



Crushing Plant--ZYS High-Efficient Cone Crusher



Shanghai Joyal Mining Machinery Co., Ltd

ZYS *High-Efficient Cone Crusher*

• Profile

The JOYAL ZYS High-Efficient Cone Crusher is a high-performance models optimized and improved on the basis of ZYS High-Efficient Cone Crusher. The ZYS High-Efficient Cone Crusher is widely used for secondary and fine crushing in the fields of mining, building materials, metallurgies and so on. The ZYS High-Efficient Cone Crusher can crush materials with middle and high hardness, such as, metal ore, basalt, granite, limestone, cobblestone, sandstone and so on.



ZYS High-Efficient Cone Crusher

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For higher productivity, better reliability and flexibility, long service life, and better final product quality, the ZYS High-Efficient Cone Crusher is absolutely your best choice.

ZYS High-Efficient Cone Crusher offer several outstanding features such as excellent tramp release system, unique hydraulic lifting system, high crusher throw and reasonable cavity design, all of these features ensure the Symons type cone crusher can offer the unbeatable performance in secondary, tertiary and quaternary applications.

If your aggregate or mining business demands the 24-hours running, high-reduction, big capacity application, you will find the ZYS High-Efficient Cone Crusher optimized for your demands.

The innovations like the stable lubrication, excellent sealing feature, great abrasive material applied in key components and rugged construction effectively reduce the wear rate , extend the replacement period of the spare parts, evidently reduce the production cost in per ton hour material processed. All of these can help you to achieve the highest level of profitability.



Componets



Working Principle

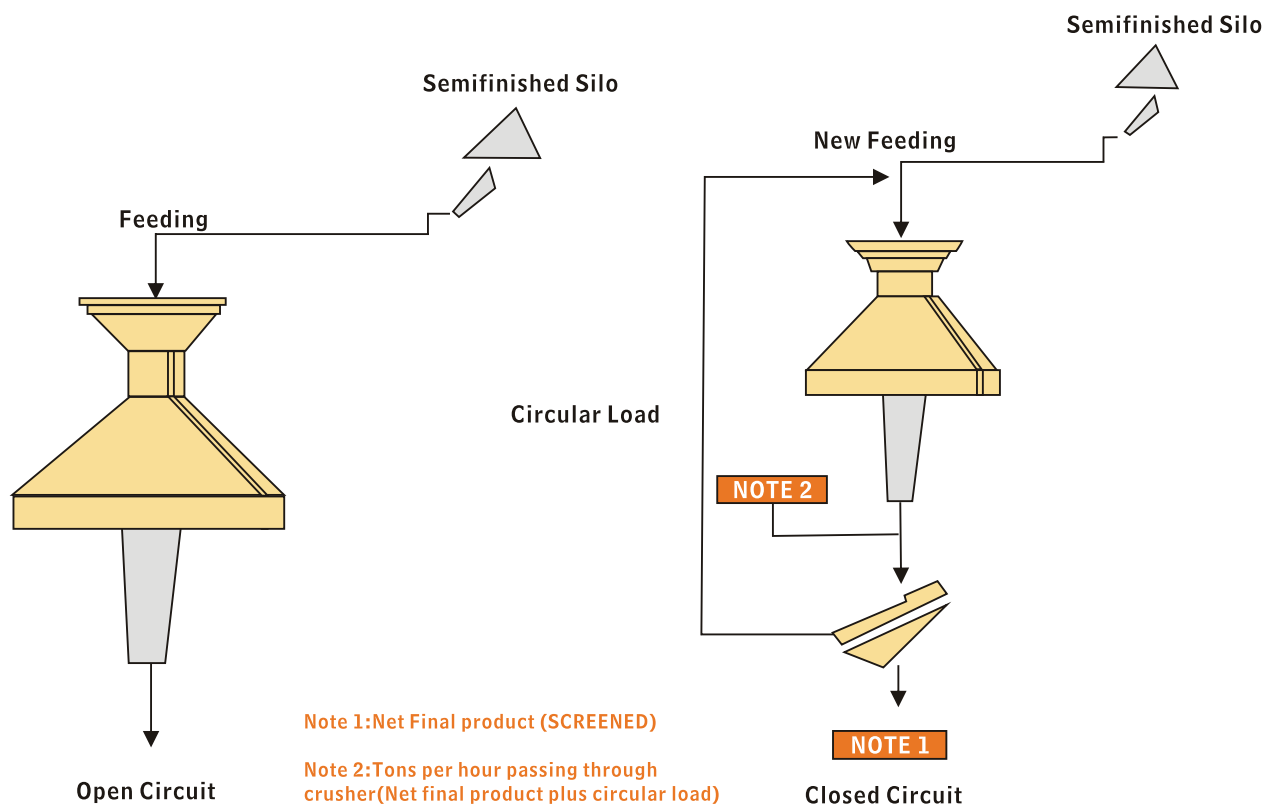
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Motor drives eccentric bushing to rotate via V-belts, pulley, shaft, pionion, gear.

