High Efficiency Tower Clean Systems

Eliminate Basin Cleaning and Reduce Energy Consumption

FLOW RATES:

Basin Sweeping: 80 – 410 US gpm (18 – 93 m^3/hr)
Side Stream: 95 – 500 US gpm (22 – 114 m^3/hr)

Maximum Pressure Rating: 150 psi (10.3 bar)
Maximum Operating Temperature: 140°F (60° C)

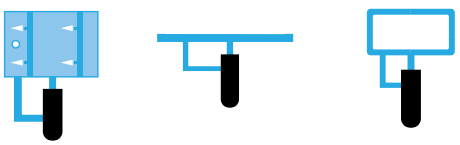
LAKOS High Efficiency eTCX Tower Clean Systems help keep the cooling tower basin free of suspended solids that cause scale, corrosion, fouling and biological activity.

Controlling these factors leads to lower maintenance, improved chemical effectiveness, longer cooling tower and downstream equipment life, and a significant decrease in long-term water and energy costs.

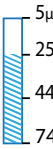
eTCX Features and Benefits:

- 99% filtration efficiency of solids down to 25 micron (2.6 Specific Gravity) and larger greatly reduces suspended solids in recirculated cooling tower water; significantly improving equipment life and removing food source for biological activity
- Minimize tower nozzle clogging, protect basin floor from under-deposit corrosion, eliminate risk of injury associated with manual basin cleaning, and greatly reduce heat transfer loss in downstream equipment
- eTCX System can be utilized for basin sweeping, side stream cleaning, and closed loop cleaning applications
- NEMA Premium 1750RPM TEFC motor provides superior efficiency, greater returns on investment, and meets most urban noise abatement levels
- eTCX Systems feature pumps fitted with bronze impellers that are precisely trimmed and dynamically balanced to reduce noise and vibration; prolonging pump seal and bearing life
- Electric fail-safe valve (EFS) eliminates manual purging and automatically closes valve in event of power failure
- eHB HydroBooster water nozzles operate at 10psi. 50% less psi than our standard HydroBoosters; reducing need for larger pumps
- Solids Recovery Vessel (SRV) offers zero water loss and helps meet waste/chemical disposal requirements. eTCX System features SRV-833 - a larger SRV allowing for fewer bag changes

FILTRATION APPLICATIONS:



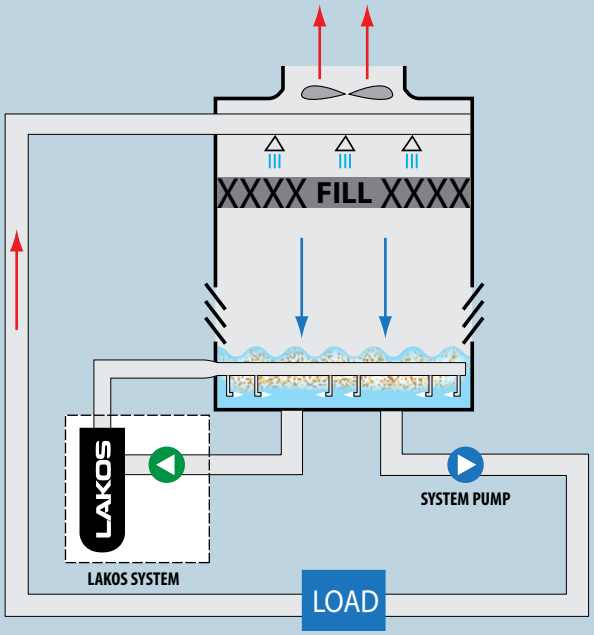
Basin Sweeping | Side Stream | Closed Loop

WATER USAGE	SOLIDS METER	MAINTENANCE
		
Zero Water Loss Options Available	Micron Removal µm (microns)	Zero Maintenance Options Available

LAKOS High Efficiency Product™

LAKOS® Separators and Filtration Solutions

High Efficiency Basin Sweeping



Traditional side stream filtration systems take a percentage of the flow (generally 10% or less) from the main line using a by-pass directly to the filtration system. The filtered water is then returned to the main line. Basin sweeping is simply relocating the traditional side stream filtration system from the main line directly to the cooling tower basin, thus increasing the percentage of side stream filtration to 20% or more.

