

Woerh[®]
Industrial solutions

**Separadora
BTH 480 b3**

**Manual de
Instrucciones**



Disc separator

Index

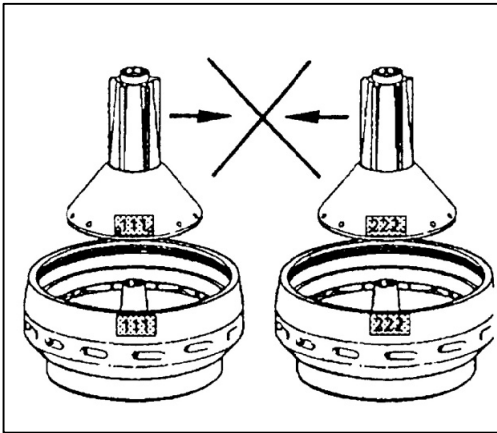
1. Operating safety of the separator	1
2. Product model and name	11
3. Performance and application	11
4. Product figure.....	12
5. Main technical data	13
6. Operating principle	13
7. Main structure in brief.....	15
8. Delivery , installation and adjustment	42
9. Operating	44
10. Maintenance	46
11. Trouble shooting.....	49
12. Spare parts list.....	50

Thanks for choosing the model BTH 150 B3 disc separator that is our product.

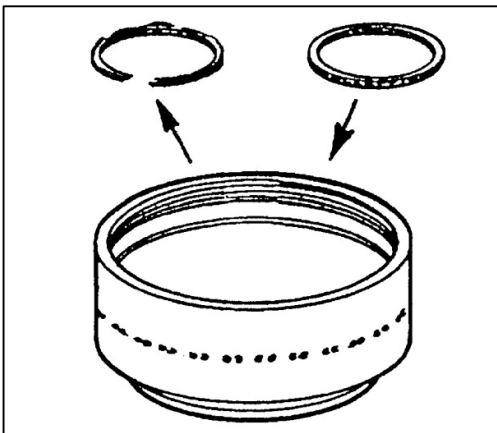
The bowl of the disc separator is rotating in high speed, in order of the separator can service for your company adequately and operate safety, read operation manual carefully before operating.

1. Operating safety of the separator

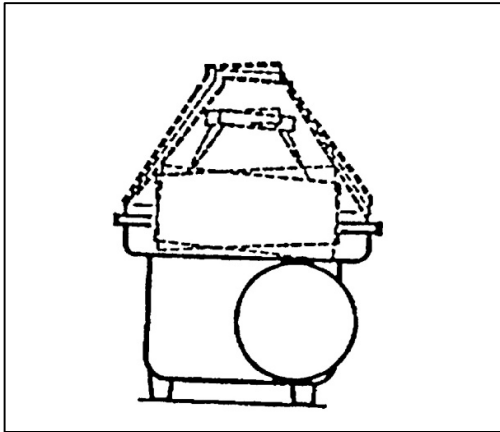
Separator is a kind of high speed rotating machine, the bowl has great centrifugal force when at work. For your operator and machine safety, please strictly following the following safety rules.



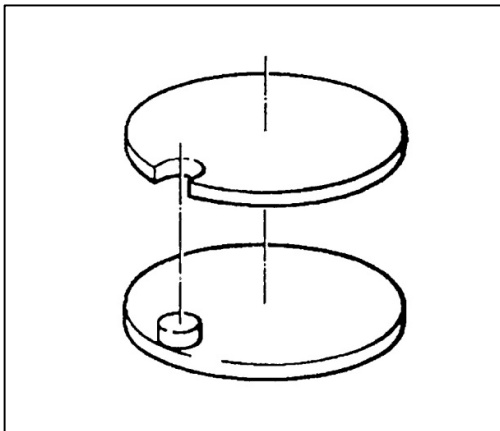
1.01 Do not reversal use the bowl internal parts, even the same model if your company has several separators.



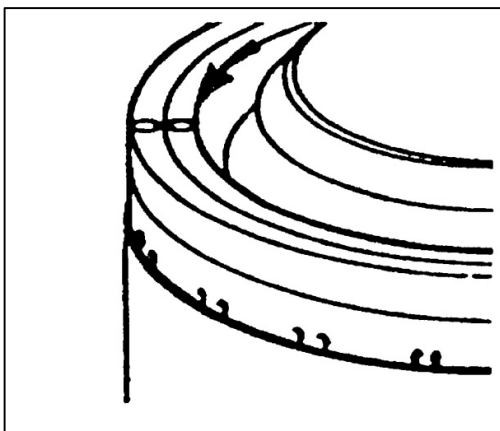
1.02 Broken spare parts need be replaced in time



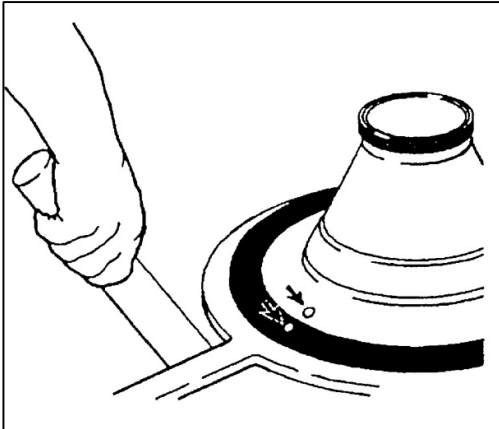
1.03 Every three months to check bowl parts corrosion, wear and fatigue, especially bowl sludge port, locked ring spiral etc. The main spare parts should be stop use when has problem, and notice our company as soon as problem, do not repair or replace arbitrarily. Separator need re-balance and nondestructive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



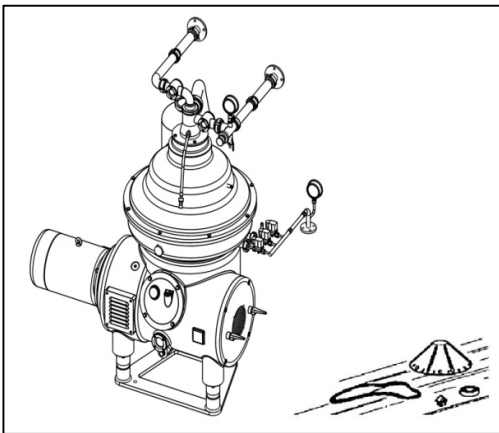
1.04 When assemble bowl, all position pins must be in good condition, if loose obviously, stop immediately and notice our company



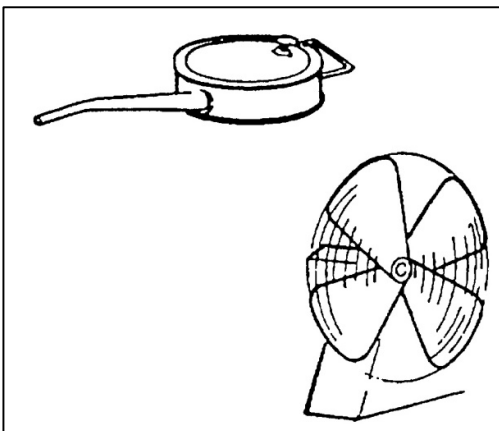
1.05 Do not replace or missing any parts when install separator bowl parts, spiral connecting parts must be installed in place, aligned in position if has assembly mark.



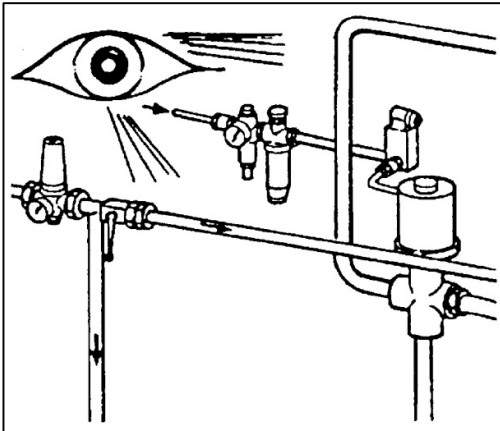
1.06 Before start, check the bowl locked ring "0" mark, inlet and outlet device and other set screw



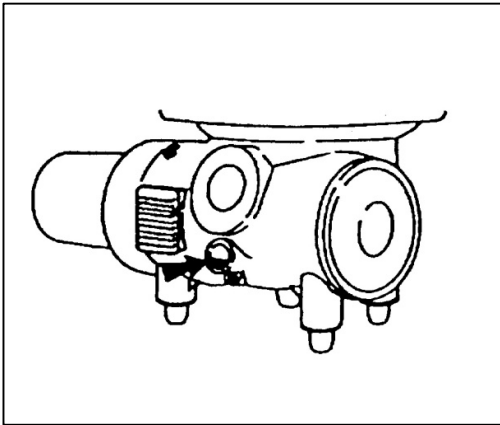
1.07 Check separator all the parts are in the place, do not missing any parts.