Mantle rotates with eccentric bushing, so mantle goes near and far from the concave, and crush stone into smaller size.



Typical flow chart



▶ 1. High-performance

Combining optimal designing of chamber type with applying reasonable speed and stroke, to make this kind of machine does more work with the same dynamic cone diameter. Therefo, this machine is of high-performance and manufacturing capacity compared with other cone crusher of the same type.

Use lminated crushing principle, to make more cubic shape materials and less needle-like materials.

▶ 2. Good products size composition

The crusher applys for laminated crushing principle to make cubic shapes of final products stand for larger proportion. Acicular and flake shape products decrease and size fraction much more well-proportioned.

▶ 3. Good stability

If there is metal or other non-broken material come to the chamber, metal going through protection device will release it and then reset automaticly. The protection device has fixed discharge opening returning point and the original discharge opening can returing back immediatly after the metal goes through the crushing chamber.

▶ 4. Convenient Cleaning-up

If the crusher stops under loading condition, hydraulic cleaning system can clean up the crushing chamber quickly so that decrease the downtime.

▶ 5. High reliability.

Adopting main shaft with big diameter, heavy main frame and separate automatic Control System of thin oil lubrication system, so that it guarantees robustness and reliable operation of the crusher.

▶ 6. Easy maintenance and operation

All parts can be disassembled from top and the upper side, so that fixed cone and dynamic cone can be disassembled easily. Under high shock and vibration environment, bronze Bearing can keep excellent bearing capacity and it is much more economic and easy for maintenance.

▶ 7. Low production costs

Due for big capacity, high reliability and easy maintenance, the production costs has been recuded greatly.

▶ 8. Widespread use

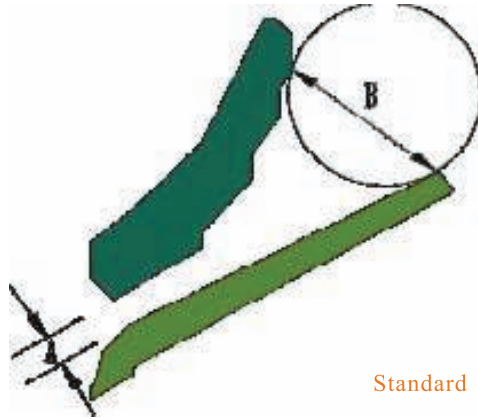
The speciality of ZYS High-Efficient Cone Crusher is maximizing the performance to apply to all kinds of crushing process: from special coarse crushing to fine crushing; from fixed crushing plant to mobile crushing plant.

ZYS High-Efficient Cone Crusher has different types of crushing chamber for choosing according to crushing process.

