



# Separators and Separator Systems



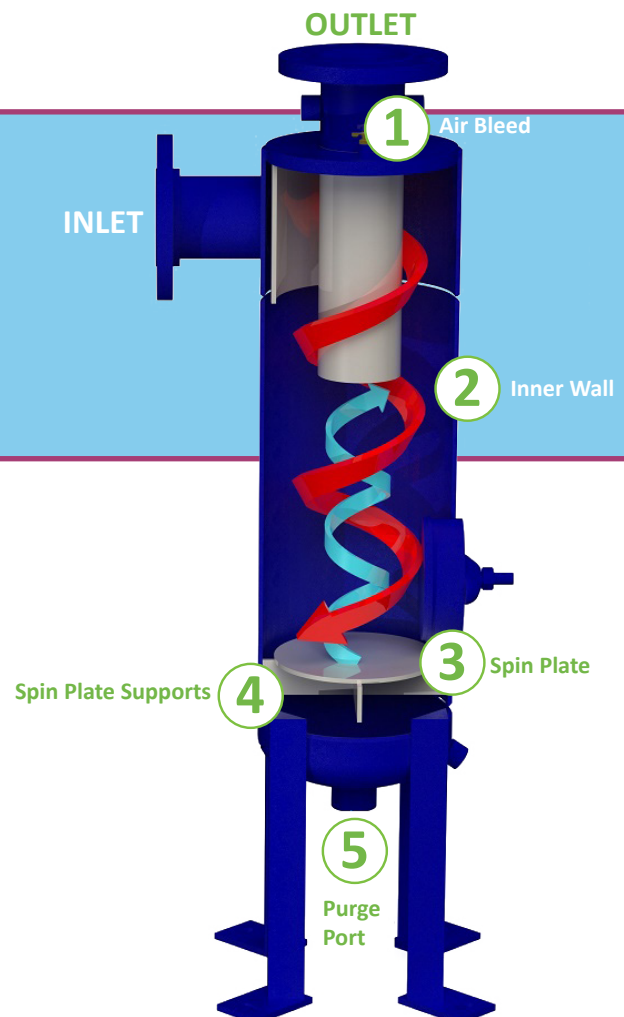
GWS places a high priority on our customer's specific needs, by offering a complete line of filtration products precisely designed to provide:

## Features:

- ✓ Quality products made in the USA
- ✓ Five-year limited warranty on vessel
- ✓ 150 psi rating, 145 degrees Fahrenheit
- ✓ UL Listed (508A) purge and pump control panels
- ✓ Low pressure drop design, generates operating cost savings over the life of the equipment
- ✓ Adequately sized legs and foot pads to absorb and carry dynamic weight
- ✓ Full flow rates from 10 gpm (US) to 10,000 gpm (US)
- ✓ Packaged separator systems with flow rates of 32 gpm (US) to 4,200 gpm (US)
- ✓ Threaded, flanged or grooved end connections for effortless installations
- ✓ Automatic purge packages with motorized ball valves
- ✓ Carbon steel standard, optional stainless steel (304-316)
- ✓ Powder coated exterior finish
- ✓ Solids recovery tank in 304 stainless steel
- ✓ Optional low profile
- ✓ Optional non-code vessel up to 300 psi
- ✓ Optional ASME (BPVC VII available up to 600 psi-250 degrees Fahrenheit)

## Applications:

- ✓ Open cooling loops and condenser water loops
- ✓ HVAC heating and cooling, hot, chilled water and heat pump loops
- ✓ Industrial cooling towers
- ✓ Power and process
- ✓ Evaporative Condensers
- ✓ Irrigation
- ✓ Waste water
- ✓ Pre-filtration for process



## How it Works

The solids-laden stream of liquid enters the separator tangentially through the entry nozzle and is directed and accelerated by the velocity plate, creating a strong centrifugal force on the flow. The faster liquid combined with the geometry of the exit tube creates a vortex in the middle of the vessel, maintaining the speed of the liquid.

Due to their higher specific gravity, the solids stay outside the spinning liquid at the vessels' inner wall circumference. As these solids reach the spin plate, they breach the openings where the liquid reverses direction guiding the solids to the vessels' exit tube.

Solids are retained in the collection chamber outside the influence of the vortex. The collected solids settle at the bottom of the separator until exiting through the purge system.

