PuraSys SBR
Sequencing Batch Reactor

Florida Maintenance Manual

ANUA

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

336.547.9338 ■ anuainternational.com

PuraSys SBR® Maintenance Manual

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If you require further information, please contact customer service at:

ANUA

P.O. Box 77457 ■ Greensboro, NC 27417

T: 336.547.9338 ■ F: 336.547.8559

info@anuainternational.com

1.0 What's in the Box?

PuraSys SBR Models PS1-4 through **PS1-8** (≤800 gpd) include (1) **Novair 200 Aerator.**
PuraSys SBR Models PS1-9 through **PS1-14** (≤1,400 gpd) include (1) **Novair 600 Aerator.**
Additionally, each system comes in a box with the following components:

Controls	(1) Anua
Optional controls add-on	(1) Autodialer
Junction box	(1) Anua with 6 cord grips
Siphon/sludge pump	(1) Ebara Optima 3MS1
Clear water pump	(1) Ebara Optima 3MS1 (see note 3)
Float switch	(3) SJE-Rhombus (included with panel)
PVC stand kit, aerator	(1) Anua A-STAND-PS
PVC stand kit, pump	(2) Anua P-STAND-PS
Wire tie	(10)
1.25" Schedule 40 PVC parts kit with grommets	(1) kit for PVC pipe
Float bracket	(3) Sim/Tech STF-FHPB 1.25"
Stainless Steel screw for stand mounting clamp	(1) Package for Sim/Tech STF-FHHW 1.25"
Siphon pipe pre-drilled with 3/8" holes	(1) 1.25", cut length per tank dimensions
Stand mounting clamp	(4) Sim/Tech STF-FHHW 1.25"
J hook wire holder	(2) Sim/Tech STF-JHOOK
Stainless clamp	(4) 2.5" SS Clamp
Pump mounting clamp	(2) MTG-CLMP-SS-AS
Aerator mounting clamp	(1) MTG-CLMP-SS-PS
Air vent	(1) 2" Banjo threaded air vent
Sonic dampener 4", aerator	(1)
Vibration dampener 1" x 1.5", aerator	(1)

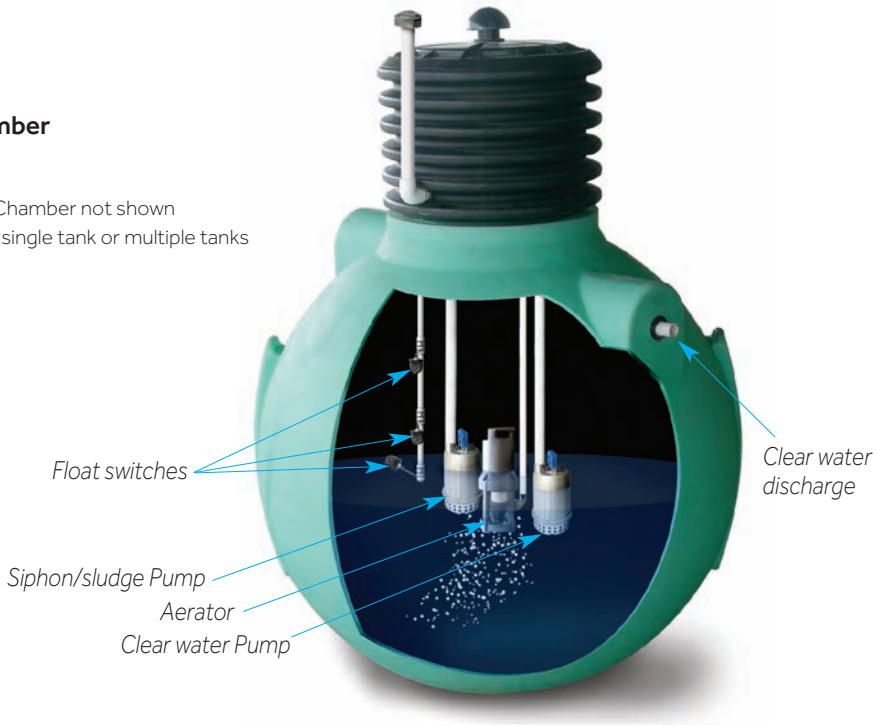
NOTE: 1. Use 1.25" Schedule 40 PVC piping for sludge pump and clear water pump.
2. For other clear water pump options, contact distributor or Anua.

2.0 Anatomy of an SBR

Figure 1

Reactor Chamber

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



2.1 Process Overview

1. **Filling**
   Water enters reactor from pretreatment.

2. **Reaction**
   Intermittent aeration allows for aerobic and anerobic 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.

