Spraying pump

Directions For Installation And Operation

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Ⅰ General

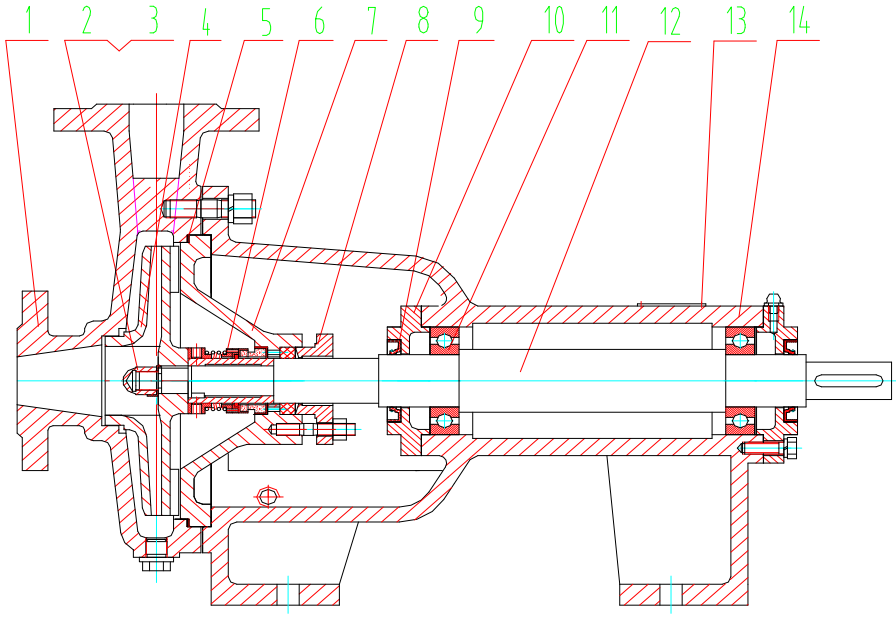
Spraying pump is a kind of equipment especially matched for mud pump for oil drilling, with the function of flushing and cooling sleeve and pistons in the process of pump operation, as well as include the other situation for transportation mud.

Ⅱ Technical Data

Type	Flow (m^3/h)	Lift (m)	Efficiency (%)	Speed (r/min)	Power(kW)	
					Power of shaft	Power of motor
32SB180J-2.2kW	7.5	10	48	1420/1750	0.55	2.2
32SB180J-4kW	9	14	48	1750	0.93	4
40SB180J-3kW	15	10	53	1420/1750	0.78	3
32PL	7.5	10	48	1420	0.55	/
32PL(B)	7.5	10	48	1420	0.55	/

Ⅲ Primary Structure

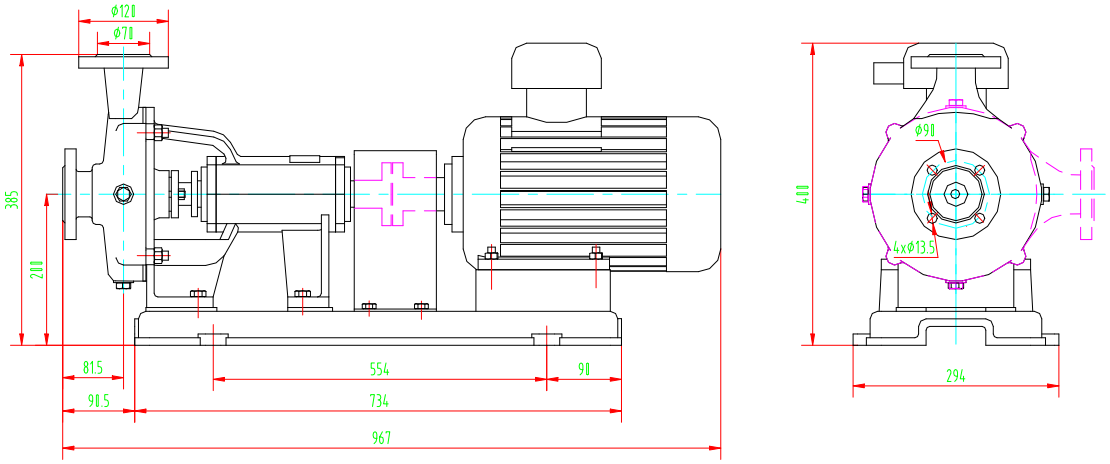
Spraying pump mainly consists of pump body, mechanically sealed pump cover, mechanical seal, impeller and pump base, etc. Advantages in its structure mainly include; mechanical sealing is adopted to ensure operation without leakage. In addition, the pump has two-drive type: motor direct drive and pulley drive.