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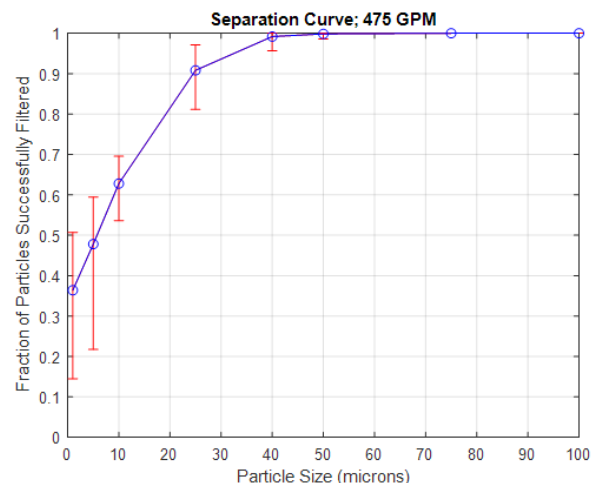
## Options:

- ✓ ASME Rated and stamped units
- ✓ GWS' low energy design eliminates the need for expensive removable heads
- ✓ Grooved end connections available
- ✓ Custom configurations available
- ✓ Air vent port
- ✓ Inlet and outlet pressure gauge ports
- ✓ Purge and auxiliary bleed outlets
- ✓ Purge packages for any voltage
- ✓ Inspection port for easy access to interior
- ✓ Vessel lifting lugs
- ✓ Recovery tank options for all sizes
- ✓ Custom filtration packages available: Low Profile and CSS/CSR with Duplex Pumps

## Figure 1. Particle Removal Efficiency Curve

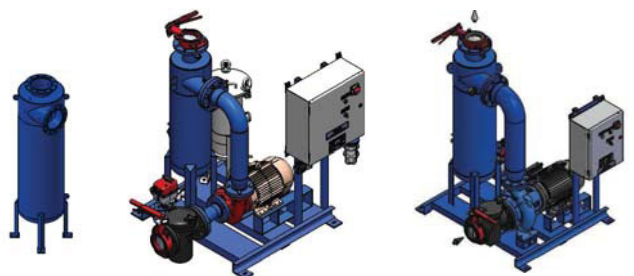
This curve shows the particle removal efficiency, calculated via CFD, for a range of particle sizes. The error bars shown are the maximum and minimum efficiencies achieved in the set of nine flow fields.

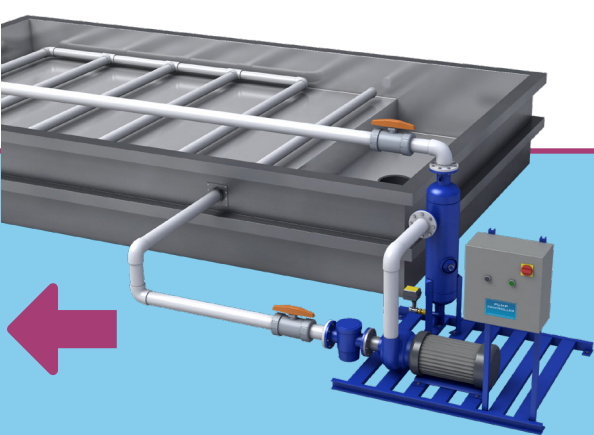
**NOTE:** Generally speaking, the error range increases as particle size decreases. The cutoff diameter for GWS separators is about 10 microns. That is, 10 micron particles, fifty percent are removed and fifty percent pass through.



## Benefits:

- ✓ Reduces solids and fouling problems in cooling water system piping and equipment
- ✓ Reduces sludge and debris
- ✓ Reduces energy costs
- ✓ Reduces labor costs associated with manual cleaning of tower basin, chillers, condensers, heat exchangers and boilers
- ✓ Aids in controlling Legionella by reducing the debris in cooling towers that hide and protect the organism
- ✓ Increase the effectiveness of all biocides by reducing the amount of organic loading
- ✓ Improves performance and efficiency of heat transfer equipment
- ✓ Durable, built to last the entire life cycle of the plant.





# Separator & Separator Systems



GWS' Centrifugal Separators can be installed in either full flow or side stream configurations and are designed as a self-contained unit for cooling towers and cooling systems. GWS' low energy high efficiency separators are also intended to optimize removal of settling solids, fabricated domestically, built to ASME standards and ideal for a range of applications where filtration is essential for 10+ micron sized particles.

Available for either basin sweeping or slip stream installations with a full set of options to suit your needs. The CSS (Auto-Purge System) and CSR (Closed Solids Recovery) models are compact, durable, economical and effective. Our systems maximize particle removal with low pressure drops resulting in significant energy savings when compared to a traditional system.

Both are built standard with a carefully selected closed coupled TEFC premium efficiency flooded end-suction pump. Or an optional self-priming pump is available if required. Separators are mounted on a welded structural steel powder coated base complete with connecting pipe manifolds made of welded and painted carbon steel, pressure gauge a UL listed pump control panel and basket strainer.

