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KEFID

KEFID MACHINERY CO.,LTD
科菲达机器有限公司

Deep Rotor VSI Crusher

DR系列高效离心冲击破碎机

OPERATION MANUAL

使用说明书

Dear Kefid customer, thanks for choosing Kefid as your trusting brand. We will return you with god? s service and shape our brand with high quality products. Facing the future development, Kefid will insist on the "everything for the customers, to customers all "service principle unswervingly, as always, adhere to the business integrity, precision manufacturing, do excellent quality-best service product brand, innovation and development. With the world leading technology, Kefid is committed to the innovation and progress of crushing screening and grinding industry.

In order to guarantee your service information timely treated, to complete your demand for our services, please contact us as the following service way, we will provide you with satisfaction, quick service:

24 hrs service Tel: 0086-371-67988500

When our professionals install the equipment, after testing, please fill in the "after-sales service feedback form". Any comments and suggestions on the quality of our products and services, please be free to let us know, our company will review your feedback and treat timely.

Guarantee your satisfaction, is the service principle of Kefid.

In addition, Kefid products enjoy the product life-long VIP service, any problems, please do not hesitate to contact us, our professional service team will design the best business solutions for you, time done to your satisfaction.

Finally, thank you again for your use of "Kefid" brand products.

注意

Due to product improvements based on your needs, the product you buy may not completely consistent with description of the specification, please use the actual product shall prevail, thank you.

Symbol Description

Operators should take safety education before operating this equipment

Read the operation instruction carefully before handling the machine. Wrong operation may lead in physical injury.

Do not forget to put on the safety helmet.

Add lubrication oil.

Lifting position.

Do not put any tool into the crushing cavity.
when the machine is working.

Do not touch the belt and the belt pulley when the machine is working.

Foundation-making should be in accordance with specific foundation drawing and under guidance of construction engineer, if space constraints require changes; the user must contact the company in advance to change the drawing.

The company is not responsible for the circuit layout or connections, transformer configuration, the user should configure the product by a professional electrician electricity planning, connection lines.

★For the update of the machine, the technical data is subject to any changes without prior notice.
★Do not feed the material before starting the machine and make sure that there areno material left in the chamber before stopping the machine.
★Please lubricate before start.
★Please read over this instruction carefully before running the machine.
★Be awareness of preserving the instruction and other related data.

CATALOG

1.Function and Usage

The DR Series Efficient Centrifugal Impact crushers, introducing the advanced German technology, are the new generation products owning many patents. It combined three crushing models and become main efficient crushing equipment in the machinery sand making industry.

The machine can be widely used in metal and non-metal, building materials, artificial sand and all kinds of metallurgical slag crushing and shaping. This machine is suitable for Mohs' hardness less than nine of the brittle materials, does not for viscous material and stone containing more soil.

2.The specifications

Table 2-1 various models of main performance parameters

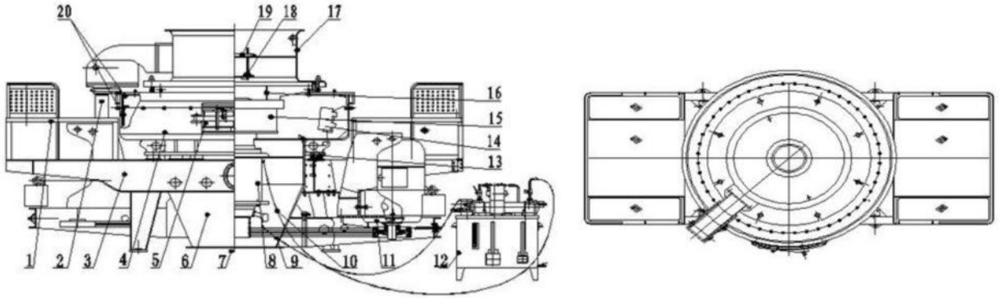
Model		DR-7615	DR-8522	DR-9532	DR-1145
Passing Capacity (t/h)	Center and Ring Feeding	150～280	240～380	350～540	500～640
	Center Feeding	70～140	120～190	180～280	250～360
Max Feed Size (mm)	Soft material	35	40	45	50
	Hard material	30	35	40	45
Rotation speed (r/min)		1700-1900	1500-1700	1300-1510	1100-1310
Power for double motor (Kw)		110-150	180-220	264-320	400-440
Overall Dimension L×W×H (mm)		4100×2330×2300	4140×2500×2700	4560×2600×2900	5100×2790×3320
Weight (t)		8.6	11.8	17.5	27.5
Power Source		AC380V , 50Hz	AC380V , 50Hz	AC380V , 50Hz	AC380V , 50Hz
Vibrating Sensor		Inspect scope: 0.1-20mm/s adjusted continuously		Inspect scope: 0.1-20mm/s adjusted continuously	
Lubrication hydraulic pressure station	flow quantity(L/min)	6	6	6	6
	Power for double oil pump	2×0.25	2×0.25	2×0.25	2×0.25
	Safety	To make sure the supply of the oil with double oil pump; stop working without oil or hydraulic pressure; temperature falls when the water cool; start the motor by heating it in winter.			
	Overall Dimension L×W×H (mm)	820×520×1270	820×520×1270	820×520×1270	820×520×1270
	Power for oil box heater(Kw)	2	2	2	2

Notice: size proportion of finished product have relation with raw material hardness, feed size, chemical composition, age, etc.

3.Structure of the Machine

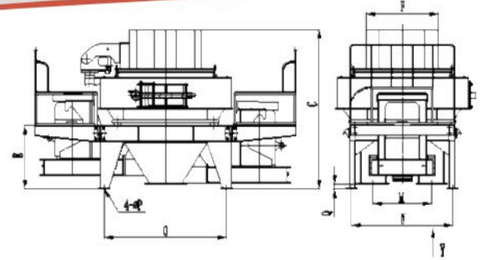
The main parts of the main structure (see diagram 3-1) feed hopper (21) Rotator device (19) main bearing assembly (8) supporting frame (3) main body (4, 6) driving device of motor (13, 14) elevating device of feed hopper (2) damping device(13) thin oil lubrication device (12) The overall dimension of main body: see diagram 3-2

3.1Structure of Mainframe



Note: 1: foot operated frame 2: cap-turning device 3: support frame 4: crushing chamber 5: inspection door 6: lower-part shell 7: outlet 8: main shaft assembly 9: oil return pipe 10: oil inlet pipe 11: electric driving system 12: thin oil lubrication system 13: vibrating sensor 14: impact plate 15: rotating crushing system 16: materials distribution cone 17: feed hopper 18: materials distribution tray 19: feeding inlet 20: up/down protecting board

3.2 Overall dimension



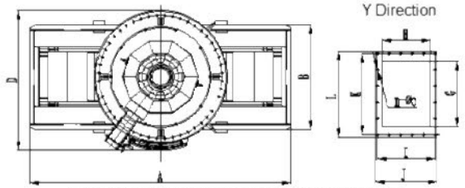


Diagram3-2 overall dimension of main body

Model	Overall dimension					Feeding、opening size										Installation dimension		
	A	B	C	D	E	F	G	H	I	J	K	L	n	M	N	O	P	Q
DR-7615	4100	1640	2300	2330	950	1160	500	128×5	680	358	150×3	490	16	14	890	1640	1780	26
DR-8522	4140	1760	2700	2500	1100	1230	800	155×6	970	408	125×4	540	20	14	940	1760	1900	34
DR-9532	4560	1840	2900	2600	1201	1290	575	142×5	750	413	101×5	545	20	14	1015	1840	2000	40
DR-1145	5100	2020	3320	2790	1358	1376	600	148×5	780	450	111×5	595	20	14	1145	1970	2130	44

Notice: Any change of Sand Making Machine technical data shall not be advised additionally.

4.Working Principle

Centrifugal impact crusher uses high-speed movement of materials with their own friction to crushing. Centrifugal impact crusher not only crushes, but also shapes the stone. According to the feeding pattern, there are two working forms: completely central feeding and central feeding with cascade feeding; according to the crushing resistance and corrosiveness of the materials, there are two working forms: crushing between materials and crushing between materials and liners. So totally there are four kinds of the working forms.

4.1 Working principle for central feeding with cascade feeding and crushing between materials (diagram 4-1 left part)

The materials enter the machine though the feed inlet (19) (see the diagram 3-1), and fall into the material tray (18) through the material distribution plate (16), and be divided into two parts. One part of material enter the high speed rotated rotator through the center of the distribution tray and are accelerated quickly inside the impeller, and then are thrown out through flowing chute of the impeller at high speed, firstly are crushed by impaction with another parts of the materials falling from the distribution tray, and then together they are impacted to the material lining of the crushing chamber(4),after that they are rebounded from the material lining up to the top of the crushing chamber, and then change the moving direction from upwards to downwards and formed continuous material screen. In this way, the material will be impacted, crushed, and grinded many times in the crushing chamber. The broken materials depart from the crushing chamber under the gravity action and fall into the lower-part shell (6) and are discharged by the discharge hopper. Upper and lower impact protecting pieces are installed on the wall of the crushing chamber to protect the body shell from wearing. Its characteristic is that the materials are accelerated by the rotator, and half of the materials are thrown out by the energy got from the rotator and then crushed, impacted, grinded with the materials lining or the materials crushed by their own high speed

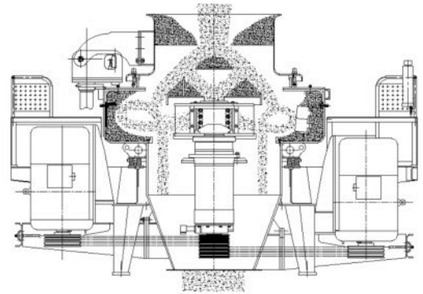


Diagram 4-1 Central feeding with cascade feeding Crushing between materials (left) / Crushing between materials and liners (right)

rotated impact, which is called "crushing between materials"

4.2 Central feeding with cascade feeding and crushing between materials and liners (diagram 4-1 right part)

Main working principle is the same as central feeding with cascade feeding and crushing between materials. The difference is when crushing between materials, impact protecting pieces are installed in the crushing chamber, and the materials are formed lining around it and the materials are impacted into the lining and then crushed, however when crushing between materials and liners, the lower impact protecting pieces are changed with the guard plates/liners (17), and the materials are directly impacted to the liners and crushed then.

