Tank-Sweeping Eductors

TSE Series

Increases flow rate activity to control solids accumulation in sumps, basins and pits. Protects pumps and process fluid systems, too.

To keep unwanted solids from settling in a sump, LAKOS Eductors provide a patented venturi action, which accelerates the input flow rate to sweep solids toward the desired pump intake for LAKOS separation and recirculation.

- Helps avoid troublesome solids accumulation
- Reduces maintenance and shutdown routines
- Protects pumps and process fluid systems from fouling and/or abrasive wear from unwanted solids
- Minimizes bacterial growth, brought on otherwise by solids accumulation
- Limits the need for chemical treatments to control bacteria & algae by preventing solids build-up

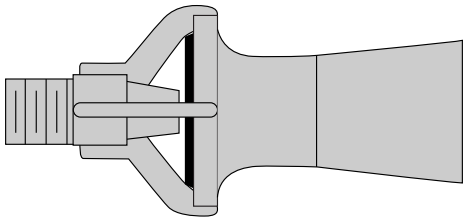
Able to operate at low pressures (as little as 20 psi or 1.4 bar) and in low submergence (as little as 12 inches or 305 mm), LAKOS Eductors multiply the input flow by a factor of four or five (see chart below), enabling the use of a smaller pump at reduced energy costs to effectively control solids accumulation in most any liquid chamber. Its compact design is durable and easy to install.

Operating Data

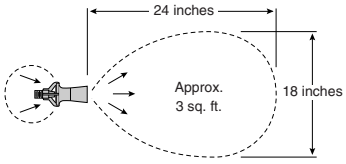
Model*	Connection Size	Flow Input / Output
TSE-0037-K	3/8-inch male NPT	10 US gpm / 50 US gpm (2.3 m^3/hr / 11.4 m^3/hr)
TSE-0075-K	3/4-inch male NPT	20 US gpm / 95 US gpm (4.5 m^3/hr / 21.6 m^3/hr)
TSE-0150-K	1 1/2-inch male NPT	50 US gpm / 235 US gpm (11.4 m^3/hr / 53.3 m^3/hr)
TSE-0037-B	3/8-inch male NPT	10 US gpm / 40 US gpm (2.3 m^3/hr / 9.1 m^3/hr)
TSE-0075-B	3/4-inch male NPT	20 US gpm / 80 US gpm (4.5 m^3/hr / 18.2 m^3/hr)
TSE-0150-B	1 1/2-inch male NPT	50 US gpm / 200 US gpm (11.4 m^3/hr / 45.4 m^3/hr)

NOTE: Flow rates above are based on an input pressure of 20 psi (1.4 bar).

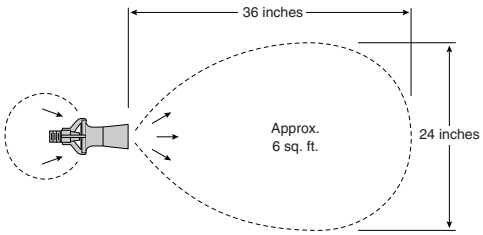
* TSE-K models are made of polypropylene plastic; TSE-B models are made of cast iron.



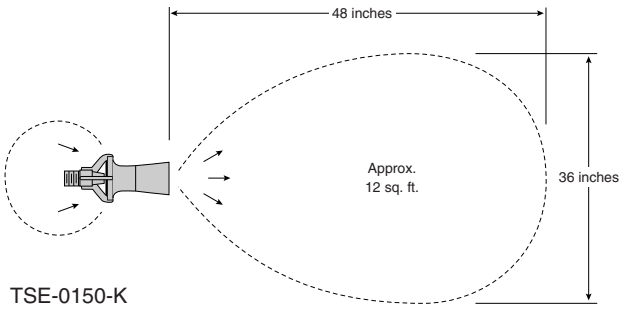
Pattern & Scope of Primary Influence



TSE-0037-K



TSE-0075-K



TSE-0150-K

System Flow Requirements

The following information indicates the logic employed to size LAKOS Separators and Eductor Systems for selected tank-sweeping applications. You are encouraged to consult LAKOS for final calculations and recommendations. See back page for Basic Data Requirements.