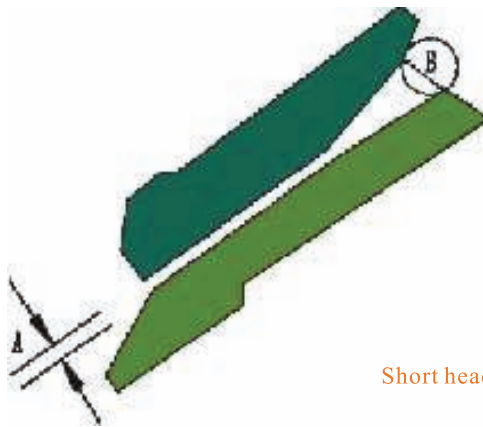
▶ 9. Separate Lubrication

Sketch of the cavity between standard and short head type

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Standard



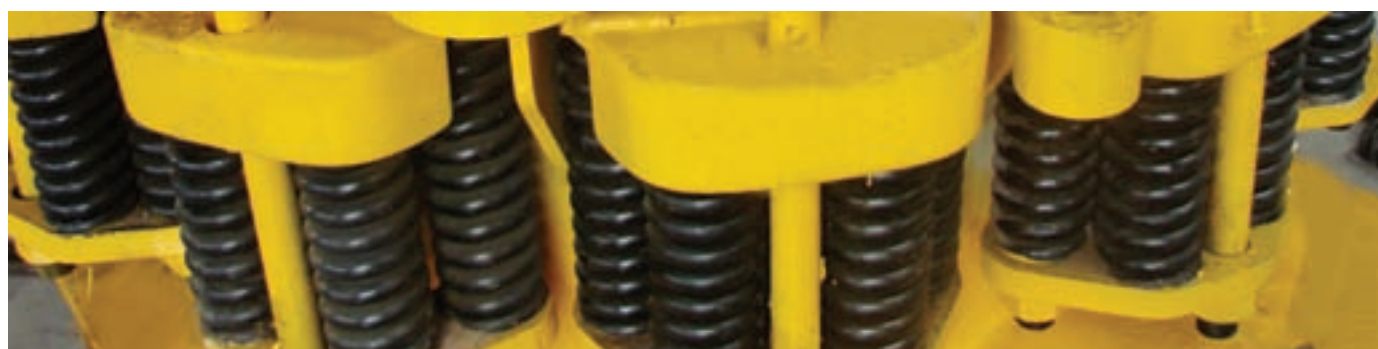
Short head

Main Specifications

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Specification chart in open circuit (STANDARD)

Model	Cavity	Recommend-ed minimum discharge setting A(mm)	Feed opening with min. recom-ended discharge setting A (mm)		Capacities in tons per hour passing through the crusher at indicated discharge												Power (KW)			
			Opening Side "B"	Closed Side "B"	9	13	16	19	22	25	31	38	51	64	76	89		102		
36" (3')	Fine	9	102	83	45	58	70	80	93											75
	Coarse	13	175	159		59	71	92	107	115	137	165								
	Extra Coarse	25	178	163						129	145	175	198							
51" (4.25')	Fine	13	137	109		106	125	145	153	161	183									185
	Medium	16	210	188			132	156	174	201	224	253	304							
	Coarse	19	241	216				171	198	217	249	295	349							
	Extra Coarse	25	259	238						230	272	304	358	450						
66" (5.5')	Fine	15	209	188				200	224	256	298	324								240
	Medium	22	241	213					252	286	330	380	417	437						
	Coarse	25	269	241						299	353	417	453	634						
	Extra Coarse	38	368	331									431	476	680					
84" (7')	Fine	19	278	253				381	406	499	615	726	849	1028						400
	Medium	25	334	303						605	721	800	994	1120	1284					
	Coarse	31	369	334							786	835	1078	1250	1370	1450				
	Extra Coarse	38	460	425									886	1179	1354	1478	1525	1637		



Main Specifications

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Specification chart in open circuit (SHORT HEAD)

Model	Cavity	Recommend-ed minimum discharge setting A(mm)	Feed opening with min. recom-mended discharge setting A (mm)		Capacities in tons per hour passing through the crusher at indicated discharge											Power (KW)			
			Opening Side "B"	Closed Side "B"	3	5	6	10	13	16	19	25	29	32	38				
36" (3')	Fine	3	41	13	27	40	53	67	91										75
	Coarse	3	60	33	28	41	54	68	92	100									
	Extra Coarse	6	76	51			58	72	93	112	127								
51" (4.25')	Fine	3	64	29	36	57	83	102	134	160								155	
	Medium	6	89	54			84	104	136	164									
	Coarse	8	105	70				110	157	180	202	224							
	Extra Coarse	16	133	98							209	236							
66" (5.5')	Fine	5	70	35		90	134	160	207									240	
	Medium	6	89	54			137	164	210	253	280								
	Coarse	10	133	98				190	253	282	304	330							
	Extra Coarse	13	133	117					253	282	309	337							
84" (7')	Fine	5	105	51		189	271	340	361	404	470	509						400	
	Medium	10	133	95				352	408	450	509	558	617						
	Coarse	13	178	127					450	481	542	596	661	687					
	Extra Coarse	16	203	152						505	592	650	684	693	727				



