Premium Efficiency Process Cooling Filtration Systems

Automatically Keep Industrial Process Towers Clean

FLOW RATES:

Basin Sweeping: 110 – 1110 US gpm (25 – 252 m^3/hr)
Side Stream: 140 – 1110 US gpm (32 – 252 m^3/hr)

Maximum Pressure Rating: 150 psi (10.3 bar)
Maximum Fluid Operating Temperature: 100°F (37.8° C)
Contact factory for high temperature models

LAKOS Premium Efficiency eJCX Systems help keep cooling towers free of dirt and debris.

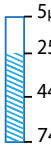
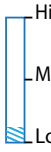
Removing dirt and debris from process water helps lower maintenance costs, improves water treatment effectiveness, extends equipment life, and reduces energy costs.

eJCX Features and Benefits:

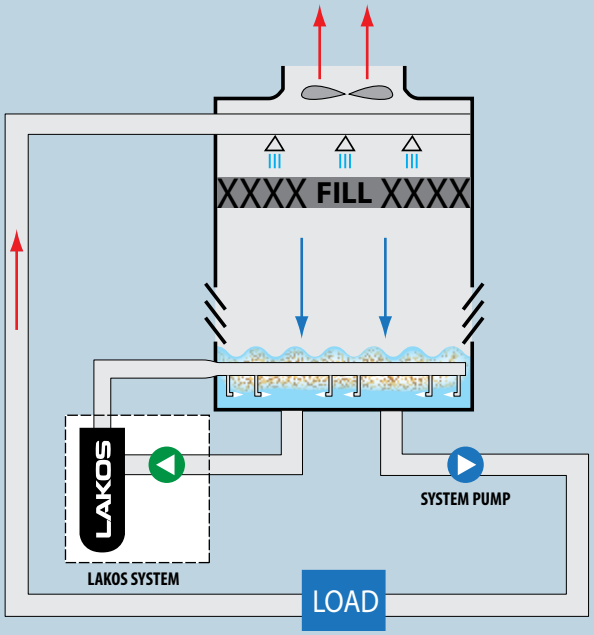
- Up to 99% filtration efficiency of solids down to 25 micron (2.6 Specific Gravity) and larger greatly reduces suspended solids in recirculated cooling tower water; significantly reducing maintenance and extending downstream equipment life
- Control panel supports both Solids Recovery Vessel (SRV) and Automated Purge (EFS/ABV) allowing users the option to convert their system from an SRV to ABV/EFS - Eliminating the need to change the control panel.
- NEMA Premium 1750RPM TEFC motor provides superior efficiency, greater returns on investment, and meets most urban noise abatement levels
- Electric fail-safe valve (EFS) eliminates manual purging and automatically closes valve in event of power failure
- For Basin Sweeping applications, eHB Hydrobooster nozzles efficiently sweep the basin floor of dirt and debris at half the pressure of previous nozzles - thus helping save energy
- Solids Recovery Vessel (SRV) offers zero water loss and helps meet waste/chemical disposal requirements. eJCX 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

High Efficiency Basin Sweeping



Traditional side stream filtration systems take a percentage of the flow (generally 10-25% 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 eJCX SYSTEM

AVERAGE SYSTEM PUMP POWER REDUCTION

eJCX Systems 28.5%

JCX Systems

28.5% Less Energy Required

AVERAGE SYSTEM NOISE REDUCTION (dB comparison)

eJCX Systems 79.8%

JCX Systems

79.8% Less Noise

AVERAGE SYSTEM PUMP POWER REDUCTION (per US gpm)

eJCX Systems 34.4%

JCX Systems

34.4% Pump Power Reduction (P/gpm)

