

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 serviced 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 BULB MAY BE ILLUMINATED.**

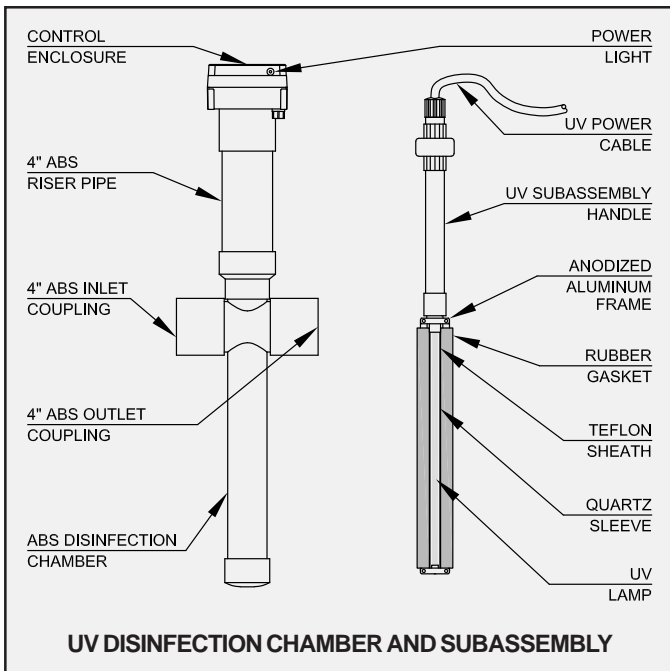
COMPONENTS

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

- | | |
|---------------------------|---|
| 1) Control enclosure | 8) Power cable with watertight connector |
| 2) 4" ABS riser pipe | 9) UV subassembly with anodized aluminum frame, quartz sleeve and Teflon sheath |
| 3) 4" ABS inlet coupling | 10) Subassembly handle |
| 4) Turbulence inducer | |
| 5) 4" ABS outlet coupling | |
| 6) Disinfection chamber | |
| 7) UV lamp (bulb) | |

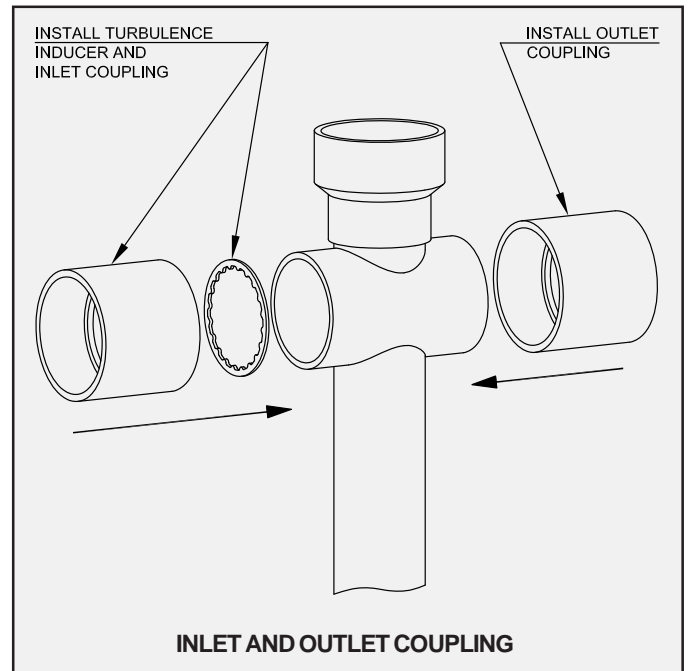
These components should be supplied by the installer:

- | | |
|------------------------|-------------------------------|
| 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

