



## AS-H Sequencing Batch Reactor (SBR) system

All-in-one activated sludge technology for advanced biological wastewater treatment



*The patented floating decanter in the Alfa Laval AS-H Sequencing Batch Reactor System provides precise decanting for optimum effluent quality*

The Alfa Laval AS-H Sequencing Batch Reactor (SBR) System is an advanced technology for flexible and efficient biological treatment of a wide range of wastewater types and flow rates by means of activated sludge. It is especially suited for applications where influent flow and organic loads can vary, and effluent requirements are stringent.

The SBR process can be used for any type of biodegradable wastewater for removal of biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS) as well as nutrients (nitrogen and/or phosphorus). It offers optimized treatment with advanced process and control methodology.

The system combines all of the best features of an activated sludge technology in a single reactor rather than separate basins for anaerobic, anoxic, cyclic aerobic, and sedimentation.

The Alfa Laval AS-H SBR system is provided complete with floating decanters, blowers, diffused aeration system, mixers, waste sludge pumps, motorized influent and air control valves as well as instrumentation and a process control center. It is suitable for numerous basin geometries and is widely applicable to new basins or retrofit of existing basins or lagoons.

### Applications

- Municipal and industrial wastewater treatment
- Any wastewater stream requiring a biological treatment process
- Biological nutrient removal
- Advanced secondary treatment
- Combined with tertiary filtration, an effluent suitable for water reuse is achieved

## Benefits

- All treatment steps occur in the same tank including settling and decanting:
  - Eliminates the clarifier
  - Smaller footprint
  - Eliminates recycle pumps and piping
  - Cost-efficient way to achieve more stringent effluent limits
- Simple, robust design
- Easy installation
- Highly automated process which facilitates operation and requires less manpower
- Easy to retrofit into existing plants and earthen lagoons



## Working principles

All the key elements and selector concepts of advanced activated sludge technology including anaerobic, anoxic, cyclic aerobic, and sedimentation processes of the Alfa Laval AS-H Sequencing Batch Reactor System occur in a single automated reactor, cycling between each processing step to ensure that the time for each step is optimized.

The core of the system is a patented floating decanter, a leading technology for constant rate decanting for the best effluent quality and optimization of downstream processes. Constant rate decanting from the top water level to the bottom water level is achieved by the lowering of a circular V-notched weir. The weir is stopped at a depth that produces the target decant flow rate. Once the target rate is achieved, the weir is stopped at that point and the head over weir principle ensures that this rate is maintained from top water level to bottom.

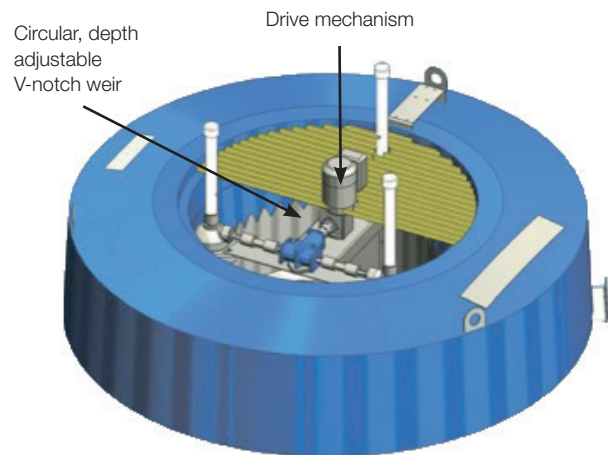
This decanter design eliminates the impact of surge flows that occur with decanters that are either fully opened or fully closed. In these cases, the available head of water from the decanter to the discharge point dictates the flow rate resulting in high initial flows and greatly diminished flows at bottom water level.

The biological treatment takes place in the following cycles:

1. Static fill
2. React fill
3. React phase
4. Settling
5. Decanting

Aeration and mixing is automatically controlled during the react cycles (React fill and React) to ensure the targeted effluent quality is achieved including advanced treatment for the removal of nutrients N and P.

When it is time for the mixed liquor suspended solids (MLSS) to settle prior to decanting, the settling step is also optimized in a completely quiescent volume with no moving mechanical components.