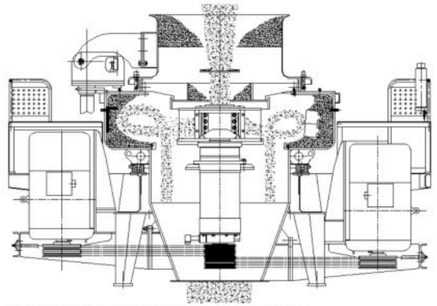


Diagram 4-2 completely central feeding
Crushing between materials (left) / Crushing between materials and liners (right)

4.3 Completely central feeding and crushing between materials (diagram 4-2 left part)

Main working principle is the same as central feeding with cascade feeding and crushing between materials. The difference is when completely central feeding, the distribution cone will be adjusted, and the materials fall into the distribution tray directly from the feed inlet and then come into the throw wheel through the center of the distribution tray.

4.4 Working principle of completely central feeding and crushing between materials and liners (diagram 4-2 right part)

Main principle is the same as the central feeding with cascade feeding and crushing between materials and liners; however the feeding way is completely central feeding.

4.5 Crushing between materials is suitable for the materials with medium and above hardness and high corrosiveness such as basalt, etc. During the processing, the materials thrown out from the rotator and impact with the material lining, while not impact with the metal components of equipment directly. It can reduce the wastage and accordingly can

reduce the time for maintenance and serving. The shape of the final products during this process is good and with a little more powder.

4.6 Crushing between materials and liners are suitable for the materials with hardness below medium level and low corrosiveness such as limestone, etc. And during this processing, the ratio of crushing is high but the cost of worn guard plate/liners is high too, and the shape of final products is not as good as the above process.

5.Electrical part

5.1 Technical data:
Voltage rating: AC380V/220V 50Hz (three phases and four line) Current rating: AC15A
Output contact content: 10A
Control method: semi-automatic

5.2 Working pattern:

1)Oil pump: only one oil pump be used if it works normally. The second oil pump will work automatically only if the pressure and amount of current cannot reach the setting data or when the first oil pump get some problems.

2)Oil temperature control: keep the oil temperature above15℃ if there is the electricity in the electric control panel. When the oil temperature above 50℃, the external water supply system start to work automatically till the oil temperature fall down to 15℃. If the oil temperature above70℃ and prolong 10minutes then will give a stop signal to the machine.

3)Automatic cycle of oil pump: after the mainframe and oil pump stop, if the oil temperature is lower than 15℃, the heater will heat automatically and meanwhile the oil pump works automatically to keep the oil temperature above15℃,at that time, heat three more minutes, stop heating, then after one more minute, stop the oil pump, do care freezing in winter.

5.3 Mode of connection: See the attached drawing and instruction of panel, the electric control panel and oil station must be installed on earth.

5.4 Adjustment:
1)Oil thermometer has been set, and it can be adjusted according to on-site condition.
2)Rotating direction of the oil pump motor.(follow the mark)

5.5Operation: Push button "on/off" when starts the oil station; push button "on/off" when stops the oil station.

6.Thin Oil Lubrication

6.1 Brief Introduction of Lubrication System

This machine is a double pumps lubrication system to ensure supply complementary, no oil flow, no oil pressure, if oil temperature is too high, it will stop automatically; cooling system and heating device work automatically to ensure bearing lubrication is always at its best, in this way, solving the bearing heat problem thoroughly, making the bearing maintain constant temperature, and extending maintenance intervals and service life of the bearing.

6.2 Working Principle and procedure (see diagram 6-1)

When running, the oil gets to upper part of the bearing sleeve through oil tanking filter, and are sucked out by the gear pump, via one way valve, double cylinder filter, oil cooler, top oil tank (15) (see diagram 3-1) and then due to the gravity the oil will flow across the bearing of the lower parts of bearing sleeve and then flow back to the oil box via oil return pipe.

5X Series Vertical Shaft Impact lubrication system detects temperature automatically ,when oil temperature is lower than 15℃is will heat automatically, at the same time the pump start to work, when up to 15℃,there will be a signal to the PLC to tell stop heating, after three minutes, PLC stop heating, after one more minute, the

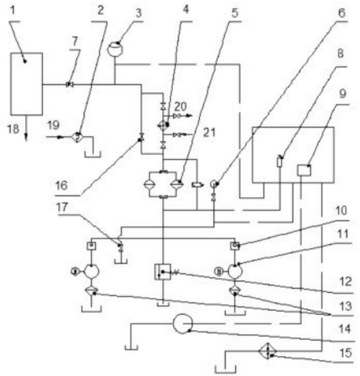


Diagram 6-1

Note: 1.top oil tank 2.oil return magnetic screen filter 3.oil flow signal 4.oil cooler 5.double cylinder filter 6. pressure meter of electric contact 7.oil-supply valve 8.warner 9. temperature controller. 10.one way valve 11.gear pump 12.safty valve 13.oiltaking filter 14. platinum heat resister 15.electrical heater 16. Pass-by valve 17. flow dividing valve 18.oil supply 19.oil return 20.water out 21.water in

pump stop working. At this time, you can start the pump, the lubricating oil through the mainframe, when up to the fixed standard ,the white signal shining, now you can start the mainframe, when the mainframe working, the temperature may blew 15℃ again, but in such situation, the heating system doesn't work, it will not affect the operation of the mainframe. The temperature will above 40℃ because the friction of components, the temperature control system will start automatically ,this system use water to reduce the temperature ,after the temperature down to 40℃ there will be a signal for the PLC to stop cooling, after five minutes, the PLC stop the pump. When the temperature above 70℃, and prolong ten minutes, PLC will give mainframe a signal to stop (white light turn off, center power relay KA cut off), this will protect the mainframe. Stop mainframe before stop the machine, and then stop the lubricating system.

Notices: 15℃, 40℃, 70℃ is a fixed data. When the temperature control watch works abnormally, it will give a signal to the PLC through below 15℃ that is heating state. The effect of lubricating system is to make the mainframe work normally, to protect the bearing of mainframe and to avoid large loses.

6.3 Notices of Installation and Adjustment

1)Lubrication pump station should be installed in the proper temperature, less dust, less vibration, easy adjustment, inspection, maintenance convenient place, and closest to the mainframe, shorten the length of pipes, maintain a minimum pressure drop;

2)Add # 35 bearing oil, or 68 # load closed gear oil. into pump station's oil tank to the standard level before running;

3)Lubrication pump's rotation is one-way direction ,the wire connection must abide by the signboard of motor;

4)Oil flow standard set flow is 8L/min, can be adjusted between6~12L/min (settings too large or small will not work), it have relations with the oil type, temperature, quality, length of pipeline;

5)The lubrication pump is indoor installation type, outdoors or in harsh environment use must take protective measures.

6)Lubrication Pump Station and the electric cable shall be connected well, and tighten the nut;

7)Power cord to the corresponding position, the zero line and grid connection must be reliable, power distribution equipment shell and fuel tank must be reliable grounded

6.4 Parameters of Main Components

PLC model: original Mitsubishi PLC, FX1N-14MR, 220V

Temperature controller: WL-C80-4,220V

RTD: platinum RTD PT100cu

Thermal resister: 31-32ohm, 31-33=100ohm, 32-33=100ohm

System control voltage: AC220V 50-60HZ Heater: 2KW AC220V
Other components follow actual component model

6.5 Affixation Explanation

1)Distribution Cabinet choice dry, rain, dust for installation, easy to operate observation;

2)With electrical circuit diagram, an external terminal connection diagram;

3)If the lead wire of pump is not suitable pump voltage, it can be connected to 220V AC to control the pump indirectly.

6.6 Common Problems and Solutions

Problems	Causes	Solutions
1.Temperature watch shows flashes, oil pump and heating start automatically	Thermal resistance lines are wrong, broken, damaged	Check the lines, change the RTD
2.Two pumps work together	Inappropriate set of flow switch ,line break, dirt filters, pipe plug, bubbles in oil	Check flow switch and lines,clean the filter, check the oilthe oil pump work continuously
3.White light is not on	Heating state, the pump did not start normally, flow switch is not connected,	Under heating State can't start pump normally Check the flow settings.Replace the Indicator
4.Temperature controller has no electricity	The lack of zero line or power, instrument damage fuse blows, there is short circuit	Check the power Replace temperature control table Check the cause of the short circuit and change fuse
5.X4,X5 lights on PLC is not on	Corresponding thermal relay auxiliary contact off, motor is over-current,thermal relay damaged	Check the reasons for Over-current Replacement of thermal relay
6.Power light on PLC does not shine	The lack of zero line or power line,PLC damaged fuse blows, there is short circuit	The lack of zero line or power line,PLC damaged fuse blows, there is short circuit Check the power Change PLC Check the cause of short circuit and change the fuse

7.Foundation, Installation and Test-run

7.1 Foundation requirements and notices

The equipment should be installed on the concrete base or steel structure, and the foundation should be able to bear 4 times of weight of the total equipment. The foundation must meet the following requirements:

1)Meet the common foundation requirements: static balance, intensity, sedimentation control.

2)Control the inherent frequency of foundation; make sure there is no syntony between foundation and equipment.

3)Control foundation amplitude. Foundation amplitude shouldn't affect the normal run of machine. 4) There should have enough height and installation space left for workshop and foundation according to foundation chart.

5)If to use concrete foundation, the intensity grade of concrete is no less than C20 (is 200 size), the mode of compound steel bar should be reasonable, use good tactility steel bar, can't use cool processed steel bar. Stuffing tube or cable channel should be embedded in the foundation in advance. There should be 15 day's maintenance period after cast the concrete foundation.

7.2 Installation and notices:

1.Installation

1)Make the foundation according to foundation chart, notice the position and dimension of anchor bolt. The foundation upper surface shall be leveled with level bar.

2)Lifting equipment should be fitted up the machine, and leave enough lifting space. Lifting capacity is due to the max weight of the biggest set. On the one side of the machine should leave enough places for maintenance.

3)Install the mainframe. Lift the mainframe by crane; put the mainframe on the foundation. Suggesting there should be rubber gasket in the connection between found board and foundation surface and connection among anchor bolt.

4)Adjust the horizontal angel 1.5mm with adjustment iron; make the main shaft is vertical with surface. The check face of level bar is the belt wheel bottom of mainframe.

5)Fixed and fasten. The second cast should use the higher grade concrete than foundation. Maintenance period is no less than seven days.

6)Lubricating system is fixed on the flat concrete ground or steel structure, its box surface must be below the return oil hole of main shaft assembly no less than 400mm. Lubricate route and seal proof is reliable, and connection of oil tube is not too tight. The injection quantity of fuel tank is:150~190L/35# bearing oil or 68# load closed gear oil industry. Make sure the oil level is correct.

