

norweco® SINGULAIR®

OHIO DIRECT BURIAL NPDES TREATMENT SYSTEM INSTALLATION INSTRUCTIONS

All National Pollutant Discharge Elimination System (NPDES) installations in Ohio must be remotely monitored or equipped with a failsafe pump lock out. The Service Pro MCD control center features remote monitoring via standard residential telephone lines or home Internet connection to comply with Ohio NPDES requirements. Digital Subscriber Line (DSL) phone service requires the use of a low-cost optional DSL filter. Voice Over Internet Protocol (VOIP) is not reliable with any telemetry system and not recommended. In order to meet Ohio Department of Health and Ohio EPA permit requirements, the distributor must record each installation online into the Service Pro MCD database, and a valid monitoring agreement must be maintained. The monitoring service of the Singulair NPDES system for the first two years is included in the initial installation cost. After the initial two year service contract has expired, the homeowner is still required by law to maintain a monitoring agreement and service contract, at their own expense, either from the Norweco distributor or another authorized service provider.

INTRODUCTION

Singulair NPDES treatment systems will treat domestic wastewater flows up to 600 gallons per day. The system includes either a concrete or Singulair Green Model 960 treatment system, one Model AT 1500 UV disinfection system and one prewired control center with air pump. In addition to these components provided by Norweco, a state approved sampling port must be supplied by the distributor. All components must be properly installed for compliance with Ohio NPDES requirements. To insure proper treatment system operation, please take the time to familiarize yourself with the contents of these instructions.

COMPONENTS

The Singulair NPDES accessory equipment package is installed for use with the Singulair 960 system to meet NPDES permit requirements in the State of Ohio. For instructions on the proper installation, start-up, maintenance and service of the 960 wastewater treatment system, please refer to the Singulair Bio-Kinetic Installation Manual.

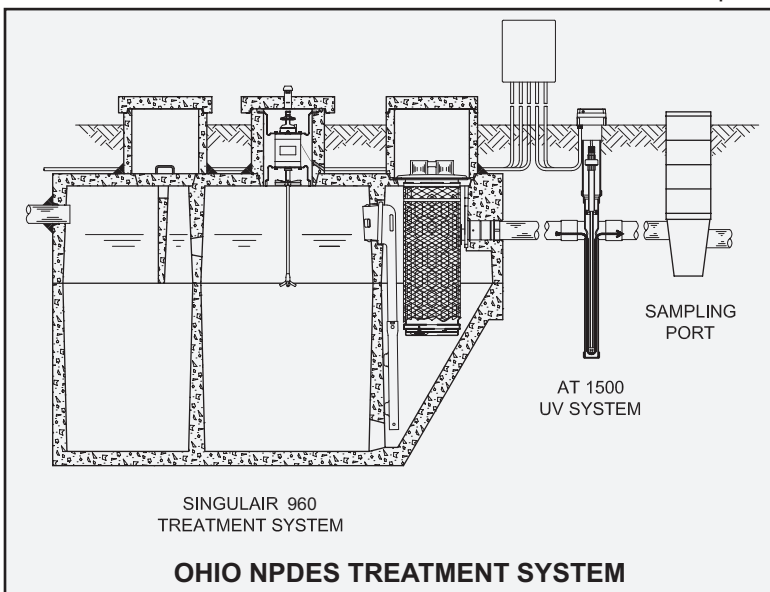
The Singulair NPDES accessory package consists of the following components:

- 1) Prewired control center with integral air pump
- 2) Model AT 1500 ultraviolet (UV) disinfection system with post-aeration diffuser

The following items are required to complete the installation and should be supplied by the installer:

- 1) Electrical conduit
- 2) Conduit fittings
- 3) Electrical cable
- 4) Telephone or network cable
- 5) *Sampling port
- 6) *Solvent primer and cement