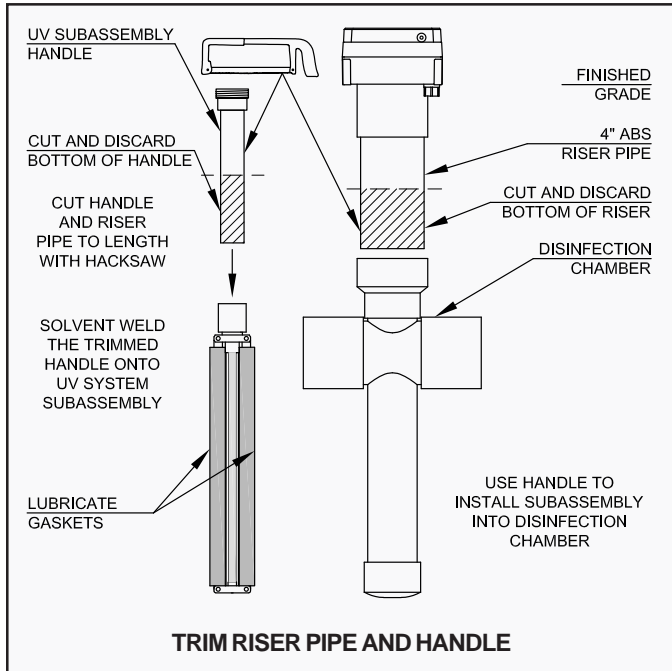
1. The excavation for the upstream wastewater treatment system should include an additional 3 feet of length to allow for installation of the Model AT 1500.
2. Carefully unpack the Model AT 1500 system. Remove and properly discard all packaging materials from the system components. The UV lamp should 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.



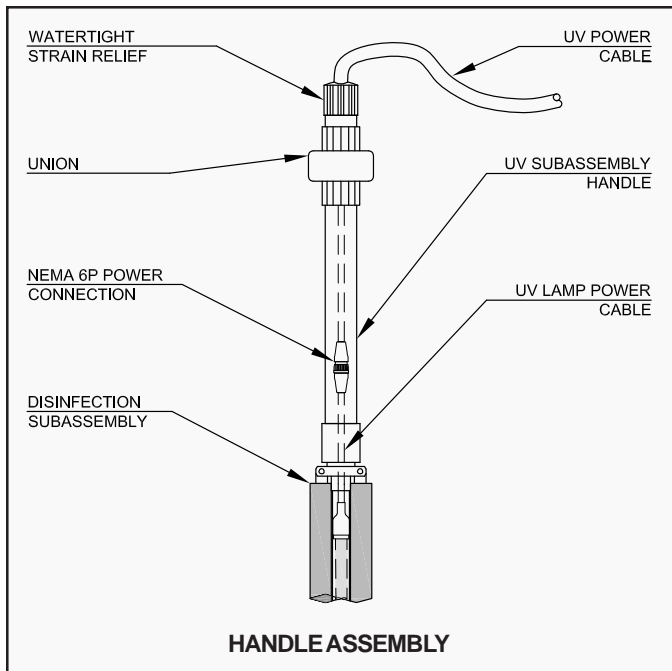
4. Solvent weld the effluent line of the upstream treatment system to the 4" inlet coupling of the Model AT 1500. Next, solvent weld the 4" outlet coupling to the final effluent line. Cover the open top of the disinfection chamber and backfill up to the bottom of the plumbing.

ULTRAVIOLET DISINFECTION (Cont.)

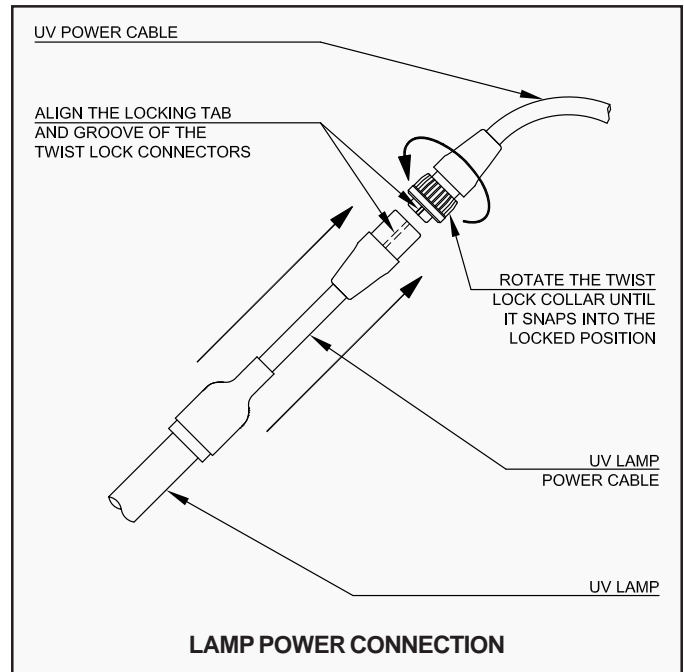
5. The control enclosure should be completely above grade in the finished installation. The riser pipe and UV handle are purposely manufactured longer than necessary and must be trimmed. Fit the riser pipe into the top of the disinfection chamber and mark a trim line on the **BOTTOM**. Mark the subassembly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



6. Use a hacksaw to cut along the trim line on both the riser pipe and handle to make them the proper length.
 7. Solvent weld the riser pipe to the disinfection chamber.
 8. Disassemble the union and set aside the top portion and UV power cable. Solvent weld the lower portion of the handle onto the UV system subassembly.
 9. 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 "1" on the UV power cable to the terminal block marked "1". Connect the lead labeled "2" on the cable to the terminal block marked "2". Connect the lead labeled "3" on the cable to the terminal block marked "3". Connect the yellow lead on the cable to the terminal marked "Y/G".