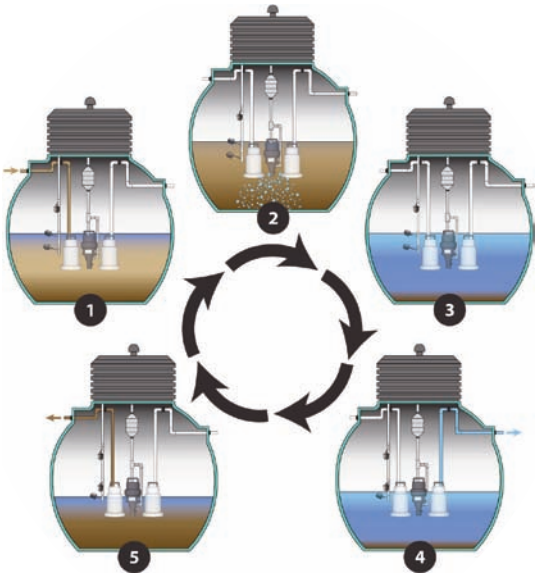
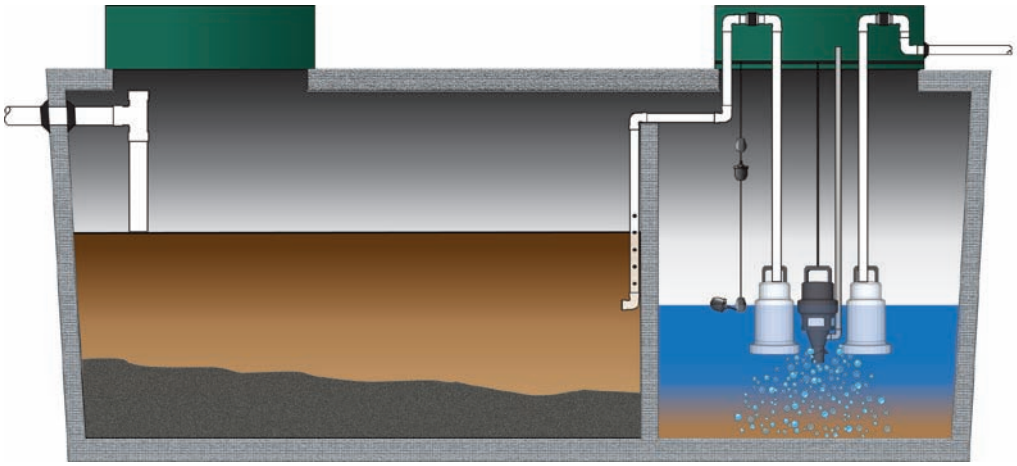


Figure 2 The SBR Process

Figure 3



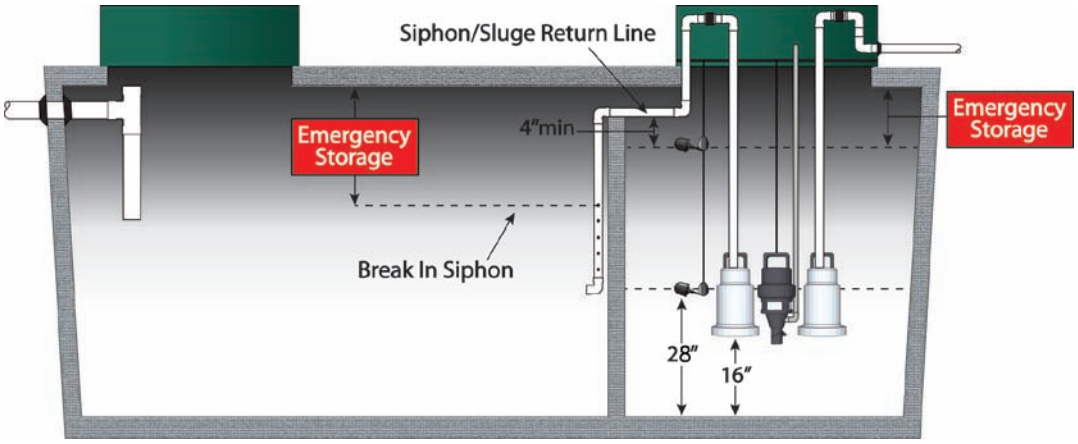
Pretreatment or Septic Tank
(1 chamber tank. Examples include septic tank, pump tank, or holding tank. For 2 chamber configuration, contact Anua)

Reactor Chamber or Tank

2.2 Emergency Storage and Alarm Conditions

PuraSys SBR controls the movement of effluent through the system in a timed sequence of batches. PuraSys SBR incorporates a clear water discharge pump. Since treated effluent is timed dosed from the system, adequate emergency storage must be provided. This is typically provided in the pretreatment tank due to the operational sequence of the controls. For a one tank, 2-compartment configuration, the reactor chamber can be included in the emergency storage calculations.