* Available for purchase from Norweco



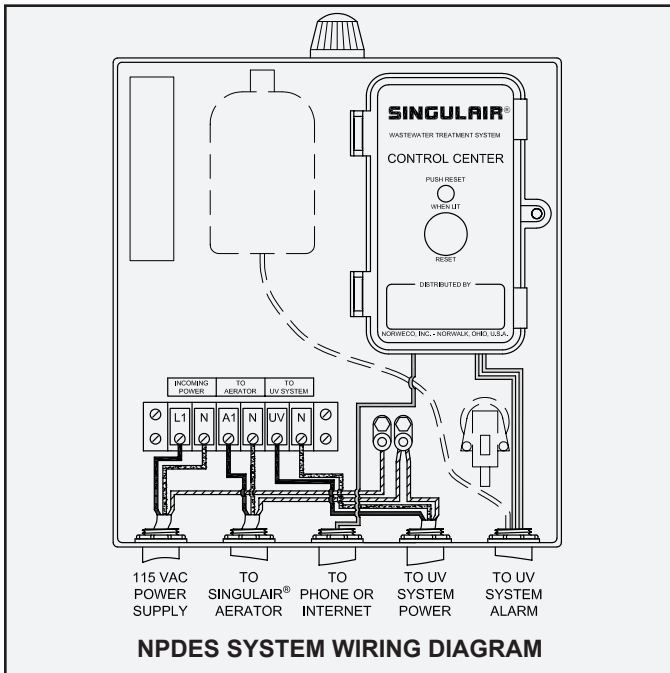
The distributor **MUST** install a state approved sampling port downstream of the UV disinfection system so that a free falling effluent sample can be obtained. The NPDES permit requires collection and testing of an effluent sample from each installation on an annual basis. An improperly designed sampling port will negatively affect the test results. The sampling port can be as simple as a PVC pipe cross with a sump. It is essential to properly clean and sterilize the sampling port

prior to collection of a free falling sample. Pre-engineered sampling ports are available for purchase from Norweco. **IT IS A VIOLATION OF STATE AND FEDERAL LAW TO INSTALL AN OFF-LOT DISCHARGING SYSTEM IN THE STATE OF OHIO WITHOUT AN APPROVED SAMPLING PORT.** Always follow proper sampling procedures to insure accurate results are obtained. Consult the Norweco Technical Bulletin EFFLUENT SAMPLING TECHNIQUES FOR RESIDENTIAL TREATMENT SYSTEMS for additional information regarding proper sampling procedures.

SINGULAIR® OHIO NPDES INSTALLATION INSTRUCTIONS (Cont.)

ELECTRICAL WIRING

All electrical work must be performed in accordance with the latest edition of the National Electrical Code, as well as all applicable state and local codes. Detailed wiring instructions for the Singulair Model 960 system are provided in the Singulair Bio-Kinetic System Installation Manual. Detailed wiring instructions for the UV system are provided in the Model AT 1500 UV Disinfection System Installation and Operation Manual.

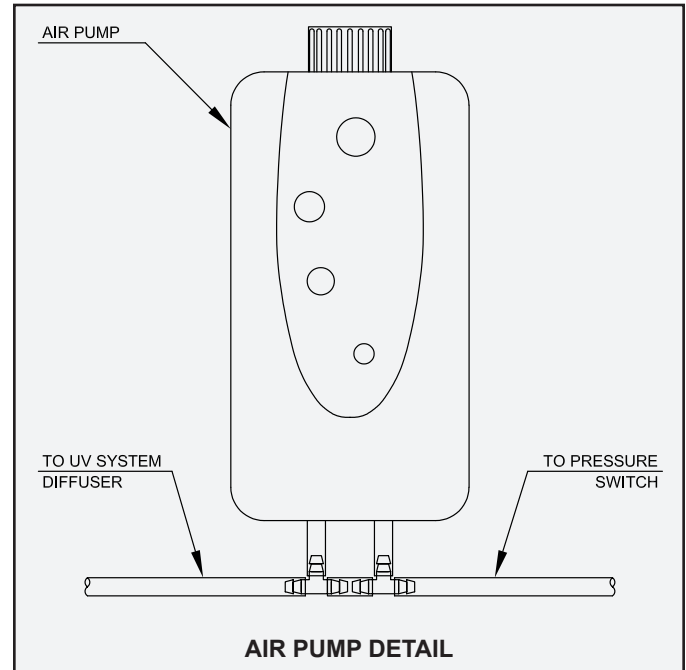


The prewired control center is provided with all conduits and cables that are required for the aerator and UV disinfection system. Prewired flexible conduits simplify installation of the Singulair aerator and UV system. The installer only needs to provide the incoming power cable and conduit from the home. A #14/2 AWG minimum electrical cable should be installed from the main service panel to the control center. A ½" PVC conduit fitting is provided on the control center for the incoming power conduit. The hot (black) lead from the main service panel should be connected to the "L1" terminal on the terminal strip in the control center. The (white) neutral lead should be connected to the "N" terminal adjacent to the "L1" terminal in the control center. The ground lead should be connected to the ground lug provided in the control center.