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Specification chart in closed circuit (STANDARD)

Model	Cavity	Recommend-ed minimum discharge setting A(mm)	Feed opening with min. recom-mended discharge setting A (mm)		Effective square opening on circuit screen																	
					Recommended closed side settings																	
			Opening Side "B"	Closed Side "B"	10		13		16		19		22		25		31		38		50	
					I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II
36" (3')	Fine	9	102	83	32	59	36	63	41	68	54	81	63	95	72	95	86	108	108	135	131	153
	Coarse	13	175	159					41	68	54	81	68	99	77	99	90	113	108	135	131	153
	Extra Coarse	25	178	163									68	99								
51" (4.25')	Fine	13	137	109					86	122	95	140	113	167	131	171	158	185	185	200		
	Medium	16	210	188							108	158	122	180	140	185	171	212	194	234	212	252
	Coarse	19	241	216									126	189	149	194	171	221	198	243	225	266
	Extra Coarse	25	259	238															203	248	234	279
66" (5.5')	Fine	15	209	188							144	212	162	239	189	243	216	270	270	324		
	Medium	22	241	213													225	279	279	338	297	351
	Coarse	25	269	241														284	342	306	360	
	Extra Coarse	38	368	331																	315	369
84" (7')	Fine	19	278	253																		
	Medium	25	334	303																		
	Coarse	31	369	334																		
	Extra Coarse	38	460	425																		



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Specification chart in closed circuit (SHORT HEAD)

Model	Cavity	Recommend-ed minimum discharge setting A(mm)	Feed opening with min. recom-mended discharge setting A (mm)		Effective square opening on circuit screen															
					Recommended closed side settings															
					3		5		5		6		10		13		16		19	
Opening Side "B"	Closed Side "B"	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	
36" (3')	Fine	3	41	13	14	27	18	36	27	40	45	59	63	77	72	99				
	Coarse	3	60	33	14	27	18	36	27	40	45	59	63	77	72	99	86	122		
	Extra Coarse	6	76	51							50	63	68	81	77	104	95	131	117	135
51" (4.25')	Fine	3	64	29	18	36	32	63	50	72	68	99	90	117	113	153				
	Medium	6	89	54							72	108	95	126	113	153				
	Coarse	8	105	70									99	135	126	180	158	225	180	234
	Extra Coarse	16	133	98													158	225	180	234
66" (5.5')	Fine	5	70	35			59	117	81	126	122	180	158	198	189	243				
	Medium	6	89	54							122	180	158	198	189	243	221	315	252	326
	Coarse	10	133	98									162	216	198	252	225	324	288	347
	Extra Coarse	13	133	117											198	252	225	324	288	358
84" (7')	Fine	5	105	51			108	216	144	227	216	324	284	351	324	405	378	450		
	Medium	10	133	95									284	378	324	453	378	495	450	544
	Coarse	13	178	127											345	486	405	585	495	594
	Extra Coarse	16	203	152																



Main Specifications

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Machinery dimension(mm)

The model of crusher		36"	51"	66"	84"
Crusher centerline to mainframe flange	A	850	1000	1440	1650
Crusher centerline to countershaft housing face	B	880	1130	1400	1780
Crusher centerline to the end of countershaft	C	1870	2040	2450	2980
Main frame base to the bottom of main frame cap	D	455	630	810	1030
Max diameter of adjustment ring	E	2000	2500	3280	4270
Main frame cap diameter	F	550	690	810	920
Main frame base to the top of adjustment ring	G	1100	1300	1550	1960
Main frame base to the top of feed hopper	H	1720	2300	2690	3300
Location measure of anchor screw	J	660	880	1130	1245
Height required to disassembly the machine		2800	3600	4200	5400
Overall dimension		2865x2000x2190	3300x2500x2940	4105x3280x3505	5110x4270x4350

