

DESIGN

A key piece of equipment in any SBR system is the decanter. Through years of experience, we have developed a high quality, advanced engineered decanter mechanism. The basic components of the ABJ decanter include:

- Effluent collection trough with integral overflow weir
- Scum exclusion float
- Seal and bearing assemblies
- Electromechanical actuator

The decanter is fabricated of stainless steel. The stainless steel construction provides a prolonged life with little or no maintenance. The decanters are passivated after welding to retain the stainless steel's corrosion resistance. The rugged construction has been field proven to operate dependably in harsh conditions. All seals and bearings are constructed of synthetic materials for prolonged service life, do not require lubrication and ship factory assembled, simplifying installation. Stainless steel is used in lieu of alternatives such as fiberglass reinforced plastic (FRP) due to its high resistance to degradation from ultraviolet rays and its ability to withstand temperature changes.

The scum exclusion float is located in front of the decanter overflow weir and is designed to act as a baffle, preventing scum and floatables from entering the effluent collection trough. See drawing 99-410 for details of this component.

A linear drive actuator slowly drives the decanter into the clarified liquid. The actuator motor is mounted at the basin walkway, not in the basin. This allows access and service from the walkway without the need to enter the basin full of sewage. ***Floating decanters do not offer this option.*** The actuator used for the ABJ decanter incorporates redundant limit switches at the top and bottom of travel to ensure reliable operation. See drawing 99-450 for specific details.

The ABJ decanter does not require effluent valves, controls, valve vaults, troublesome flex (knee) joints, throttling arrangements or dewatering supports. This eliminates the capital and maintenance costs of these components and the risks associated with valve failures (i.e. solids carryover and effluent quality deterioration).

OPERATION

The decanter is raised and lowered using an electromechanical actuator. The decanter sits in the "park" position located above the top water level (TWL) during the aeration and settle phases of the operating cycle, thereby eliminating any possibility of solids carryover during these periods. During the decant phase, the decanter travels from the top "park" position to the bottom water level position (BWL), generally 3 to 6 feet and consistently withdraws only the uppermost supernatant from the basin.

Since the decanter draws liquid from the top down, it does not entrain solids that are settling. The scum float mounted in front of the weir also prevents floatables from entering the effluent. When the decanter enters the liquid, the scum float and scum plate is in contact with one another preventing flow into the effluent trough. The float then separates from the scum plate after the bottom of the

float is submerged. The clear supernatant is then allowed into the trough (a couple inches below the surface) between the float and the scum plate. The slow descent of the decanter does not disrupt the sludge blanket in front of the float.

In the park position, the decanter is located above the TWL and below the top of the basin wall, which provides "fail safe" overflow protection in the event of a power failure or severe flood. The decanter scum exclusion float will prevent the carry over of any floatables during such emergency periods. In addition, the park position eliminates the need for air seal or valves to prevent leaking and/or solids entry.

The decanter speed is controlled by a series of pulses or through the use of a variable frequency drive (VFD). As a result, the decanter discharge rate is relatively constant from the time the decanter enters the water to the time it reaches the bottom water level (BWL). In the case of storm flows, the speed is automatically adjusted to accommodate these flows. The flexibility to adjust the decant rate facilitates treatment of high flows without compromising the total aeration or settling time in the system.

Systems using floating or fixed decanters do not have the ability to adjust the decant rate. With these types of decanters, the only way to accommodate higher flows is to increase the decant time, thus decreasing the time allotted for aeration and settling. This ultimately leads to deterioration of the effluent quality.

The limit switches are fully integrated with process control time overrides and interlocks, thereby eliminating the potential for blower activation during decant.

SPECIAL ATTRIBUTES

- Stainless Steel Construction – Provides a corrosion resistant, long lasting decanter mechanism.
- Visible Effluent – This open trough decanter design allows the plant staff to observe the effluent at all times during the decant phase ("If it looks good, it's operating good"). Floating decanters do not offer this option.
- Maintenance – All maintenance can be performed without entering the basin.
- Emergency Overflow – The park position of the decanter prevents liquid from overflowing the tank in case of flooding and/or power outages. ***Again, floating decanters do not offer this option.***
- Uniform Discharge Rate – The ABJ decant system provides a uniform discharge rate, minimizing downstream process requirements and simplifying the design.
- Installation – The decanters are shipped with all of the major components pre-assembled.
- Time Proven – The ABJ decanter has been installed and is operating successfully in hundreds of facilities around the world in a wide range of climatic conditions.