A watertight, flexible, non-metallic conduit is supplied for connection of the Singulair aerator to the control center. This conduit is furnished with the appropriate length of #14-2 AWG UF cable to supply power to the aerator. One end of the cable is prewired to the control center terminal strip. The other end of the conduit and cable must be routed through the wall of the aeration chamber riser. Inside the aeration chamber riser, connect the female electrical connector to the UF cable as detailed in the aerator installation instructions.

The air pump is located inside the control center. Power connections to the air pump are made at the factory prior to shipping. No connections or adjustments need to be made to the air pump during installation.

The outlet of the air pump is connected to a pressure switch inside the control center. The pressure switch continually monitors the air pump operation and activates an alarm if a low air flow condition is detected. The pressure switch is connected to Auxiliary Input 2 in the Service Pro MCD control center. The alarm circuit for the pressure switch operates on a low voltage signal.



The remaining two flexible non-metallic conduits furnished in the NPDES control center are provided to connect the Model AT 1500 UV disinfection system to the control center.

The first conduit for the AT 1500 UV disinfection system contains the black, white and green power wires. Black and white power wires are connected in the prewired control center to the "UV" and "N" terminals provided. The green wire is connected to the copper ground lug. These wires provide 120 volts to the UV disinfection system.

The second conduit for the AT 1500 UV disinfection system contains two blue alarm leads and a clear flexible air line. The blue alarm leads are connected to Auxiliary Input 1 in the Service Pro TNT control center. The clear air line is connected to the outlet of the air pump.

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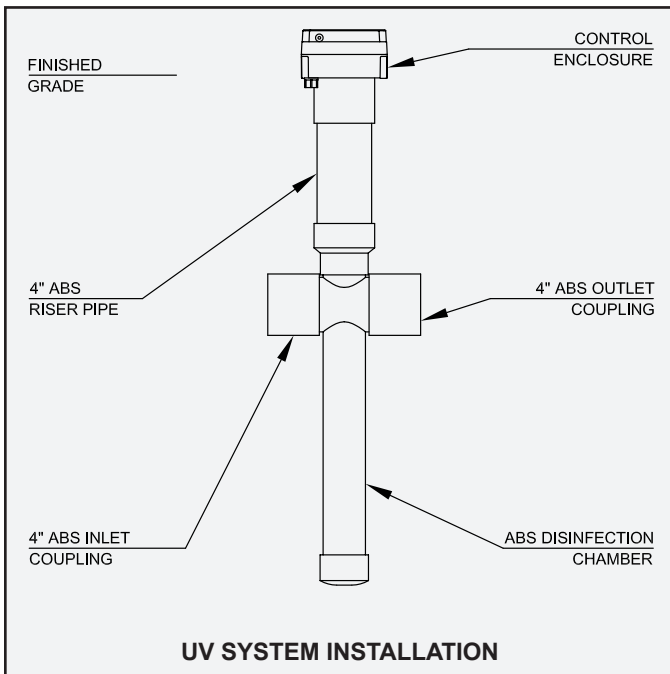
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SINGULAIR® OHIO NPDES INSTALLATION INSTRUCTIONS (Cont.)

UV SYSTEM INSTALLATION

The Model AT 1500 UV disinfection system is essential to insure fecal coliform and E. coli are reduced to the levels specified in the NPDES permit. A post-aeration air stone diffuser is provided near the bottom of each Model AT 1500 system. For ease of installation and service, the air stone diffuser is attached to the removable subassembly in the UV system. Prior to wiring and connection of the air line, the inlet and outlet plumbing must be connected to the UV system. Reference the Model AT 1500 UV Disinfection System Installation and Operation Manual for information specific to the proper installation of the UV system.