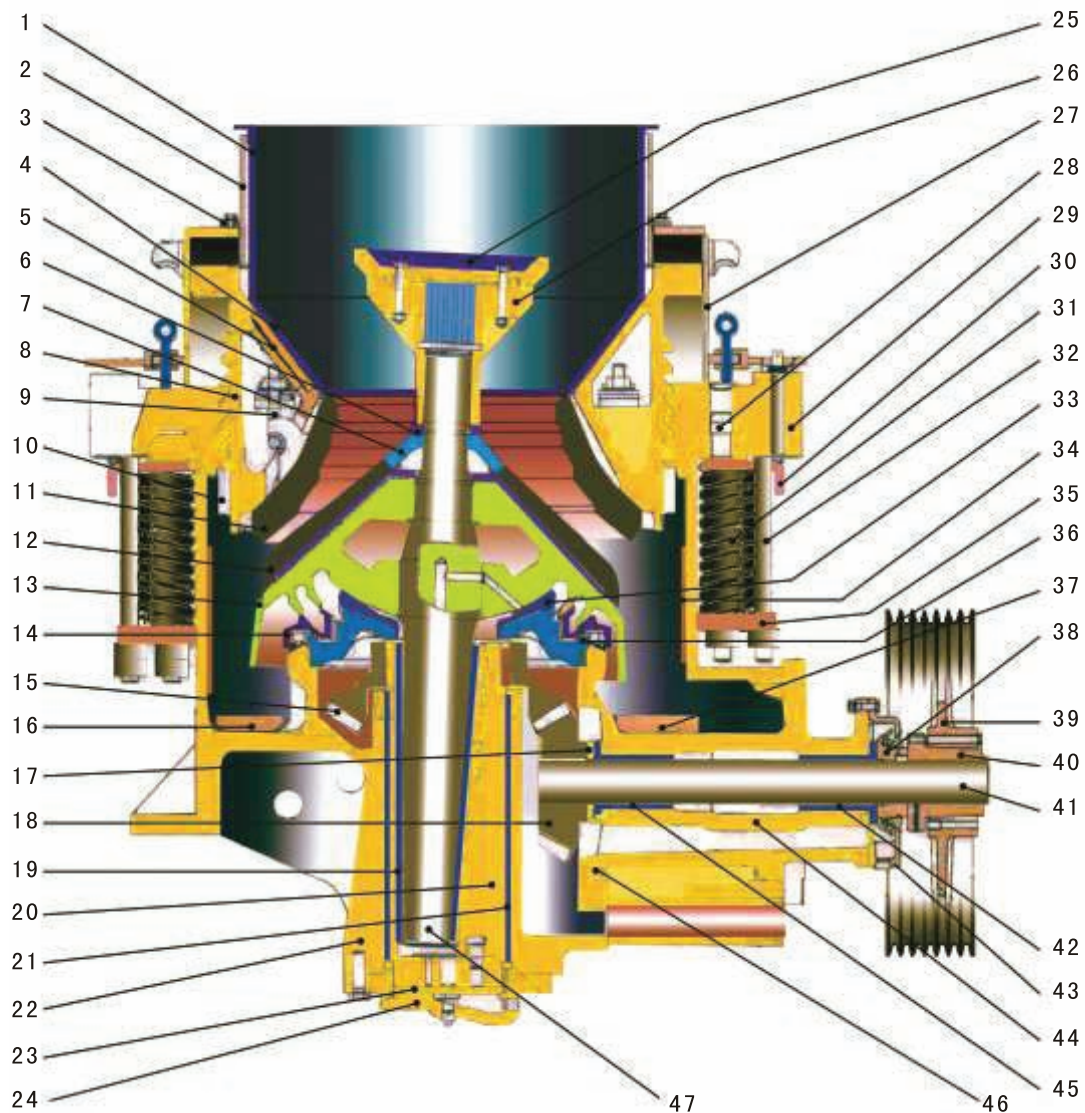
Weight list(kg)

