AVH 600CZEX DISC CENTRIFUGE

OPERATION MANUAL

Disc separator

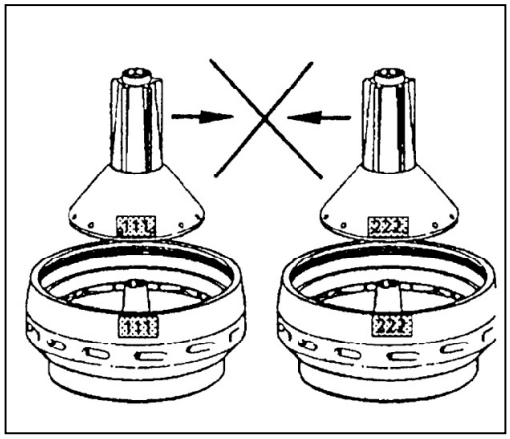
Catalogue

Thanks for choosing Woerh disc separator.

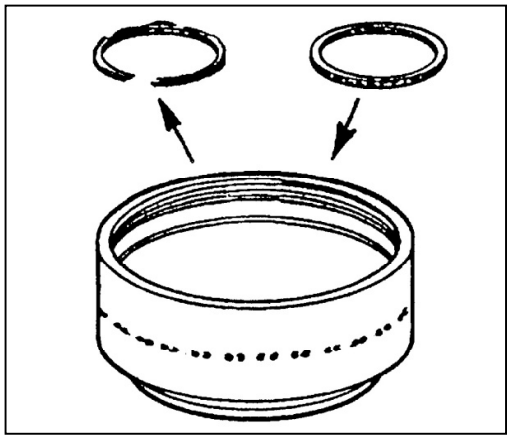
The bowl of the disc separator is rotating in high speed, in order of the separator can service for your company adequately and operate safety, read operation manual carefully before operating.

1. Operating safety of the separator

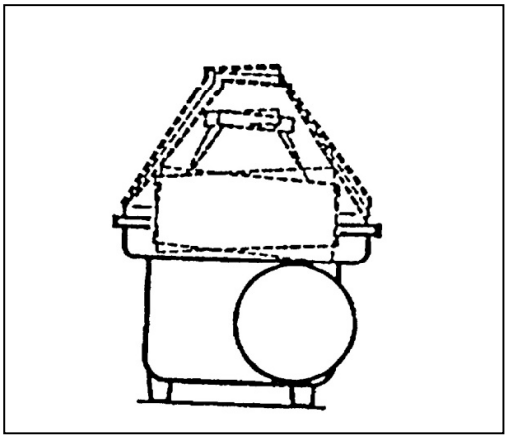
Separator is a kind of high speed rotating machine, the bowl has great centrifugal force when at work. For your operator and machine safety, please strictly following the following safety rules.



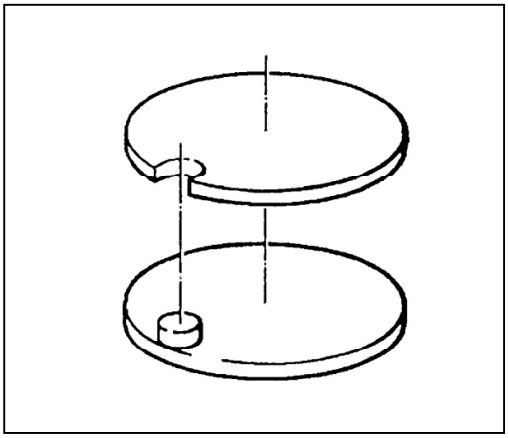
1.01 Do not reversal use the bowl internal parts, even the same model if your company has several separators.



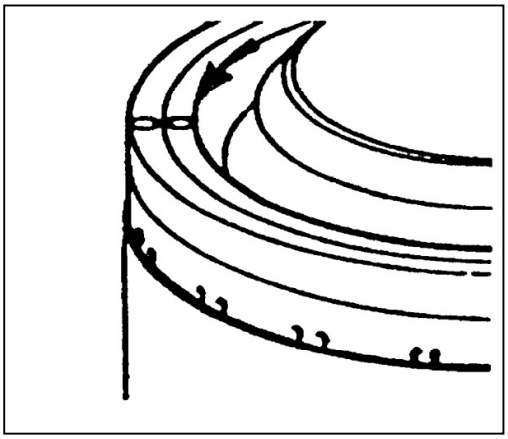
1.02 Broken spare parts need be replaced in time



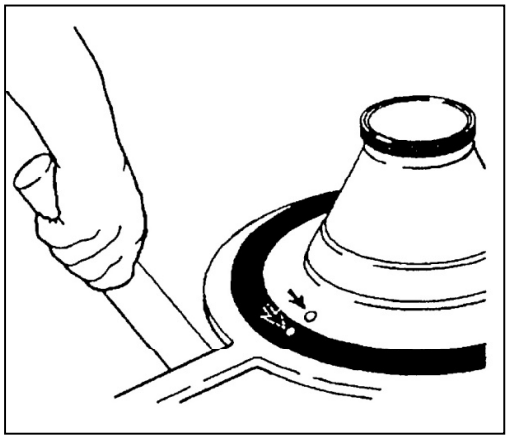
1.03 Every three months to check bowl parts corrosion, wear and fatigue, especially bowl sludge port, locked ring spiral etc. The main spare parts should be stop use when has problem, and notice our company as soon as problem, do not repair or replace arbitrarily. Separator need re-balance and nondestructive flaw detection when used two years, users can send to our company to deal with if unconditionally



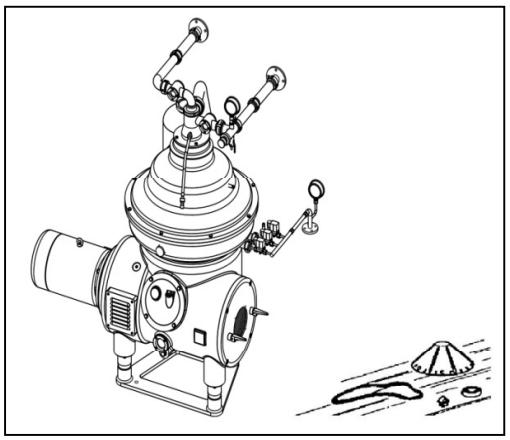
1.04 When assemble bowl, all position pins must be in good condition, if loose obviously, stop immediately and notice our company



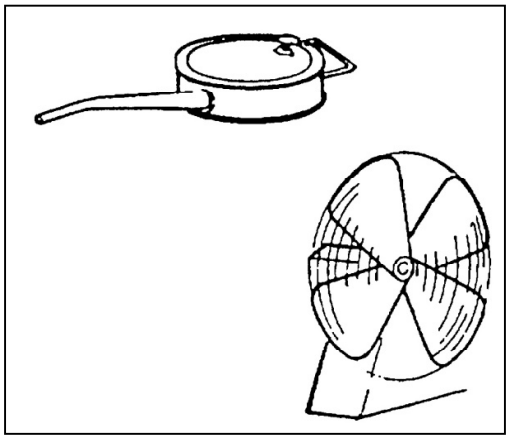
1.05 Do not replace or missing any parts when install separator bowl parts, spiral connecting parts must be installed in place, aligned in position if has assembly mark.



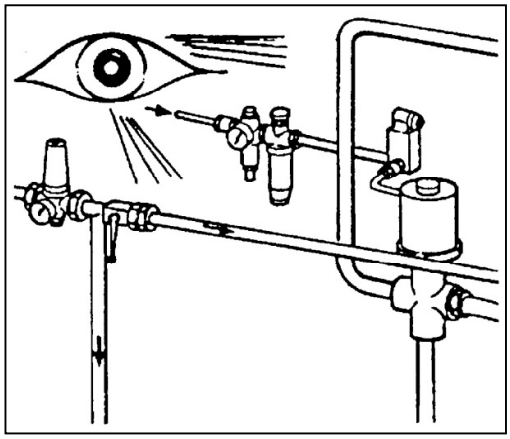
1.06 Before start, check the bowl locked ring**"0"** mark, inlet and outlet device and other set screw



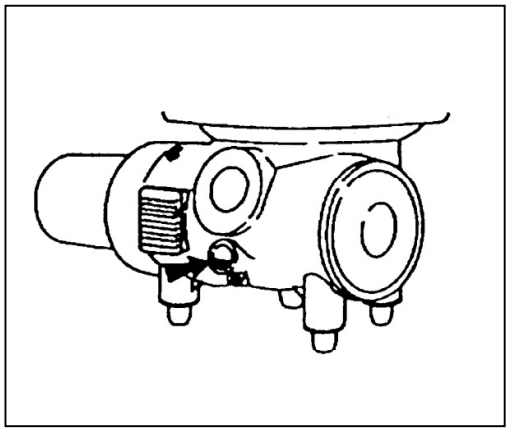
1.07 Check separator all the parts are in the place, do not missing any parts.



1.08 Check lubrication and cooling system



1.09 Check wiring line and soft pipe, sight glass

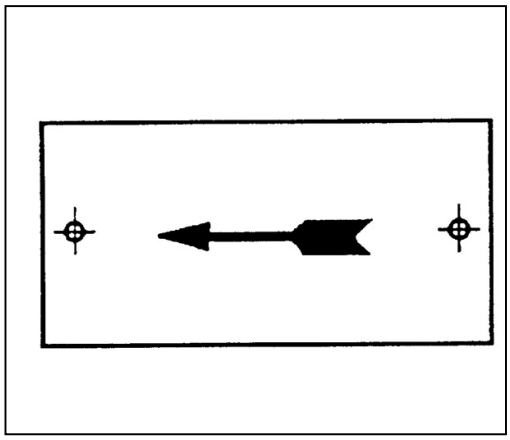


1.10 Check oil mark level of gearbox before each time start, oil level is no low than sight glass middle line.

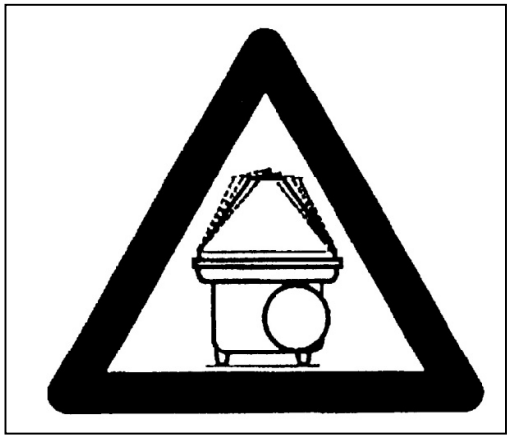
1.11 As separator high speed rotated, big noise when run, please wear headphones if conditionally.

1.12 Do not introduce explosion material to separator

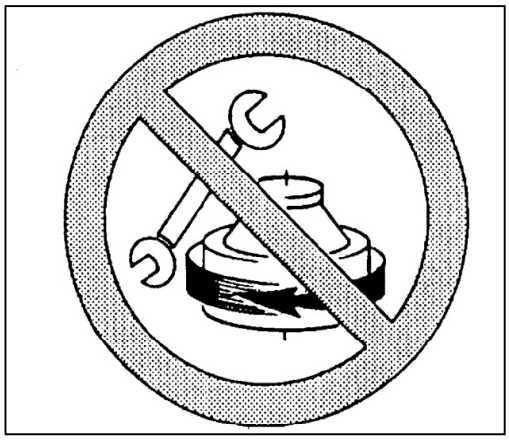
1.13 Prohibited separate none agreed material(corrosion resistance, high density, flammable, volatile and explosive material), if need, please contact manufacturer, use after confirm. Prohibited authorization operation, if material is harmful to human body, need to wear protective clothing.



1.14 Check whether the motor and bowl rotation direction is the same with arrow on the frame when start up the machine.

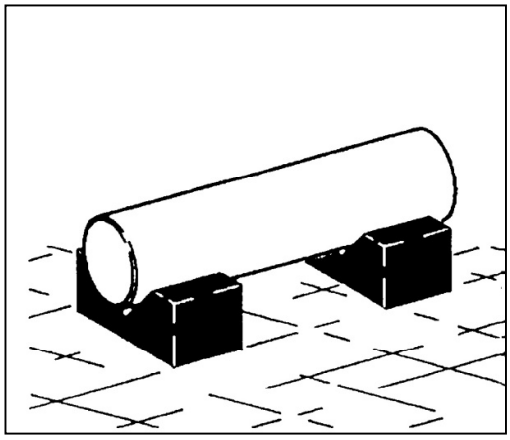


1.15 Switch off power and stop if separator has abnormal vibration, after separator stop completely, than disassemble, cleaning and check all the parts, note the install order and identify fault cause, re-install and start, restart and stop time is no less than 4 hours.