7)Screw all bolts, clear all eye winker, and adjust the level of driving belt. Since the machine use the mightiness narrow v-

belt, it should be pull tighter than common v-belt.

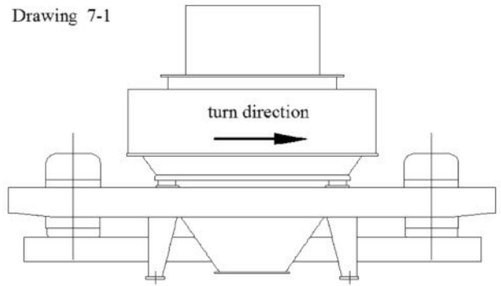
8)Distributing cone is used when central feeding with cascade feeding, but take off the distributing cone if only central feeding. When using distributing cone, adjust the height of cone in order to change the flow and position of fallen material.

9)Input system is fitted with effective iron remov

2.Notices

1)Before installation should check the components and spare parts according to packing list, check whether the spare parts is complete, check whether the spare parts is damaged during transportation.

Drawing 7-1



2)Before installation the equipments should be well stored at site. Nude outside parts should wipe the anti-rust grease, keep the equipments from sun and rain, and prevent the body from rusting.

3)If the period from leaving factory to installation is more than six months, open the bearing cylinder assembly to clean, grease, fills the oil seal with butter.

7.3 Adjustment and Test-run

After finished installation, take a full inspection and test-run before running.

1.Full inspection

1)Check whether the lubricating tube connected reliably, oil pump runs normally, oil flow indicator, oil temperature and oil pressure is normal, add oil again before trial-run. Lubricant is 35# bearing grease or 68# load closed gear oil industry; grease level should be in the normal range.

2)Hydraulic station pressure and oil flow electricity should form linkage with main motor.

3)Check the connection of spare parts, all should be fastened and reliable All sealing should well. Check if there is anything on the throw wheel, if has, clean it timely.

4)Check the connection of motor. Before install driving belts, driving the motor firstly to check the rotation direction whether comply with the direction of machine mark, if not, adjust the rotation direction of main shaft. Refer to chart 7-1.

5)Adjust driving belts on the two sides of main shaft, make its tension is the same, and belts is flat and straight.

6)Loosen the bolts of feed hopper, press hydraulic jack by hand and heist the hopper, turn the hopper, check the running effect.

7)Drive belt wheel of main shaft, check the main shaft turning, it should turn flexibly, no block and stop.

2.Adjustment and test-run of thin oil lubrication system

Check the turning of oil pump; it should comply with the marked direction. The system should be connected reliable.

The following parameters have been adjusted before the machine leaving factory.

1)Adjust the pressure of system

Block the front of oil flux indicator, open the side valve. Start the oil pump; adjust the side valve and regulating screw of safety valve. Pay attention not to make the system pressure too high, tighten the screw of safety valve when the overflowed pressure is 0.63±0.05Mpa.

2)Adjust oil supply Adjust the side valve; make the indication of oil flow indicator to 8L/min.

3)Adjust Pressure Switch

When supply reach to 8 L/min,the reading of indicator is turn-on pressure of pressure switch or disconnection pressure of spare pump.

When oil supply is less than 2L/min, the pressure is turn-on pressure of spare pump.

4)Temperature controller debugging

When oil temperature is higher than 40℃, the temperature controller starts the water supply system. it will stop until the oil temperature is lower than 40℃.

When oil temperature is lower than 15℃, the temperature controller starts the heater. The heater will stop until the oil

temperature is higher than 15℃.

3.Unload test-run

1)The time of unload test-run is four hours

2)Before test-run, wrenching the belt wheel, it should rotate flexible.

3)After start, the machine should run stably. The body should have no fierce vibration and no abnormal noise. Otherwise should stop to examine. Obviate the problems then test-run again until it runs normally.

4)When test-run, the temperature of bearing is no more than 50℃ or the max. Temperature is no more than 70℃, otherwise should clear bearing or adjust the space.

4.Load test-run

1)Load test-run should after qualified unload trial-run.

2)The time of load test-run is eight to twenty-four hours. Meanwhile there must be people continuously monitor and observe the operation of the machine, including electricity of main frame, oil temperature, oil level of oil box, oil pressure, flux, amplitude, record the operating condition.

3)In the first three minutes of beginning, the feeding material should be moist sand which size is less than 20mm. It is helpful to form even and balanced material liner. Continue to feed stone when the machine runs well.

4)The input size of material is strictly according to the technical chart. Over-size material input is forbidden.

5)Feeding material evenly and continuously, until reach to the full load of crusher.

8.Operation procedure of the equipment

8.1 "Crushing between materials" working condition should remove the guarding plate around and hanging plate, and install the lower stroke guarding plate. "Crushing between materials and plates" is reversed.

8.2 Electricity must be cut off when checking the inside parts, make sure the main machine stop working absolutely, then open the testing door to check inside.

8.3 Look down from the feeding hole and Check the impeller rotating direction. The impeller should rotate anticlockwise.

8.4 The start sequence of crusher and conveying equipment is: conveyor of discharge gate ----thin oil lubrication station---centrifugal impact crusher---material conveyor. The crusher must be started unloaded, feed the materials until the crusher works well. 8.5 The input size should strictly be according to the stipulated requirement, prevent steel and oversize material from feeding into the crusher. Otherwise, it will damage the alloy bar and make impeller wear out. Clay or gummy material inside can cause to block impeller flow chute and central material-feeding pipe, make the machine disorder. Big materials should be eliminated timely.

8.6 Firstly stop feeding materials immediately when conveyors of discharge stop working, otherwise it can damage the impeller and motor. So the conveyor of discharge and the feeding system should turn on and off chain-like.

8.7 Feeding should evenly and continuously.

8.8 During the equipment operation, fierce vibration and abnormal noise should not appear. Otherwise, stop the machine immediately and check. After eliminating the problems, turn on the machine sequence.

8.9 The testing gate should be closed well when the main machine is running .In order to avoid danger, opening the testing gate to check working condition inside is forbidden when machine is running.

8.10 This machine is high-speed running equipment. Pay more attention to safety when the equipment is running and operators should operate in the appointed position. Unrelated person should be far away from the equipment. If need to repair the machine, shall stop the machine and turn off the electricity.

9.Maintenance and Repair

9.1 Daily maintenance

9.1.1. Specialized person should responsible for the equipment during the machine running. The operator should be technically trained with full knowledge of the machine, and should also familiar with operation rules.

9.1.2. In order to ensure normal work of the machine, the safe operation system of equipment maintenance should be formulated to guarantee the long-term, safe and reliable operation. Meanwhile, the necessary maintenance tools, spare parts and lubricating oil must be provided.

9.1.3. The fastener should be checked during each shift, if finding any part loosened, fasten it timely. 9.1.4. The equipment should be checked periodically through checking door to inspect every inner worn parts such as rings, liners, guard plate around and wear-resistant parts in the flow passage of throwing wheel. If found any parts worn, should be

repaired or changed immediately. If the wear-resistant parts is worn, the whole set of them should be changed to ensure the throw wheel in balance. If the throw wheel found worn, it should be repaired or changed. 9.1.5. The fastening parts of throwing wheel should be checked every 7 days, if found any parts worn, replace or repair them at once.

9.1.6. The fastening parts and tear-wear parts of vortex cavity should be checked once half a month. If anything abnormal, eliminate immediately.

9.1.7. The 35# bearing oil or 68# load closed gear oil industry is used in thin oil lubrication station, 150～190L oil should be put into the oil tank. The oil should be replaced after 200 hours of operation for the first time, and during normal operation, the oil should be replaced each 1000 hours. The pipes should be disassembled when replacing the oil, the connecting oil pipes should be cleaned and dry, and worn seal pad should be replaced.

9.1.8. Adjust the tensile force of transmitting V belt appropriately, so that to guarantee the V belt is under even stress. The unbalanced current of the motors in two sides should not exceed 15A.

9.1.9. Check lubrication pressure system frequently, and anything abnormal should be repaired at once.

9.1.10. The calcium-based grease should be filled in the seal ring under the bearing cabinet with cover-rotating type oil cup installed under the bearing barrel when stopping the machine.

9.1.11. The bearing barrel should be disassembled and cleaned after 1000 hours of normal operation for the first time. (To disassemble the bearing barrel, please refer to drawing 11-3 and 11-4)

Diagram9-1

Common problems	Causes	Settlement
1.Belts of pulley is hot	The driving belts are loose.	To adjust the tension bolt, tighten the belts.
2.Excessive vibration of	The tear-wear parts of throwing wheel are worn heavily. The tear-wear parts are not worn evenly, and the throwing wheel is not in balance. The feeding size of material is too large or feed unevenly. The flow passage of throwing wheel is blocked.	To change the tear-wear parts. To adjust the position of tear-wear parts to ensure the throwing wheel in balance. To adjust the feeding size and keep feeding even averagely. Eliminate the materials blocked.

Common problems	Causes	Settlement
3.Temperature of bearing is too high.	The bearing is broken. Lack of oil The lubricating oil is dirty. Oil temperature is too high.	To replace the bearing. Increase oil supply. To clean the bearing and replace the lubricating oil. Switch on the cooling water.
4.The machine stops suddenly.	The oil flow or oil pressure is abnormal causing the power stops or materials blocked.	To check the electric parts of oil flow, power resources, etc. and remove the block
5.Abnormal noise.	There are metal in raw materials. The guard plate or tear -wear parts fall off or are loose.	Screen the raw materials to remove the metal. To check and fasten all the connecting parts.
6.The oil supply system does not supply oil.	The running direction of oil pump is wrong. The one-way valve is installed reversely. The oil feed valve is not turned on. The split-flow valve is completely opening. The system is blocked.	To install the valve correctly according to direction of arrow on the valve. Turn on the oil feed valve. Turn down the split-flow valve. Clean the system.
7.The oil supply is too little.	The sealing surface of oil pump is worn. The system is blocked and the resistance is heavy. The opening of split-flow valve is too wide. The system leaks	Check the oil pump, replace the sealing parts or the oil pump. Clean the system. To adjust the opening of split-flow valve. Stop the leaking
8.Temperature of oil is too high.	not connected to the cooling water. The temperature of cooling water is high. The flux of cooling water is not enough. The side valve is open.	Switch on the cooling water. To reduce temperature of cooling water. Turn on the cooling valve to enlarge the flux. Turn off the side valve.