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.



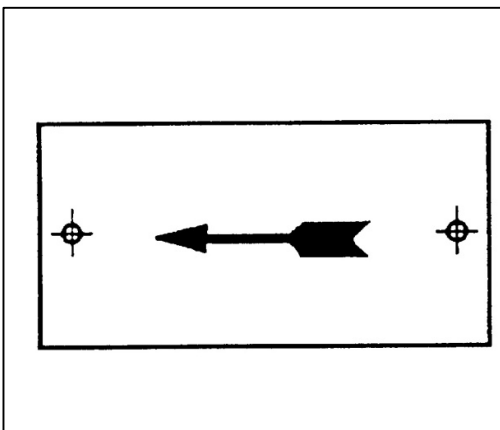
1.11 As separator high speed rotated, big noise when run, please wear headphones if conditionally.



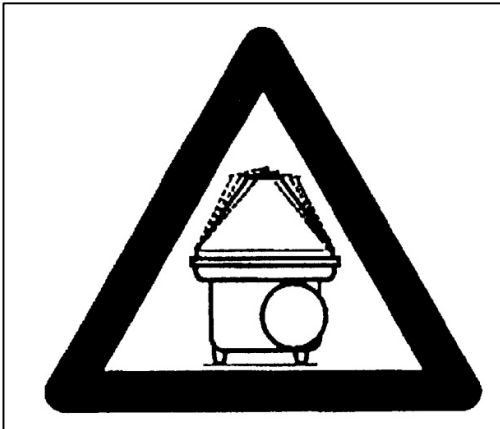
1.12 Do not introduce explosion material to separator



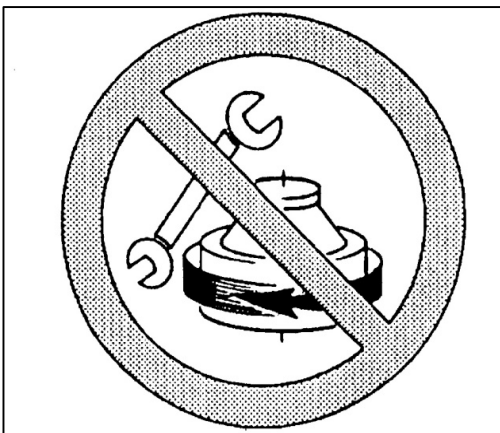
1.13 Prohibited separate none agreed material (corrosion resistance, high density, flammable, volatile and explosive material), if need, please contact manufacturer, use after confirm. Prohibited authorization operation, if material is harmful to human body, need to wear protective clothing.



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



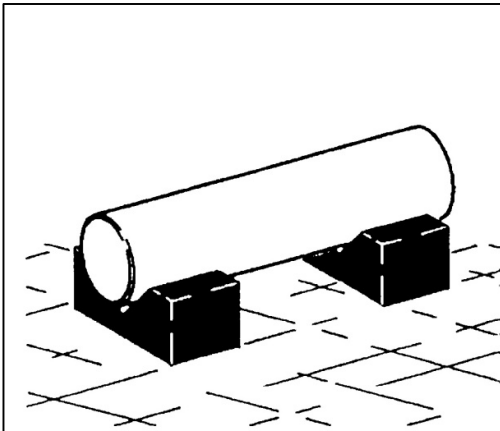
1.15 Switch off power and stop if separator has abnormal vibration, after separator stop completely, than disassemble, cleaning and check all the parts, note the install order and identify fault cause, re-install and start, restart and stop time is no less than 4 hours.



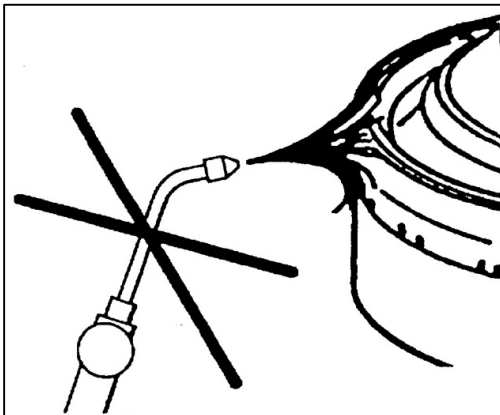
1.16 Do not loosen any parts before bowl is not stop completely.



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)<150mg/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: BTH 480 B3 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, monitors speed, current and vibration of separator all the time. The machine has many advantages, such as running evenly, lower noise, stronger separating ability, and higher automatic degree. It is widely used in Light industry, chemical industry, medicine, food and so on.

The main application: concentrated yeast and other materials.

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.



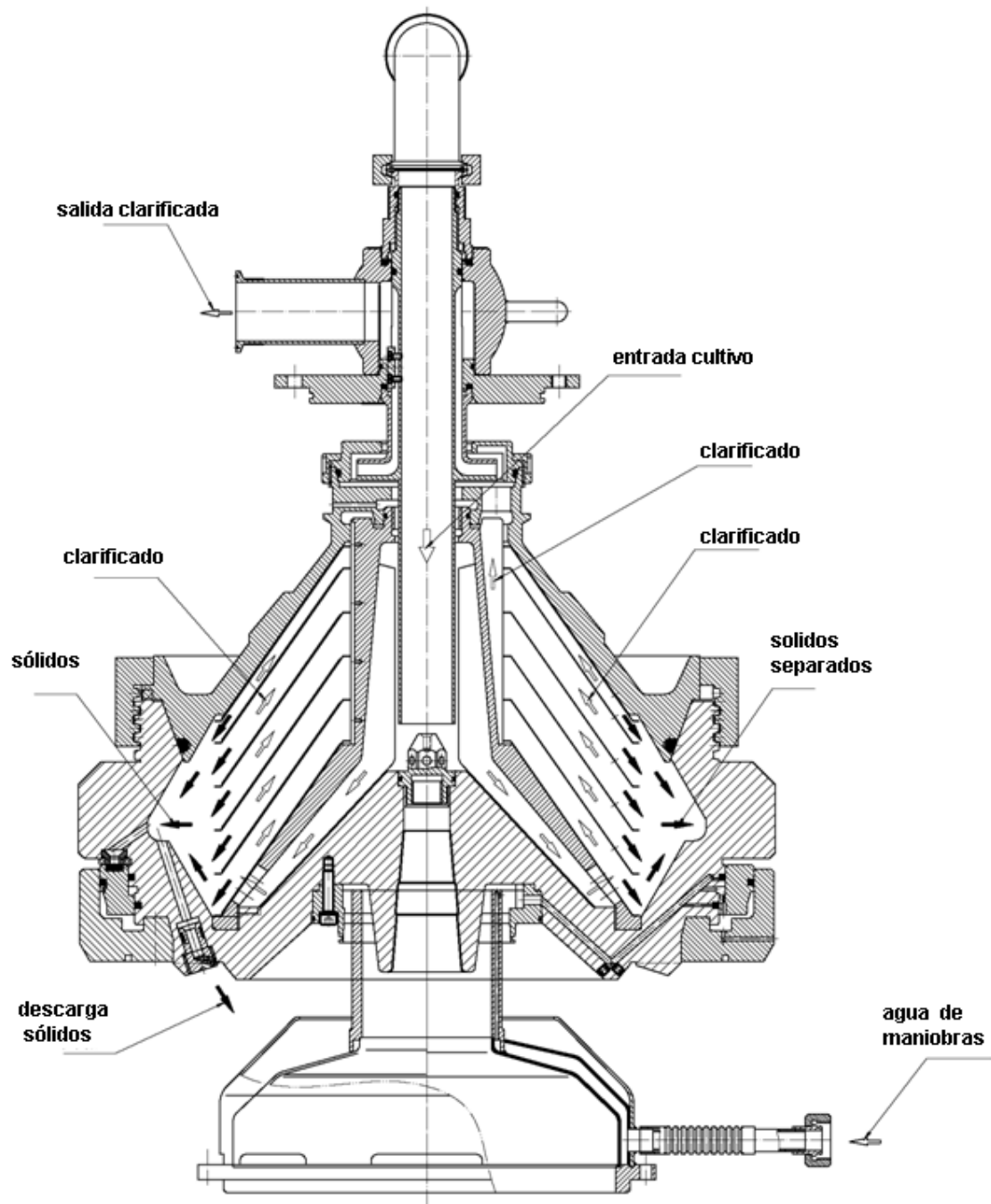
5. Main technical data (see table one)

