

Introduction: AdvanTex® AX-RT Treatment Unit Operation

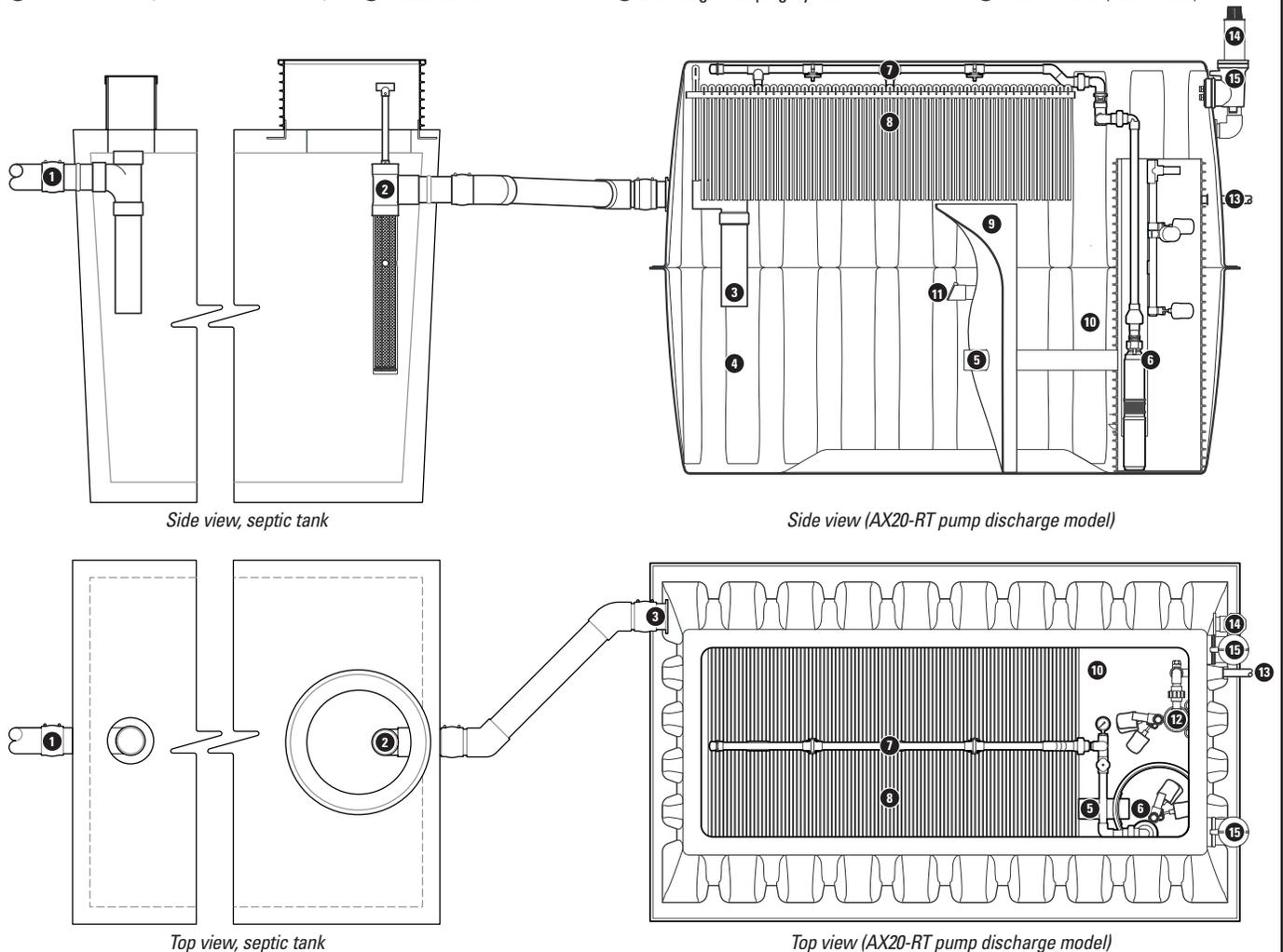
This supplement contains information to help you successfully operate and maintain an AdvanTex® AX-RT Treatment System. The AX-RT operates similarly to the AdvanTex AX20 Treatment System, but there are some differences to be aware of when performing O&M activities. A big difference is that the AX-RT consists of a single, self-contained module for recirculation, treatment, and dosing, instead of separate units.

