

Biotube® EasyPak™ Pump Package

System Description

Orenco's Biotube EasyPak pump packages feature a passively self-cleaning design. They are intended for pumping effluent from a separate dosing tank following a septic tank. The EasyPak pump vault includes a Biotube effluent filter cartridge that filters out solids, so that only clear effluent is pumped out of the dosing tank. This reduces biological loading and clogging of downstream components, saving money on O&M and extending the life of drainfields, secondary treatment systems, and other parts of the septic system.

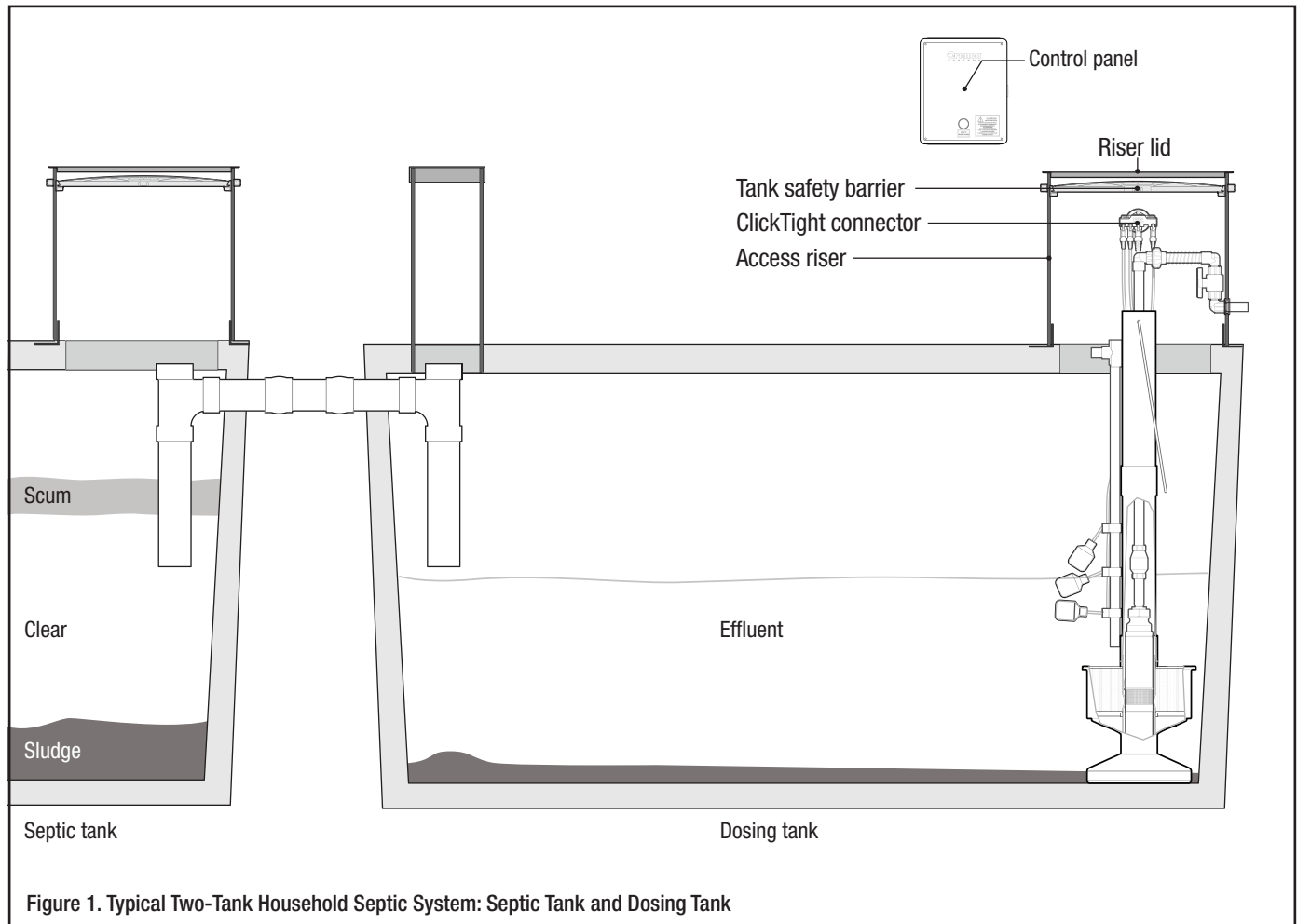


Figure 1. Typical Two-Tank Household Septic System: Septic Tank and Dosing Tank

Figure 1 shows a typical household system with a septic tank and dosing tank. Raw sewage enters the septic tank and separates into three distinct zones: a scum layer, a clear layer, and a sludge layer. An outlet tee from the septic tank allows effluent from the clear layer to flow into the dosing tank. The EasyPak pump package in the dosing tank pumps filtered effluent to the drainfield or other downstream component.

Pumping System

Figure 2 shows the components of an EasyPak pumping system for a dosing tank.

1. ClickTight™ or splice box:
 - The ClickTight provides secure, moisture-resistant cable connections between the control panel and ClickTight-compatible float switches and a ClickTight-compatible pump.
 - In the electrical splice box, wires from the control panel are spliced with the cords from the pump and float switches.
2. Biotube PVEP pump vault: A specially configured, passively self-cleaning pump vault allows pumping from the bottom half of the dosing tank.
3. Biotube filter cartridge: Biotube filtration removes solids as small as 1/8in (3.2mm) from wastewater, protecting pumps and other downstream components.