For static or intermittent applications

Compute the total area of the pit (square footage) by multiplying its internal length x width. Then, multiply this number by the appropriate factor noted here:

For extra-heavyweight solids 4.00

For heavyweight solids 3.33

For moderate weight solids 2.50

For lightweight (but still settleable) solids 2.00

This number becomes your minimum LAKOS tank-sweeping flow requirement to a selected quantity of LAKOS Eductors. See chart on front cover for available Eductors, to be chosen to match, but not exceed this calculated flow requirement. Consult factory for assistance.

Important:

The above calculation is based on average application conditions. Factors such as the *total volume of fluid in the pit* and the *concentration of solids* can dramatically change the suggested flow requirement.

Generally speaking, as the calculated tank-sweeping flow requirement approaches 200 U.S. gpm (45 m^3/hr), LAKOS recommends increasing the flow requirement to a minimum of 285 U.S. gpm (65 m^3/hr) in order to take advantage of the increased solids-handling capabilities of the larger models of LAKOS Separators.

If calculated tank-sweeping flow requirement exceeds 1,000 U.S. gpm (227 m^3/hr), consult factory for specific assistance.

For process protection applications

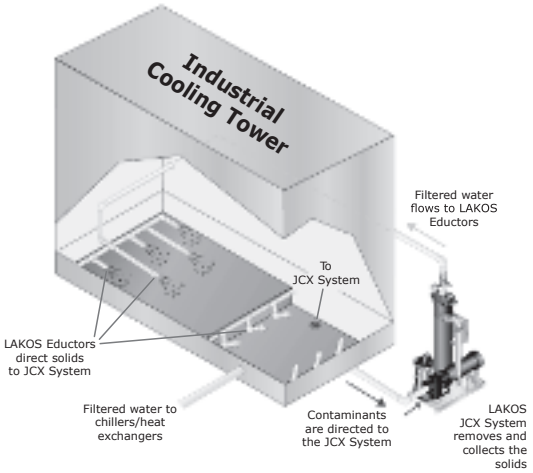
Determine the actual flow rate of the process pump which transfers fluid from the pit to process use (If multiple pumps are involved, consult factory for assistance). Multiply that number by 1.5 and add this flow increase to the tank-sweeping flow requirement calculated in the previous section above. This total flow requirement becomes the basis for the selection of the proper LAKOS Separator, pump and Eductors. See diagram on page 3 for greater detail.

For other applications

For other applications LAKOS systems can be designed for a wide variety of application needs. See back cover for "Basic Data Requirements" and consult LAKOS for assistance.

Application Techniques

For Industrial Cooling Towers –
See LS-730 JCX Brochure



For Static Pits & Sumps

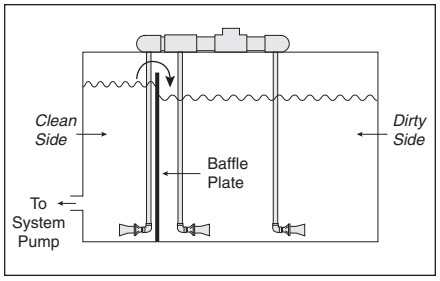
A "static pit" is basically any volume of fluid that does not experience continuous or active/frequent pumping for process use. In fact, there is likely no pump installed in this type of pit. Such applications can be kept free of accumulating solids with a simple closed loop header and LAKOS Eductors, eliminating shoveling/dredging routines.

For Pits & Sumps With Intermittent Pumping

Positioning the LAKOS Eductors to sweep solids away from the process pump's intake, this technique calls for the operation of the LAKOS Eductor system for periods in excess of the process pump's operating cycle in order to prevent troublesome solids accumulation and reduce solids concentration in the pit. Reduces the concentration of solids passing through the process pump to extend pump life and reduce solids fouling and abrasion in the system.