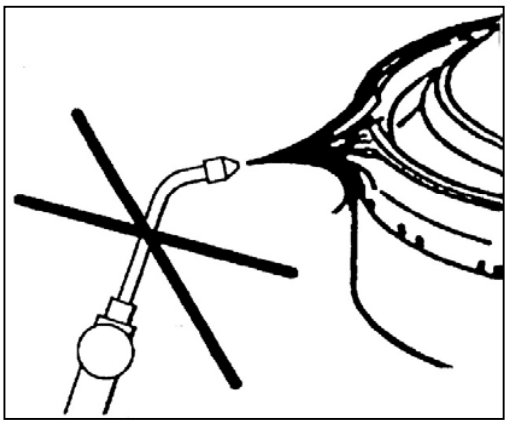


1.16 Do not loosen any parts before bowl is not stop completely.

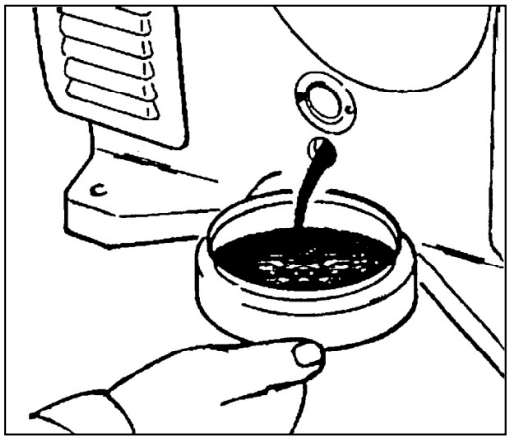
1.17 Use working plate when disassemble, Do not climb up or stand in the separator to avoid damage the parts.



1.18 Removed parts should be put in appropriate place, such as rubber washer or board to avoid parts scroll or injury.



1.19 Prohibited use flame heating or welding main parts, especially bowl body, bowl cover, locked ring, sliding piston, vertical shaft and horizontal shaft etc.



1.20 Recycle slid oils to avoid contaminated products, when recycle, Note that chemical composition in waste oil may be harmful to human body, please disposal the oil in accordance local laws.

1.21 The bowl must hoisting up as a whole, with special-purpose tool. Before hoisting up, the bowl must be jacked with the special-purpose 7, press the discs with the compact device 5. Assembly and disassemble the bowl parts of the separator is forbidden.

1.22 Soft operating water: total hardness (calculate as CaO) <250mg/L, the other standard confirm to drink water. Operating water pressure:**0.3～0.6MPa**(adjustable)

1.23 Please use the regular parts provided by the manufacturer.

2. Product model and name

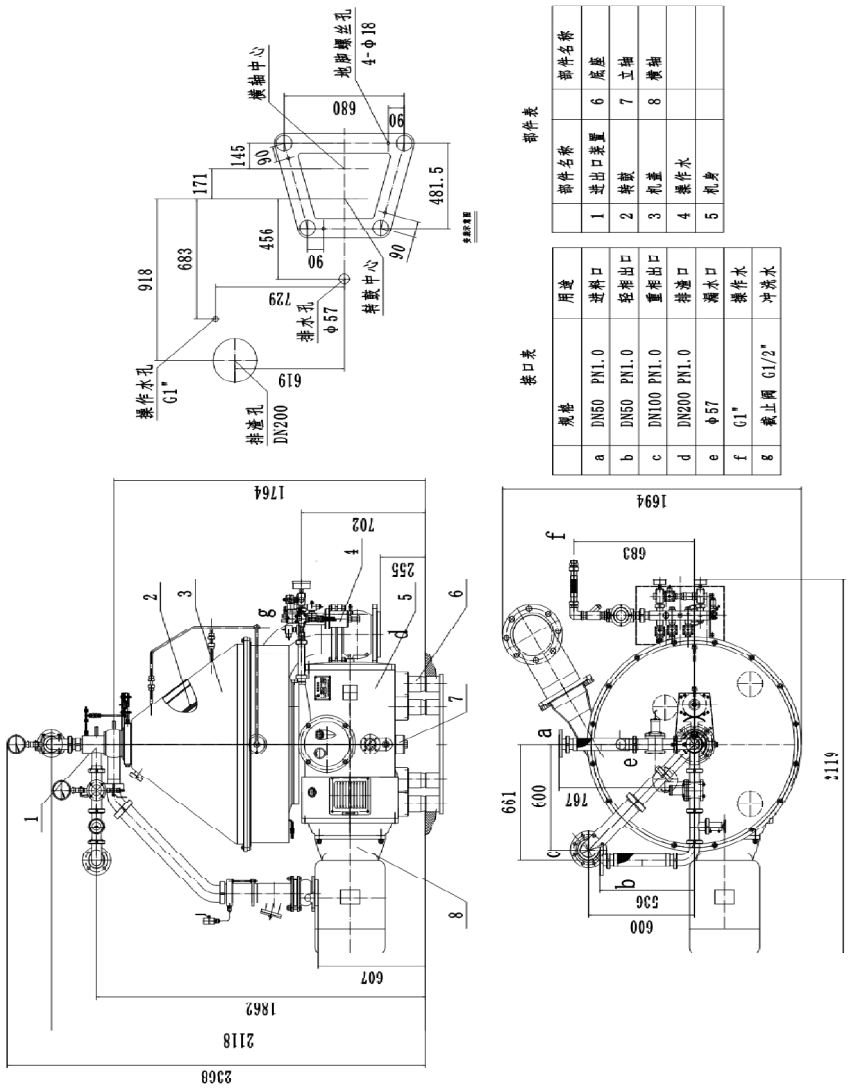
Abbreviation: DHZYS700 disc separator

3. Performance and application

This product absorbs the advantage of the same kind foreign Product. All the parts that may contact the feeding are made of stainless steel. Obviously reduce the chemical effect of the feeding and the machine spare parts. The separated light phase products and heavy phase products are discharged from the machine by centripetal pump, so the product may enter the machine under lower pressure. The separator adopts the PLC automatic control system, can carry out automatic de-sludging, ability of fitness is stronger, automatic degree is high. Easy to adjust, worker labor strength is opposite to ease, the solids content ratio in the mixture fluid is widely (to be lower than 0.5%). Power drive adopts directly start by frequency converter, start reliably, prevent overload. The machine has many advantages, such as running evenly, lower noise, stronger separating ability, and higher automatic degree. It is one of the most precise equipment in oil refining industry and widely used in dairy de-fat and clarify, according to the different demands of customers, the equipment also can be used in clarification and purification of similar material.

4. Product figure (see attach fig. 1)

The separator is made up of feed and discharge device, bowl, hood, driving device vertical, driving device horizontal, frame, foundation and motor, PLC automatic control system.



部件表

	部件名称		部件名称
1	进出口差置	6	底座
2	转鼓	7	主轴
3	机座	8	横轴
4	操作水		
5	机身		

接口表

	规格		用途
a	DN50	PN1.0	进料口
b	DN50	PN1.0	轻相出口
c	DN100	PN1.0	重相出口
d	DN200	PN1.0	排液口
e	φ57		调水口
f	G1"		操作水
g	截止阀	G1/2"	冲洗水

附图一 离心机外形及安装示意图

5. Main technical data (see table one)

Table one

Model	DHZYS700
Bowl speed	4226rpm
Equivalent subsidence area	$113\times10^7cm^2$
Capacity	400 – 500 t/d
Motor model	Y225S—4P—B5
Power	37kW
Dimension （L×W×H）	2190×1693×2368
Weight	~3200kg

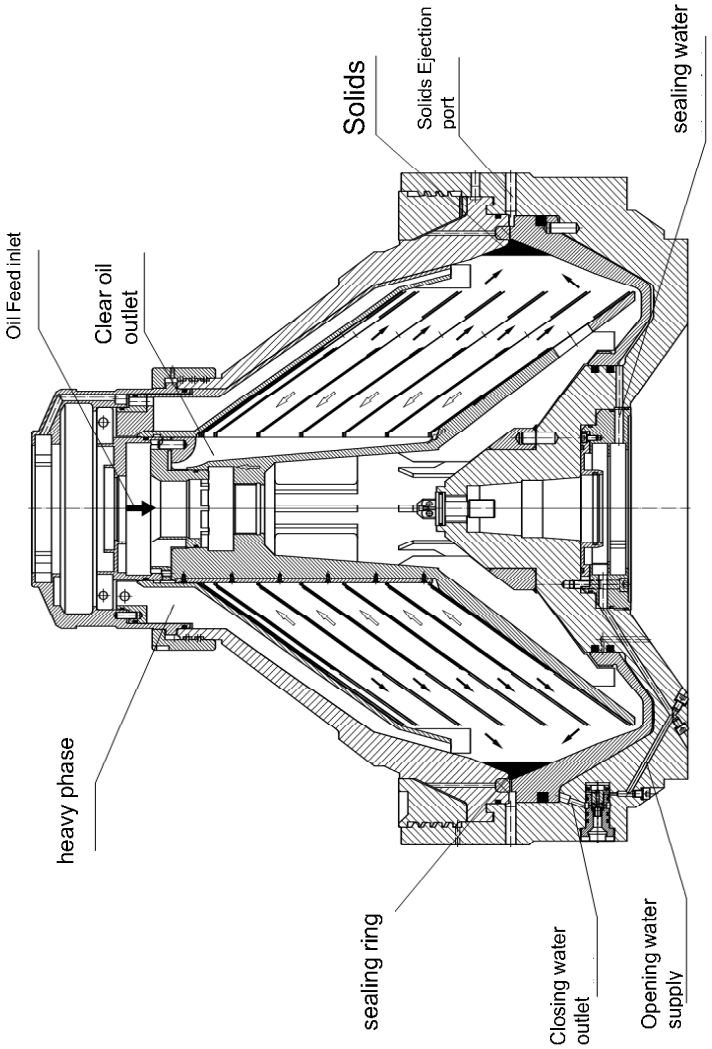
Note: Actual capacity depends on feeding features

6. Operating principle (see attach fig. 2)

Four solenoid valves are controlled automatically by the PLC intelligence control instrument. Customer may input the control time by oneself according to the demand by the PLC intelligence control instrument manual. When the control instrument is at automatic work appearance, the solenoid valve used in sealing water is opened by the control instrument once every minute to add the water. This water is entering from the water distributor, to the space between the bowl and the sliding piston. Lift the sliding piston by the centrifugal force of the water. Make upper surface of the sliding piston to press the gasket on the bowl top, complete seal. At this time start feeding. When de-sludging, opening water is entering from the water distributor to opening hole, push small piston slide entad, make sealing water flow out from the discharge nozzle, then the sliding piston falls, solid impurities in sediment holding space are ejected from the sediment ejection ports by centrifugal force. Then immediately fill the sealing water, sliding piston seals again. Simultaneity the solenoid valve used in washing water is opened, flush solids in the hood. The process is made by PLC intelligence control instrument, feeding needn't stop.

The mixture fluids to be processed are fed to the bowl from feeding pipe, and enter eight center hole channels from center hole of distributor. Under the effects of centrifugal force, the solids that have heavier density are collected on the bowl wall; they include soap and impurities, collected in sediment holding space. After a while, the separated solids are ejected from the bowl at controlling of PLC. The intervals at which de-sludging have to take place depend on the quality of the mixture fluid. De-sludging include automatic de-sludging, total de-sludging, partial de-sludging. Normally customer don't need total de-sludging, put up partial de-sludging under the condition of effects of automatic de-sludging are bad. The interval between two partial de-sludging is up to two minutes, and electric current is normal. Then re-establish the automatic de-sludging interval. The heavier and better fluidity products (higher density) are threw towards the bowl wall under the effects of centrifugal force, flow upwards along passages between bowl top and disc top, then are discharged from the machine by upper centripetal pump; the lighter products

(lower density) flow along the inner side of the discs into the passage in the upper distributor, the lighter product is discharged from the machine by the centripetal pump. Thus the mixture fluid is separated well. The separator adopts self de-sludging and centripetal pump. Thus the machine can work continuously for a long time, attain good separation effects in long run. In addition, this equipment adopts special adjustable centripetal pump and can adjust the position of separation surface according to the material quality.