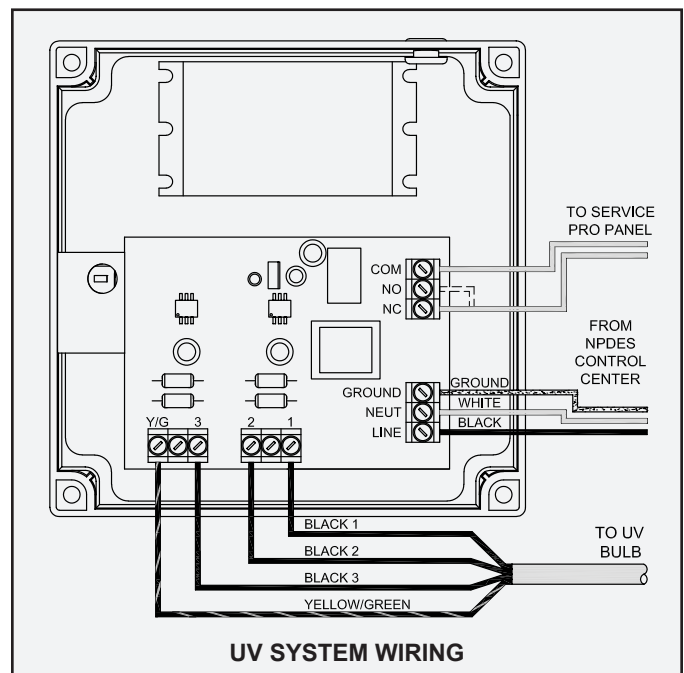
After the Model AT 1500 UV disinfection system has been connected to the inlet and outlet plumbing, the post-aeration air line must be connected. To connect the air pump to the diffuser in the UV system:

1. Remove the cover from the UV control enclosure and remove the 4" threaded black plug.
2. Insure the black air line on the UV subassembly is connected to the barbed connector in the riser.
3. Connect the alarm conduit from the control center to the UV control enclosure. Insure the compression nut on the fitting is tightened.
4. Connect the clear air line from the conduit to the barbed connector inside the UV control enclosure.

CAUTION: DO NOT LOOK DIRECTLY AT THE UV LAMP OR EXPOSE SKIN DURING OPERATION OF THE UV DISINFECTION SYSTEM. PERMANENT EYE DAMAGE AND SKIN BURNS WILL OCCUR FROM EXPOSURE TO UV RADIATION. UV BLOCKING PROTECTIVE EYEWEAR IS PROVIDED WITH EVERY SYSTEM AND MUST BE WORN DURING INSTALLATION, SERVICE OR ANY TIME THE BULB MAY BE ILLUMINATED.

Detailed electrical wiring instructions for the UV system are included in the Model AT 1500 UV Disinfection System Installation and Operation Manual. Power to the Model AT 1500 UV disinfection system is supplied from the NPDES control center. The UV system contains an alarm output that must be connected to the auxiliary alarm circuit of the Service Pro MCD control center. To connect the Model AT 1500 UV disinfection system to the NPDES system control center:

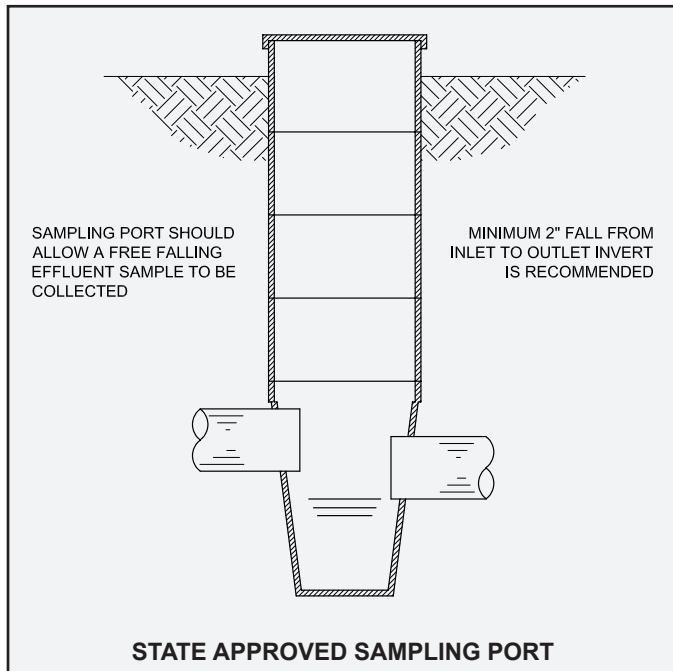
1. Connect the UV system power conduit from the NPDES control center to the UV system control enclosure. Use one of the preinstalled conduit fittings on the control enclosure. Insure that the compression nut on the conduit fitting is tightened.
2. Remove all four thumb screws and remove the black electrical insulator.
3. Connect the hot (black) wire from the NPDES control center to the terminal marked "LINE" in the UV control enclosure. Connect the common (white) wire to the terminal marked "NEUT". Connect the green ground wire to the terminal in the enclosure marked "GROUND".
4. The alarm conduit from the NPDES system control center contains two blue alarm leads that are connected to Auxiliary Input 1 in the Service Pro MCD control center. In the UV control enclosure, connect one of the blue alarm leads to the "COM" terminal and the other to the "NC" terminal.
5. Check to insure that the black wires labeled "ONE", "TWO", and "THREE" are connected to the corresponding terminal blocks marked "1", "2", and "3". The yellow/green wire should be connected to the terminal block marked "Y/G".
6. Replace the electrical insulator and gasketed cover on the UV system control enclosure and close the cover on the NPDES system control center.



