COMMERCIAL / INDUSTRIAL **COOLING TOWER SIDE STREAM FILTER SYSTEMS**

When performance & value matters.

EXCALIBUR Water Systems

WHY DO COOLING TOWERS REQUIRE FILTRATION?

Cooling towers are excellent air scrubbers. High volumes of air pass through the tower subjecting components to airborn contaminants. Concentrated make up water can also contribute to build up of contaminants on the cooling tower distribution and fill areas which eventually flake off and become suspended in the recirculating water. Even a marginal improvement in the efficiency of evaporative cooling equipment, heat exchangers and chillers can offer owners significant savings over the lifespan of the cooling systems. Improving the water quality in the cooling loop is a simple, cost effective method of realizing efficiency gains.

Many contaminants cannot be seen by the visable eye. Collectively they can lead to system inefficiencies, increased micro biological growth and excessive corrosion. Suspended solids result in water with high turbidity which can foul heat exchange surfaces. These silt like contaminants also end up in low flow areas such as the cooling tower basin. This provides a place for bacteria to attach and multiply which results in high potential for under deposit corrosion and microbiologically induced corrosion (MIC). Under high flow conditions the suspended solids can also be abrasive and cause excessive wear of pump seals and valves and erosion of pipes.

BENEFITS OF COOLING TOWER FILTRATON

- Reduced energy consumption via clean heat exchange surfaces
- Reduced treatment chemical costs and enhanced performance
- Enhanced biological growth control reducing the risk of health related problems
- Increased cooling tower life expectancy from continuous cleaning
- A mechanical system provides continuous maintenance while a maintenance crew can only provide interval maintenance; continuous maintenance ensures a cleaner system. Also, the maintenance crew faces health risks if they are cleaning a contaminated system

FEATURES OF THE EXCALIBUR SIDE STREAM COOLING TOWER FILTER

- Each side stream filter has its own pump to maintain cooling system capacity
- Excalibur Side Stream Filter media is designed to remove particles down to 1 micron
- Excalibur control valves provide multiple backwash initiation, including pressure differential, water flow volume or time
- Excalibur regeneration provides backwash and fast rinse using separate source municipal or filtered water
- Ability to install multiple filter vessel system with one controller to stage backwash and fast rinse so not to affect water flow required for other equipment
- Excalibur side stream filter has controller with a built-in motor control package
- Historical operating data provided in Excalibur Side Stream Filter provides, the number of back washes, peak flow rate since day of install, current flow rate and total daily flow up to 63 days, which is useful in determining how many times system volume has turned over, along with many other useful parameters
- Excalibur Side Stream Filter provide pressure gauges for separate source regenerations, pump discharge and post filter
- Excalibur Simplex Side Stream Filters will not require an additional pump for separate source backwash and fast rinse will utilize the inline pump system that is part of side stream filter

EXCALIBUR SIMPLEX COOLING TOWER SIDE STREAM 5-MICRON FILTER SYSTEM

Advantages

- Controller with built-in motor control package
- Centrifugal pump with easy serviceability
- Electronically controlled backwash and fast rinse regeneration cycles
- Historical operating data
- Accurate flow meter with totalizer
- Pressure is boosted for separate source regeneration from inline booster pump
- Pressure gauge readings for regeneration separate source, untreated source, pump discharge and post filter
- Blue powder coated carbon steel frame 1" to 3" square tubing
- Pressure relief valve to control maximum water pressure
- 5-micron filtration
- 40 psi pressure boost from cooling tower water supply or greater

FILTER SPECIFICATIONS

MODEL	TOTAL MEDIA (ft^3)	CONTROL VALVE	TANK SIZE (in)	FLOW RATE (GPM)			CYCLE DURATION (Min)		PUMP (HP)	APPROX. SPACE REQUIRED (in)			Shipping Weight (lbs)
				CONTINUOUS	PEAK	BACKWASH	BACK-WASH	FAST RINSE		L	W	H	
EWS FS1AG5SS5	5.0	1.0"	18x65	17.7	22.1	25.0	10.0	8.0	1.5	54	20	75	720
EWS FS15AG9SS5	9.0	1.5"	24x72	31.4	39.3	47.2	10.0	8.0	2.0	66	26	85	1090
EWS FS2MQCAG14SS5	14.0	2"QC	30x72	49.1	61.4	74.0	10.0	8.0	5.0	81	32	95	1720
EWS FS2HAG21SS5	21.0	2"H	36x72	70.7	88.4	106.0	10.0	8.0	5.0	102	38	98	2430
EWS FS3AG28SS5	28.0	3"	42x72	96.3	120.3	144.0	10.0	8.0	7.5	123	44	110	3,420
EWS FS3AG37SS5	37.0	3"	48x72	126.1	157.1	189.0	10.0	8.0	15.0	179	50	107	4,435

* Large tank can be replaced with system controlled multiple small tanks to reduce the regeneration drain flow and to get continuous filtered water. Contact Excalibur for more information.
* No additional pump required to boost separate source regeneration pressure.

