ZJQ Submersible Slurry Pump

User Manual

IVY-PUMP

Hebei Ivy Pump Industry Co., Ltd.

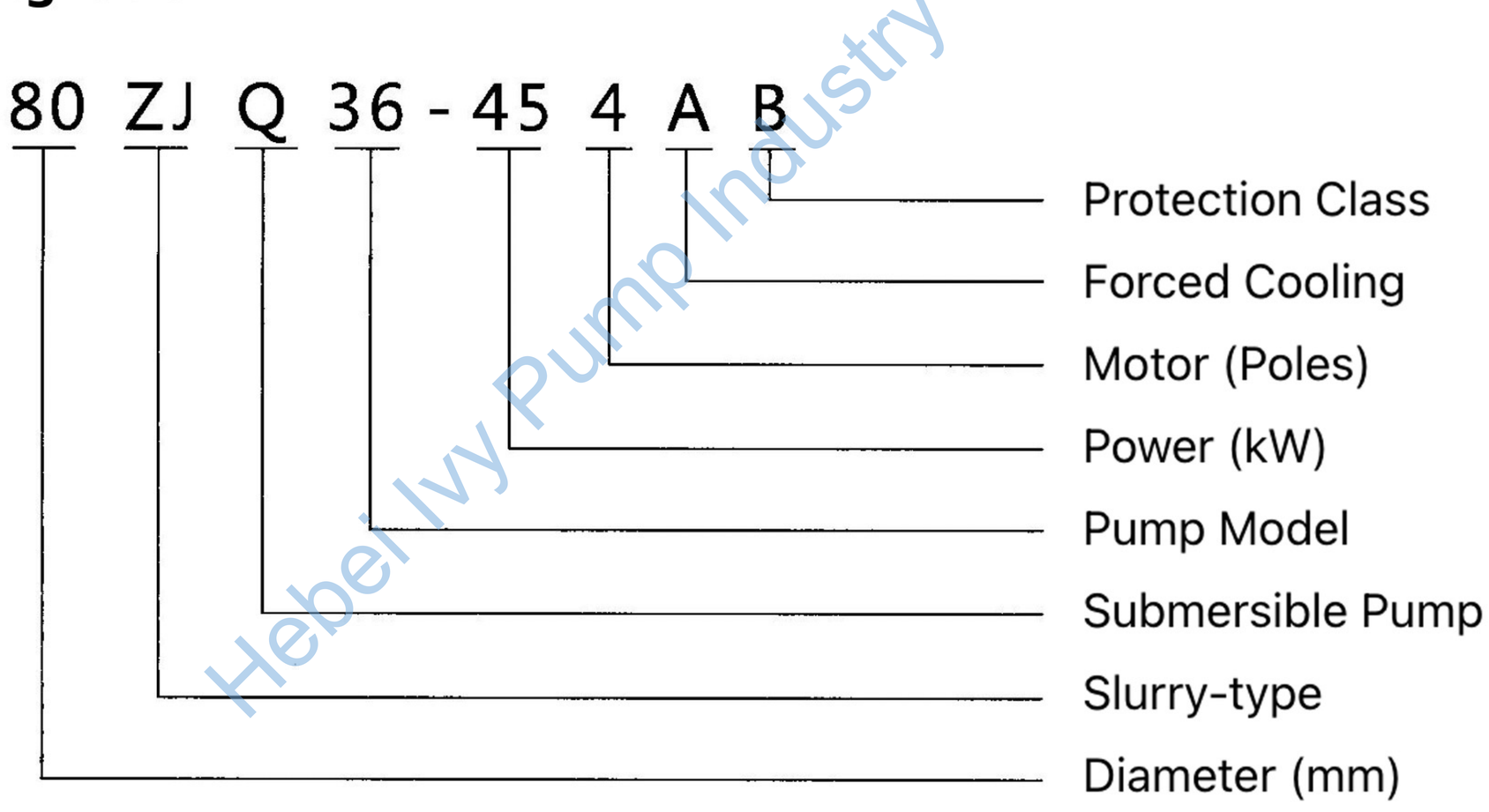
Overview

.. The ZJQ submersible slurry pump features comprehensive optimization and innovative design in areas such as hydraulic modeling, sealing technology, mechanical structure, and protection and control systems. This product has a simple structure, is easy to install, safe and reliable to use, and has a long service life. Since the pump is submerged underwater, there is no need to construct complex above-ground pump houses or mounting structures; it operates without noise or vibration, resulting in a cleaner worksite.

Main Applications

This product is suitable for conveying slurries containing abrasive particles such as sand, gravel, coal slag, and tailings. It is primarily used in industries including metallurgy, mining, power generation, chemical processing, environmental protection, river dredging, sand extraction, and municipal engineering. Easy to install and relocate, with high slurry extraction efficiency, this product can operate safely for extended periods under harsh operating conditions, making it an ideal replacement for traditional vertical submersible pumps and submersible sewage pumps.