7. Main structure in brief

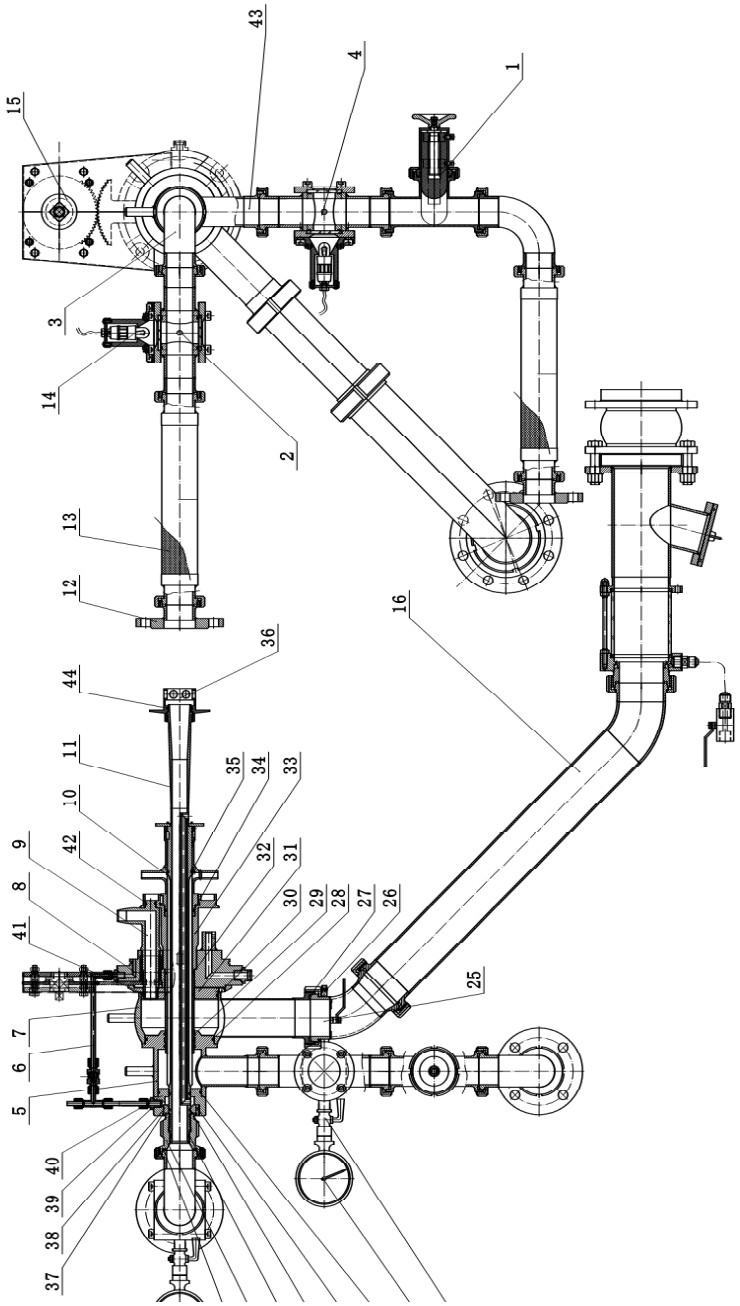
7.1 Inlet and outlet device（see fig.3）

It is used for feeding mixed liquid and light and heavy phase material after separated, it is on the top of frame (see fig.3), the name, quantity and specification of main parts see table two. Mount upper centripetal pump on the oil inlet pipe(the lower of oil inlet pipe stretch into bowl distributor and the upper mounted into centripetal pump cover), after the upper stretched into light and heavy phase outlet housing, then put on oil sleeve, fix oil inlet pipe on the light and heavy phase outlet housing with locked nut, the relevant parts are all sealed by sealing ring. Use 4 screws M10×20 to fix the light and heavy phase outlet housing on the hood. .Pay attention to the fit of the bowl when disassembling and mounting the machine. Corresponding pipe parts should also be formed a complete set to the technological pipe lines.

Table two

No	Description	Qty	C o d e	Remark
1	Regulating valve	2	600-0250	
2	Oil inlet	2	600-0251	
3	Bend	2	600-0252	
4	Oil outlet	1	600-0253	
5	Upper outlet pipe		600-0254	
6	Overflow pipe		600-0255	
7	Lower outlet pipe		600-0256	
8	Connection plate	1	500-0200	
9	Heavy phase centripetal pump	1	500-0201	
10	Light phase centripetal pump		500-0202	
11	Oil inlet	1	600-0257	
12	Flange joint	2	600-0258	
13	Soft metal pipe	2	600-0259	
14	Sight glass light	2	600-0260	
15	Regulating device	1	600-0261	
16	Heavy phase outlet pipe	1	600-0262	
17	Seal ring	10	250-0008	

18	Locked nut	1	600-0263	
19	O ring	1	100-0208	GB1235-76
20	O ring	2	100-0011	GB1235-76
21	Pin	1	600-0264	
22	O ring	1	100-0010	GB1235-76
23	Pressure gauge0.6MPa	2	750-0051	
24	Copper ball valve	2	600-0265	
25	Sample valveG1/2"	2	600-0266	
26	Sample nozzle	2	600-0267	
27	Seal ring	1	250-0100	
28	O ring	1	100-0100	GB1235 -76
29	O ring	2	100-0101	GB1235-76
30	O ring	1	100-0102	GB1235-76
31	Ring	1	600-0268	
32	O ring	2	100-0017	GB1235-76
33	Heavy phase centripetal pump house	1	600-0269	
34	O ring	1	100-0017	GB1235-76
35	O ring	1	100-0105	GB1235-76
36	Sleeve	1	600-0270	
37	Spring collar	1	600-0271	
38	Washer	1	450-0300	
39	Joint	1	450-0301	
40	Joint	1	450-0302	
41	O ring	1	100-0201	
42	O ring	4	100-0106	GB/T70.1-2000
43	Joint	1	450-0303	GB93-2000
44	O ring	4	100-0209	GB95-2000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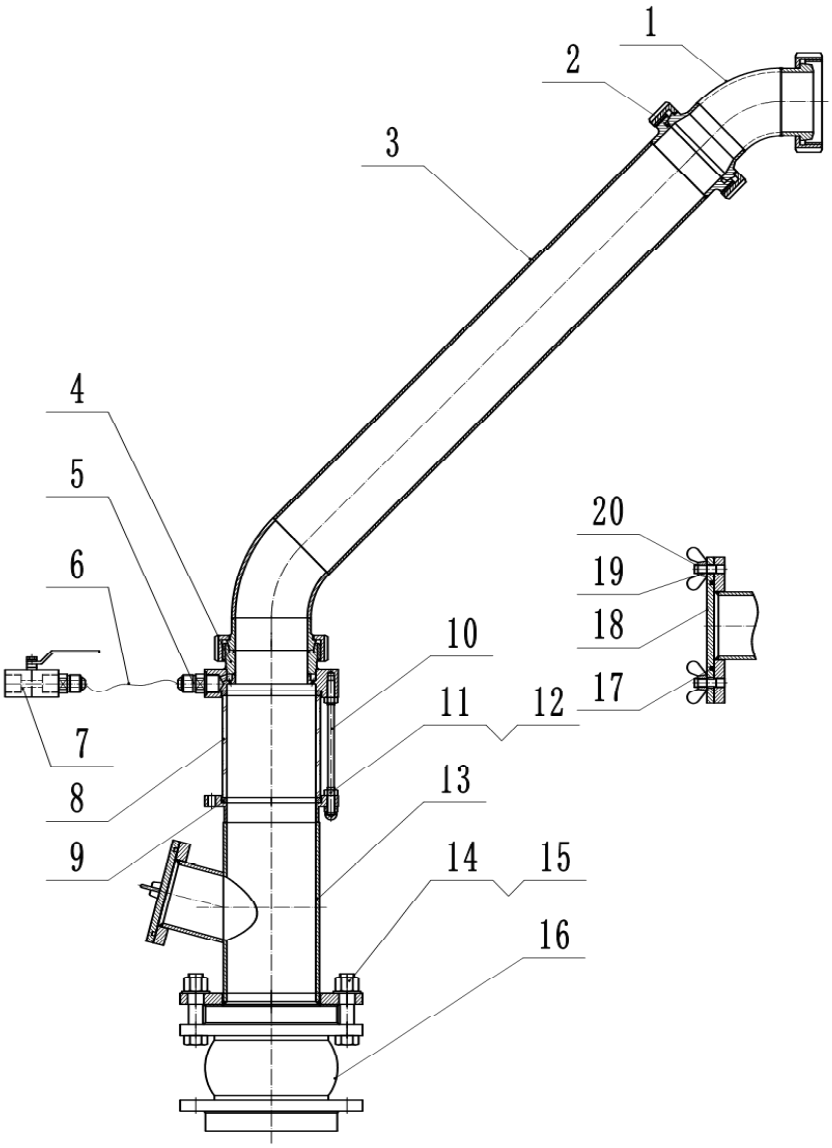
In/out Lines

7.1.2 Heave phase outlet pipe （see fig.4）

Heavy phase outlet pipe is the way of separator discharge heavy phase. It's main parts of spare parts name. Quantity. Specification please see table three.

Table three

No	Description	Qty	C o d e	R e m a r k
1	Bend	1	600-0272	
2	Seal ring	1	250-0001	
3	Straight pipe	1	600-0273	
4	Joint	1	600-0274	
5	Joint	4	600-0084	
6	Metal soft pipe	2	600-0038	
7	Ball valve	2	600-0275	
8	Sight glass	1	600-0169	
9	Seal ring	2	250-0101	
10	Double screw	4	450-0304	
11	Hexagon nut	8	450-0014	
12	Nut	4	450-0014	
13	Heavy phase outlet	1	600-0276	
14	Hexagon screw	8	450-0004	GB/T5780-2000
15	Nut	8	450-0005	GB41-86
16	Soft joint	1	600-0214	
17	Seal ring	1	250-0102	
18	plate	1	650-0100	
19	Nut	2	450-0014	
20	Double head screw	2	450-0012	GB898-1988



Heavy phase Outlet pipe

7.2 Bowl (see attach fig. 5)

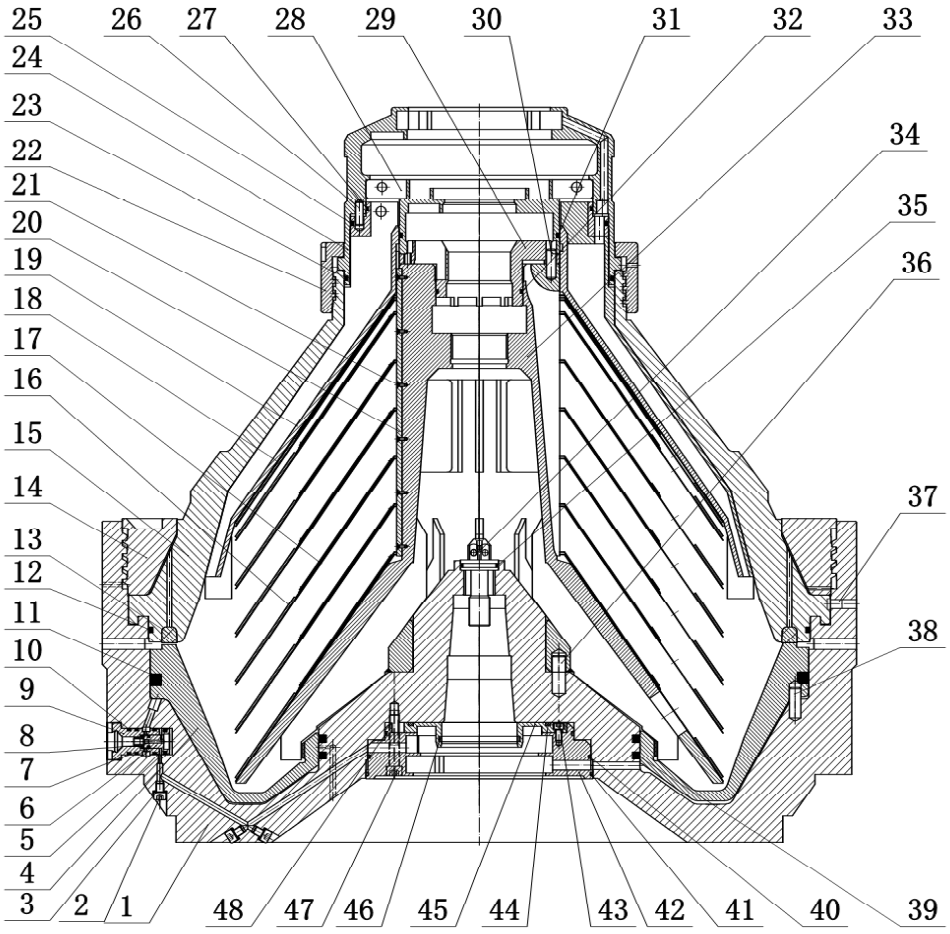
The bowl is the place that separate materials, the "heart of the machine".(see attached fig.5) Its name, quantity and specification of main parts see table four. The bowl body is mounted onto the top of the vertical shaft, fixed tightly in vertical shaft through nuts. Then assemble successively distributor, discs, top panel, bowl top, lock sleeve, lock circle, centripetal pump cover and small lock ring, etc. Add sealed circle to the positions that require seal. The discs are numbered from the bottom to the top, and should be mounted by the same order after disassemble and cleaning. Otherwise, the dynamic balancing will be damaged. As the same, the parts from different machines can't be exchanged for use even the customer have several machines with the same type

All the axial thread except the disassembly and assembly thread is left-hand thread, and should be assembled accurately, especially the lock steeve must be fixed to the mark position. The peripheral direction should be aligned to the mark place.