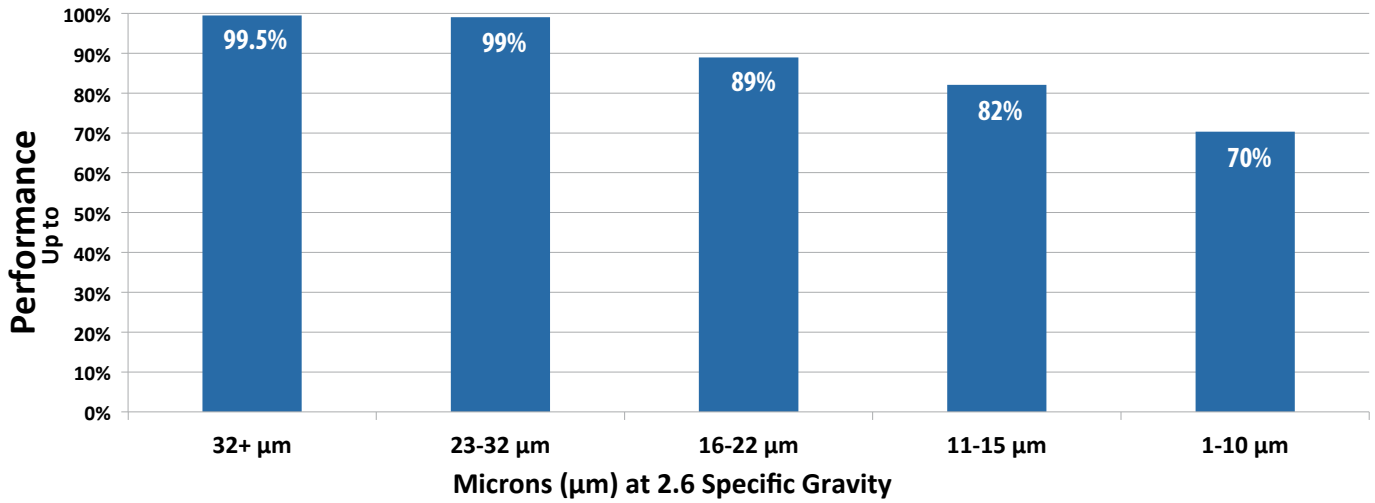
AVERAGE SYSTEM kW REDUCTION

eJCX Systems 29.7%

JCX Systems

29.7% Decrease in system kW consumption

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

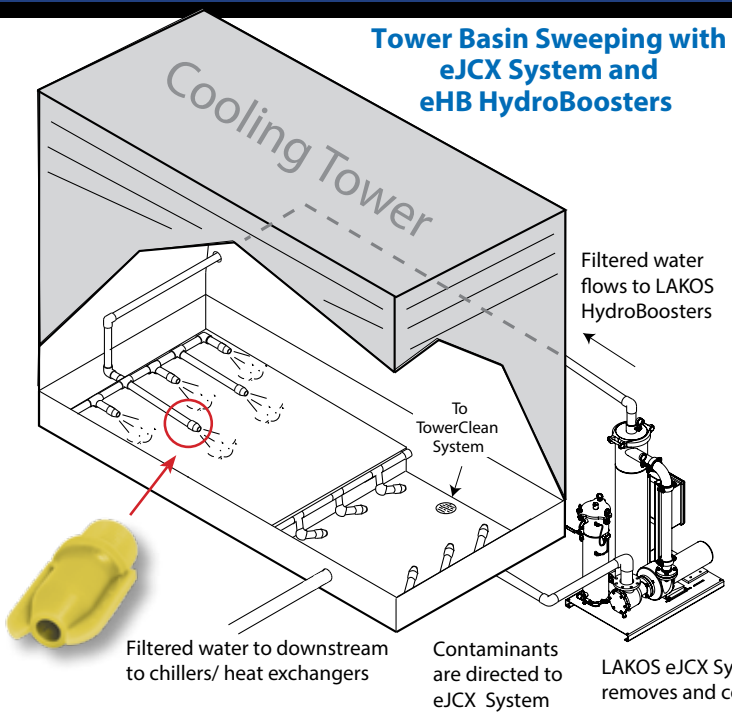


The above efficiency results were based upon 20% side stream within 16 hours. Field results may vary depending on side stream percentage and basin size.
Single Pass Separator Performance results verified by Independent Testing.

eHB HydroBoosters™

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

Tower Basin Sweeping with eJCX System and eHB 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

