Pinnacle-Flo, Inc.

Centrifugal Pump
User's Manual

10620 Stebbins Cir., STE D.
Houston, TX 77043

1.832.303.1245
info@Pinnacle-Flo.com

（PLEASE READ THE MANUAL CAREFULLY BEFORE USE）

Contents

1. Usage and Application Range

SB series centrifugal sand pump mainly supplies to solids control circulating system of oilfield drill rig, and be used to provide drilling liquid with a certain discharge capacity and pressure to desander, desilter and mud mixer, to assure these equipments work efficiently.

The SB8×6×14 centrifugal sand pump applies to over 3000-meter-long drilling rigs; The SB8×6×11 centrifugal sand pump applies to under 3000-meter-long drilling rigs,also can be can be used to supply mud to triplex mud pump as a filling pump. The SB6×5×11 centrifugal sand pump applies to truck-mounted drilling rigs or pocket drilling rigs; The SB4×3 centrifugal sand pump is usually used as measuring pump or replenishment pump; he SB4×3 centrifugal sand pump is usually used as clean water pump

2. Main Structure ,Feature and Working Principle

Its main parts are pump shell, impellers, bearing block, pump axle, bearing, shaft coupling,wearing plate, seal apparatus, oil seal, motor and base.

The Series Centrifugal Sand Pump has these features: （1）open impeller, apply to transport high viscosity drilling liquid. （2）combination seal for a long service life. （3）use universal bearing houses and bearings, convenient to maintain and cut the costs.（4）the major parts are made from antiwear nodular iron, and long service life.

The prinple is that under the motor, the impellers of the pump rotate at high speed, the dring fluid is sucked into the suction pipe. After the drilling fluid flows through the suction pipe and gets enough energy and velocity under the centrifugal force, the drilling fluid is expelled continuously out of the pump.

3. Main Technical Parameters

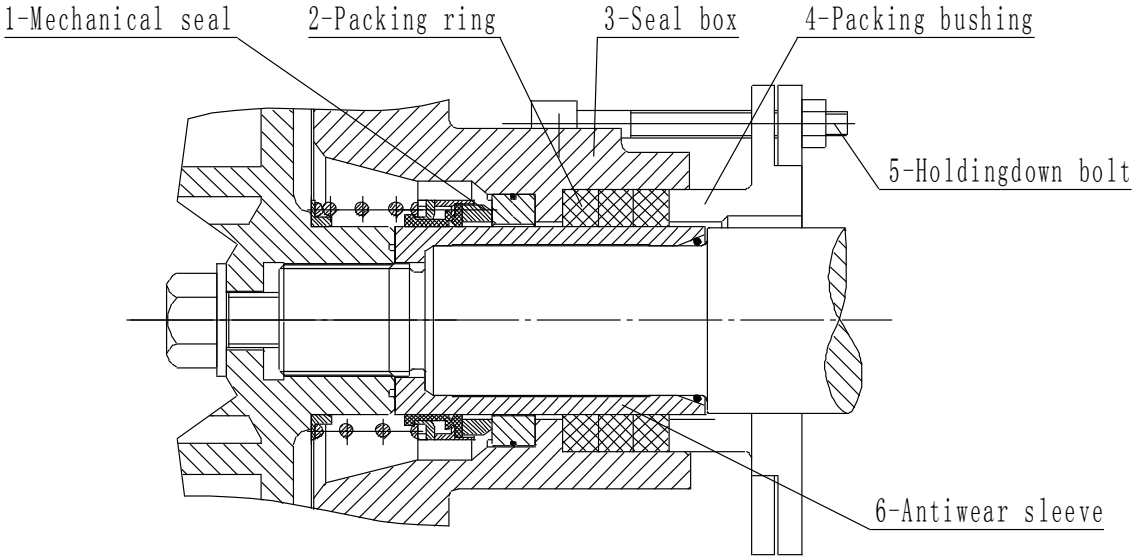
Parameters / Type	Rotation speed r/min	Capacity m^3/h	Pressure head m	Efficiency （%）	Motor HP. kW
JSB8×6×14	1450/1750	240~260	28~33	65	55/75
JSB8×6×11	1450/1750	220~240	24~28	65	37/45
JSB6×5×11	1450/1750	180~220	24~28	65	30/37

JSB4×3	1450/1750	60	22~28	65	11/15
JSB3×2	1450/1750	50	22~28	65	7.5/11

4. Seal Apparatus Maintenance

WSB centrifugal sand pumps adopt combination seal(shown in Fig-1),consist with mechanical seal, packing, packing bushing, seal box, holdingdown bolt, antiwear sleeve etc.