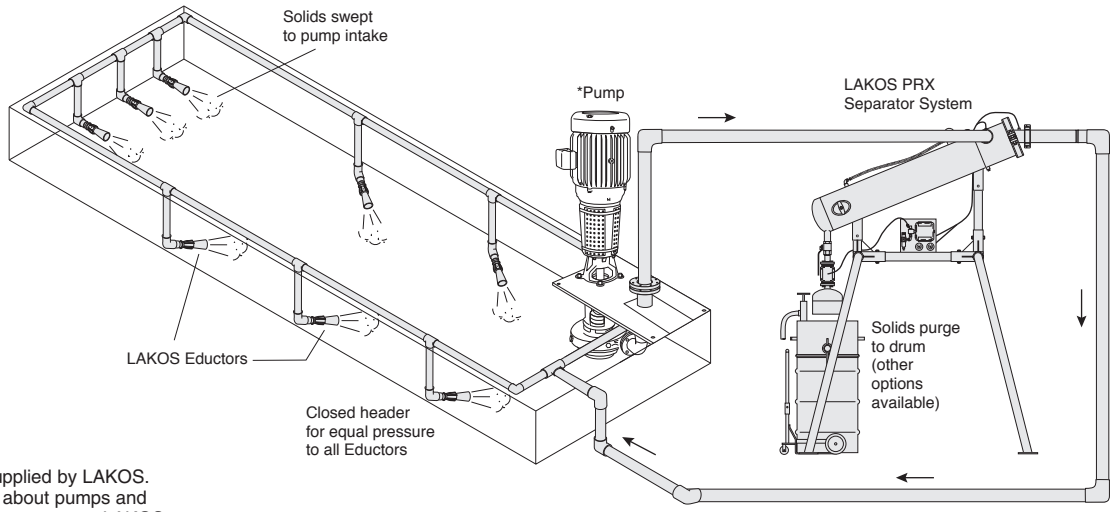
For Dynamic Pits & Sumps – Process Protection

When the application involves "dynamic" or continuous/active pumping of the pit, a more comprehensive installation scheme is employed, enabling the LAKOS Eductor System to not only prevent unwanted solids accumulation, but also effectively protect the pump and process system from solids fouling and abrasive wear.

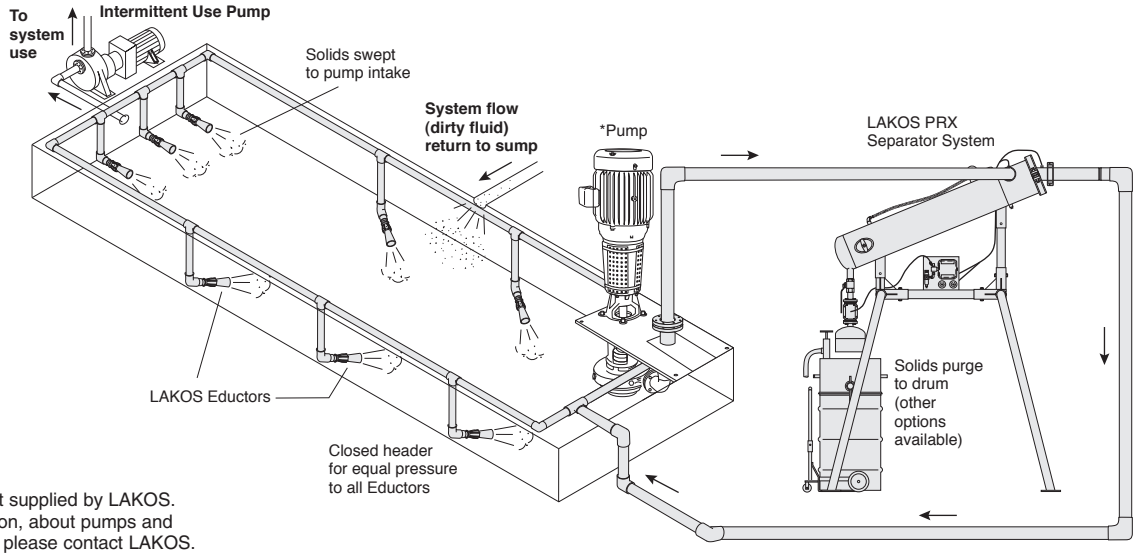


Clean-to-dirty water overflow (side view)

NOTE: Illustrations are conceptual only. Consult LAKOS for specific application assistance.