Another difference is that the AX-RT has no Recirculating Splitter Valve (RSV). Effluent percolates down through the textile media and is split — by means of a tank baffle — between the recirc/blend chamber and the recirc/filtrate chambers of the AX-RT recirculating treatment tank.

Raw sewage enters the septic tank through its inlet tee. In the septic tank, the raw sewage separates into three distinct zones — a scum layer, a sludge layer, and a clear zone. Effluent from the clear layer passes through a Biotube® effluent filter and is discharged by gravity to the recirc/blend chamber of the AX-RT unit. The effluent then flows through the recirc transfer line to the recirc pumping system. The recirc pumping system pumps effluent from the recirc/blend chamber through the manifold to the spray nozzles in the top of the unit. Effluent percolates down through the textile media and is divided — by means of a tank baffle — between the recirc/blend chamber and the recirc/filtrate chamber inside of the unit.

Figure 1. AdvanTex® AX-RT Functional Areas and Components (AX20-RT Shown):

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|---|---|--|--|
| <ul style="list-style-type: none"> ➊ Septic Tank Inlet Tee ➋ Biotube® Effluent Filter ➌ AX-RT Inlet and Tee ➍ Treatment Tank (Recirc/Blend Chamber) | <ul style="list-style-type: none"> ➎ Recirc Transfer Line ➏ Recirc Pumping System ➐ Manifold and Spin Nozzles ➑ Textile Media | <ul style="list-style-type: none"> ➒ Tank Baffle ➓ Treatment Tank (Recirc/Filtrate Chamber) ➔ Recirc-Return Valve ➕ Discharge Pumping System | <ul style="list-style-type: none"> ➖ AX-RT Outlet ➗ Passive Air Vent ➘ External Splice Box ➙ Control Panel (Not Shown) |
|---|---|--|--|