4. Orenco 4in (100mm) turbine effluent pump: A high-head effluent pump transports effluent to the distribution point. (See Appendix A.)
5. Float switch assembly: Float switches affixed via float collars to a quick disconnect float stem are mounted onto the pump vault to monitor and control the liquid level inside the dosing tank.
6. Discharge plumbing assembly (DPA): A discharge plumbing assembly connects the pump to the point of discharge from the dosing tank.
7. Control panel: A control panel to govern the operation of the pump is mounted within sight of the pump system and where motor contactor noise will not be disruptive. (See Appendix B.)

Accessory Equipment

The following products may be required to complete the package:

- Access risers with fiberglass lids
- Tank safety barriers
- Riser tank adapters with bolt-down kits
- Adhesives
- Grommets

Visit Orenco's website at www.orenco.com for more information about selecting these products.

Package Selection

All EasyPak pump packages are available with and without ClickTight and for both demand-dose and timed-dose applications. For more information on package selection, see the following Orenco technical data sheets:

- [Biotube EasyPak 60Hz ClickTight Pump Packages Technical Data Sheet, NTD-ESS-BPP-2](#)
- [Biotube EasyPak 60Hz Pump Packages Technical Data Sheet, NTD-ESS-BPP-1.](#)

Design Tools

Orenco's PumpSelect™ software allows system designers and specifiers to select the correct pump for the application. When information about the drainfield is entered, the software calculates the pump flow rate and total dynamic head (TDH) required for the system. As an additional resource, see [Headloss Equations Design Aid, NDA-000-000-1.](#)