Model of crusher	36"		51"		66"		84"	
	Standard	Short head	Standard	Short head	Standard	Short head	Standard	Short head
Crusher complete	9980	10530	22460	22590	43270	43870	67360	70130
Bowl,Bowl liner,Adjustment cap	1820	2040	4900	4350	10250	9160	14830	14330
Head,Main shaft,Mantle,Feed plate	1680	2000	3630	4310	7580	9250	13970	17240
Main frame	2630		5490		11430		18140	
Adjustment ring, Spring	2130		5490		8260		10800	
Coutershaft box,Countershaft,Crusher sheave	910		1270		2130		3180	
Eccentric	540		1050		1910		3450	



Structure

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- 1 Feed hopper
- 2 Bowl hopper
- 3 Adjustment cap seal
- 4 Feed cone
- 5 Cover plate
- 6 Torch ring
- 7 Main shaft sleeve
- 8 Bowl
- 9 U-shaped bolt and washer
- 10 Adjustment ring dust collar
- 11 Bowl liner
- 12 Mantle
- 13 Head
- 14 Socket sealing ring
- 15 Gear
- 16 Arm guard
- 17 Pinion thrust washer
- 18 Pinion
- 19 Inner eccentric bushing
- 20 Eccentric
- 21 Outer eccentric bushing
- 22 Main frame
- 23 Step bearing plates
- 24 Main frame cap

- 25 Feed plate
- 26 Main shaft nut
- 27 Adjustment cap
- 28 Main frame pin
- 29 Adjustment ring
- 30 Upper spring segment
- 31 Spring
- 32 Spring bolt
- 33 Socket liner
- 34 Main frame liner
- 35 Lower spring segment
- 36 Socket
- 37 Countershaft box guard
- 38 Oil flinger
- 39 Crusher sheave
- 40 Sheave taper sleeve
- 41 Countershaft
- 42 Outer countershaft bushing
- 43 Oil flinger housing
- 44 Countershaft box
- 45 Inner countershaft bushing
- 46 Countershaft box seal
- 47 Main shaft

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The JOYAL Crushing plant includes vibrating feeder, jaw crusher, impact crusher or cone crusher, vibrating screen, belt conveyor and centrally electric controlling system, etc. The designed capacity is from 40t/h to 600t/h. To meet customer's specific requirement for the stone crushing, we can also add other equipments such as cone crusher, dust catcher on the crushing plant.

