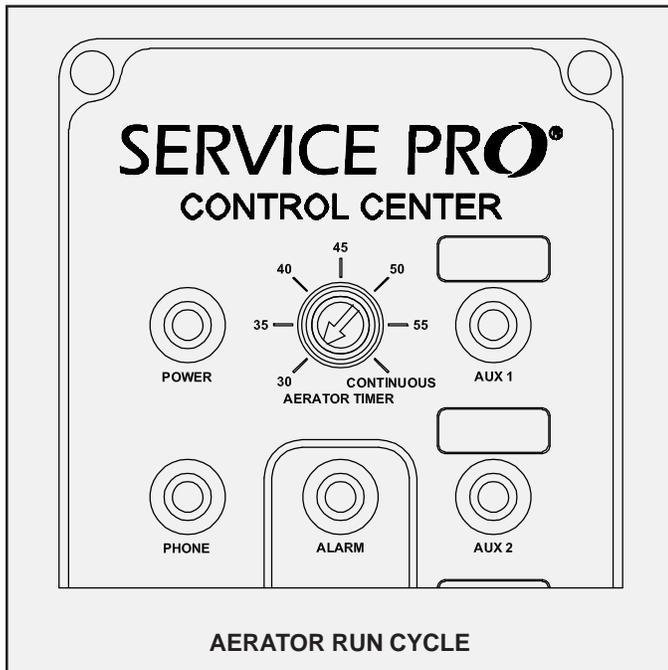
TIME CLOCK SETTING AND SERVICE INSTRUCTIONS (Cont.)

TIME CLOCK ADJUSTMENT

NOTE: Use a small blade screwdriver to rotate the time clock dial to the desired position. Do not use excessive force when turning the time clock dial.

Singulair systems with more than one aerator must have all control centers set for the aerators to operate on identical run cycles. Follow these steps to adjust the time clock:

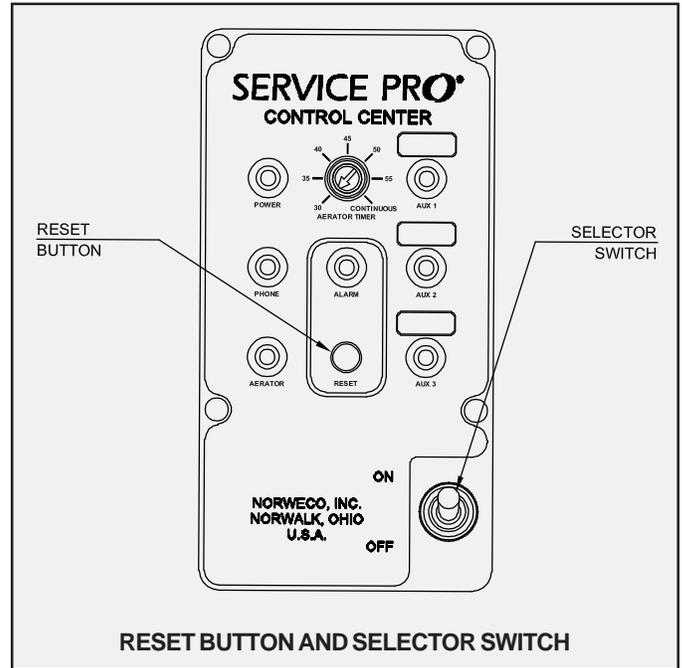
1. Open the control center enclosure and place the selector switch in the "off" position.
2. Rotate the time clock dial clockwise until the arrow molded into in the dial is aligned with the desired run time setting.
3. Place the selector switch in the "on" position.



4. Close the control center cover and secure it with a tamper evident seal.
5. Record the new aerator run cycle on the Service Inspection Card.

SERVICE INSTRUCTIONS

The operation of the Service Pro control center can be verified on site through a series of tests. Before testing the Service Pro control center operation, insure the aerator is installed in the Singulair tank and the watertight electrical connector is plugged into the aerator power cord. To restart the aerator time clock cycle, place the selector switch in the control panel momentarily in the "off" position. Return the selector switch to the "on" position. The aerator should now be operating.



Allow the aerator to operate for 60 seconds before proceeding. If the aerator turns off or the alarms on the control center activate, an aerator over current condition has been detected or a problem has been detected in the Service Pro control center.

To test the aerator under current detection feature, simply unplug the watertight electrical connector from the aerator power cord. The visual alarm indicator on the control center should begin to flash within five seconds. Plug the electrical connector into the aerator power cord. The aerator should resume normal operation within five minutes and the visual alarm indicator on the control center will turn off.

To test the audible and visual alarms, hold the reset button in for five seconds. The alarms will activate for a five second period and then turn off.

Should the Service Pro control center require any service, replace the entire control center insert.

CAUTION: Be sure to shut off the Singulair circuit breaker in the main electrical service panel before any repairs are made. Confirm that the incoming electrical service reads zero volts before proceeding with control center insert replacement. Refer to Control Center Wiring and Installation Instructions for details on replacement of the control center insert.



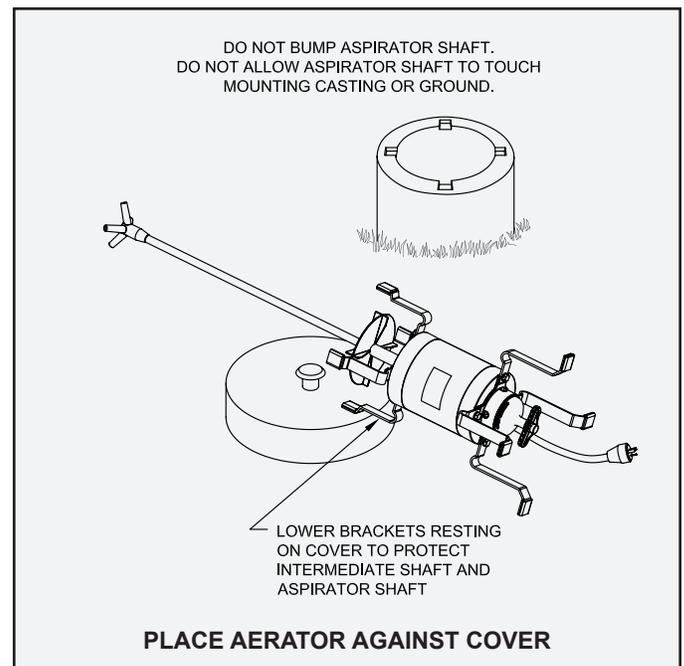
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BIO-KINETIC® WASTEWATER TREATMENT SYSTEM **SINGULAIR® AERATOR SERVICE**

The Singulair aerator has been specifically designed for use in the Singulair system and is the only electro-mechanical component. It provides maximum air introduction, thorough mixing and assures reliable, economical wastewater treatment. For Singulair systems requiring more than one aerator, follow these instructions for each aerator and aeration chamber. The Singulair aerator is factory lubricated for the life of the unit. No service inside the aerator is required. Unauthorized disassembly will void the warranty.

CAUTION: Any time an aerator or test equipment is connected or disconnected, first shut "off" the selector switch in each control center. Failure to do so could result in personal injury or equipment damage.

1. Open the control center and push the reset button on the Service Pro panel.
2. As you approach the Singulair tank, listen for excessive noise before removing the vented cover.
3. Remove the vented access cover located above the aeration chamber and place it aside. The aerator should be operating normally.
4. Make sure the debris screens are in place in the air intake ports. Manually check the aerator brackets for excessive vibration.
5. Check the aeration chamber for odor. A musty odor indicates the presence of aerobic conditions essential for good treatment. A septic odor indicates inadequate aeration, suggesting that the passage of air into the tank contents has been restricted.
6. Carefully remove the debris screens from the air intake ports. Wipe the aerator air intake ports with a damp cloth being careful not to allow dirt or debris to enter the intake openings.
7. Using the Singulair flowmeter, check the air delivery. It should read approximately 3 CFM. Refer to the Singulair Aerator Flowmeter instruction sheet for complete details.
8. Inspect the outside of the electrical connector assembly for worn spots. Uncouple the connector and check for any evidence of moisture inside. Secure the closure cap over the female half of the connector to keep it clean and dry while you work.
9. Within 2-3 minutes after turning off the aerator, perform a settleable solids test of the aeration chamber contents. Refer to Singulair Tank Pumping instructions for details.
10. Remove the aerator from the mounting casting. BE CAREFUL when removing the aerator to see that the aspirator shaft does not come in contact with the mounting casting. The aspirator shaft is straightened to a critical tolerance before it is shipped from the factory. It must retain this straightness tolerance or vibration may result. Excessive vibration can greatly shorten aerator life and could also cause the unit to consume more electrical power than necessary.
11. Check the rubber shock absorbers on each bracket for wear. Replace any that are missing or worn.
12. Check the power cord from the moisture resistant electrical connector to the aerator. Be sure it is free of nicks or worn spots.
13. Lay the aerator on its side against the aerator mounting casting or vented cover. Check to see if there is a water mark on the outside of the aerator and notify the owner if one is found. The aerator is flood proof and mechanically designed so that it can return to normal operation unharmed after being subjected to intermittent high water. However, a high water mark on the outside of the aerator does indicate there is a problem in the effluent disposal line, disposal field or elsewhere in the installation. If the problem is left uncorrected, wastewater could back up into the tank, void the aerator warranty and eventually flood the facility.
14. Carefully loosen the two stainless steel set screws on the bottom of the intermediate shaft and remove the



SINGULAIR® AERATOR SERVICE (Cont.)