Table one

Model	BTH 480 B3
Bowl speed	~6500rpm
Power	30Kw
Start time	8~15min
Stop time	≤50min
Weight	~1860kg

6. Operating principle (see attach fig. 2)

The mixture liquid to be processed are fed to the bowl from feeding pipe, Under the effects of centrifugal force, the solids that have heavier density are collected on the bowl wall. The solids are collected in sediment holding space, continuously ejected through the nozzle orifice that disposed in the lower part of the bowl. Rationally regulate the number and size of the nozzle according to the concentration and yield of materials. The lighter products (clear liquid) 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 nozzles, tap outlet and centripetal pump. Thus the machine can work continuously for a long time, attain good separation effects in long run.



OPERATION

7.Main structure in brief

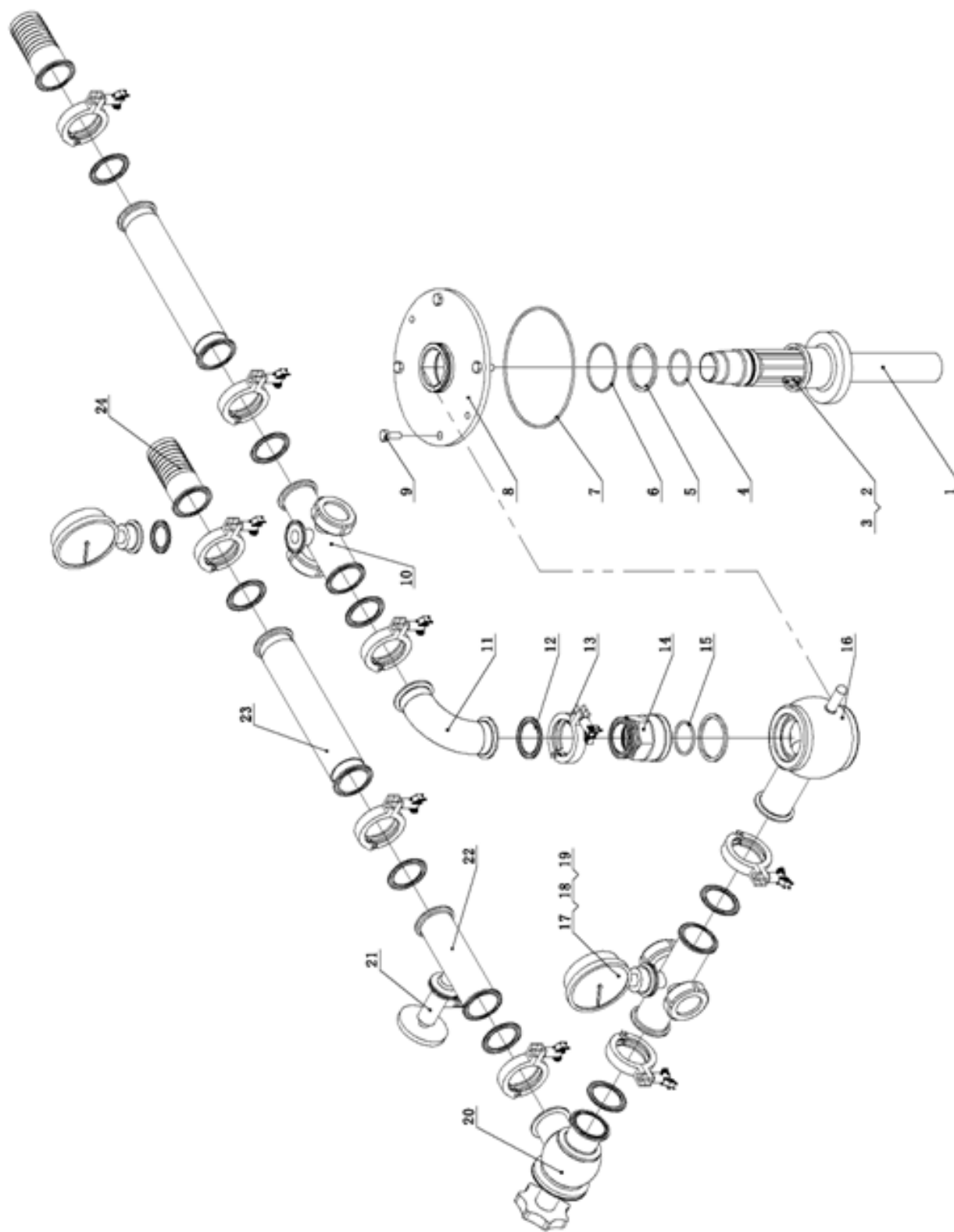
7.1 Inlet and outlet device (see fig.3)

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	Code
1	Feeding tube	1	600-0300
2	key	1	450-0500
3	Cylinder head screw	2	450-0501
4	O ring	1	100-0122
5	Seal ring	2	250-0400
6	O ring	1	100-0019
7	O ring	1	100-0068
8	Light phase outlet body	1	600-0301
9	Hexagon screw	4	450-0502
10	Sight glass	2	600-0302
11	90°Clip-on elbow	1	600-0303
12	Clamp washer	8	250-0401
13	Clamp	8	600-0304
14	Locking screw nut	1	450-0503
15	O ring	1	100-0123
16	Light phase outlet base	1	600-0305

No	Description	Qty	Code
17	Pressure gauge	2	750-0004
18	Clamp washer	2	250-0402
19	Clamp	2	600-0306
20	Sanitary regulating	1	600-0307
21	Clamp sampling valve	1	600-0308
22	Clip-adjustable	1	600-0309
23	Metal hose	2	600-0310
24	Clip-on hose connector	2	600-0311