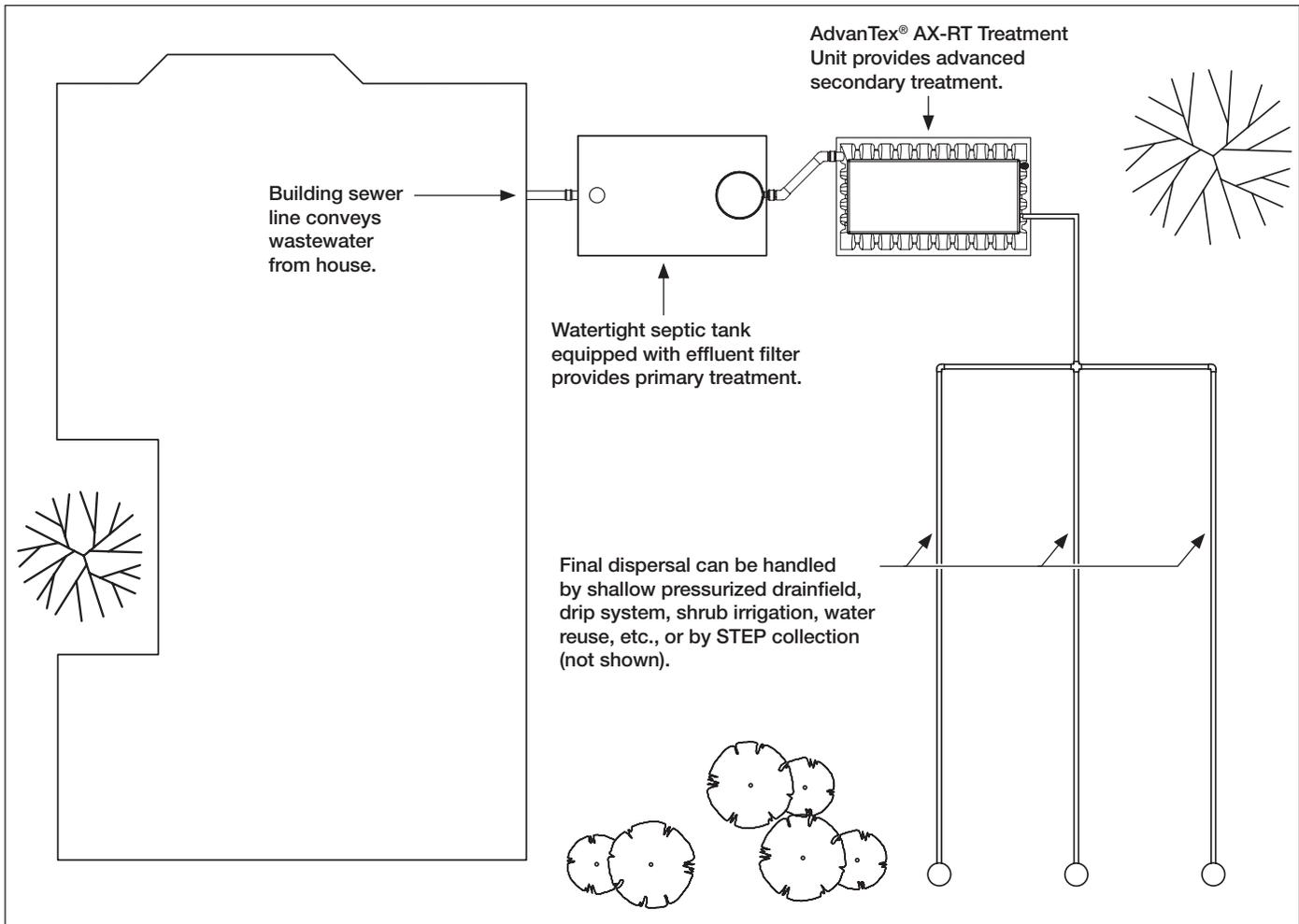


Introduction to AdvanTex AX-RT, continued

The recirc pump's operation is controlled by a timer in the control panel. It allows the pump to dose the textile media for short periods (usually 0.8 to 1.0 minutes), typically 72 times a day. These frequent "micro-doses," which optimize the treatment process, occur 24 hours a day, to maintain the proper biological environment.

Treated effluent can be discharged to the drainfield by means of a discharge pump system or by gravity discharge. The "High Level Alarm" and "ON" floats for the discharge pump are set at the factory and are non-adjustable. Dose volume for the discharge pump system is determined by adjustments to the "OFF" float. AX-RT units with gravity discharge simply discharge when the level of treated effluent in the recirc/filtrate chamber is at the level of the discharge outlet. For units equipped with UV disinfection, the effluent passes through the UV treatment unit before being pumped or flowing by gravity to final dispersal.

Typical Site Plan for an AdvanTex AX-RT Treatment Unit



AdvanTex O&M Manual: Changes Specific to the AX-RT

The following shows AX-RT-specific information not found in Parts 1 and 2 of the *AdvanTex® O&M Manual* that are relevant to operating and maintaining the AdvanTex AX-RT Treatment Unit. Use the general information found in the *O&M Manual* along with this information to start up and properly service AX-RT systems.

Start-Up Checklist Changes Primary Treatment

Note: All pumping equipment is contained in the AX-RT unit. Substitute the checklist item below for the checklist items in the “Process Tank Pumping Equipment” and “Process Tank Pumping System” sections.

Septic Tank

- Biotube® filter installed correctly on the septic tank outlet.

Note: There is no recirculating splitter valve (RSV) or separate discharge basin in an AX-RT system. Floats in the recirculation pump system are set at the factory for correct performance. Do not adjust the floats in the recirculation pump system. Substitute the checklist items below for the checklist items in the “Secondary Treatment” section.

Secondary Treatment AX-RT Unit

- AX-RT unit installed level.
- All piping properly covered and compacted.

Ventilation System

- Passive air vent on AX-RT unit properly installed.

Recirculation Pump System

- Floats operate properly.
- Pump plumbing connected correctly to manifold.

Recirculation Pump System Operation

- Pump operates in “Manual.”
- Pump operates in “Automatic.”
- Pump run amps: _____
- Pump rest volts: _____ run volts: _____

AX-RT Filter Operation

- Complete, square spray square pattern with full coverage of sheets

AX-RT Discharge Unit (pump discharge only)

- Floats operate properly.
- Pump discharge plumbing connected correctly.
- “Off” float adjusted for correct discharge dose to dispersal.

