

## PuraSys<sup>®</sup> SBR<sup>®</sup>

### Sequencing Batch Reactor

#### Applications

**PS1-4** through **PS1-8** ( $\leq 800$  gpd)  
1 aerator, 2 pumps with mounting hardware, float switch and smart control panel with NEMA 4X rated enclosure

**PS1-9** through **PS1-14** ( $\leq 1,400$  gpd)  
1 large aerator, 2 pumps with mounting hardware, 2 float switches and smart control panel with NEMA 4X rated enclosure

**PS2**  
2 large aerators, 2 pumps with mounting hardware, fill pump, 5 float switches and smart control panel with NEMA 4X rated enclosure

#### Treatment Performance

Parameters	Typical Values
BOD <sub>5</sub>	$\leq 10 - \leq 30$ mg/l
TSS	$\leq 10 - \leq 30$ mg/l
Total Nitrogen	$\leq 20$ mg/l

#### The SBR Process

The SBR is a batch process, allowing the controller to fill the reactor and adjust aeration to each batch. Since treatment occurs this way, nitrification and denitrification can occur in the same chamber.

Adjusting aeration is important in small treatment plants because flows vary widely and often. Too much air can lead to system failure through sludge bulking. The PuraSys SBR automatically recognizes when water is being used and adjusts aeration to maintain a healthy environment for the proper bacteria to thrive.

The PuraSys SBR uses a step-fill sequencing batch reactor process, meaning that it fills the reactor several times during each cycle. At the beginning of each step, water is brought from the pretreatment to the reactor. It is then aerated for nitrification to occur. Water is then brought again from the pretreatment to the reactor, bringing with it an anoxic carbon source, ideal for denitrification. In this way, the step-fill SBR can attain high levels of nitrogen reduction without an external carbon source.

#### Five Steps of the SBR Process

##### 1. Filling

Water enters reactor from pretreatment.

##### 2. Reaction

Intermittent aeration allows for aerobic and anaerobic conditions which break down BOD and nitrogen.

##### 3. Sedimentation

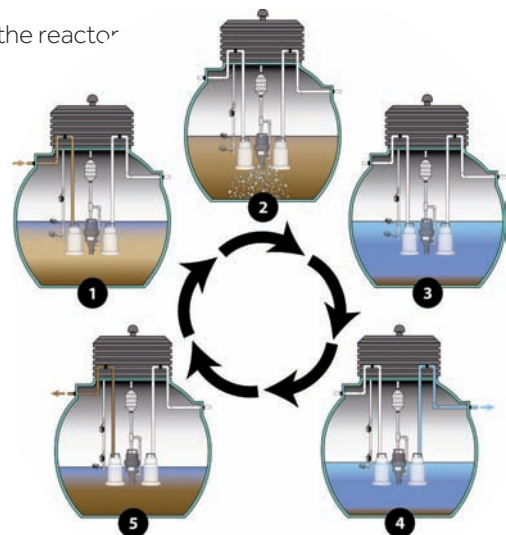
Solids settle to the bottom of the reactor

##### 4. Clear Water Discharge

Top portion of reactor (clear water) is pumped to effluent.

##### 5. Idle and Sludge Return

The system waits for the beginning of the next cycle.



## Maintaining a Healthy Reactor

The key to effective treatment is maintaining a healthy reactor. The PuraSys SBR provides the process control needed to maintain a healthy environment for proper floc growth. Flocs are the particles where bacteria grow that perform treatment. Proper flocs will settle well, making a cleaner effluent. The system's alarm will provide notification of any equipment failure in order to keep bacteria alive.

## Design vs Actual Flow: Two Settings

Design flow and actual flow often differ, a problem that can lead to system failure. The PuraSys SBR addresses this by allowing service providers to change two settings in the smart control panel: aeration and sludge return times. Aeration can be increased or decreased as the influent loading characteristics change. Sludge age and blanket can be increased or decreased through the sludge return timer settings.

## PuraSys Components

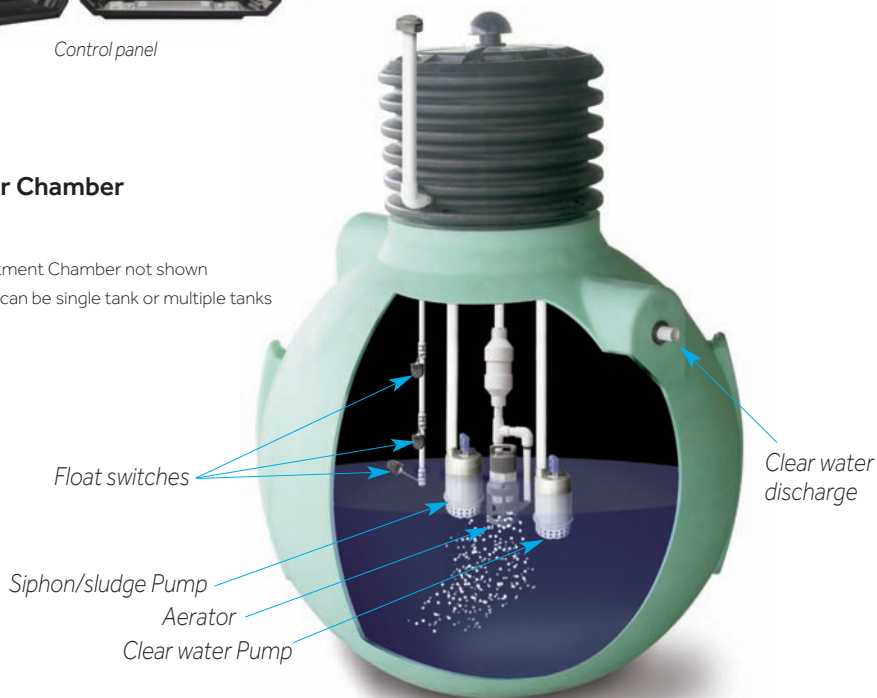


Control panel

## Reactor Chamber

Notes:

1. Pretreatment Chamber not shown
2. System can be single tank or multiple tanks



Only modules bearing the NSF® logo and designated PS1-XX are certified to NSF/ANSI Standards 40 and 245

