

Submersible Pump Protection Separators

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

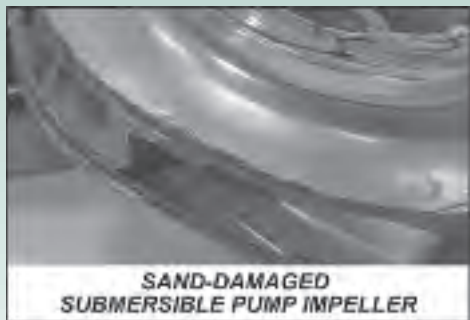
SUB-K

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

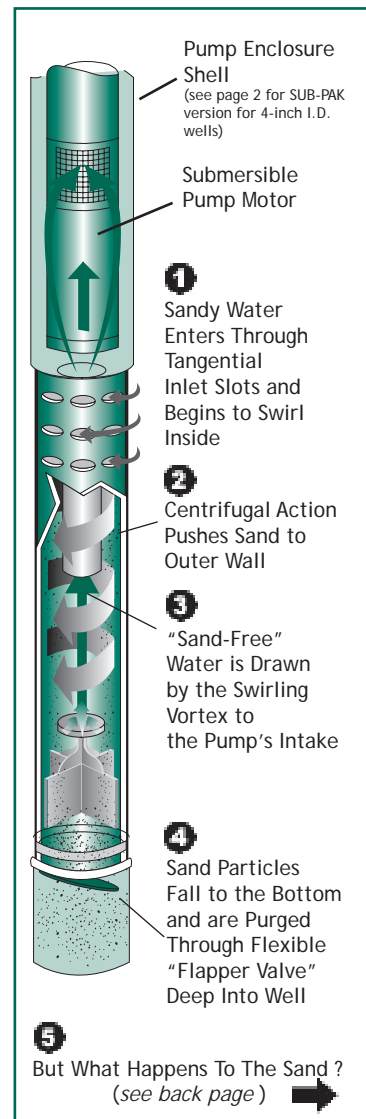
- Reduces sand abrasion wear to pump impellers and other components, **EXTENDING** the pump life by 5x or more... **GUARANTEED!**
- Helps maintain optimum pump yield
- Saves on pump energy costs with higher operating efficiency
- Minimizes critical pump breakdowns
- Improves flow past the pump motor,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



Flow range:
3 - 99 U.S. gpm
(.7 - 23 m³/hr)

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

How It Works



Installation Schematics

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.

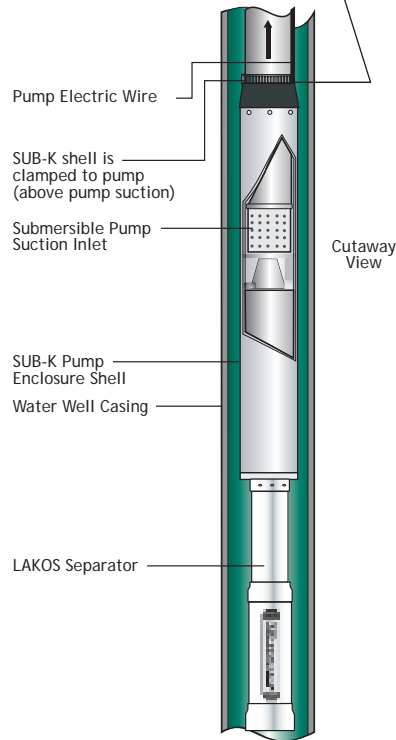
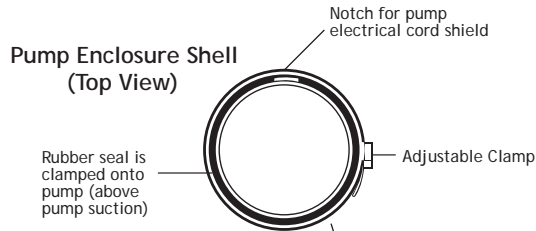
Sand storage space requirement

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.