10.Name and Quantity of Tear-wear parts

Table 10-1 Form of the standard wearing parts

No.	Name	Installation Position	DR-7615		DR-8522		DR-9532		DR-1145	
			Model	Qty	Model	Qty	Model	Qty	Model	Qty
1	Bearing of Main shaft	Main shaft assembly	Made by special demand	3	Made by special demand	3	Made by special demand	3	Made by special demand	3
2	Thrust Bearing GB 301-94	Lift assemble	8116	1	8116	1	8116	1	8116	1
3	Locking assemble of main shaft GB5867-86	Pulley of Main shaft	Z5-110×155	1	Z5-100×145	1	Z5-130×180	1	Z5-140×190	1
4	Locking assemble of motor shaft GB5867-86	Pulley of motor	Z2-65×95	2	Z2-75×115	2	Z2-80×120	2	Z2-80×120	2
5	Narrow V-belt GB/T12730-1991	Transmissi on assembly	15N	10	15N	12	25N	10	25N	12
6	O sealing ring GB3452.1-92	Oil return pipe	42.5×3.55G	1	42.5×3.55G	1	42.5×3.55G	1	42.5×3.55G	1
7	Oil seal of top main shaft GB3452.1-92	Main shaft assembly	109×3.55G	1	103×5.3G	1	118×5.3G	1	128×5.3G	1

No.	Name	Installation Position	DR-7615		DR-8522		DR-9532		DR-1145	
			Model	Qty	Model	Qty	Model	Qty	Model	Qty
8	O sealing ring GB3452.1-92	Main shaft assembly	120×3.55G	2	125×3.55G	1	140×3.55G	2	150×3.55G	2
9	Oil sealing of main shaft(F) GB9877.1-88	Main shaft assembly	B120×150×12	1	B125×150×12	1	B140×170×15	1	B150×180×15	1
10	Oil sealing of main shaft(F) GB9877.1-88	Main shaft assembly	B140×170×15	2	B150×180×15	2	B160×190×15	2	B170×200×15	2
11	Oil seal(F) GB9877.1-88	Lift assembly	B110×140×12	1	B110×140×12	1	B110×140×12	1	B110×140×12	1

Table 10-2 list of wear and tear parts

NO	Name	Quantity	Note	Belongs to
1	Upper shaft sleeve	1		Hopper of lift assemble
2	Lower shaft sleeve	1		
3	Rubber tensional springs	16		Supporting frame assembly
4	Protection circle of throw wheel	1		Throw wheel assembly
5	Upper flow way plates	3		
6	Lower flow way plates	3		
7	Impacted blocks	9		
8	Material distribution	1		
9	Grinding proof boards	3		
10	Hammers	6		

NO	Name	Quantity	Note	Belongs to
11	Discharge lining circle	12		Upper of the main frame
12	Feed pipe	1		
13	Upper impact guard plate	24		
14	Lower impact guard plate	24		
15	Material bucket lining circle	5		
16	Material distribution tray	1		
17	Material distribution cone	1		
18	Around guard plate	48		

See the diagram 10-1 and diagram11-2 to see the position of the easy wear parts

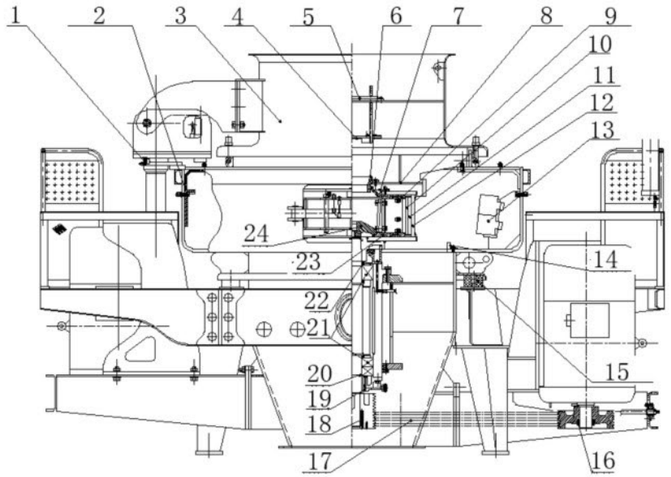
Table 10-3 Standard parts list for hydraulic pressure lubricating station

Sequence No.	Code	Item	Qty	Remark
1	VSI8518-07-015	hydraulic pressure integration pad	1	
2	GB3452.1-92	"O" type sealing ring	4	9 ×1.8
3		ball valve RC1/2	1	
4		ball valve RC3/8	5	
5		ball valve RC3/4	2	
6		double male joint	1	M14×1.5 / R3/8
7		double male joint -2	2	M22×1.5 / R3/8
8	GB/T 5625.2-1985	double male joint -1	2	M22×1.5 / M18×1.5

Sequence No.	Code	Item	Qty	Remark
9		double male joint B	2	two terminal R3/8
10		double male joint A	4	M18×1.5 / R3/8
11	GB/T 5625.1-1985	expanded joint 14	4	Interface M22×1.5
12	JB/T7941.3-1995	oil scale B250	1	Including bolts, O type circle
13	WZP-267M	platinum thermal resistance	1	With seal pad, length 100mm, temperature -50~150℃
14	DBDS6K10/6-2.5	overflow valve	1	
15	AL807/R/R	temperature controller	1	220V
16	SRYZ-220/2	pipe-type heater for oil	1	with protecting jacket and seal pad
17	EF4-50	hydraulic air pressure cleaner	1	
18		rubber pad	1	Oil-proof rubber board δ2、δ6
19	XU-16-80J	oil filter	2	M18X1.5
20	HY-2	oil-returning magnetic mesh filter	1	
21	GLCQ1-0.8	oil cooling machine	1	PN0.63MPa
22	YXQ-10	oil flow signal indicator	1	R3/8，PN0.4MPa
23	S8A11	One-way valve	2	Rc3/8，PN1.6MPa，DN8
24	CB-B6	gear pump (output volume 0.6mL/r)	2	nominal pressure 1.6Mpa, interface Rc3/8
25	YS6334 B5	visual purple miniature motor	2	0.25KW，1400rpm
26	SPL15	double cylinder filter	1	filtration accuracy 80μm, interface Rc3/8

To ensure the normal operation of machine, the tear-wear parts should be prepared sufficiently. The tear-wear parts are not covered under warrant.

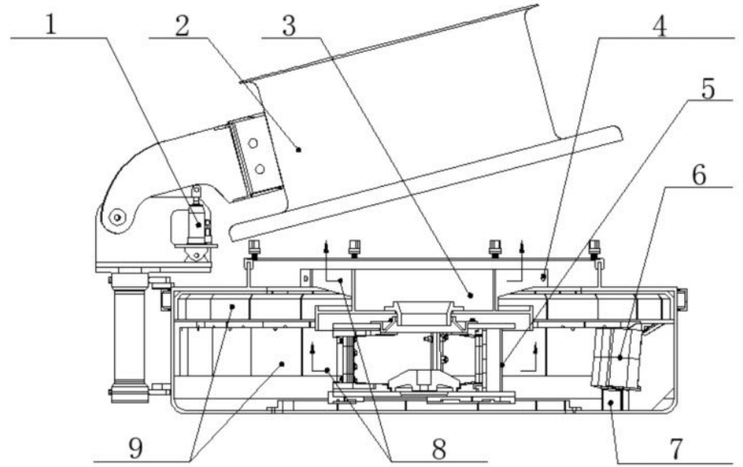
Diagram 10-1



Note:1: oil sealing 2: upper/lower liner 3: feed opening 4: distribution plate 5: liner of inlet 6: feed pipe 7: protecting ring of the rotor 8: distribution rack 9: upper flow pass plate 10: hammers 11: anti-impact plate 12: anti-wearing plate 13: side guard plate 14: protective ring 15: rubber damping spring 16:taper sleeve 17:v-belt 18:taper sleeve 19:oil sealing 20:O-shaped ring 21:bearing 22: oil sealing 23:lower flow pass plate 24:distribution cone

11.Disassembly and assembly

Diagram11-1 Inner parts



Note:1. hydraulic lifting jack 2. feed hopper 3. material distribution tray 4. fixed bolts for material distribution tray 5. impeller assembly 6. side protecting plate 7. fixing seat for side protecting plate 8. hanging upwards 9. Liners

11.1 Disassembly and assembly of throw wheel

11.1.1. Clear the dust on the upper cover firstly, if in the strong wind day, should put the wind shield around the throw wheel.

11.1.2. Loose the set bolt of the upper cover, lift the hopper by hydraulic jack manually, move the hopper away from the shell then fix it ,make it not move freely.

11.1.3. Clean the dust and material on the Material distribution tray, loose the bolt and lift the material distribution tray by boom rig.

11.1.4. Loose the set bolt of the impeller, lift and move out the impeller, lift slowly avoid damage the main shaft.

11.1.5. Disassembly the parts of impeller, more attention: the stress should be balanced when change the easy-worn parts of the impeller., or else will cause the machine tremble.

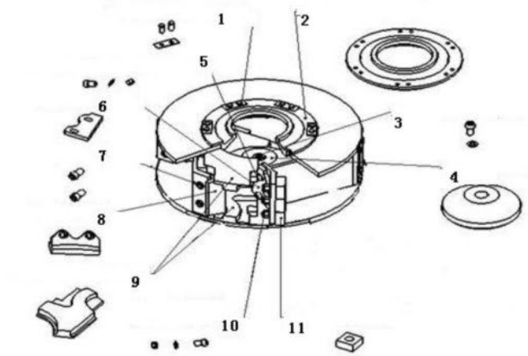


Diagram 11-2 disassemble of bearing

Note:1.disassemble bolt and pad 2.disassemble the impeller protection circle 3.disassemble bolt and pad 4. disassemble material distribution cone 5. disassemble bolt and pad and nut 6. disassemble wearing plate 7. disassemble bolt 8. disassemble hammers 9. disassemble upper and lower flow way plates 10. disassemble bolt, pad and nut 11. disassemble impact pieces

11.2 Replacement of the around guard plate, impact plate of the crushing room

11.2.1. Remove the material distribution tray and throw wheel according to the procedure of disassemble of throw wheel

11.2.2. Clean the material under layer inside the crushing room

11.2.3. Remove the set bolt of the hanging plate, remove the around guard plate and hanging plate, replace the worn around guard plate or remove the bolt and replace the impact plate.