Entrada y Salida

7.2 Bowl (see attach fig. 4)

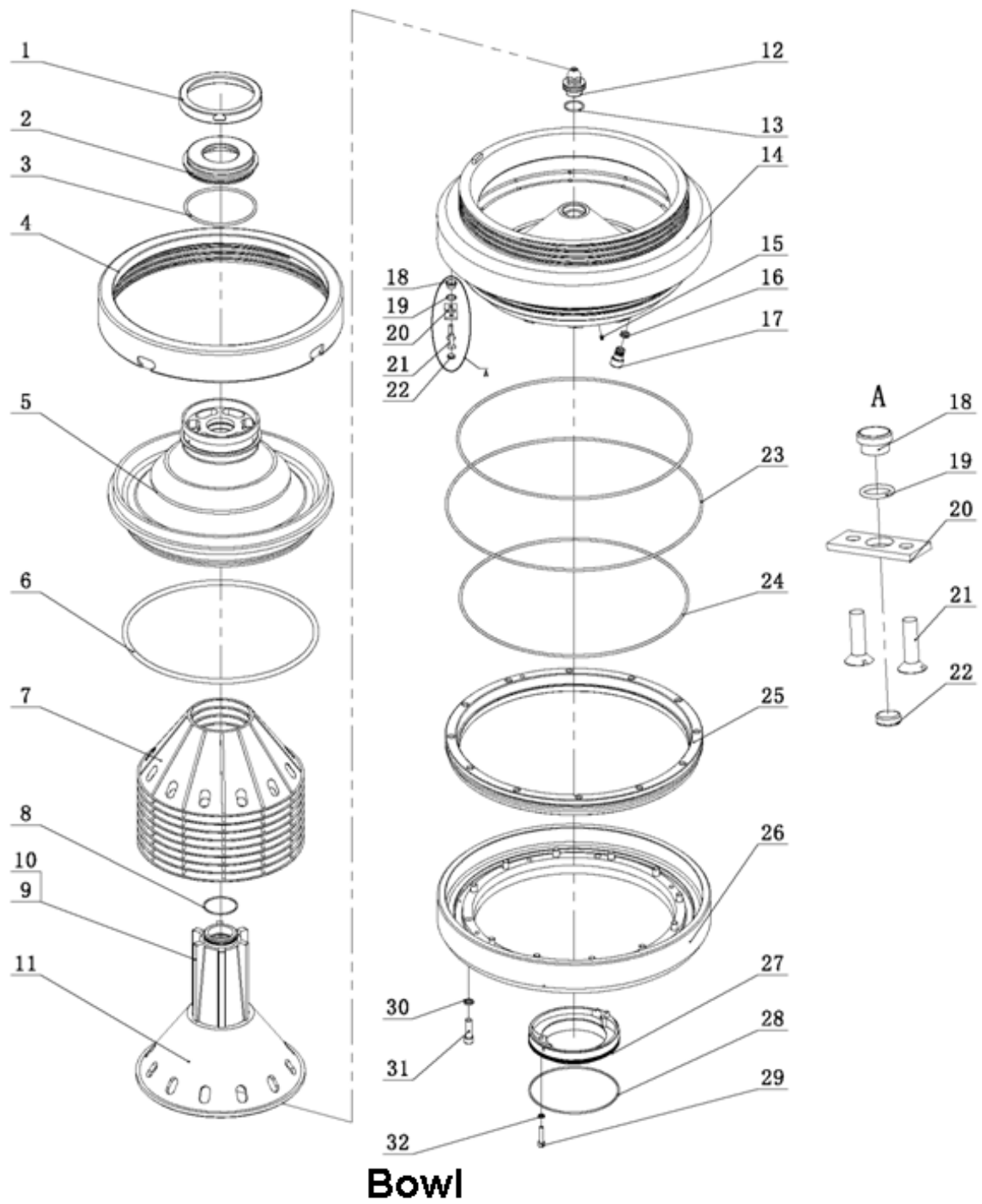
The bowl is the place that separate materials, the “heart of the machine”.(see attached fig.4) Its name, quantity and specification of main parts see table three. The bowl body is mounted onto the top of the vertical shaft, fixed tightly in vertical shaft through nuts. Then assemble successively distributor, 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 sleeve must be fixed to the mark position. The peripheral direction should be aligned to the mark place.

Table three

No	Description	Qty	Code
1	Small caps lock	1	650-0150
2	Centripetal pump cover	1	650-0151
3	O ring	1	100-0124
4	caps lock	1	650-0152
5	Bowl cover	1	650-0153
6	O ring	1	100-0125
7	Disc	90	650-0154
8	O ring	1	100-0060
9	Screw	8	450-0007
10	Flat key	1	450-0504
11	Dispenser	1	650-0155
12	Vertical shaft screw nut	1	450-0505

No	Description	Qty	Code
13	O ring	1	100-0043
14	Bowl body	1	650-0156
15	Set screw	4	450-0506
16	O ring	24	100-0126
17	nozzle	12	650-0157
18	sludge port	12	650-0158
19	O ring	12	100-0127
20	Plate	12	650-0159
21	Slotted countersunk head screws	24	450-0507
22	Seal ring	12	250-0403
23	Seal ring	1	250-0404
24	Seal ring	2	250-0405
25	Slide ring	1	650-0160
26	Fixing ring	1	650-0161
27	Water chamber	1	650-0162
28	O ring	1	100-0128
29	Inner hexagon screw	2	450-0412
30	Spring washer	12	450-0080
31	Inner hexagon screw	12	450-0032
32	Spring washer	2	450-0508

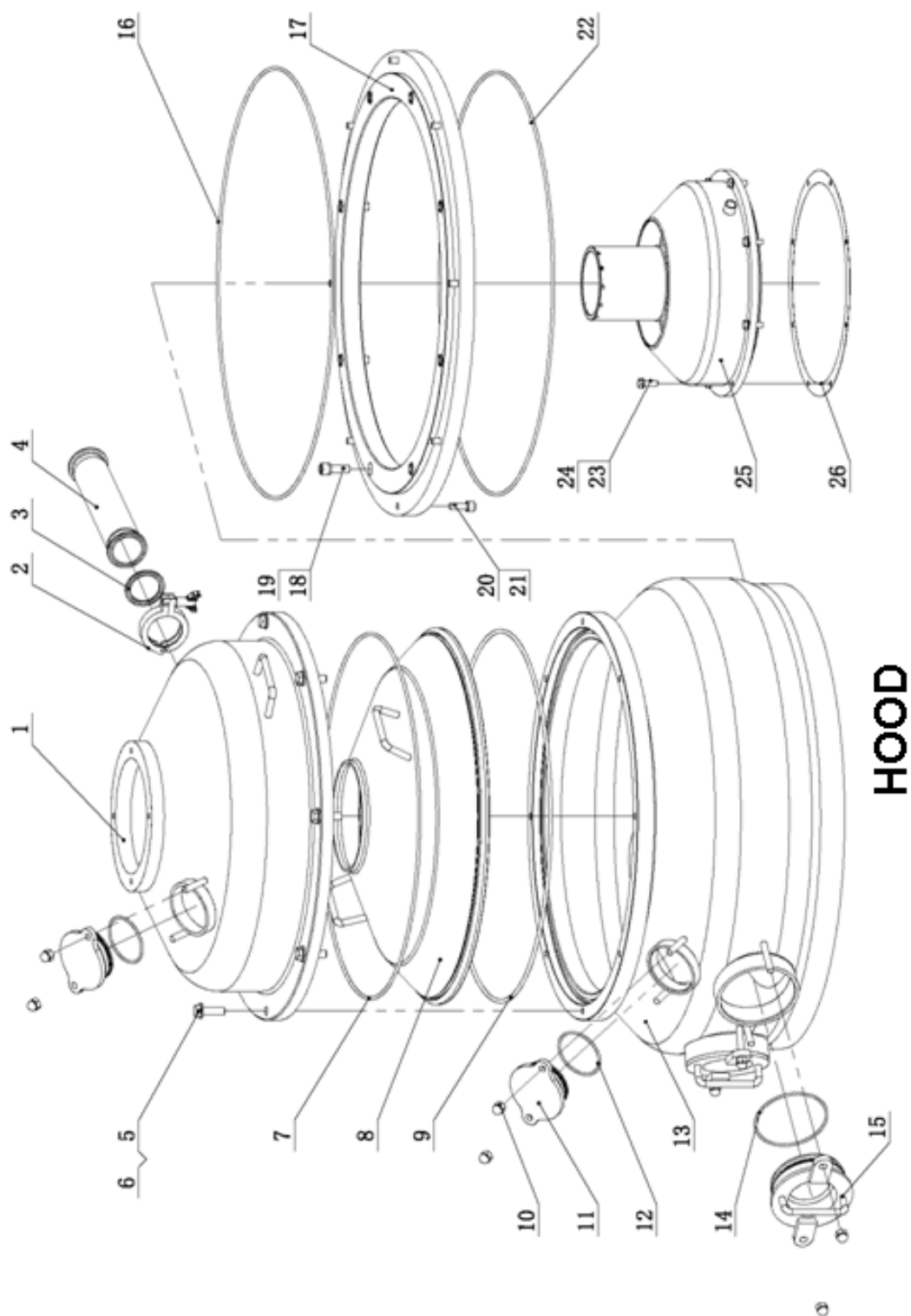


7.3 Hood (see attach fig.5)

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 four.

