

YZ Submersible Slurry Pump

User Manual



IVY-PUMP

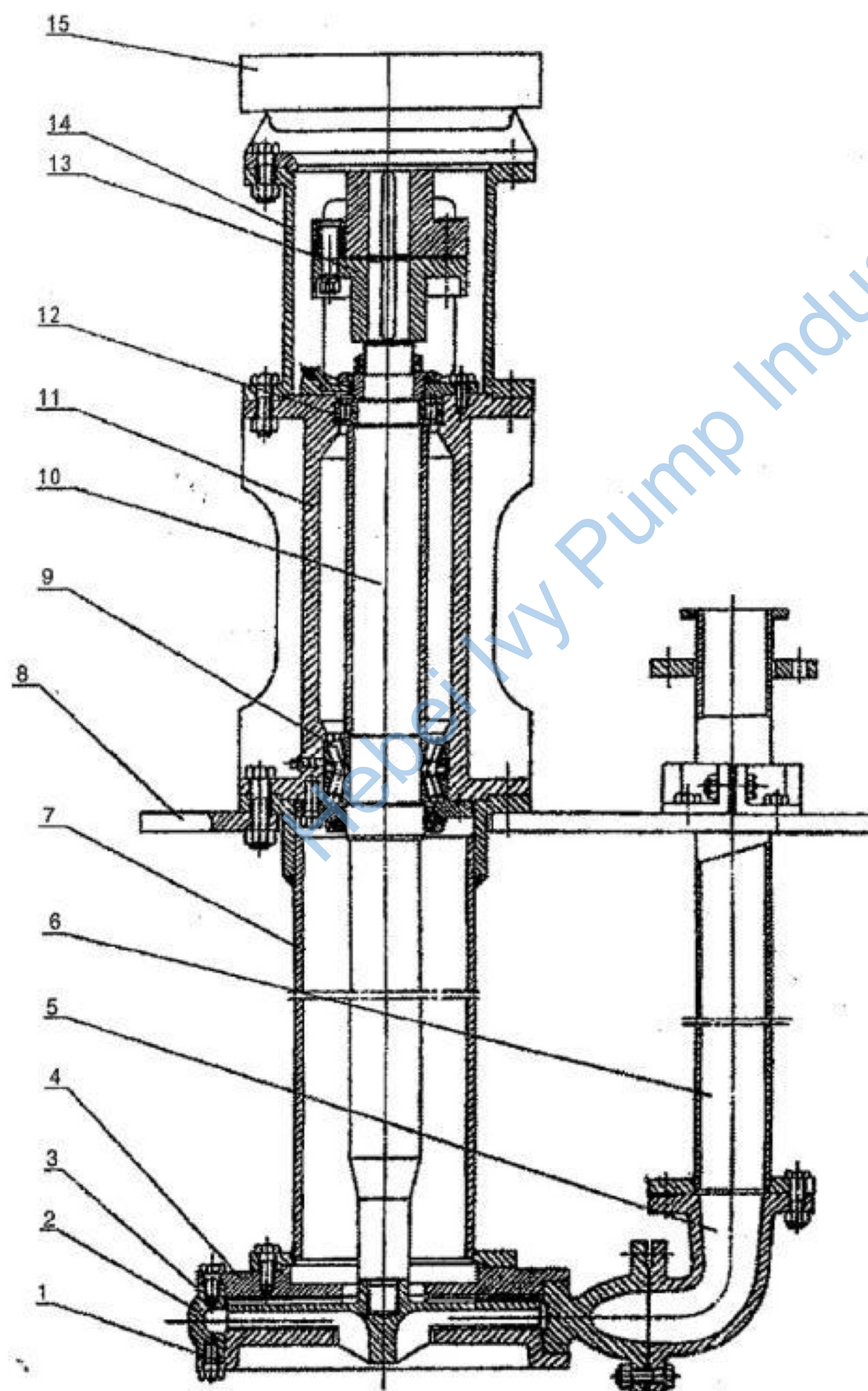
Hebei Ivy Pump Industry Co., Ltd.