11.2.4. Be careful not to damage the main shaft during the replacement.

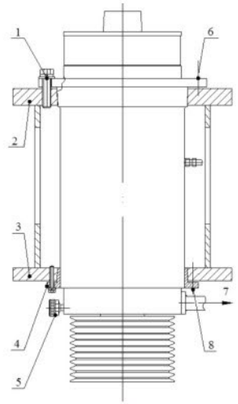


Diagram 11-3 disassemble of bearing

Note:1.fixed bolts 2.upper dowel plate 3.lower dowel plate 4.flange 5.oil cup 6. forcing off screw hole 7.oil drainage 8.forcing off screw hole

11.3 Change the bearing

11.3.1.Remove the material distribution tray and throw wheel according to the above procedure, clean the dust on the bearing sleeve and orientation tray.

11.3.2.Loose the fixed bolt of the motor seat, remove the driving belt.

11.3.3.Discharge the lubricating oil in the bearing box, disassemble the sucker ,oil exit pipe and grease cup, pressurize the oil of bearing sleeve, prevent the dust and staff enter.

11.3.4.Remove the flange bolt of the lower cone and the bolt of bearing sleeve which fixed onto positioning plate , remove the lower cone and then push out the bearing sleeve from the upper positioning plate.

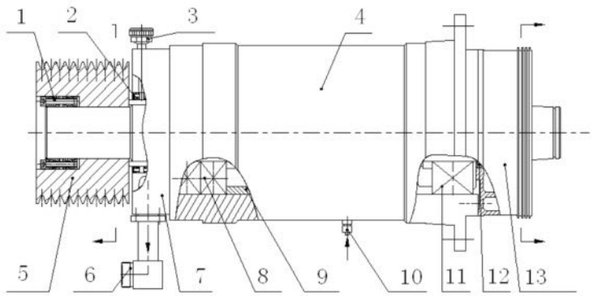


Diagram 11-4 internal structure of bearing cylinder

Note:1. taper sleeve 2. oil sealing 3. forced filling oil cup 4. bearing housing 5. pulley 6. return oil pipe 7. lower bearing cover 8. bearing 9. bearing sleeve 10. inlet opening 11. bearing 12. oil sealing 13. upper bearing cover.

11.3.5.Lift out the parts of bearing sleeve slowly by lift device.

11.3.6.Clean the dust on the bearing sleeve ,prevent the dust inter.

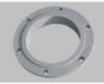
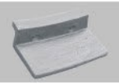
11.3.7.The inside structure and disassemble of the bearing sleeve can refer to picture 11-4,pull out the main shaft from side of pulley, more attention to not damage the main shaft .

11.3.8.New bearing should be cleanout before installation , use the clean and un fluff cloth to rub-up the inside of bearing.

11.3.9.When install the bearing , should put the bearing inside the mineral oil and make it 100 C then install immediately.

Name list of wearing and tearing parts and pictures

No.	Name	pictures
1	Impact block	
2	Hammer head (bearable block)	
3	Runner plate	
4	bearable plate	
5	Protect loop of swing wheel	
6	Share feeding cone	
7	Impact block (Around protecting plant)	

No.	Name	pictures
8	Feed pipe	
9	Impeller assembly	
10	Up beat board	
11	Down beat board	
12	Hopper bushing ring	
13	Bearing sleeve	
14	Bearing sleeve assembly	

Note: different models of the 5X Efficient Centrifugal Impact Crusher, some of the wearing and tearing parts' appearance and quantity may not the same, please in accordance with each model.

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目 录

一、用途与适用范围

DR系列高效离心冲击破碎机是我公司引进德国技术，同时拥有多项自主专利产权的新一代产品，集三种破碎模式于一体，成为机制砂行业核心设备的一种全新高效破碎机。

该设备可广泛应用于金属和非金属矿石、建筑材料、人工造砂以及各种冶金矿渣的破碎与整形。本机适用于莫氏硬度小于9级的脆性物料,不适用于粘性物料以及含泥土较多的石料。

二、主要性能参数

表2-1 主要性能参数表

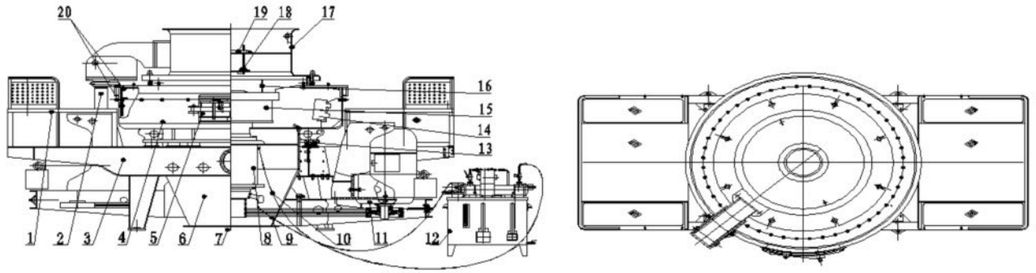
型号		DR-7615	DR-8522	DR-9532	DR-1145
通过量(t/h)	瀑落与中心进料	150～280	240～380	350～540	500～640
	全中心进料	70～140	120～190	180～280	250～360
最大入料尺寸(mm)	软料	35	40	45	50
	硬料	30	35	40	45
转速(r/min)		1700-1900	1500-1700	1300-1510	1100-1310
双电动机功率(KW)		110-150	180-220	264-320	400-440
最大外型尺寸长×宽×高(mm)		4100×2330×2300	4140×2500×2700	4560×2600×2900	5100×2790×3320
重量(t)		8.6	11.8	17.5	27.5
电源		AC380V，50Hz	AC380V，50Hz	AC380V，50Hz	AC380V，50Hz
润滑液压站	流量（L/min）	8	8	8	8
	双油泵电机功率(KW)	2×0.25	2×0.25	2×0.25	2×0.25
	安全保护	双油泵互补保证供油；无油流、无油压自动停机；水冷降温；冬季电机加热启动。			
	外型尺寸 长×宽×高(mm)	820×520×1270	820×520×1270	820×520×1270	820×520×1270
	油箱加热器功率(KW)	2	2	2	2

注：成品粒度大小分布与原料硬度、大小、化学成分、年代等因素有关。

三、设备结构

主机部分主要结构（见图3-1）有进料斗（17）、甩轮装置（15）、主轴总成（8）、支架（3）、机体（4、6）、电机传动装置（11）、顶盖回转装置（2）、减震装置(13)，稀油润滑装置（12）等。（主机主要外形尺寸见图3-2）

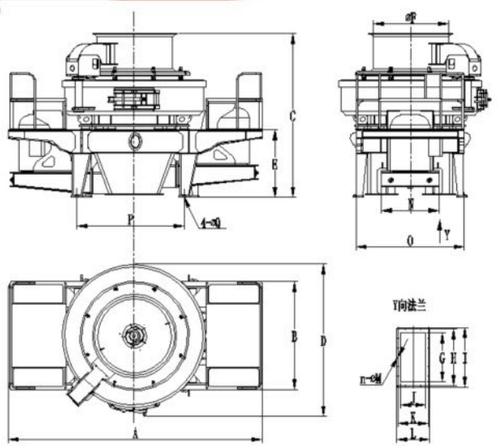
3.1.主机结构



1.脚踏板 2.顶盖回转装置 3.支架 4.上机体 5.观察门 6.下机体 7.出料门 8.主轴总成 9.回油管 10.进油管 11.电机传送装置 12.稀有润滑站 13.减震器 14.反击块 15.甩轮装置 16.分料盘 17.进料斗 18.散料盘 19.进料口 20.上/下击打护板

图3-1 结构示意图

3.2 . 外形尺寸



型号	外形尺寸					进、出料口尺寸										安装尺寸		
	A	B	C	D	E	F	G	H	I	J	K	L	n	M	N	O	P	Q
DR-7615	4100	1640	2300	2330	950	1160	500	128×5	680	358	150×3	490	16	14	890	1640	1780	26
DR-8522	4140	1760	2700	2500	1100	1230	800	155×6	970	408	125×4	540	20	14	940	1760	1900	34
DR-9532	4560	1840	2900	2600	1201	1290	575	142×5	750	413	101×5	545	20	14	1015	1840	2000	40
DR-1145	5100	2020	3320	2790	1358	1376	600	148×5	780	450	111×5	595	20	14	1145	1970	2130	44

图3-2 外型尺寸图　　以上参数如有变动，恕不另行通知。

四、工作原理

离心冲击破碎机是利用高速运动的物料相互自行破碎及物料之间的摩擦而粉碎。离心冲击破碎机不仅能够碎石，而且可以对石子进行整形。

根据物料的进料方式，离心冲击破碎机工作形式可分为完全中心进料和中心进料伴随瀑落进料；根据物料的抗压强度、磨蚀性，离心冲击破碎机的工作形式可分为“石打石”和“石打铁”两种破碎形式。所以离心冲击破碎机的工作形式可分为四种：中心进料伴随瀑落进料“石打石”和“石打铁”，完全中心进料“石打石”和“石打铁”。

1.中心进料伴随瀑落料“石打石”工作原理（图4-1左半部）

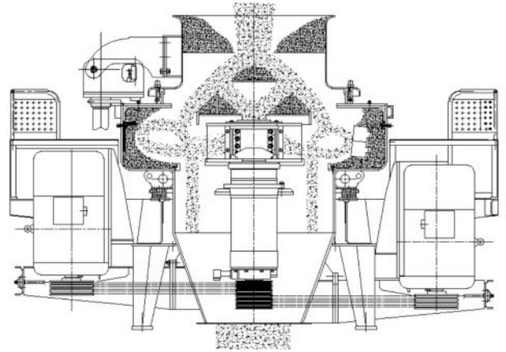


图4-1 中心进料伴随瀑落料
石打石（左） / 石打铁（右）

物料经过进料口(19)（参见图3-1)进入破碎机，此时散料盘活动挡板转到内侧盖住中心孔，物料在散料盘(18)上堆积后从四周落到分料盘(16)上,被分料盘分成两部分:一部分由分料盘中心的进料管进入高速旋转的甩轮(15)，在甩轮中被迅速加速，然后高速从甩轮流道内抛射出去，首先同分料盘四周落下的另一部分物料冲击破碎，然后一起冲击到破碎腔(即上机体4)的物料衬层上，被反弹后斜向上冲击到破碎腔顶部，改变方向向下运动，与从甩轮流道发射出的物料形成连续的料幕，这样物料在破碎腔中受到多次撞击、摩擦和研磨作用而破碎。破碎后的物料在重力作用下离开破碎腔进入下机体(6)卸料斗中卸料。破碎腔壁上安装上下击打护板(20,保护机壳不被冲击磨损。其特征为物料在加速时靠甩轮加速，大约半数颗粒在甩轮内获得能量射出后与瀑落物料和衬层发生冲击、摩擦或物料之间作高速撞击而破碎，这种方式即为“石打石”。

