

Pump Selection for a Pressurized System

Input Parameters

Orifice Size	3/16 inches
Residual Head at Last Orifice	3.0 feet
Orifice Spacing	3.5 feet
Number of Laterals per Cell	5
Lateral Length	33.0 feet
Lateral Line Size	1.50 inches
Lateral Pipe Class/Schedule	40
Distributing Valve Model	None
Manifold Length	20 feet
Manifold Line Size	4.00 inches
Manifold Pipe Class/Schedule	40
Lift to Manifold	5.0 feet
Transport Length	14.0 feet
Transport Line Size	2.00 inches
Transport Pipe Class/Schedule	40
Discharge Assembly Size	2.00 inches
Flow Meter	None
'Add-on' Friction Losses	5.0 feet

Calculations

Minimum Flow Rate per Orifice	0.76 gpm
Number of Orifices per Zone	50
Total Actual Flow Rate	37.8 gpm
Number of Lines per Zone	5
% Flow Differential 1st and Last Orifice	0.7 %
Lift to Manifold	5.0 feet
Residual Head at Last Orifice	3.0 feet
Head Loss in Laterals	0.1 feet
Head Loss Through Distributing Valve	0.0 feet
Head Loss in Manifold	0.0 feet
Head Loss in Transport Pipe	0.3 feet
Head Loss Through Discharge	2.9 feet
Head Loss Through Flow Meter	0.0 feet
'Add-on' Friction Losses	5.0 feet
Total Flow Rate	37.8 gpm
TDH	16.3 feet



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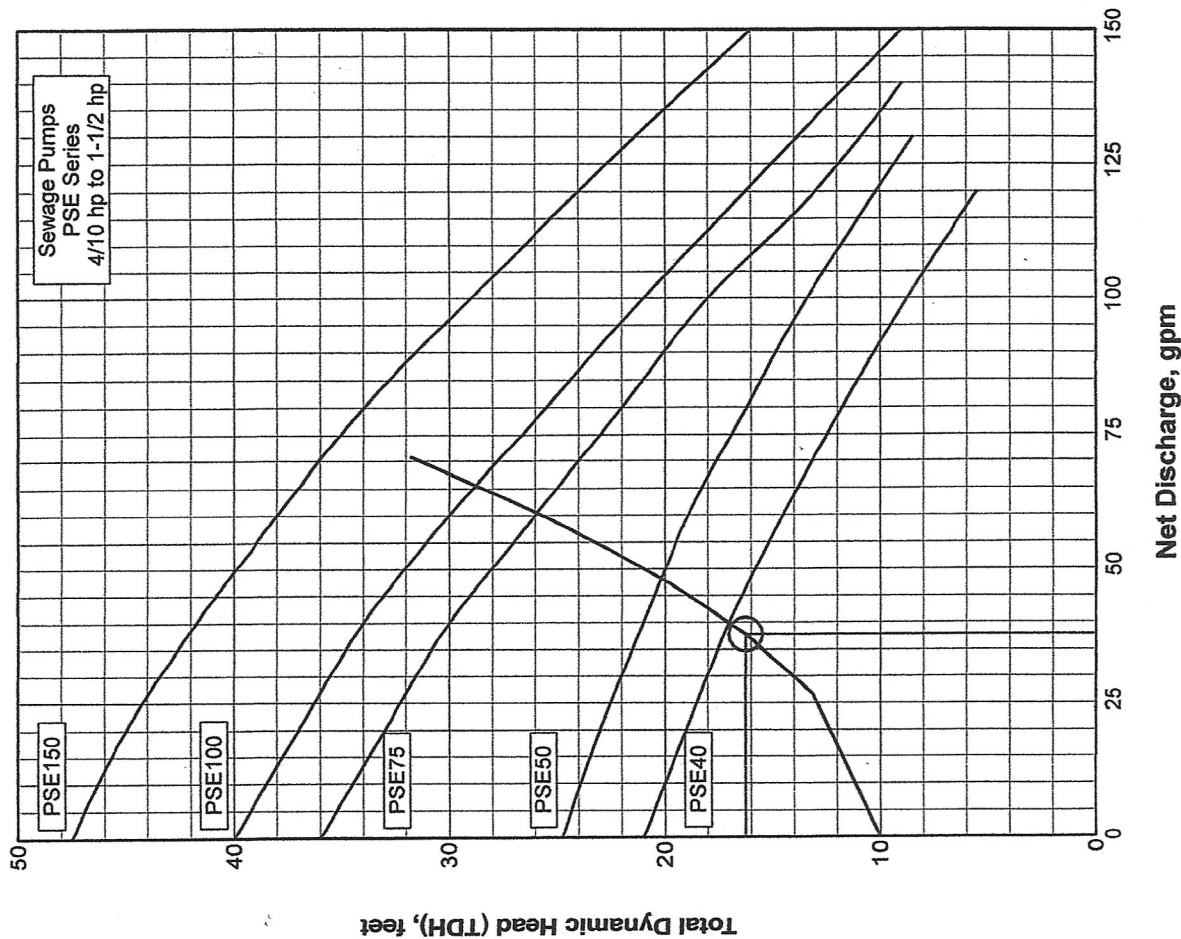
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MODEL AT 1500