EXCALIBUR SIMPLEX COOLING TOWER SIDE STREAM 1-MICRON FILTER SYSTEM

Advantages

- Controller with built-in motor control package
- Centrifugal pump with easy serviceability
- Electronically controlled backwash and fast rinse regeneration cycles
- Historical operating data
- Accurate flow meter with totalizer
- Separate source regeneration
- Pressure gauge readings for regeneration separate source, untreated source, pump discharge and post filter
- Blue powder coated carbon steel frame 1" to 3" square tubing
- Pressure relief valve to control maximum water pressure
- 1-micron filtration
- 40 psi pressure boost from cooling tower water supply or greater

FILTER SPECIFICATIONS

MODEL	TOTAL MEDIA (ft^3)	CONTROL VALVE	TANK SIZE (in)	FLOW RATE (GPM)			CYCLE DURATION (Min)		PUMP (HP)	APPROX. SPACE REQUIRED (in)			Shipping Weight (lbs)
				CONTINUOUS	PEAK	BACKWASH	BACK-WASH	FAST RINSE		L	W	H	
EWS FS15AG9SS1	9.0	1.5"	24x72	12.6	15.7	47.1	10.0	8.0	0.75	94	26	85	1010
EWS FS2MQCAG14SS1	14.0	2"QC	30x72	19.6	24.6	73.7	10.0	8.0	1.0	100	32	95	1510
EWS FS2HAG21SS1	21.0	2"H	36x72	28.3	35.4	106.0	10.0	8.0	1.5	106	38	98	2110
EWS FS3AG28SS1	28.0	3"	42x72	38.5	48.1	144.0	10.0	8.0	2.0	124	44	110	3080
EWS FS3AG37SS1	37.0	3"	48x72	50.3	62.9	189.0	10.0	8.0	3.0	148	50	107	3,740

* Large tank can be replaced with system controlled multiple small tanks to reduce the regeneration drain flow and to get continuous filtered water. Contact Excalibur for more information.
* Booster pump required for separate source regeneration, if combined pressure available is less than 40 psi.

EXCALIBUR TWIN PARALLEL COOLING TOWER SIDE STREAM 5-MICRON FILTER SYSTEM

Advantages

- Controller with built-in motor control package
- Centrifugal pump with easy serviceability
- Electronically controlled backwash and fast rinse regeneration cycles
- Historical operating data
- Accurate flow meter with totalizer
- Pressure is boosted for separate source regeneration from inline booster pump
- Pressure gauge readings for regeneration separate source, untreated source, pump discharge and post filter
- Blue powder coated carbon steel frame 1" to 3" square tubing
- Pressure relief valve to control maximum water pressure
- 5-micron filtration
- 40 psi pressure boost from cooling tower water supply or greater

FILTER SPECIFICATIONS

MODEL	TOTAL MEDIA (ft^3)	CONTROL VALVE	TANK SIZE (in)	FLOW RATE (GPM)			CYCLE DURATION (Min)		PUMP (HP)	APPROX. SPACE REQUIRED (in)			Shipping Weight (lbs)
				CONTINUOUS	PEAK	BACKWASH	BACK-WASH	FAST RINSE		L	W	H	
EWS FTW1AG5SS5	10.0	1.0"	18x65	35.4	44.2	50.0	10.0	8.0	2.0	82	20	75	1340
EWS FTW15AG9SS5	18.0	1.5"	24x72	62.8	78.6	94.4	10.0	8.0	5.0	108	26	85	2210
EWS FTW2MQCAG14SS5	28.0	2"QC	30x72	98.2	122.8	148.0	10.0	8.0	7.5	145	32	95	3320
EWS FTW2HAG21SS5	42.0	2"H	36x72	141.4	176.8	212.0	10.0	8.0	15.0	207	38	98	4860
EWS FTW3AG28SS5	56.0	3"	42x72	192.6	240.6	288.0	10.0	8.0	15.0	219	44	110	6,800
EWS FTW3AG37SS5	74.0	3"	48x72	252.2	314.2	378.0	10.0	8.0	15.0	231	50	107	8,100

* Large tank can be replaced with system controlled multiple small tanks to reduce the regeneration drain flow and to get continuous filtered water. Contact Excalibur for more information.
* No additional pump required to boost separate source regeneration pressure.