YZ Submersible Slurry Pump

Overview

The YZ submersible slurry pump is a vertical, single-stage, single-suction, cantilevered centrifugal pump. Its specialized bearing seal prevents the ingress of slurry and gravel, effectively ensuring the service life of the bearings. The impeller is a semi-open type, featuring an integrated agitator blade extending from the suction edge of the impeller. There are no bearings, seals, or supports between the fixed disc, the impeller, and the pump casing, making the pump maintenance-free. It can handle media containing high concentrations of solid particles, offers high flow rates, and features wear-resistant alloys for its flow-passing components. The submersion depth of the YZ slurry pump is ≤ 3000 mm.

Structural Diagram of the YZ Submerged Slurry Pump



1. Front Cover
2. Pump Body
3. Impeller
4. Pump Cover
5. Discharge Elbow
6. Discharge pipe
7. Connecting Pipe
8. Mounting Plate
9. Bearing
10. Shaft
11. Bearing Housing
12. Bearing
13. Coupling Assembly
14. Motor Mount
15. Motor

Note: The liquid level must not exceed the pressure relief hole at the top of the connecting pipe

YZ Submersible Pump Performance Parameters

Model	Flow Rate		Head (m)	Rotational Speed (r/min)	Efficiency (%)	Matching Motor	
	m ³ /h	L/S				Model	Power (kW)
50YZ25-12	12	3.3	13.5	1430	37.3	Y100L ₂ -4	3
	25	6.9	12		39.5		
	30	8.3	11		38.2		
	7	1.9	5.5	910	37.3	Y90L-6	1.1
	15	4.2	4.8		39.5		
	19	5.3	4.4		38.2		
50YZ25-12A	11	3	9.3	1430	36.8	Y100L ₁ -4	2.2
	23	6.3	8.1		39		
	27	7.5	7.3		37.7		
	7	1.9	3.7	910	36.8	Y90S-6	0.75
	14	3.9	3.3		39		
	17	4.7	2.7		37.7		
50YZ25-12B	10	2.7	7.5	1430	26.3	Y100L ₁ -4	2.2
	21	5.8	7.2		28.5		
	25	6.9	5.9		37.2		
	6	1.7	3	910	26.3	Y90S-6	0.75
	13	3.6	2.9		28.5		
	15	4.2	2.4		37.2		
50YZ36-50	18	5	53	1470	28	Y180L-4	22
	36	10	50		34		
	45	12.5	48		36		
	11	3.1	23	970	28	Y160M-6	7.5
	23	6.4	21		34		
	29	8.1	20		36		
50YZ36-50A	16	4.4	44	1470	37	Y180M-4	18.5
	33	9.2	42		33		
	41	11.4	40		35		
	10	2.8	18	960	27	Y132M ₂ -6	5.5
	21	5.8	17.5		33		
	26	7.2	17		35		
50YZ36-50B	15	4.2	37	1460	26	Y160L-4	15
	30	8.3	35		33		
	37	10.3	33.6		34		
	9	2.5	15.5	960	26	Y132M ₂ -6	5.5
	19	5.3	15		33		
	24	6.7	14		34		
65YZ50-12	30	8.3	13.2	1440	47.7	Y132S-4	5.5
	50	13.8	12		55.9		
	60	16.6	10.8		55.7		
	19	5.3	5.5	940	47.7	Y112M-6	2.2
	32	8.9	5		55.9		
	39	10.8	4.5		55.7		
65YZ50-12A	28	7.7	11.9	1440	47.2	Y132S-4	5.5
	48	13.3	10.8		55.4		
	57	15.8	9.7		55.2		
	18	5	5	940	47.2	Y100L-6	1.5
	31	8.6	4.5		55.4		
	37	10.3	4		55.2		