Setting Timers for New Systems

Initial timer settings for an AX-RT should be established based upon expected average daily flows and a recirculation ratio of 4:1 (filter recirculation ratio). Table 1 provides recommended timer settings. If flows vary significantly from expected flows, timer settings should be adjusted accordingly. Contact Orenco for more information.

Table 1. Recommended Timer Settings for New Systems

Models AX20-RT, AX20-RTUV	Number of Residents	Time On Setting Min (Sec)	Avg Daily Flow, gpd (L/day)	Time Off Setting Min
	2	0.8 (48)	100 (379)	36.1
	3	0.8 (48)	150 (568)	23.8
	4	0.8 (48)	200 (757)	17.6
	5	0.8 (48)	250 (946)	13.9
	6	0.8 (48)	300 (1136)	11.5
	7	0.8 (48)	350 (1325)	9.7
	8	0.8 (48)	400 (1514)	8.4
Model AX25-RT	Number of Residents	Time On Setting Min (Sec)	Avg Daily Flow, gpd (L/day)	Time Off Setting Min
	2	0.7 (42)	100 (379)	47.7
	3	0.7 (42)	150 (568)	31.6
	4	0.7 (42)	200 (757)	23.5
	5	0.7 (42)	250 (946)	18.7
	6	0.7 (42)	300 (1136)	15.4
	7	0.7 (42)	350 (1325)	13.1
	8	0.7 (42)	400 (1514)	11.4
	9	0.7 (42)	450 (1703)	10.1
	10	0.7 (42)	500 (1893)	9.0
	11	0.7 (42)	550 (2082)	8.1
	12	0.7 (42)	600 (2271)	7.4

• Assumes water usage of 50 gal. (190 L) per person per day and a return recirculation ratio of 3:1. (Filter recirculation ratio of 4:1.)

• Override OFF cycle time is set at one-half of the OFF cycle time. Override ON cycle time is set the same as the ON cycle time.

Setting Discharge Dose Volume

The AX-RT is pre-set at the factory for a discharge dose volume of 43 gal/dose (162 L/dose). If necessary, use the discharge pump “Off” float to make adjustments to the discharge dose volume. Each 1-in. (25 mm) increase or decrease in “Off” float height is equal to approximately 8.7 gal. (33 L) change in dose volume.

Do not adjust the settings of the “High-Level Alarm” and “On” floats.

Table 2. Dose Volume Information

Pump gal./min (L/sec)	10 (0.6)	20 (1.3)	30 (1.9)	50 (3.2)
Factory float setting*, in. (mm)	30 (762)	30 (762)	30 (762)	30 (762)
Lowest “Off” setting, in. (mm)	16 (406)	18 (457)	20 (508)	24 (610)
Max dose volume, gal. (L)	156 (591)	139 (526)	123 (466)	90 (341)

*Settings are measured from the bottom of the discharge side of the AX-RT unit.

Perform Field Sampling

When you arrive at the site, remove the lid from the AX-RT and take your sample from the recirc/filtrate side of the AX-RT unit before doing anything else, so that the sample won't be contaminated by material that you stir up while working.

When you collect effluent samples, be careful not to touch the textile sheets, unit walls, or other components. Disturbing the sheets, walls, or other components could contaminate the samples. Also, be sure to thoroughly clean and dry your sampling device between uses to avoid cross-contamination.

Measure Sludge and Scum

Measure sludge and scum in the septic tank AND on the recirc/blend side of the AX-RT unit. Follow the instructions for pumpouts found in the *AdvanTex O&M Manual* for the process tank.

NOTE: A light buildup of solids is expected to form in the AX-RT unit over time. After the second year that the system is in use, we recommend measuring solids accumulation in the AX-RT whenever you perform regularly scheduled maintenance.

If more than trace amounts of scum or solids are found in the recirc/blend side of the AX-RT unit, check the recirc/filtrate side of the unit for solids and scum, schedule a pumpout, and begin troubleshooting the system. The Advanced Service Tips and Troubleshooting Guide can help you determine the cause. You may need to change timer settings or discuss household habits with the system users.

Notes