

Deluxe Tower-Clean Systems

TCX

Controls solids accumulation in cooling towers; for side-stream filtration, too.

Featuring the centrifugal-action performance of LAKOS Separators, the TCX Series is an effective filtration package designed to reduce solids problems in cooling water systems. Eliminates manual tower cleaning & blowdown. Reduces heat exchanger fouling. Minimizes water loss & chemical usage. Improves energy savings.

Using continuous, directed circulation (see illustrations, page 2), the TCX System prevents troublesome solids accumulation in tower basins/remote sumps and helps control harmful bacterial growth. As a side-stream filter, TCX limits solids fouling throughout the cooling water loop.

Performance has been independently tested, achieving 98% removal of 5-75 micron solids.

Fully-assembled, factory-tested & installation-ready

Minimizes valuable engineering, purchasing, plumbing and electrical responsibilities. Maximizes user confidence and operating performance. Installs quickly and easily.

Fully-accessible LAKOS Separator

Allows for easy inspection or servicing.

Top quality components

Valves, strainer, electrical controls and connection piping built to highest specifications for long-lasting reliability.

Full-feature electrical control panel

IEC starter with overload module. HOA selector switch, NEMA 4x enclosure, re-set/disconnect/trip switch, CSA-approved. Available in all power requirements.

Compact design fits restricted spaces

Less than the size of most alternative filtration packages, yet easily serviceable.

Concentrated sludge; zero liquid loss

Separated solids are captured in an easy-to-service closed-bag vessel. No system interruptions. Standard visual indicator may be optionally replaced with electric contacts for use with central control panels, flashing lights, audible alarms, etc. Systems also available with an automatic purge valve for periodic solids flushing to desired waste.

Factory-supported HydroBooster design

With your tower basin/remote sump configuration, LAKOS will design the most appropriate system to maximize your operating performance (see page 2).

NOTE: HydroBooster hardware is priced separately.



Flow range:
65-1100 U.S.gpm
(15-250 m³/hr)

Maximum Pressure Rating
125 psi (8.6 bar)

Description

Operation

Installation

Model Selection

Dimensions

Specifications

Sample Installations

Model Selection

To effectively control settleable solids build-up in a cooling tower basin or remote sump, the TCX Series requires active and directed circulation of the basin/sump in order to "sweep" troublesome solids into the TCX Series pump intake. LAKOS HydroBoosters (sold separately) best accomplish this function (see illustrations at right). TCX Series model selection is based on the flow rate necessary for the total area of the basin or remote sump. Use the following calculations:

For Packaged Cooling Tower Systems

$$\text{Flow Rate} = \left[\begin{array}{c} \text{Length*} \\ \text{of} \\ \text{Basin} \end{array} \right] \times \left[\begin{array}{c} \text{Width*} \\ \text{of} \\ \text{Basin} \end{array} \right] \times \left[\begin{array}{c} 1^{**} \end{array} \right]$$

Note: LAKOS also offers a simple selection guide for all major cooling tower makes, series and sizes. Consult factory for assistance.

For Remote Sumps

$$\text{Flow Rate} = \left[\begin{array}{c} \text{Length*} \\ \text{of} \\ \text{Basin} \end{array} \right] \times \left[\begin{array}{c} \text{Width*} \\ \text{of} \\ \text{Basin} \end{array} \right] \times \left[\begin{array}{c} 1.5^{**} \end{array} \right]$$

*This value must be in feet for accuracy.

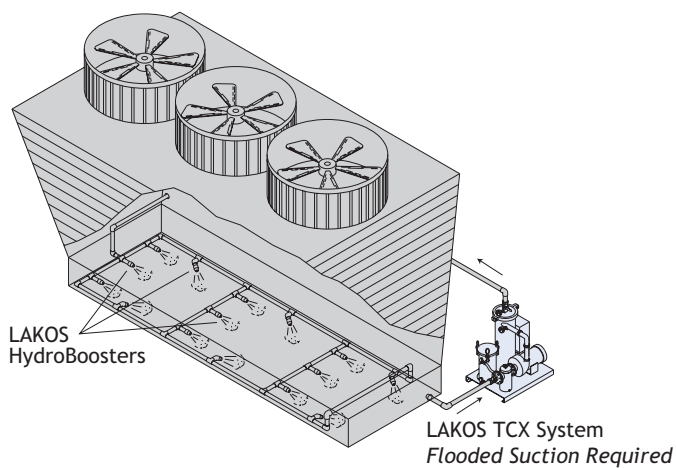
**For basin/sump depths greater than 6 feet (1.8 meters), consult factory.

