Submersible Pump Protection Separators

Removes sand at the pump intake to EXTEND PUMP LIFE by 5x or more

SUB-K

Defend your submersible pump and water system from the abrasive, damaging and costly effects of sand with a LAKOS SUB-K Pump Protection Separator. Using controlled centrifugal action, troublesome sand is removed from the water before it enters the pump, reducing wear to impellers and other vital components.

Manufactured using our state-of-the-art injection molding techniques and industrial strength composite materials, the SUB-K features no moving parts to wear out, no screens or filter elements to clean or replace, and requires no routine maintenance. Trouble-free and effective, LAKOS SUB-K Separators are easy to install into water wells as small as 4 inches I.D.

Key Benefits

- Reduces sand abrasion wear to pump impellers and other components, EXTENDING the pump life by 5x or more...*GUARANTEED* !
- Helps maintain optimum pump yield
- Saves on pump energy costs with higher operating efficiency
- Minimizes critical pump breakdowns
- Improves flow past the pump motor, helping to cool the motor

SAND-DAMAGED SUBMERSIBLE PUMP IMPELLER

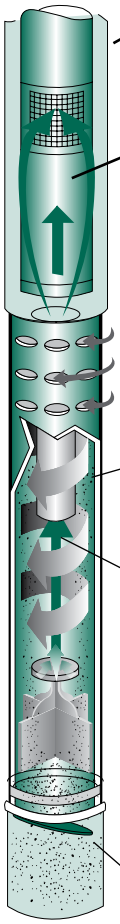
SUB-08-4-K Pump Protection Separator
SUB-08-5-K Pump Protection Separator
SUB-12-4-K Pump Protection Separator
SUB-12-5-K Pump Protection Separator
SUB-16-4-K Pump Protection Separator
SUB-16-5-K Pump Protection Separator
SUB-28-4-K Pump Protection Separator
SUB-28-5-K Pump Protection Separator
SUB-52-5-K Pump Protection Separator
SUB-99-6-K Pump Protection Separator

New Injection-molded design improves efficiency even more !

Flow range:
3 - 99 U.S. gpm
(.7 - 23 m^3/hr)

For higher flow rates and for all turbine pumps, refer to the LAKOS PPS Separators

How It Works



Pump Enclosure Shell
(see page 2 for SUB-PAK version for 4-inch I.D. wells)

Submersible Pump Motor

1. Sandy Water Enters Through Tangential Inlet Slots and Begins to Swirl Inside
2. Centrifugal Action Pushes Sand to Outer Wall
3. "Sand-Free" Water is Drawn by the Swirling Vortex to the Pump's Intake
4. Sand Particles Fall to the Bottom and are Purged Through Flexible "Flapper Valve" Deep Into Well
5. But What Happens To The Sand ?

(*see back page*)

LAKOS®
Separators and Filtration Solutions

Proper Model Selection

Choose the flow rate
Refer to the General Specifications on page 3 and select the proper model according to the actual flow rate of the pump.

Submergence is important
For proper flow through the separator it must be submerged below the drawdown level of the well by at least 30 feet (9.2 meters).

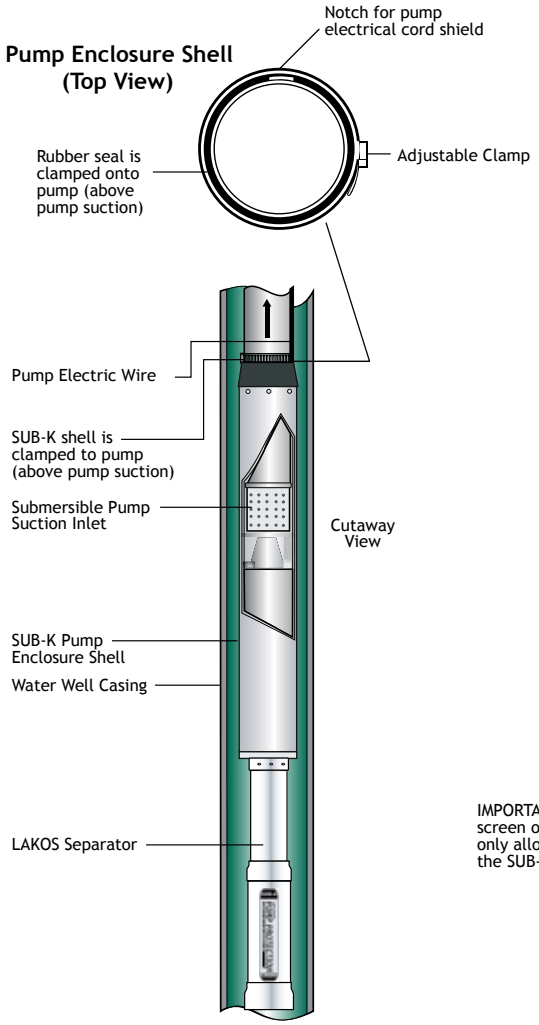
Check well I.D.
Note the minimum well diameter for each model in the chart on page 3. For 4-inch wells, choose the SUB-PAK models, which use well seals instead of a shell.