*Pump shown is not supplied by LAKOS.
For more information, about pumps and
our PRX Systems, please contact LAKOS.



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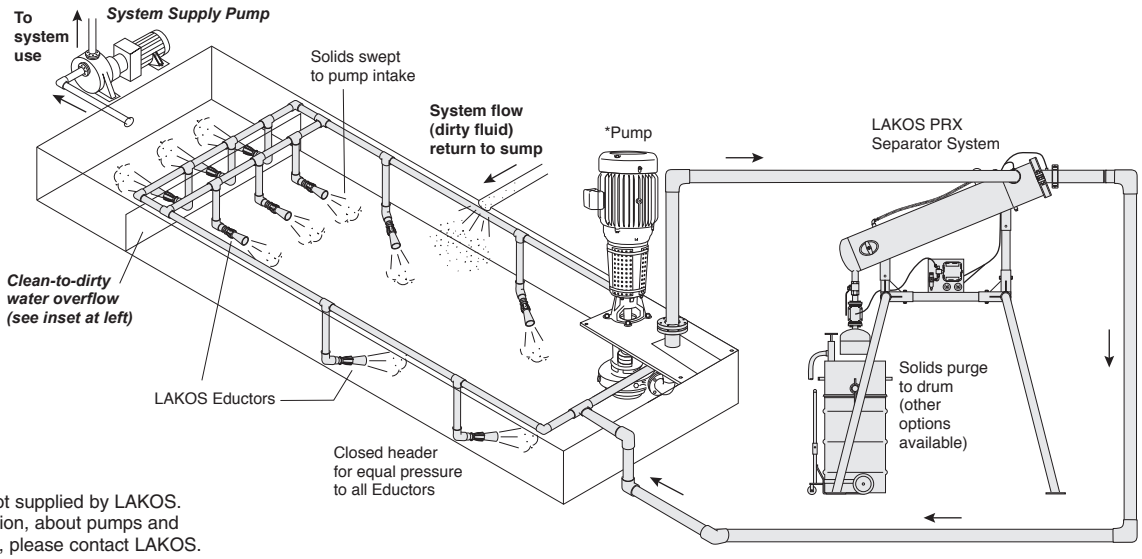

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Pump Selection Recommendations

- When possible, select a vertical configuration pump over a horizontal configuration pump for increased durability, reliability and efficiency. Submerged volute also removes doubts about water lifting concerns.
- Avoid self-priming pumps to feed fluid to a LAKOS Separator in large tank-sweeping applications. Inefficient. Mechanical seal requires frequent replacement.
- Pumps have moving parts ... and moving parts will wear out. A 1750 rpm pump will provide four times the service life of a 3500 rpm pump with the same pressure and flow specifications. Always recommend 1750 rpm pumps for large pit sweeping applications.
- Pressure at the Eductor header must be a minimum of 20-25 psi. Take into consideration the head and pressure losses of your installation when choosing a pump to feed the Eductors.

Basic Data Requirements for System Design

- Dimensions of the pit, sump or basin (length, width & depth):_____
- Identify if pit is sloped or contains weirs, baffles, etc.: _____
- Fluid capacity in the pit, sump or basin (gallons or liters):_____
- Static and operating depth of fluid in the pit, sump or basin:_____
- Flow rate of system pump currently drawing from the pit, sump or basin: _____
- Location of pump in pit; potential for moving the pump if necessary:_____
- Description of the settlable solids to be removed, specific granite and concentration: _____

  _____
- Identify any other solids/contaminants in the fluid and concentration:_____
- Desired handling of separated solids (e.g. to drain, in a drum or hopper, etc.): _____
- Power availability:_____
- Available space near pit for placement of LAKOS System:_____

Name: _____

Company: _____

Address: _____

City/State/Zip:_____

Phone:_____

Fax: _____

IMPORTANT:
The typical installation pattern for LAKOS Eductors suggests a simple, "one-directional" sweeping of solids toward a pump intake. More realistically, the flow activity created by the Eductors essentially prevents the settling and accumulation of solids on the bottom of a tank by continuously blending the solids in this created turbulence. This intentional activity insures that fluid drawn from a tank by a pump will carry troublesome solids out of the sump or pit.

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