10. Remove the threaded access plug from the riser.
 11. Align the locking tab and groove of the twist lock connectors on the UV lamp power cable and the UV power cord. 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. Holding the lamp power cable, carefully insert the lamp through the handle and completely into the quartz sleeve of the UV subassembly.
 12. Assemble and tighten the union in the handle to insure a watertight connection. Tighten the strain relief on the handle assembly.
 13. Use water or glycerin to lubricate the rubber gaskets located on both sides of the UV subassembly.
 14. Do not touch the Teflon sheath or allow excess glycerin to contact it. Use a clean, soft cloth and isopropyl alcohol to remove fingerprints or excess glycerin.
 15. Fill the disinfection chamber with clean water.
 16. Carefully insert the UV subassembly into the disinfection chamber. Insure the locating pins in the chamber lock into the openings on the subassembly.

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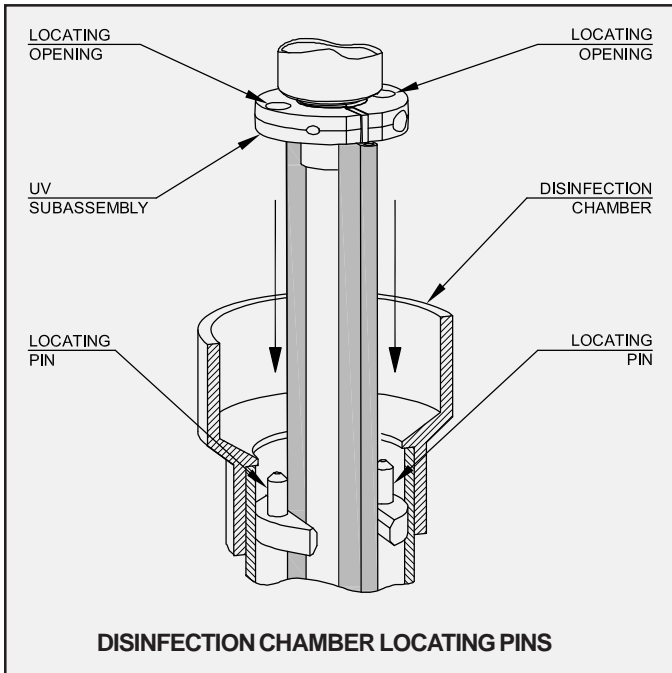
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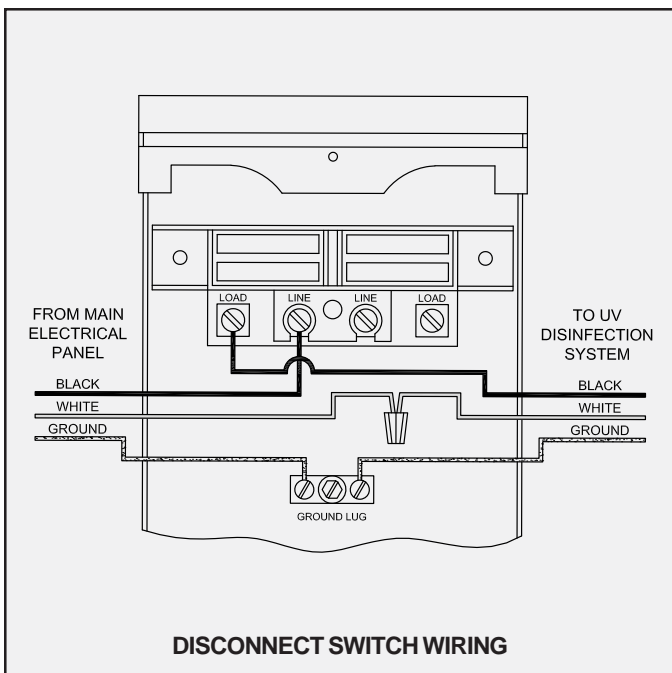
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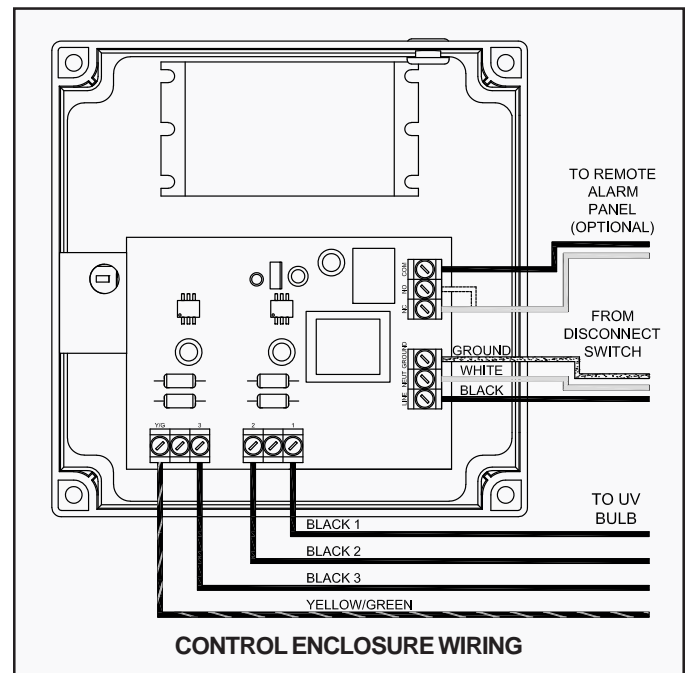
ULTRAVIOLET DISINFECTION (Cont.)