Figure 4



Emergency storage in typical two compartment tank

1. **One Tank, 2-Compartment Configuration**

   The total emergency storage volume is calculated based on the available volume in the pretreatment tank and the reactor chamber/tank above the normal operating levels to the inside tank lid. Since the chambers are connected via the air space above the baffle wall, volume in both chambers can be counted for emergency storage. In some jurisdictions, the riser volume can be counted for emergency storage. Emergency storage can be calculated as follows:

   - Pretreatment tank: Determine the volume between the top siphon hole to the top of the tank (inside lid).
   - Reactor chamber: Determine the volume between the high water alarm and the top of the tank (inside lid).
   - If allowed per local jurisdiction, determine the volume in the risers.
   - Total storage volume = Pretreatment + Reactor + Risers

2. **Two Tanks Configuration**

The total emergency storage volume is calculated based on the available volume in the pretreatment tank above the normal operating level to the inside tank lid. In some jurisdictions, the riser volume can be counted for emergency storage. Emergency storage can be calculated as follows:

- Pretreatment tank: Determine the volume between the top siphon hole to the top of the tank (inside lid).
- If allowed per local jurisdiction, determine the volume in the risers.
- Total storage volume = Pretreatment + Risers

3. **Alarm Conditions**

An alarm will trigger under the following conditions:

- High water float activated in reactor chamber.
- Aerator current <1 or no current.
- Siphon/sludge pump current <1 or no current.

The operational sequence is outlined below:

- If the clear water discharge pump fails or malfunctions, a high water condition will occur in the reactor chamber. The high water condition will trigger the an alarm. The high water alarm will suspend operation of the siphon/sludge pump.
- If the current sensor does not read proper current to the aerator, an alarm will trigger. The aerator alarm will suspend operation of the siphon/sludge pump.
- If the current sensor does not read proper current to the siphon/sludge pump, an alarm will trigger. At this point, this pump is not operational.

Figure 5

3.0 Maintenance

Maintenance steps:

1. Check the smart control panel for alarms or for errors.
2. Check pretreatment tank and take a sludge reading (see right).
3. Open reactor chamber lid. Check for noxious odor and take a sludge sample
4. If the system is in sedimentation mode and prior to clear water discharge, you may be able to perform a clarity test
5. Manually test the pumps and aerator.
6. Make adjustments and take readings.
7. Replace cover and record maintenance.
8. Give a copy of the maintenance report to the system owner. File the maintenance report with regulatory authority as required by law.

Figure 6

3.1 Clarity Test

Note: Multiple methods exist to visually assess effluent quality (e.g. sludge judge clear tube). The service provider must do a visual inspection of effluent quality during each visit. The clarity test outlined below is one method that may be used.

The clarity test may be used to visually determine effluent quality. To perform the clarity test, the service provider places an eight-inch disk with alternating black and white colored quadrants just above the sludge blanket in the reactor chamber. Be careful not to disturb the sludge blanket! If the disk is visible when the reactor chamber is 1/3 full, then the effluent quality passes the clarity test.

3.2 Sludge (Biomass)

A mature system should have a healthy, one-foot layer of sludge at the bottom of the reactor chamber. This one-foot sludge layer is maintained at a constant level due to the sludge pump portioning excess sludge back to the pretreatment tank. A sludge reading requires a tool, such as a Sludge Judge, that allows you to pull a sample and see the sludge profile. If a recent aeration event occurred, the service provider must wait about 30 minutes prior to obtaining a sludge sample.

Figure 7

Four things to take note of when looking at the sludge:

1. Size
2. Color
3. Settleability
4. Volume (level)

4.0 Troubleshooting

Mechanical failure may be pumps, aerator, or float switches

- Replace failed component
- Test component for proper operation

Field Issue

- Determine if there is a blockage or break in any lines.
- Check for signs of high groundwater
- Check for signs of damage by animals or insects
- Check for signs of damage by any type of motor vehicle
- Check for signs of damage by any plant or tree root intrusion

Infiltration or Exfiltration

- Identify leak using chalk, camera, or smoke
- Repair leak and test

Electrical/controls

- Test power supply for volts
- Test pumps and aerator for volts and amperage draw.
- Replace controls or other electrical components that are malfunctioning or non-operational

5.0 Owner Use

The PuraSys SBR is similar to a scaled-down, automated version of a municipal treatment plant. PuraSys SBR is designed to treat typical domestic sewage. The SBR treatment process can be interrupted or harmed by chemicals designed to kill microorganisms or by physical matter other than toilet paper. The owner "Do's and Don'ts" for PuraSys SBR are similar to a typical septic tank system. Many owner "Do's and Don'ts" guides for septic tank systems are available online.