The CSS has a standard 24 hour purge timer/controller. Optional battery back-up closes the purge if a power loss occurs. The CSR includes a solids recovery tank (RT) with a pressure annunciator, sight flow indicator and manual isolation valves. Optional recovery tank service light illuminates when service is required. The CSR is ideal for hot and chilled water closed loops.

All come standard with 120volt control circuit, HOA with remote command start-stop. Options include PCL controls for seven (7) day programmable purge control, InstAlert remote monitoring, BACnet® without panel mounted PLC or BACnet®

## Side Stream Filtration

Self-contained and packaged with its own pump, a General Separator System may be installed as a side stream on the main system. An appropriately sized model will eliminate most of the troublesome solids in the fluid stream. The amount of filtration is based on the desired turnover rate.

TYPICAL ENERGY SAVINGS OFFSETS ENTIRE PURCHASE COST IN 2 YEARS WHEN COMPARED TO EDUCATOR-BASED FILTER!

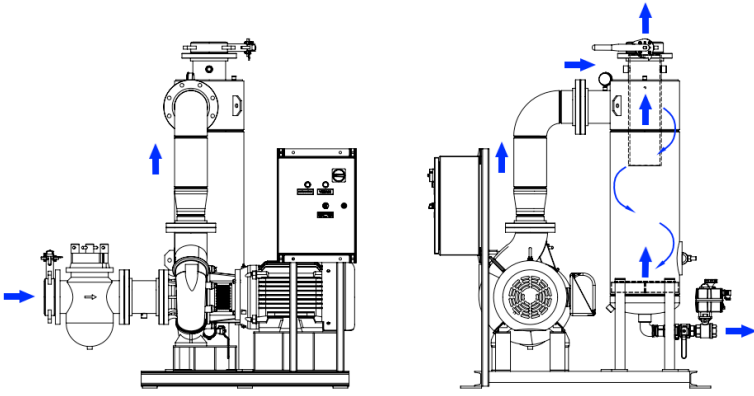
## Self-contained Side Stream Basin Sweeper System

This standard configuration demonstrates how CleanSweep™ moves settled dirt gently along the basin in the tranquil water and does not re-suspend safely settled solids.

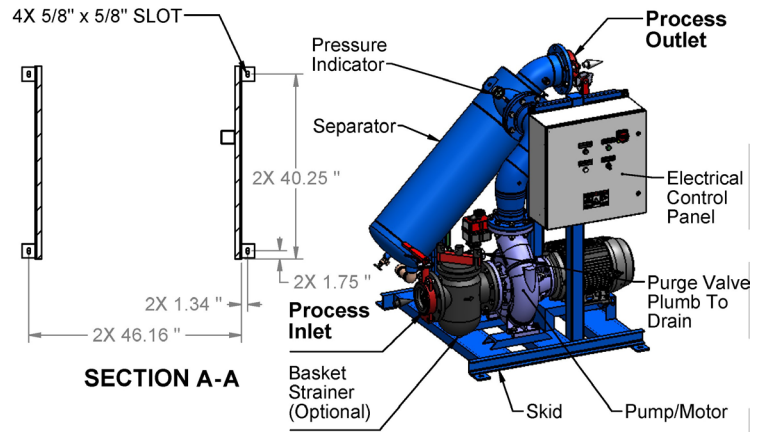




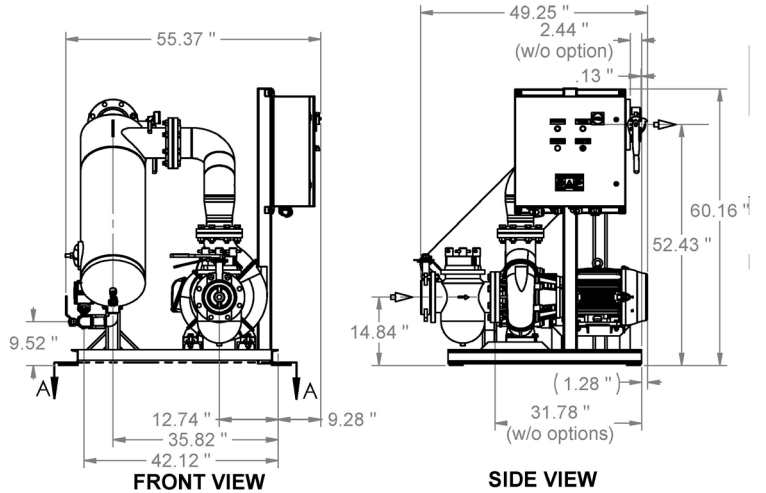
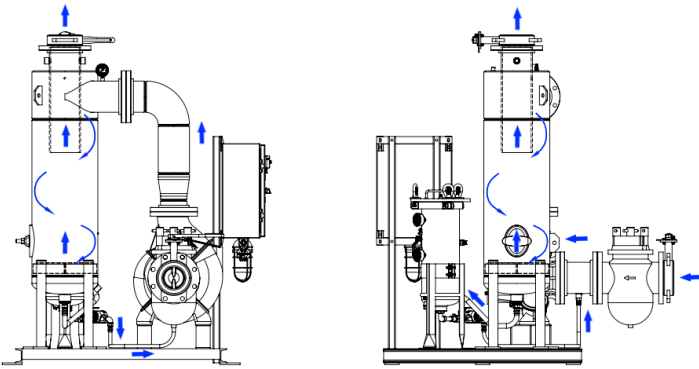
# CSS Auto Purge System