- aspirator shaft. Remove any internal deposits from the four aspirator orifices with the aspirator shaft cleaning tool. Connect the aspirator shaft to the shaft cleaning hose and outside water faucet to flush the inside of the aspirator shaft clean. Use full water pressure. Remove the shaft from the cleaning hose and inspect the bore to see that it is clean.
15. Push the stainless steel brush with extension handle through the stainless steel intermediate shaft and hollow motor shaft to dislodge any residue that may have accumulated. **NOTE:** Do not flush the motor shaft with water. Remove any debris from the air intake openings.
 16. Thoroughly clean both the bottom and the top surfaces of the foam restrictor.
 17. Reinstall the aspirator shaft into the intermediate shaft. Match the permanent alignment marks on the aspirator and intermediate shafts to maintain the original factory balance. Tighten the set screws with a tee-handle allen wrench, finger tight only. Too much pressure may dish the side of the aspirator shaft and compromise the straightness tolerance.
 18. Visually check the aeration chamber surface for the presence of grease or oil. An accumulation of these materials indicates the pretreatment chamber should be evaluated. Refer to Singulair Tank Pumping instructions for details.
 19. Check the aeration chamber for the presence of non-biodegradable materials. Accumulation of these materials in the aeration chamber indicates the pretreatment chamber should be evaluated. Refer to Singulair Tank Pumping instructions for details.
 20. Inspect the underground power cable in the aerator mounting casting for breaks or scars in the insulation. Examine the inside of the mounting casting and riser for evidence of ground water entry.
 21. Carefully reinstall the aerator in the mounting casting. Do not allow the aspirator shaft to touch the mounting casting side walls. Make sure the weight of the aerator is evenly distributed on the upper end of all four mounting brackets.
 22. Using a multi-meter, check the voltage at the electrical connector. The meter should read 115 volts \pm 5% for systems equipped with electro-mechanical control centers and zero volts for systems with Service Pro controls. Record the voltage on the Service Inspection Card.
 23. Wipe the aerator electrical connector with a clean, dry cloth to remove moisture or dirt accumulated during service. Plug the electrical test pigtail in between the male and female electrical connectors and check the amperage of the newly serviced aerator. The aerator should not draw more than 3.8 amps. Record the amperage on the Service Inspection Card.
 24. Clean or replace the four air intake debris screens. Make sure one screen is placed in each intake opening to prevent debris from entering the aerator.
 25. Inspect the vent cap in the aerator access cover and clear the fresh air openings of any debris to insure unrestricted passage of air. Reinstall the access cover on the mounting casting. **DANGER: Make sure the system access cover is in good condition and securely installed on the mounting casting. Never allow access risers to be left uncovered or partially covered. Failure to secure access covers and safety nets could result in bodily injury, illness or death. Riser safety nets are available from Norweco for concrete or plastic risers.**
 26. Make the appropriate notations regarding the aerator, the results of the settleable solids test and related items on the Service Inspection Card.
 27. Proceed with clarification chamber service as outlined in Clarification Chamber and Bio-Kinetic Service instructions. When the routine service is complete, return to the control center and restore the Singulair system to the proper operating time cycle for this installation. Close the control center cover and secure it with a new tamper evident seal.

IF AN AERATOR MUST BE REMOVED

The service technician should be able to restore most installations to full operation during the initial service call. If the aerator is no longer eligible for the three-year limited warranty, the aerator should be removed and replaced with a remanufactured and fully warranted exchange unit from your rotating stock. This will become the permanent aerator in service at the facility and your company's service records should be updated to reflect the new aerator serial number. If the serial number portion of the Warranty Registration Card is still attached to the control center, be sure to fill in the new serial number for the owner. When you have accumulated several aerators requiring factory service, return them to Norweco. This reduces administrative time and the cost of shipment per unit. When remanufactured aerators are returned to you, add them to your rotating stock. In this way, the installation is restored to full service with a fully warranted unit in only one service trip.

EXCHANGE AERATOR COSTS

You may compute exact costs for exchange aerators during your service inspection since the cost is determined by system age, regardless of condition. Exchange rates are given on the Singulair Warranty and Exchange Program data sheet. In cases where the aerator has failed under warranty, you should replace it with a loaner unit to insure continued operation of the system and protect effluent quality. Return the warranted unit to the factory immediately for replacement and schedule reinstallation with the owner at the earliest possible convenience when it is returned to you.

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BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

CLARIFICATION CHAMBER AND BIO-KINETIC® SERVICE

Check operation of the Service Pro control center and complete all Singulair Aerator Service instructions to the point of aerator reinstallation before proceeding with clarification chamber service. Do not reinstall the aerator in the mounting casting until all Bio-Kinetic systems have been removed from the Singulair tank. For Singulair systems requiring more than one Bio-Kinetic tertiary treatment device, follow these instructions for each Bio-Kinetic system installed.

CAUTION: *Anytime an aerator or service pump is connected or disconnected, first shut off the selector switch in each control center. Failure to do so could result in personal injury or equipment damage.*

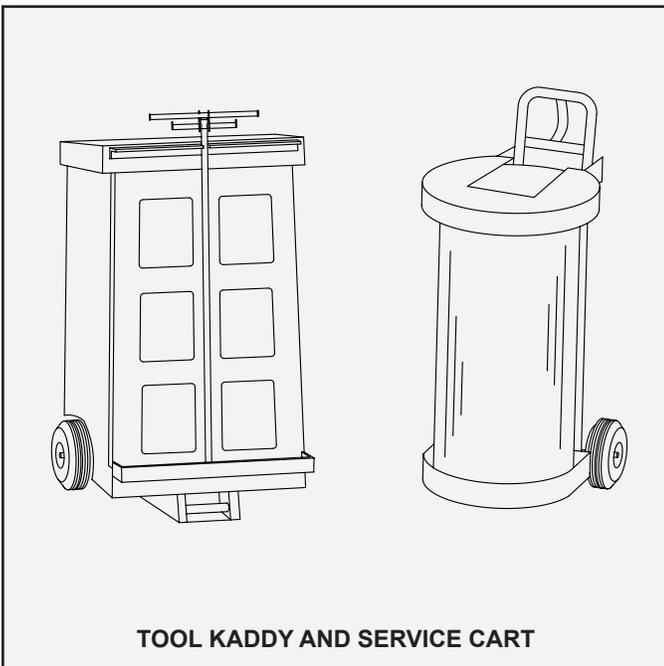
1. Move the Singulair field service cart with exchange Bio-Kinetic system and Tool Kaddy near the clarification chamber access cover. Remove the service container from the field service cart, unscrew the wing nuts holding the service container cover and set them aside. Remove the service container cover and place it upside down along side the clarification chamber access riser. Remove the exchange Bio-Kinetic system from the service container and set it aside. Remove the universal tool from the front of the Tool Kaddy and open the doors.

Bio-Kinetic system and the liquids in the tank for color and odor. Note the condition of the system on the Service Inspection Card.

NOTE: Attached to the Bio-Kinetic system service cover is a red tag listing the Singulair system model number, classification and daily treatment capacity. This service cover and tag must remain with the installation and be reinstalled after exchanging the Bio-Kinetic system.

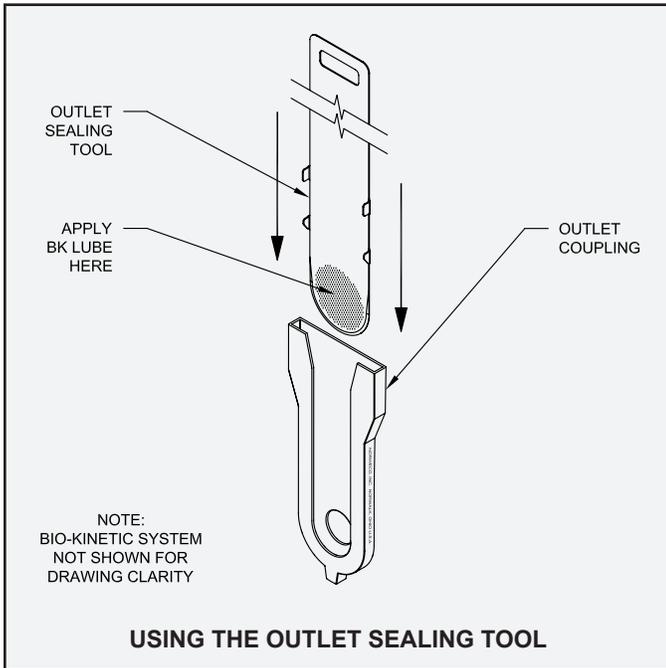
CAUTION: Chemicals or liquids from the Bio-Kinetic system feed tubes should not be allowed to contact skin or clothing. Refer to the Blue Crystal and Bio-Neutralizer handling instructions and container labels for safety procedures and first aid. Liquids or chemicals from the feed tubes may cause grass or landscaping to discolor.

3. To prevent loss of liquid from the Singulair system during service, use the Bio-Kinetic System Outlet Sealing tool. Thoroughly lubricate both sides of the tool below the tabs to the rounded end with Bio-Kinetic lubricant. With the tabs facing toward the Bio-Kinetic system, insert the tool in between the Bio-Kinetic outlet flange and the cast-in-place receiving flange of the tank. Completely insert the tool to the bottom of the outlet coupling.
4. Using the disassembly tool, remove the internal components from the Bio-Kinetic system. The internal components should be set aside while the remainder of the Bio-Kinetic system is removed.
5. The Bio-Kinetic system is equipped with a drain valve and a fill valve to allow for easy removal and reinstallation during service. The locking lugs must be disengaged to allow for removal. Using the locking lug tool, rotate each of the four round black locking lugs clockwise from beneath the access riser. Insert the universal tool lifting handle into the upper lip of the Bio-Kinetic system outer chamber bucket.