Table four

No	Description	Qty	Code	Remark
1	Bowl body	1	650-0102	
2	Inner hexagon screw	6	450-0009	GB70-85
3	Seal washer	6	200-0004	
4	Sliding piston	1	650-0101	
5	SPGO	2	100-0107	
6	Piston	2	600-0171	
7	SPGO	2	100-0108	
8	Valve core	2	200-0002	
9	Valve body	2	600-0170	
10	O ring	8	100-0003□□	GB1235-76
11	Seal ring（Ⅰ）	1	250-0103	
12	Seal ring（Ⅱ）	1	100-0120	
13	Seal ring	1	250-0104	
14	Locked nut	1	650-0103	

15	Bowl cover	1	650-0104	
16	Big disc	54	650-0105	
17	Small disc	54	650-0106	
18	Top disc	3	650-0107	
19	Disc gland	1	650-0108	
20	Flat key	3	650-0109	
21	Sunk screw	18	450-0007	GB68-85
22	Small locked nut	1	650-0110	
23	O ring	1	100-0109	GB1235-76
24	Centripetal pump cover	1	650-0111	
25	O ring	1	100-0110	
26	Round pin（Ⅰ）	2	650-0112	
27	O ring	1	100-0111	
28	Up centripetal pump cover	1	650-0113	
29	Low centripetal pump cover	1	650-0114	
30	Round pin（Ⅱ）	2	650-0115	
31	O ring	1	100-0112	GB1235 -76
32	O ring	1	100-0113	GB1235-76
33	Distributor	1	500-0203	
34	Vertical bolt	1	450-0050	
35	O ring	1	100-0114	GB1235-76
36	Round pin（Ⅲ）	3	650-0116	
37	Position pin	1	650-0117	
38	Round pin（Ⅳ）	3	650-0118	
39	Seal ring(Ⅲ)	2	250-0105	
40	O ring	1	100-0115	GB1235-76
41	O ring	1	100-0116	GB1235-86
42	Water room	1	650-0119	
43	Inner hexagon screw	2	450-0305	GB70-85
44	O ring	1	100-0117	GB1235-76
45	Water room cover	1	650-0120	
46	O ring	1	100-0118	GB1235-86
47	Inner hexagon screw	4	450-0306	GB70-85
48	O ring	1	100-0119	GB1235-76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Bowl

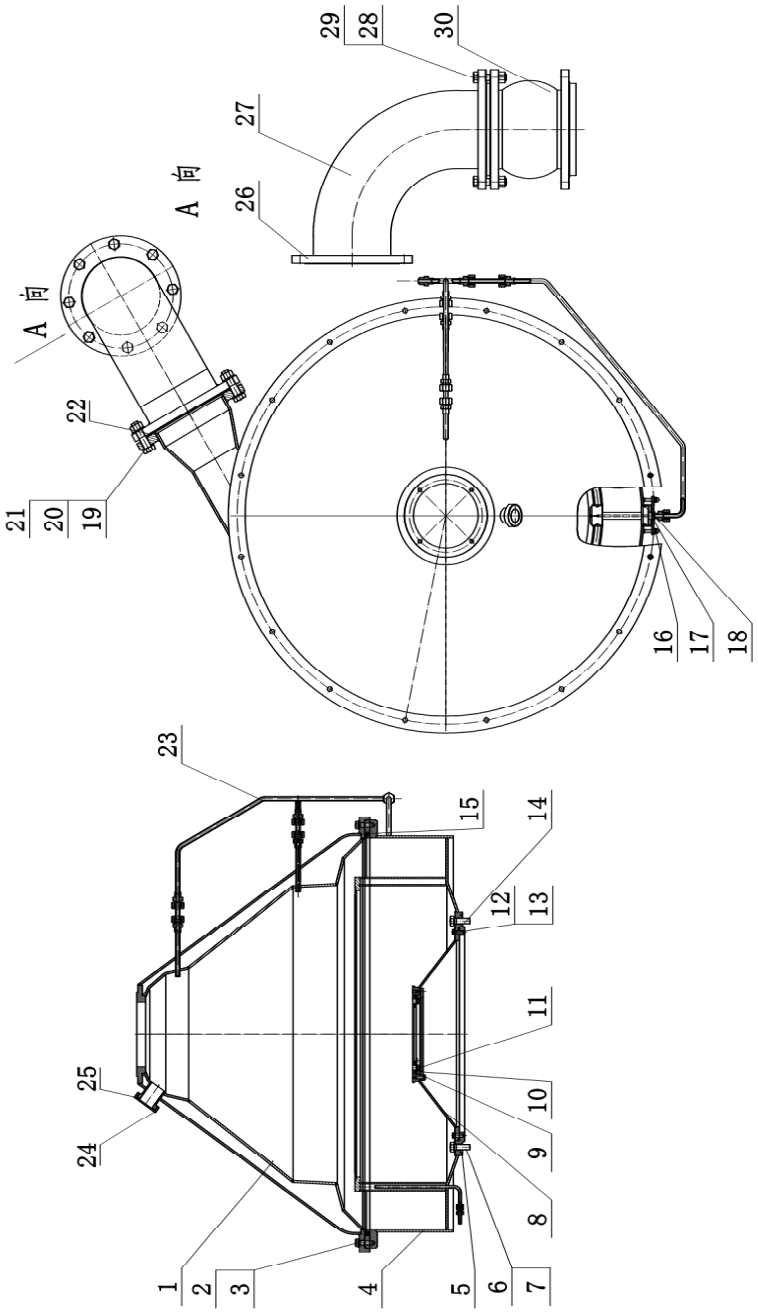
7.3 Hood (see attach fig.6)

Hood is a protective device for the bowl's safety rotating, also is operating-water's control and supply system. Its main parts see table five.

Table four

No	Description	Qty	Code	Remark
1	Up cover	1	650-0121	
2	Hexagon screw	16	450-00405	GB5782- 86
3	Flat washer	16	450-0062	GB95-86
4	Lower cover	1	650-0122	
5	O ring	1	100-0121	
6	Hexagon screw	15	450-0011	GB5782-86
7	Spring washer	15	450-0063	GB93-86
8	Water proof cover	1	650-0123	
9	Hexagon screw	8	450-0012	GB5781-86
10	Gland	1	450-0064	
11	Seal washer	1	450-0307	
12	Inner hexagon screw	16	450-0012	GB70-86
13	Spring washer	16	450-0350	
14	O ring	1	100-0058	
15	Seal ring	1	250-0106	
16	Nut	2	450-0014	GB923-1988
17	Seal cover	1	650-0124	
18	O ring	2	100-0016	GB1235-76
19	Hexagon screw	16	450-0044	GB5780-2006
20	Hexagon nut	16	450-0045	GB40-2006
21	Flat washer	32	450-0308	GB95-2006
22	Paper cushion	1	250-0300	
23	Wash water pipe	1	600-0277	
24	Gland	1	450-0065	
25	O ring	1	250-0007	GB1235-76
26	Flange	2	600-0278	

27	Bend	1	600-0279	
28	Hexagon screw	8	450-0044	GB5780-2006
29	Nut	8	450-0045	GB41-86
30	Soft joint	8	250-0302	GB41-86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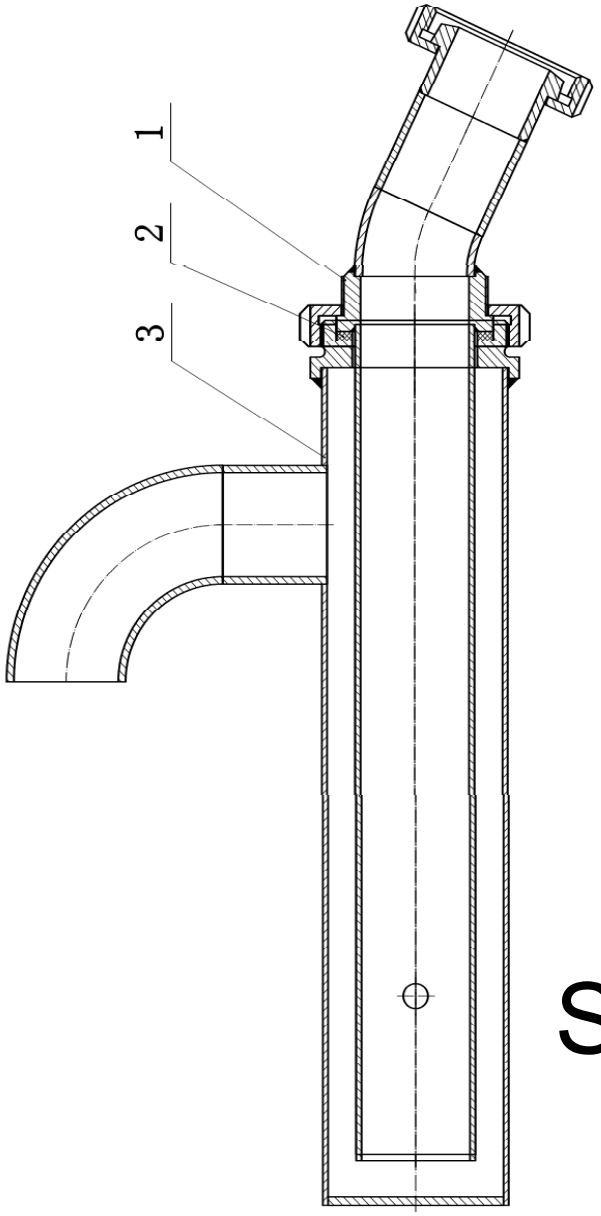
Hood

7.4 Drain pipe（see fig.7）

Drain pipe is connected with lower hood. It's main parts please see table six.

Table six

No	Description	Qty	Code	Remark
1	Bend	1	600-0280	
2	Seal ring	1	250-0003	
3	External sleeve pipe	1	650-0125	



Sifon

7.5 Vertical driving device (see attach fig.8)

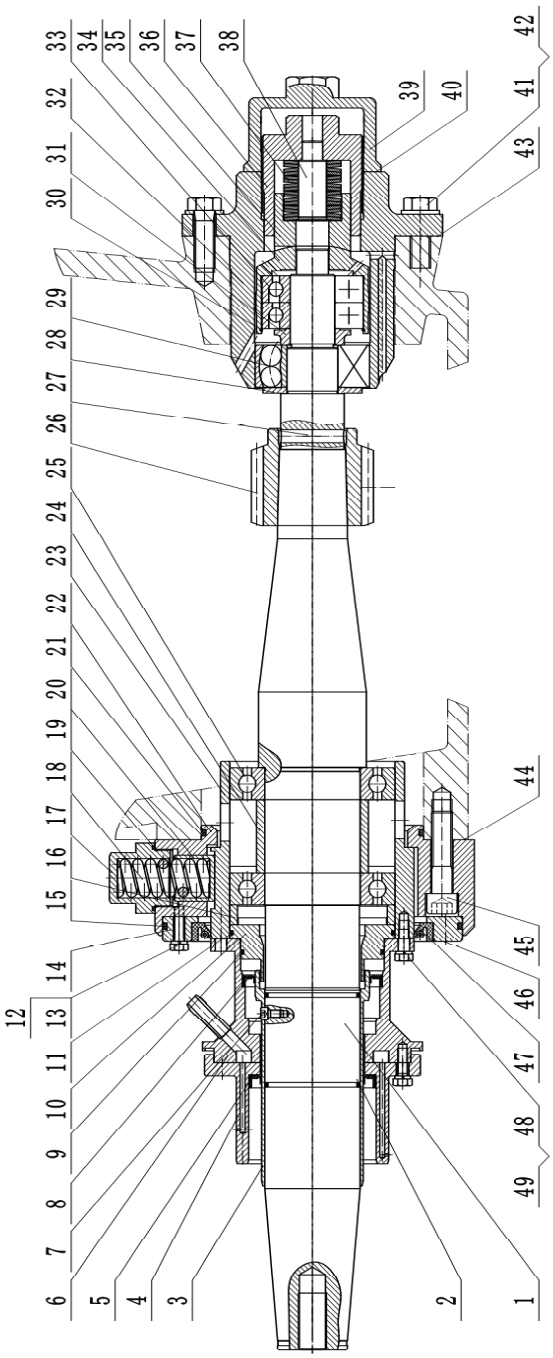
Vertical driving device is a part, which can increase speed and transfer power and adjust height of the bowl. It is one of the main components of the machine. A single-row ball bearing is fitted at the upper end of the shaft, a double-row self-centering ball bearing and two single-row angular contact ball bearings are filled at the down end of the shaft.

Note: don't admit adjusting height of the shaft at random without our company's engineer. Its main parts see table seven.