Table four

No	Description	Qty	Code
1	Up cover	1	650-0163
2	Clamp	1	600-0312
3	Clamp washer	1	250-0406
4	Metal hose	1	600-0313
5	Hexagon screw	8	450-0032
6	Level washer	8	450-0062
7	O ring	1	100-0129
8	Inner cover	1	650-0164
9	O ring	1	100-0130
10	Nut	8	450-0002
11	Observation hole cover	2	650-0165
12	O ring	2	100-0131
13	Lower cover	1	650-0166
14	O ring	2	100-0132
15	Hand hole cover	2	650-0167
16	O ring	1	100-0133
17	Transition flange	1	650-0168
18	Inner hexagon screw	8	450-0509
19	Spring washer	8	450-0080
20	Inner hexagon screw	8	450-0036
21	Spring washer	8	450-0057
22	O ring	1	100-0134
23	Hexagon screw	8	450-0116
24	Level washer	8	450-0068
25	Water shield	1	650-0169
26	washer	1	250-0407



7.4 Vertical driving device (see attach fig.6)

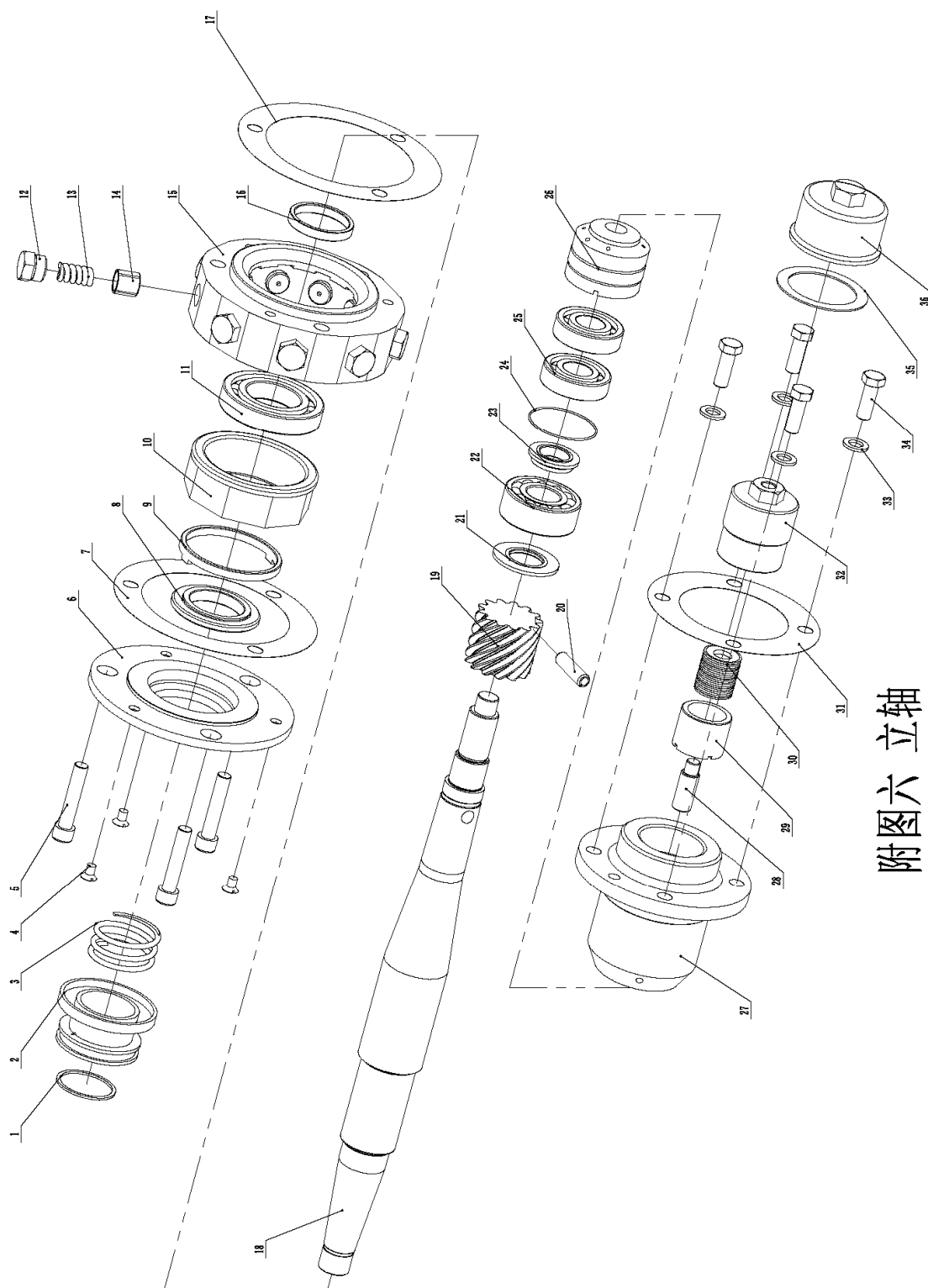
Vertical driving device is a part, which can increase speed and transfer power and adjust height of the bowl. It is one of the main components of the machine. A single-row ball bearing is fitted at the upper end of the shaft, a double-row self-centering ball bearing and two single-row angular contact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

Table five

No	Description	Qty	Code
1	O ring	1	100-0135
2	Seal cover	1	650-0170
3	Spring	1	450-0510
4	Screw	3	450-0110
5	Screw	3	450-0004
6	Protective cover	1	650-0171
7	Washer	1	250-0408
8	Bearing collar	1	650-0172
9	Bearing retaining ring	1	650-0173
10	Bearing protect sleeve	1	650-0174
11	Bearing	1	400-0014
12	screw plug	9	450-0511
13	Spring	9	450-0512
14	Spring base	9	450-0513
15	Spring chamber	1	650-0175
16	Spacer	1	450-0514
17	Washer	1	450-0313
18	Vertical spindle	1	650-0176

No	Description	Qty	Code
19	Small screw gear	1	650-0177
20	Round pin	1	450-0217
21	Bearing collar	1	450-0218
22	Bearing	1	400-0010
23	Bearing protect ring	1	400-0202
24	Wire collar	1	450-0310
25	Bearing	2	400-0003
26	Gland sleeve	1	650-0178
27	Fixed sleeve	1	650-0179
28	Spring bush	1	450-0515
29	Spherical base	1	650-0180
30	Support disc springs	1Set	450-0072
31	Washer	1	450-0312
32	Support spring Adjusting sleeve	1	650-0181
33	Washer	4	450-0230
34	Hexagon screw	4	450-001
35	Washer	1	450-0074
36	Lower bearing cover	1	650-0182



附图六 立轴

7.6 Horizontal spindle (see attach fig.7)

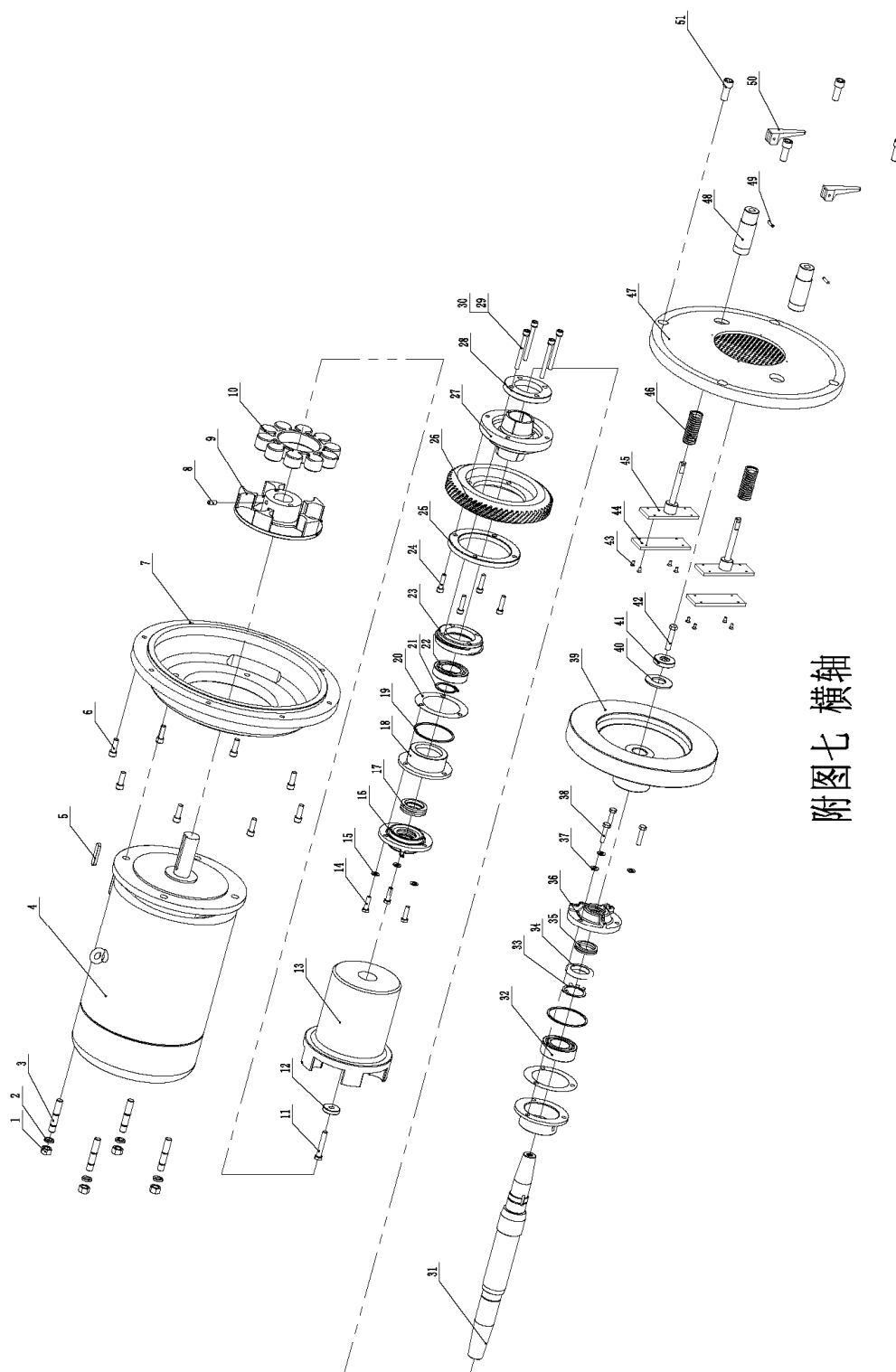
Horizontal shaft is one of parts that transmit power. It is located in the middle of the machine (see attached fig.7). Its main parts such as name, quantity, specification see table six. The bearings are located separately on the frame by the bush to keep the horizontal shaft run steadily and ensure its position. The motor drives gradually the horizontal shaft 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 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 six