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.**

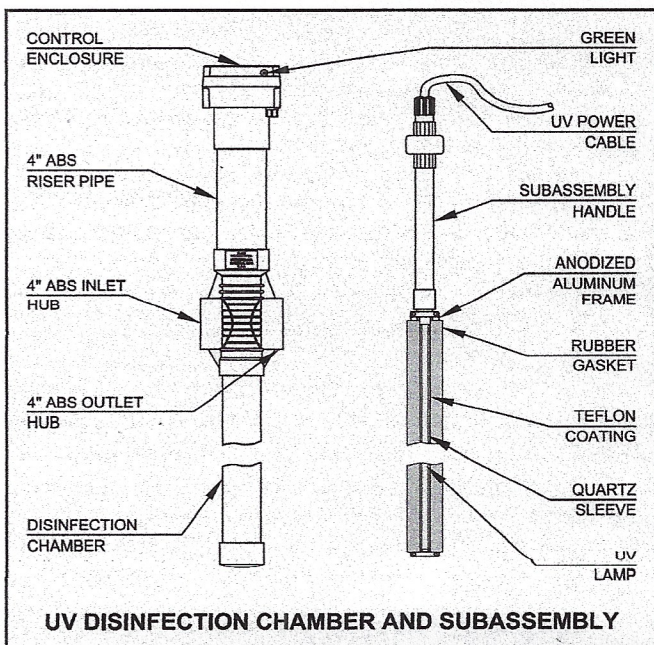
COMPONENTS

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

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

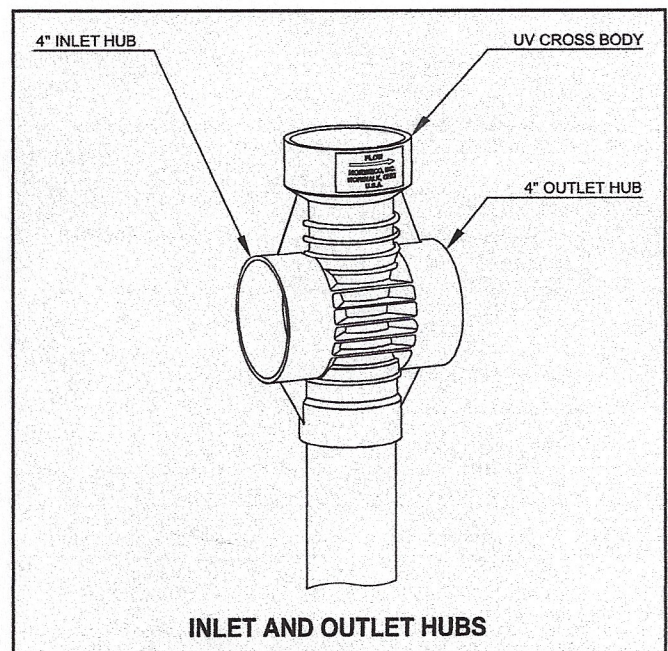
The components should be supplied by the installer:

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

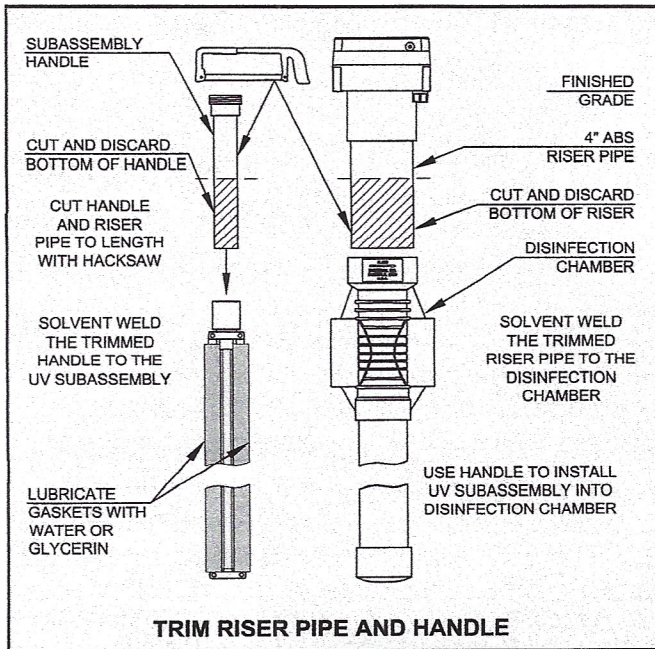
1. The excavation for the upstream wastewater treatment system should include an additional 3 feet of length to allow for installation of the Model AT 1500.
2. Carefully unpack the Model AT 1500 system. Remove and properly discard all packaging materials from the system components. The UV lamp should remain in the protective shipping sleeve until it is installed.
3. Flow direction indicator arrows are molded into the disinfection chamber. When installing the disinfection chamber, be sure to orient the chamber correctly with the flow arrows pointing towards the effluent plumbing.