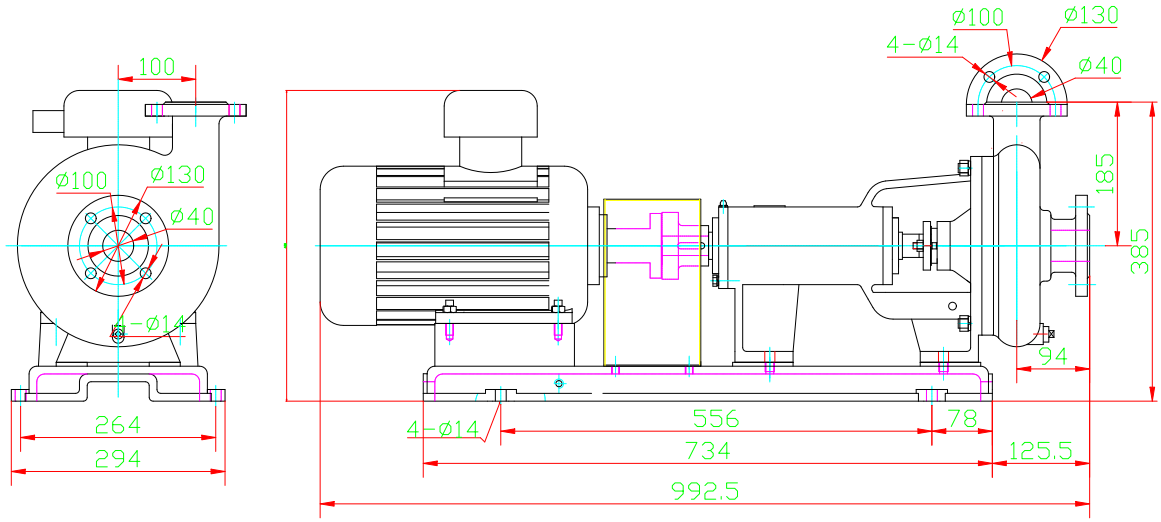
1.Pump body 2.Cap nut 3.Washer 4.Impeller 5.Asbestine plank
6.Mechanical seal 7.Pump cover 8.Block hydrosphere 9.Oil seal
10.Bearing cover 11.Bearing 12.Shaft 13.Nameplate 14.Pump base

Structural drawing for 32SB180J Sand Pump 32PL Spraying Pump

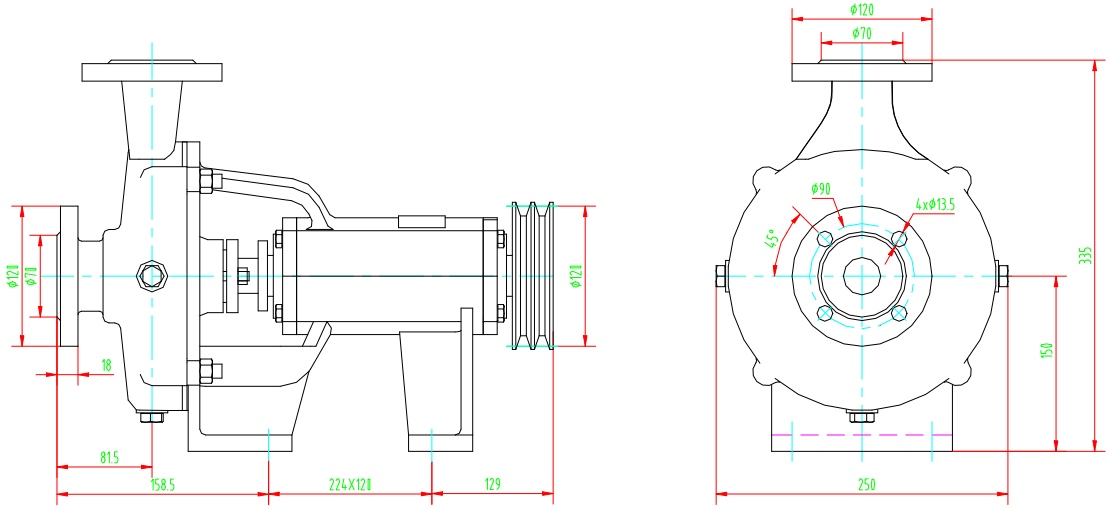
Ⅳ Outline, structure and installation dimensions