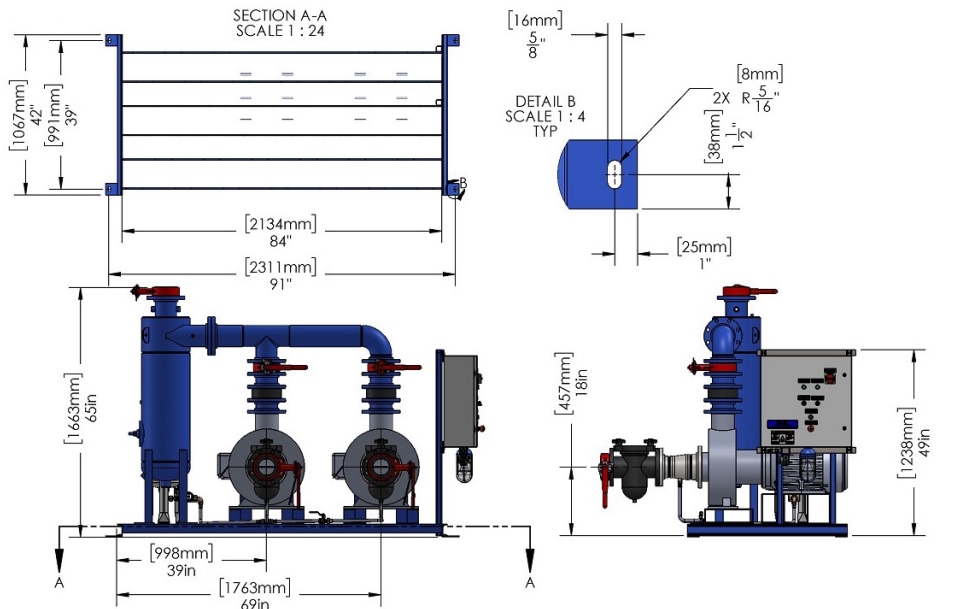
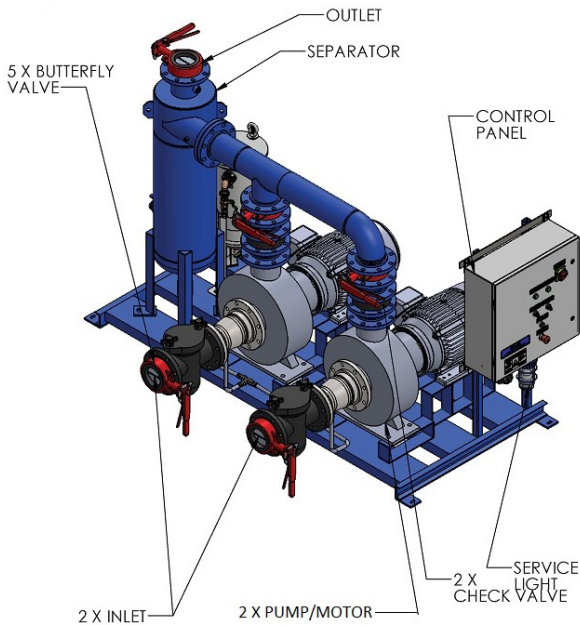
# CSS Low Profile



# CSR Closed Solids Recovery System



# CSR Duplex



# GENERAL WATER SYSTEMS

Our mission is to provide our customers with products that will allow their cooling systems to enjoy long-term stability and operate in a consistent and reliable way. GWS pledges to guarantee customer satisfaction by:

- Engineering integrated filtration products
- Maintaining a high level of applications experience and an in-depth water treatment knowledge base
- Manufacturing the best in shop-durable products
- Enhancing customers operational practices



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