Table seven

No	Description	Qty	Code	Remarks
1	Vertical shaft	1	650-0126	
2	O ring	2	100-0019	GB1235-76
3	Shaft cover	1	650-0127	
4	Operating water top part	1	650-0128	
5	Oil seal	1	350-0052	
6	Operating water lower part	1	650-0128	
7	Inner hexagon screw	2	450-0309	GB70-85
8	Oil seal	1	350-0050	
9	O ring	1	100-0026	
10	Shaft sleeve	1	650-0130	
11	O ring	1	100-0020	GB1235-86
12	Hexagon screw	4	450-0015	GB5781-86
13	Washer	6	450-0068	GB97-85
14	Ring	1	100-0033	
15	O ring	1	100-0021	GB1235-86
16	Interval ring	1	650-0131	
17	Spiral plug	9	500-0020	
18	Spring	9	450-0070	
19	O ring	9	100-0022	GB1235-86
20	Spring piston	9	500-0021	
21	O ring	1	100-0023	GB123586
22	Spring room	1	500-0022	
23	Bearing protect sleeve	1	450-0096	
24	Bearing bush	1	450-0097	
25	Bearing	2	400- 0001	GB276-94

26	Small screw gear	1	500-0204	
27	Round pin	1	450-0071	GB876-76
28	Bearing collar	1	450-0218	
29	Bearing	1	400-0010	GB281-94
30	A type collar	1	450-0310	GBT895.1-1986
31	Bearing protect ring	1	400-0202	GB5782-86
32	Fixed sleeve	1	650-0039	
33	Bearing	2	400-0003	GB292-94
34	Gland sleeve	1	500-0205	
35	Ball support	1	500-0206	
36	Regulating sleeve	1	500-0207	
37	Disc spring	1 set	500-0208	
38	Spring bush	1	500-0209	
39	Lower bearing cover	1	450-0204	
40	Washer	1	450-0311	
41	Hexagon screw	4	450-0011	GB5781-86
42	Washer	4	450-0063	GB97-85
43	Washer	1	450-0312	
44	Washer	1	450-0313	
45	Inner hexagon screw	3	450-0017	GB70-85
46	Hexagon screw	4	450-0018	GB5781-86
47	Oil seal	1	350-0051	
48	Hexagon screw	16	450-0019	GB5781-86
49	Washer	16	450-0068	GB97-85



Vertical Spindle

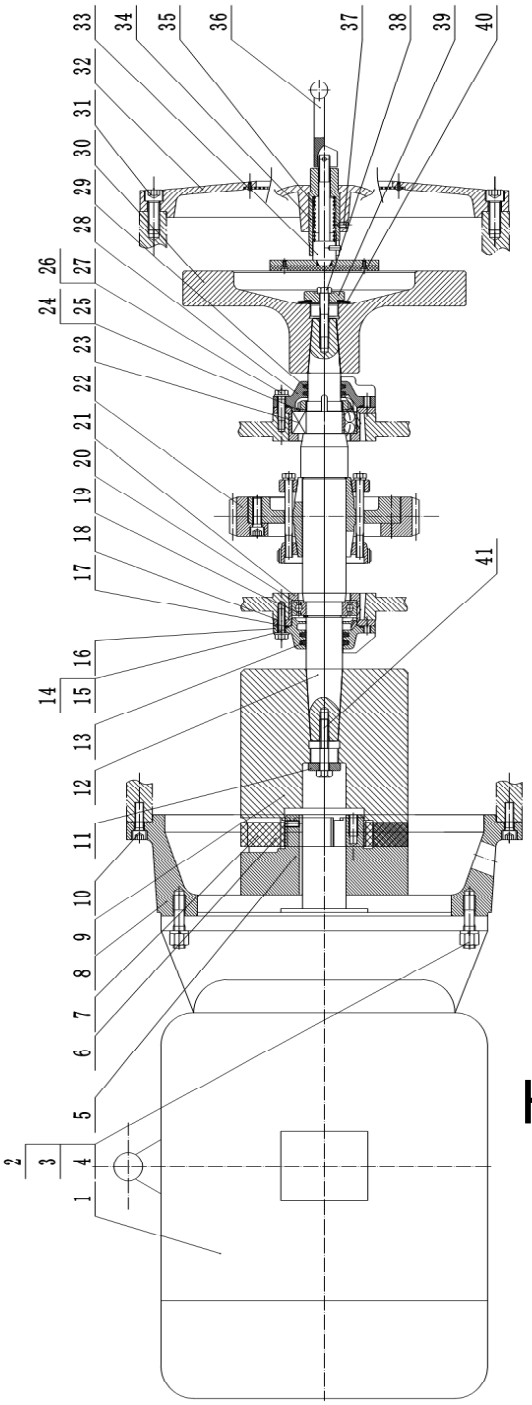
7.6 Horizontal spindle (see attach fig.9)

Horizontal shaft is one of parts that transmit power. It is located in the middle of the machine (see attached fig.7). Its main parts such as name, quantity, specification see table six. The bearing3210/SKF and the bearing6210/SKF are located separately on the frame by the bush to keep the horizontal shaft run steadily and ensure its position. The motor drives gradually the horizontal shaft whirling through a fluid clutch, the big gear are locked tightly in horizontal shaft with set cover and speed measurement big gear. Then the big spiral gear on the cross drives the small spiral gear of vertical shaft to rotate and the another cross splashes lubricant oil to the bearing (6215/SKF)of vertical shaft to cool and smooth the bearing. The brake device is installed on the other end of the shaft, which make the machine pass the resonance area quickly and decrease the stop time. The drive of the machine adopts fluid clutch to start smoothly, lower noise, avoid overloading and it can regulate start time.

Table eight

No	Name	Qty	Code	Remarks
1	Motor	1	650-0134	
2	B type double head bolt	4	450-0020	GB899-88
3	Spring washer	4	450-0063	GB93 -87
4	Hexagon nut	4	450-0005	GB51-86
5	Coupling (Ⅰ)	1	500-0210	
6	Elastic block	1	450-0134	
7	Set screw	1	450-0314	GB77-85
8	Supporting cover	1	650-0134	
9	Coupling （Ⅱ）	1	500-0211	
10	Inner hexagon cylindrical screw	8	450-0315	GB70-85
11	Clamping ring	1	450-0081	
12	Horizontal shaft	1	650-0041	
13	Felt collar	2	250-0800	
14	Hexagon screw	3	450-0025	GB5783-86
15	Level washer	3	450-0057	GB97.2-85
16	Gland	1	400-0006	
17	O type sealing ring	2	100-0024	GB1235-86
18	Paper cushion	2	250-0303	

19	Axle collar	1	450-0240	GB894.1-86
20	Bearing	1	400-0004	GB276-94
21	Bush	2	450-0239	
22	Big gear	1	500-0212	
23	Bearing	1	400-0008	GB276-94
24	Stop washer	1	450-0241	GB858-76
25	Round nut	1	450-0227	GB812-76
26	Hexagon screw	3	450-0029	GB5783-76
27	Level washer	3	450-0057	GB97.1-85
28	Gland	1	500-0213	
29	Felt collar	1	250-0800	
30	Brake wheel	1	650-0042	
31	Inner hexagon screw	4	450-0028	GB70-86
32	End cap	1	650-0134	
33	Brake axle	1	500-0029	
34	Brake axle sleeve	2	450-0130	
35	Spring	2	450-0083	
36	Handle	2	450-0131	
37	Set screw	2	450-0321	GB71-86
38	A type double head bolt	1	450-0322	GB5781-86
39	Gland	1	450-0084	
40	Disc spring	1	450-0085	
41	left tooth screw	1	450-0024	



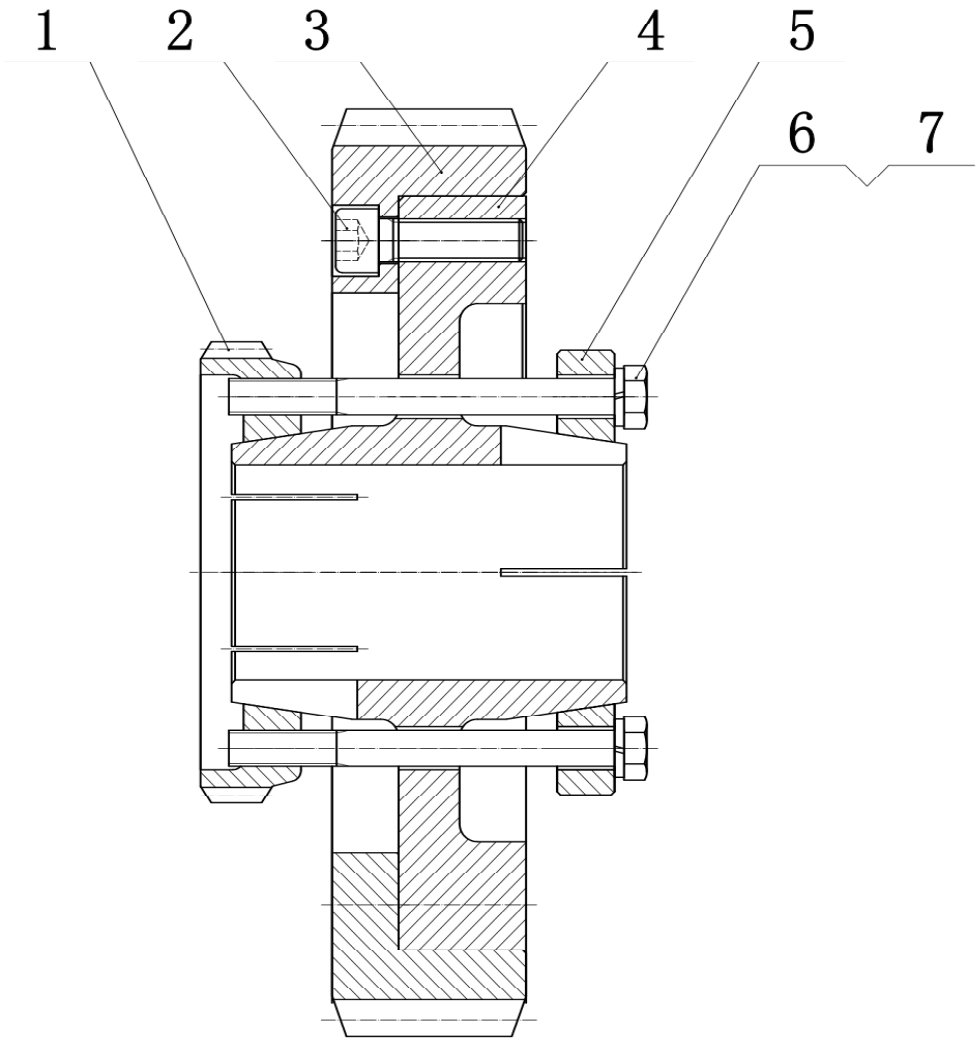
Horizontal shaft

7.6.1 Copper gear（see fig.10）

It's main parts please table nine

Table nine

No	Description	Qty	Dimension	Remark
1	Speed big gear	1	500-0214	
2	Inner hexagon screw	8	450-0032	GB70-86
3	Geared ring	1	500-0215	
4	Wheel core	1	500-0216	
5	Plate	1	450-0132	
6	Hexagon screw	4	450-0323	GB5780-86
7	Spring washer	4	450-0057	GB93-87



Gear to shaft Fixation system

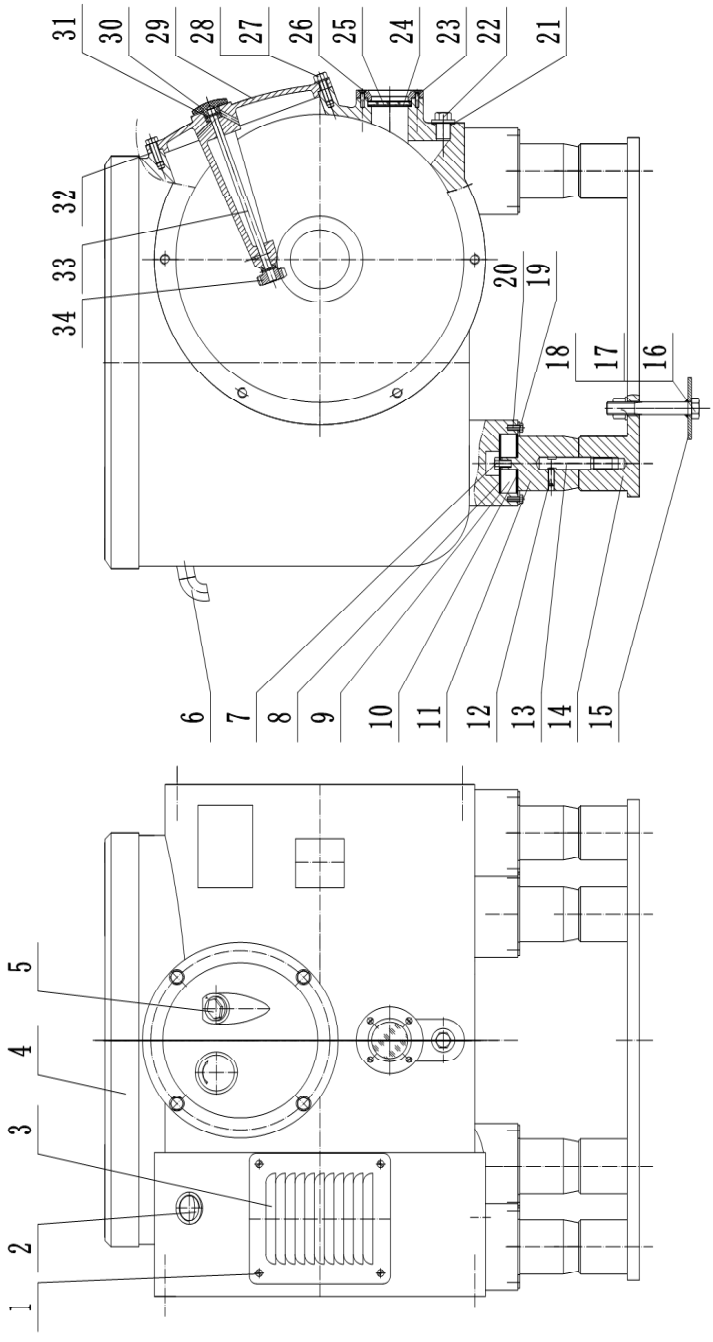
7.7 Frame, foundation and motor (see attach fig.11)

The horizontal shaft, vertical shaft are installed inside the frame, the frame is the support, seal and protection device of main parts of the machine. The motor is directly joined to the frame through support cover. In order to make the separator run smoothly in high speed, foundation is applied at the bottom, allocated with rubber bumper, to absorb the vibration. Its main parts see table ten.