Additional advantage is gained by recirculating the filtered water through a network of pipes and nozzles that sweep and direct other settled and suspended solids from the basin towards the filtration system – and away from the condenser water pump.

Basin sweeping capacity is determined by the volume of water in the basin rather than assigning a percentage of the full flow, as is commonly done with traditional side stream applications.

ADVANTAGES OF eTCX SYSTEM

AVERAGE SYSTEM PUMP POWER REDUCTION

eTCX Systems 28.5%

TC Systems

28.5% Less Energy Required

AVERAGE SYSTEM NOISE REDUCTION (dB comparison)

eTCX Systems 79.8%

TC Systems

79.8% Less Noise

AVERAGE SYSTEM PUMP POWER REDUCTION (per US gpm)

eTCX Systems 34.4%

TC Systems

34.4% Pump Power Reduction (P/gpm)

AVERAGE SYSTEM kW REDUCTION

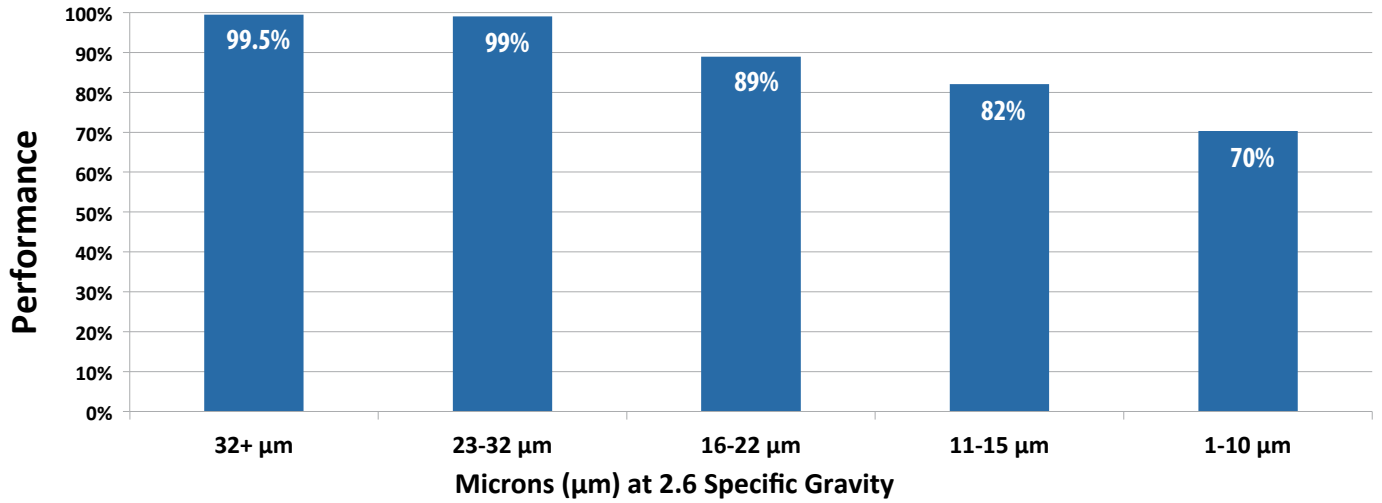
eTCX Systems 29.7%

TC Systems

29.7% Decrease in system kW consumption

Ask us about our ROI Calculator