With the above calculation, refer to the TCX Flow Rate column on page 3. Select the model that has an equal or next larger flow rate. For flow rates larger than those found on the chart, two or more TCX Systems may be required. Custom systems also available.

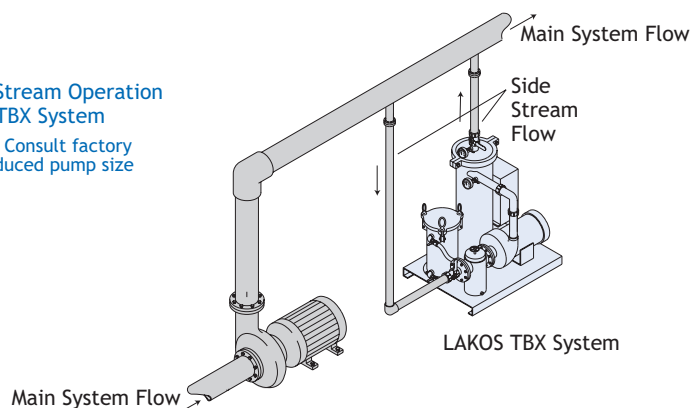
Side-Stream Systems-TBX Series

Compact and complete with its own pump, specify the TBX option for side-stream applications (see illustration at right). Typically sized for 10-20% of the mainstream flow, the appropriate TBX unit will help control solids accumulation in a recirculating loop. Features include a reduced horsepower pump for valuable energy savings. For proper model selection, determine the desired side-stream flow rate for your application and find the corresponding flow rate in the **TCX Flow Rate** column in the chart on page 3. Select the model whose actual flow rate is equal to or greater than your side-stream requirement.

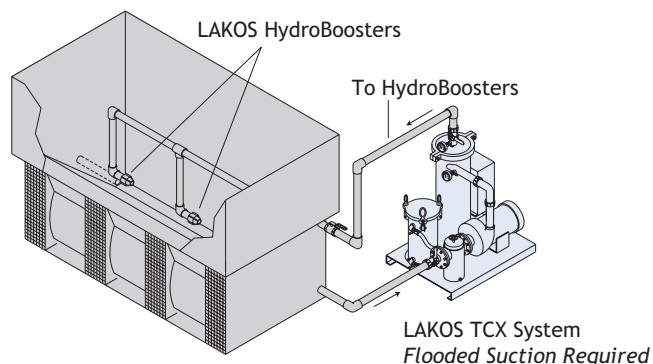
Tower Basin Cleaning with TCX System & HydroBoosters
(sizing per selection sheet)



Side-Stream Operation with TBX System
NOTE: Consult factory for reduced pump size



Tower Basin Cleaning (V-Line Design) with TCX System & HydroBoosters
(sizing per selection sheet)



HydroBoosters

Maximum basin/remote sump cleaning benefits can only be accomplished with directed turbulence within the tower basin/remote sump. LAKOS HydroBoosters provide that turbulence with patented vortexing action (see illustration below). Actually magnifies the pump output through the HydroBoosters to sweep solids off the basin/remote sump and toward the pump intake. Operates in low submergence, too. Consult LAKOS for design options and application assistance.