Seal apparatus sketch



Maintenance:

a) When use a new sand pump or the mechanical seal is changed newly, keep the packing bushing in relexed state to avoid wearing out the antiwear sleeve prematurely.

b) After working one year,and the mechanical seal fails,the pump is sealed by packings by compressing the packing bushing with the holdingdown bolt. When the packing bushing fails to adjust, add a packing(packing section is 12mm ×12mm).

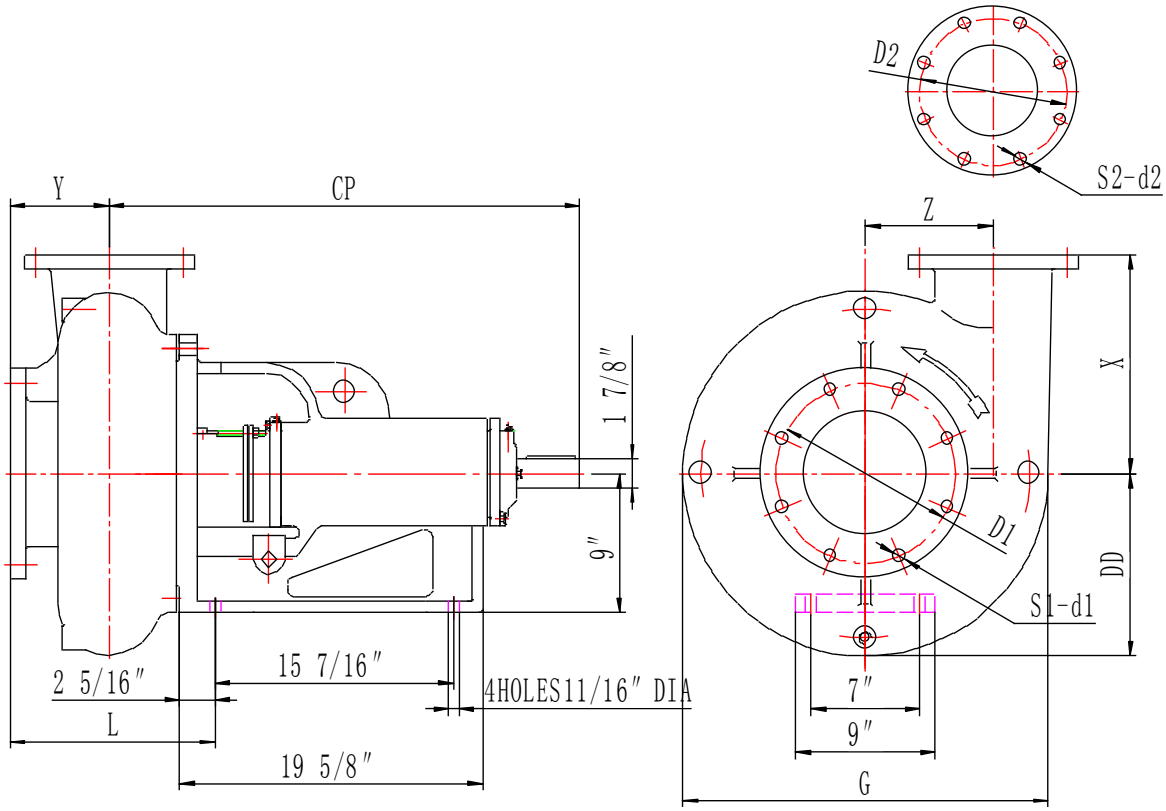
c) After shaft sleeve antiwear layer wears out, change the mechanical seal and shaft sleeve in time.

5. Bearing cavity maintenance

a) Grease is 3# extra press lithium base grease ,input it 50ml bearing every 3 months

b) Cleaning bad grease of bearing cavity every half year.