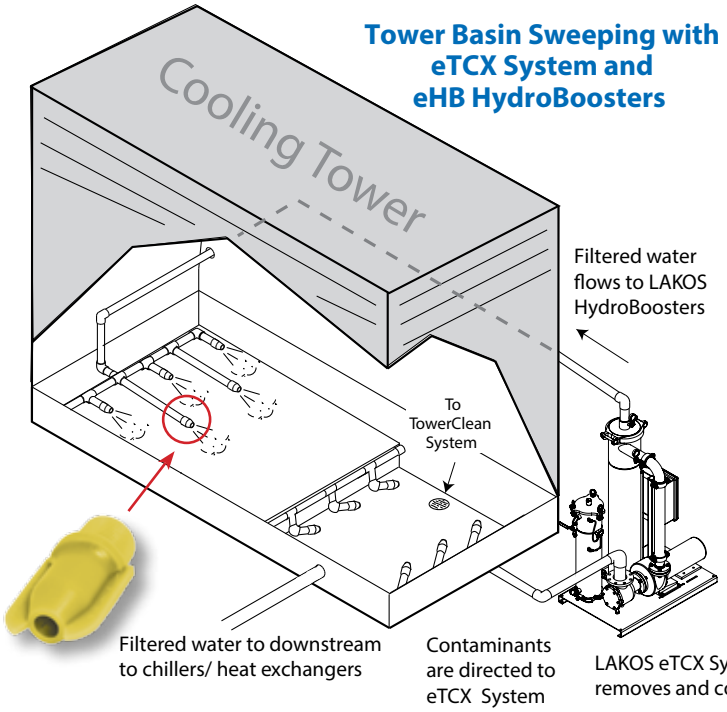
Solids Removal Chart: *Recirculated flow at 20% Side Stream*



The above efficiency results were based upon 20% side stream within 16 hours. Field results may vary depending on side stream percentage and basin size. Performance results verified by independent testing.

eHB HydroBoosters™

**eHB HydroBoosters operate at 10psi.
50% less than our standard HydroBoosters**



HydroBoosters in action

Directed turbulence maximizes cleaning efficiency in the tower basin/remote sump. LAKOS eHB HydroBoosters provide that turbulence with patented vortexing action. Consult LAKOS for technical assistance in basin sweeping layout and piping options.

Basin Cleaning in a Factory Packaged Tower

TC Systems in Aulani Disney Hawaii Resort, Hawaii USA

Basin Sweeping in a Field Erected Tower

HydroBooster Layout at Roseburg Forest Products, California USA

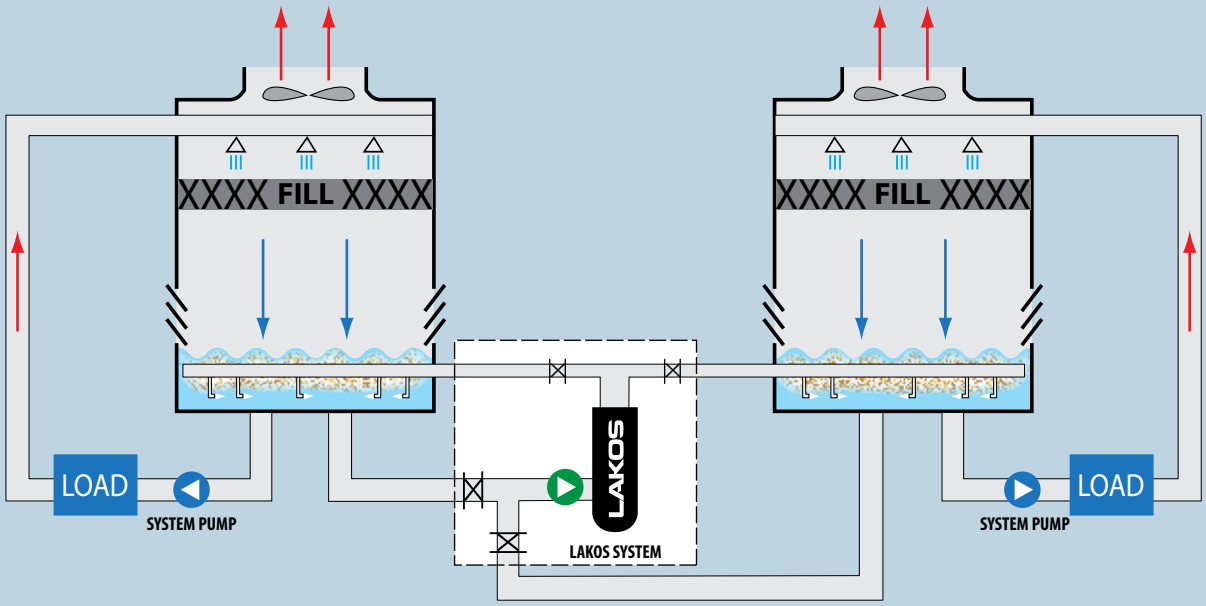
Solids Recovery Vessel (SRV)