Lakos Separators are manufactured and sold under one or more of the following U.S. Patents: 3,289,608; 3,512,651; 3,568,837; 3,701,425; 3,947,364; 3,963,073; 4,027,481; 4,120,795; 4,123,800; 4,140,638; 4,147,630; 4,148,735; 4,305,825; 4,555,333; 5,320,747; 5,338,341; 5,368,735; 5,425,876; 5,571,416; 5,578,203; 5,622,545; 5,653,874; 5,894,995; 6,090,276; 6,143,175; 6,167,960; 6,202,543; Des. 327,693; and corresponding foreign patents, including 600 12 329.4-08 (Germany) and EP 1 198 276 B1 (EU); other U.S. and foreign patents pending.

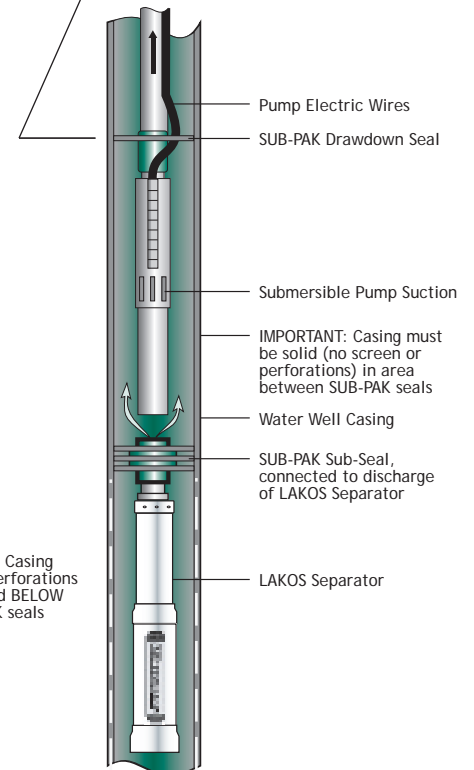
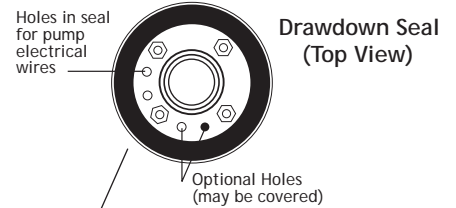
SUB-K Models

Includes pump enclosure shell



SUB-PAK Models

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

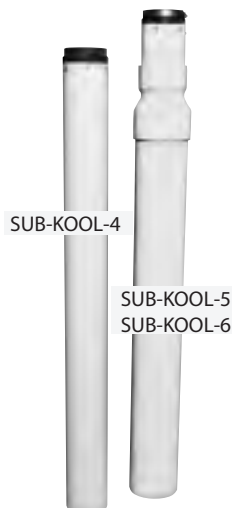


IMPORTANT: Casing screen or perforations only allowed BELOW the SUB-PAK seals

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. | | Flow Range | | Weight | |
|---------------|-------------------|------|------------|--------------------|--------|------|
| | in. | mm | U.S. gpm | m ³ /hr | 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 diagram on the previous page.