No	Description	Qty	Code
1	Hexagon screw	4	450-0516
2	Spring washer	4	450-0517
3	double head bolt	4	450-0518
4	Motor	1	650-0184
5	Flat key	1	450-0128
6	Hexagon screw	8	450-0040
7	Supporting cover	1	650-0183
8	Set screw	1	450-0314
9	Coupling(I)	1	650-0087
10	Elastic block	1	450-0134
11	left tooth screw	1	450-0024
12	Clamping ring	1	450-0132
13	Coupling (II)	1	650-0086
14	Hexagon screw	3	450-0035
15	Level washer	3	450-0057

No	Description	Qty	Code
16	Gland	1	650-0185
17	Felt collar	2	250-0800
18	Bush	2	650-0186
19	O ring	2	100-0024
20	Paper cushion	2	450-0209
21	Axle collar	1	450-0240
22	Bearing	1	400-0004
23	Speed big gear	1	650-0187
24	Inner hexagon screw	4	450-0029
25	Clamping ring	1	650-0188
26	Geared ring	1	650-0189
27	Wheel core	1	650-0190
28	Clamping sleeve	1	650-0191
29	Inner hexagon screw	4	450-0118
30	Spring washer	4	450-0057
31	Horizontal spindle	1	650-0192
32	Bearing	1	400-0008
33	Stop washer	1	450-0241
34	Round nut	1	450-0227
35	Felt collar	2	250-0800
36	Gland	1	650-0193
37	Level washer	3	450-0057
38	Hexagon screw	3	450-0029
39	Brake wheel	1	650-0194
40	Disc spring	1	450-0085
41	Gland	1	450-0084
42	Hexagon screw	1	450-0322
43	Slotted countersunk head screws	4	450-0519

No	Description	Qty	Code
44	Brake blocks	2	500-0028
45	Brake shaft	2	500-0040
46	Spring	2	500-0041
47	End cap	1	650-0195
48	Brake axle sleeve	2	650-0196
49	Set screw	2	450-0321
50	Handle	2	450-0131
51	Inner hexagon screw	4	450-0028





附图七 横轴

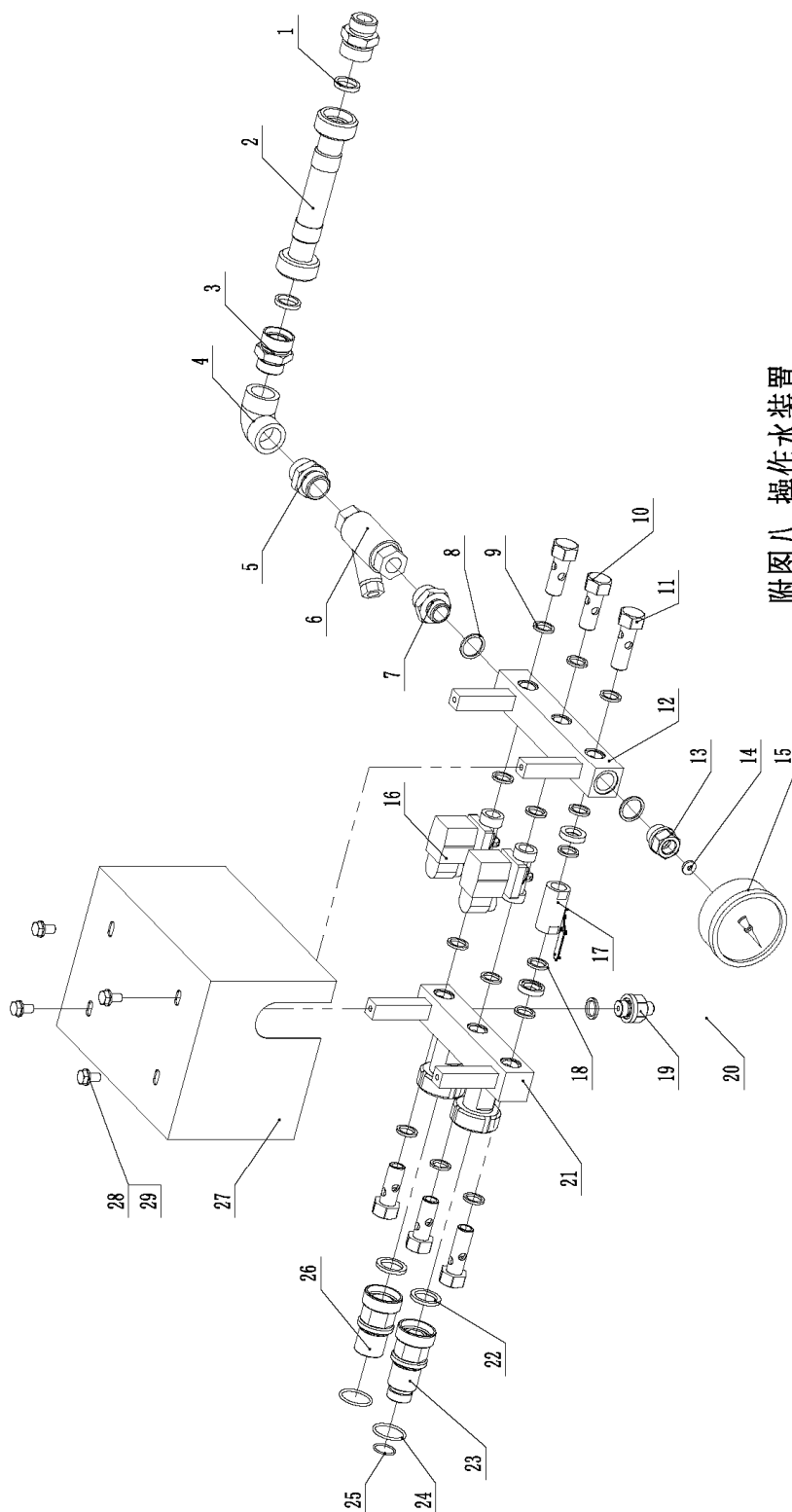
7.7 Operation water device (see attach fig.8)

