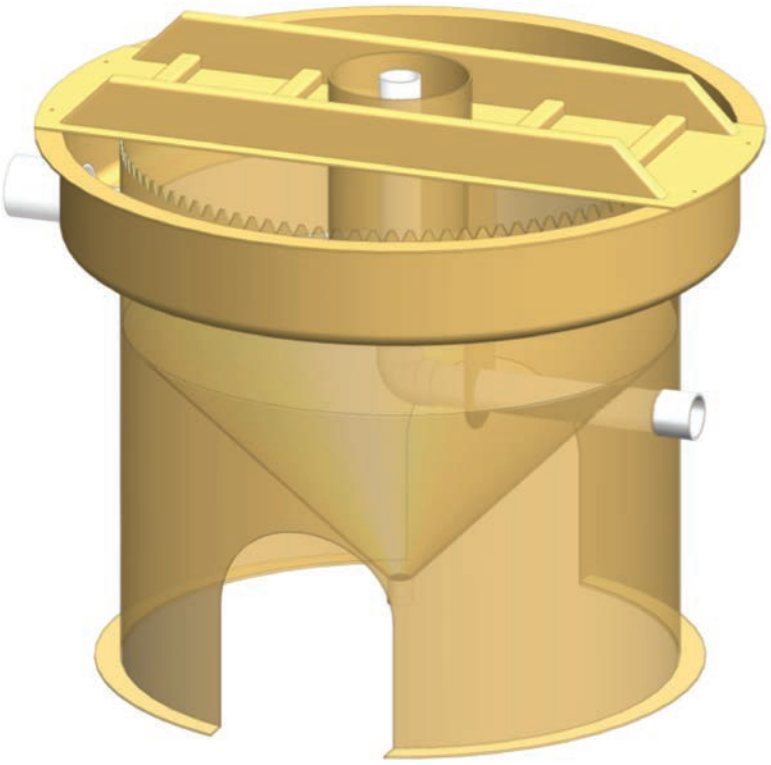
PENTAIR

AQUATIC ECO-SYSTEMS

RADIAL FLOW SETTLER
45° CONE (RFS-45)



INSTALLATION AND OWNER'S MANUAL

IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

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SECTION 1: GENERAL DESCRIPTION OF SYSTEM

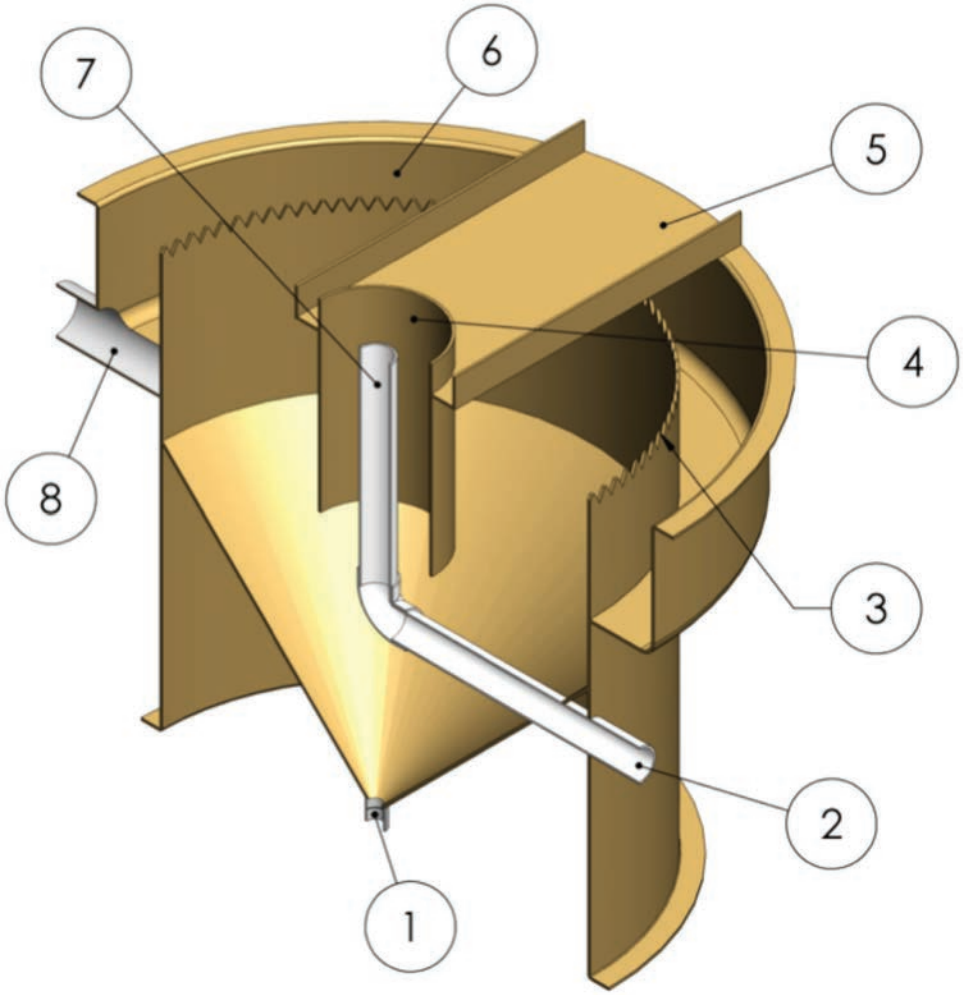

Figure 1.0 Typical RFS-045

Mark	Description	Mark	Description
1	Solids Outlet	5	Stilling Well Support
2	Liquid Inlet	6	Launder
3	V-Notch Weir	7	Standpipe Assembly
4	Stilling Well	8	Liquid Outlet

SECTION 2: THEORY OF OPERATION

The Radial Flow Settler (RFS) is used to remove particulates from effluent water. Effluent water enters the RFS Liquid Inlet, flows upward through the adjustable Standpipe Assembly, and back down through the Stilling Well. As the water flows radially towards the V-Notch Weir the particulates settle to the cone bottom for removal through a Solids Outlet. The filtered water flows up and over a V-Notch Weir into the Launder, exiting though the Liquid Outlet.