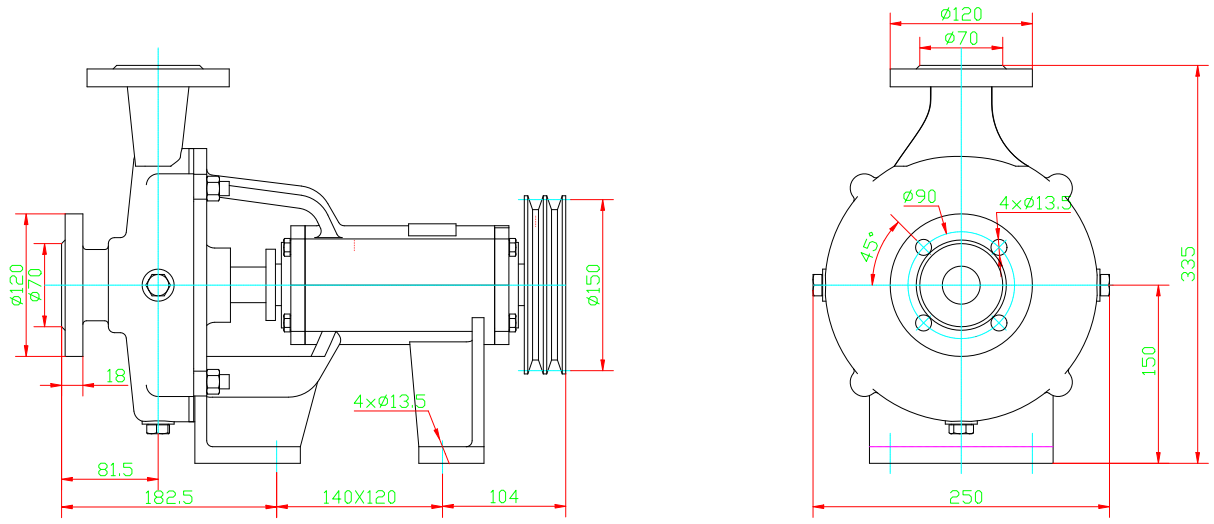
Shape for 32SB180J



Shape for 40SB180J



Shape for 32PL



Shape for 32PL(B)

Ⅴ Installation、Operation and Maintenance

1. Installation

（1）Pump installation

Installation location of pump shall be as near to the pumping source as possible, to shorten length of the suction section and reduce suction loss. Pump installation shall be horizontal, firm, reliable and vibration-prevention.

（2）Installation of shaft coupling(for motor straight unite drive)

Service life of pump and motor depends on alignment of elastic shaft coupling, installation error with pump and motor shaft require to parallel limit offset no more than 0.25mm axes corner meet error no more than 0.12mm. If inspect result mistake, adjust degree of tightness of pump and motor’s install bolt or tray iron, to put up axes tune. When square with frank rule process inspect to reach require.

（3）Strap wheel installation

Two strap wheel axle should parallel, and no more than 2mm with end error; strap must alignment, degree of tightness equal; motor shall be balanced and locked-in.

（4）Installation of pipeline

A. Inlet pipeline section area must larger than pump sever area, or equal to pump sever area.

B. Suction pipeline shall not be fitted with any throttle valve but can be equipped with a normal open valve to minimize disorder of fluid flow, which may be closed only when the pump is disassembled for inspection/repair.