6. Installation



Pump size	D1	S1-d1	D2	S2-d2	G	L	x	Y	Z	CP	DD	WT kg
3x2x13	6	4-3/4	4 3/4	4-3/4	17 7/8	8 3/4	10 1/4	3 7/8	7 1/8	29 1/4	9	200
4x3x13	7 1/2	8-3/4	6	4-3/4	17 7/8	9 3/8	10 1/4	4 1/4	6 7/8	29 3/8	9	205
6x5x11	9 1/2	8-7/8	8 1/2	8-7/8	17 7/8	12 1/16	11	5 3/4	5 1/2	30 5/8	9	246
6x5x14	9 1/2	8-7/8	8 1/2	8-7/8	21	12 1/16	11	5 3/4	6	30 5/8	10 1/2	252
8x6x11	11 3/4	8-7/8	9 1/2	8-7/8	20	13 1/4	14	6 3/8	6 5/16	31 1/4	10	270
8x6x14	11 3/4	8-7/8	11 3/4	8-7/8	23 9/16	13 1/4	14	6 3/8	8 1/2	31 1/4	12	287
10x8x14	14 1/4	8-1	14 1/4	8-1	22 3/8	13 11/16	14 3/16	7 3/16	8 3/8	31 1/4	11 3/16	310

7. Operation

a) If the desander pump is newly installed or re-used after a long period of time, check the lubrication and junction carefully. First of all, lubricant is filled into the seal cavity and the bearing cavity. Never is there foreign matters in the pump cavity.

b) The impellers of the pump are connected to the pump axle through screw. At the first usage, ensure that the rotating direction is correspondent to that labeled on the pump shell, or the impellers will be removed to touch the protection plate in front of

it and the pump will be damadged quickly.

c) The desander pump should be started at the condition that the suction valve is open and the exhaust vavle is closed. After running for 1~2min, open the exhaust valve and adjust the pump pressure. If the pump pressure and flow rate too high or too low, or the motor is too hot, adjust the opening of the exhaust valve till the pump is running stably.

d) When the fluid surface in the circulation tank is low, turn off the pump and restart it after the tank is filled. Vapor corrosion can be avoided.

e) In cold season or for a long time of no running, remove the screw plug under the bottom of the pump shell to let the fluid out for preventing it from condensing.

f) Often check the temperature of the pump axle and bearing. Not higher than 40℃(the total temperature is ambient temperature +40℃).

j) If abnormal sounds occur in operation, stop running at once. Restart the pump after troubles are disposed.

h) The new desander pump and its seal apparatus have been carefully tested and checked after production. Do not wrench or take out the adjustment screw.

8. Troubleshooting

Trouble	Causes	Guidance
Pump pressure and flow rate too low	Impellers too small	Replace with bigger ones
	Bad seal of pipe junction, serious leakage	Better junction
	Suction and exhaust pipes too long and benting	Shorten and straighten them
	Rotary speed not up to the rated value	Replace a motor with bigger power
	Too big clearance between secondary impellers and the antifriction table	Fix packing rings and adjust the clearance to within 0.5~1mm
	Foreign matters barring in suction pipe	Clean out
	Suction vavle not open wide	Open it widely
Pump pressure and flow rate too high	Too big impellers	Replace with smaller ones

Bearing surface too hot	Bearing clearance too small, so too much rolling friction	Adjust the bearing clearance
Abnormal sounds during running	Pipes or junctions broken	Repair or replace
	Junction loose	Tighten
Serious leakage at the sealed part	Mechanical seal fails	Sealed by packing