NOTE: All -SUB-K 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

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

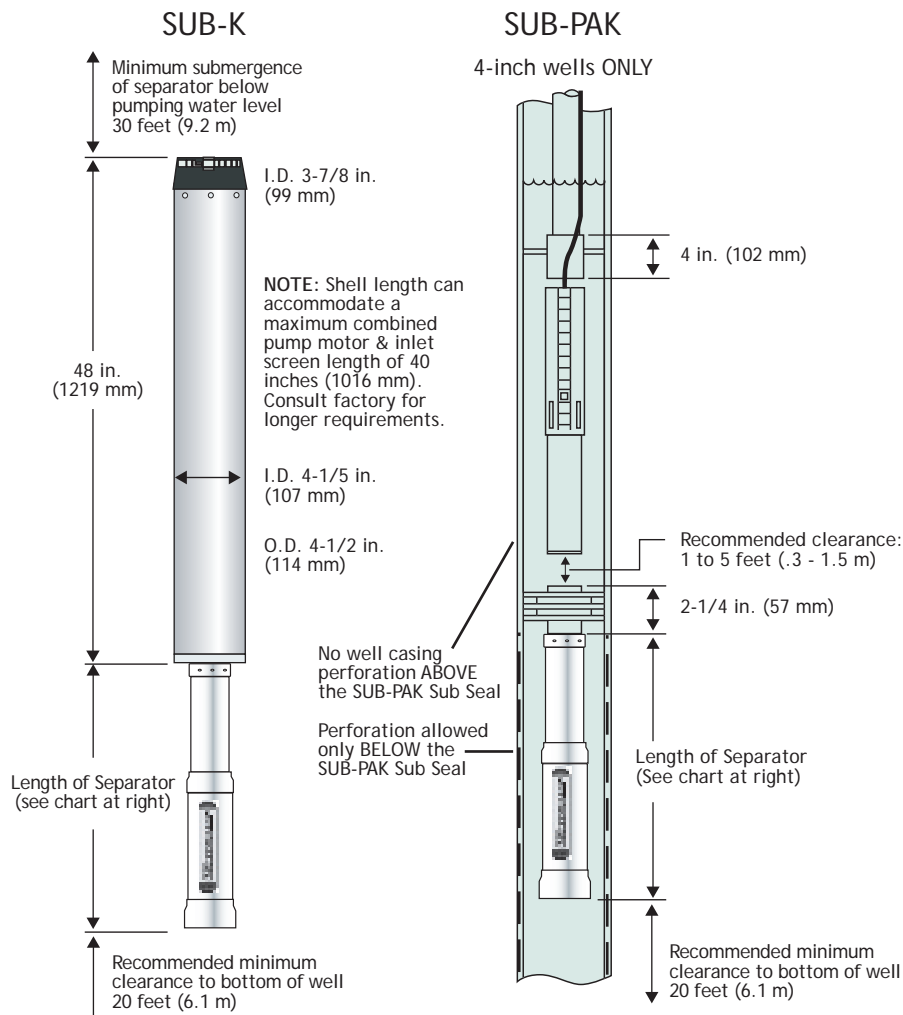
Drawdown Seal

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: 2 inch female, N.P.T.

Installation Specifications



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 |

Where Does The Sand Go?

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 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).

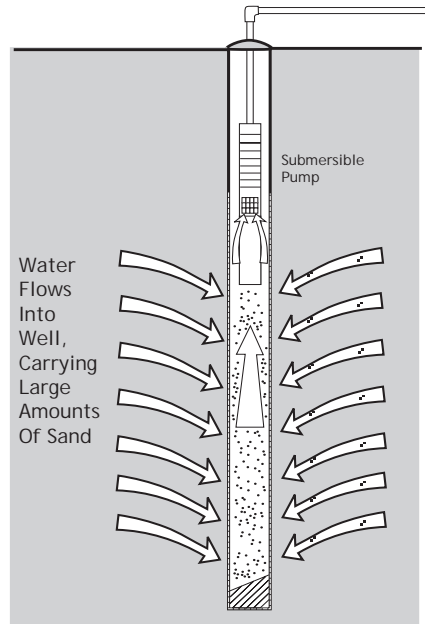
1365 North Clovis Avenue
Fresno, California 93727 USA
Telephone: (559) 255-1601
FAX: (559) 255-8093
Toll Free: (800) 344-7205
(USA, Mexico & Canada)
E-mail: info@lakos.com

www.LAKOS.com

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.



Without a SUB-K Separator

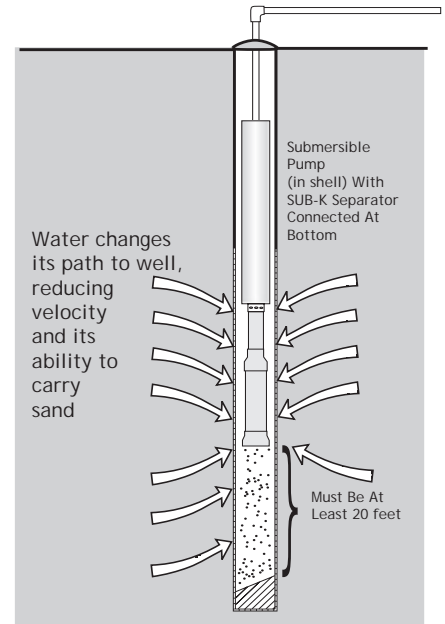
Sand enters the well, then flows into the pump. The abrasion on impellers and diffusers causes damage over time.

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.



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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