C. In order to prevent bubble in suction pipeline, gradual transition from high altitude to low altitude shall be available between the pumping source and the pump. If the user needs to use the pump under the condition that there is a suction height, please use a vacuum pump or a

bottom valve for water drawing.

D. Pipeline at pump inlet must be horizontal and straight, with a length of at least twice as diameter of the suction pipeline.

E. When temporarily using a hosepipe for suction pipeline, ensure that the hosepipe will not be compressed, because pressure in the suction pipeline is generally lower than the atmospheric pressure. If the hosepipe is compressed, as it is affected by the atmospheric pressure, flow will be reduced and even intercepted.

F. Outlet pipeline shall be fitted with a normal open valve, which is convenient for inspection/repair.

G. Each pipeline (including inlet pipeline) must be with its own support. It is strictly forbidden to let a pump bear weight of any pipeline.

H. When operation condition is unclear or unstable, outlet pipeline must be equipped with a throttle valve, to ensure that pump operates at the design point.

2. Operation

（1）Preparation

A. Manually turn pump shaft, to ensure smooth operation with any grating.

B. Fill the pump body and inlet pipeline with fluid to bleed off air.

C. No-load running time of the pump cannot exceed 5s. The pump must run under the condition of being filled with liquid. Otherwise, the mechanical seal may be damaged.

（2）Startup and operation:

A. Start the prime mover and gradually open the gate valve to the required position to operation is made.

B. Stop the machine in case that there is noise or other abnormal phenomena occurring in operation.

（3）Lubrication and maintain daily

A．Bearing lubrication

Bearing shall be lubrication with universal lithium-based grease, must replace the grease for every 1500 hours' operation.

B. For winter nonuse, completely drain water deposited in the pump avoid frost crack of pump case.

3. Maintain and Maintenance

（1）Disassembly (refer to structural drawings and explosive drawing)

a．Remove pump base and body's coupling bolt, remove pump body (1).

b． Disassemble impeller： first remove impeller nut, and stop washer then, remove impeller.

c． Loosen packing gland nuts, remove mechanically sealed pump cover (7) and mechanical seal (6); remove the packing gland (8).

d．Remove two bearing glands (10).

e． With cuprum stick or wood block padding the shaft end, from left towards right, remove shaft (12) and bearing components from pump base (14)(do not damage shaft

shoulder).

（2）Inspection

a．Impeller：for serious cavitations (especially main leaf), excessive corrosion, ablation or breakage, impeller should be replace.

b．Shaft：when radial run out exceeds 0.05mm, oil seal location is seriously abraded, or shaft screw thread, groove, pedestal site or other surface is damaged, it is required to repair shaft, when the shaft cannot be repaired, replace the shaft.

c．Oil seal：disassembled oil seal must be replaced

d． Ball bearing： excessively worn bearing, excessively tight/loose bearing or that produces nose when operating must be replaced(a new bearing may be unpacked only at the time of replacement. Therefore, the bearing used for replacement must be with the same type and dimensions of the original bearing to be replaced).

（3）Assembly (refer to structural drawings and explosive drawing)

a． Before assembly, all parts, especially screw thread, bearing and bearing lubricating points, should be carefully washed. In addition, the rough parts should be polished with fine gauze.

b． Fist assemble the bearing and bearing gland at dynamic end install shaft with bearing into the pump base at left.

c．Then, mount bearing gland, breakwater ring, apply a thin layer of anti-attrition agent to shaft.

d．Assemble mechanically sealed pump cover and mechanically seal.

e． Mount impeller, pay attention to clearance between impeller back and mechanically seal pump cover, tighten lock nut.

f. Mount pump body, tighten fast bolt.

g．Assembly order is just the reverse of disassembly, after assembly, manually turn shaft, and each part shall be without any blockage.

（4）Faults and Troubleshooting

a．Mechanically real serious leakage, serious wearing and shaft surface worn.

—— Remove pump body, replacing shaft if there are over deep groove by examined, otherwise replacing mechanically real.

b．Grease serious leakage at bearing glands, polyurethane seal wearing serious.

—— Eliminate：replace polyurethane oil seal.

Generic thing, shall be replace polyurethane oil seal after pump operation 6 months.

c．Impeller run unnatural

—— Reason：impeller installation is out of standard.