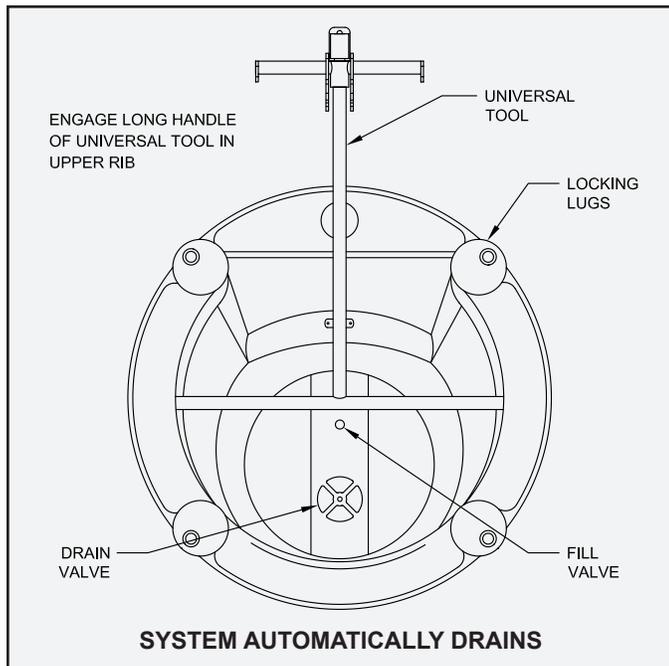


2. Lift off the concrete clarification chamber access cover(s) and turn it (them) upside down near the access riser. If the unit is equipped with Blue Crystal or Bio-Neutralizer feed tubes, carefully remove each tube, one tube at a time. Lay each feed tube down on the concrete access cover. Remove the Bio-Kinetic system service cover and check the condition of the

CLARIFICATION AND BIO-KINETIC® SERVICE (Page 2 of 6)

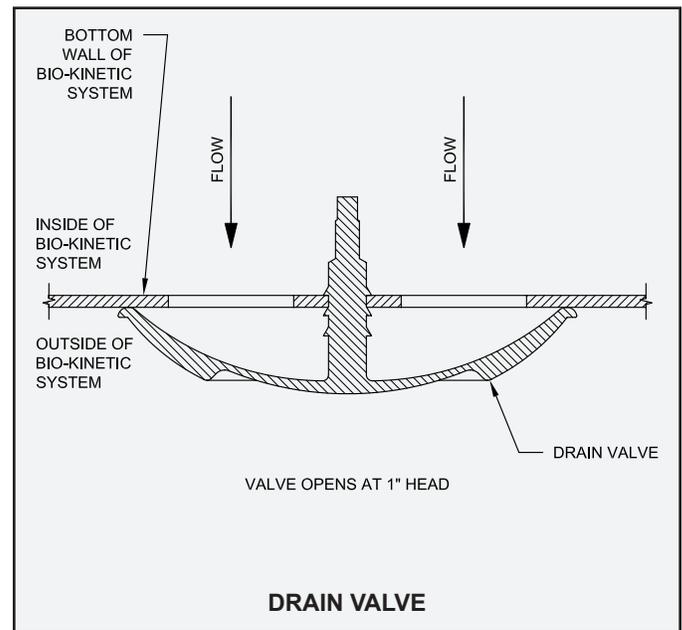


6. While standing over the riser, begin lifting the system from the tank. The self drain valve will automatically open as the system is lifted out of the riser. Continue lifting until the majority of the water has drained out of the system. Remove the Bio-Kinetic system from the mounting casting. Set the Bio-Kinetic system on the upside down lid of the service container
7. Record the color and condition of the Bio-Kinetic system on the Service Inspection Card and on the "Supplementary Service" section of the Owner's Manual. Make appropriate notations on the condition of the clarification chamber. Also note the liquid level on the filter media. The peak flow filter media should



be clean in appearance if the hydraulic loading has never been great enough to cause the liquid level in the clarification chamber to rise above the design flow filter media. If a temporary hydraulic surge has occurred, a dark line will be visible on the peak flow filter media. Note the system water level on the Service Inspection Card.

8. Unscrew the discharge flange assembly and remove both pieces. It may be necessary to hold the inside threaded flange to unscrew the two pieces. After both pieces of the discharge flange are removed, place the internal components back into the Bio-Kinetic system.



9. Place the Bio-Kinetic system into the service container. The outlet of the Bio-Kinetic system must align with the flat panel in the container. Thread the discharge flange assembly together and place it on the flow deck. Now put the service container cover in place.
10. Reinstall the Singulair aerator as outlined in the Aerator Installation instructions. The aerator must be in operation while the remaining clarification chamber service is performed.
11. Check the surface of the clarification chamber for grease or biologically untreatable material. A significant accumulation of these materials indicates

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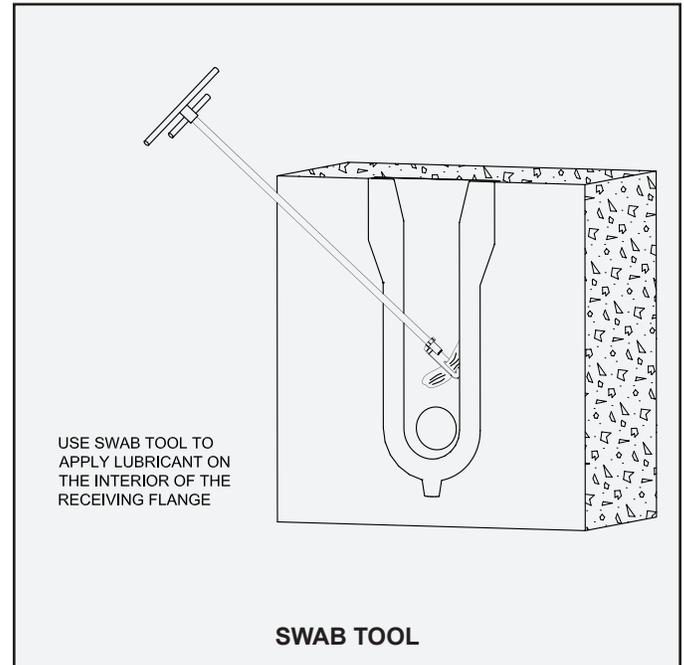
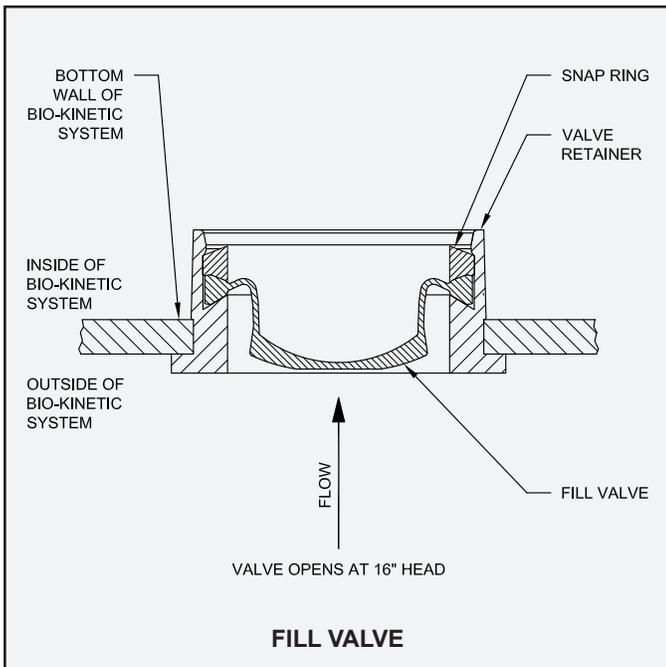
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the pretreatment chamber should be evaluated to determine if pumping is required. With the aerator running, use the hopper scraping tool to gently scrape all areas of the clarification chamber hopper side walls. Scrape all the way down to the bottom of the chamber, below the discharge of the Bio-Static sludge return. Then scrape the small flat area at the bottom of the hopper, pushing toward the aeration chamber as far as possible.

is a problem with drainage. Improper drainage will lead to flooding of the Singulair Bio-Kinetic wastewater treatment system and must be reported to the owner. Examine the inside of the access riser for evidence of surface water entry.



12. If the Singulair tank is pumped during system service the pressure sensitive fill valve will fill the Bio-Kinetic system automatically as the tank refills.

NOTE: It is important that the clarification chamber side walls be cleaned only after the aerator has been serviced and reinstalled. The aerator must be operating so that settled sludge will be fully returned to the aeration chamber by the hydraulic currents flowing through the Bio-Static sludge return.

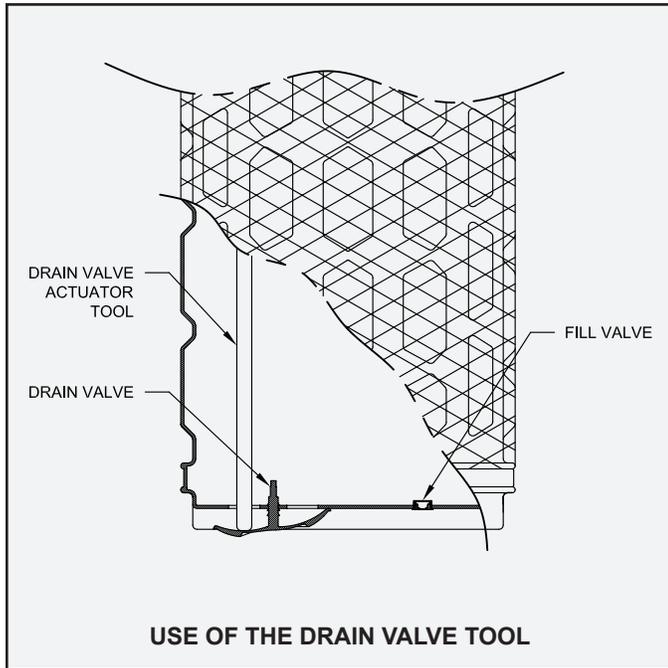
13. Visually check each Bio-Static sludge return to insure that it is securely engaged in the aeration/clarification chamber wall.
14. If necessary, use water to wash away any sludge from the inside of the system mounting casting, grade riser, cover and surrounding grass or landscaping.
15. Note the liquid level in the clarification chamber. If the liquid level is above the flow line of the outlet coupling, consult the troubleshooting guide to determine if there

16. Examine the condition of the Singulair tank outlet coupling and cast-in receiving flange. Any debris that has accumulated in the grooves of the receiving flange or the inside of the tank outlet coupling must be removed. Wipe the face of the receiving flange and the internal surface of the grooves clean. Using the swab tool, apply a liberal amount of Bio-Kinetic lubricant to the entire face of the receiving flange and the inside of the grooves. Apply the lubricant evenly until all interior surfaces of the receiving flange and grooves are thoroughly coated.