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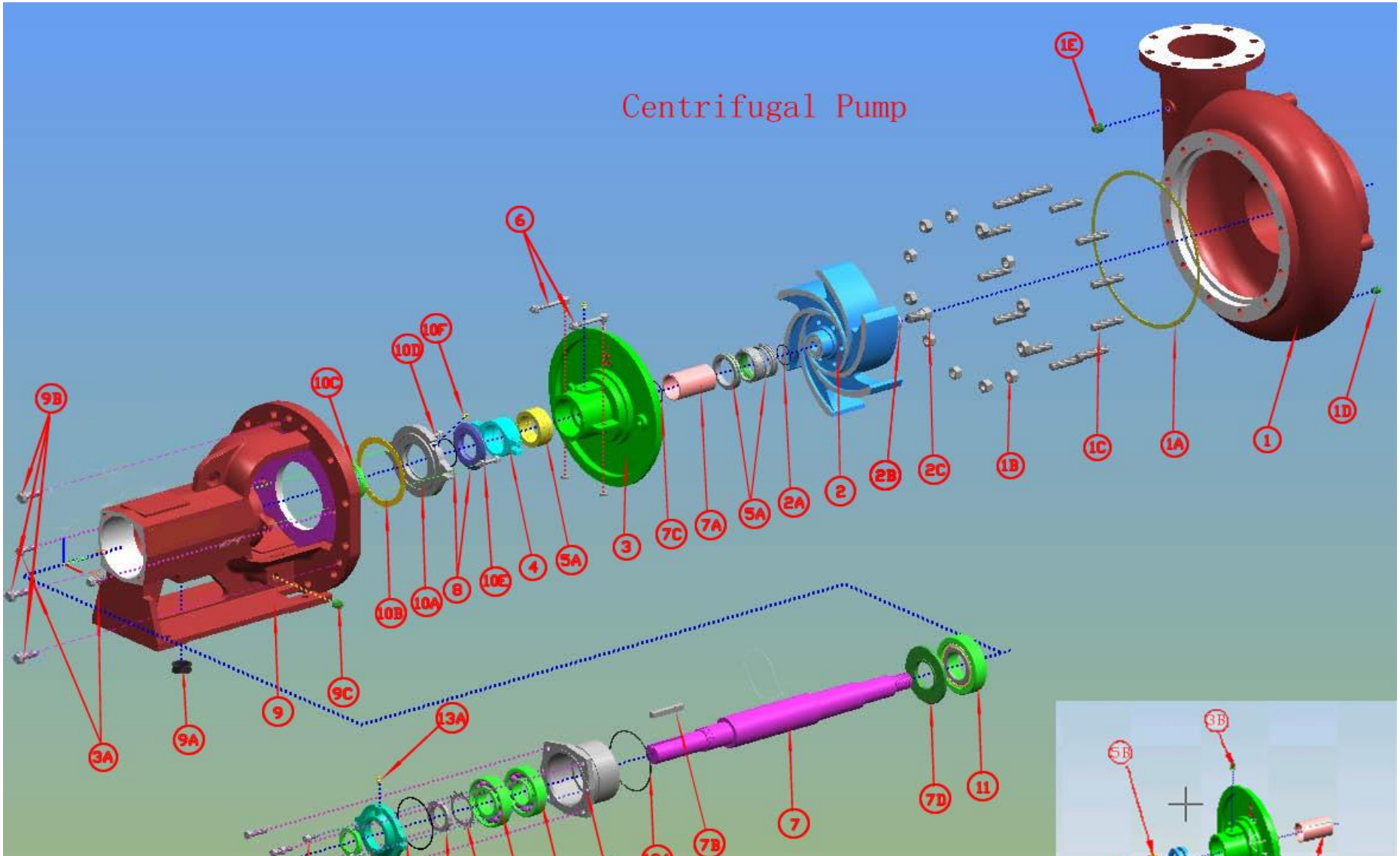
9. Main parts



