

Five Star "Upflow" Sand Filter

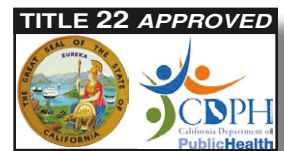
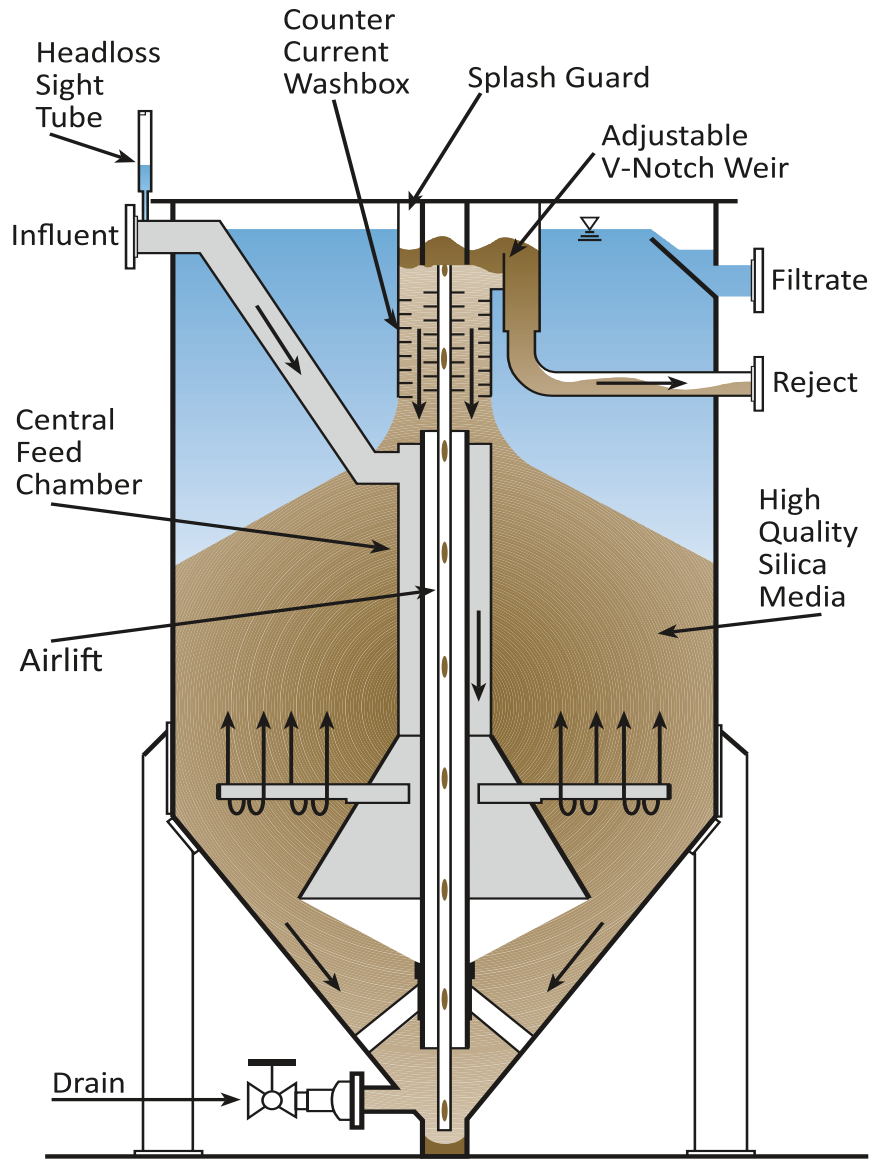


TITLE 22 APPROVED



Five Star Filtration

“UPFLOW” Gravity Sand Filter



Available Five Star Filter Sizes

Circular Package Models									
Model No. (FRP, CS, SS)	Area ft ²	Diameter ft	Height		Throughput	Reject	Pressure	Air Flow	
			40"	80"	GPM	Rate (GPM)	Drop (in.)	(SCFM)	
FS-7 UF	7	3	10'-1"	13'-1"	10-35	3-4	6-24	1-2	
FS-12 UF	12	4	10'-8"	14'-0"	15-60	3-4	6-24	1-2	
FS-19 UF	19	5	11'-5"	14'-9"	30-95	5-6	6-24	1-2	
FS-25 UF	25	6	12'-4"	15'-8"	42-140	5-6	6-24	2-4	
FS-38 UF	38	7	13'-4"	16'-8"	60-190	6-8	6-24	2-4	
FS-50 UF	50	8	14'-0"	17'-4"	75-250	6-8	6-24	2-4	
FS-64 UF	64	9	14'-8"	18'-0"	100-320	8-10	6-24	2-4	
FS-78 UF	78	10	15'-8"	19'-0"	120-390	8-10	6-24	2-4	
FS-113 UF	113	12	17'-4"	20'-8"	170-565	8-10	6-24	2-4	
Rectangular and Concrete Models									
Model No. (FRP, CS, SS)	Area ft ²	W x L ft	Height	Modules	Throughput GPM	Reject Rate (GPM)	Pressure Drop (in.)	Air Flow (SCFM)	Bed Depth (in.)
FS-100 UF	100	10x10	14'-6"	4	150-500	20-24	6-24	12	40-80
FS-150 UF	150	10x15	14'-6"	6	225-750	30-36	6-24	18	40-80
FS-200 UF	200	10x20	14'-6"	8	300-1000	40-48	6-24	24	40-80
FS-100 UF	100	7.1x14.2	17'-6"	2	150-500	12-6	6-24	6	40-80
FS-200 UF	200	14.2x14.2	17'-6"	4	800-1000	24-32	6-24	12	40-80

The Five Star “Upflow” Filter has been designed with one thing in mind “**performance**”. In virtually every application that involves granular media filtration, the Five Star gravity sand filter is the **BEST** choice for the removal of suspended and colloidal solids. Designed as an upflow dynamic bed filter, the Five Star “Upflow” Filter provides a continuous supply of filtered water without interruptions for backwash cleaning cycles.