CAUTION: Bio-Kinetic lubricant has been specially formulated. Use of other lubricants, especially petroleum based lubricants, can cause degradation of the rubber components and will void the warranty.

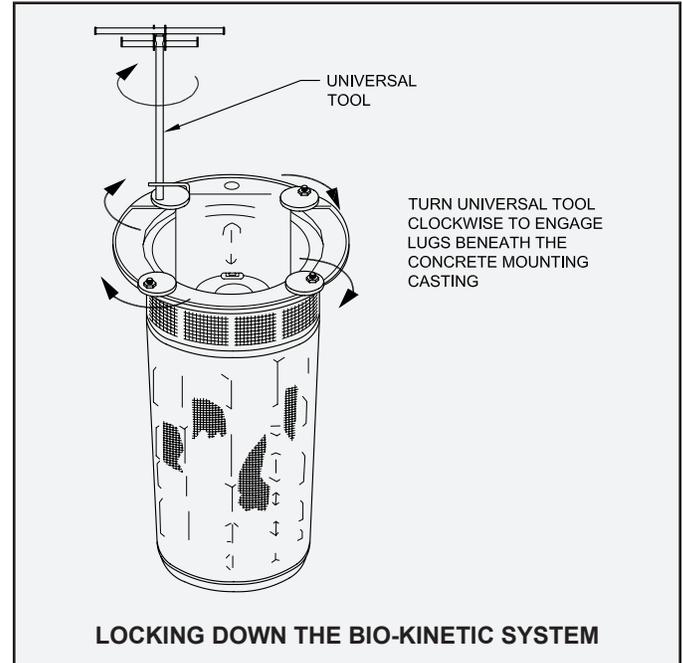
17. Remove the discharge flange assembly and internal components from the exchange Bio-Kinetic system. Lubricate the grommet in the outlet opening. From the inside of the contact chamber, insert the male threaded flange through the grommet. Reinstall the gasketed discharge flange on the Bio-Kinetic system by turning it clockwise until tight. Reinstall the flow deck and internal components. Apply lubricant to the exterior surfaces of the gasketed discharge flange.

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18. Remove the internal components from the replacement Bio-Kinetic system and set aside. Use the universal tool to lower the exchange Bio-Kinetic system outer chamber into the mounting casting. Carefully insert the tip of the drain valve actuating tool through the drain valve located in the bottom of the outer chamber of the Bio-Kinetic system. This will allow the Bio-Kinetic system to fill with water as it is lowered into position. If allowed to tilt, the Bio-Kinetic system could rub the edge of the access opening and damage the filter media. Align the discharge flange with the cast-in-place receiving flange. As the chamber is set into position on the concrete ledge of the access opening, the Bio-Kinetic system discharge flange must engage the top of the cast-in-place receiving flange before proceeding.
19. Once in the proper position, carefully remove both the drain valve actuating tool and the universal tool. This will allow the drain valve to seal against the exterior bottom of the Bio-Kinetic system. Use the locking lug tool to twist each of the round, black locking lugs clockwise so that each of the lugs is rotated to the furthest extension point possible.
20. Reinsert the internal components from the replacement Bio-Kinetic system. Locate the level indicator mounted above the outlet of the Bio-Kinetic system flow distribution deck. The bubble should be resting squarely between the two lines in the clear plastic case. If the location of the bubble indicates the system is not installed in a level position, the flow deck should be leveled using the four adjustment lugs provided for this purpose. With the ratchet drive, extension and $\frac{7}{16}$ " socket from the Tool Kaddy, turn each of the adjustment lugs until the bubble comes to rest squarely between the two lines in the clear plastic case.

NOTE: Leveling of the flow distribution deck is essential for proper operation of the flow equalization ports, chemical feed tubes and effluent weir within the Bio-Kinetic system.



21. Remove the Bio-Kinetic system outlet sealing tool from in between the system outlet flange and the cast-in-place receiving flange of the Singlair tank.
22. The system service cover with information tag from the originally installed Bio-Kinetic system must be reinstalled in the tank. Install the cover, handle side up, by aligning the four holes in the cover with the four locking lug bolts. Be sure the optional chlorination and dechlorination feed tube access openings are in the proper position. The cover will come to rest on the collar of the Bio-Kinetic system. There is no need to add fasteners to the locking lug bolts.
23. If the installation requires effluent disinfection, the chlorine feed tube opening in the service cover must be positioned on the inlet side of the system nearest the aerator mounting casting. The Bio-Kinetic system chlorine feed tube should be filled with Norweco Blue Crystal disinfecting tablets. Blue Crystal tablets have been specially formulated for use in the Bio-Kinetic system, other disinfecting chemicals will not provide the same results. Before handling Blue Crystal disinfecting tablets, carefully read the container label and the "Warning" section of these instructions. To fill

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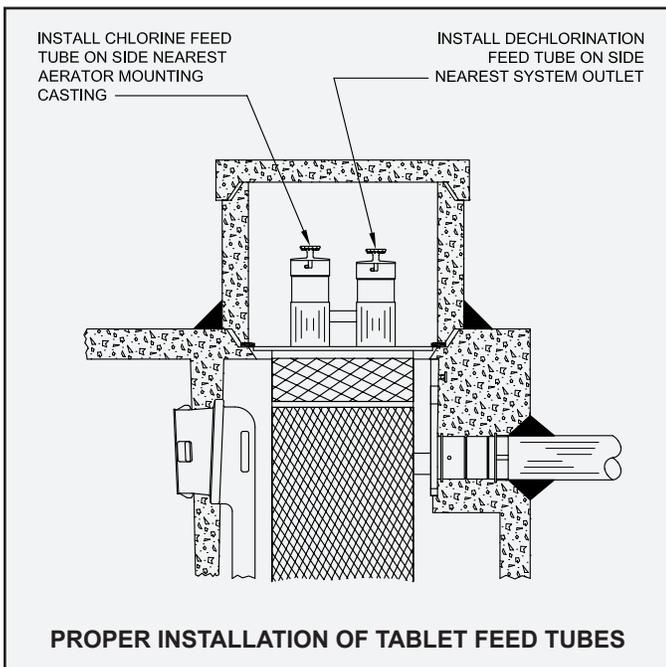
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the chlorine feed tube, remove the cap, hold the tube open end down with one hand and insert Blue Crystal disinfecting tablets, one tablet at a time, until the tube is filled. The tube holds approximately a six-month supply and each tablet must lie flat in the stack. When the tube has been completely filled, replace the cap. Install the feed tube, slotted end down, through the plastic collar molded into the top of the Bio-Kinetic system service cover. The feed tube will begin to engage the round recess in the flow distribution deck. Rotate the tube clockwise until it locks into position.

nose and throat, and may be fatal if swallowed. Avoid breathing dust and do not allow contact with eyes, skin or clothing. Contaminated clothing should be removed and washed before reuse. If tablets or residue contact skin, wash with plenty of soap and water for fifteen minutes. If irritation continues, call a physician. If swallowed, immediately drink large quantities of water, do not induce vomiting, avoid alcohol and get medical attention immediately. If inhaled, immediately remove victim to fresh air. In case of fire, apply liberal quantities of water. It is a violation of Federal Law to use Blue Crystal disinfecting tablets in a manner inconsistent with the instructions printed on the storage container label.

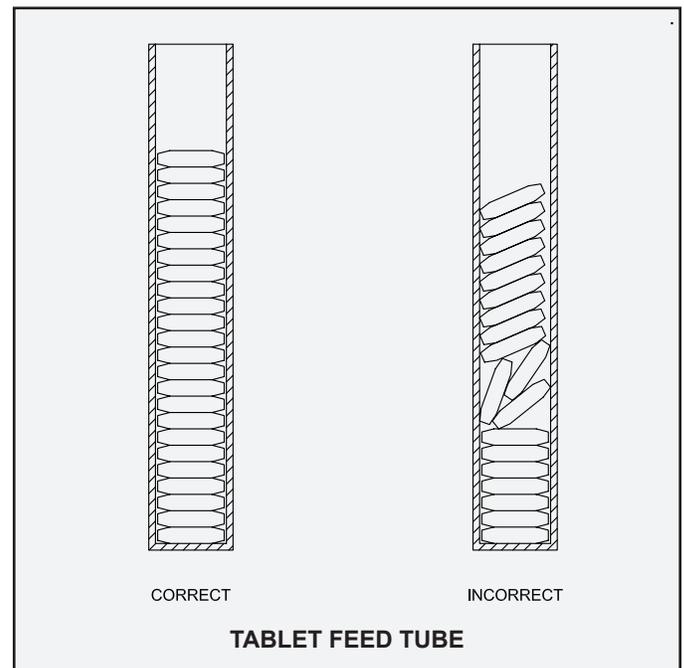


NOTE: The chlorine feed tube must always be installed through the mounting collar nearest the aerator mounting casting. If the installation requires disinfection and dechlorination, there will be two feed tube mounting collars molded into the protective cover. The dechlorination feed tube must be installed nearest the system outlet.

WARNING

Blue Crystal disinfecting tablets are a strong oxidizing agent and highly corrosive. Tablets should be stored in a cool, dry, well-ventilated area away from combustible materials such as paper, petroleum products, chemicals, rags or cardboard. Tablets should be mixed only with water. Contact with other liquids or chemicals may cause fire. Wear rubber gloves and either safety goggles or a face shield when handling Blue Crystal disinfecting tablets or working with the chlorine feed tube. Keep tablets out of the reach of children, as they can cause skin and eye damage, be irritating to the

24. If the installation requires effluent dechlorination, the Bio-Kinetic system will be supplied with a dechlorination feed tube. To fill the dechlorination feed tube, remove the cap, hold the tube open end down with one hand and insert the Bio-Neutralizer dechlorination tablets, one tablet at a time, until the tube is filled. The tube holds approximately a six-month supply of tablets and each tablet must lie flat in the stack. Replace the cap



and insert the dechlorination feed tube, slotted end down, into the mounting collar closest to the system outlet. The bottom of the tube must come to rest evenly on the floor of the flow distribution deck.