2.中心进料伴随瀑落料 “石打铁” 工作原理（图4-1右半部）

基本工作原理与中心进料伴随瀑落料“石打石”相同。所不同的是“石打石”时破碎腔中安装的是击打护板，物料在其周围形成衬层，物料冲击到物料衬层上破碎，而“石打铁”时将下击打护板（20）换成反击块（14）（保留上击打护板），物料直接冲击到反击块上而破碎。

3.完全中心进料“石打石”工作原理（图4-2左半部）

基本工作原理与中心进料伴随瀑落料 “石打石”相同。不同的是完全中心进料时将散料盘（18）活动挡板翻到外侧，物料全部从散料盘中心孔中直接落入分料盘中，经分料盘中间进料管进入甩轮中。

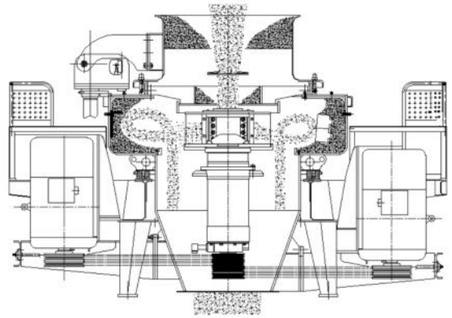


图4-2 完全中心进料
石打石（左） / 石打铁（右）

4.完全中心进料“石打铁”工作原理（图4-2右半部）

基本工作原理与中心进料伴随瀑落料 “石打铁”相同，而进料方式为完全中心进料。

5.“石打石”适用于中硬以上磨蚀性大的物料破碎，如玄武岩等。破碎过程中从甩轮射出的物料与物料衬层发生冲击而不与设备金属元件直接接触，减少铁耗，从而减少维护保养时间。“石打石”工作情况下成品粒形好，含粉量稍多。

6.“石打铁”适用于中硬以下磨蚀性小的物料破碎，如石灰石等，“石打铁”工作情况下破碎效率较高，反击块磨损费用也高，成品粒形稍差。

五、电气部分

5.1技术数据:

额定电压： AC380V/220V 50Hz (三相四线)

额定电流： AC15A

输出触点容量： 10A

控制方式： 半自动

5.2工作模式:

油泵：正常使用时只有一台油泵工作，只有在压力、流量达不到设定值时，第二台才工作，或第一台油泵出故障时，第二台自动开启，以保证主机正常运行。

油温控制：只要电柜有电，油温就保证在15℃以上，油温高于40℃时，外接供水系统（用户自备）自动工作，直至降到低于40℃，如果油温连续10分钟高于70℃，就要给主机发出一个停机信号。

油泵自动循环：主机、油泵停机后，如果油温低于15℃时，加热器自动加热，同时油泵自动启动循环整个油路，至油温升到15℃后延时3分钟停止加热，再1分钟后油泵停止，防止冬季上冻。

5.3接线方式:

接线方式见柜中附带图纸和说明，电柜和油站必须可靠接地。

5.4调试:

油温表已设定好，可根据现场情况改动。

油泵电机转向。（按油泵电机上标示转向）

5.5操作:

油站启动时，按“启动/停止”，油站停止时，再按一次“启动/停止”

六、稀油润滑部分

6.1润滑系统概述 本机润滑系统是双油泵互补保证供油，无油流、无油压，油温过高时自动停机；冷却系统及加热装置自动工作，确保轴承润滑始终处于最佳状态。从而彻底解决轴承发热等问题，使主轴轴承保持恒温，延长维护周期和使用寿命。

6.2工作原理及流程(见图6-1)

工作时，油液经吸油过滤器，由齿轮泵吸入，经单向阀、双筒过滤器、油冷却器（参见图3-1）到达轴承筒上部轴承处，然后靠重力流经轴承筒下部轴承，从回油管流回油箱。

5X系列立轴冲击破润滑系统温度自动检测，油温低于15度自动加热，油泵同时启动循环整个油路，加热到15度时温控仪给PLC停止加热信号，PLC延时3分钟停止加热，停止加热后延时1分钟油泵停止循环。此时才能启动油泵，按按钮油泵工作，润滑油经油路流进主机，油泵工作1分钟后，并且流量达到设定值时，白色指示灯亮（中间继电器KA吸合），主机才能启动工作，主机工作状态如果油温反弹下降低于15度时，加热

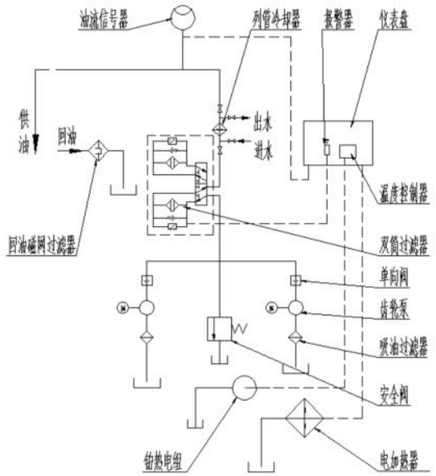


图6-1 稀油站工作原理图

系统不工作，不影响主机运行。主机工作后由于机械摩擦，油的温度会逐渐上升，上升到40度时系统会自动启动降温，降温是用水经换热器循环把油温降下来，油温低于40度时，温控仪给PLC停止降温信号，PLC延时5分钟再停止水泵。主机工作时油温高于70度，并且连续持续10分钟，PLC给主机停机信号（白色指示灭，中间继电器KA断开），来保护主机。停机时先停主机，等主机叶轮停稳后才能关闭润滑系统。

注意： 15度，40度，70度的设定值出厂时已设定好。温控表显示不正常时，就以低于15度信号传给PLC,即加热状态。加热状态时按钮自动退出，按按钮无动作。主机的二次控制回路一定要与外控线串联起来；其作用是：只有润滑系统正常工作时，主机才能工作。保护主机轴承，以免造成大的损失。

6.3安装调试注意事项

1.润滑泵站应安装在环境温度合适，灰尘少，振动小，便于调整、检查、维护保养方便的地方，并且尽可能靠近主机，缩短系统配管长度，保持最低压力降。

2.使用前先向泵站的油箱内加入35#轴承油或者68#中负荷工业闭式齿轮油至油标规定液面。

3.润滑泵的旋转方向是单向的，使用时必须按电机上旋向牌规定的旋向接线使用。

4.润滑油的流量标准设定流量为8L/min，可以在6～12L/min范围内任意调节（设定过大或小都不行），与润滑油的型号，温度，质量，管路的长短有关。

5.该润滑泵为室内安装型，在室外或环境恶劣的场合使用时，必须采取防护措施。

6.润滑泵站与配电柜的连接线插好，并旋紧螺帽。

7.电源线接到对应位置，零线必须可靠的与电网连接，配电柜外壳和油箱可靠接地。

6.4主要元器件参数

PLC模块：原装日本三菱PLC,FX1N-14MR，220V 温控表：WL-C80-4,220V 热电阻：铂热电阻 PT100cu

热电阻阻值：31-32=1欧，31-33=100欧，32-33=100欧
系统控制电压：AC220V 50—60HZ 加热器：2KW，AC220V 其他元器件按实际元器件型号

6.5附加说明
1.配电柜选择干燥，防雨，防尘地方安装，便于操作观察。
2.附带电器线路图，外接端子接线图。
3.如果水泵引出线不适合水泵电压，可接220V的交流接触器来间接控制水泵。

6.6常见故障及排除

故障现象	产生原因	处理方法
1.温控表显示闪烁，油泵和加热自动启动	热电阻线接错，断线，损坏	检查线路，更换热电阻
2.两台泵工作	流量开关设置不合适，线路断线，过滤网脏，管路堵塞，油路中有气泡	检查流量开关及线路。清洗过滤网，检查油路。油泵连续工作循环油路。
3.白色指示灯不亮	加热状态，油泵没有正常启动，流量开关没有接通，指示灯损坏。	加热状态不能正常启动油泵，检查流量设置，更换指示灯。
4.温控表无电	电源缺相或缺零线，仪表损坏，熔断器烧断，有短路现象	检查电源，更换温控表，检查短路原因更换熔丝
5.PLC上X4,X5灯不亮	相对应的热继电器辅助触点断开，电动机过电流，热继电器损坏	检查过电流原因，更换热继电器
6.PLC上电源灯不亮	电源缺相或缺零线，PLC损坏，熔断器烧断，有短路现象	检查电源，更换PLC，检查短路原因更换熔丝

七、设备的基础、安装与调试

7.1设备基础要求与注意事项

设备应安装在混凝土基础或钢结构基础上，基础应能够承受四倍的整机重量。设备的基础必须满足以下要求：

1.满足一般基础的静力平衡,强度,沉降控制等要求。

2.控制基础的固有频率，不使机器和基础发生共振现象。

3.控制基础的振幅，不使基础的振幅影响机器的正常运转。

4.厂房和基础应根据基础图尺寸留有足够的高度和安装位置。

5.如采用混凝土基础，基础采用的混凝土强度等级不宜低于C20（即200号），基础配筋方式应合理，应使用延性好的钢筋，不应用冷加工钢筋，基础中须预埋穿线管或电缆沟。混凝土基础浇好后必须有15天的保养期。

7.2设备的安装及注意事项

1.安装

(1)按安装基础图要求做好基础，注意地脚螺栓的位置尺寸。用水平仪校正基础上平面。

(2)设备上方应设置有起吊设备,且应留有起吊空间,起吊能力以设备中最大件重量定。设备一侧留适当的空间以备检修用。

(3)安装主机。用起吊设备吊起主机，将主机放置于基础上。建议在地脚板与基础面接触处和地脚螺栓连接间垫上橡胶垫。

(4)用调整垫铁调整设备水平度1.5mm，使设备主轴与水平面垂直，水平尺检查面为主机皮带轮下端面。

(5)固定牢固。混凝土基础二次灌浆使用比基础高一等级的混凝土，保养期不少于7日。

(6) 稀油润滑站固定于平整水泥地面或钢架上，润滑站安装时其箱体上回油口必须低于主轴总成回油口且高度差不小于400mm。润滑油路连接及密封可靠，油管连接不可太紧。油箱注油量为35#轴承油或者68#中负荷工业闭式齿轮油150～