17. Tuck the excess power cable into the riser pipe.
18. Use a dedicated 115 volt AC single phase 15 amp circuit in the main electrical panel for service to the UV disinfection system. **NOTE:** Make sure the breaker is "off" before proceeding.
19. A disconnect switch should be provided to de-energize power to the UV disinfection system during service. Mount the power disconnect switch enclosure to the facility being served.
20. Install a #14/2 AWG cable from the dedicated breaker in the main electrical panel to the disconnect switch.
21. In the disconnect switch enclosure, connect the hot (black) lead from the main electrical panel to the "Line" terminal. Connect the black lead to the UV system to the "Load" terminal. Twist both white leads together



- and secure with a wire nut connector. Connect both ground leads to the ground lug in the enclosure.
22. 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 with the conduit fittings provided. A watertight connection is critical to insure proper operation and safety.
23. Attach the incoming hot (black) lead to the terminal block marked "LINE" in the UV control enclosure. Attach the common (white) lead to the terminal block marked "NEUT" in the enclosure. Attach the incoming ground lead to the terminal block marked "GROUND" in the enclosure.
24. (Optional) If a remote alarm panel is required, the alarm leads should be installed in a separate conduit using the second conduit fitting provided. A watertight connection is critical to insure proper system operation and safety. 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.
25. Solvent weld a plug into any unused conduit fittings to insure watertight integrity is maintained.
26. Apply thread sealant to the threaded access plug and install plug in the riser opening. Tighten to insure a watertight seal.
27. Secure the gasketed cover in place on the top of the control enclosure, using the four screws provided.



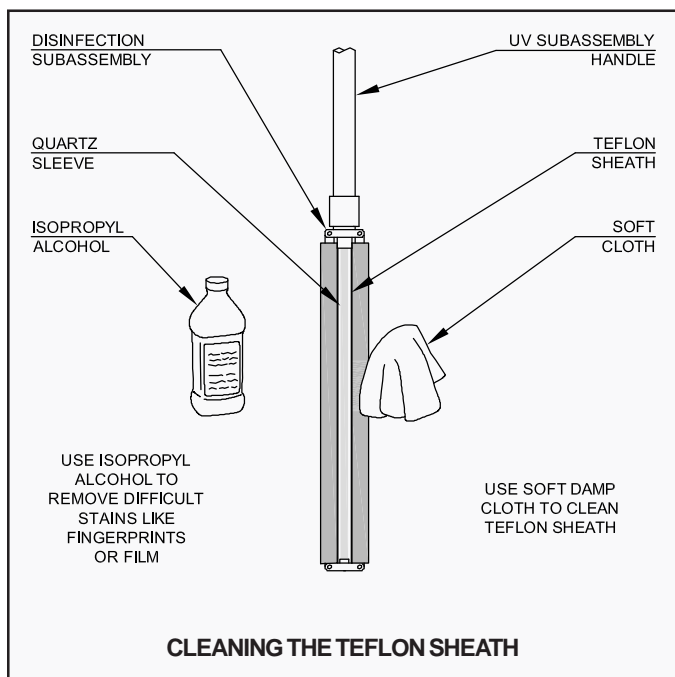
28. Backfill around the disinfection chamber and riser pipe. Finished grade should be below the control enclosure to prevent the entry of surface water.
29. Turn "on" the UV breaker in the main electrical panel.
30. Turn "on" the power at the disconnect switch.
31. The green light on the control enclosure should now be illuminated to indicate the system is operational.