Table ten

No	Name	Qty	Dimension	Remark
1	Screw	4	M6×16	GB67-85
2	Oil plug	1	ϕ52×16	
3	Shutters	1	232×215	
4	Frame	1	680×842×800	
5	Vent plug	1	ϕ38×35	
6	Drain pipe	1	ϕ60	
7	Hexagon screw	4	M12×20	GB5782-86
8	Washer	4	ϕ98×3	
9	Shock pad	4	450-0135	
10	Cushion	4	450-0088	
11	Supporting leg	4	ϕ90×126	
12	Set screw	4	M10×30	GB77-85
13	Screw	4	ϕ20×120	
14	Base	1	590×790×100	
15	Plate	4	ϕ100×6	
16	Screw	4	M20×140	GB5782-86
17	Nut	4	M20	GB6170-86
18	Washer	4	ϕ20	GB97.1-85
19	Flange plate	4	ϕ136×3	
20	Hexagon screw	12	M8×20	GB5782-86
21	Washer	1	ϕ34×ϕ24.5×4	
22	Oil plug	1	ϕ38×44	
23	Sunk screw	4	M6×25	GB819-85
24	Washer	2	ϕ71×ϕ60×2	
25	Sight glass	1	600-0041	
26	Cover	1	ϕ110×17	

27	Hexagon screw	4	M12×35	GB5782-86
28	Washer	4	ϕ12	GB97.1-85
29	Shaft cover	1	ϕ322×275	
30	Indicate plate	1	ϕ60×30	
31	Pin	2	ϕ3×25	GB879-86
32	Paper cushion	1	250-0802	
33	Speed shaft	1	ϕ12×303	
34	Speed small screw gear	1	ϕ48×25	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Frame

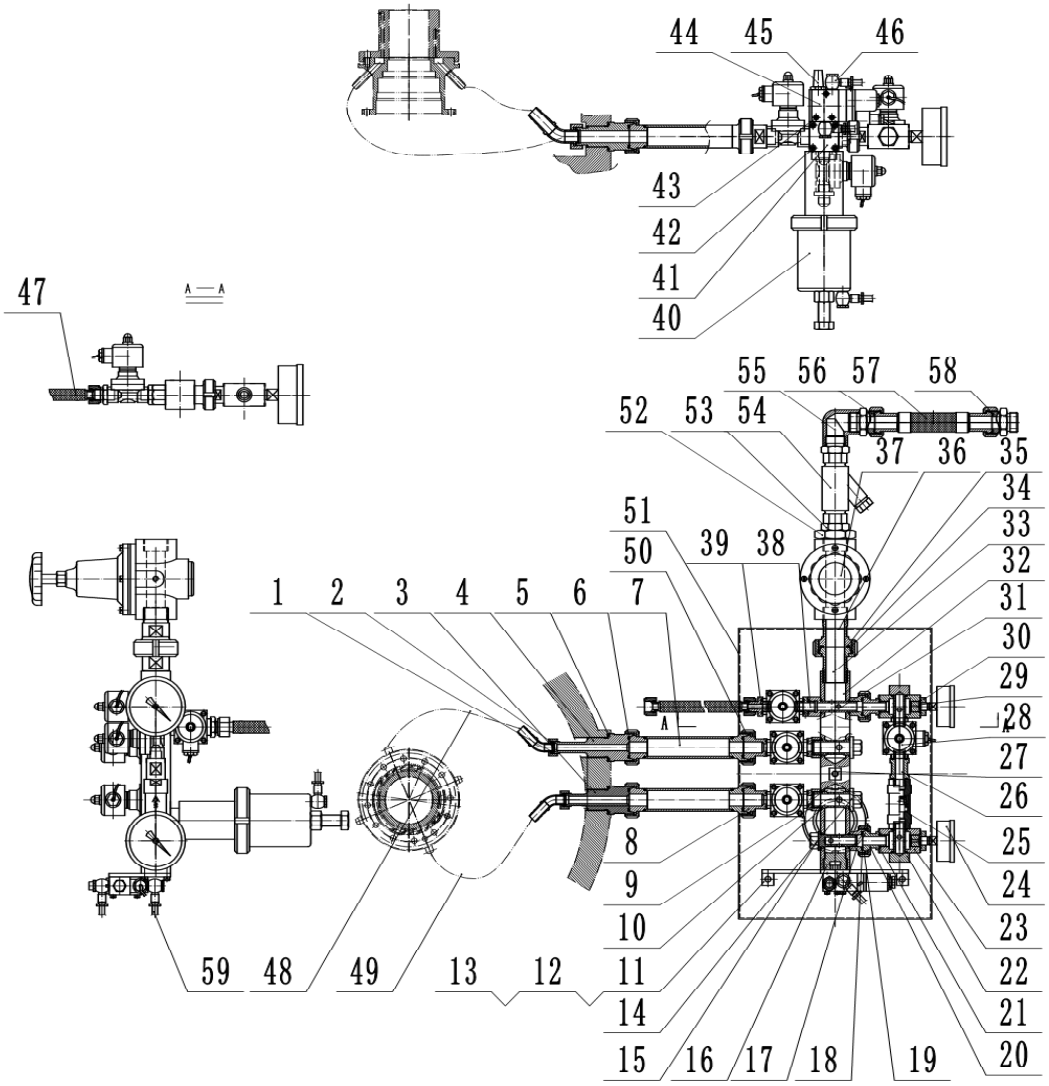
7.8 Operation water device (see attach fig.12)

Operation water is the collective name of all the sealing water, ejection water and flushing water. It able to execute sealing, ejection, flushing by open/close solenoid valve in order. Its main parts see table eleven.

Table eleven

No	Description	Qty	Dimension	Remark
1	O ring	2	100-0071	
2	Bend - -45	2		
3	Joint （一）	1	ϕ48×140	
4	Joint （二）	1	ϕ48×120	
5	O ring	2	100-0025	GB1235-86
6	Seal ring	4	ϕ38×ϕ28×4	
7	Connecting pipe	2	ϕ60×203	
8	Joint	2	ϕ44×53	
9	Joint	2	ϕ44×*97	
10	Seal ring	4	250-0015	
11	Join column	2	20×20×125	
12	Hexagon screw	7	M10×16	GB5781-86
13	Spring washer	7	ϕ10 ”	GB93-86
14	Screw	2	ϕ38×83	
15	Screw	1	ϕ38×20	
16	Cocks	1	ϕ42×30	
17	Joint	2	ϕ40×27	
18	Seal ring	2	100-0055	
19	Round nut	2	ϕ52×20	
20	Joint	2	ϕ36×40	
21	Seal ring	24	250-0107	
22	Screw	3	ϕ34×68	
23	Tee cock	2	40×40×70	
24	Pressure gauge	2	750-0051	
25	Valve	1	G1/2”	
26	Joint	1	ϕ32×59	
27	Join column	1	20×20×95	
28	Solenoid valve	4	600-0104	

29	Seal ring	2	250-0108	
30	Joint	2	ϕ32×25	
31	Screw	1	ϕ34×84	
32	Valve body	1	50×50×340	
33	Joint	1	ϕ54×63	
34	Round nut	1	ϕ75×28	
35	Seal ring	1	250-0204	
36	Joint	1	ϕ58×73	
37	Valve	1	G11/4"	
38	Joint	1	ϕ34×32	
39	Joint	2	ϕ34×38	
40	Measurement column	1	ϕ112×316	
41	Fixed plate	1	50×105	
42	Inner hexagon screw	4	M6×16	GB70-85
43	Inner hexagon screw	3	M5×35	GB70-85
44	Solenoid valve	1	600-0153	
45	Cyclone	1	G1/4"	
46	Joint	2	G1/4"	
47	Soft metal pipe	1	M20×1.5	
48	Rubber hose	1	(inner diameterϕ13)	
49	Rubber hose	1	(inner diameterϕ13)	
50	Round nut	2	ϕ60×23	
51	Operating water cover	1	500×330	
52	Joint	1		
53	Joint	2	G1"	
54	Y type filter	1	G1"	
55	90° bend	1	G1"	
56	Joint Ⅲ	2	ϕ47×50	
57	Soft metal pipe	1	M39×2×200	
58	Seal ring	2	250-0016	
59	Rubber hose	2	(external diameter ϕ10)	



Operating water system

7.9 Automatics control instrument

The structure detail of Automatics control instrument is on the Automatics control instrument manual. Before install and setup and debug, please read the manual carefully.

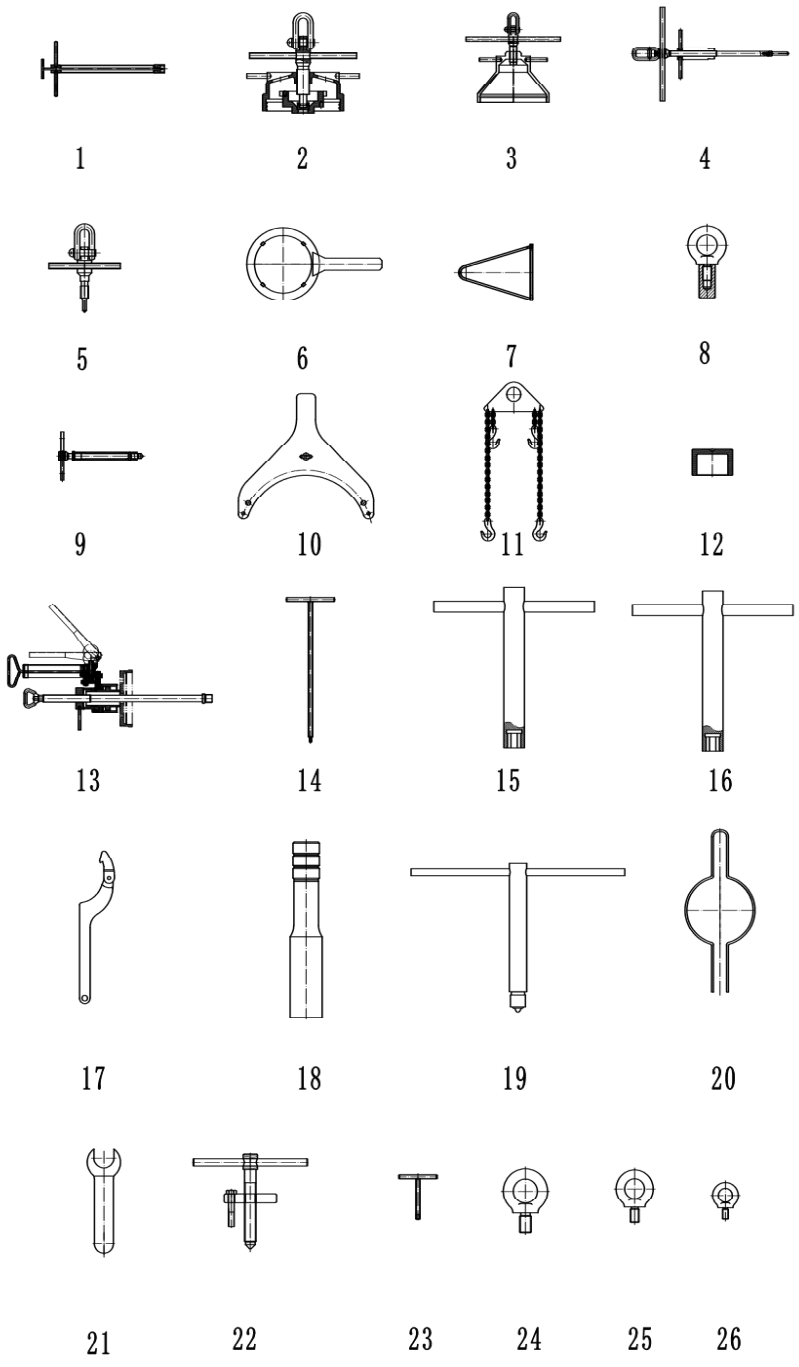
Please don't take apart and repair it or connect the line at random.