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

Table seven

No	Description	Qty	Code
1	Seal ring	2	250-0016
2	Metal hose	1	600-0044
3	Joint 	2	600-0313
4	90°elbow	1	600-0314
5	Joint	2	600-0315
6	Y type filter	1	600-0316
7	Joint	1	600-0043
8	Seal washer	2	200-0008
9	Seal ring	16	200-0006
10	Bolt	2	450-0520
11	Bolt	4	450-0521
12	water tank	1	600-0317
13	Joint 	1	600-0318
14	Seal ring	1	200-0001
15	Pressure gauge	1	750-0002
16	Solenoid valve	2	600-0104
17	Ball valve	1	600-0319
18	Washer	2	200-0010
19	Joint	1	600-0320
20	Metal hose	1	600-0208
21	Water outlet pipe	1	600-0321
22	Seal ring	2	250-0015

No	Description	Qty	Code
23	Joint (一)	1	600-0322
24	O ring	2	100-0001
25	O ring	1	250-0409
26	joint(二)	1	600-0323
27	Operating water cover	1	600-0324
28	Inner hexagon screw	4	450-0314
29	Level washer	4	450-0057



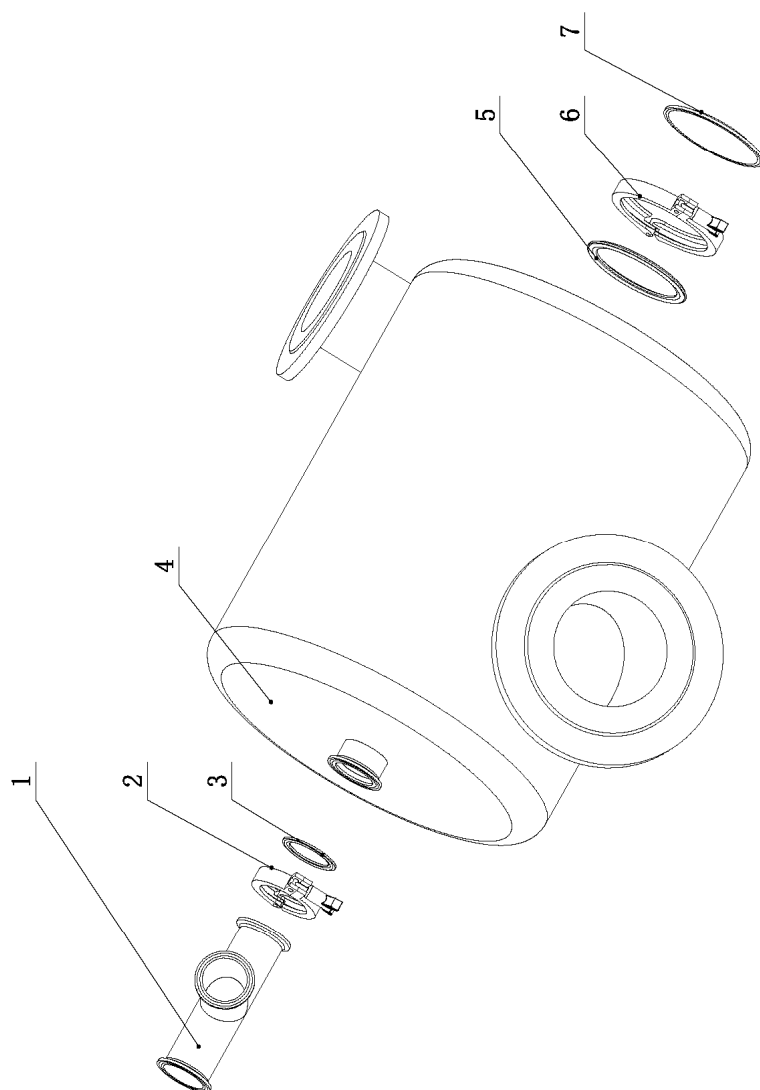
附图八 操作水装置

7.8 Silencer(see attach fig.9)

The silencer is connected to the down frame, it absorbs solids that lower cover collected and remove the abnormal noise produced by high speeding rotation bowl as possible. The bottom of the silencer adopt rubber soft connections contacting with pipe to reduce the vibration. It's main parts see table eight.

Table eight

No	Description	Qty	Code
1	Clip-on tee	1	600-0328
2	Clamp	1	600-0304
3	Clamp washer	1	240-0401
4	Tank	1	600-0327
5	Clamp washer	1	250-0410
6	Clamp	1	600-0325
7	Blind board	1	600-0326



附图九 缓冲器

7.9 Frame, foundation and motor (see attach fig.10)

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 nine.

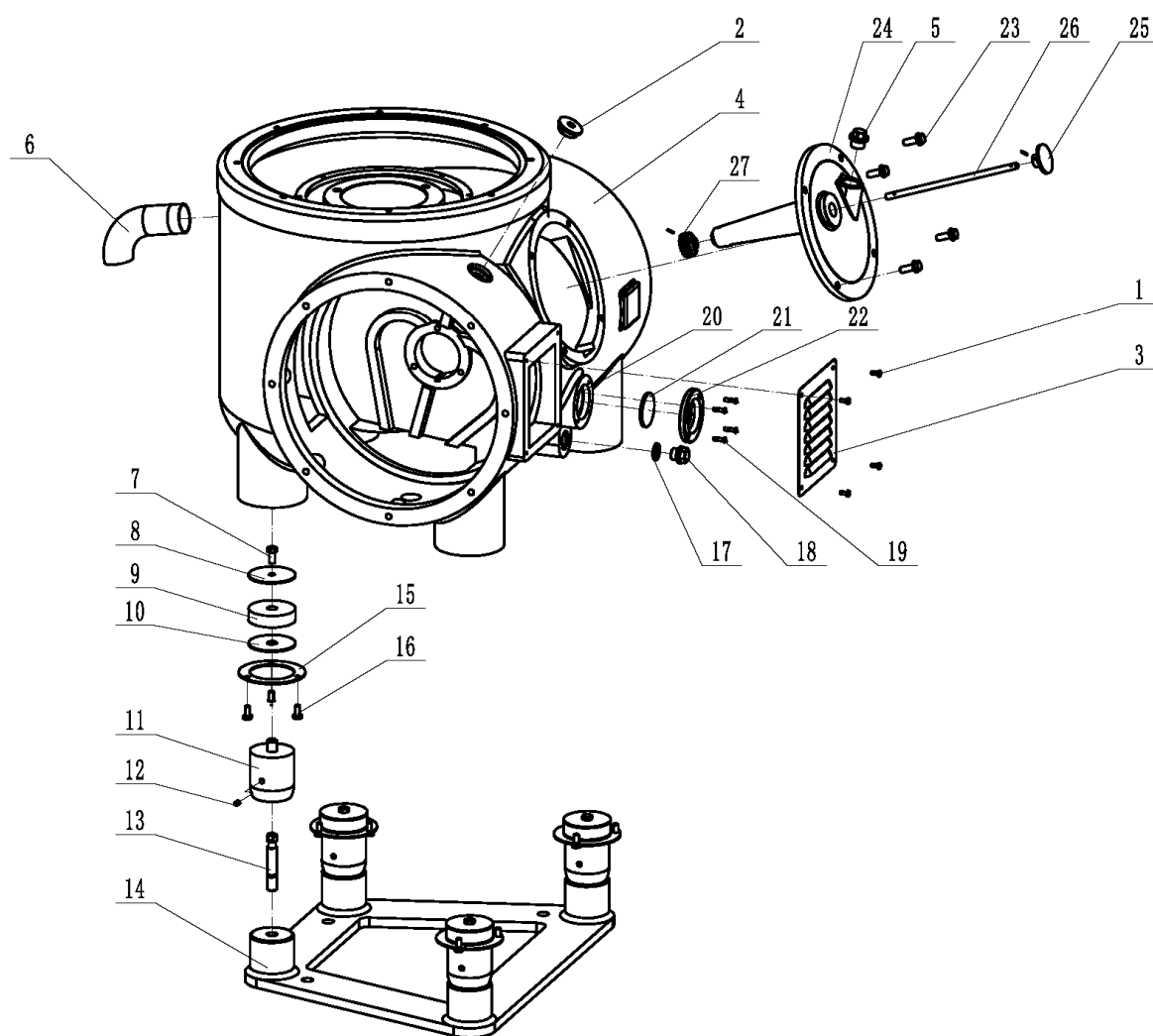
Table nine

No	Description	Qty	Code
1	Screw	4	450-0053
2	Oil plug	1	450-0033
3	Shutters	1	500-0023
4	Frame	1	650-0029
5	Vent plug	1	450-0034
6	Drain pipe	1	600-0003
7	Hexagon screw	4	450-0035
8	Washer	4	450-0088
9	Shock pad	4	450-0135
10	Cushion	4	450-0088
11	Supporting leg	4	650-0010
12	Set screw	4	450-0036
13	Screw	4	450-0037
14	Base	1	650-0046
15	Flanges plate	4	450-0090
16	Hexagon screw	12	450-0038
17	Washer	1	250-0013
18	Oil plug	1	450-0039
19	Sunk screw	4	450-0405

BTH480 B3 Disc separator

20	Washer	2	250-0014
----	--------	---	----------

No	Description	Qty	Code
21	Sight glass	1	600-0041
22	Cover	1	600-0042
23	Hexagon screw	4	450-0040
24	Shaft cover	1	500-0024
25	Indicate plate	1	500-0025
26	Speed shaft	1	500-0026
27	Speed small screw gear	1	500-0027



7.10 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.