WARNING

Bio-Neutralizer dechlorination tablets must be stored in a cool, dry place away from acids and oxidizers. Do not allow Bio-Neutralizer tablets to come into

CLARIFICATION AND BIO-KINETIC® SERVICE (Page 6 of 6)

contact with chlorine tablets. Although not rated a hazardous material by the USEPA, exercise caution when handling and wash skin thoroughly with soap and water if contact occurs.

25. Reinstall the clarification chamber access cover. If the installation requires effluent disinfection and/or dechlorination, note the quantity of tablets installed on the Service Inspection Card in order to properly invoice the customer for the appropriate chemical tablets. Clean and store all tools and supplies. **DANGER: Make sure the system access cover is in good condition and securely installed on the mounting casting. Never allow access risers to be left uncovered or partially covered. Failure to secure access covers and safety nets could result in bodily injury, illness or death. Riser safety nets are available from Norweco for concrete or plastic risers.**
26. When the service is complete, return the selector switch in the control center to the proper time cycle position. Close the cover of the control center enclosure and secure it with a new tamper evident seal.

EFFLUENT DISPOSAL SYSTEM CHECK

1. Determine if the effluent from the Singulair system is being carried to an outlet for surface and/or subsurface discharge, or if it is being disposed of onlot. Inspect the condition of the effluent disposal system and make appropriate notations on the Service Inspection Card.
2. Although the Singulair system effluent may be discharged and/or disposed of in several acceptable fashions, there should always be a ground water relief point installed in the effluent line. It should be located at a point no higher than the outlet invert of the Singulair tank. It will prevent flooding in cases where the disposal line is submerged or saturated with ground water. Locate the ground water relief point and be sure that it is free of obstructions.
3. Locate the point of discharge closest to the system outlet. A free-falling "grab" sample of effluent can be collected after the point of discharge has been thoroughly cleaned. Take note of effluent color, odor and the presence or absence of suspended particles. Accumulation of mud in the effluent disposal line or at its outlet can be a sign of a crushed or broken effluent line and should be reported to the owner. Foaming, odor or particulate sediment indicates that the system has not been providing adequate treatment. Recheck the entire system using the Singulair Troubleshooting guide.

NOTE: An effluent "grab" sample allows a visual assessment and should only be used in conjunction with routine service and/or troubleshooting procedures

to accurately evaluate system operation. A "composite" sample, collected over 24 hours of system operation, preserved and transported using USEPA established procedures, is necessary if laboratory analysis of the effluent is to be performed. Laboratory analysis of an effluent "grab" sample can lead to misleading conclusions about system operation and should not be conducted. For further information regarding proper evaluation techniques for sampling onsite systems, refer to the Norweco Technical Bulletin EFFLUENT SAMPLING TECHNIQUES FOR RESIDENTIAL TREATMENT SYSTEMS.

4. Make appropriate notations on the condition of the plant effluent and disposal system on the Service Inspection Card.

BEFORE YOU LEAVE THE FACILITY...

1. Make sure that both sides of all three Service Inspection Cards are properly and completely filled out, including any specific notes or special services that your inspection indicates are needed.
2. Leave the top section of the Service Inspection Card with the owner and provide a brief verbal explanation of the condition of the system. Advise when to expect your next routine visit and provide your business card with office phone number, should the owner have any questions.
3. Point out the advantages of a continued service policy with your company if the warranty or current service policy is nearing expiration.
4. Explain that the Singulair aerator is set to operate on a time cycle and should not be turned off even during extended periods of non-use. Explain also that the Singulair control center contains no user-serviceable parts and that the cover is secured with a tamper evident seal both for owner protection and protection of component parts.
5. Review the operation of the red warning light and audible alarm on the Service Pro control center with the owner. Inform the owner that the control center should be checked daily to insure proper system operation. Explain that if the light glows and the alarm sounds, it could be due to temporary high water or electrical power fluctuation and that the reset button should be pushed to see if normal operation is resumed before requesting special service.

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BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

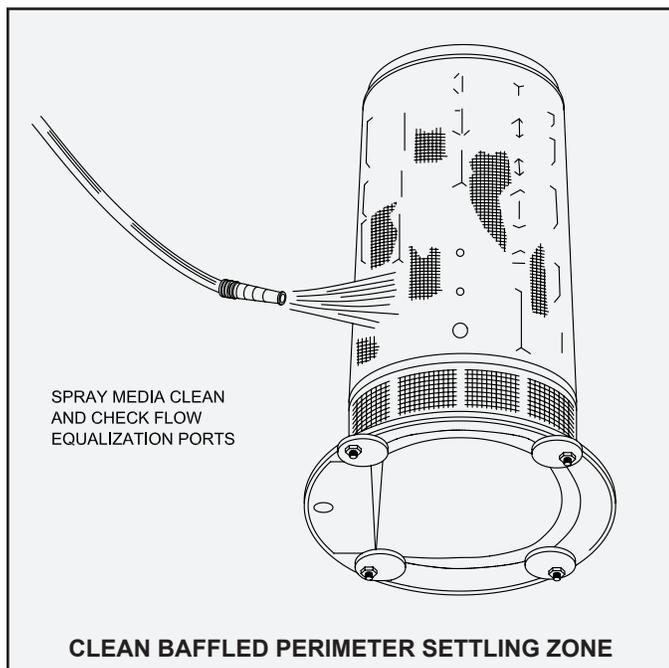
CLEANING AND DISASSEMBLY INSTRUCTIONS FOR THE BIO-KINETIC® SYSTEM

EQUIPMENT REQUIRED FROM THE BIO-KINETIC SYSTEM TOOL KADDY

- water hose and spray nozzle
- Bio-Kinetic system universal tool
- rubber gloves
- safety face shield or goggles
- ratchet drive and 7/16" socket

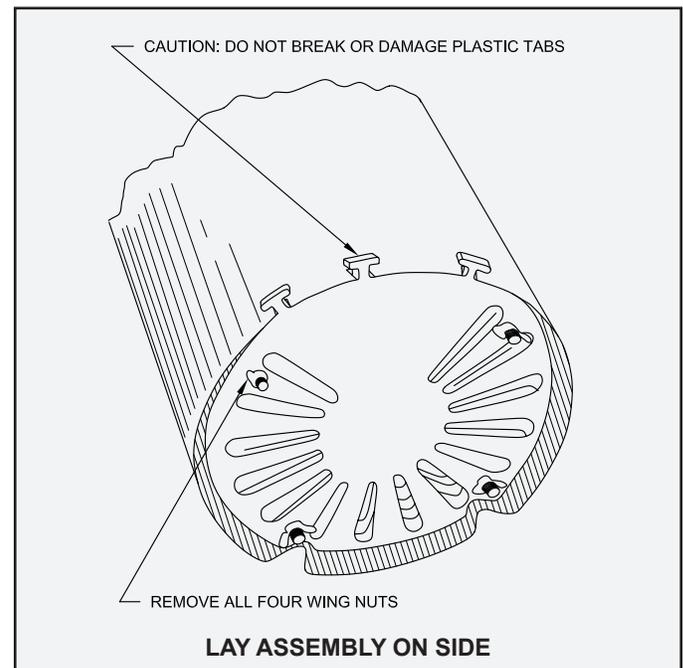
A fresh water supply and sewer drain are required for cleaning the Bio-Kinetic system.

1. Remove the Bio-Kinetic system from the service container. Rinse the container and lid. Rotate the four locking lugs to the outboard position on the Bio-Kinetic system. Remove the gasketed discharge flange assembly from the flow deck and rinse it with water.
2. Grasp the top flange of the system with one hand and insert the disassembly tool beneath each of the strap handles on the flow deck. Pull up on the disassembly tool to remove the flow deck and internal system components from the contact chamber and set aside. Use the water hose and spray nozzle to wash the inside of the contact chamber.
3. Use the water hose and spray nozzle to wash off the



filter media. Continue spraying until all sludge and wastewater have been flushed from the media. Invert the filter assembly and flush accumulated material from the baffled perimeter settling zone. Inspect the perimeter settling zone to be certain that it is totally clean. Check the flow equalization ports to be sure they are clean and unobstructed.

4. Wash off any debris that has accumulated on the surface of the flow distribution deck and baffle wall shroud. Lay the assembly down on its side and



remove the four wing nuts on the bottom. Remove and wash the bottom deck plate.

CAUTION: Do not break or damage the molded plastic tabs on the edge of the bottom deck plate.