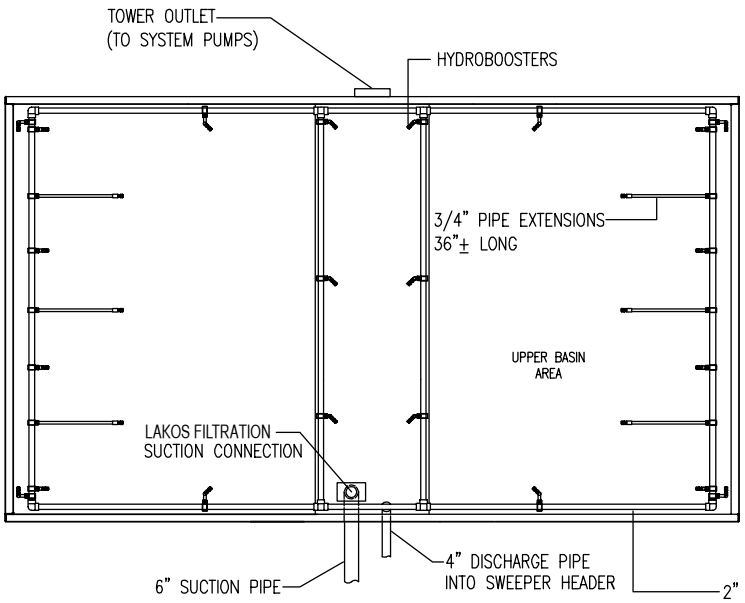
JCX Systems in Aulani Disney Hawaii Resort, Hawaii USA

Basin Sweeping in a Field Erected Tower

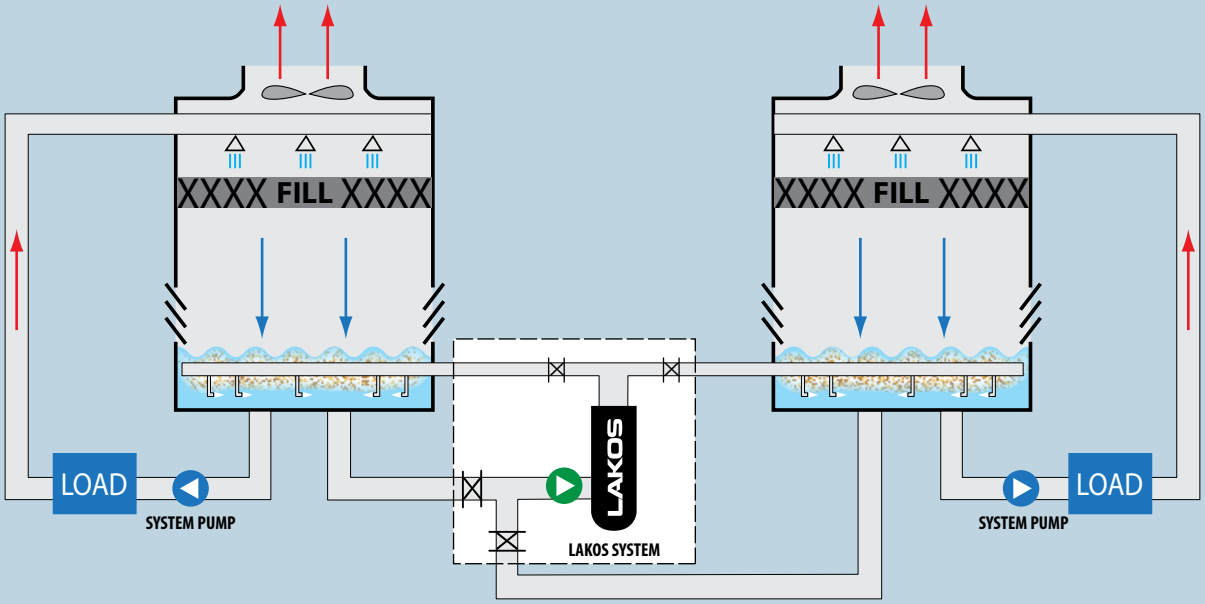
HydroBooster Layout at Roseburg Forest Products, California USA

Installation Best Practices

- Start with a clean basin.
- Required submergence of 2" above centerline inlet of HydroBoosters.
- Position the HydroBoosters to direct solids toward the filtration system's pump intake and away from any other system pump suction areas.
- Use a closed-loop header in order to equalize the pressure to each HydroBooster.
- Eliminate weirs, baffles or other devices which may promote settling or dead spots within the sump.
- Where possible, take advantage of any existing slopes to direct solids toward the low end of a sump.
- When possible, position the system's pump intake where solids are most likely to enter the sump.