Centrifugal pump parts list

ITEM	QTY	PART No.	MISSION PART No.	DESCRIPTION	MATERAIL	WEIGHT kg
1*	1	See below	See below	Casing	QT600-3	0.005
1A	1	0602	10399-46-1	Gasket,casing	Vellumoid	
1B	12	0603	3932-61	Nut,casing	Stl	
1C	12	0604	3862-76	Stud,casing	Stl	
1D	1	0605	8505-04-01	Plug,Casing Drain	Stl	
1E	1	0605	8505-04-01	Plug,flush line	Stl	
2*	1	See below	See below	Impeller	QT600-3	
2A	1	0607	19110-72	Seal,impeller	Viton	0.002
2B	1	0608		Washer,impeller	Stl	
2C	1	0609		Bolt,impeler lock	Stl	
3*#	1	0610	22223-01-30	Stuffing box,mech.seal	QT600-3	20
3*&	1	0611	20614-01-30	Stuffing box,packed	QT600-3	20
3A	2	0612	3861-117	Bolt,stuffing box	Stl	
3B&	1	0613	19368-01	Grease fitting	Brass	0.01
4	1	0614	20622A	Gland assy,packing	Stl 304	1
5A#	1	0615	22451-1	Seal,mechanical	Tung/Tung	1
5A#	3	0616		Packing, Shaft - M.S. Backup	Kevlar	0.06
5A#	5	0617		Packing, Shaft - w/latern ring	Kevlar	
5A	1	0618		Ring, Latem	Bronze	
6	2	0619	B3701A	Bolt assy,gland	Stl 304	0.15
7	1	0620	20612-02-33	Shaft	42CrMo	17
7A	1	0621	20943-04A	Sleeve,shaft	38CrMoAl	1
7B	1	0622	4371-5-21	Key,shaft	Stl	
7C	1	0623	23444-01-72	Seal,shaft sleeve	Viton	
7D	1	0624		Oil thrower & Stop pin	Stl	
8	1	0625	22210-1A	Deflector assembly	Composite	0.4
9	1	0626	20618-12-1	Frame,grease lubricated	Cast iron	80
9A	1	0627		Plug,oil drain	Buna-n	
9B	3	0628	2538-1H	Bolt,casing jack	Stl	
9C	1	0605	8505-04-01	Plug, Frame Drain	Stl	
10A	1	0629	20626	Cover,inboard bearing	Iron	2.6
10B	1	0630	20625	Gasket,I.B.Brg.Cover	Vegetable fiber	
10C	1	0631	20619-01	Oil seal, I.B.Brg.Cover	Buna-n	0.06
10D	2	0632	3861-1	Bolt, I.B.Brg.Cover	Stl	
10E	2	0634	3932-2	Nut, I.B.Brg.Cover	Stl	
10F	1	0613	19368-01	Grease fitting	Brass	0.01
11	1	0635	20615-1	Bearing,inboard	Vendor	2.1
12	1	0636	20624-01-01	Housing,O.B.bearing	Iron	6
12A	1	0637	7496-253	Seal, O.B.Brg.housing	Buna-n	0.001
12B	4	0638	3861-138	Bolts, O.B.Brg.housing	Stl	
12C	2	0639	3932-62	Nut, O.B.Brg.housing jam	Stl	
13	1	0640	20617A	Cover,O.B.Bearing	Iron	1.8
13A	1	0613	19368-01	Grease zerk, O.B.Brg.Cover	Brass	0.01
13B	1	0641	7496-26	O-ring, O.B.Brg.Cover	Buna-n	0.001

13C	1	0642	20619-02	Oil seal, O.B.Brg.Cover	Buna-n	0.05
13D	2	0643	3861-139	Bolt, O.B.Brg.Cover	Stl	
14	2	0644	20616-1	Bearing, O.B.	Vendor	1.5
14A	1	0645	6124-4	Lockwasher,O.B.Bearing	Stl	
14B	1	0646	6123-4	Locknut, O.B.Bearing	Stl	0.22
Casings-includes studs,nuts & gasket						
1*	1	0601-3213	19203-01-30A	Casing,3×2×13	QT600-3	60
1*	1	0601-4313	19205-01-30A	Casing,4×3×13	QT600-3	67
1*	1	0601-6511	19122-01-30A	Casing,6×5×11	QT600-3	102
1*	1	0601-6514	19123-01-30A	Casing, 6×5×14	QT600-3	105
1*	1	0601-8611	19763-01-30A	Casing, 8×6×11	QT600-3	132
1*	1	0601-8614	19117-01-30A	Casing,8×6×14	QT600-3	125
1*	1	0601-10814	20937-01-30A	Casing,10×8×14	QT600-3	155
Impellers						
2*	1	0606-32YYY	19204-XX-30	Impeller,3×2×13	QT600-3	11.5
2*	1	0606-43 YYY	19206-XX-30	Impeller,4×3×13	QT600-3	13.5
2*	1	0606-65 YYY	19121-XX-30	Impeller,6×5×11	QT600-3	20
2*	1	0606-65 YYY	19121-XX-30	Impeller, 6×5×14	QT600-3	22
2*	1	0606-86 YYY	19116-XX-30	Impeller, 8×6×11	QT600-3	22
2*	1	0606-86 YYY	19116-A0-30	Impeller,8×6×14	QT600-3	24
2*	1	0606-108 YYY	21867-XX-30	Impeller,10×8×14	QT600-3	32

Note：1. XX－Impeller code－First X equals diameter of impeller in inches minus 4.Therefore 10″=6,9″=5 etc…14″ use letter A;

2. Second X equals fractional data in1/8′s.Therefore 1/8″=1, 1/4″=2 ,etc…Thus a 10.5″impeller is coded as 60, 12″impeller is coded as 80, 13.25″impeller is coded as 92 etc…

3. YYY－the metric diameter of impeller，therefore 12″ is coded as 305mm，11″ is coded as 280mm