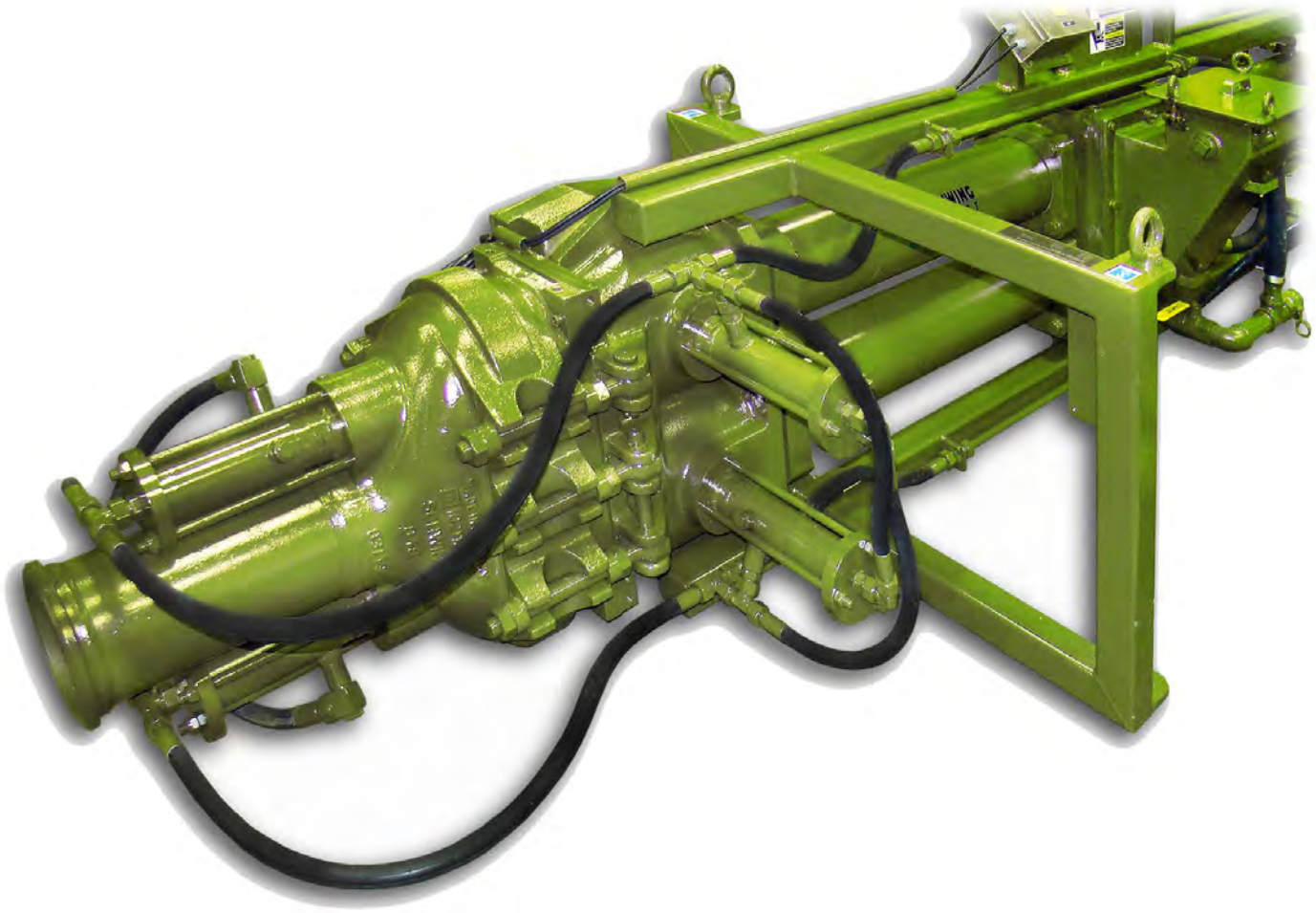
Piston Pumps

General & Technical Overview



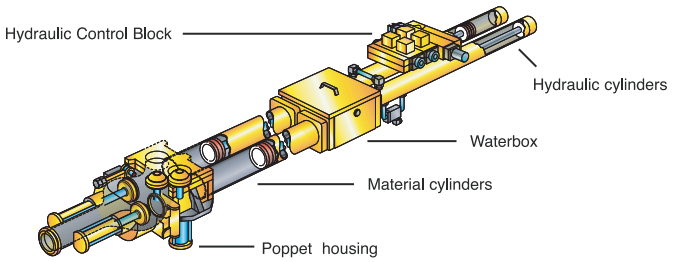
SCHWING BIOSET

A Systems Approach to Responsible Biosolids Handling

For more than three decades Schwing has addressed all aspects of residual management by pioneering the concept of moving materials through a pipeline. This technology was originally developed and successfully applied to concrete pumping using a twin cylinder, all-hydraulic piston pump. This same basic design has proven very effective conveying a myriad of materials through a pipeline including biosolids in municipal applications worldwide.

Today Schwing Bioset is the recognized leader in biosolids pump technology.

A broad range of Schwing Bioset sludge pump systems with pumping rates exceeding 1000 gpm and pumping pressures over 3,500 psi on some models suggest unlimited possibilities for conveyance of materials previously considered unpumpable. Schwing Bioset pumps, feed systems, power units, pipelines, drying, alkaline stabilization, sliding frame discharge systems, valves, control systems and accessories provide single source responsibility and versatility to tailor a system to nearly every application. Our goal is to ensure your confidence when dealing with the world-wide leaders in sludge pump technology - Schwing Bioset.



Pump Model		EKSP		KSP 5						KSP 10						KSP 12		
Pump version		EKSP 10	EKSP 17	KSP 5 -KSP 5V			KSP 5R -KSP 5RV			KSP 10-KSP 10V			KSP 10R-KSP 10RV			KSP 12-KSP 12V		