Features and Benefits:

- New Solids Recovery Vessel (SRV-833) features double capacity to allow for fewer bag change outs
- Capture separated solids easily and return clean liquid back to eTCX pump suction; eliminating liquid loss
- Continuous operation; remove collected solids without interrupting system flow for service
- Lower waste treatment costs, meet waste disposal requirements and greatly reduce chemical loss
- Indicator package (SRI-816) provides convenient way to determine bag change-outs
- Optional dry contact available for remote monitoring with BMS (Building Management System) connection or audio/visual alarms for bag changes
- For more information see LAKOS literature LS-622

SRV-833

Dual Tower Switching for Light Solids Loading



LAKOS recommends one eTCX basin sweeping system per cell for maximum energy savings and reduced life-cycle costs.

When short term budget needs demand, eTCX systems also provide the benefit of filtering two cooling tower cells alternately – without operator input.

Alternating Kit Features and Benefits:

- Provides primary and stand-by tower filtration
- Use one filtration system to clean two cooling tower cells alternately. Economical basin sweeping solution for applications with light solids loading
- Utilized when filtration requirements have larger horsepower (HP) needs and the environment is such that it will allow for smaller HP systems to alternate between cells
- Automated valve switching operation eliminates manual switching in multiple tower configurations
- Units can be set up to allow BMS interface as the primary control to switch the single filtration system between two cells, thus reducing frequent operator interaction

Electric Fail-Safe Valve (EFS)

EFS

Features and Benefits:

- Battery backup electric fail-safe option automatically closes valve in event of power failure
- Eliminates manual purging
- EFS actuator features an electronic circuit that automatically adjusts the motor speed (depending on torque variations) to keep cycle time constant – maintaining consistent purge durations
- EFS actuator housing is made of a V0 self-extinguish class techno-polymer material for fire safety
- Can be combined with an SRV to offer temporary hands-off operation
- For more information see LAKOS literature LS-913

Models & Dimensions

Basin Sweeping Model Selection

After determining the basin size using the formula to the right, refer to the flow rate column below.

Select a model that has an equal or larger flow rate. Flow rates larger than those below are available. Please consult LAKOS.

Since active and directed circulation of basin/sump liquid is required for effective solids removal, model selection for the LAKOS eTCX System is based upon the size of the basin or remote sump. This is best determined with these calculations:

For Packaged Cooling Towers

Flow Rate = Length of Basin (feet) X Width of Basin (feet) X 1 gpm/ft² (2.44 m³/hr/m²)

For Remote Sumps with Water Depth Greater than 3 ft**

Flow Rate = Length of Basin (feet) X Width of Basin (feet) X 1.5 gpm/ft² (3.66 m³/hr/m²)

Basin Sweeping Configuration

Flow Rate = Basin square footage

Models	eHTX Separators	Flow Rates**		Diffuser/Strainer inlet****	Separator outlet	System Weight		Pump HP/kW*	Full Load Amperage***			
		US gpm	m³/hr			lbs	kgs		208V	230V	460V	575V
eTCX-0080-SRV	eHTX-0040	80	18	2-1/2"	1-1/2"	568	257	2 HP/ 1.49 kW	5.5	5	2.5	2
eTCX-0110-SRV	eHTX-0060	110	25	3"	2"	683	309	3HP/2.23 kW	9	8.4	4.2	3.4
eTCX-0160-SRV	eHTX-0080	160	36	4"	2-1/2"	832	377	5 HP/3.72 kW	13.9	13.4	6.7	5.4
eTCX-0210-SRV	eHTX-0090	210	48	4"	3"	875	396	5 HP/3.72 kW	14.8	13.4	6.7	5.4
eTCX-0310-SRV	eHTX-0140	310	70	6"	4"	1109	502	7.5 HP/ 5.59 kW	21	18.8	9.4	7.5
eTCX-0410-SRV	eHTX-0185	410	93	6"	4"	1233	555	10 HP/7.45 kW	25.4	24	12	9.6