—— Eliminate： adjust and installation(manually turn shaft, each part shall be without any blockage, friction).

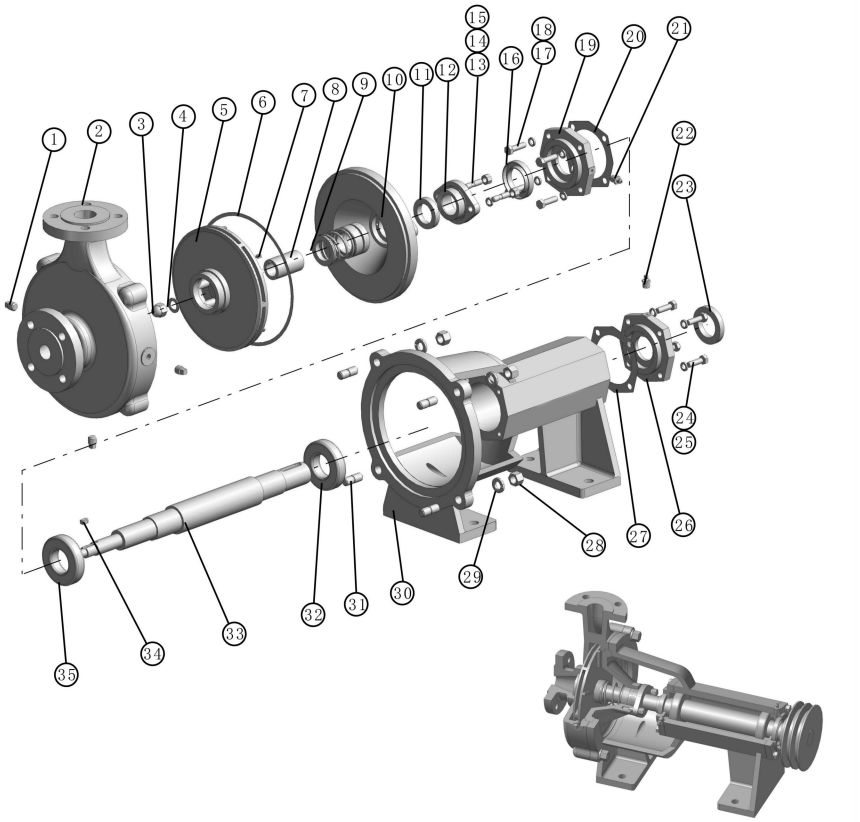
d. Sand pump (spraying pump) common faults and troubleshooting schedule as follows.

Faults and Troubleshooting Schedule

S/N	Fault	Cause	Troubleshooting
1	Excessive shaft power	1. Friction between impeller and pump base end face/mechanically real pump cover. 2. Pump operates under a condition where lift is much lower than that of the design point.	1. Adjust clearance between impeller and pump base end face/ mechanically real pump cover, to eliminate friction. 2. Check whether the service machine meets requirements; make opening of the drainage valve smaller, to make pump operates at the design point.
2	Reduced lift and flow	1.Large particles block suction pipe and impeller flow passage 2. Lower Speed of pump 3. Worn impeller 4.Excessive clearance between impeller and pump base end face, and increased leakage 5. Too small opening of inlet valve	1. Eliminate tamper. 2. Make pump operates at the rated speed. 3. Replace impeller. 4. Adjust clearance between impeller nd pump base end face. 5. Open inlet valve wider.
3	Bearing overheat	1. Too much or little lubricant 2. Foreign substances in oil 3. Worn bearing	1. Keep oil surface at position as specified by the oil level gauge. 2. Replace lubricant. 3. Replace bearing.
4	Vibration and abnormal noise during pump operation	1.Unbalanced wearing of impeller 2. Worn bearing 3. Loose connection 4. Cavitations of pump	1. Replace impeller. 2. Replace bearing. 3. Tighten all loose parts. 4. Improve suction condition, to prevent air into pump.
5	sealing serious leakage	1. Seriously worn shaft sleeve . 2.Foreign substances in mechanically real assembly. 3. Mechanical seal installation skew 4.Mechanical seal worn and ineffective.	1. Replace shaft sleeve. 2. Eliminate foreign substances and wash sealing parts. 3. Installation seal assembly again. 4. Replace mechanical seal.