Process of Crushing Plant

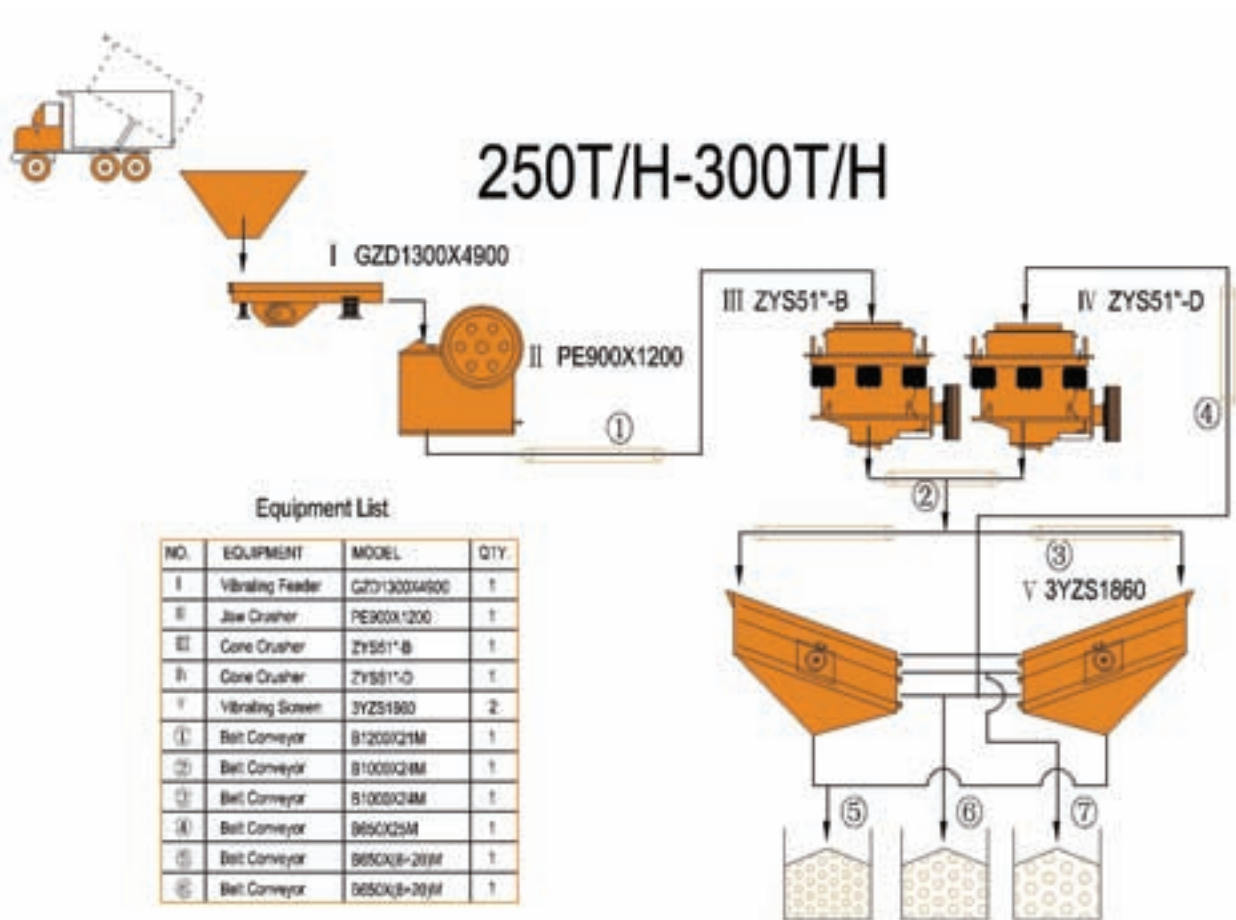
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The Big materials are fed to the jaw crusher evenly and gradually by vibrating feeder through a hopper for the primary crushing.

After first crushing, the material will transferred to impact crusher or cone crusher by belt conveyor for secondary crush; the crushed materials will then transferred to vibrating screen for separating.

After being separated, the parts that can meet standard will be taken away as final products, while the other parts will be returned to impact crusher, thus forming a closed circuit.

Size of final products can be combined and graded according to customer's specific requirement. We can also equip dust catcher system to protect environment.