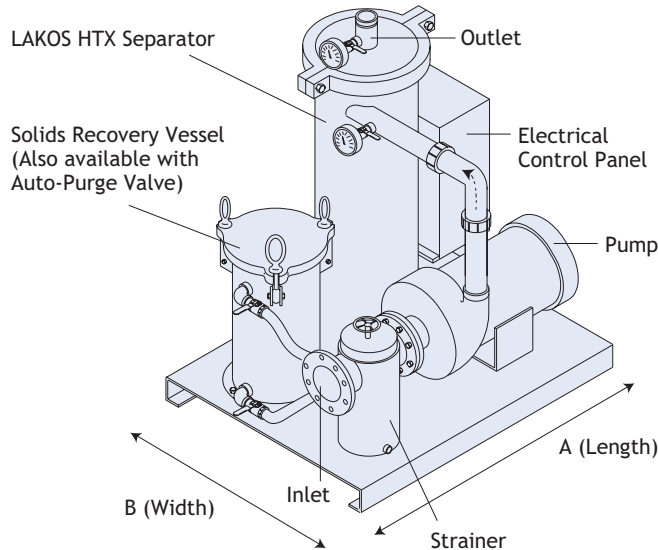
General Specifications

Model ¹	TCX Flow Rate ²		Separator Model	Pump HP	Full Load Amperage			System		Dry Weight	
	U.S. gpm m ³ /hr				230V	460V	575V	Inlet	Outlet	lbs.	kg.
TCX-0065-SRV TBX-0065-SRV	65	15	HTX-0030-TC	3 1.5	8.6 4	4.2 2	3.4 1.7	2" THREADED ³	1-1/2" GROOVED	550	249
TCX-0100-SRV TBX-0100-SRV	100	23	HTX-0060-TC	5 2	12.7 5.3	6.4 2.7	5 2.2	3" FLANGED	2" GROOVED	585	265
TCX-0145-SRV TBX-0145-SRV	145	33	HTX-0085-TC	5 3	12.7 8.3	6.4 4.2	5 3.4	3" FLANGED ³	2-1/2" GROOVED	598	271
TCX-0200-SRV TBX-0200-SRV	200	45	HTX-0130-TC	7.5 5	18.9 13.7	9.4 6.8	7.6 5.5	3" FLANGED ³	3" GROOVED	930	422
TCX-0280-SRV TBX-0280-SRV	280	64	HTX-0200-TC	10 5	24.1 13.7	12 6.8	9.6 5.5	4" FLANGED ³	4" GROOVED	1100	499
TCX-0400-SRV TBX-0400-SRV	400	91	HTX-0285-TC	15 7.5	36 20.3	17.9 10.1	14.3 8.1	6" FLANGED	4" GROOVED	1800	816
TCX-0525-SRV TBX-0525-SRV	525	119	HTX-0285-TC	20 15	48 38	24 18.9	19.4 15.3	6" FLANGED ³	4" GROOVED	2015	914
TCX-0825-SRV TBX-0825-SRV	825	187	HTX-0450-TC	30 20	70 49	35 24.7	27.8 19.7	8" FLANGED	6" GROOVED	2270	1030
TCX-1100-SRV TBX-1100-SRV	1100	250	HTX-0500-TC	40 20	94 49	47 24.7	37.6 19.7	8" FLANGED ³	6" GROOVED	3370	1529

¹ For side-stream applications, use "TBX" for reduced horsepower pump.

² Consult factory for larger systems or special requirements.

³ Suction piping from the cooling tower basin to the TCX System inlet must be 1-2 pipe diameters larger than the specified TCX inlet.
NOTE: See sample specifications (back cover) for additional component specifications.



Dimensions

Model	A (Length)		B (Width)		C (Height)	
	in	mm	in	mm	in	mm
TCX-0065-SRV	40	1016	24	610	36-7/8	937
TCX-0100-SRV	40	1016	24	610	41-1/2	1054
TCX-0145-SRV	40	1016	24	610	48-3/4	1238
TCX-0200-SRV	40	1016	24	610	51-3/8	1305
TCX-0280-SRV	40	1016	24	610	63-5/8	1616
TCX-0400-SRV	48	1219	30	762	78-1/2	1994
TCX-0525-SRV	48	1219	30	762	78-1/2	1994
TCX-0825-SRV	60	1524	36	914	96	2438
TCX-1100-SRV	60	1524	36	914	96	2438

System Componentry

LAKOS HTX Series Separator
Centrifugal Pump
Basket Strainer
Electrical Control Panel
LAKOS Solids Recovery Vessel with Indicator Package
Inlet/Outlet Pressure Gauges
Fully Assembled on a Skid
All Interconnecting Piping & Valves

See Sample Specifications on back page for additional details

Options:

Inlet/Outlet Valve Kit
Electrical Contacts for Solids Recovery Vessel
Motorized Ball Valve (vs. Solids Recovery Vessel)
Alternative Power Requirements
Booster Pump or Premium Efficiency Motor
Upgraded Pump Seals

Sample Specifications

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).

Purpose & Function

The following specified equipment will help prevent particle fouling of the cooling system's componentry, reduce maintenance and servicing routines, maintain optimum energy efficiency of the heat exchange process, limit blowdown & chemical use practices and control harmful bacteria growth in the basin/sump.

If specified for cooling tower basin/remote sump use: A completely assembled package shall be supplied for the isolated recirculation and particle separation/filtration of the fluid in the cooling tower basin/remote sump in order to prevent troublesome accumulation of solids in the tower basin/sump. Flow through the separator package shall be continuous, without interruption for the periodic evacuation of separated solids.

Placement of the separator package's inlet and outlet within the basin/sump shall be strategically determined and supplemented where necessary with specific flow enhancement/agitation devices known as HydroBoosters. Each HydroBooster shall be capable of increasing its input flow, at 20 psi (1.4 bar) or more, to six times greater output flow without abrasive wear to the HydroBooster, thereby providing the proper directed turbulence to prevent troublesome solids accumulation and induce separable solids to the separator package's pump suction. Required submergence shall be as little as 2-3 inches (50-75 mm). Polypropylene construction.