Dual Tower Switching for Light Solids Loading



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

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

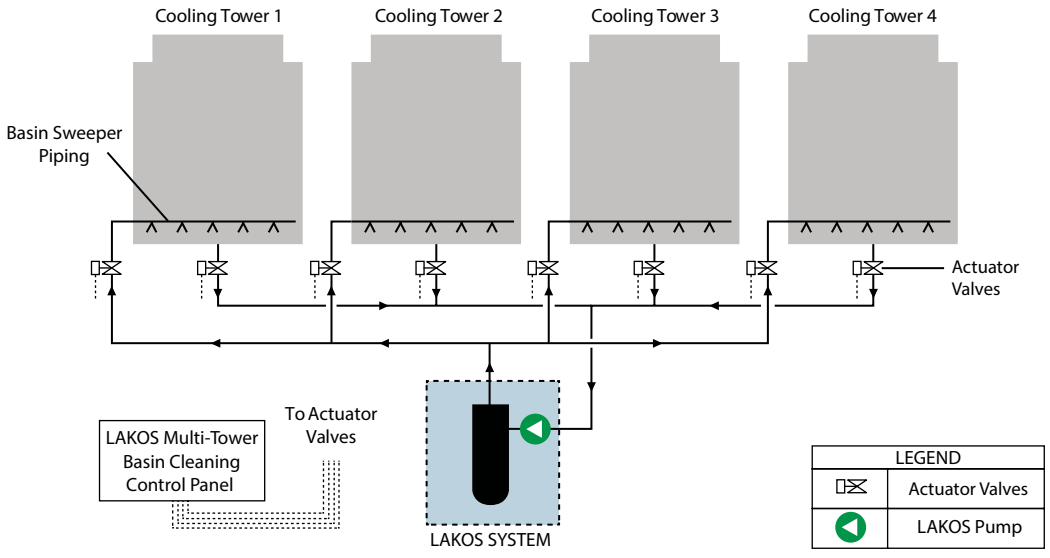
Alternating Kit Features and Benefits:

- 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 dual cell tower configurations

LAKOS Multi-Tower Basin Cleaning Control Panel
NEMA4x Enclosure

Actuator/Valve Assemblies

Layout Drawing



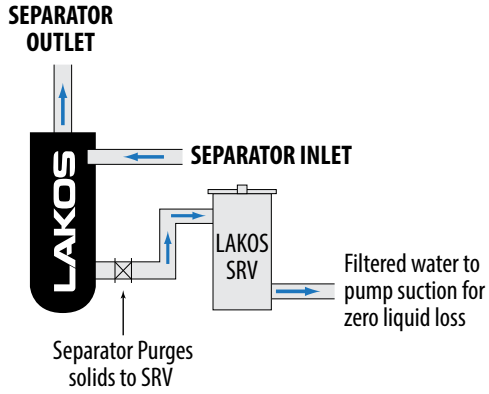
1. All wiring, conduit, and fittings from the control panel to the actuator/valve assemblies to be sized and provided by others. 2. Multi-Tower Basin Cleaning control panel is powered separately from the LAKOS Filtration system.

Solids Recovery Vessel (SRV)

Features and Benefits:

- Capture separated solids easily and return clean liquid back to eJCX 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
- 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



Solids Recovery Vessel (SRV) helps capture separated solids from LAKOS Separators – and return clean liquid back to the system through pump suction for zero liquid loss

Electric Fail-Safe Valve (EFS)

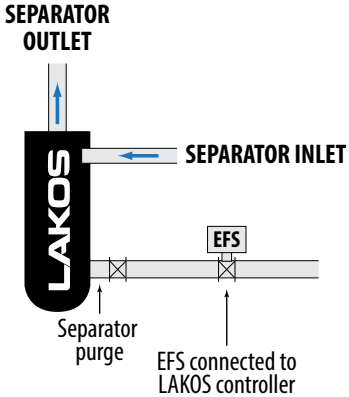
Features and Benefits:

- 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

EFS

Models	Valve Diameter	
	inches	mm
EFS-07	3/4"	19.05
EFS-15	1-1/2"	38.1

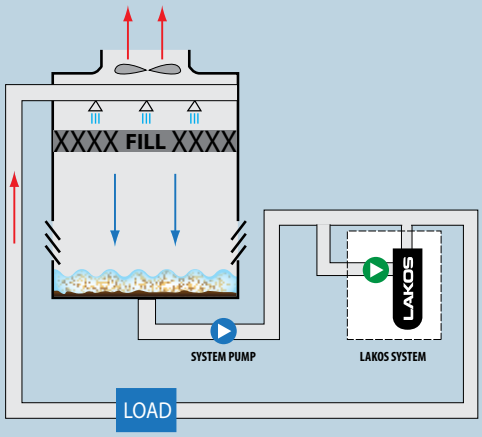
Purge controller is required and included as part of valve kit.