EXCALIBUR TWIN PARALLEL COOLING TOWER SIDE STREAM 1-MICRON FILTER SYSTEM

Advantages

- Controller with built-in motor control package
- Centrifugal pump with easy serviceability
- Electronically controlled backwash and fast rinse regeneration cycles
- Historical operating data
- Accurate flow meter with totalizer
- Separate source regeneration
- Pressure gauge readings for regeneration separate source, untreated source, pump discharge and post filter
- Blue powder coated carbon steel frame 1" to 3" square tubing
- Pressure relief valve to control maximum water pressure
- 1-micron filtration
- 40 psi pressure boost from cooling tower water supply or greater

FILTER SPECIFICATIONS

MODEL	TOTAL MEDIA (ft^3)	CONTROL VALVE	TANK SIZE (in)	FLOW RATE (GPM)			CYCLE DURATION (Min)		PUMP (HP)	APPROX. SPACE REQUIRED (in)			Shipping Weight (lbs)
				CONTINUOUS	PEAK	BACKWASH	BACKWASH	FAST RINSE		L	W	H	
EWS FTW15AG9SS1	18.0	1.5"	24x72	25.2	31.4	94.2	10.0	8.0	1.5	99	26	85	1960
EWS FTW2MQCAG14SS1	28.0	2"QC	30x72	39.2	49.2	147.4	10.0	8.0	2.0	117	32	95	2975
EWS FTW2HAG21SS1	42.0	2"H	36x72	56.6	70.8	212.0	10.0	8.0	3.0	131	38	98	4190
EWS FTW3AG28SS1	56.0	3"	42x72	77.0	96.2	288.0	10.0	8.0	5.5	157	44	110	6300
EWS FTW3AG37SS1	74.0	3"	48x72	100.6	125.8	378.0	10.0	8.0	5.5	163	50	107	7,600

* Large tanks can be replaced with system controlled multiple small tanks to reduce the regeneration drain flow and to get continuous filtered water. Contact Excalibur for more information.
* Booster pump required for separate source regeneration, if combined pressure available is less than 40 psi.

EXCALIBUR SYSTEM CONTROLLED REGENERATION COOLING TOWER SIDE STREAM 5-MICRON FILTER SYSTEM

Advantages

- Pump Controller with built-in motor control package
- System Controller for regenerations and progressive flow
- Continuous water filtered flow up to total system demand
- Regenerate one tank at a time while others remain in service
- Historical operating data
- Accurate flow meter with totalizer
- Electronically controlled backwash and fast rinse regeneration cycles
- Centrifugal pump with easy serviceability
- Separate source regeneration
- Pressure gauge readings for regeneration separate source, untreated source, pump discharge and post filter
- Blue powder coated carbon steel frame 1" to 3" square tubing
- Pressure relief valve to control maximum water pressure
- 5-Micron filtration
- 40psi pressure boost from cooling tower water supply or greater

FILTER SPECIFICATIONS

MODEL	MEDIA PER UNIT (ft^3)	CONTROL VALVE	TANK SIZE (in)	FLOW RATE (GPM)						CYCLE DURATION (Min)	
				PROGRESSIVE CONTINUOUS				PEAK PER UNIT	BACKWASH	BACKWASH	FAST RINSE
				3/T	4/Q	5	6				
EWS FSC1NAG5SS5	5.0	1.0"	18x65	53.1	70.8	88.5	106.2	22.1	25.0	10.0	8.0
EWS FSC15NAG9SS5	9.0	1.5"	24x72	94.2	125.6	157.0	188.4	39.3	47.2	10.0	8.0
EWS FSC2MQCNAG14SS5	14.0	2"QC	30x72	147.3	196.4	245.5	294.6	61.4	74.0	10.0	8.0
EWS FZ2HAG21SS5	21.0	2"H	36x72	212.1	282.8	-	-	88.4	106.0	10.0	8.0
EWS FZ3AG28SS5	28.0	3"	42x72	288.9	385.2	-	-	120.3	144.0	10.0	8.0
EWS FZ3AG37SS5	37.0	3"	48x72	378.3	504.4	-	-	157.1	189.0	10.0	8.0