Purging separated sand
Accumulated sand flushes from the SUB-K Separator into the bottom of the well, either when (a) the pump shuts off or (b) when the weight of the accumulated sand pushes the separator's flapper valve open. Maximum efficiency will only occur if the pump operates somewhat intermittently.

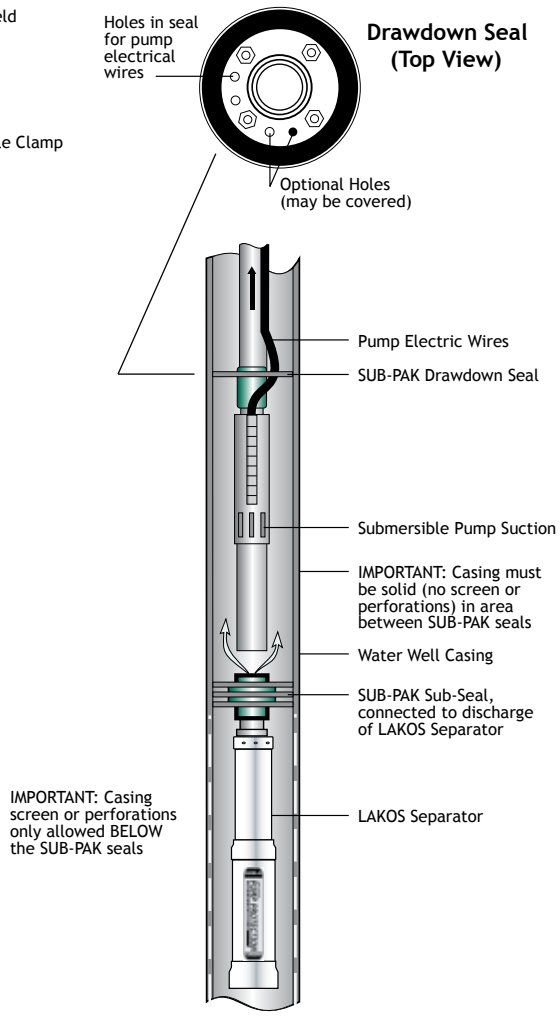
Sand storage space requirement
Allow at least 20 feet (6.1 meters) of space below the separator's purge outlet to accommodate the separated sand. See "Where Does The Sand Go?" on the back page.

Installation Schematics

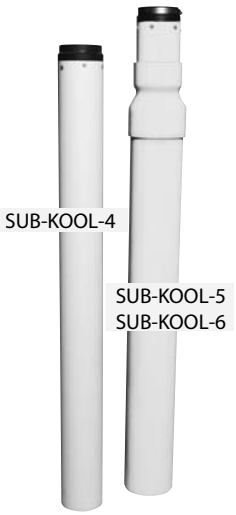
SUB-K Models
Includes pump enclosure shell



SUB-PAK Models
For 4-inch wells where well seals are used instead of shell



SUB-KOOL Pump Motor Cooling Shroud



Simple, economical, and effective, the SUB-KOOL shroud is available in three sizes for your pump cooling requirements. All models designed for standard 3-3/4 inch diameter pumps. Select shroud size according to your pump flow requirements.

- Easy to install
- Lightweight
- Corrosion-free composite materials

Model	Length	Inner and Outer Diameter	
SUB-KOOL-4	48 in (1219 mm)	I.D. 4-1/5 in. (107 mm)	O.D. 4-1/2 in. (114 mm)
SUB-KOOL-5	51-3/4 in (1314 mm)	I.D. 4-1/5 in. (107 mm)	O.D. 6-1/8 in. (156 mm)
SUB-KOOL-6	51-3/8 in (1305 mm)	I.D. 4-1/5 in. (107 mm)	O.D. 7-1/2 in. (191 mm)
SUB-KOOL-Custom	Consult Factory		