Side Stream and Closed Loop Configuration

Flow Rate is critical to system performance. Select model based on Side Stream Flow Rates. LAKOS recommends 20% Side Stream

Models	eHTX Separators	Flow Rates**		Diffuser/Strainer inlet****	Separator outlet	System Weight		Pump HP/kW*	Full Load Amperage***			
		US gpm	m³/hr			lbs	kgs		208V	230V	460V	575V
eTCX-0080-SRV	eHTX-0040	95	22	2-1/2"	1-1/2"	568	257	2 HP/ 1.49 kW	5.5	5	2.5	2
eTCX-0110-SRV	eHTX-0060	140	32	3"	2"	683	309	3HP/2.23 kW	9	8.4	4.2	3.4
eTCX-0160-SRV	eHTX-0080	210	48	4"	2-1/2"	832	377	5 HP/3.72 kW	13.9	13.4	6.7	5.4
eTCX-0210-SRV	eHTX-0090	250	57	4"	3"	875	396	5 HP/3.72 kW	14.8	13.4	6.7	5.4
eTCX-0310-SRV	eHTX-0140	365	83	6"	4"	1109	502	7.5 HP/ 5.59 kW	21	18.8	9.4	7.5
eTCX-0410-SRV	eHTX-0185	500	114	6"	4"	1233	555	10 HP/7.45 kW	25.4	24	12	9.6

NOTES: All eTCX models are available in PLUS system configurations for filtration down to .35 microns.

* Model-0080 uses 3500RPM.

** Higher flow rates available. Contact LAKOS.

*** Contact LAKOS for motor specific FLA.

**** Minimum suction pipe size is equivalent to system's diffuser inlet. Pump NPSHR and piping to-and-from LAKOS Systems should be reviewed and sized accordingly. Consult LAKOS for design assistance if length of suction line is more than 25' or has several elbows or elevation changes.

Inlet/Outlet Premium Butterfly Valve Kits

Model	Inlet Valve Sizes	Outlet Valve Sizes
eTCV models	**2.5" to 6" Flanged Butterfly Valves**	**1.5" to 4" Butterfly Valves** 1.5" model is NPT ball valve

HydroBoosters™

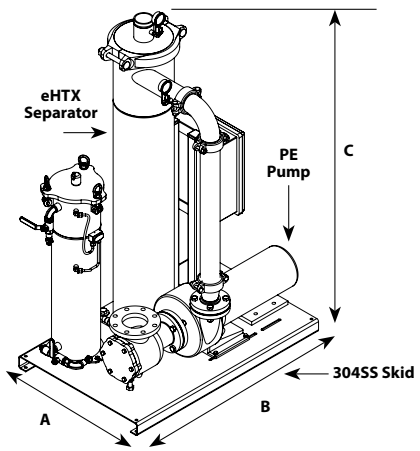
Model	Connection Size	Extension Pipe Size (minimum)	Input Flow and Induced Outflow
eHB	**½" (12.7mm) male NPT**	**¾" (19.05mm)**	**10 US gpm and 60 US gpm** (2m³/hr and 14 m³/hr)

NOTE: These flow rates are based on an input pressure of 10psi (.68 bar).
Minimum water level above centerline of HydroBooster should be 2 inches (50.8 mm).