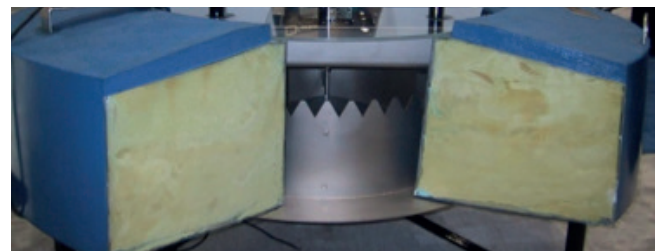


## Floating decanter - Design features and benefits

The patented Alfa Laval AS-H Floating Decanter employs a depth adjustable V-notch weir to precisely decant at a target rate. This prevents disturbance of settled sludge resulting in the best possible effluent quality. Since no motorized effluent decant valve is required, installation is easier and less complicated.

The decant flow is stopped using a robust drive mechanism that raises the circular V-notch weir above the water level. No special underwater seals or valves are required.

The fiberglass encased high density foam flotation collar prevents both the accumulation of solids and the withdrawal of surface scum at the weir.



Cut-away showing circular V-notch weir and fiberglass encased closed cell foam

**Control system**

The Alfa Laval SBR System is controlled by a flow proportional control system that continuously monitors the influent flow rate to the sequencing batch reactor(s) to ensure that optimum treatment time is provided for each processing step. With an SBR design based on decades of experience, the customer will benefit from a proven, operator friendly system for any number of reactors needed to accomplish the goals for treatment. Scope of supply for controls can vary from a user-friendly HMI and PLC to a plant-wide SCADA system.

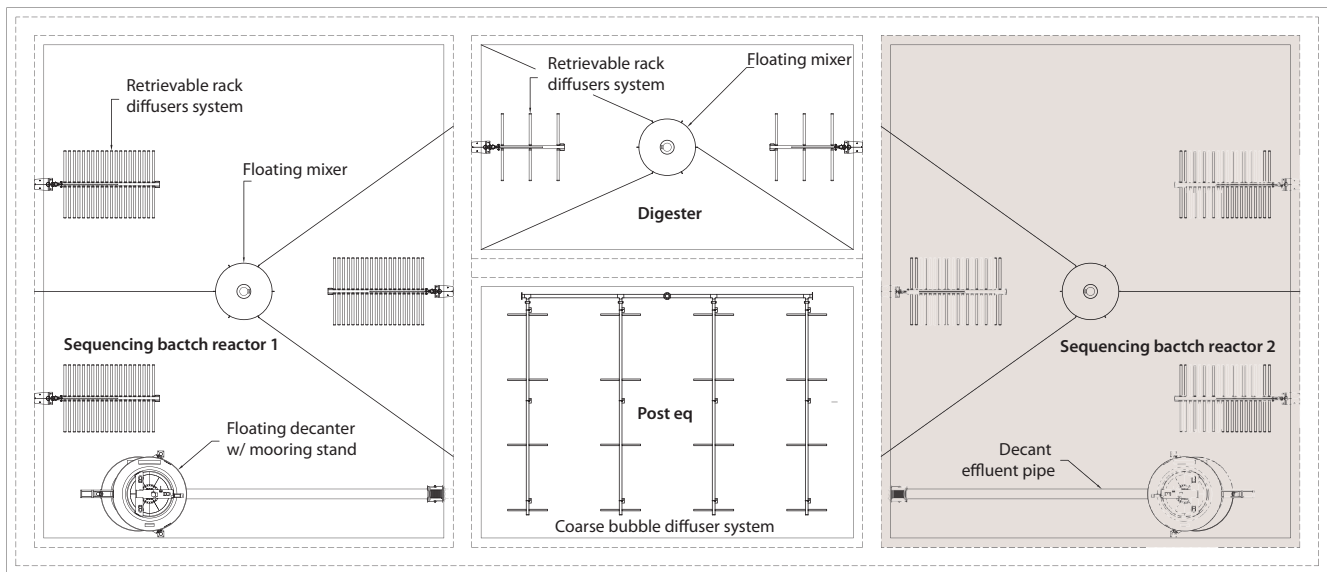
**Optional extras**

The standard Alfa Laval AS-H Sequencing Batch Reactor System is a true batch system, but for some applications a continuous inflow with intermittent decant system could be furnished.

**Service and maintenance**

The Alfa Laval AS-H Sequencing Batch Reactor System has been designed to require minimal maintenance. It is engineered to provide years of reliable, uninterrupted service.

One of the Alfa Laval strengths is our process expertise, and we are a phone call away to provide operational support for the activated sludge process.



Alfa Laval reserves the right to change specifications without prior notification.

**How to contact Alfa Laval**

Up-to-date Alfa Laval contact details for all countries are always available on our website at [www.alfalaval.com](http://www.alfalaval.com)



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