MODEL	PUMP (HP)				APPROX. SPACE REQUIRED (in)						SHIPPING WEIGHT (lbs)			
					LENGTH				WIDTH	HEIGHT				
	3/T	4/Q	5	6	3/T	4/Q	5	6			3	4	5	6
EWS FSC1NAG5SS5	2.5	3	5	5	104	132	160	183	20	75	1960	2600	3300	3900
EWS FSC15NAG9SS5	5	5	7.5	10	132	171	215	294	26	85	3150	4180	5180	6500
EWS FSC2MQCNAG14SS5	7.5	10	10	10	175	210	245	280	32	95	4780	6230	7685	9130
EWS FZ2HAG21SS5	10	15	-	-	193	234	-	-	38	98	6580	8630	-	-
EWS FZ3AG28SS5	10	15	-	-	211	308	-	-	44	110	9430	12800	-	-
EWS FZ3AG37SS5	15	25	-	-	279	357	-	-	50	107	11750	15460	-	-

* Booster pump required for separate source regeneration, if combined pressure available is less than 40 psi.

* **N** must be replaced with number of Vessels and **Z** with **T** (triplex) or **Q** (quadplex) to order filter system

EXCALIBUR SYSTEM CONTROLLED REGENERATION COOLING TOWER SIDE STREAM 1-MICRON FILTER SYSTEM

Advantages

- Pump Controller with built-in motor control package
- System Controller for regenerations and progressive flow
- Continuous water filtered flow up to total system demand
- Regenerate one tank at a time while others remain in service
- Historical operating data
- Accurate flow meter with totalizer
- Electronically controlled backwash and fast rinse regeneration cycles
- Centrifugal pump with easy serviceability
- Separate source regeneration
- Pressure gauge readings for regeneration separate source, untreated source, pump discharge and post filter
- Blue powder coated carbon steel frame 1" to 3" square tubing
- Pressure relief valve to control maximum water pressure
- 1-Micron filtration
- 40psi pressure boost from cooling tower water supply or greater

FILTER SPECIFICATIONS

MODEL	MEDIA PER UNIT (ft^3)	CONTROL VALVE	TANK SIZE (in)	FLOW RATE (GPM)						CYCLE DURATION (Min)	
				PROGRESSIVE CONTINUOUS				PEAK PER UNIT	BACKWASH	BACKWASH	FAST RINSE
				3/T	4/Q	5	6				
EWS FSC15NAG9SS1	9.0	1.5"	24x72	37.8	50.4	63.0	75.6	15.7	47.1	10.0	8.0
EWS FSC2MQCNAG14SS1	14.0	2"QC	30x72	58.8	78.4	98.0	117.6	24.6	73.7	10.0	8.0
EWS FZ2HAG21SS1	21.0	2"H	36x72	84.9	113.2	-	-	35.4	106.0	10.0	8.0
EWS FZ3AG28SS1	28.0	3"	42x72	115.5	154.0	-	-	48.1	144.0	10.0	8.0
EWS FZ3AG37SS1	37.0	3"	48x72	150.9	201.2	-	-	62.9	189.0	10.0	8.0

MODEL	PUMP (HP)				APPROX. SPACE REQUIRED (in)						SHIPPING WEIGHT (lbs)			
					LENGTH				WIDTH	HEIGHT				
	3/T	4/Q	5	6	3/T	4/Q	5	6			3	4	5	6
EWS FSC15NAG9SS1	1.5	2	2.5	5	132	172	210	254	26	85	2950	3940	4905	5970
EWS FSC2MQCNAG14SS1	2.5	5	5	5	160	210	250	290	32	95	4505	6070	7520	8970
EWS FZ2HAG21SS1	5	5	-	-	188	234	-	-	38	98	6420	8470	-	-
EWS FZ3AG28SS1	5	7.5	-	-	206	268	-	-	44	110	9270	12430	-	-
EWS FZ3AG37SS1	7.5	10	-	-	234	307	-	-	50	107	11380	15100	-	-

* Booster pump required for separate source regeneration, if combined pressure available is less than 40 psi.