Dimensions

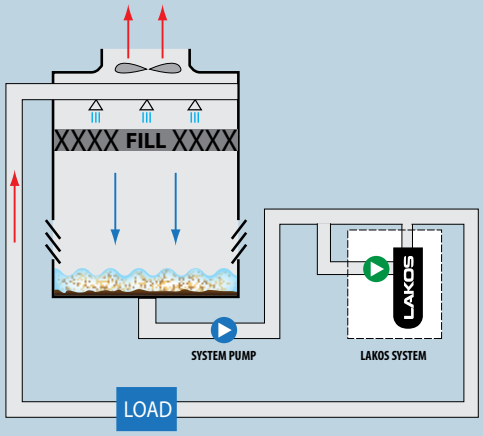
Models	Dim A		Dim B		Dim C	
	inches	mm	inches	mm	inches	mm
eTCX-0080-SRV	45	1143	29-1/2	749	45-1/4	1149
eTCX-0110-SRV	45	1143	29-1/2	749	50-11/16	1287
eTCX-0160-SRV	45	1143	29-1/2	749	59-1/2	1511
eTCX-0210-SRV	45	1143	29-1/2	749	66-11/16	1694
eTCX-0310-SRV	45	1143	31-1/2	800	76-5/8	1946
eTCX-0410-SRV	45	1143	31-1/2	800	82	2083

More detailed CAD drawings and CSI specifications are available at LAKOS.com.



High Efficiency Side Stream and Closed Loop Cleaning

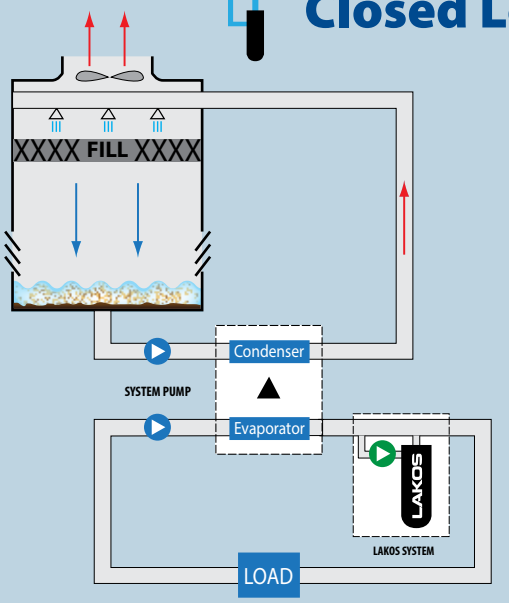
Side Stream



BENEFITS:

- Economical filtration solution
- Large or variable flow application where full flow is not an option and basins are not accessible
- Reduce suspended solids in main line flow
- Easy to retrofit
- Zero liquid loss options with LAKOS Solids Recovery Vessel
- Zero filtration maintenance when using LAKOS automated purge valves

Closed Loop



BENEFITS:

- Side stream filtration to remove solids generated in closed loops
- Zero liquid (water or coolant) loss with Solids Recovery Vessel
- Direct replacement for side stream bags or spiral wound cartridges

Side Stream Filtration, Parkland Hospital, Texas USA

Closed loop Filtration, Data Center, Virginia USA

Claude Laval Corporation, headquartered in Fresno California since 1972, is recognized worldwide for engineering, manufacturing and marketing the original centrifugal action solids from liquids separator and being the world-wide leader in cyclonic separation technology.

LAKOS Separators are manufactured in the USA.

eTCX system components are warranted for one (1) year from date of delivery. If installed 6 months or more after ship date, warranty shall be a maximum of 18 months from ship date. eHTX separators are warranted for five (5) years from date of delivery. For detailed warranty information visit http://www.lakos.com

LAKOS is an active member of the U.S. Green Building Council
LAKOS is a proud and contributing member of ASHRAE for over 30 years

LAKOS Separators are manufactured and sold under one or more of the following U.S. Patents: 5,320,747; 5,338,341; 5,368,735; 5,425,876; 5,578,203; 5,622,545; 5,653,874; 5,894,995; 6,090,276; 6,143,175; 6,167,960; 6,202,543; 7,000,782; 7,032,760 and corresponding foreign patents, other U.S. and foreign patents pending.

LS-910 (Rev. 3/13)

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