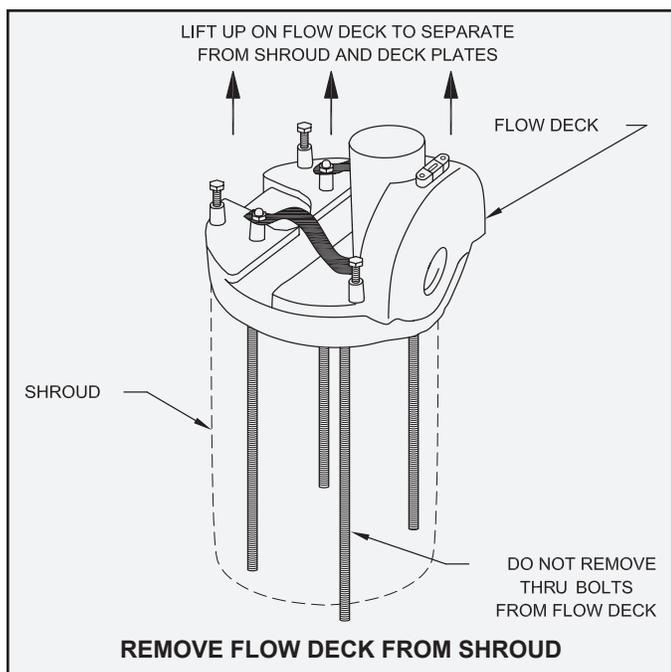
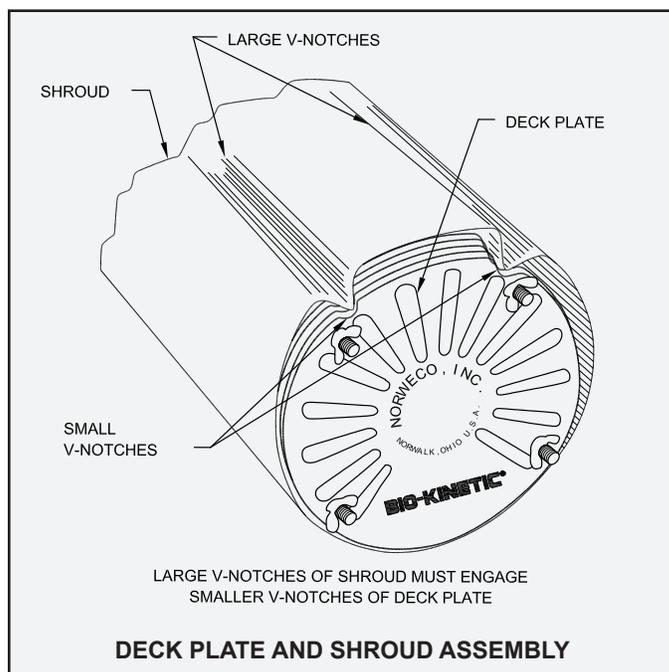
Do not remove the remaining deck plates at this time. Stand the assembly upright and lift up on the flow distribution deck to separate it from the baffle wall shroud and deck plates. You may find it helpful to hold the baffle shroud between your feet when lifting up on the flow deck.

NOTE: The thru bolts will be removed from the shroud and deck plates when the flow deck is lifted off the baffle

BIO-KINETIC® SYSTEM CLEANING AND DISASSEMBLY INSTRUCTIONS (Cont.)

wall shroud. Do not remove the thru bolts from the flow distribution deck. Rinse the flow distribution deck thoroughly inside and out. Inspect the weir and final discharge zone to be sure they are completely clean.

5. Lift up the baffle wall shroud to remove it from the deck plates. Rinse the inside and outside of the shroud and set it aside. Take the cleaned, round bottom deck plate and set it on the floor with the engraved name facing down.
6. Remove the top deck plate from the remaining stack and wash off both sides. When cleaned, set it on top of the cleaned, round bottom deck plate. Repeat this procedure with each deck plate until all plates are cleaned and reassembled into a single stack. Each deck plate is molded with four circular depressions in the bottom side of the plate and four round stand-off posts in the top side of the plate. When restacking the clean deck plates, make sure the four depressions on the bottom engage the top of the four posts below. All



deck plates must be placed onto the stack baffle side up (engraving down). When properly assembled, all edges of each plate should be vertically aligned.

7. Lower the baffle wall shroud over the assembled stack of deck plates. The two large V-notches in the shroud should engage the smaller notches on the edge of the deck plates. Check the four leveling lugs on the flow deck. They must be unscrewed until they are flush with the bottom of the flow deck. Now position the flow distribution deck above the baffle wall shroud so that the outlet of the flow distribution deck is directly opposite the two large V-notches in the shroud. Insert each of the four thru bolts through the holes in the top of the baffle shroud and into the stack of deck plates. Lower the flow distribution deck until it fully engages

the top of the baffle shroud. Push each thru bolt down into the assembly as far as it will go.

8. Lay the assembly on its side and push the thru bolts through the bottom deck plate. Fasten a wing nut to each of the four through bolts where they project through the bottom deck plate. While tightening each wing nut, make sure the molded plastic tabs on the bottom deck plate engage the slots on the edge of the shroud. Tighten enough to insure all three tabs are fully engaged into the three slots in the shroud.
9. Lubricate the grommet in the outlet opening of the contact chamber. Grasp the strap handles and lower the flow deck and internal components into the cleaned contact chamber making sure to align the flow deck outlet with the outlet of the contact chamber. Apply a moderate amount of downward force until the outlet of the flow distribution deck aligns with the outlet of the contact chamber.
10. Place the assembled Bio-Kinetic system back into the cleaned service container. Place the discharge flange assembly onto the flow distribution deck. Now place the service container cover into position by aligning the four holes in the cover with the locking lug bolts. Add a wing nut to each of the lug bolts to hold the cover in place. Return the container to your service stock.

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BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

FILTER MEDIA REPLACEMENT KIT INSTRUCTIONS

The filter media replacement kit is provided so that repair of a Bio-Kinetic system with worn or damaged media may be easily accomplished, if required, during the routine service cycle. Media replacement should be done only when necessary and only by a factory-trained technician as part of maintaining a stock of exchange Bio-Kinetic systems. Media replacement should be performed at your place of business rather than at the installation site. Replacement of properly functioning media will not improve operational performance and is not recommended.

The filter media replacement kit contains the following items to be used during replacement:

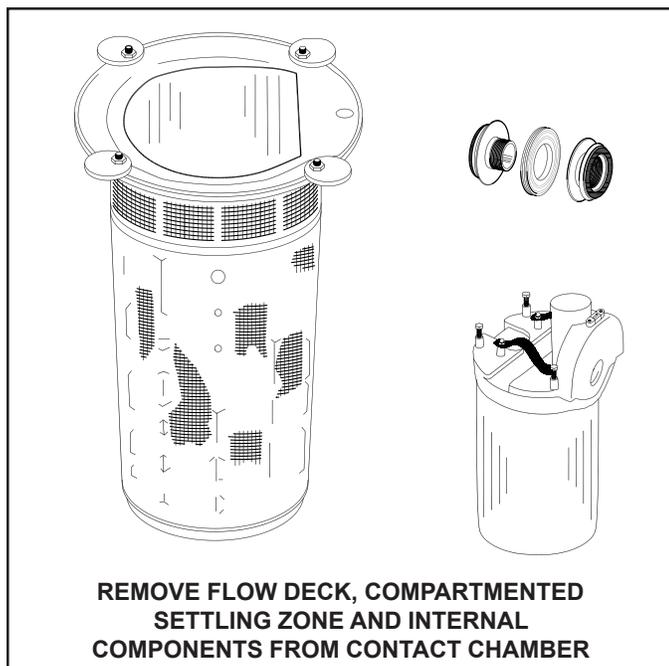
- One cylindrical filter media section, made up of design and peak flow media, lock-stitched together with bonded nylon thread for maximum strength and durability.
- Two retainer straps, one inserted into each stitched hem located at both ends of the filter media cylinder.
- One separate retainer strap to place around the outside of the center stitched seam connecting the peak flow and design flow media.

The following equipment is required from the Bio-Kinetic system Tool Kaddy:

- rubber gloves
- safety face shield or goggles
- retainer strap tool

No adhesive is necessary to attach the media to the Bio-Kinetic system when utilizing the replacement kit. Media replacement, when performed as outlined in these instructions, will bring the unit up to new system standards. For instructions regarding removal and reinstallation of the Bio-Kinetic system from the Singulair tank, refer to the instructions contained in the Clarification Chamber and Bio-Kinetic Service section of the Singulair Service Manual.

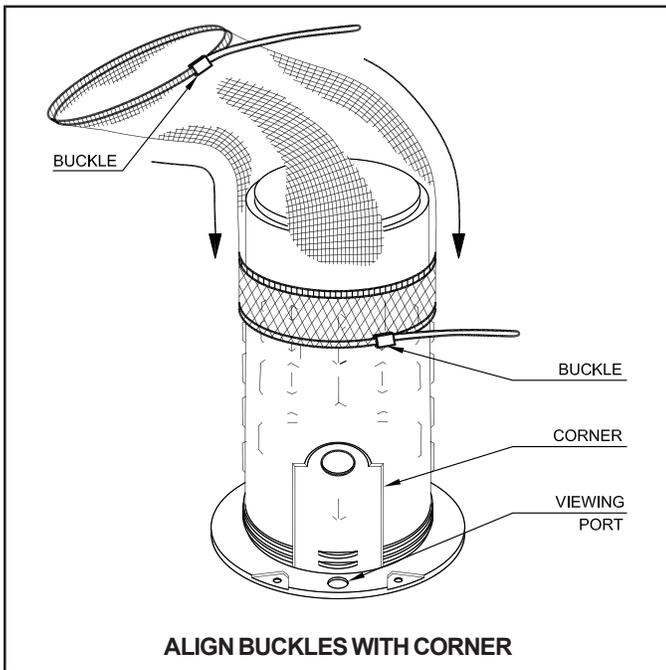
1. Remove the Bio-Kinetic system from the service container. Rinse the container and lid. Rotate the four locking lugs to the outboard position on the Bio-Kinetic system. Remove the gasketed discharge flange assembly from the flow deck and rinse it with water.



