Down Hole Separators

Pump Protection For Turbine and Large Submersible Pumps

DHS

Removes sand, increasing the life and efficiency of turbine and submersible pumps.

When sand threatens the performance of a pump, LAKOS Down Hole Separators can help solve the problem. Utilizing controlled centrifugal action, LAKOS actually separates troublesome sand from the water before it enters the pump, and before it can grind away at a pump's internal components. Separated sand is then discharged deep into the well.

Made of durable carbon steel, LAKOS Down Hole Separators (DHS) feature no moving parts to wear out, no screens or filter elements to clean or replace, and require no routine maintenance. Trouble-free and effective, the LAKOS DHS is easily installed onto the suction end of a turbine or submersible pump.

Reduces pump wear, repair and replacement

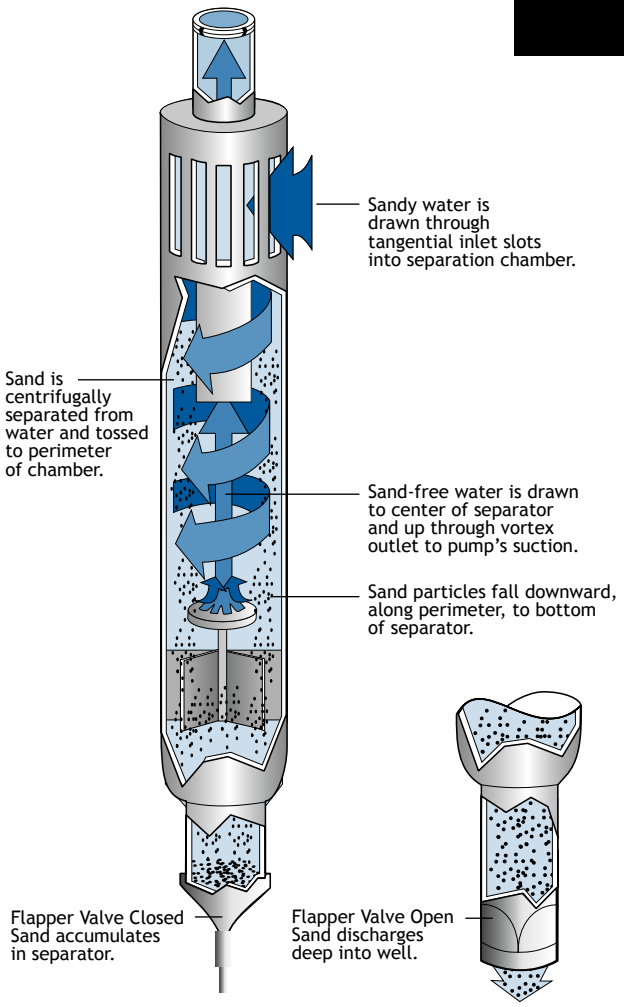
Extends pump life by four times or more

Helps maintain optimum pump yield

Saves on pump energy costs with higher operating efficiency

Minimizes critical pump breakdowns

Reduces the burden on other filtration and treatment processes



Flow range:
100-3,180 U.S. gpm
(23 - 723 m^3/hr)

Models also available for lower flow submersible pumps

Instructions

Installation Schematics

Dimensions

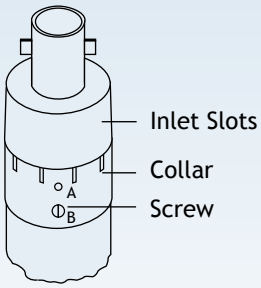
General Specifications

Warranty

LAKOS®
Separators and Filtration Solutions

Flow Adjustment Collar

Standard on selected models, this manual adjustment allows you to fine-tune the performance of LAKOS Down Hole Separators. It is designed specifically for a significant variation in your pump's actual flow rate. Most often, this adjustment will be made at the factory according to the flow rate specified when ordering. Should a change of flow rate indicate an appropriate adjustment (according to the chart), you may wish to make that adjustment at your earliest opportunity. To do so, simply remove the screws holding the collar in place and slide the collar to the proper position. Replace screws in proper insets.



Model	Flow Range U.S. gpm	Flow Range m^3/ hr.	Position Of Collar
DHS-125-E	125-200	27-45	Collar On
	200-250	45-57	Collar Off
DHS-150-F	150-210	34-48	A
	210-275	48-62	B
	275-325	62-74	Collar Off
DHS-325-G	325-425	74-97	A
	425-525	97-119	B
	525-650	119-148	Collar Off
DHS-550-H	550-675	125-153	A
	676-825	154-187	B
	826-1110	188-252	Collar Off
DHS-825-I	825-1050	187-238	A
	1050-1225	238-278	B
	1225-1450	278-329	Collar Off
DHS-1010-J	1010-1275	230-290	A
	1275-1450	290-329	B
	1450-1800	329-409	Collar Off
DHS-1640-K	1640-1890	373-429	A
	1890-2250	429-511	B
	2250-2560	511-582	Collar Off

Installation Specifications

LAKOS Down Hole Separators come in a variety of sizes and may be shipped in a variety of ways. Most often, however, each unit is shipped complete, strapped onto a wooden skid. Before installation, remove all labels, decals and shipping instructions from each unit to avoid plugging the inlet slots. LAKOS Down Hole Separators are designed to continuously flush separated particles back into the source water.