Pressure version		K	K	S	K	HD	S	K	HD	S	K	HD	S	K	HD	S	K	HD
Delivery capacity output (m^3/hr)	max.**	2.9	5.9	7.9	7.9	7.9	7.9	7.9	7.9	12.0	12.0	12.0	12.0	12.0	12.0	20.0	20.0	20.0
	min.*	0.59	0.59	1.5	1.0	0.41	1.5*	1.0*	0.41*	2.5	1.5	0.79	2.5*	1.5*	0.79*	4.0	2.0	1.5
Pumping pressure (Bar)	max.	90	90	80	100	150	70	70	70	60	90	150	60	70	70	40	60	120
Length	(mm)	2705	3706	2680	2680	2860	2169	2169	2349	2679	2679	2879	2169	2169	2349	2679	2679	2860
Width	(mm)	599	599	681	681	681	831	831	831	681	681	681	831	831	831	681	681	681
Weight approx.	(kg)	510	560	750	750	870	810	810	930	780	780	900	840	840	970	845	845	968.2
Pumping cylinder capacity	(liters)	8.8	17.7	5.2	5.2	5.2	5.2	5.2	5.2	8.8	8.8	8.8	8.8	8.8	8.8	12.7	12.7	12.7
Pumping cylinder dia. x stroke	(mm)	150 x 500	150 x 1000	115 x 500	115 x 500	115 x 500	115 x 500	115 x 500	115 x 500	150 x 500	150 x 500	150 x 500	150 x 500	150 x 500	150 x 500	180 x 500	180 x 500	180 x 500
Hydraulic cylinder diameter	(mm)	90	90	90	90	125	90	90	125	90	90	125	90	90	125	90	90	125
Cylinder ratio		2.78	2.78	2.36	1.63	.85	2.36	1.63	.85	4.01	2.78	1.44	4.01	2.78	1.44	5.79	4.00	2.07
Suction poppet diameter +	(mm)	125	125	125	125	125	-	-	-	125	125	125	-	-	-	125 / 210	125 / 210	125 / 210
Pressure poppet diameter +	(mm)	100	100	100	100	100	-	-	-	100	100	100	-	-	-	100 / 150	100 / 150	100 / 150

Pump Version:
R = Rock Valve™ (patented transfer tube)
V = Vertical configuration
H = Horizontal configuration
L = Large poppets - suction and discharge
XL= Extra Large Poppets - suction and discharge