YZ Submersible Pump Performance Parameters

Model	Flow Rate		Head (m)	Rotational Speed (r/min)	Efficiency (%)	Matching Motor	
	m ³ /h	L/S				Model	Power (kW)
65YZ50-12B	26	7	10.7	1440	46.8	Y112M-4	4
	45	12.5	9.7		54.9		
	54	15	8.7		54.7		
	16	4.4	4.5	940	46.8	Y100L-6	1.5
	29	8.1	4		54.9		
	35	9.7	3.5		54.7		
80YZ80-20	48	13.3	22	1460	45	Y160M-4	11
	80	22.2	21		55		
	96	26.7	18.5		53		
	31	8.6	9.5	960	45	Y132M ₁ -6	4
	52	14.4	9		55		
	63	17.5	8		53		
80YZ80-20A	44	12.2	18.6	1460	43	Y160M-4	11
	73	20.3	17.5		53		
	90	25	15.6		51		
	28	7.8	8	960	43	Y132M ₁ -6	4
	48	13.3	7.5		53		
	59	16.4	6.5		51		
80YZ80-20B	39	10.8	16	1460	43	Y132M-4	7.5
	68	18.9	15		53		
	80	22.2	13.4		51		
	25	6.9	6.9	960	43	Y132S-6	3
	44	12.2	6.5		53		
	52	14.4	5.8		51		
100YZ100-30	60	16.7	36	1470	41	Y180L-4	22
	100	27.8	31		54		
	120	33.3	28		56		
	39	10.8	15.5	970	41	Y160M-6	7.5
	65	18.1	13.5		54		
	79	21.9	12		56		
100YZ100-30A	75	20.8	30	1470	39	Y180M-4	18.5
	92	25.6	26		52.5		
	110	30.6	24		54		
	48	13.3	12.8	960	39	Y132M ₂ -6	5.5
	60	16.7	11		52.5		
	71	19.7	10		54		
100YZ100-30B	50	13.9	25	1460	38	Y160L-4	15
	85	23.6	22		52		
	102	28.3	20		53		
	32	8.9	10.8	960	38	Y132M ₂ -6	5.5
	55	15.3	9		52		
	67	18.6	8		53		
100YZ120-60	72	20	61	1480	38	Y250M-4	55
	120	33	60		50.5		
	144	40	56		52		
	47	13.1	26	970	38	Y200L ₁ -6	18.5
	78	21.7	25		50.5		
	94	26.1	24		52		

YZ Submersible Pump Performance Parameters

Model	Flow Rate		Head (m)	Rotational Speed (r/min)	Efficiency (%)	Matching Motor	
	m ³ /h	L/S				Model	Power (kW)
100YZ120-60A	65	18	50	1480	36.5	Y225M-4	45
	108	30	49		49		
	130	36.1	16		50		
	42	11.7	21.5	970	36.5	Y180L-6	15
	70	19.4	21		49		
	85	23.6	6.8		50		
100YZ120-60B	59	16.4	41	1480	35.5	Y200L-4	30
	98	27.2	40		48		
	118	32.8	37		49		
	38	10.5	17.5	970	35.5	Y160L-6	11
	64	17.8	17		48		
	77	21.4	15.5		49		
100YZ160-38	96	26.7	45	1480	43.8	Y225M-4	45
	160	44.4	39		52		
	192	53.3	36		50.6		
	62	17.2	19	970	43.8	Y180L-6	15
	104	28.9	16.5		52		
	125	34.7	15		50.6		
100YZ160-38A	88	24.4	38	1480	43.8	Y225S-4	37
	148	41.1	33		51		
	177	49.2	30		49.5		
	57	15.8	16	970	42.8	Y160L-6	11
	97	26.9	14		51		
	116	32.2	12.5		49.5		
100YZ160-38B	82	22.8	33	1480	43	Y200L-4	30
	137	38.1	28		52		
	164	45.6	26		50		
	53	14.7	14	970	43	Y160L-6	11
	89	24.7	12		52		
	107	29.7	11		50		
150YZ250-40	150	41.7	44	1480	44	Y250M-4	55
	250	69.4	10		51		
	300	83.3	38		52		
	98	27.2	18	970	44	Y200L-6	18.5
	163	45.3	17		51		
	196	54.4	16		52		
150YZ250-40A	135	37.5	35	1480	43	Y225M-4	45
	225	62.5	32		50		
	270	75	30		51		
	88	24.4	15	970	43	Y180L-6	15
	147	40.8	13.5		50		
	176	48.9	12.5		51		
150YZ250-40B	120	33.3	28	1480	43	Y225S-4	37
	0	55.6	25		49		
	240	66.7	24		50		
	78	21.7	12	970	43	Y160L-6	11
	131	36.4	10.5		49		
	157	43.6	10		50		