190升，油位正确。

(7)拧紧所有紧固螺栓，清除机体内所有异物，调整传动带水平，因本机采用了强力窄V带，所以应比普通三角带拉得紧一些。

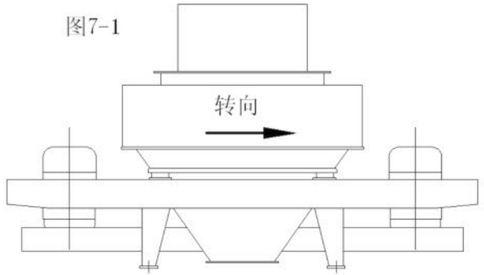
(8)调整散料盘，中心进料时则将其活动挡板转到外侧，使物料从中心孔通过。中心进料伴随瀑落料则将挡板转到内侧盖住中心孔，并可通过调节散料盘高度来调整流向分料盘中心与四周的物料量。

(9)进料系统应安装有效的除铁设备。

2.注意事项

(1)安装前应按装箱单清点，检查各零部件及备件是否齐全，检查各零部件在运输中有无损伤。

图7-1



(2)设备在现场未安装时，应妥善保管，外露表面须涂上防锈油脂，并避免日晒雨淋，以防机体生锈。

(3)设备从出厂到安装前6个月以上者，应对轴承筒总成拆开清洗，擦油，油封处填满黄油。

7.3设备的调试

设备安装到位后，运行前应按要求进行全面检查和试运转。

1.全面检查

(1)检查润滑油管是否连接可靠，油泵运转是否正常，各油流指示器、油温、油压是否正常，试运转前应

重新加一次油。加入的润滑油为35#轴承油或者68#中负荷工业闭式齿轮油，使油位在正确范围内。

(2)液压站压力及油流继电器应与主电机控制形成联动。

(3)检查各部件的连接件，应牢固可靠。各密封处应密封可靠。检查甩轮上是否有异物，如有应及时清理。

(4)检查电机接线是否正确。安装传动带前应先点动电动机，检查其旋转方向，应与破碎机标牌所示方向一致；若相反则调整接线。破碎机主轴转向见图7-1。

(5)调整主轴两侧传动带的拉紧力相同并且平直。

(6)松开进料斗螺栓，手动液压千斤顶，使料斗升起，转动料斗，检查转动效果。

(7)盘动主轴带轮，检查主轴转动，应转动灵活，无卡死、卡滞现象。

2.稀油润滑装置调试

检查油泵转向应与标示方向相同，系统连接可靠。

以下各项参数在出厂时已调整好：

(1)调整系统压力。

油流指示器之前堵死，打开分流阀门。开动油泵，调整分流阀门和安全阀调压螺丝，注意不要使系统压力过高，使溢流压力为0.63±0.05MPa时，锁紧安全阀螺丝。

(2)调整供油量。

调整分流阀门，使油流指示器指示流量为8L/min。

(3)调整压力继电器。

当系统油流量达到8L/min时的压力表读数即为压力继电器的主机接通压力或备用泵的断开压力。

当系统流量为2L/min以下时的压力为备用泵的接通压力。

(4)温控器的调试。

当油温高于40℃时，温控器启动供水系统。至油温低于40℃以后供水系统停止工作。

当油温低于15℃时，温控器启动加热器。至油温升至高于15℃后停止加热器。

3.空负荷试车

(1)空负荷试车时间4小时。

(2)试车前扳动带轮，应转动灵活。

(3)开车后破碎机应运转平稳。机体不应有剧烈振动，无异常噪音。否则应停车检查，排除后再试车，直至正常。

(4)试车时轴承温升不得超过50℃或最高温度不得超过70℃，否则应清洗轴承或调整间隙。

4.负荷试车

(1)负荷试车必须在空载试车合格后进行。

(2)负荷试车时间为8～24小时。其间必须有人连续监控观察设备运转情况，包括主机电流、油温、油箱油位、油压、流量、振幅等，并做记录。

(3)开车后最初的3分钟加入的物料应该为潮湿且粒度小于20mm的沙土石，以利于甩轮之内形成均匀平衡的料衬，运行无异常情况后接着进需破碎的石块。

(4)入料粒度应严格按破碎机技术参数表中要求的粒度范围给入。严禁大于规定粒度的物料进入。

(5)给料应均匀连续，给料量达到破碎机满负荷为止。

八、设备的操作规程

1.“石打石”工作将反击块及其支架去掉，将下击打护板装上。“石打铁”则相反。

2.检查内部工作部件时必须切断电源，待机器完全停止运转后方可打开检修门进行检查。

3.检查甩轮旋向，从入料口俯视，甩轮应为逆时针旋转。

4.破碎机与输送设备启动顺序应为：

排料口输送机 → 稀油站 → 离心冲击破碎机 → 给料输送机.破碎机应空载启动，待运转正常后方可进料。

5.入料粒度严格按各规格破碎机规定的进料粒度范围给入。严禁铁器以及大于规定粒度范围的物料进入破碎机。否则会冲断硬质合金条造成甩轮过分磨损，进入泥土或粘性物料会造成堵塞甩轮流道及中心进料管，使破碎机不能正常工作。发现大块物料应及时清除。

6.排料输送机停止运转时，应立即停止进料，否则会造成压死甩轮，烧毁电机。因此，排料输送机应与给料系统连锁开、停机。

7.给料均匀连续。

8.破碎机运转过程中，不得有剧烈振动和异常噪音。否则应立即停车检查，排除故障后才能顺序开车。

9.破碎机工作时检查门要密封关严。严禁在工作时打开检查门观察内部工作情况，以免发生危险。

10.离心冲击破属于高速运行设备。设备运行时应特别注意安全生产，操作人员应在指定岗位上操作。无关人员应远离设备。若需上机修理，应在完全停机且切断电源后进行。

九、设备的维护、保养

9.1日常维护

1.设备在使用过程中应有专人负责，操作人员必须经过技术培训，具有一定的技术水平，了解本设备的技术性能，熟悉操作规程。

2.为使设备正常工作，应制定设备维护保养安全操作制度，保证设备长期安全可靠运转。同时要配备必要的维修工

具和润滑材料及设备。

3.每班检查紧固件，发现松动立即紧固。

4.定期停机，打开检查门检查破碎机内部机件的磨损情况，各耐磨环、衬板、反击块及甩轮流道耐磨块的磨损程度。磨损后应及时更换或修补，耐磨块磨损后应全套同时更换，保证甩轮运转平衡，发现甩轮磨损应及时更换或请制造厂修补。

5.运转7天检查一次甩轮紧固件，耐磨件如有损坏应立即更换或修理。

6.运行半月检查一次涡流腔的紧固件及耐磨件，如有不正常情况马上采取措施予以排除。

7.稀油站用35#轴承油或者68#中负荷工业闭式齿轮油，油箱注油量150～190L。首次运行200小时后换油，正常工作1000小时换一次油，换油时要拆开管路，将联接管件油管清洗吹干，更换损坏的密封垫。

8.传动V带拉紧力大小调整合适，保证V带受力均匀，两侧电机不平衡电流不超过15A。

9.经常检查润滑系统，如发现非正常现象应立即维修。

10.定期在停机时用轴承筒下部安装的旋盖式油杯向轴承室下密封圈处加钙基润滑脂。

11.轴承筒首次正常运行1000小时拆开清洗一次（拆卸轴承筒参考图11-3及图11-4）。

9.2常见故障及排除方法

表9-1常见故障及排除方法表

故障现象	产生原因	处理方法
1.带轮皮带发热	传动带过松	调整拉紧螺栓，张紧皮带
2.机器振动过大	甩轮易损件磨损严重 易损件磨损不均，甩轮不平衡 给料不均匀或粒度过大 甩轮流道堵塞	更换易损件 调整易损件位置使甩轮平衡 调整均匀给料或给料粒度 取出堵塞物
3.轴承温度过高	轴承损坏 缺油 润滑油脏污 油温过高	更换轴承 增大进油量 清洗轴承、更换润滑油 接通冷却水
4.机器突然停车	因油流等不正常致使连锁系统动作，电源中断或卡料	检查润滑油路各控制元器件、电源等，排除卡堵物
5.声音异常	给入料中有金属物 护板或易损件松动或脱落	严格进料筛选，加强除铁 检查并紧固所有连接件
6.润滑系统不供油	油泵转向错误 单向阀装反 供油阀没打开 系统堵塞	纠正油泵电机转向 按阀体上箭头方向正确安装 打开供油阀 清洗系统
7.油量太小	油泵密封面磨损 系统堵塞，阻力大 分流阀开度过大 系统漏损	检查油泵，更换密封件或更换油泵 清洗系统 调整分流阀开度 堵漏
8.润滑油温过高	没有接通冷却水 冷却水温度高 冷却水流量不足	接通冷却水 降低冷却水温度 打开冷却阀，加大流量

十、易损件名称、数量

表10-1 标准件易损件表

序号	名称	安装部位	DR-7615		DR-8522		DR-9532		DR-1145	
			型号	数量	型号	数量	型号	数量	型号	数量
1	主轴轴承	主轴总成	按特殊要求定做	3	按特殊要求定做	3	按特殊要求定做	3	按特殊要求定做	3
2	推力轴承 GB 301-94	升降机构	8116	1	8116	1	8116	1	8116	1
3	主轴胀套 GB5867-86	主轴带轮	Z5-110×155	1	Z5-100×145	1	Z5-130×180	1	Z5-140×190	1
4	电机轴胀套 GB5867-86	电机带轮	Z2-65×95	2	Z2-75×115	2	Z2-80×120	2	Z2-80×120	2
5	窄V带 GB/T12730-1991	传动总成	15N	10	15N	12	25N	10	25N	12
6	O形密封圈 GB3452.1-92	回油管	42.5×3.55G	1	42.5×3.55G	1	42.5×3.55G	1	42.5×3.55G	1
7	轴端O形圈 GB3452.1-92	主轴总成	109×3.55G	1	103×5.3G	1	118×5.3G	1	128×5.3G	1

序号	名称	安装部位	DR-7615		DR-8522		DR-9532		DR-1145	
			型号	数量	型号	数量	型号	数量	型号	数量
8	O形密封圈 GB3452.1-92	主轴总成	120×3.55G	2	125×3.55G	1	140×3.55G	2	150×3.55G	2
9	主轴油封（F） GB9877.1-88	主轴总成	B120×150×12	1	B125×150×12	1	B140×170×15	1	B150×180×15	1
10	主轴油封（F） GB9877.1-88	主轴总成	B140×170×15	2	B150×180×15	2	B160×190×15	2	B170×200×15	2
11	油封（F） GB9877.1-88	升降机构	B110×140×12	1	B110×140×12	1	B110×140×12	1	B110×140×12	1