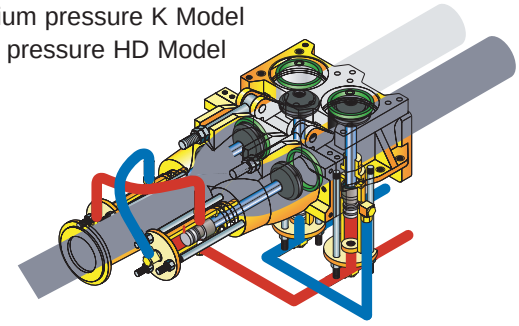
Pressure Version:
S = rod side
K = piston side
HD = high pressure version

Schwing Bioset Patented Valve Technology

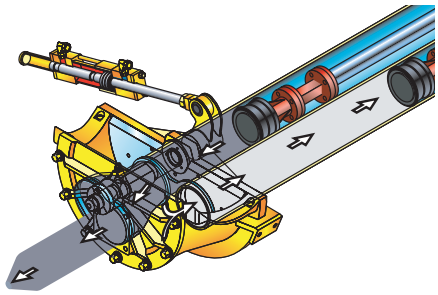
Pump models are available with the Poppet Valve, which is best suited for compressible, mechanically dewatered slurries and the Rock Valve™, which is available for pumping materials with particles up to 3" in diameter. Most models have three hydraulic configurations available to best match the pump to the application:

1: Low pressure S Model
2: Medium pressure K Model
3: High pressure HD Model

Poppet Valves are available in three sizes to accommodate different flow rates and particle sizes. Small, large, and extra large poppets provide the flexibility to overcome any challenge.



Poppet Valve
Application: Compressible sewage sludge, filter cake and slurries



Rock Valve™
Application: Uncompressible sludge with large, coarse foreign particles up to three inch diameter in size

KSP12(L)			KSP 17						KSP 25 (L)						KSP 45L	KSP 50L(XL)			
KSP 12R-KSP 12RV			KSP 17-KSP 17V			KSP 17R-KSP 17RV			KSP 25-KSP 25V			KSP 25R-KSP 25RV			KSP 45-KSP 45V	KSP 50-KSP 50V		KSP 50R-KSP 50RV	
S	K	HD	S	K	HD	S	K	HD	S	K	HD	S	K	HD	HD	K	HD	K	HD
20.0	20.0	20.0	25.0	25.0	25.0	25.0	25.0	25.0	35.9	35.9	35.9	35.9	35.9	35.9	57.5	65.6	65.6	65.6	65.6
4.0*	2.0*	1.5*	2.5	1.5	0.86	2.5*	1.5*	0.86*	4.0	2.0	1.5	4.0*	2.0*	1.5*	5.0	4.0*	2.0*	4.0*	2.0*
40	60	70	60	90	150	60	70	70	40	60	120	40	60	70	100	130	200	130	200
2169	2169	2349	3759	3759	3911	3350	3350	3479	3759	3759	3919	3350	3350	3479	3759	6147	6147	6147	6147
831	831	831	681	681	681	831	831	831	681	681	681	831	831	831	681	1783	1783	1783	1783
860	860	990	850	850	975	945	945	1230	945	945	1065	990	990	1275	845	3719	3719	3719	3719
12.7	12.7	12.7	17.7	17.7	17.7	17.7	17.7	17.7	25.4	25.4	25.4	25.4	25.4	25.4	41.6	50.3	50.3	50.3	50.3
180 x 500	180 x 500	180 x 500	150 x 1000	150 x 1000	150 x 1000	150 x 1000	150 x 1000	150 x 1000	180 x 1000	180 x 1000	180 x 1000	180 x 1000	180 x 1000	180 x 1000	230 x 1000	200 x 1600	200 x 1600	200 x 1600	200 x 1600
90	90	125	90	90	125	90	90	125	90	90	125	90	90	125	150	125	150	125	150
5.79	4.00	2.07	4.01	2.78	1.44	4.01	2.78	1.44	5.79	3.99	2.07	5.79	3.99	2.07	2.35	3.67	1.44	3.67	1.44
-	-	-	125	125	125	-	-	-	125 / 210	125 / 210	125 / 210	-	-	-	210	200 / 280	200 / 280	-	-
-	-	-	100	100	100	-	-	-	100 / 150	100 / 150	100 / 150	-	-	-	150	150 / 250	150 / 250	-	-

\+ = Poppet valve diameters are nominal measurements
* = Minimum depending on the admissable valve change-over time
** = Maximum theoretical output (100% filling efficiency) based on pumping water. Pumps will be derated per specific material requirements.