YZ Submersible Pump Performance Parameters

Model	Flow Rate		Head (m)	Rotational Speed (r/min)	Efficiency (%)	Matching Motor	
	m ³ /h	L/S				Model	Power (kW)
150YZ280-20	168	46.7	21	980	47	Y250M-6	37
	280	77.8	20		62		
	336	93.3	16.5		57		
	125	34.7	11.2	730	47	Y225S-8	18.5
	208	57.8	11		62		
	250	69.4	9		57		
150YZ280-20A	154	42.8	18	980	46	Y225M-6	30
	258	71.7	17		61		
	310	86.1	14		56		
	114	31.7	9.5	730	46	Y200L-8	15
	192	53.3	9		61		
	230	63.9	7		56		
150YZ280-20B	142	39.4	15	980	45	Y200L ₂ -6	22
	237	65.8	14		60		
	285	79.2	11		55		
	105	29.2	8	730	45	Y180L-8	11
	176	48.9	7		60		
	212	58.8	6		55		
200YZ460-35	276	76.7	38	1480	59	Y280M-4	90
	460	127.8	35		69		
	552	153.3	33		64		
	182	50.6	16.5	980	59	Y225M-6	30
	304	84.4	15		69		
	365	101.4	14		64		
200YZ460-35A	255	70.8	32.5	1480	58	Y280S-4	75
	426	118.3	30		67		
	511	141.9	28.3		63		
	167	46.4	14	970	58	Y200L ₂ -6	22
	279	77.5	12.5		67		
	334	92.8	11.5		63		
200YZ460-35B	235	65.3	27.5	1480	57	Y250M-4	55
	391	108.6	25		66		
	470	130.6	23.8		62		
	154	42.8	11.5	970	57	Y200L ₁ -6	18.5
	256	71.1	10.5		66		
	308	85.6	10		62		
200YZ500-20	300	83.3	23	980	62	Y280M-6	55
	500	138.9	20		71		
	600	166.7	18		67		
	223	61.9	12	730	62	Y250M-8	30
	372	103.3	11		71		
	446	123.9	9		67		
200YZ500-20A	278	77.2	19.7	980	61	Y280S-6	45
	463	128.6	17		69		
	555	154.2	15.4		65		
	207	57.5	10	730	61	Y225M-8	22
	344	95.6	9		69		
	413	114.7	8		65		

Possible Pump Failures and Solutions

Fault	Cause	Solution
Pump Fails to Draw Liquid	1. The pump has not been primed 2. The suction line, discharge line, or pump flow path is blocked 3. Air has not been fully purged from the suction line or inside the pump 4. The suction lift exceeds the allowable range 5. The discharge line is too small, resulting in excessive pressure loss 5. The operating head exceeds the design head 7. Hot or volatile media are being pumped 8. The rotation direction is reversed	1. Refill the pump 2. Remove debris 3. Inspect the suction line and bleed air from it 4. Reinstall the pump according to the allowable suction lift 5. Replace with a suitable discharge pipe 6. Select a different pump 7. Reduce the suction lift or use a self-priming installation 8. Correct the rotation direction
Insufficient Pump Flow	1. The foot valve is too small 2. The suction pipe is not submerged deep enough, causing air to be drawn into the pump 3. The suction pipe is too narrow or blocked by debris 4. The impeller is severely worn or corroded 5. The seal ring is severely worn or corroded 6. The clearance between the semi-open impeller and the pump cover is too large 7. The rotational speed is too high	1. Replace with a suitable foot valve 2. Increase the immersion depth of the suction pipe 3. Replace with suitable piping and remove debris 4. Replace the impeller 5. Replace the seal ring 6. Reduce the clearance 7. Check the current and restore the rotational speed
Insufficient Pump Head	1. Severe impeller corrosion 2. Pump performance does not meet design requirements 3. Insufficient rotational speed 4. Excessive clearance between the semi-open impeller and the pump cover	1. Replace the impeller 2. Replace the pump with one that meets design requirements 3. Check the power supply and restore rotational speed 4. Reduce the clearance
Severe Pump Vibration	1. Pump and motor shafts are misaligned 2. Pump shaft is bent 3. Impeller is unbalanced	1. Adjust and align the pump and motor shafts 2. Remove and straighten or replace with a new one 3. Remove and balance
Pump Bearing Overheating	1. No or insufficient lubricating oil (grease) 2. Pump and motor shafts are misaligned 3. Bearing damage	1. Add lubricating oil (or grease) as required and realign 2. Adjust and align the pump and motor shafts 3. Replace the bearings
Severe mechanical seal leakage	1. Insufficient spring pressure 2. Corrosion, wear, or scratches on the end faces of the rotating or stationary rings 3. Loose mounting screws causing the spring to lose its function 4. The rotating seal ring is improperly coiled or has become corroded and deformed 5. The stationary ring is installed at an angle 6. Insufficient machining precision and surface finish of the bearings. This affects the axial movement of the rotating ring 7. Impurities, foreign objects, or medium crystallization affect the axial movement of the rotating ring or cause it to become lodged between the end faces of the rotating and stationary rings	1. Readjust the spring compression or replace the spring 2. Repair or replace damaged moving and stationary rings 3. Tighten the screws and readjust the spring 4. Replace the moving ring seal 5. Reinstall the stationary ring 6. Replace the bearing with one that meets machining accuracy requirements 7. Remove impurities, foreign objects, and crystals, and thoroughly clean the seal components.
Motor Overheating	1. Operating conditions (flow rate, head) exceed the pump's design specifications 2. The specific gravity of the fluid exceeds the specifications of the motor configured for the pump 3. The packing gland is overtightened, or the mechanical seal springs are set too tight 4. Poor pump assembly quality, resulting in friction points, or the motor and pump shaft are not coaxial	1. Select a suitable pump from the standard series 2. Match the pump with an appropriate motor 3. Readjust the compression of the packing gland or mechanical seal springs 4. Inspect the assembly quality and troubleshoot any installation issues