表10-2 非标易损件表

序号	名称	数量	备注	归属部分
1	上轴套	1		进料斗升降机构
2	下轴套	1		
3	橡胶减振弹簧	16		支架总成
4	甩轮护口圈	1		甩轮总成
5	上流道板	3		
6	下流道板	3		
7	冲击块	9		
8	甩轮分料锥	1		
9	耐磨板	3		
10	主锤头	6		

序号	名称	数量	备注	归属部分
11	下料衬环	12		机体上部总成
12	进料管	1		
13	上击打护板	24		
14	下击打护板	24		
15	料斗衬环	5		
16	分料盘	1		
17	散料盘	1		
18	反击块	48		

易损件位置详见图10-1及图11-2。

表10-3 液压润滑站标准件表

序号	代号	名称	数量	备注
1		液压集成块垫片	1	
2	GB3452.1-92	O形密封圈	4	9 ×1.8
3		球阀RC1/2	1	
4		球阀RC3/8	5	
5		球阀RC3/4	2	
6		双公接头	1	M14×1.5 / R3/8
7		双公接头-2	2	M22×1.5 / R3/8
8	GB/T 5625.2-1985	双公接头-1	2	M22×1.5 / M18×1.5

序号	代号	名称	数量	备注
9		双公接头B	2	两端R3/8
10		双公接头A	4	M18×1.5 / R3/8
11	GB/T 5625.1-1985	扩口管接头	4	接口M22×1.5
12	JB/T7941.3-1995	油标B250	1	包括螺栓、O形圈
13	WZP-267M	铂热电阻	1	带密封垫，插长100mm，温度-50～150℃
14	DBDS6K10/6-2.5	溢流阀	1	
15	AL807/R/R	温度控制器	1	220V
16	SRYZ-220/2	油用管状加热器	1	带保护套，密封垫
17	EF4-50	液压空气滤清器	1	
18		橡胶垫	1	耐油橡胶板δ2、δ6
19	XU-16-80J	吸油过滤器	2	M18X1.5
20	HY-2	回油磁网过滤器	1	
21	GLCQ1-0.8	油冷却器	1	PN0.63MPa
22	YXQ-10	油流信号器	1	R3/8，PN0.4MPa
23	S8A11	单向阀	2	Rc3/8，PN1.6MPa，DN8
24	CB-B6	齿轮泵（排量6mL/r）	2	公称压力1.6Mpa，接口Rc3/8
25	YS6334 B5	紫光微型电机	2	0.25KW，1400rpm
26	SPL15	双筒过滤器	1	过滤精度80μm，接口Rc3/8

为保证设备正常运转，应备足易损件配件。易损件不在保修范围内。

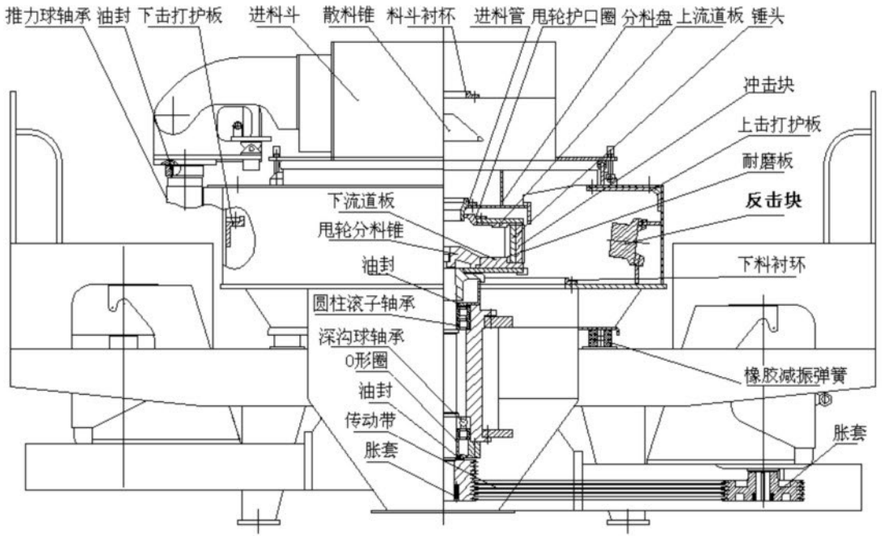


图10-1 易损件及位置图

十一、拆装

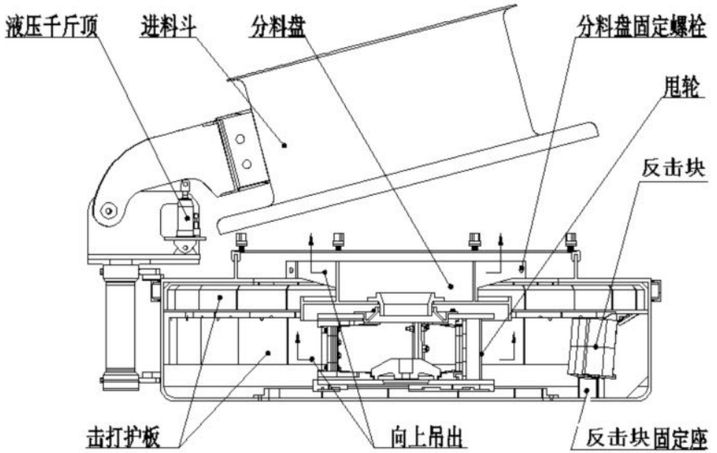


图11-1 内部零部件的拆卸

11.1甩轮的拆装

1.首先将上盖上边积存的灰尘清除干净，如果遇到大风天气，则应在周围设置挡风板。

2.松开上盖固定螺栓，（参见图11-1）手动液压千斤顶将进料斗顶起，转动料斗离开机壳后将其固定使之不能自由转动。

3.清除分料盘上的灰尘和积料，松开螺栓并用起吊装置向上吊出分料盘。

4.松开甩轮固定螺栓，取下分料锥，向上吊出甩轮，将甩轮移出机体；注意提升要缓慢，以免损伤主轴。

5.拆卸甩轮部件（参见图11-2）。需要注意的是，更换甩轮中易损件时甩轮的各向受力要平衡，否则会引起机器振动。

6.拆装叶轮时应注意叶轮轮毂和主轴之间安装的O形密封圈，避免丢失，安装时一定要装上。

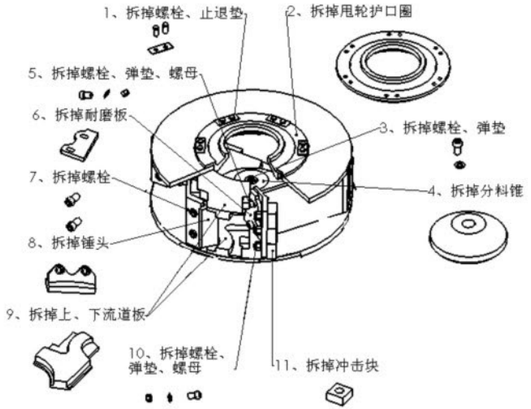


图11-2 甩轮的内部结构及拆卸

11.2破碎腔周边反击块、击打护板的更换（参见图11-1）

1.参照拆装甩轮的步骤先将分料盘和甩轮卸掉。

2.清除破碎腔中的物料衬层。

3.卸掉挂板固定螺栓，将反击块及其挂板取下，更换磨损的反击块或卸掉螺栓更换击打护板。

4.更换过程中注意不要损伤主轴。

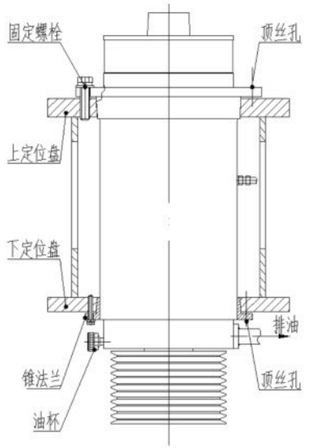


图11-3 轴承筒拆卸

11.3轴承的更换 （见图11-4）

1.按照上面的拆卸步骤依次卸掉分料盘、甩轮，清除轴承筒上和定位盘上的灰尘。

2.松开电机座固定螺栓，拆去传动带。

3.将轴承室中润滑油排出干净，拆掉进出油管及旋盖式油杯，将轴承筒上进油口密封，防止灰尘及杂物进入。

4.卸掉下部锥法兰螺栓及轴承筒固定在上定位盘的螺栓，将下部锥法兰利用法兰上的顶丝孔向下顶出并卸下，然后用轴承筒上法兰的顶丝孔将轴承筒从上定位盘中向上顶出（见图11-3）。

5.用起吊装置向上慢慢吊出轴承筒部件。

6.将轴承筒上的灰尘清理干净，以免进入轴承筒。

7.轴承筒内部的结构及拆卸可参见图11-4。拆卸时从皮带轮一侧将主轴拉出。注意拆卸时不要损伤主轴。

8.新轴承安装前要清洗，用干净的不起毛的布擦净轴承内径。

9.安装轴承时，先将轴承放入矿物质油中，加热到100℃后立即组装。

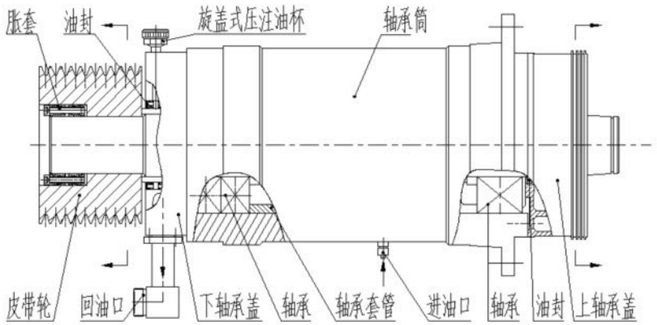
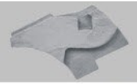
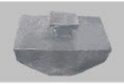
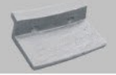


图11-4 轴承筒内部结构 **注：本用户手册中反击块即周护板，其本质相同！**

易损件表明细及简图

序号	名称	图片
1	冲击块	
2	锤头（耐磨块）	
3	流道板	
4	耐磨板	
5	甩轮护口圈	
6	分料锥	
7	反击块(周护板)	

序号	名称	图片
8	进料管	
9	叶轮总成	
10	上击打衬板	
11	下击打衬板	
12	料斗衬环	
13	轴承筒	
14	轴承筒总成	

注：不同规格的5X系列高效离心冲击破碎机，部分易损件外观和数量可能不尽相同，请以实物和实际数量为准。