Annotate： These pumps shall be used only within the design

Attached A 32SB180J(32PL) Sand Pump Explosive Drawing

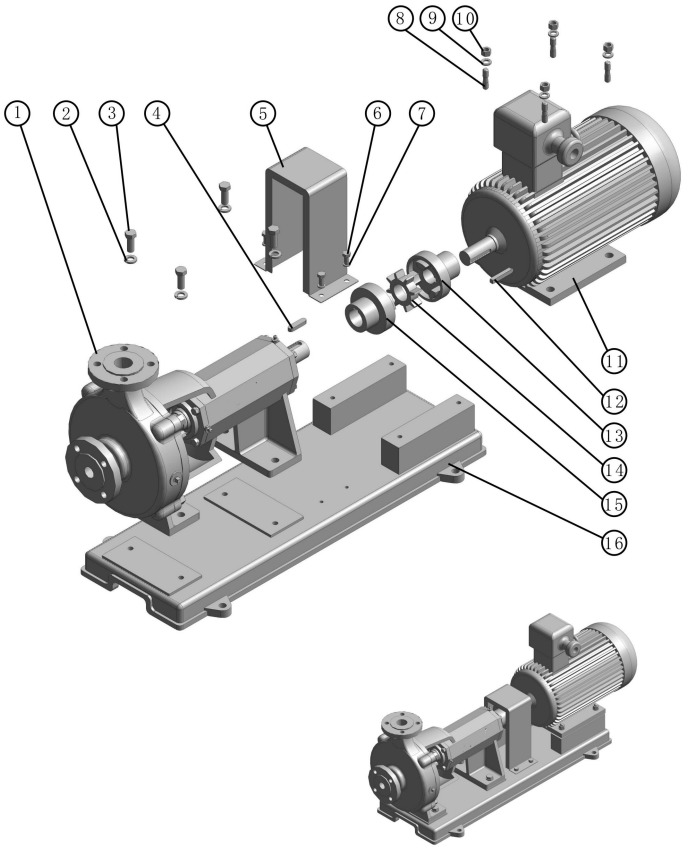


Bill of materials (32SB180J(32PL) Sand pump Explosive Drawing)

Item	Description	Part No.	Qty.	Item	Description	Part No.	Qty.
1	Plug	32SB180J0001	3	19	Bearing cover	32SB180J0019	1
2	Pump body	32SB180J0002	1	20	Paper gasket	32SB180J0020	1
3	Cap nut	32SB180J0003	1	21	Oil cup	32SB180J0021	1
4	Lock gasket	32SB180J0004	1	22	Oil cup	32SB180J0022	1
5	Impeller	32SB180J0005	1	23	Oil seal	32SB180J0023	1
6	Paper gasket	32SB180J0006	1	24	Screw bolts	32SB180J0024	4
7	Key	32SB180J0007	1	25	Spring gasket	32SB180J0025	4
8	Shaft sleeve	32SB180J0008	1	26	Bearing cover	32SB180J0026	1
9	Mechanical seal	32SB180J0009	1	27	Paper gasket	32SB180J0027	1
10	Pump cover	32SB180J0010	1	28	Screw nuts	32SB180J0028	4
11	Packing	32SB180J0011	1	29	Spring gasket	32SB180J0029	4
12	Packing gland set	32SB180J0012	1	30	Pump base	32SB180J0030	1
13	Double head studs	32SB180J0013	2	31	Double head studs	32SB180J0031	4
14	Spring gasket	32SB180J0014	2	32	Bearing	32SB180J0032	1
15	Screw nuts	32SB180J0015	2	33	Shaft	32SB180J0033	1
16	Oil seal	32SB180J0016	1	34	Key	32SB180J0034	1