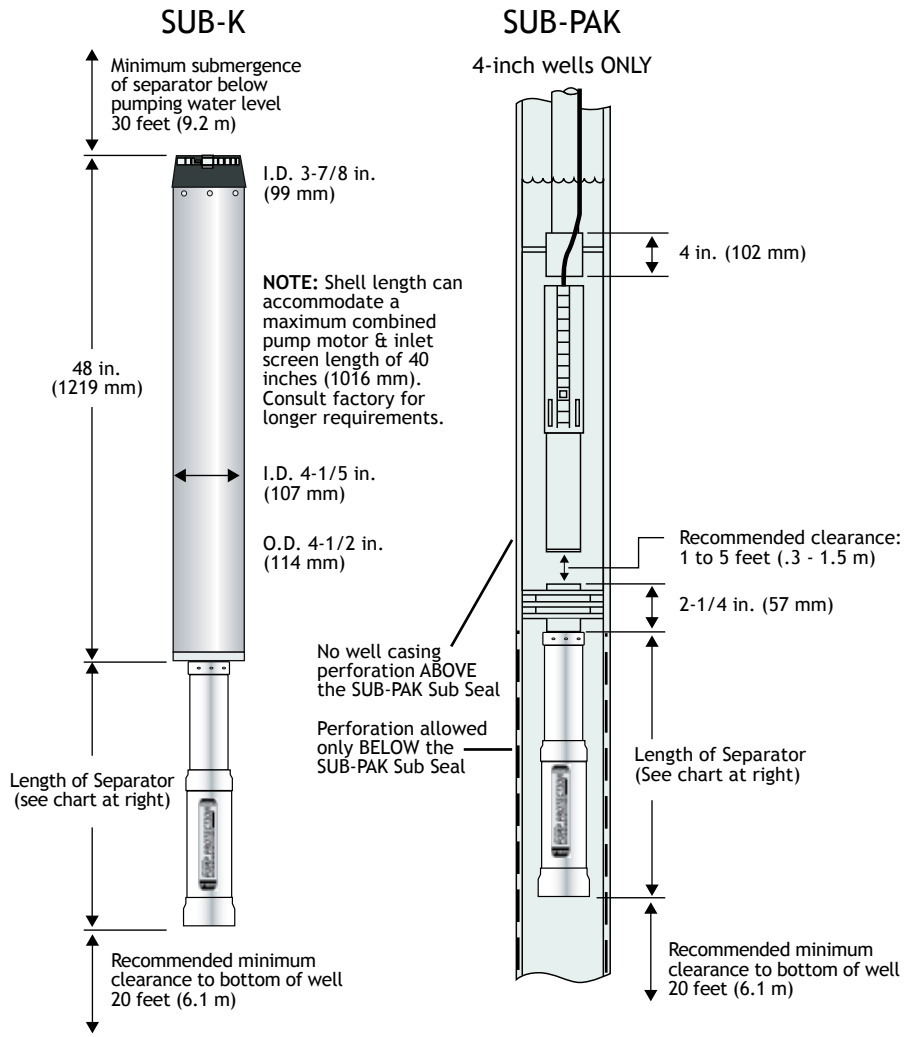
General Specifications

Model	Minimum Well I.D. in.	mm	Flow Range U.S. gpm	m^3/hr	Weight lbs.	kg
SUB-8-4-PAK*	4*	102*	3 - 8	.7 - 2.0	9	4.1
SUB-12-4-PAK*	4*	102*	5 - 12	1.0 - 3.0	9	4.1
SUB-16-4-PAK*	4*	102*	10 - 16	2.5 - 3.5	9	4.1
SUB-28-4-PAK*	4*	102*	14 - 28	3.0 - 6.5	11	5
SUB-8-5-K	5	127	3 - 8	.7 - 2.0	12	5.5
SUB-12-5-K	5	127	5 - 12	1.0 - 3.0	12	5.5
SUB-16-5-K	5	127	10 - 16	2.5 - 3.5	12	5.5
SUB-28-5-K**	5	127	14 - 28	3.0 - 6.5	15	6.8
SUB-52-5-K**	5	127	24 - 52	5.5 - 12.0	20	9.1
SUB-99-6-K**	6	153	48 - 99	11.0 - 22.5	23	10.5

* LAKOS SUB-PAK Series Separators are designed for use ONLY IN 4 INCH I.D. WELLS. Contact LAKOS regarding 4.5 inch SUB-PAKs. Refer to the SUB-PAK digram on the previous page.
NOTE: All -SUB-PAK Models are designed to accommodate the typical pump diameter of 3-3/4 inches (95 mm). Maximum length of pump motor and inlet screen area (combined) cannot exceed 38 inches (965 mm). Consult factory for special requirements and/or
** application assistance and for other sizes.
Standard Pump Enclosure Shell for this model is 48 inches (1219 mm) long. Shells also available in optional 60-inch (1524 mm), 72-inch (1829 mm) and 84-inch (2134 mm) lengths.

Maximum Particle Size: 1/4 inch (6mm)
Maximum Particle Concentration: 500 ppm
Minimum Depth of Well Below Separator Setting: 20 feet (6.1 m)
Minimum Submergence of Separator: 30 feet (9.2m) below pumping draw down water level

Installation Specifications



Materials of Construction

Separator, Shell and Internal Deflector Plate

PVC composites and ABS. Seal on shell is ethylpropylene rubber with stainless steel clamp.