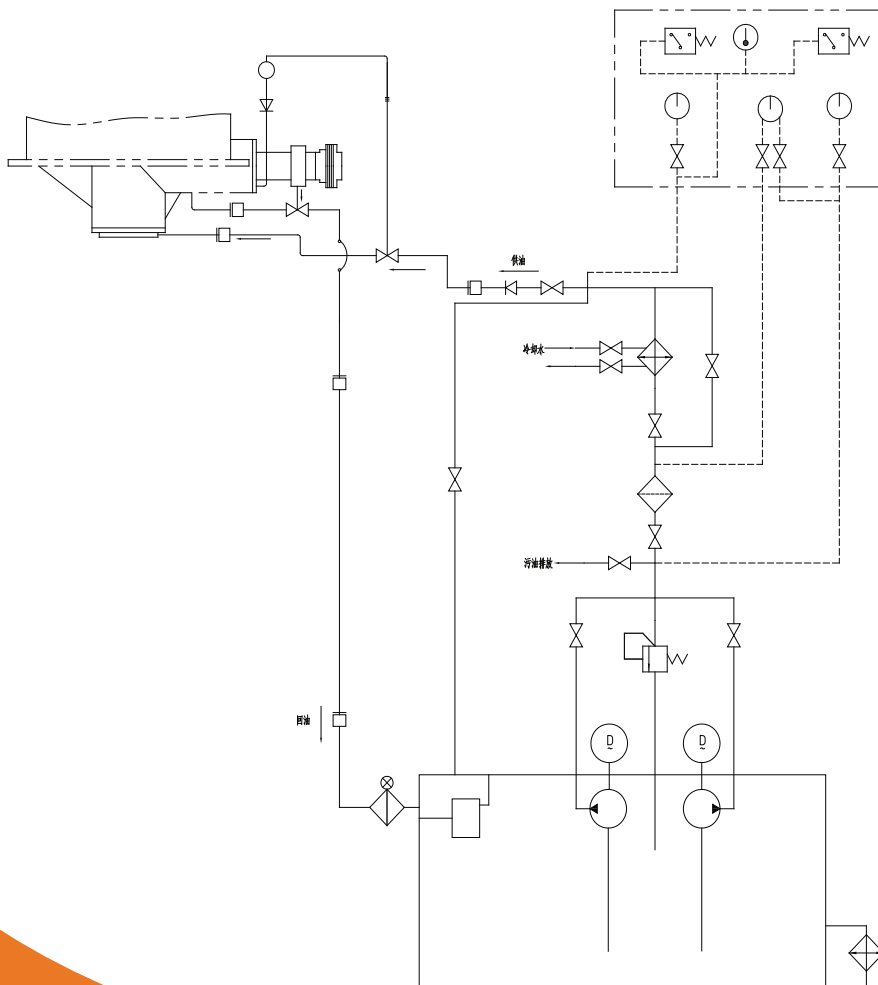
■ The Lubricating System

Since the friction surface receives much pressure, lubrication is very important to the crusher. The crusher is centrally lubricated with watery oil.

Oil route

There are two routes for the oil to enter the machine,

- >> one is through the oil hole at the bottom of the crusher, then to the hollow eccentric shaft surface, bowl-shaped bearing and the big and small gears through 3 separate ways.
- >> The other is through the hole in the transmission shaft support, then to the transmission bearing. The return route is a spill hole at the bottom of the small bevel gear and another spill hole in the dust-proof cover.



Adjustment and locking of hydraulic system

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- Start thin oil station before start the main unit, if the lubrication system is ok, start the main unit, then start the vibrating feeder if the machine running normal without load. Stop feeding before stop crusher, ores in crushing chamber is exhausted totally, stop the main unit, and stop the thin oil station at last.
- Before start the thin oil station, open relative oil valve and switch, adjust the pressure adjust device, keep the pressure between 0.04-0.1MPa, the oil temperature should be in 30-40°C, if the temperature is too low, start the resistance heater first.
- Please refer to the electricity control cabinet instruction for all electric switch function. And put them in proper position before start the main unit.



Trouble	Cause	Trouble shooting
1. oil flow indicator shows no flow. Oil pump running but oil pressure less than 0.04Mpa	1. low oil temperature 2. oil path switch is not start properly 3. oil pump not good	1. heat oil 2. check oil path switch 3. overhaul or change oil pump
2. too much pressure difference between filter forwards and backwards	Block in filter	Clean the filter when pressure difference surpass 0.05MPa
3. oil pressure and oil temperature increase	Oil pipe or oil path block	Stop the machine and find out the block point and remove
4. oil temperature surpass 60℃ but oil pressure not increases	Problem in rolling rubbing parts	Stop the machine and check ball tile, bushing, thrust mat, find out the causes and remove
5. oil level decreases	1. leak machine bottom end cap 2. leak in transmission shaft flange 3. block in bowl baring base or oil return tunnel	1,2 stop the machine and fix bolt or change mat 3. stop the machine, check and clean the oil path and tunnel, adjust oil level and remove the the problem
6. water enter oil, oil level increases	1. water pressure bigger oil pressure cooler 2. leak water in cooler 3. too much water in water seal 4. block in water return pipe	1. adjust the water pressure lower than oil pressure 2. check the leak parts 3. adjust water amount 4. clean the water return pipe , oil tank, change new oil
7. oil in water seal, oil temperature not increases	Oil tunnel block	Clean oil tank and oil return pipe
8. crusher vibrates strongly Too fast cone rotation	1. Oil lack or dust in oil between main unit and bushing 2. bowl tile damaged 3. not enough gap between cone bushing	Stop the machine, check the causes and do the needful
9. frequent vibrating during machine working	1. not enough pressure in spring 2. fine and sticky material feed 3. uneven or too much feeding	1. tighten nut in spring or change the spring 2,3. feed properly
10. crushing chamber moves up with strong noise then work normally	Uncrushed material falls into crushing chamber, which will cause main shaft broken	Remove iron before feeding, use metal detector



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