Multiple Applications

Flow Measurement System

Schwing Bioset's patented flow measurement system measures the volume of material pumped within 5% and instantaneously reports the filling efficiency of the material cylinders providing real-time monitoring of the health of your pump. This information is used by operating staff to precisely control operations and schedule wear part replacement on their schedule, rather than reacting to any unexpected shut-downs. Schwing Bioset's Flow Measurement System is just another example of how our industry leading technology plays a key role in your operations success.

SCHWING BIOSET FLOW MEASURING SYSTEM

FILL EFFICIENCY

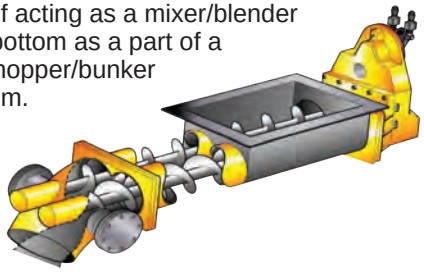
$$\frac{T3 - T2}{T3 - T1}$$

65L(XL)	KSP 80L(XL)						110L(XL)	140L(XL)	220L(XL)	315XL	Pump Model	
KSP 65 KSP 65V	KSP 80-KSP 80V			KSP 80R-KSP 80RV			KSP 110 KSP 110V	KSP 140 KSP 140V	KSP 220 KSP 220V	KSP 315 KSP 315V	Pump version	
HD	S	K	HD	S	K	HD	HD	HD	HD	HD	Pressure version	
88.8	115.0	110.0	105.0	115.0	110.0	105.0	168.1	173.8	178.3	219.9	Delivery capacity output (m³/hr)	max.**
7.7	6.0	5.0	3.0	6.0*	5.0*	3.0*	13.6	17.0	26.3	37.7		min.*
130	44	74	107	44	74	100	130	130	130	150	Pumping pressure (Bar)	max.
5461	6240	6240	6350	5560	5560	5664	5461	7340	9500	9906	Length	(mm)
1016	1001	1001	1001	1560	1560	1800	1016	1194	1321	1676	Width	(mm)
2722	2685	2685	2825	2470	2470	2560	4536	6214	8029	16012	Weight approx.	(kg)
66.5	83.1	83.1	83.1	83.1	83.1	83.1	113.1	141.4	219.1	315.5	Pumping cylinder capacity	(liters)
230 x 1600	230 x 2000	230 x 2000	230 x 2000	230 x 2000	230 x 2000	230 x 2000	300 x 1600	300 x 2000	300 x 3100	360 x 3100	Pumping cylinder dia. x stroke	(mm)
150	125	125	150	125	125	150	200	200	200	250	Hydraulic cylinder dia.	(mm)
2.35	5.73	3.39	2.35	5.73	33.9	2.35	2.25	2.25	2.25	2.07	Cylinder ratio	
200 / 280	200 / 280	200 / 280	200 / 280	-	-	-	210 / 280	210 / 280	280	280	Suction poppet diameter +	(mm)
150 / 250	150 / 250	150 / 250	150 / 250	-	-	-	150 / 250	150 / 250	250	250	Pressure poppet diameter +	(mm)

SCHWING Bioset reserves the right to change specifications without notice.

Screw Feeders: Models SD 250, 350, 500

While primarily used as a feeder, each unit is also capable of acting as a mixer/blender and /or a live bottom as a part of a large storage hopper/bunker pumping system.



Twin Screw Feeder: The primary application for the twin screw feeder is for feeding non-flowable material that cannot be sucked into the cake pump to improve filling efficiency.