17	Screw bolts	32SB180J0017	4	35	Bearing	32SB180J0035	1
18	Spring gasket	32SB180J0018	4				

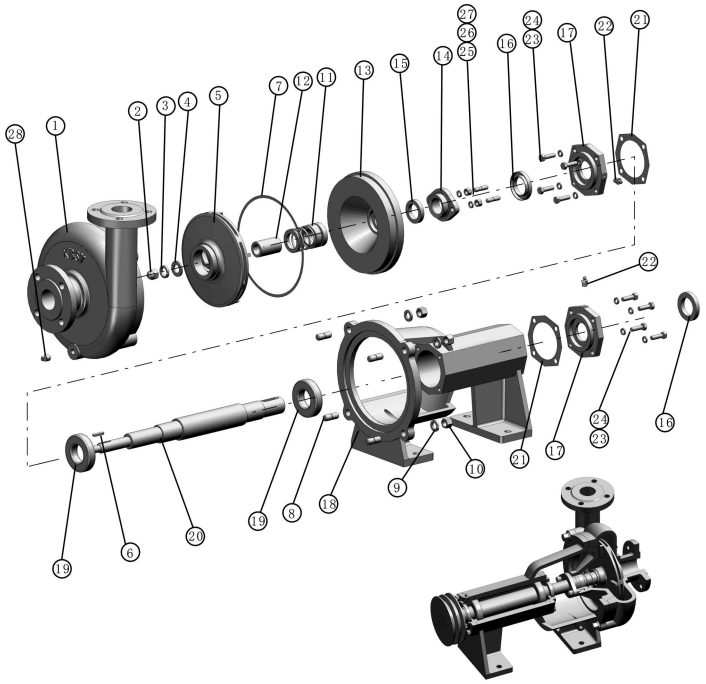
Attached B 32SB180J Sand Pump Set Explosive Drawing



Bill of materials (32SB180J Sand pump Set Explosive Drawing)

Item	Description	Part No.	Qty.	Item	Description	Part No.	Qty.
1	Pump head	32SB180J0001S	1	9	Spring gasket	32SB180J0009S	4
2	Spring gasket	32SB180J0002S	4	10	Screw nut	32SB180J0010S	4
3	Screw bolt	32SB180J0003S	4	11	Electromotor	32SB180J0011S	1
4	Key	32SB180J0004S	1	12	Key	32SB180J0012S	1
5	Shield cover	32SB180J0005S	1	13	Electromotor joint	32SB180J0013S	1
6	Screw bolts	32SB180J0006S	4	14	Slip dollop KL	32SB180J0014S	1
7	Washer	32SB180J0007S	4	15	Pump joint	32SB180J0015S	1
8	Double head studs	32SB180J0008S	4	16	Foundation	32SB180J0016S	1

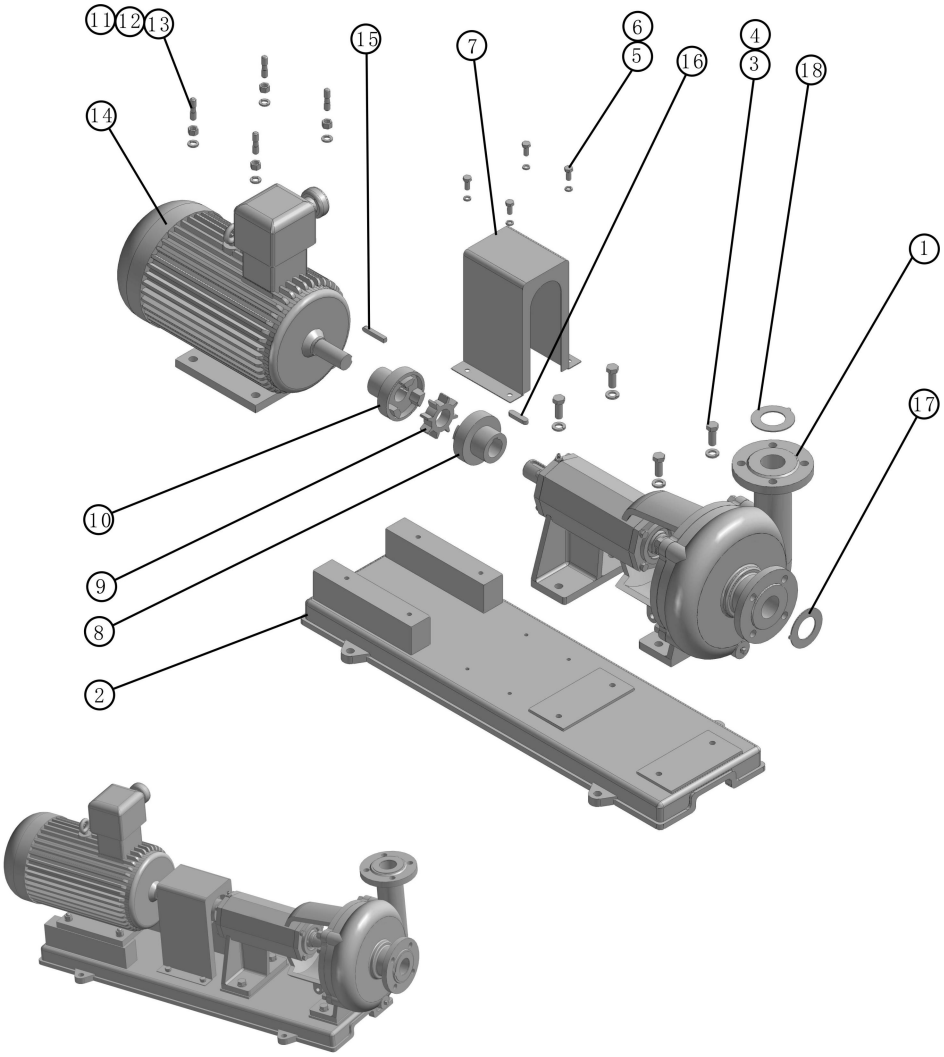
Attached C 40SB180J Sand Pump Explosive Drawing