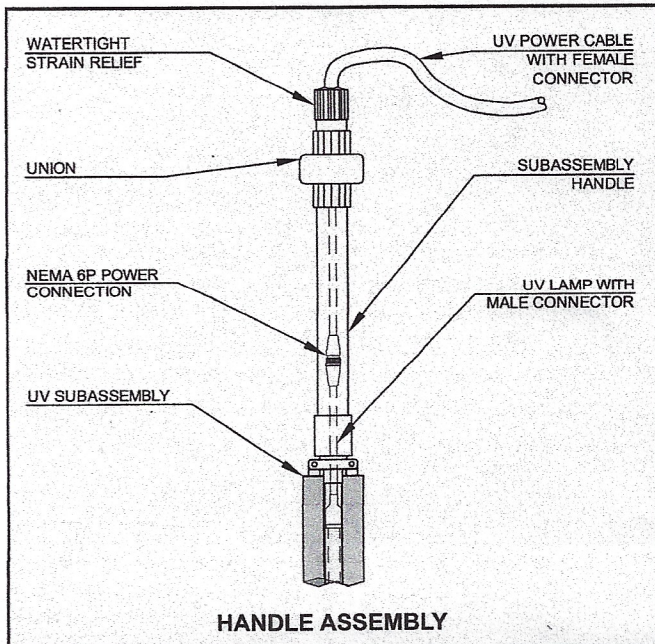
4. Solvent weld the effluent line of the upstream treatment system to the 4" inlet hub of the Model AT 1500. Next, solvent weld the 4" outlet hub to the final effluent line. Cover the open top of the disinfection chamber and backfill up to the bottom of the plumbing.

AT 1500 UV DISINFECTION INSTALLATION AND OPERATION (Cont.)

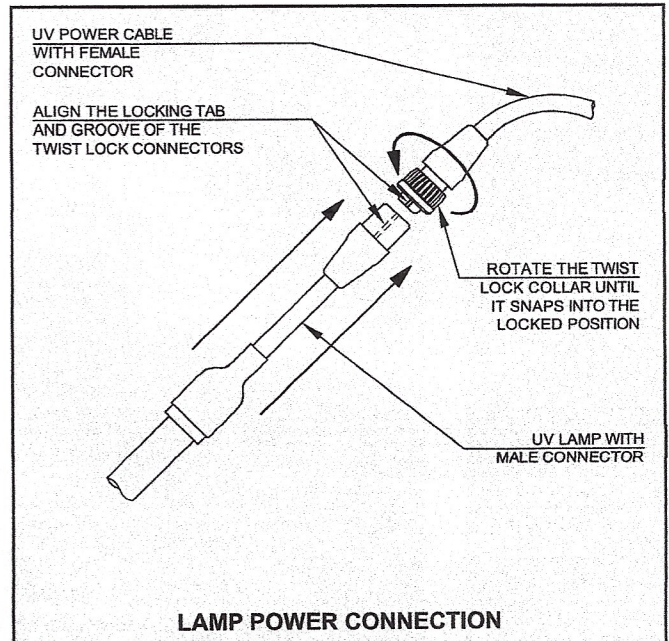
5. The control enclosure should be completely above grade in the finished installation. The riser pipe and subassembly handle are purposely manufactured longer than necessary and must be trimmed. Fit the riser pipe into the top of the disinfection chamber and mark a trim line on the bottom. Mark the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



6. Disassemble the union on subassembly handle and set aside the top portion with UV power cable.
7. Use a hacksaw to cut along the trim line on both the riser pipe and handle to make them the proper length.
8. Solvent weld the riser pipe to the disinfection chamber and solvent weld the handle to the UV 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 "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".



10. Remove the threaded access plug from the riser pipe.
11. Match the alignment tab on the male connector from the UV lamp to the alignment groove in the female twist lock connector on the 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.
12. 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.
13. 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.
14. Use water or glycerin to lubricate the rubber gaskets located on both sides of the UV subassembly.
15. 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.
16. Fill the disinfection chamber with clean water.