7.10 Special tools (see fig.13)

Table twelve

No	Description	Application	Remark
1	Wrench	Assemble/disassemble vertical shaft bolt	ϕ32×250×250
2	Bowl cover tool	Assemble/disassemble bowl cover	420×472
3	Sliding piston tool	Assemble/disassemble sliding piston	530×500
4	Lift device	Lift distributor and bowl parts	530×880
5	Bowl body tool	Lift bowl body	375×300
6	Lock cup tool	Assemble/disassemble locked ring	ϕ400×662
7	Lift tool	Assemble/disassemble upper cover	ϕ240×306
8	Lift tool	Lift vertical shaft	62×142
9	Assemble/disassemble tool	Assemble/disassemble valve body	355×270
10	Wrench	Assemble/disassemble locked ring	710×660
11	Lift tool	Lift spare parts	620×250
12	Blocks	Assemble/disassemble sliding piston	ϕ170×110
13	Compress device	Compressing discs	880×520
14	Piston tools	Assemble/disassemble piston	355×270
15	Wrench	Assemble/disassemble horizontal shaft bolt	ϕ32×250×250
16	Wrench	Assemble/disassemble screw	ϕ32×250×250
17	Wrench	Assemble/disassemble round nut	46×275×6
18	Hand hammer	Assemble/disassemble disc compressing	ϕ60×410
19	Assemble/disassemble tool	Assemble/disassemble brake wheel and coupling	M39×1.5×385
20	Chamber tools	Assemble/disassemble centripetal pump	ϕ278×680

21	Wrench	Assemble/disassemble nut	70×250
22	Disassemble tool	Assemble/disassemble coupling	240×200
23	Assemble/disassemble device	Assemble/disassemble lower centripetal pump cover	80×94
24	Lift ring M16	Lift spare parts	62×90
25	Lift ring M12	Lift spare parts	52×74
26	Lift ring M8	Lift spare parts	36×52



Special Tools

8. Delivery, installation and adjustment

8.1.1 Consult with our company for delivery and packing of the separator.

8.1.2 Separator package type and transport please negotiate with our company.

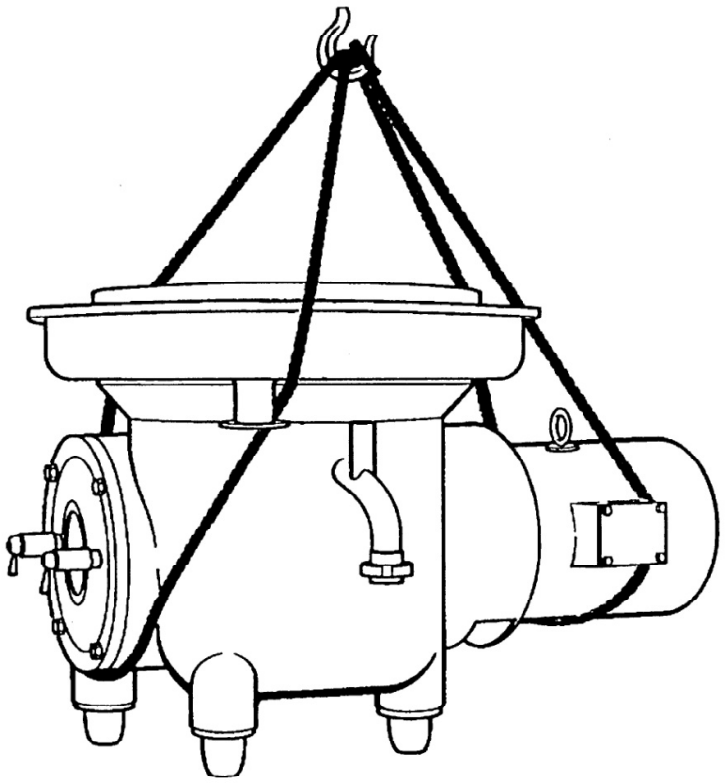
8.1.3 The complete machine is delivered in a packed box, along with a set of auxiliary tools, anchor device and some spare parts, one copy of operation specification and quality certification. There is only one group of tools for the same model and the same client.

8.1.4 The machine fixed on the bottom of the packing box, when lift, it is not allowed more than 30 degree, must keep stable and avoid press on top.

8.2.1 Separator installation and regulating

8.2.2 When design equipment flat arrangement diagram and concrete the base of the separator, be insure that other machine's vibration don't affect the separator. And set aside enough space for disassemble and installation of the horizontal shaft. The distance between the centers of two separators is up to 3.6m. The base should accord with request in figure 1. Four foods protrude from the ground by approx. 10mm. Make it level,then install after basic maintenance.

8.2.3 Check all the parts of the separator carefully before installing the separator, and flush the pipe line



degree.

8.2.5 Test the machine level after putting it down to foundation. Then install the bowl.

8.2.6 The operating-water must be soft water. Pressure should be at least 0.2-0.4mPa, and it is stable and adjustable. **Note**: the operating-water must be supplied by the separateness pump. Strainer must be installed in the pipeline.

8.2.7 Power of the motor is 37 kW, the fluid clutch drive power, the starting current is usually 80A~100A, the starting time is approximately 4~8minutes.when assemble, please choose time relay(1~10minutes) and the current meter for 120A,the electric current will be cut when start the contact implement, and the working current should not be lower than 80A

9. **Operating**

9.1 Preparing before starting

9.1.1 Before first starting, Clean the gear housing, then fill in lubricant oil up to the level mark. Open the upper hood to check if there is foreign substance around the bowl, release the brakes, then turn the bowl clockwise by hand, check if anything blocking, and can turn freely, nothing abnormal, shortly switch on the motor. Close the upper hood. Connect the entire pipe. Check the pipe system according to the requirements of production technology. Flush connection pipe system.

9.2 Starting

Check if the brakes are released, close the entire feed valve. Start the motor, if find abnormal friction noise, immediately stop to check, solve it as soon as possible, and do not force start. Normally the starting current is 90A; the electric current should lower 60 Ampere immediately after reaching full speed, vibration accretion is normal phenomenon when the machine passes the critical speed, vibration will reduce after reaching full speed. The starting time should be about 4~8 minutes, the counter should show about 67rpm. When the electric current is lower 30Ampere and no abnormal phenomenon appear, open the operating pump, and adjust the water pressure, the pressure is between 0.2mPa and 0.45mPa, then open the PLC control instrument, the solenoid valves are opened automatically, seal the bowl, noise and vibration reduce again, then open the hot water valve slowly (the water volume is not too big, submerge the sight glass of feed just), after about one minute, discharge clear water from the light-phrase outlet, observe the Ampere meter and the separator, if no abnormal phenomenon appear, starting complete. If noise augment and the electric current raise after feed the hot water, then at once stop feeding, it is because the bowl is not sealed completely. Check if the solenoid valves are plugged, and check if the control instrument has worked, solve it and feed hot water, debug again.

After the separator works normally, feed the liquid to be separated according to the requirements of production technology. Adjust feed flux, and then adjust discharge pressure according to separating condition.

De-sludging interval of the separator cannot be under three minutes generally, choose partial de-sludging when request manual de-sludging. Every manual de-sludging does not start until the electric current is normal. The current can raise at once when de-sludging. Undulation of

the current is not up to 5A.

Work listed above may be accomplished under guidance of our company's engineer according to customer request.

9.3 Stop

Before stop, close feed valve first, feed hot water to flush the bowl, simultaneity open the discharging-dirty valve on the light-phrase discharge pipeline, till flow the clear water from the light-phrase discharge port. Start manual de-slugging to discharge the impurities in the bowl for saving parking time. After complete flushing, stop feeding the hot water, press "manual de-slugging" button to discharge remain liquid in the bowl. Shut down the motor and the pump; let the separator stop at freedom.

Note: 1. Do not brake at normal stopping, to reduce the wheel gear to wear away.

2. Do not stop feeding the operating-water and shut down the operating pump during running. Stop feeding if the soft water supplies shortage, but do not stop the separator.

3. Operator does not leave during running, in order to find the problem and solve it in time.

10. **Maintenance**

10.1 The separator must be maintained regularly according to production condition.

10.2 Need't wash the bowl after every stopping. When occur severe vibrations during starting. The bowl need be washed. But the longest interval of washing the bowl cannot exceed one month.

10.2.1 Disassembling procedure: When the machine stopped completely, close all the inlet and outlet valves, loosen the relevant round nuts on the pipeline, disjoin the inlet and outlet pipes with the feed and discharge housing, release the grooved nut, unscrew four hex head screws on the feed and discharge housing, remove the feed and discharge housing, unscrew eight hex head screws on the upper hood, remove the upper hood with the lifting device (for the upper hood). Loosen small lock ring clockwise with the annular wrench (for small lock ring). Remove the upper centripetal pump chamber cover、 the upper centripetal pump、the lower centripetal pump cover 、the lower centripetal pump and the feeding pipe orderly. Then use the socket wrench (for spindle screw) to unscrew the spindle screw clockwise and remove it. Use the jack (for the bowl) to force the bowl off the spindle cone. Place the bowl on a wooden plate , then compress the disc stack with disc stack compressing device, unscrew the main lock ring clockwise, remove other parts with special tools orderly.

10.2.2 Washing the feeding pipe 、 upper and lower centripetal pump and parts of bowl with the hot Alkaline water cleanly. If needs, may scrape off the dirty substance with shovel made of bamboo and wood, but do not be allowed using the metal. In case damage the surface of the parts. Clean the sealing groove and operating-water holes in the bottom of bowl carefully.

Note: the sealing surface of the polyamide main bowl gasket in the bowl top must be smooth, if be damaged, replace it in time.

10.2.3 Re-install all the bowl parts according to their original sequence after cleaning, especially the discs must be reassembled by the original sequence, they are not interchangeable. Replace damaged gaskets, smoothly the burr of the big gasket on the sliding piston, do not damage the sealing surface of the gasket. Before placing the assembled bowl onto the drive spindle, oil the upper part of the spindle cone. Then clean and wipe dry the conical part of the spindle with a smooth rag. Carefully clean the inside cone of the bowl hub as well to assure proper fitting. Then clean and grease threads on bowl top and lock ring to prevent seizing. Castor oil can be used as lubricant. When assembling, avoid striking, also forbid knocking at the surface of parts straightly, "S" mark on the bowl and the bowl top must be in line with each other when assembling. Then assemble feed and discharge device. Shortly switch on the motor, if find that friction occurs between the centripetal pump and parts of the bowl, well then need to adjust the distance between the light-phrase discharge housing and the upper hood. Remove the adjusting washer and four hex head screws, tighten the grooved nut connecting to the feeding pipe, then lift the light-phrase discharge housing with screwdriver. Measure the clearance between the light-phrase discharge housing and the upper hood.

Example: Clearance is 5.8mm, and then thickness of the washer is 4mm;
Clearance is 3mm, and then thickness of the washer is 1mm;

10.3 Replace lubricant oil in the gear housing after 250 hours of running after initial starting and every 1500 hours afterwards. Waste oil from other equipment can not be used absolutely.

10.4 After continuous using after half year, in time check if parts of the bowl are be corrosible and erosible, it need to replace, please contact us. It is required to check once, to re-balance the bowl and apply harmless crack-detection on both the vertical shaft and the bowl every two years of continuous use.

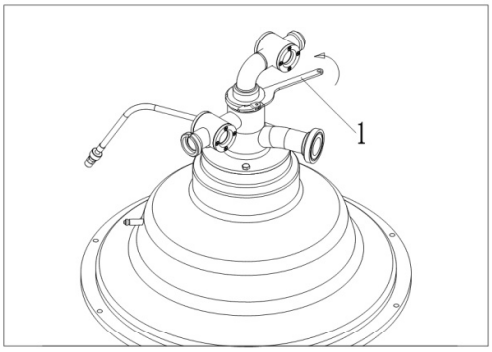
10.5 When it is necessary to change the four bearings, must use it which are appointed in the manual, and must clean carefully when assembling. The nine radial springs in the spring housing were chosen & tested strictly. Thus must change the whole set of the springs when need replacing.

10.6 the eutexia protective plug of the fluid clutch is easy to melt because of overload. After solving the problem, replace the plug. The driving liquid in the clutch is 20# oil, the volume is 4.5l, if starting time is not lower than 4 minutes, oil volume is too excessive, if starting time exceeds 8 minutes, and oil volume is deficient. Replace driving oil in the clutch after 1000 hours of running.

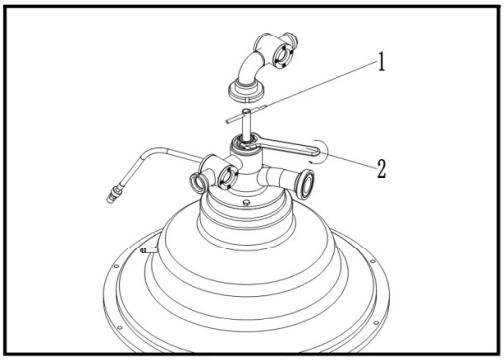
10.7 When stop running the separator over a longer period of time, should wash and wrap dry all the parts of the bowl, daub the antirust on it, and lay it on the wooden plate or

rubber base at dry and ventilated place. The gaskets should be preserved at cool and dry place, out of the sunshine and dust, prevent from vulcanizing.

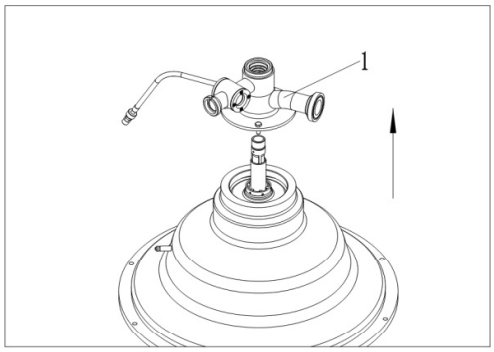
10.8 Disassemble steps when cleaning



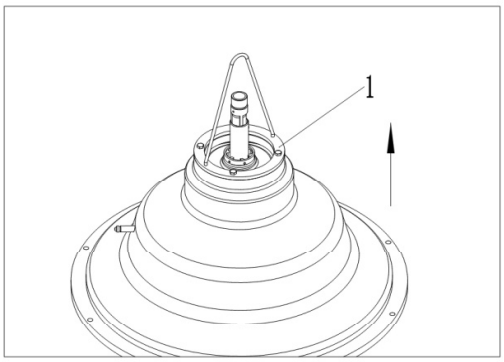
- Use special tool（1）unscrew locked nut of oil inlet pipe



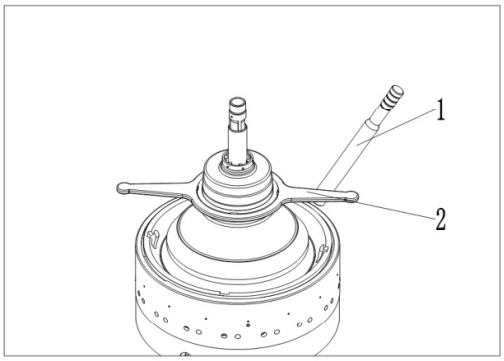
- Use special tool（1）fix inlet pipe
- Use special tool（2）unscrew locked nut for oil inlet pipe（left tooth）.