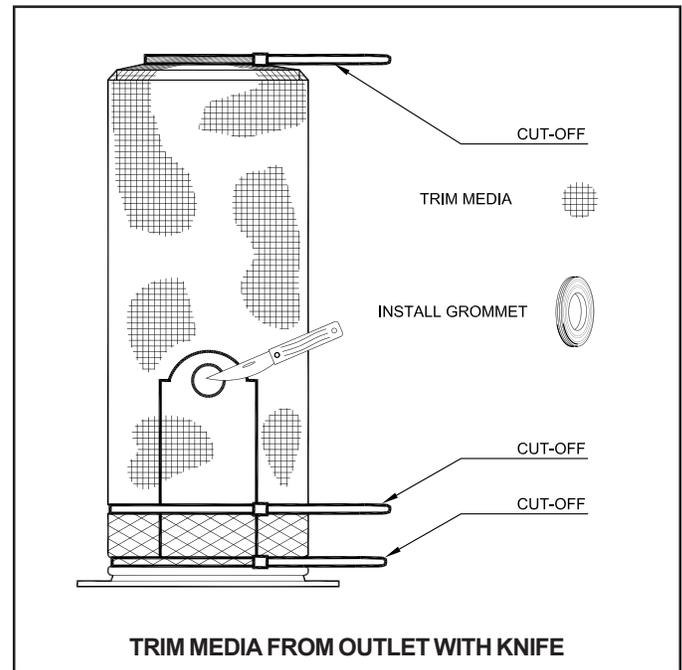
2. Insert the disassembly tool beneath each of the strap handles on the flow deck. Pull up on the disassembly tool to remove the flow deck and internal system components from the contact chamber and set the internal components aside. Use the water hose and spray nozzle to wash the inside of the contact chamber.
3. Use the water hose to wash off the filter media. Spray until all sludge and dirt have been flushed from the media. Now invert the filter assembly and flush accumulated material from the baffled perimeter settling zone. Inspect the perimeter settling zone to be certain that it is totally clean. Check the flow equalization ports to be sure they are clean and unobstructed.
4. Remove the black rubber outlet grommet from the outlet opening. With a knife, cut and remove the three retainer straps and the old filter media from the Bio-Kinetic system. Take care not to damage the contact chamber or baffled perimeter settling zone. Clean any accumulation of adhesive from the horizontal grooves at the top, middle and bottom of the contact chamber. With a wet rag, clean the outside of the contact chamber to insure ease of installation of the new filter media and straps. Inspect the design flow, sustained flow and peak flow ports again to be sure they are clean and unobstructed. Be sure there are no burrs on the inside, as well as, the outside surface of each port.

FILTER MEDIA REPLACEMENT KIT INSTRUCTIONS (Cont.)

- Remove the locking lugs, bolts, nuts and washers from the top flange of the Bio-Kinetic system. Turn the contact chamber over with the top flange resting on a clean even surface.
- Starting with the peak flow filter end, slide the replacement filter media cylinder onto the contact chamber. The filter media cylinder will fit tightly against the baffles of the perimeter settling zone. Some effort will be required to slide the media over the contact chamber. Rubber gloves will provide the friction necessary for proper media installation. Be careful not to damage the filter media or retainer straps.
- The stitched hem at each end of the filter media cylinder has a retainer strap with plastic buckle. Install the filter media so that the retainer strap buckle is seated on the corner of the outlet boss of the contact chamber. This position is on the corner closest to one of the locking lugs on either side of the viewing port.



- Engage the peak flow retainer strap into the horizontal groove closest to the top flange of the contact chamber. Once in position, tighten the strap with the retainer strap tool. The strap should be tightened enough to permanently locate the filter media in position. Make sure the buckle remains on the corner of the outlet boss. Do not over-tighten the strap. Over-tightening could warp the contact chamber. Once the strap is secured, cut off the excess strapping material with the retainer strap tool.
- Attach the retainer strap tool to the strap at the bottom of the design flow media. Tighten the strap until all wrinkles have been removed from the filter and the media cylinder is taut and firmly drawn against the baffles of the contact chamber. Do not over-tighten the media. Cut off the excess strapping material with the strap tool.



- Place the third, separate retainer strap over the seam that joins the design flow and peak flow media. Make sure this strap is properly engaged in the locating grooves molded into the baffles of the contact chamber. Place the buckle on the edge of the outlet boss in alignment with the other two. Using the retainer strap tool, tighten the strap over the seam and secure the buckle on the outlet boss corner. Once the strap has been firmly tightened, cut off the excess strapping material with the strap tool.
- With a knife, trim the media from the outlet of the Bio-Kinetic system using the outlet opening as a guide. The hole in the filter media should not be larger than the outlet opening. Remove the trimmed media and reinstall the black rubber grommet. **NOTE:** When reinstalling the grommet, make sure the media surrounding the outlet opening stays between the contact chamber and the outboard flange of the grommet. Correct reinstallation of the grommet is important for proper Bio-Kinetic system operation.
- Reinstall all four locking lugs with the bolts, nuts and washers originally supplied.

Proceed with the remaining steps outlined in Bio-Kinetic System Cleaning and Disassembly Instructions. If no service is required, reassemble the Bio-Kinetic system according to Bio-Kinetic Cleaning and Disassembly Instructions and return the system to your service stock.

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BIO-KINETIC® WASTEWATER TREATMENT SYSTEM TROUBLESHOOTING

During service inspections you may periodically encounter a situation which, if not identified and corrected, will result in interruption of service for the Singulair system. This troubleshooting guide is designed to enable you to isolate the cause of system problems that may be encountered from time to time. Whenever a potential problem is encountered, you should take immediate steps to eliminate the cause. Please note that all areas of installation, including those normally the responsibility of the contractor, excavator, electrician and owner, are covered. You will find that many problems can be traced to causes other than the system or its components. Your help and suggestions in solving these for the owner will save unnecessary expense and will insure maximum system performance. **DANGER: Make sure all system access covers are in good condition and securely installed on the risers. Never allow access risers to be left uncovered or partially covered. Failure to secure access covers and safety nets could result in bodily injury, illness or death.**

PLEASE NOTE:

This troubleshooting guide provides efficient and correct solutions to most wastewater treatment problems when used in conjunction with established inspection procedures performed by a factory-trained service technician.

Before responding to a customer service call, check to see that:

- ✓ A member of your service staff, factory-trained and certified by Norweco, is dispatched to answer the call.
- ✓ Installation and service records for the particular system are up-to-date and have been reviewed.
- ✓ The service technician has a copy of the Singulair Service Manual.
- ✓ The service vehicle has loaner aerators, exchange aerators, Bio-Kinetic Service Cart, exchange Bio-Kinetic systems and a fully stocked Tool Kaddy with replacement parts.
- ✓ Clear and concise directions to the installation, including tank and control center location, are given to the service technician.

OPERATIONAL TROUBLESHOOTING

MUD OR SILT IN SINGULAIR SYSTEM OR BIO-KINETIC SYSTEM*

Influent sewer line separated at a joint or fitting	Have contractor excavate and repair
Sewer line crushed	Have contractor excavate and replace
Defective seal around tank inlet or outlet	Excavate and reseal
Singulair tank structurally damaged	Excavate and patch or replace tank
Singulair casting joint improperly sealed	Excavate and seal with non-shrink grout

*Have Singulair system pumped to remove mud after repairs have been completed. Multiple pumping may be required to remove all mud from the Singulair system. See: Singulair Tank Pumping instructions.

TROUBLESHOOTING (Cont.)

SEPTIC ODOR IN SINGULAIR SYSTEM

Aerator turned off	Place control center selector switch in "automatic" position
Insufficient air delivery by aerator	Service aerator
Aspirator shaft plugged with deposits	Remove from aerator and flush with shaft cleaning hose
Aspirator orifices plugged with deposits	Remove deposits
Water softener backwash discharging into system	Have owner remove backwash line from system
Circuit breaker tripped	See "Control Center Warning Light Glows/Audible Alarm Sounding"
Improperly sealed pretreatment chamber access cover	Seal pretreatment access cover
Vent cap openings restrict fresh air entry	Clean vent cap openings
Incomplete treatment due to hydraulic overloading	See "Hydraulic Overloading"
Periodic septic odor for no reason	Have sanitary sewer vent checked

HYDRAULIC OVERLOADING OF SINGULAIR SYSTEM

Ground water entering system through tank joint	Excavate and seal with non-shrink grout
Ground water entering system through crack in side wall	Excavate and patch with non-shrink grout
Ground water entering system through defective seal at inlet or outlet line	Excavate and reseal piping as needed
Roofing down spouts, footer drains, sump pump piping or garage and basement floor drains tied into Singulair system influent line	Have contractor relocate improper connection downstream of Singulair system

ORGANIC OVERLOADING OF SINGULAIR SYSTEM

Aeration chamber settled solids test reads in excess of 75%	Evaluate pretreatment chamber - See Singulair Tank Pumping Instructions
Aeration chamber solids appear black	Evaluate pretreatment chamber - See Singulair Tank Pumping Instructions

FLOATING SOLIDS IN CLARIFICATION CHAMBER OR PLANT EFFLUENT

Excessive sludge on clarifier sidewalls	Scrape hopper side walls
Restriction of Bio-Static or sludge return port	Remove obstruction
Pretreatment chamber discharging excessive solids	Evaluate pretreatment chamber - See Singulair Tank Pumping Instructions
Hydraulic overloading of system	See "Hydraulic Overloading"

CONTROL CENTER WARNING LIGHT GLOWS/AUDIBLE ALARM SOUNDING

Liquid in tank at level of foam restrictor	See "Singulair System Flooded"
Aerator drawing excessive current	See "Aerator Drawing Excessive Current"
Dead short in power line to aerator	Have owner call his electrician

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BIO-KINETIC® WASTEWATER TREATMENT SYSTEM AERATOR TROUBLESHOOTING

AERATOR WILL NOT OPERATE

Electrical service to aerator interrupted	See “No Electrical Power from Control Center to Aerator”
Voltage supplied is insufficient to start aerator*	Report condition to power company
Defective bearing, windings or insulation in motor	Return entire aerator to factory
Debris wound on aspirator shaft	Remove debris with knife
Aspirator shaft bent	Return entire aerator to factory
Foam restrictor or entire aerator under water	See “Singulair System Flooded”

*If you suspect low voltage, check the voltage at the watertight electrical connector, not at the Service Pro control center. If voltage above 103 or more is measured, check the other possibilities listed in this section.