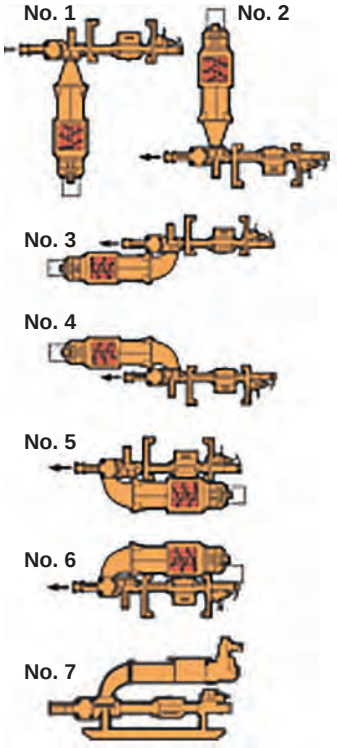
The power unit is equipped with an auxiliary hydraulic pump to control speed by varying hydraulic pump output; output may be adjusted manually or electronically. The screw feeder can be located in multiple configurations in relation to the pump.

The screw feeder is a combination of two intermeshing segmented flight cake breakers and twin screw conveyors. The unit is designed to be self-cleaning during conveying. The inlet is a rectangular flange and has dimensions corresponding with customer specifications. The drive gear box is sized in accordance with the material to be pumped and the pressure required in the suction housing to insure good volumetric filling efficiency. The entire rotating assembly provides continuous duty under all anticipated load conditions.

The screw feeder is bolted to the pump suction housing with a flanged connection. The screw feeder tub/housing and screws can be constructed of A36 steel or stainless steel.

Pressure Control: An optional transducer is located in the transition between the pump and screw feeder. This device will control the sludge pressure in the transition. A signal from the pressure transducer will control the output of the hydraulic pump, and consequently the screw feeder RPM insuring the pressure in the transition will be maintained at the preset point. This control will optimize the pump's filling efficiency, maximize wear part life, minimize power consumption and lengthen intervals between service.

Standard Screw Feeder / Discharge Configurations



Screw feeder is positioned 90 degrees to the pump on the right or left side in the direction of flow. Pump and screw feeder are in the same horizontal plane.

Screw feeder is positioned in front and parallel with the pump on the right or left side in the direction of flow. Pump and screw feeder are in the same horizontal plane.

Screw feeder is positioned parallel with the pump on the right or left side in the direction of flow. Pump and screw feeder are in the same horizontal plane.

Screw feeder is positioned above the pump. The pump cylinders are positioned in the horizontal plane.

Screw Feeder Model		SD 250	SD 350	SD 350 HD	SD 500
Pressure Version	(HD = High Pressure)	Standard	Standard	HD	Standard
Inlet Opening Width min/max	(mm)	432	610 / 762	610 / 762	881
Inlet Opening Length min/max	(mm)	610 / 5182	610 / 5182	610 / 5182	61 / 5182
Screw Speed min/max	(RPM)	0-40	0-40	0-40	0-40
Flight Diameter	(mm)	240	330	330	485
Standard Version	(kw/HP)	13.6 / 18	13.6 / 18	N/A	37 / 50
High Pressure Version	(kw/HP)	N/A	22/30	35/50	N/A
Weight Approx. (varies with Inlet Opening Length)	(kg)	780.2 / 1300	1300 / 1800	3700 / 4800	200 / 2900

A Name You Can Trust

Schwing Bioset Solutions for Water and Wastewater

Piston Pumps for Solids
High-pressure positive displacement piston pumps with lowest life cycle costs to efficiently transport biosolids through pipelines.

Class A Bioset Process
Advanced alkaline stabilization technology that is totally enclosed and PFRP approved to operate at 55C.

Screw Press Dewatering
High-performance dewatering with low energy and maintenance requirements and the widest range of model sizes available.

Container Wagons
Evenly load containers with ground accessible service points, minimal maintenance requirements, and full automation.

Membrane Bioreactors (MBRs)
Microfiltration systems with end-free hollow fiber membranes.

Sliding Frames & Storage Silos
Truck receiving, truck loading, or intermediate storage of dewatered solids with lowest cost of ownership.

Class A Fluid Bed Drying
Thermal drying technology operating under inert conditions with high thermal efficiencies and low maintenance requirements.

Phosphorus Removal / Struvite Recovery
Remove nutrients from wastewater, improve dewatering, reduce scaling, and create a struvite end product.

Residuals Management
Offered through a partnership with our resource recovery company to transport, market, and beneficially reuse residuals.

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