Bill of materials (40SB180J Sand pump Explosive Drawing)

Item	Description	Part No	Qty.	Item	Description	Part No	Qty.
1	Pump body	40SB180J0001	1	15	Packing	40SB180J0015	1
2	Cap nut	40SB180J0002	1	16	Oil seal	40SB180J0016	2
3	Spring gasket	40SB180J0003	1	17	Bearing cover	40SB180J0017	2
4	Washer	40SB180J0004	1	18	Pump base	40SB180J0018	1
5	Impeller	40SB180J0005	1	19	Bearing	40SB180J0019	2
6	Key	40SB180J0006	1	20	Shaft	40SB180J0020	1
7	Paper gasket	40SB180J0007	1	21	Paper gasket	40SB180J0021	2
8	Double head studs	40SB180J0008	4	22	Oil cup	40SB180J0022	2
9	Screw nuts	40SB180J0009	4	23	Screw bolts	40SB180J0023	8
10	Spring gasket	40SB180J0010	4	24	Spring gasket	40SB180J0024	8
11	Mechanical seal	40SB180J0011	1	25	Double head studs	40SB180J0025	2
12	Shaft sleeve	40SB180J0012	1	26	Screw nuts	40SB180J0026	2
13	Pump cover	40SB180J0013	1	27	Spring gasket	40SB180J0027	2
14	Packing gland set	40SB180J0014	1	28	Bolt Plug	40SB180J0028	1

Attached D 40SB180J Sand Pump Set Explosive Drawing



Bill of materials (40SB180J Sand pump Set Explosive Drawing)

Item	Description	Part No	Qty.	Item	Description	Part No	Qty.
1	Pump head	40SB180J0001S	1	10	Electromotor joint	40SB180J0010S	1
2	Foundation	40SB180J0002S	1	11	Spring gasket	40SB180J0011S	4
3	Spring gasket	40SB180J0003S	4	12	Screw nut	40SB180J0012S	4
4	Screw bolts	40SB180J0004S	4	13	Double head studs	40SB180J0013S	4
5	Spring gasket	40SB180J0005S	4	14	Electromotor	40SB180J0014S	1
6	Screw bolt	40SB180J0006S	4	15	Key	40SB180J0015S	1
7	Shield cover	40SB180J0007S	1	16	Key	40SB180J0016S	1
8	Pump joint	40SB180J0008S	1	17	Suction rubber pad	40SB180J0017S	1
9	Slip dollop KL	40SB180J0009S	1	18	Discharge rubber pad	40SB180J0018S	1

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