AERATOR DRAWING EXCESSIVE CURRENT

Foam restrictor partially under water	See “Singulair System Flooded”
Debris on aspirator shaft	Remove debris with knife
Motor failure	Return aerator to factory
Insufficient voltage (less than 103 volts)	Report condition to power company
Excessive voltage (greater than 126 volts)	Report condition to power company

AERATOR MAKING EXCESSIVE NOISE

Rubber shock absorbers on brackets worn	Replace shock absorbers
Bearing failure in aerator motor	Return aerator to factory
Noise is generated by excessive vibration	See “Aerator Operates With Excessive Vibration”

AERATOR OPERATES WITH EXCESSIVE VIBRATION

Debris on aspirator shaft	Remove debris with knife
Aspirator shaft bent	Return entire aerator to factory
Aerator mounting brackets bent	Straighten brackets
Top aerator brackets not seated evenly	Adjust mounting brackets
Aspirator shaft installed too tightly on intermediate shaft	Reinstall aspirator shaft with set screws finger tight only. If condition persists return entire aerator to factory.
Aspirator shaft installed with improper alignment to intermediate shaft	Reinstall aspirator shaft to factory alignment marks

AERATOR OPERATES BRIEFLY BEFORE CIRCUIT BREAKER TRIPS

Aerator is drawing excessive current	See “Aerator Drawing Excessive Current”
Aerator is partially under water	See “Singulair System Flooded”
Aspirator shaft bent	Return entire aerator to factory
Moisture has entered aerator motor	Return entire aerator to factory

AERATOR TROUBLESHOOTING (Cont.)

ELECTRICAL TROUBLESHOOTING

CAUTION: Before initiating any electrical component inspection or repair, turn off all power to the Singulair system by switching off the dedicated circuit breaker in the main electrical service panel and then testing with the electrical multi-meter. Repairs should always be made by a qualified electrician using proper procedures and safe tools. Make sure all circuits are properly grounded. Do not stand in damp locations when making electrical system tests. Always use tools with insulated handles for electrical repairs. Make sure all system access covers are in good condition and securely installed on the risers. Never allow access risers to be left uncovered or partially covered. Failure to secure access covers and safety nets could result in bodily injury, illness or death.

NO ELECTRICAL POWER FROM ELECTRICAL SERVICE PANEL TO CONTROL CENTER

Circuit breaker in electrical service panel has tripped	Turn breaker to "off" position, then turn "on"
Fuse in electrical service panel has blown	Have owner replace fuse
Circuit breaker in electrical service panel turned "off"	Turn breaker "on"
Loose connection in electrical service panel	Tighten all connections: First, shut off breaker in main electrical service panel
Defective circuit breaker in electrical service panel	Have owner replace circuit breaker
Corrosion on contacts prevents flow of current	Clean or replace contacts
Incomplete circuit - neutral not properly wired	Have owner wire directly to neutral bar
Power cable from service panel to Service Pro control center severed	Have owner locate break and repair

NO ELECTRICAL POWER FROM CONTROL CENTER TO AERATOR

Service Pro control center terminal A1 and neutral read zero voltage	Place selector switch in "on" position. If voltage is read, place selector switch in "automatic" position and rotate time clock knob until voltage is read. If no voltage can be read, replace control center insert.
Singulair circuit breaker has tripped	Push reset breaker
Singulair circuit breaker is defective	Replace breaker
Singulair selector switch turned "off"	Turn switch to "automatic" operation
Singulair selector switch defective	Replace control center insert
Corrosion on terminals prevents flow of current	Clean or replace contacts
Power cable from Service Pro control center to aerator damaged	Locate damage and repair
Loose wiring connection	Check all connections

AERATOR WILL NOT START

Reset breaker in Service Pro control center tripped	Push reset breaker
Loss of power to Service Pro control center	See both "No Electrical Power" sections
Insufficient voltage present at aerator	Report condition to power company
Watertight electrical connector not properly engaged	Remove watertight electrical connector and plug in tightly
Watertight electrical connector not properly wired	Rewire watertight electrical connector
Defective motor	Return entire aerator to factory

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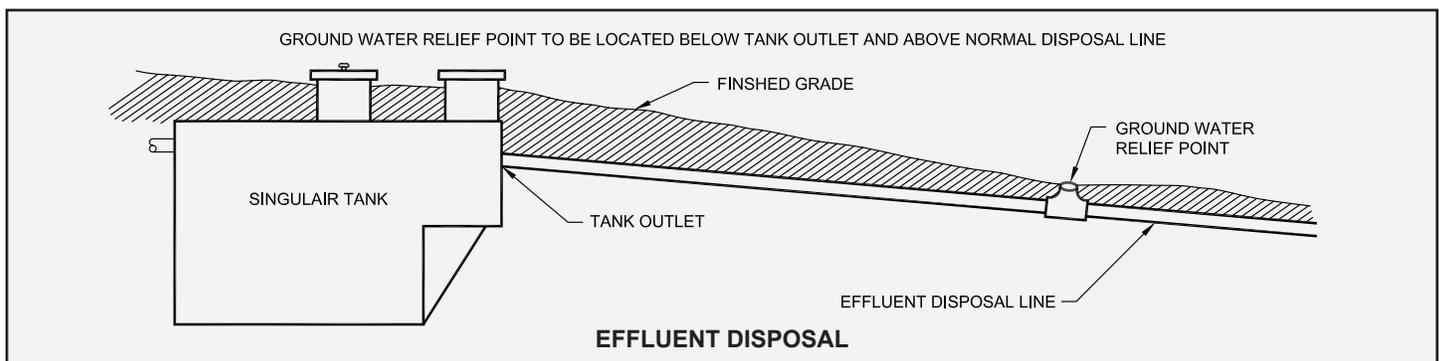
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BIO-KINETIC® WASTEWATER TREATMENT SYSTEM

BIO-KINETIC® SYSTEM TROUBLESHOOTING

Although the system effluent may be discharged and/or disposed of in several acceptable fashions, there should be a ground water relief point installed in the effluent line. It should be at a point no higher than the outlet invert of the Singulair tank. It will prevent flooding in cases where the disposal line is submerged or saturated with ground water. Locate the ground water relief point and be sure that it is free from obstructions. **DANGER: Make sure all system access covers are in good condition and securely installed on the risers. Never allow access risers to be left uncovered or partially covered. Failure to secure access covers and safety nets could result in bodily injury, illness or death.**



SINGULAIR SYSTEM FLOODED

Bio-Kinetic system plugged	See "Bio-Kinetic System Plugged"
Tank outlet plugged	Clean debris from tank outlet
Groundwater relief point restricted	Remove obstruction
Disposal field plugged	Notify owner immediately
Effluent pump failure	Repair or replace effluent pump
Surface water drains toward Singulair tank	Have contractor regrade and/or install risers
Outlet line installed with insufficient fall	Have contractor correct
Outlet line crushed or filled with debris	Have contractor clean or replace
Effluent disposal lines have insufficient fall or settled	Have contractor correct or replace

BIO-KINETIC SYSTEM PLUGGED

Mud has fouled filter media	See "Mud or Silt in Singulair System"
Organic overloading	See "Organic Overloading"
Hydraulic overloading	See "Hydraulic Overloading"
Water softener backwash discharging into system	Have owner remove backwash line from system
Solids flowing in from pretreatment chamber	Evaluate pretreatment chamber - See Singulair Tank Pumping instructions
Incomplete treatment due to aerator shut-off	Place control center selector switch in "automatic" position
Internal components flooded	Remove and service Bio-Kinetic system
Grease or inorganic matter on filter media or in clarification chamber	Evaluate pretreatment chamber - See Singulair Tank Pumping Instructions

BIO-KINETIC® SYSTEM TROUBLESHOOTING (Cont.)

BIO-KINETIC SYSTEM PLUGGED (Cont.)

Compartmented contact chamber plates plugged

Clean chamber plates

Outlet weir obstructed

Inspect and clean outlet weir

CAUTION: Never allow chemical wastes, grease or mud to enter the Singulair system. These materials alter the desirable characteristics of activated sludge and will cause severe problems in the performance of the system.

NO RESIDUAL CHLORINE IN FINAL EFFLUENT

Chlorine feed tube not dispensing chlorine - empty

Refill feed tube with Blue Crystal disinfecting tablets

Chlorine feed tube not dispensing chlorine - tablets jammed

Gently tap tablets down in feed tube to be sure they make contact with the inside bottom of tube

Chlorine feed tube not dispensing chlorine - not fully engaged

Check feed tube to be sure bottom of tube is flush in flow deck

Chlorine feed tube not dispensing chlorine - feed tube plugged

Remove obstruction and reinstall feed tube

CAUTION: Extreme care must be used when handling chemicals. Refer to the Blue Crystal handling instructions before attempting any service. Proper procedures and personal protective equipment must be utilized to avoid serious injury.

FINAL EFFLUENT APPEARS CLOUDY OR TURBID

Aerator not operating

See Aerator Trouble-Shooting

Hydraulic overloading

See "Hydraulic Overloading"

Organic overloading

See "Organic Overloading"

Chlorinator not working

See "No Residual Chlorine in Final Effluent"

Bio-Kinetic system is damaged

Replace system. See Clarification Chamber and Bio-Kinetic Service Instructions

Bio-Kinetic system is plugged

See Routine Clarification Chamber and Bio-Kinetic Service Instructions

Saturated disposal field

Report to owner immediately

DECHLORINATION INSTALLED WITH RESIDUAL CHLORINE STILL PRESENT IN FINAL EFFLUENT

Dechlorination feed tube not dispensing chemical-empty

Refill feed tube with Bio-Neutralizer dechlorination tablets

Dechlorination feed tube not dispensing chemical-tablets jammed

Gently tap tablets down in feed tube to be sure they make contact with the inside bottom of tube

Dechlorination feed tube not dispensing chemical-not fully engaged

Check feed tube to be sure bottom of tube is flush in flow deck

Dechlorination feed tube not dispensing chemical-feed tube plugged

Remove obstruction and reinstall feed tube

CAUTION: Extreme care must be used when handling any chemicals. Refer to the Bio-Neutralizer handling instructions before attempting any service. Proper procedures and personal protective equipment must be utilized to avoid serious injury.

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