DO:

- Think before you put anything down the sink, toilet, or drains.
- Read all labels and use the manufacturer's recommended amounts for all household cleaning products.
- Use cleaning products little and often so the unit isn't overloaded.
- Spread your clothes washing throughout the week.
- Keep your pretreatment tank and reactor chamber lids accessible for inspections and pumping.
- Have your pretreatment tank pumped regularly and checked for leaks or cracks.
- In the event of the alarm sounding after electrical storms or power failure, check if the electrical circuit-breakers tripped off by first turning them off and then turning them back on again.
- **Call your Authorized Service Provider with issues or questions.**

DON'T:

- **Flush foreign objects** - these can damage pumps and cause blockages.
- **Flush wipes** - these do not degrade like paper and can cause problems with treatment.
- **Pour grease down the drain** - these harm microbes in the system and can cause blockages.
- **Pour toxic chemicals down the drain** - these can kill microbes in the system.
- **Pour large volumes of cleaning chemicals and bleach down the drain** - use these items in moderation.

The owner should maintain a service contract with an authorized service provider for the life of the system. Routine service should be performed twice a year or more frequently per usage.

In the event of the alarm, an audible alert and visual alert will be activated. The owner should call the service provider if an alarm is triggered.

6.0 Owner's Responsibilities

- The owner is required to use and maintain the system in accordance with the guidelines contained within this manual.
- The owner should not have anyone work on the PuraSys SBR system except an authorized service provider.
- The owner is ultimately responsible to file any reports or other documentation required by the regulatory authority.
- Prior to use, the owner is responsible to register the system with Anua.
- See checklist in Section 13.0.
- **Failure to adhere to these guidelines will result voiding the warranty outlined in Section 14.0.**

7.0 Owner Checklist

☐ The service provider has explained the operation of the system and answered my questions satisfactorily.
☐ The service provider has shown me the list of items that shall not be allowed into the system.
☐ I am aware that only the service provider may maintain or repair the system, including scheduling pumpouts, or else my warranty can be voided.
☐ I am aware that I am to report any alarm, bad odor, or strange noise to the service provider immediately.
☐ I am aware the the system needs to be maintained regularly in order to operate properly for the life of the system.
☐ I have the contact information for my service provider.
☐ I grant the service provider, distributor, and Anua reasonable access to the treatment system to provide routine maintenance and quality control checks. _____ **Initials**
☐ I have registered my system with Anua.

8.0 Warranty

Warranty:

- Anua warranties the PuraSys SBR for a period of two years, unless otherwise specified by the regulatory authority, from the date of delivery. This warranty is subject to the *Terms and Conditions* section and the PuraSys SBR being operated in accordance with the parameters outlined in this manual and the owner complying with the parameters outlined in this manual.
- In addition, Anua will, at its own expense, repair and replace any defective parts of the PuraSys SBR, which manifests itself within two years, unless otherwise specified by the regulatory authority, from the date of delivery.

Terms and conditions:

- This warranty does not apply to any defects whether patent or latent, and whether workmanship or materials or design of works carried out by any independent contract, or any failure due to accidental or malicious damage, or failure to comply with recommendations for operations and maintenance, or unit abuse, fair wear and tear, frost, storm damage, infiltration of storm or surface water or any other such climatic conditions or acts of God generally.
- In particular note that this warranty will not operate unless the customer can produce written evidence of the system having been desludged as required.
- Notwithstanding this warranty if the cost of remedial work is increased due to delay on part of the customer informing of the problem, we reserve the right to invoice the customer for such increased cost.
- This warranty is strictly limited to the replacement of product supplied by Anua. It specifically excludes all other alleged headings of loss, including consequential loss.