ULTRAVIOLET DISINFECTION (Cont.)

MAINTENANCE AND SERVICE

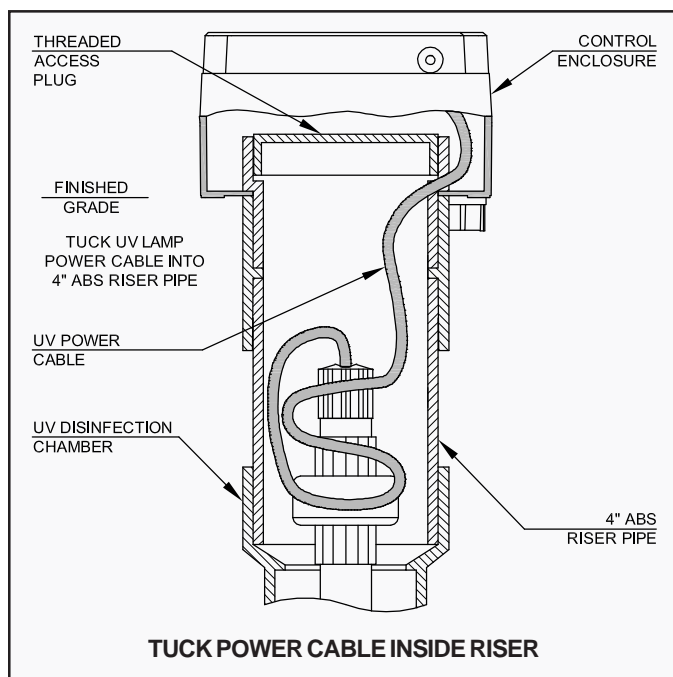
UV blocking protective eyewear must be worn during service or any time the bulb may be illuminated. It is recommended that the subassembly be removed and serviced every six months to insure proper disinfection. Inspect the Teflon sheath for damage or biological film. If the sheath is damaged or biological film is present between the sheath and the quartz sleeve, the subassembly must be replaced. Contact Norweco for replacement parts. If biological film is present on the surface of the Teflon sheath, the sheath must be cleaned to insure proper disinfection. To clean the Teflon sheath:

1. Insure power is turned off at the disconnect switch or in the main service panel.
2. Use a soft damp cloth to carefully wipe down the sheath.
3. Use isopropyl alcohol on a soft cloth to carefully remove difficult stains like fingerprints or biological film.



The system is designed to provide long service life. 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. UV blocking protective eyewear must be worn during service or any time the bulb may be illuminated. To replace the lamp:

1. Turn off power to the UV system at the disconnect switch or in the main service panel. Confirm that the green indicator light on the side of the enclosure is "off".
2. Remove the control enclosure cover and threaded plug.
3. Remove the subassembly from the disinfection chamber and disassemble the union in the handle. Use the power cable to remove the UV lamp from the subassembly.
4. Disconnect the UV lamp power cable from the UV power cord by rotating the twist lock collar counter-clockwise a quarter turn.



5. Connect new lamp and carefully lower into the UV subassembly. Make sure the lamp is fully seated in the quartz sleeve.
6. Reassemble and tighten the union in the handle.
7. Lower the subassembly into the disinfection chamber.
8. Reinstall the threaded access plug onto the riser.
9. Reinstall the control enclosure cover and secure with the four screws provided.
10. Turn on power at the disconnect switch or main service panel. Verify that the green indicator light on the side of the control enclosure is illuminated.

NOTE: The UV lamp contains mercury which is harmful to the environment. Insure that old UV lamps are disposed of at a recycling 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 indicator 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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U.S.A. 44857
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