Flapper Valve

Fabric-reinforced neoprene rubber

Drawdown Seal

Ethylpropylene rubber on a zinc-plated steel coupling. Connection size: 1-inch and 1-1/4 inch female, N.P.T.

Sub Seal

Nitrile rubber on a steel merchant's coupling. Connection size:

Model	Connection Size
SUB-8-4-PAK	2-inch FNPT
SUB-12-4-PAK	2-inch FNPT
SUB-16-4-PAK	2-inch FNPT
SUB-28-4-PAK	2 1/2-inch FNPT

Dimensions

Model	Length of Separator in.	mm
SUB-8-4-PAK*	36.50	927
SUB-12-4-PAK*	36.50	927
SUB-16-4-PAK*	36.50	927
SUB-28-4-PAK*	40.75	1035
SUB-8-5-K	36.50	927
SUB-12-5-K	36.50	927
SUB-16-5-K	36.50	927
SUB-28-5-K	40.75	1035
SUB-52-5-K	43.75	1111
SUB-99-6-K	50.00	1270

Limited Warranty

All products manufactured and marketed by this corporation are warranted to be free of defects in material or workmanship for a period of at least one year from date of delivery. Extended warranty coverage applies as follows:

All LAKOS SUB-K Separators: Five year warranty

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 destination, 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).

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Where Does The Sand Go?

No, the SUB-K doesn't cause the sand to build up and clog the well. It simply doesn't happen...except in extreme cases (and even then, needing to bail a well occasionally is better than repetitive repair/replacement of a pump).

According to a 1985 study conducted by Ohio University and under the direction of the National Water Well Association (and published in the October 1985 issue of Water Well Journal), purged sand from a pump protection separator creates the following conditions:

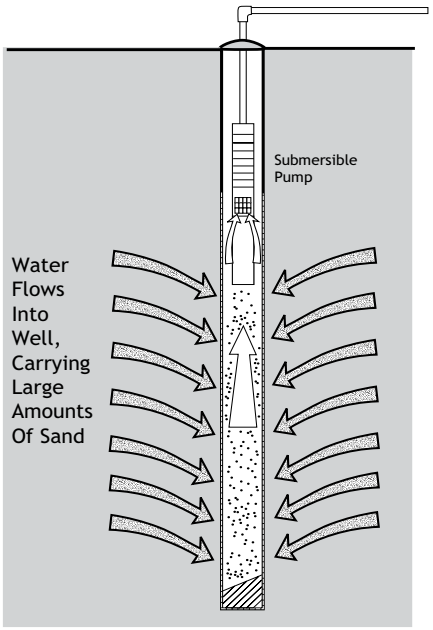
1. Purged sand begins to accumulate in the bottom of the well, blocking some of the casing perforations and changing the incoming flow characteristics.

2. Forced to take a less direct path into the well, the incoming flow velocity is reduced, making it less likely that the water will carry sand into the well.

3. An "equilibrium" is achieved, keeping excessive sand from entering the well.

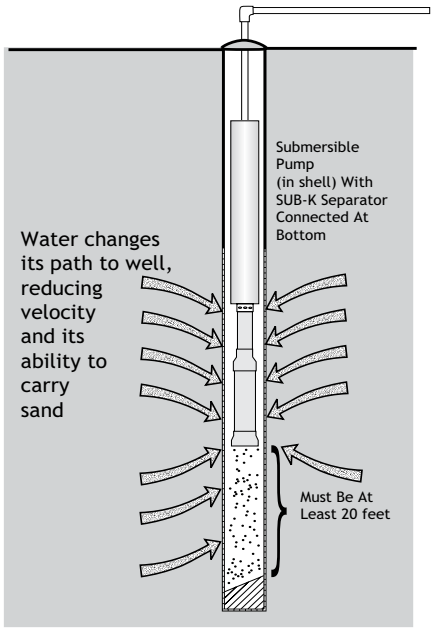
4. The natural movement of underground water just as easily moves some sand out of the well as it does into the well

CONCLUSION: Years of experience proves that LAKOS Pump Protection Separators DO NOT cause a problematic build-up of sand in the well, and thousands of successful installations enjoy extended pump life.



Without a SUB-K Separator

Sand enters the well, then flows into the pump. The abrasion on impellers and diffusers causes damage over time.



WITH A SUB-K Separator

Sand is removed before it enters the pump's inlet, and falls to the bottom of the well.

Is Pump Performance Affected?

Pump flow is not affected, but a 9 to 15 foot head loss (2 to 7 psi) can be expected due to increased friction losses.

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Separators and Filtration Solutions