EFS and LAKOS Controller automatically purge separated solids from Separator's collection chamber at pre-determined time intervals – eliminating manual purging.

Premium Efficiency Side Stream and Closed Loop Cleaning

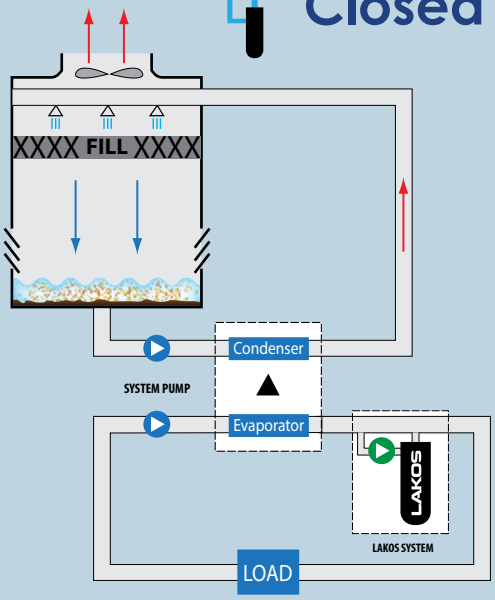
Side Stream



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

Inlet/Outlet Premium Butterfly Valve Kits

Model	Inlet Valve Sizes	Outlet Valve Sizes
eTCV models	**2.5" to 8" Flanged Butterfly Valves**	**1.25" to 4" Butterfly Valves** 1.25" and 1.5" models are NPT ball valves

HydroBoosters™

Model	Connection Size	Extension Pipe Size (minimum)	Input Flow	Input PSI
eHB	**½" (12.7mm) male NPT**	**¾" (19.05mm)**	**10 US gpm** ($2m^3$/hr)	**10 psi**

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).

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 eJCX 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	Separators	Flow Rates[1]		Diffuser/Strainer Inlet (125# ANSI Flanged)[3]	Separator Outlet (150# ANSI Flanged)	System Weight		Pump HP/kW
		US gpm	m³/hr			lbs	kgs	
eJCX-0110	eJPX-0080-V	110	25	3″	2″	692	314	3 HP/2.23 kW
eJCX-0160	eJPX-0110-V	160	36	4″	2-1/2″	874	396	5 HP/3.72 kW
eJCX-0210	eJPX-0135-V	210	48	4″	3″	1026	465	7.5 HP/5.59 kW
eJCX-0310	eJPX-0195-V	310	70	6″	4″	1323	600	7.5 HP/5.59 kW
eJCX-0410	eJPX-0250-V	410	93	6″	4″	1322	600	10 HP/7.45 kW
eJCX-0610	eJPX-0350-V	610	139	6″	4″	1681	762	20 HP/14.8 kW
eJCX-0910	eJPX-0425-L	910	207	8″	6″	2715	1231	25 HP/18.7 kW
eJCX-1110	eJPX-0560-L	1110	252	8″	6″	3091	1402	30 HP/22.4 kW

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	Separators	Flow Rates[1]		Diffuser/Strainer Inlet (125# ANSI Flanged)[3]	Separator Outlet (150# ANSI Flanged)	System Weight		Pump HP/kW
		US gpm	m³/hr			lbs	kgs	
eJCX-0110	eJPX-0080-V	140	32	3″	2″	692	314	3 HP/2.23 kW
eJCX-0160	eJPX-0110-V	200	45	4″	2-1/2″	874	396	5 HP/3.72 kW
eJCX-0210	eJPX-0135-V	250	57	4″	3″	1026	465	7.5 HP/5.59 kW
eJCX-0310	eJPX-0195-V	350	80	6″	4″	1323	600	7.5 HP/5.59 kW
eJCX-0410	eJPX-0250-V	490	111	6″	4″	1322	600	10 HP/7.45 kW
eJBX-0610	eJPX-0350-V	610	139	6″	4″	1757	797	10 HP/7.45 kW
eJBX-0810	eJPX-0425-L	810	184	8″	6″	2340	1061	15 HP/11.2 kW
eJBX-1110	eJPX-0560-L	1110	252	8″	6″	2917	1323	25 HP/18.7 kW

NOTES:

[1] Higher flow rates available. Contact LAKOS.