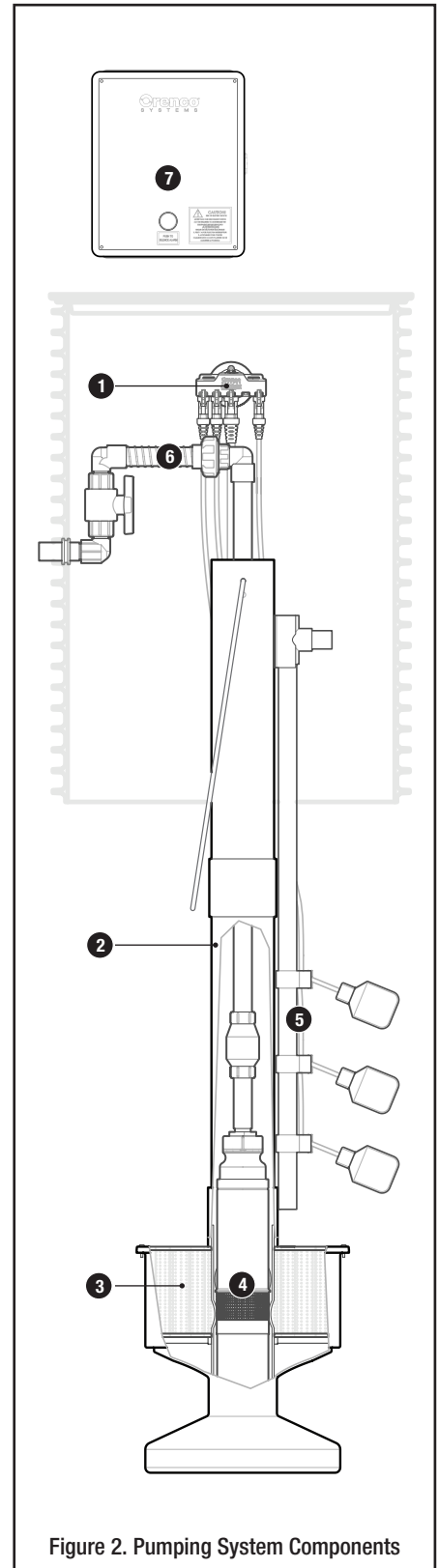


Figure 2. Pumping System Components

Appendix A. 4in (100mm) Turbine Effluent Pumps

In on-site wastewater and pressure distribution systems, Orenco's 4in (100mm) turbine effluent pumps are commonly used because of several advantages they offer compared with other types of pumps in those applications:

- Cycle life – They regularly reach lifetime cycle counts of more than one million.
- Scouring velocity – They provide more than sufficient energy to flush laterals and help keep orifices clear.
- Run-dry capability – They have run-dry capability with no deterioration in pump life or performance.
- Durability – They can operate for extended periods in the “no discharge” condition or at heads greater than the maximum “shut-off” head.
- Maintainability – A ½hp (0.37kW) turbine pump weighs about 25lb (11.3kg) and can be removed by one person for maintenance or repairs without the need for a lifting mechanism.
- Abrasion and corrosion resistance – Orenco's pumps are constructed entirely of 300-Series stainless steel and thermoplastics.

Appendix B. Control Panels

Orenco's simplex control panels provide pump control based on dose method. Demand-dose panels are specifically engineered for pumping from dosing tanks into such applications as conventional gravity systems. Timed-dose panels are specifically engineered for applications that require programmable timers, such as pressurized drainfields and secondary treatment systems. Shared features of both control panels include the following:

- Motor-start contactor for increased system life
- 20A Auto/Off/Manual toggle switch for easy troubleshooting and maintenance
- Resettable control circuit breaker that negates the need for easily lost or forgotten fuses
- Discrete, touch-safe terminal locations for simple, intuitive pump and float switch wiring
- Fiberglass enclosure for increased durability over plastic
- Easily accessed external “Push to Silence Alarm” button for homeowner control over audible alarms

Demand-dose panels include the following features:

- Audible and visual alarms to signal high-level conditions
- Audible alarm silence relay keeps the audible alarm off until power is removed then restored
- Auto reset feature resets the alarm when the tank liquid level returns to normal

Timed-dose panels include the following features:

- Choice of digital or analog timers
- Digital timers are accurate to within 1%
- Multiple timer settings allow for optimum dosing during both normal and peak flow conditions
- Built-in programming keys for adjusting timer settings in the field without a portable computer
- Built-in elapsed time meter and counters
- Audible and visual alarms to signal high- and low-level conditions
- High- and low-level alarm conditions differentiated by steady or blinking light
- Silenced alarms automatically reactivated after 12hrs if condition is not corrected
- Timed delays on float switch inputs to prevent chattering
- Visual indicators of float switch positions