Appendix 1 PuraSys SBR Inspection Checklist

Contact Details

Client Name:

Site address: _____

_____

State/Zip: _____

Phone: _____

Service Provider:

Address: _____

_____

State/Zip: _____

Phone: _____

Ref no: _____

Date installed: _____

Inspection Date: _____

Regulatory Authority: _____

Pretreatment Tank

Is pretreatment tank accessible?	☐ Yes	☐ No
Are access covers secure?	☐ Yes	☐ No
Sludge level in tank:		
Scum level in tank:		
Date of last de-sludging:		
Does tank need de-sludging?	☐ Yes	☐ No
Watertightness of pretreatment tank:	☐ Satisfactory	☐ Unsatisfactory
Condition of risers:	☐ Satisfactory	☐ Unsatisfactory
Condition of pipe connections:	☐ Satisfactory	☐ Unsatisfactory

General comments:

Reactor Chamber or Tank

Is reactor chamber or tank accessible?	☐ Yes	☐ No
Are access covers secure?	☐ Yes	☐ No
Sludge level in tank:		
Is aerator operating satisfactorily?	☐ Yes	☐ No
Is aerator attached to pipe stand satisfactorily?	☐ Yes	☐ No
Aerator run time setting:		
Is grease present in reactor chamber or tank?	☐ Yes	☐ No
Watertightness of tank:	☐ Satisfactory	☐ Unsatisfactory
Condition of risers:	☐ Satisfactory	☐ Unsatisfactory
Condition of pipe connections:	☐ Satisfactory	☐ Unsatisfactory

General comments:

Siphon/sludge Pump and Clear Water Pump

Are pumps accessible and removable? ☐ Yes ☐ No

Are pumps operating satisfactorily? ☐ Yes ☐ No

Are floats operating satisfactorily? ☐ Yes ☐ No

Are pumps attached to pipe stands satisfactorily? ☐ Yes ☐ No

Condition of floats, control panel and alarms: _____

Clear Water Pump Readings

Pump delivery rate:		Pump delivery dose:	
Last pump reading (A):		Date of last pump reading (C):	
Current pump reading (B):		Date of current reading (D):	
Difference (X) (i.e. B - A):		# days in period (Z) (i.e. D – C):	
Average (X/Z) gallons:			

ETM Readings

Last ETM reading (A):		Date of last reading (C):	
Current ETM reading (B):		Date of current reading (D):	
Difference (X) (i.e. B - A):		# days in period (Z) (i.e. D – C):	
Average (X/Z):			

Siphon/sludge Pump Timer Setting

_____

Alarm Conditions

No. of times alarm has been activated: ☐

Reason for activation: _____

_____

_____

General comments:

_____

_____

_____

_____

Water Supply

Water source: ☐ Well ☐ Community water supply ☐ Water haul or cistern

Water meter reading (A): ☐ Last water meter reading (B): ☐

Date of last reading: (C) ☐ Date of current reading (D): ☐

Difference (X) (i.e., B – A): ☐ # days in period (Z) (i.e., D – A): ☐

Average amount of water per day (X/Z): ☐

Is there a water softener or water conditioning unit? ☐ Yes ☐ No

Appendix 2 PuraSys SBR Effluent Sampling

Client Name:

Site address: _____

_____

State/Zip: _____

Phone: _____

Ref no: _____

Date installed: _____

Was contact made with owner prior to visit? ☐ Yes ☐ No

Was occupancy established? ☐ Yes ☐ No

Check all that apply: ☐ Solids present ☐ Odor ☐ Grease ☐ Color

Sampled by: _____ Date of sampling: _____

Time of sampling: _____ Delivery to laboratory: _____

Name of laboratory: _____

Address of laboratory: _____

_____

State/Zip: _____

Name of laboratory analyst(s): _____

_____

Laboratory accreditation details: _____

_____

Monitoring Systems

Sample ID	Parameter	Units	Influent	Effluent

Laboratory signature: _____

Appendix 3 PuraSys SBR Troubleshooting Report

Client Name:

Site address: _____

_____

State/Zip: _____

Call out performed by: _____

Maintenance performed by: _____

Phone: _____

Ref no: _____

Date installed: _____

Check all that apply:

Maintenance

- ☐ Warranty
- ☐ Scheduled maintenance
- ☐ Maintenance contract
- ☐ No maintenance contract
- ☐ Other (please specify)

_____

_____

Call-out

- ☐ Warranty
- ☐ Emergency call-out
- ☐ Maintenance contract
- ☐ No maintenance contract
- ☐ Other (please specify)

_____

_____

Date reported: _____ Date addressed: _____

Problem: _____

_____

Cause of problem: _____

_____

Corrective action taken: _____

_____

Problem corrected? ☐ Yes ☐ No

Please send a copy of the Troubleshooting Report, with a copy of the inspection checklist to Anua at P.O. Box 77457, Greensboro, NC 27417.

You may also email: info@anuainternational.com or fax: 336-547-8559

Manufacturer's Representative:

1400 N. Orange Blossom Trail, Orlando, FL 32804
P 407.841.9237
davidevans@harrywarren.com

P.O. Box 77457
Greensboro, NC 27417

T 336.547.9338
F 336.547.8559
anuainternational.com