SINGULAIR® OHIO NPDES INSTALLATION INSTRUCTIONS (Cont.)

SAMPLING PORT INSTALLATION

The installer must provide a state approved sampling port downstream of the UV disinfection system. To insure accurate results, it is essential that the sampling port allows a free falling effluent sample to be collected. Pre-engineered sampling ports are available for purchase from Norweco. The sampling port should always be installed within 3 feet of the UV disinfection system. Installing the sampling port further than 3 feet from the UV system may negatively affect the accuracy of effluent samples.



BACKFILL

Once the sampling port has been installed, the system should be backfilled. Backfill the Singulair tank per the Tank Delivery and Setting Instructions. Insure the air line for the post-aeration system is protected during the backfilling process. Always use sand, gravel or fine crushed stone to backfill the UV system and sampling port up to the inlet and outlet plumbing. Then backfill with native soil to finished grade. The control enclosure on the UV disinfection system should be completely above grade in the finished installation. Final grading should slope away from all access covers and risers so surface runoff will drain away from the system.

ACTIVATING THE SYSTEM

Inspect all electrical connections and insure that all junction boxes have been covered to maintain watertight integrity. Verify that all conduit connections are properly sealed. Energize the dedicated circuit breaker in the main service panel and turn on the breaker in the NPDES control center. Insure proper operation of the NPDES system components. The green indicator lamp should be lit on the UV system and the air pump should be operating. Close and secure all access covers prior to leaving the site.

NPDES SYSTEM SERVICE

The Singulair NPDES treatment system must be serviced at six month intervals to maintain proper operation and insure that permit requirements are met. Detailed instructions for servicing the Singulair system are included in the Singulair Service Manual. For service of the UV disinfection system, consult the Model AT 1500 UV Disinfection System Installation and Operation Manual.

Inspect the air pump at each service visit for proper operation. If the air flow is inadequate, Auxiliary alarm 2 will activate in the Service Pro MCD control center. If the alarm activates, check the air pump and the vent in the control center enclosure for obstructions. Check the air line to insure that it has not been damaged and that all connections are secure. Replacement air pumps are available for purchase from Norweco.

EFFLUENT SAMPLING

Special precautions and record keeping are required when collecting samples for compliance with the Ohio NPDES permit. Consult the Norweco document titled EFFLUENT SAMPLING FOR RESIDENTIAL TREATMENT for detailed sampling procedures. Always wear proper eye protection and disposable gloves when collecting samples.

Prior to sample collection, the bottle, sampling equipment and effluent pipe must be cleaned and sterilized. It is essential that the sampling point allows a free falling effluent sample to be collected. Samples taken directly from a sump will provide inaccurate results due to the accumulation of solids over time.

A proper sample can only be collected when there is effluent flow. Flow may be induced by adding water to the system inlet or pretreatment chamber. Induced flows must be typical of the normal incoming flow rate. A surge flow will create a washout of solids and skew test results. Once effluent is flowing, place the mouth of the bottle directly into the falling stream of effluent to collect the sample.

The sample should be chilled during transport and handling to inhibit further biological activity. Invalid data will result if the sample is held for a longer period of time than the guidelines permit. For this reason, travel time, laboratory operating hours, weekend and holiday schedules all must be considered when collecting effluent samples for compliance with NPDES permit requirements.

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