For Turbine models:

LAKOS Turbine Separators are manufactured with a standard riser size (note chart on page 3). Should this riser not match the connection to your pump's bowl assembly, you'll need to arrange for the proper connection (i.e. reducer, etc.). Lifting lugs are provided on the riser of all models size "E" through "KKA" for ease of installation. Connect the separator to the bowl assembly, then install the flapper valve.

At this point, you may proceed with your customary routine for installing the pump.

For Submersible models:

To make LAKOS Down Hole Separators operate properly, the pump's entire intake must be directed first through the actual separator. To achieve this with a submersible pump, we provide a pump enclosure shell. The submersible pump is contained within this shell and then attached directly to the separator itself. (See instructions below for proper installation of the pump in the shell). With the pump properly secured in the shell, the riser is now attached directly to the column pipe.

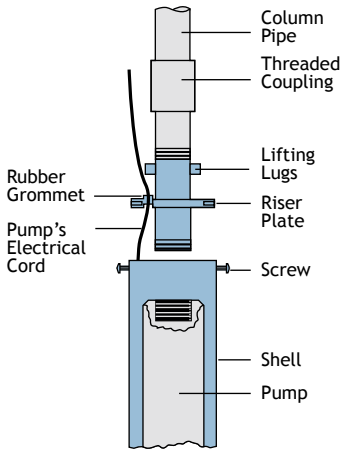
Installation may now proceed as normal for submersible pumps.

Once installed, LAKOS Down Hole Separators require no routine maintenance. Should you ever need to pull your pump, always take such an opportunity to inspect the separator and purge assembly. LAKOS Down Hole Separators must be operated according to the flow range per model designated in the chart on page 3. Should your original flow rate vary significantly, note the instructions below for use of the adjustable flow collar on selected models.

Enclosing the Pump in the Shell

For Submersible Pump Protection Models Only

The pump enclosure shell is designed to make certain that all water entering the pump is first drawn through the separator. This requires that the pump intake be properly shielded as described below.



1. Remove the riser assembly from the shell by removing the stainless steel set screws.
2. Attach the riser assembly to the pump's discharge.
3. Thread the pump's electrical cord through the opening in the rise plate. A rubber grommet is provided to establish a good seal.
4. Slide the pump into the shell and secure riser with the screws.
5. Gap between riser plate and shell should be sealed with a waterproof plastic sealant, putty or caulking compound to prevent water entry at this point.
6. Attach flapper valve before attaching riser to column pipe.
7. Pump and shell assembly is now ready for installation. A pair of lifting lugs is provided to make hoisting and adding column pipe easy. Shell assembly should be attached directly to the separator unit (see diagram, page 3).

General Specifications

Model	Minimum Well I.D.		Flow Range		Outside Diameter		Length With Riser & Flapper Valve		Riser Size	Weight		Required Minimum Submergence	
	in	mm	U.S. gpm	m^3/ hr	in	mm	in	mm	N.P.T.	lbs	kg	ft	meters
DHS-100-D	6	152	100-175	23-40	5-5/8	143	88-3/8	2245	2-1/2 "	93	42	30	9.2
DHS-125-E	7	178	125-250	29-57	5-9/16	141	106	2692	3"	142	64	30	9.2
DHS-150-F	8	203	150-325	34-74	6-5/8	168	120-1/4	3054	4"	220	100	30	9.2
DHS-325-GSA	9-3/4	248	325-520	74-118	8-5/8	219	124	3150	6"	191	87	60	18.4
DHS-520-GGA	9-3/4	248	520-710	118-161	8-5/8	219	130	3302	6"	213	97	60	18.4
DHS-325-G	10-3/4	273	325-650	74-148	8-5/8	219	132-1/2	3366	6"	267	121	30	9.2
DHS-600-HSA	12	305	600-910	136-207	10-5/8	270	141-1/2	3594	8"	281	128	60	18.4
DHS-880-HHA	12	305	880-1375	200-312	10-5/8	270	145-3/4	3702	8"	315	143	60	18.4
DHS-550-H	13-1/4	337	550-1110	125-252	10-3/4	273	147	3734	8"	390	177	30	9.2
DHS-1290-ISA	13-1/4	337	1290-1700	293-386	10-3/4	273	150-1/2	3823	8"	393	178	60	18.4
DHS-825-I	15-1/4	387	825-1450	187-329	12-3/4	324	154	3912	8"	454	206	30	9.2
DHS-1460-JSA	15-1/4	387	1460-2040	332-463	12-3/4	324	158	4013	10"	492	223	60	18.4
DHS-1010-J	17-1/4	438	1010-1800	230-409	14	356	163	4140	10"	526	239	30	9.2
DHS-1780-KSA	17-1/4	438	1780-2420	404-550	14	356	170	4318	10"	575	261	60	18.4
DHS-1640-K	19-1/4	489	1640-2560	373-582	16	406	185	4699	10"	703	319	30	9.2
DHS-2520-KKA	19-1/4	489	2520-3180	573-723	16	406	204	5182	12"	754	342	60	18.4