Pump Disassembly, Installation, Operation, and Precautions

Pump Disassembly

1. Unscrew the oil plug on the pump body and the drain plug on the bearing housing, and completely drain the liquid from the pump and the oil reservoir in the bearing housing. If there is an external liquid seal line, it should also be removed.
2. Remove the bolts connecting the pump housing to the bearing housing, and remove the bearing housing assembly from the pump housing (before doing so, remove the intermediate connecting piece of the extended coupling).
3. Loosen the impeller nut and remove the impeller and key.
4. Remove the pump cover along with the shaft sleeve, mechanical seal end cover, and other assemblies from the top. Take care to prevent the shaft sleeve and bearing cover from sliding relative to each other. Then disassemble the mechanical seal end cover, remove the mechanical seal together with the shaft sleeve, and finally separate the shaft sleeve from the mechanical seal. For soft packing seals, first remove the shaft sleeve from the shaft cover, then sequentially remove the packing gland, packing, and packing rings. For mechanical seals with special designs, follow the specific disassembly and assembly procedures.
5. Remove the feet, pump coupling, and key.
6. Remove the acid-resistant ring from the bearing housing and extract the bearings from the housing.
7. Separate the bearings from the shaft.

Pump Assembly

The pump assembly sequence can generally follow the reverse order of disassembly. However, during assembly, be sure to inspect all sealing surfaces and gaskets to ensure they are intact, and take care not to omit any gaskets or install defective ones.

Pump Installation

1. After unpacking, inspect the pump and motor. If it is confirmed that there is no damage caused by loading, unloading, or transportation, and that all fasteners are secure with no loosening, and the pump's inlet and outlet covers are intact with no dust or debris inside the pump, then there is no need to disassemble and reassemble the unit; it can be transported directly to the installation site for installation.
2. Level the pump foundation surface using a spirit level. After the concrete foundation has cured, place the pump on the foundation. Use a spirit level to check the horizontal alignment of the pump and motor shafts. If they are not level, adjust using shims until level is achieved. Then, pour concrete into the foundation and anchor bolt holes.
3. After the concrete has set, check whether the base and anchor bolt holes are loose. Once confirmed to be secure, tighten the anchor bolts and recheck the levelness.
4. When reinstalling the motor, pump, and base, strictly check the concentricity of the pump shaft and the motor. Measure the differences on the outer ring of the coupling at the top, bottom, left, and right; these differences must not exceed 0.1 mm. The difference between the maximum and minimum end-face clearances of the two coupling faces around the circumference must not exceed 0.3 mm.
5. The pump's suction and discharge piping must have their own supports; the weight of the piping must not be borne directly by the pump to prevent damage to the pump.
6. When the pump is installed above the liquid level (within the pump's permissible suction head range), a foot valve must be installed at the end of the suction line, and a priming screw or valve must be provided on the discharge line for priming the pump before startup. When the pump is installed below the liquid level (in a flooded configuration), a control valve and a strainer must be installed on the suction line to prevent debris from being drawn into the pump.