Superior, Consistent Performance

The combination of the upflow water and the deep bed enables the Five Star “Upflow” Filter to offer the best performance available in upflow filter designs. High quality filtrate can be achieved at varying flow rates depending on influent feed solids loading.

Low Pressure Drop

Upflow filter designs typically require two to three feet of driving head upstream of the filter. The upflow design allows the majority of the captured solids to remain in the lower portion of the filter bed and be removed from the filter very quickly. Consistent low headloss is normal for the Five Star “Upflow” Filter. A continuously cleaning washbox utilizes **filtered** water to clean the media before it returns to the top of the filter bed. One meter and two meter filter beds are available with very little difference in head loss.

Low O & M Costs

Operation and maintenance costs are minimal because the Five Star “Upflow” Filter has **NO** moving parts in the filter. There are **NO** screens, level controllers or valves to maintain. The only wear part in the filter is the airlift pump with a life span typically around 5 years. The only air usage is the airlift pump. Air consumption is typically 1 to 4 scfm at 40 psi per airlift. Scheduled operator attention and service is all that is required.

High Quality Construction

The Five Star “Upflow” Filter meets the strictest construction requirements in the industry. Standard tank materials are FRP (fiberglass reinforced plastic). Alternative materials available are carbon steel and stainless steel (Type 304 and 316). Heat tracing and insulated tanks are available for outdoor applications in cold climates along with Seismic 4 tanks. Concrete basin designs are available for higher flow applications with the concrete being provided by others and all internals provided by Five Star Filtration.

This is how it works!

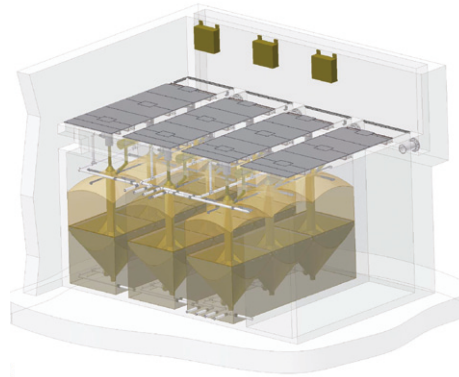
Influent enters the center of the filter through a central feed chamber. The central feed chamber has a series of radial arms to evenly distribute the influent flow to the media bed near the bottom of the filter. As the water flows upward through the filter media suspended and colloidal solids are removed. Filtrate exits the filter near the top and flows over a fixed weir plate that maintains a constant level. The solids that are captured in the filter media are drawn downward into a recessed chamber located below the lower cone by the suction of the airlift pump. The high energy, turbulent upward flow inside the airlift provides a scrubbing action that effectively separates the sand and the captured solids before discharging them in the washbox at the top of the filter. The washbox is a baffled chamber that allows for counter-current washing and gravity separation of the filter media and the captured solids. Media cleaning is accomplished utilizing **filtered** water from the upper chamber of the filter. Regenerated filter media is returned to the top of the filter bed as it falls by gravity from the counter-current washer. An adjustable V-notch weir directs the reject flow out of the filter carrying concentrated captured solids to a suitable disposal point.

Features and Benefits

UPFLOW, Continuous Operation	No shutdown for backwash cycles No ancillary equipment requirements No flow control valves
No Internal Moving Parts	Reduces operator attention and maintenance
Low Pressure Drop	Gravity or Pump fed with pressure drop typically less than 24” during normal operation Reduced power consumption
Single Media	No screens or underdrain systems
High Loading Capacities	Can accommodate upstream upsets
Continuous Backwash	Steady continuous reject stream eliminates upsets No reject pumps or tanks are typically required



2 MGD Surface Water Filtration



2.6 MGD Concrete Installation
Algae & Phosphorus Removal



0.6 MGD Tertiary Filtration

MUNICIPAL		INDUSTRIAL	
<ul style="list-style-type: none"> •Water Reclamation (CA Title 22 APPROVED) •Tertiary Filtration •Algae Removal •Phosphorus Removal •Potable Water Filtration •Denitrification 		<ul style="list-style-type: none"> •Metal Hydroxide •Mill Scale •Pre-RO Direct Filtration •Laundry Waste •Brine Waste •Pulp & Paper Process Water •Cooling Towers •Incinerator Blowdown •Mining •Oil/Emulsion Waste •Surface Water 	

Application	Loading Rate (gpm/ft ²)	Influent Solids (mg/L TSS)	Filtrate (mg/L TSS)
Tertiary Filtration	3-5	20-100	1-10
Algae Removal	2-4	20-150	50% Removal w/o chemical addition Up to 95% w/chemical addition
Pre-RO Direct Filtration	2-5	< 15 SDI (2 NTU)	< 3.5 SDI (0.1 NTU)
Surface Water Direct Filtration	2-5	10-200 (NTU)	< 0.5 NTU
Metal Hydroxides	3-5	20-100	1-5
Phosphorus Removal	3-5	20-100 (up to 8 P)	1-3 TSS, < 0.1 P
Mill Scale	3-5	20-150	2-10
Denitrification	1-3	10 –30 TSS, up to 50 Nitrate	< 5 TSS, <3 Nitrate



For more information about the Five Star "Upflow" Sand Filter contact Five Star Filtration LLC
or our local representative in your area.

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