SECTION 3: INSTALLATION

The RFS is typically provided with the Stilling Well and Support pre-assembled with 304 SST hardware.

3.1 Installation Requirements

3.1.1 The RFS is to be installed on a level support pad or floor.

3.1.2 Pad or floor to be designed to carry the total operating weight of the RFS including the vessel and water along with any other design conditions.

3.1.3 When required for stability, wind load or seismic loads, the RFS shall have adequate hold down anchors installed.

3.1.4 Support surface to be smooth and free of any debris or occlusions that may damage the bottom of the RFS.

3.2 Setting the RFS

3.2.1 The RFS is a non-pressurized vessel; as such water flows through the vessel via gravity. To allow for gravity flow the RFS needs to be installed such that the V-Notch Weir is lower than the water height in the culture tank. The greater the height differential between the culture tank's water level and the V-Notch Weir in the RFS the greater the flowrate. Consult your system designer/engineer for setting the proper height. Note: The flow rate can be adjusted/fine-tuned by changing the height of the internal standpipe assembly. As the standpipe height is elevated above the V-Notch Weir the flowrate will decrease; however, the standpipe shall not be elevated above the stilling well.

3.2.2 Set the RFS on pad or floor taking care to orientate the fittings correctly.

3.2.3 Grout bottom flange to level RFS if necessary.

3.2.4 If required, install anchors.

3.2.5 Always utilize an anchor with a nut and jam nut. Lightly tighten nut and then install jam nut. This will allow for thermal expansion or contraction.

3.2.5.1 316SS hardware is recommended

3.3 Pipe Connections

3.3.1 Connect all piping to appropriate connection locations.

3.3.2 It is recommended to use union fittings on the inlet, outlet and solids outlet of the RFS for easy removal of the unit.

3.3.3 As mentioned above the RFS functions by gravity flow therefore the inlet plumbing must allow for gravity flow into the RFS inlet port. Accordingly the effluent plumbing from the RFS port must allow for gravity flow out of the vessel.

3.3.3.1 It is recommended to install a Tee fitting with the middle of the Tee connected to RFS outlet port and the run of the Tee oriented vertically such that one side faces upward and the other side facing downward. The outlet plumbing connected to the downward facing side of the Tee shall be plumbed straight down to a distance as low as possible prior to transitioning to horizontal plumbing. This configuration allows for the gravity flow to exit the RFS down the outlet pipe while any trapped air can purge upward through the pipe and out the top of the Tee preventing airlock and siphoning. A small piece of pipe shall be inserted (NOT glued) into the upward facing side of the Tee to a height that contains any burping water to stay within the outlet drain piping.

3.3.4 A ball valve shall be installed on the solids outlet port.

3.3.4.1 An actuated ball valve can be installed such that it opens and closes automatically on a timer dependent on feed times and required purge times

3.3.4.2 The solids outlet will have a waste stream that is high in solid wastes. It is recommended to use a small piece of clear PVC pipe, approximately 12" (30 cm) long, to allow for visual inspection of the clarity of the waste stream during a purge.

SECTION 4: RFS STARTUP

4.1 Make sure the solids outlet valve is closed.

4.2 Provide a regulated flow within the capacity of the RFS model.

4.3 Adjust flow rate by manipulating the standpipe height or inlet valve

SECTION 5: NORMAL OPERATION

5.1 Under normal operation check that the liquid levels are constant.

5.2 Depending on species of fish, feed schedules and tank design the fecal waste and uneaten feed typically settles and accumulate in the cone of the RFS about 30 - 60 mins after feeding.

5.2.1 Each system is different and the accumulation time will vary.

5.3 At a user defined frequency the solids purge valve shall be opened to remove the settled solids from the RFS cone bottom.

5.4 When the settled solids have been removed from the cone and or the effluent waste is running clear the solids purge valve shall be closed (approximately 15 – 45 secs).

5.5 For convenience, systems that are fed on a timed feeder can have an actuated ball valve on the solids outlet port set to a timer to open xx mins (actual time needs to be determined by the operator) after feed to purged the solids from the RFS for xx sec (actual time of purge to be determined by the operator).

5.5.1 For example if the fish are fed on the hour every hour the RFS solids outlet valve can be set on an automatic timer to open 45 mins past the hour every hour for 30 secs.

5.6 At a minimum the RFS shall be purged twice a day. If the settled solids remain in the cone bottom for an extended amount of time they can go anaerobic and float to the surface of the RFS. The floating solids can cause issues with clogging the V-Notch Weir and the outlet port.

5.7 In some cases with the 45° cones not all the settled solids travel down the side walls to the outlet port. In such cases the RFS shut down procedure shall be followed to completely clean the solid collection cone (see Sec 6.0).

SECTION 6: SHUT DOWN

6.2 To shut down the RFS, stop flow and drain all water from the unit using the solids drain.

6.2 Rinse the side walls of any accumulated debris.

SECTION 7: MAINTENANCE

7.1 Clean sidewalls, launder, V-Notch Weir and cone bottom with a non-abrasive brush as needed.

7.1.1 Open the solids waste valve and make sure the settled solids are purged out of the cone prior to cleaning.

7.1.2 Keep solids waste valve open while cleaning.

7.1.3 Close solids waste valve after finishing cleaning.

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