Pump Operation

A. Startup

1. Check the oil level in the oil cup and the oil reservoir of the suspension unit; the oil level should be maintained at approximately 2 mm from the centerline.
2. Check that the motor is rotating in the correct direction; reverse rotation is strictly prohibited.
3. When rotating the coupling, it should feel smooth and even. Listen for any abnormal noises, such as friction sounds or irregular rolling noises, from inside the pump. If any are detected, take measures to eliminate them and ensure the coupling guard is properly installed.

4. The pump must be installed above the liquid level (in vacuum conditions). Before starting, prime the pump or evacuate the system to ensure the suction pipe inside the pump is filled with liquid and all air is purged from the pump.

5. Close the inlet and outlet pressure (or vacuum) gauges and the discharge line gate valve to the required positions.

B. Operation

1. Pay close attention to the temperature rise of the pump and motor. The bearing temperature should not exceed 35°C, and the maximum temperature should not exceed 75°C.

2. Monitor changes in the oil level in the suspension unit's oil reservoir and maintain it within the specified range. To ensure clean oil and proper lubrication, replace the oil periodically based on on-site operating conditions. Generally, the oil should be completely replaced after every 1,500 hours of operation. For pumps using grease, add grease to the grease cup at regular intervals.

3. If abnormal noises or other malfunctions are detected during operation, stop the unit immediately for inspection. Operation may only resume after the fault has been rectified.

4. Never use the gate valve on the suction line to regulate flow, as this may cause cavitation.

5. The pump should generally not operate continuously at less than 30% of its design flow rate. If operation under such conditions is unavoidable, a bypass pipe should be installed on the discharge line to ensure the pump's flow rate remains within the specified operating range.

C Shutdown

1. Slowly close the discharge line gate valve. Stop the motor.

2. Close the inlet and outlet pressure (vacuum) gauges; if the system is being primed, also close the suction line gate valve. If the seal uses an external liquid supply, close the liquid supply valve.

3. If the ambient temperature is below the liquid's freezing point, drain all liquid from the pump to prevent freeze damage.

4. For pumps that will be out of service for an extended period, in addition to draining all corrosive liquid from the pump, rinse it thoroughly with clean water. Pay special attention to thoroughly flushing the seal chamber. It is best to disassemble the pump for cleaning, reassemble it, seal the inlet and outlet, and store it properly.

Precautions for Using Mechanical Seals

Depending on the operating conditions, this series of pumps can be equipped with various types of mechanical seals, such as internally mounted single-face balanced and unbalanced types, double-face balanced and unbalanced types, and externally mounted mechanical seals. Therefore, depending on the selected seal type, other procedures and precautions may vary; specific situations should be handled in accordance with the provisions in the *Mechanical Seal Installation and Operating Instructions*. The following provides only a few points of caution.

1. Mechanical seals are generally used with clean media free of suspended particles. Therefore, newly installed piping systems and storage tanks must be thoroughly flushed to strictly prevent solid contaminants from entering the mechanical seal faces and causing seal failure.

2. When using mechanical seals in media prone to crystallization, ensure frequent flushing. Before restarting the system after a shutdown, thoroughly clean any crystals from the mechanical seal.

3. Disassembly of the mechanical seal must be performed with care; do not strike it with a hammer, metal tools, or similar objects to avoid damaging the sealing surfaces of the rotating and stationary rings.

4. If the seal is stuck due to deposits, do not force its removal. Instead, take steps to remove the deposits and rinse the area thoroughly before proceeding with disassembly to avoid damaging the sealing components.

5. Before installing a mechanical seal, inspect all sealing components for failure or damage; if any are found, repair them or replace them with new components.

6. Thoroughly inspect the mating sealing surfaces of the rotating and stationary rings.

7. Take care to eliminate any misalignment during installation. When tightening the screws, apply force evenly and securely to prevent skewing, which could cause the seal to fail.

8. Correctly adjust the spring compression so that it is neither too tight nor too loose.

If too tight, the sealing faces will wear out quickly and fail,

and result in high power consumption; if too loose, the seal will not function properly, leading to excessive leakage. Therefore, after the pump is installed, when turning the rotor by hand, the seal should feel as though the compression spring is moderately compressed, yet the rotor should rotate smoothly and freely without any sensation of binding. If it feels too tight or cannot be turned, it should be loosened slightly.