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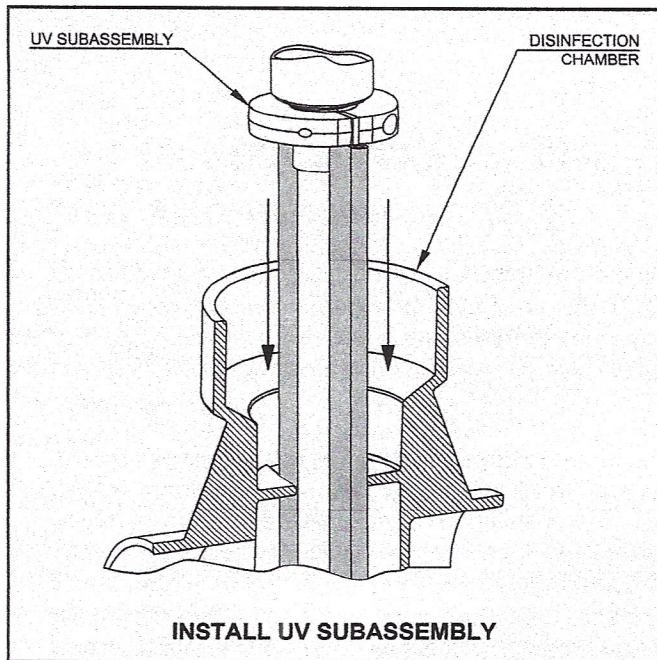
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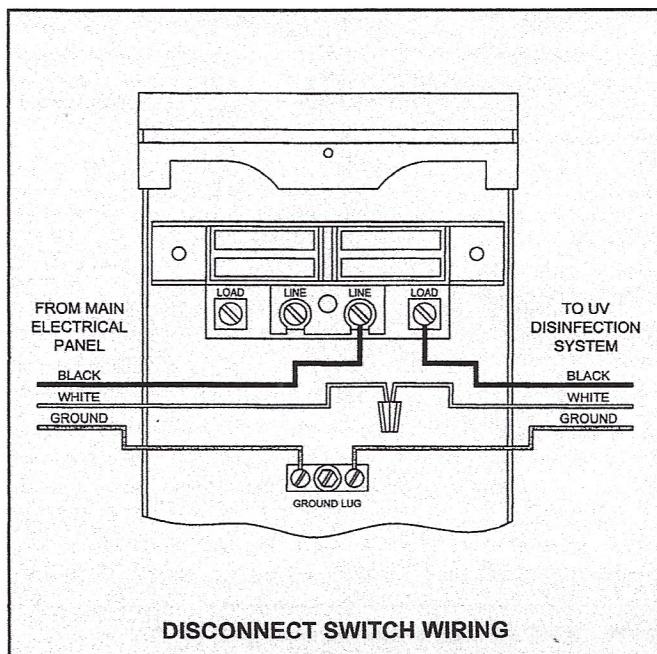
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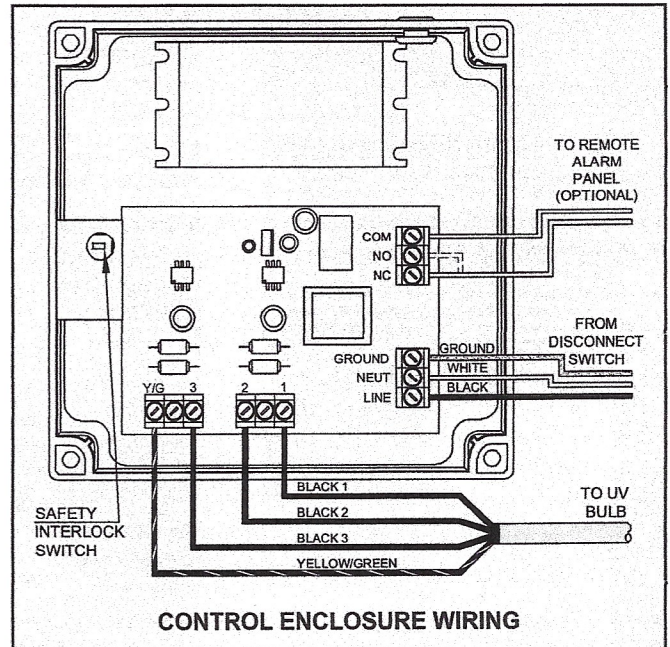
AT 1500 UV DISINFECTION INSTALLATION AND OPERATION (Cont.)



17. Align the rubber gaskets with the rectangular opening and lower the UV subassembly into the disinfection chamber.
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. **CAUTION: 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.