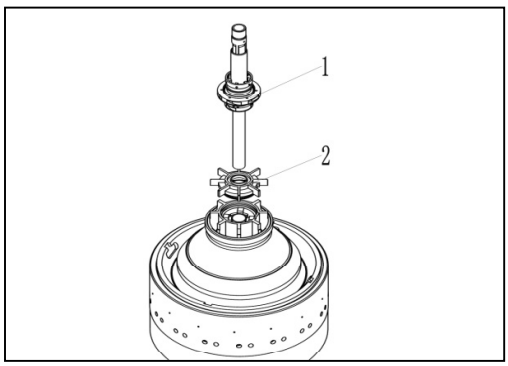
- Take up light and heavy phase outlet base



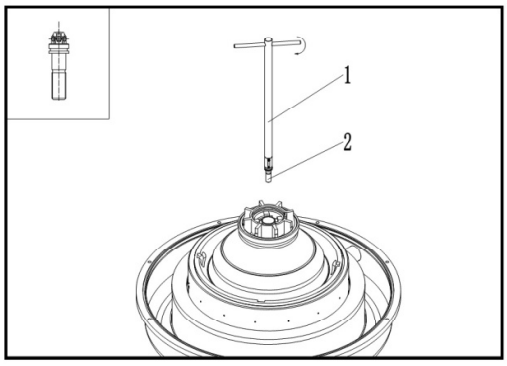
- Use special tool（1）fixed to hood
- Use bolt to screw it up
- Use crane or other device lift the hood



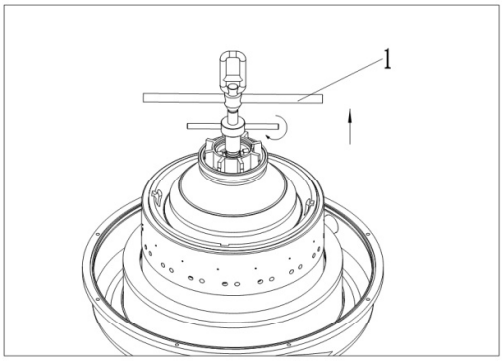
- Use special tool（2）to put on the bowl locked nut(left tooth)
- Use special tool（1）gently tap the tool（2），unscrew bowl locked nut



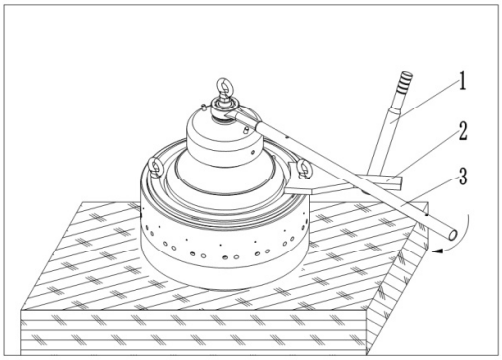
- Take off centripetal pump



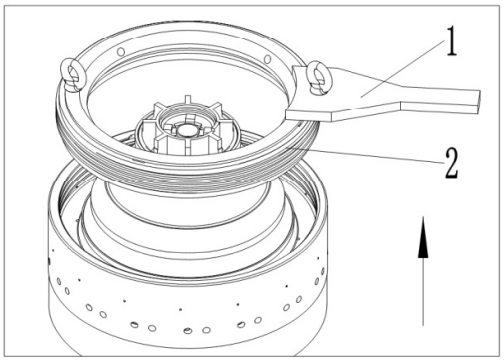
- Use tool（1）screw off vertical bolt（2,left tooth）;
- Take out vertical bolt
- Vertical bolt is as shown in the upper left corner



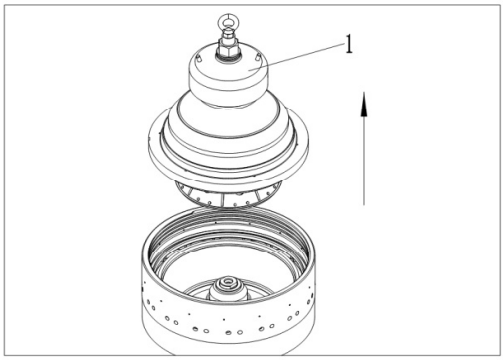
- Use tool （1） screw in to bowl，rotate below handle，make the bowl gently rise
- Use crane or the other device lift the bowl



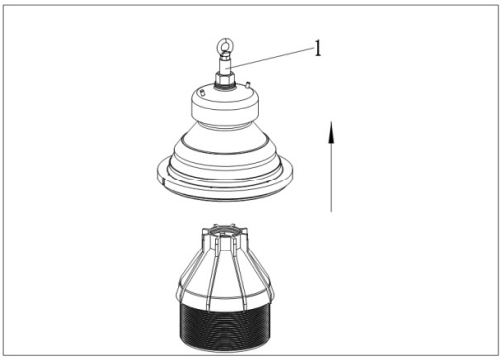
- Put the bowl in board or rubber
- Put the tool （2） to locked ring
- Clockwise rotate tool（3），clamping the discs
- Use tool （1） tap tool （2），screw off locked ring，note“0”mark.



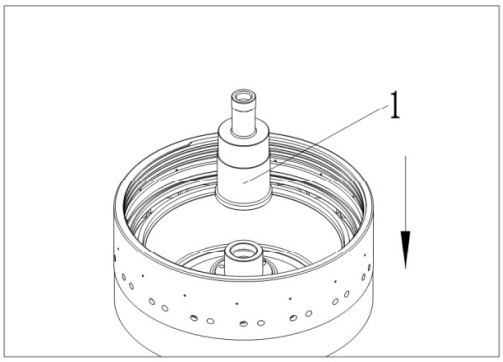
- Screw off locked ring，use crane or other device to lift it



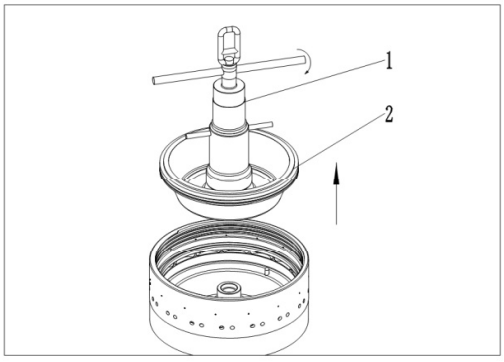
- Screw up tool（1）to bowl cover（left tooth），Use crane or other device to lift bowl cover and distributor



- Put the bowl cover and distributor in board or rubber washer
- Anticlockwise shaft of rotate tool（1），make tool（1）apart with disc gland
- Lift bowl cover



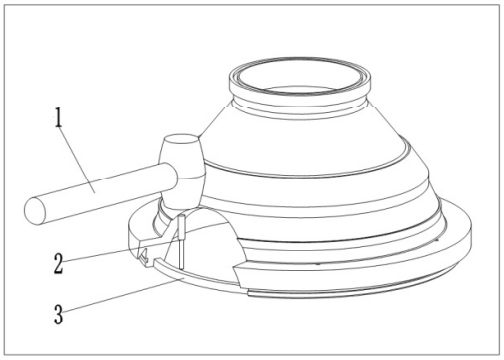
- Put tool（1）to bowl body center.



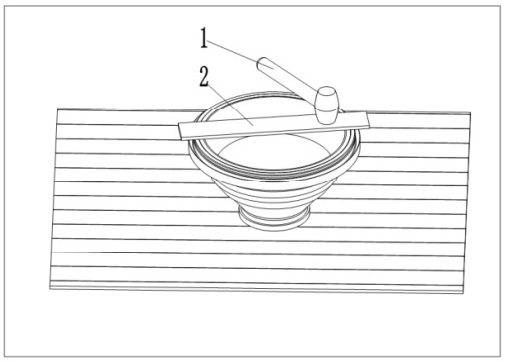
- Anticlockwise rotate tool（1），after fix，rotate upper handle，make the sliding piston rise gently
- Use crane or other device lift sliding piston，note “0”mark.

Assemble according to above steps in reverse order

10.9 Replace seal ring

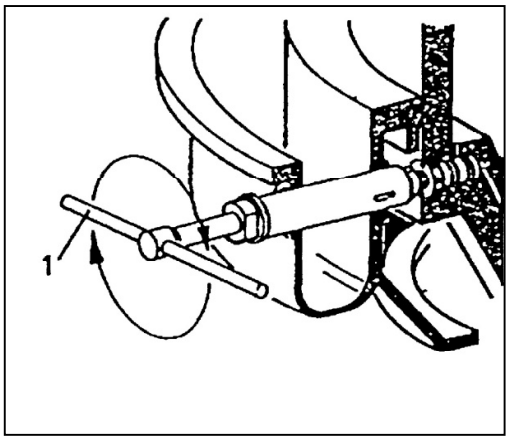


- Use diameter 4mm thimble，with mallet taps the nylon ring gently， take it off

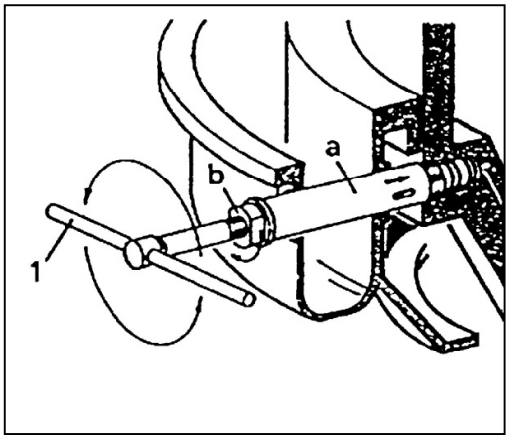


- Put the seal ring to cleaned top slot(narrow end towards the top)
- Use mallet taps gently，nylon ring higher than bowl cover 1-2mm。

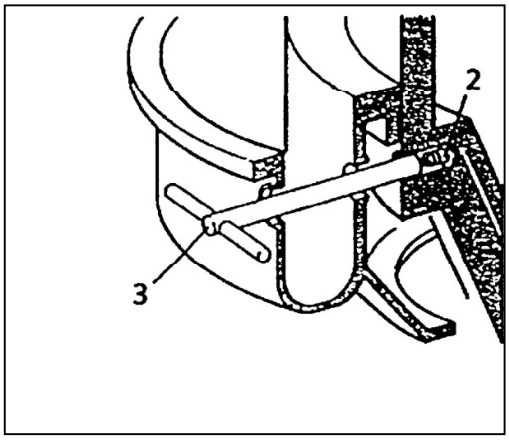
10.10 Clean small piston or replace small piston seal ring



- rotate wrench 1 to piston valve



- Push sleeve a two tips of wrench 1to small hole of piston valve
- Install locked nut b;
- Use wrench 1screw off piston valve



- When take off piston valve,the piston(2) still stuck in chassis
- Rotate wrench 3 to piston
- Use wrench 3 push the piston out from bowl chassis

Install small piston steps is clockwise order according to above steps

Note: wet the seal ring when replace

Thread smear oil

Rotate piston valve until can't go ahead, do not screw too tight;

The front of piston seat must be flush with the out wall of bowl chassis

11. **Trouble shooting** (see table thirteen)

Table thirteen

Fault	Possible cause	Remedies
The bowl does not come up to rated speed or takes too long time to do so.	a、Brake is applied. b、The oil in the clutch is deficient or leakages. c、Friction occurs at the upper and lower surface of the centripetal pump. d、big spiral gear slippery	a、Release brake. b、Check the clutch, and fill oil according to request. c、Check the adjusting washer's thickness. d、Tighten the screws on the big spiral gear
The bowl speed drops during operation.	a、The clutch leakages. b、Motor speed drops. c、De-slugging continually	a、Check the clutch, and fill oil according to request. b、Check motor and line voltage. c、Don't manual de-slugging often
Starting time is too short or starting current is too high	a、The oil in the clutch is excessive. b、Mechanical fault	a、Check oil level in the clutch. b、Check carefully, solve it.
Uneven run of the separator	a、Bowl is not properly assembled. b、Ball bearings damaged c、Bearing supporting springs damaged d、Gear damaged e、Bowl is out of balance.	a、Reassemble the bowl. b、Replace the damaged bearings c、Change all the springs. d、Replace the gear and lubricant e、Rebalance the bowl.
Abnormal noise	a、Friction occurs at the upper and lower surface of the centripetal pump b、The ejected solids cannot discharge.	a、Adjust height of the bowl, After stopping. b、Clean out the solids in the lower hood.
Bowl is not sealing.	a、The pressure of operating-water is too low. b、The solenoids valve damaged c、The polyamide gasket damaged（671/641×16.5）	a、Stop and adjust the water pressure. b、Check the control instrument and the solenoid valves c、Stop and replace

The bowl does not open at all or not completely.	a、Gaskets in annular piston are damaged. b、Gaskets in the small piston or valve body are damaged. c、Resistance of annular piston is too large. d、Hole in valve body is clogged. e、Small piston movement Chamber is dirty	a、Check and replace. b、Check and replace c、Clean guide and contact surface. d、Clean valve body. e、Clean the chamber, insure small piston move freely.