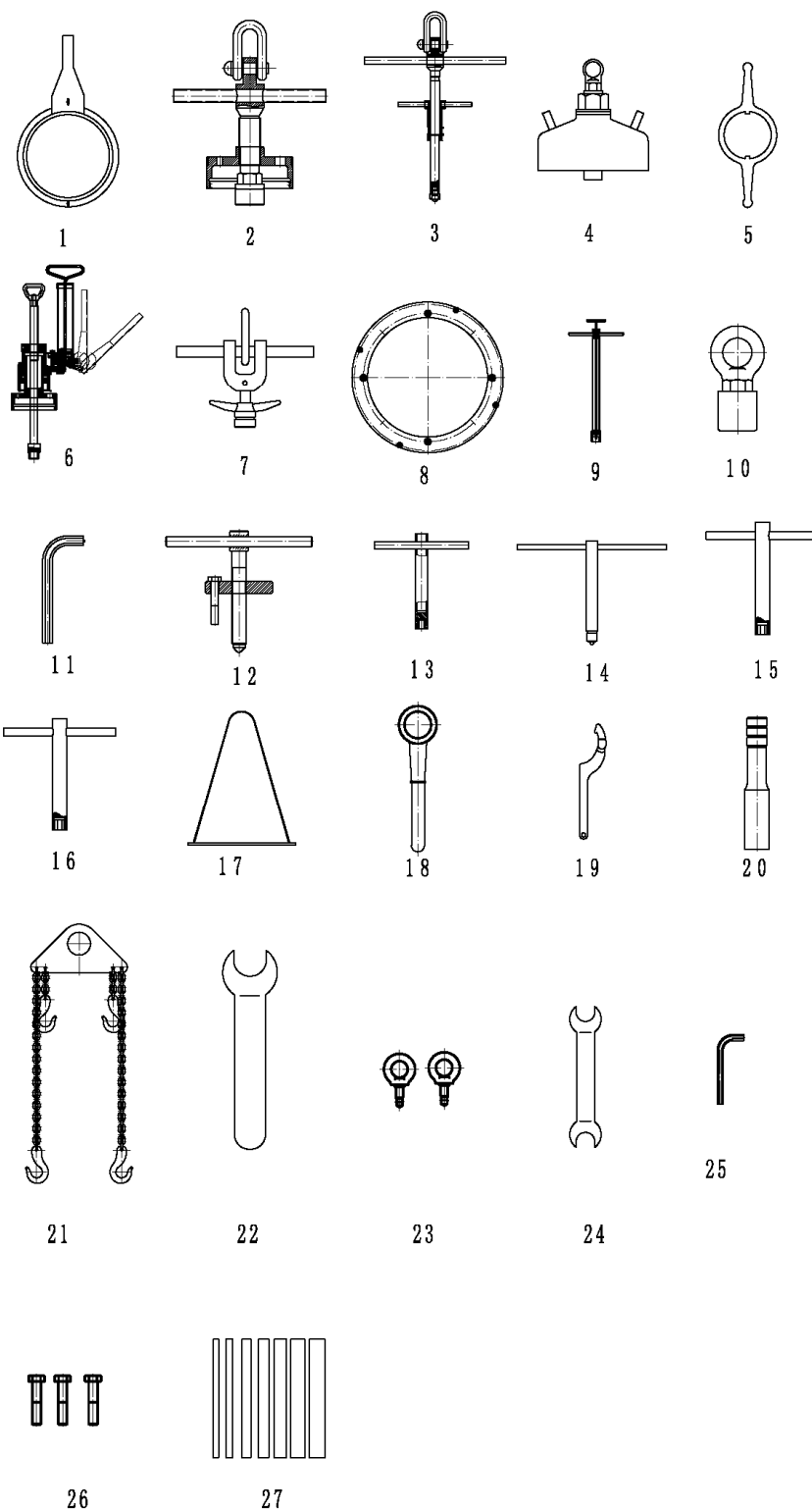
Please don't take apart and repair it or connect the line at random.

7.11 Special tools(see fig.11)

Table ten

No	Description	Application	Remark
1	Lock cup tool	Assemble/disassemble locked ring	
2	Bowl cover tool	Assemble/disassemble bowl cover	
3	Lift device	Lift distributor and bowl parts	
4	Compress device	Compressing discs	
5	Small lock cup tool	Assemble/disassemble small locked ring	
6	Compress device	Compressing discs	
7	Bowl body tool	Lift bowl body	
8	Sliding piston tool	Assemble/disassemble sliding piston	
9	Wrench	Assemble/disassemble vertical shaft bolt	
10	Lift tool	Lift vertical shaft	
11	Nozzle wrench	Assemble/disassemble nozzle	
12	Assemble/disassemble tool	Assemble/disassemble coupling	
13	Assemble/disassemble tool	Assemble/disassemble horizontal shaft Stud	
16	Assemble/disassemble tool	Assemble/disassemble clutch oil plug	
17	Lift tool	Assemble/disassemble upper cover	

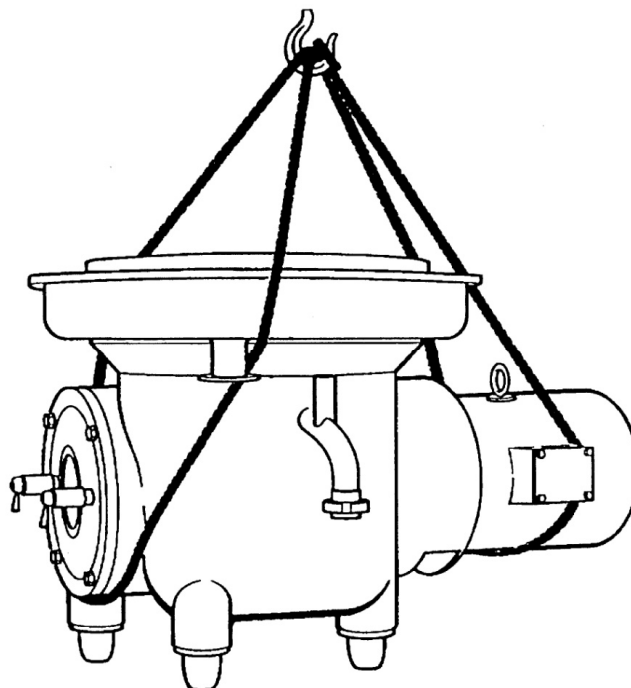
18	Wrench	Compressing discs	
19	Wrench		
20	Hand hammer		
21	Lifting tools		
22	Wrench		60
23	Lift ring screw		M10
24	Wrench		27×32
25	Wrench		10
26	Hexagon screw		M10×50
27	Measuring	Measuring the diameter of the nozzle holes	0.6-2.0



附图十一 专用工具

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



- 8.2.4 When lifting, the cord must be fastness. Don't lift separator by the stationary ring hole of the motor. Be steady when lifting and putting down and not allowed more than 30 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 0.3-0.6mPa, 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 30 kW, the fluid clutch drive power, the starting current is usually 60A~80A, the starting time is approximately 4~8 minutes. when assemble, please choose time relay (1~10 minutes) and the current meter for 100A, the electric current will be cut when start the contact implement, and the working current should not be lower than 60A

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-phase 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.

11. Trouble shooting (see table twelve)

Table twelve

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

<p>The bowl does not open at all or not completely.</p>	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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.
---	--	---