* **N** must be replaced with number of Vessels and **Z** with **T** (triplex) or **Q** (quadplex) to order filter system

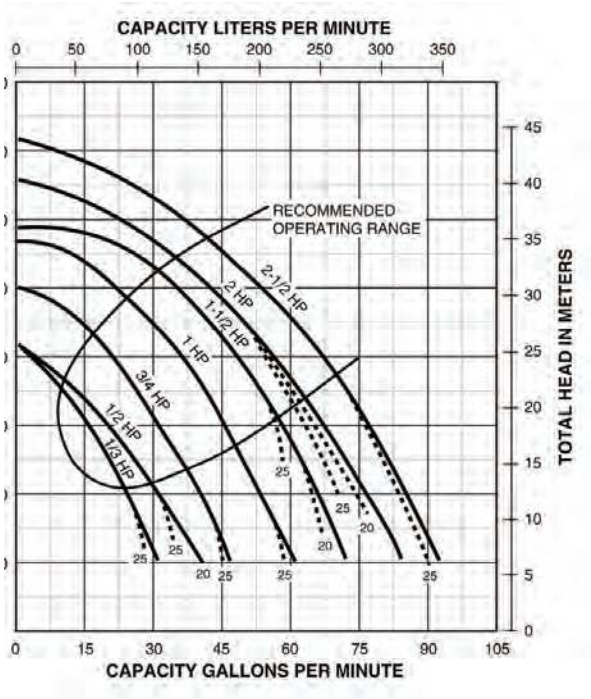
SEPARATE SOURCE REGENERATION BOOSTER PUMPS

The separate source regeneration pressure has to be boosted with an additional pump for all 1-micron filtration systems and system controlled regeneration multi-tank 5-micron filtration systems. The separate regeneration source pressure must be boosted to combined pressure of 50psi or more for proper regeneration.

EXCALIBUR HORIZONTAL CENTRIFUGAL PUMP SPECIFICATIONS

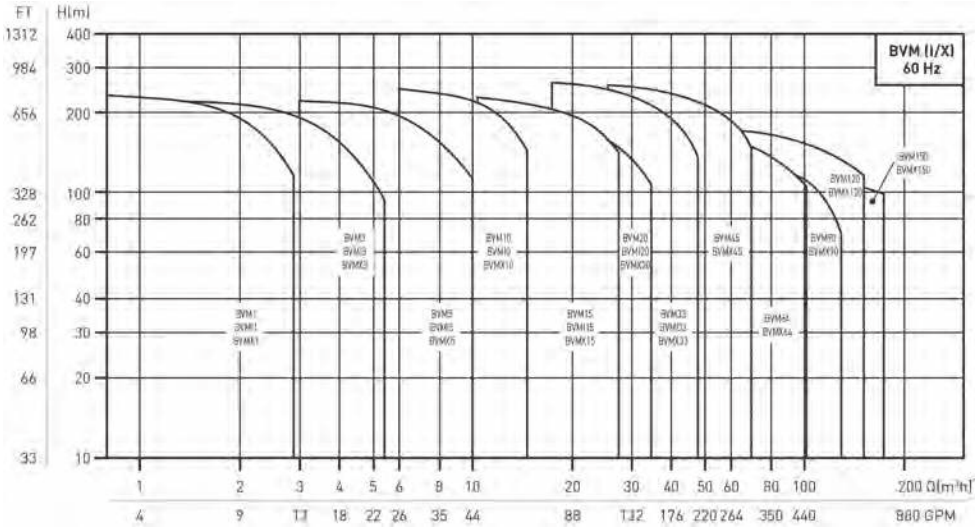
- Close grained cast iron body and seal plate
- Silicone bronze impeller with 416 stainless steel shaft
- Replaceable wear ring and feature back pull out design
- Flow rates from 15 to 60 GPM
- Totally enclosed fan cooled motors

EXCALIBUR SEPARATE SOURCE REGENERATION HORIZONTAL BOOSTER PUMPS



EXCALIBUR SEPARATE SOURCE REGENERATION VERTICAL MULTISTAGE PUMP SPECIFICATIONS

- Easy service and access with cartridge seal
- Dry running sensor eliminates the risk of breakdowns due dry running
- Vertical multistage for narrow footprint with flanged connections for easy installation and removal
- Cast iron material standard, Stainless Steel optional
- For flow rates from 70 to 380 GPM



WARRANTY INFORMATION

Equipment and/ or parts shall be covered by manufacturer's replacement warranty. Excalibur Water Systems warranties its products to be free from defect in materials and workmanship to the original owner from the date on the proof of purchase as described below.

- Fiberglass Mineral Tanks – TEN (10) Years
- Media – TEN (10) Years
- Control Valves, MAV and NHWB – FIVE (5) Yearss
- All other components – ONE (1) Year

EXCALIBUR
Water Systems

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