If specified for side-stream applications: Control of solids in the recirculated cooling water system shall be accomplished via a side-stream flow of not less than 10-20% of the full-stream system flow through a completely assembled separation/filtration package. The package's pump shall provide sufficient pressure for the re-introduction of side-stream fluid back into system flow.

Operation & Componentry

The separator package shall provide for initial pre-straining prior to pump suction (except for side-stream applications), followed by direct pumping through a specific centrifugal-action solids-from-liquid separator and immediate return of flow to the HydroBoosters (basin-cleaning applications) or system flow (side-stream applications). Separated solids shall be continuously bled from the separator's collection chamber into the package's integral solids recovery vessel and solids collection bag. Excess liquid shall pass through the bag and return to system flow via piping connected to the package's pump suction line. Alternatively, the separated solids may be purged periodically to desired disposal with an automatic purge valve.

Strainer: Cast-iron housing; manual-cleaning; 9/32-inch (7 mm) minimum mesh rating; stainless steel basket.

Pump: End-suction, single stage; TEFC motor; cast iron housing; iron impeller; bronze shaft sleeve; BUNA-N mechanical shaft seal; flooded suction required.

Separator: Centrifugal-action design, incorporating a true tangential inlet and mutually tangential Swirlax internal accelerating slots, employed to promote the proper velocity necessary for the removal of the separable solids. The internal accelerating slots shall be spiral-cut for optimum flow transfer, laminar action and particle influence into the separation barrel. The separator's internal vortex shall allow this process to occur without wear to the accelerating slots.

Separated particle matter shall spiral downward along the perimeter of the inner separation barrel, in a manner which does not promote wear of the separation barrel, and into the solids collection chamber, located below the vortex deflector plate.

To ensure maximum particle removal characteristics, the separator shall incorporate a vortex-induced pressure relief line (Vortube),

drawing specific pressure and fluid from the separator's extended solids collection chamber via the outlet flow's vortex/venturi effect, thereby efficiently encouraging solids into the collection chamber.

System fluid shall exit the separator by following the center vortex in the separation barrel and spiral upward to the separator outlet. A grooved coupling shall be incorporated in the upper body to provide full access to the separator's internal acceleration chamber. Larger models (TCX-0280 and larger) shall also feature a hand-hole clean-out in the solids collection chamber of the separator.

In a single pass through the separator, given solids with a specific gravity of 2.6 and water at 1.0, performance is expected to be 98% of 74 microns and larger. Additionally, particles finer in size, heavier by specific gravity and some lighter by specific gravity will also be removed, resulting in an appreciable aggregate removal of particles (up to 75%) as fine as 5 microns.

In a recirculating system, 98% performance is predictable to as fine as 40 microns (given solids with a specific gravity of 2.6), with correspondingly higher aggregate performance percentages (up to 90%) of solids as fine as 5 microns.

Solids collection vessel: Housing shall be 304 stainless steel with stainless steel basket and coated carbon steel lid with air pressure relief valve; 25-micron fiberfelt solids collection bag. Sightglass and flow control orifice included. Solids capacity: 360 cubic inches (6 liters).

An Indicator Package, sensing pressure differential through the solids recovery vessel, shall identify when the internal bag requires cleaning/replacement. Option: Indicator gauge may be supplemented with a dry electric contact in order to operate a light or audible signal when bag servicing is required.

Optional Automatic Purge Valve: In place of the solids recovery vessel, an electrically-actuated valve shall be programmed at appropriate intervals and duration in order to efficiently and regularly purge solids from the separator's collection chamber. Valve body shall be bronze (optional stainless steel also available). Valve ball shall be stainless steel with teflon seat.

Piping: Schedule 40 galvanized carbon steel; reinforced rubber hose to solids recovery vessel.

Electrical control: IEC starter with overload module; HOA selector switch; NEMA-4x enclosure; re-set/disconnect/trip switch; 120 volt, single phase control voltage; CSA-approved.

Power requirement: 208/230/460/575 volt, 3 phase. Specify when ordering.

Valves: Ball valves on purge line for isolation of solids-handling/purging equipment.

Optional inlet/outlet valve kit: Butterfly valve on inlet and outlet (globe valve on outlet of TCX-0065 only).

Skid plate: Stainless steel, 3/16-inch (5 mm) minimum thickness; structural steel framework on TCX-0825 and larger.

Maximum working pressure: 125 psi (8.6 bar).

Maximum operating temperature: 100° F (38° C).

Separator Source & Identification

Package system is identified by model number _____ and manufactured/assembled/tested by Claude Laval Corporation. Flow activity rate shall be _____ (U.S. gpm or m³/hr). Inlet/outlet connections shall be _____ inch. Pump horsepower shall be _____. HydroBoosters (if included) shall be provided in a quantity of ____; connection size: _____.



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