Head Loss: Typically, 9-14 feet (2.74-4.27m)
Maximum Particle Size: 1/4 inch (6.3mm)
Maximum Particle Concentration: 1,000 ppm

Each model in the Down Hole Separator is engineered for a specific flow range and with concern for certain restrictions. To assure maximum performance, carefully identify the proper model. Selecting a larger or smaller model than recommended may affect performance. Use this information to select a model according to your pump's actual flow rate. If two or more models are applicable, choose the unit with the lowest maximum flow rate. Note also the minimum well I.D. for the model chosen.
If your well I.D. is too small, either select another model that accommodates your flow rate and well I.D., or consult the factory for special assistance.

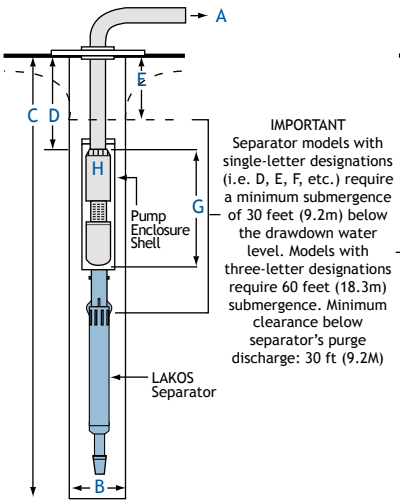
This data applies only to separators for turbine pumps. Separators for submersible pumps require a pump enclosure shell, predicated on the pump's actual dimensions. See worksheet (LS-423).

Installation Schematics

Required data for proper model selection:

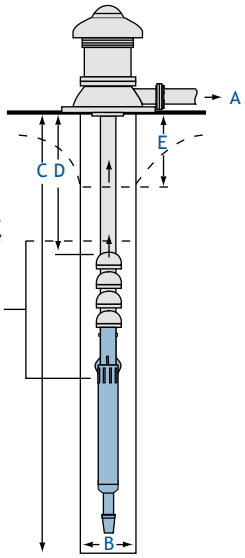
A. Maximum & minimum flow rate of pump
B. Minimum inside diameter (I.D.) of well
C. Depth of well
D. Depth of pump setting
E. Pumping water level
F. Maximum diameter of pump/motor
G. Overall length of pump and motor
H. Pump's riser size (N.P.T.)

For Submersible Pumps



IMPORTANT
Separator models with single-letter designations (i.e. D, E, F, etc.) require a minimum submergence of 30 feet (9.2m) below the drawdown water level. Models with three-letter designations require 60 feet (18.3m) submergence. Minimum clearance below separator's purge discharge: 30 ft (9.2M)

For Turbine Pumps



Lakos Separators are manufactured and sold under one or more of the following U.S. Patents: 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; 7,000,782; 7,032,760 and corresponding foreign patents, other U.S. and foreign patents pending.

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).

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Where Does The Sand Go?

Certainly the most common procedure for (and objection to) disposing of separated sand is to discharge that sand deep into the water well. It has always been, and always will be, a better alternative to grinding up a pump and destroying its efficiency. And, though the accumulation of sand in a well could eventually require evacuation (though it very seldom does), that cost is far less than the certainty of expensive pump repair or replacement and excessive energy costs through reduced efficiency.

But the sand most likely will never fill up the well. Extensive research conducted by Ohio University, under the direction of the National Water Well Association, unmasked the mystery of what a Down Hole Sand Separator can really do to solve the problem of a sandy well (see Water Well Journal, October 1985). Essentially, the study revealed that a Down Hole Separator actually helps create a state of "equilibrium," virtually eliminating the entry of additional sand into a well.

Technically it is described as such:

1. Sand is carried into a well by the velocity and efficiency of the incoming water.

2. The sand separator removes and discharges that sand back into the well until the well fills to a certain level.

3. At that level, the flow pattern of the incoming water through the ground formations and into the well is sufficiently distorted to reduce its actual incoming velocity and efficiency.

4. At such a reduced efficiency, the water is then no longer capable of carrying sand into the well.

5. The sand separator maintains that equilibrium by preventing the pump from evacuating sand, which would otherwise encourage conditions in the well to draw in more sand.

Conclusion: The separated sand from a LAKOS Down Hole Separator most often will NOT fill up the well, and may actually stop additional sand from even entering the well.

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