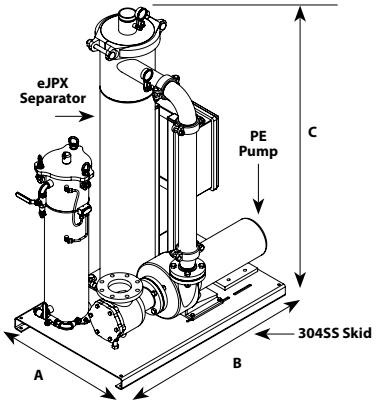
[2] Contact LAKOS for motor specific FLA.

[3] 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.

[4] eJCX-0910, eJCX-1110, eJBX-0810 and eJBX-1110 units are 22 1/2° low profile

Dimensions

Models	Dim A		Dim B		Dim C	
	inches	mm	inches	mm	inches	mm
eJCX-0110	30	762	41	1041	52	1321
eJCX-0160	32	813	40	1016	65-1/2	1664
eJCX-0210	36	914	45	1143	72-15/16	1853
eJCX-0310	36	914	48	1219	82-1/16	2084
eJCX-0410	36	914	50	1270	88-1/16	2237
eJCX-0610	40	1016	52	1321	102-3/4	2610
eJCX-0910	42	1067	78-1/2	1995	68-7/16	1739
eJCX-1110	41-7/16	1053	88-15/16	2260	75-13/16	1926
eJBX-0610	42	1067	50	1270	102-3/4	2610
eJBX-0810	38-1/4	972	78-1/2	1995	68-7/16	1739
eJBX-1110	41	1041	88-15/16	2260	75-13/16	1926



Dimensions are for spatial considerations only. Do not pre-plumb based on above dimensions. Contact factory for detailed dimensions.

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

Independent Testing

ICWT International Center for Water Technology

LAKOS Separators have been independently tested and certified by an independent testing agency, the International Center for Water Technology (ICWT), confirming our separators' filtration performance and capability to remove troublesome particle matter from pumped water.

For over 30 years the internationally recognized ICWT/CIT Testing Laboratories have been providing independent, third party testing to a wide range of irrigation and other industries around the world.

ICWT has experience with hydraulics, pumps, filters, and valves. Fluid component testing provides manufacturers, distributors and end-users with accurate performance data for applicability assessment and enable product development. ICWT was recently certified by IAPMO R&T - North America's premier third party certification body for plumbing and mechanical products. More information about the testing agency and testing process can be found at https://www.fresnostate.edu/jcast/cit/.

Limited Warranty

This product series is warranted to be free of defects in material or workmanship, given the following terms:

LAKOS Separator: 5 years

All other components: 12 months from date of installation; if installed 6 months or more after ship date, warranty shall be a maximum of 18 months from ship date.

If a fault develops, notify us, giving a complete description of the alleged malfunction. Include the model number(s), date of delivery and operating conditions of subject product(s). We will subsequently review this information and, at our option, supply you with either servicing data or shipping instruction and returned materials authorization. Upon prepaid receipt of subject product(s) at the instructed designation, we will then either repair or replace such product(s), at our option, and if determined to be a warranted defect, we will perform such necessary product repairs or replace such product(s) at our expense.

This limited warranty does not cover any products, damages or injuries resulting from misuse, neglect, normal expected wear, chemically-caused corrosion, improper installation or operation contrary to factory recommendation. Nor does it cover equipment that has been modified, tampered with or altered without authorization.

No other extended liabilities are stated or implied and this warranty in no event covers incidental or consequential damages, injuries or costs resulting from any such defective product(s).

LAKOS 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.

eJCX 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. eJPX separators are warranted for five (5) years from date of delivery. For detailed warranty information visit http://www.lakos.com

LAKOS is a proud and contributing member of ASHRAE for over 30 years

LS-1059A (Rev. 9/21)

LAKOS FILTRATION SOLUTIONS

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