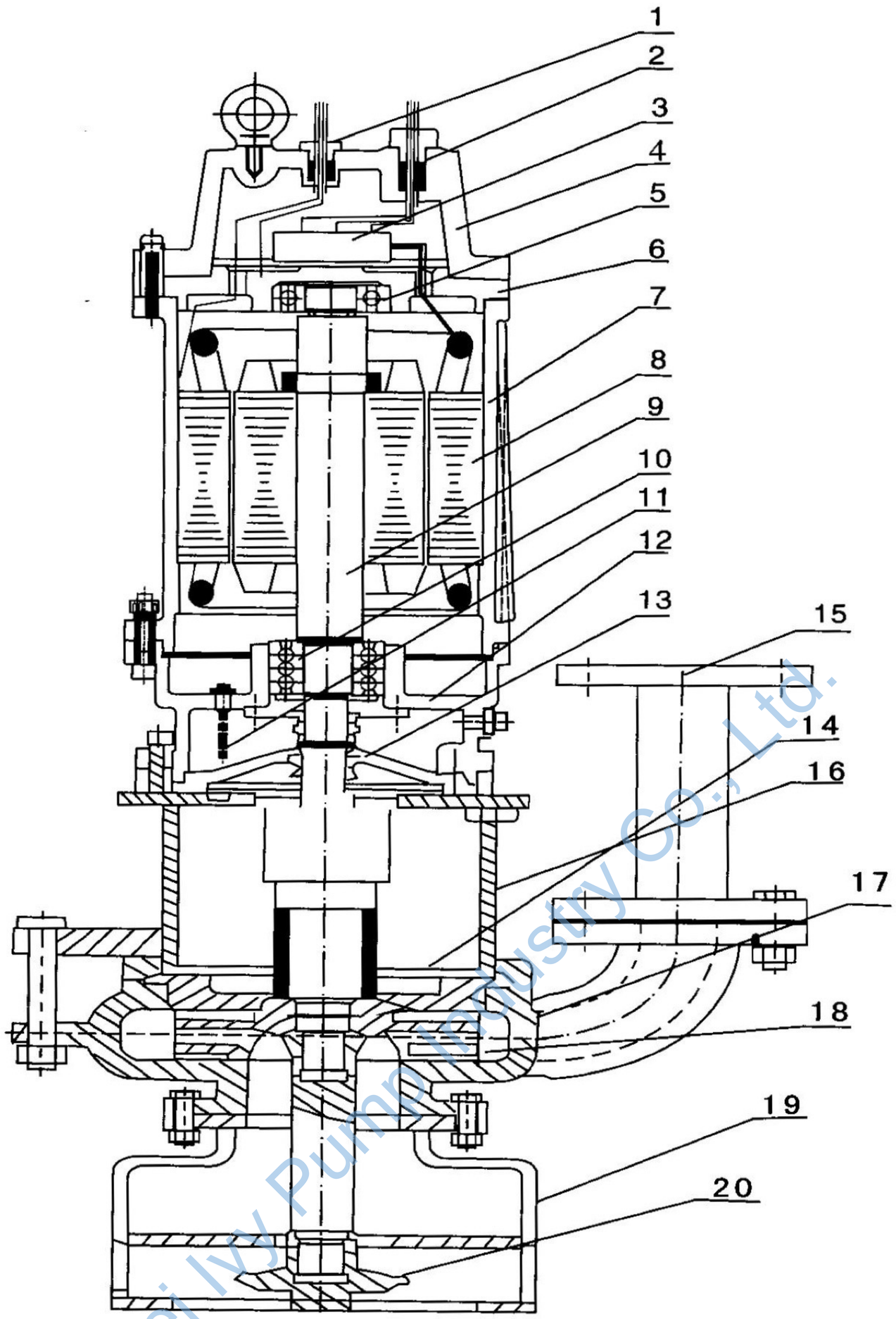
Model Designation



Operating Conditions

1. Power supply: 380 V, three-phase, 50 Hz (voltage and frequency can be customized upon request);
2. Medium temperature generally does not exceed 60°C, pH 4–10, and medium density ≤ 1300 kg/m³;
3. Suitable for media containing highly abrasive solid particles and mildly corrosive sewage slurries;
4. The diameter of solid particles in the medium must not exceed 80% of the pump's minimum flow passage size.

Product Structure Description



1	Signal Cable	6	Upper Bearing Housing	11	Oil-water sensor	16	Bracket
2	Motor Wiring	7	Motor Housing	12	Oil Chamber	17	Pump Body
3	Junction Box	8	Stator	13	Mechanical Seal	18	Impeller
4	Motor Cover	9	Shaft (Rotor)	14	Guard Plate	19	Base Filter Screen
5	Bearing	10	Bearings	15	Outlet Pipe	20	Agitator

Structural Description

1. Pump Casing and Impeller

Based on practical testing, the pump casing and impeller have been carefully selected and matched. The impeller is made of high-chromium, wear- and corrosion-resistant material, ensuring excellent flow characteristics, high efficiency, a flat power curve, and resistance to overload. The impeller is precisely balanced, resulting in low vibration and smooth operation.

2. Agitator

The agitator wheel, located at the bottom of the pump, stirs sediment settled on the riverbed into turbulent flow before extraction. It integrates submersible pumping, agitation, sand blowing, and sand extraction functions, ensuring high sand suction efficiency and more thorough dredging.

3. Motor

The specially designed submersible motor features IPX8 protection and Class F insulation, which allows for a higher permissible temperature rise. Under normal temperature rise conditions, the motor’s insulation has a long service life; furthermore, the effective submersible cooling system keeps the actual temperature rise low, further extending the motor’s insulation lifespan.

4. Motor Cooling

Heat generated by the motor is dissipated through the housing. As long as the medium submerges the motor stator

5. Shaft Seals

The motor shaft seal employs two independent mechanical seals connected in series, forming a dual-line of reliable sealing protection.The first line is located within the pump's fluid; as fluid pressure increases, the sealing surfaces are pressed tighter together, effectively preventing water from entering the oil chamber. The second line is located within the oil chamber, preventing oil from entering the motor. If the first line fails (which is subject to slightly harsher operating conditions than the second), the second line can still prevent oil and water from entering the motor. The bellows-type mechanical seal, combined with an innovative structural chamber, significantly enhances the reliability of the shaft seal. Under normal operating conditions, the mean time between failures exceeds 8,000 hours.

6. Oil Chamber

The oil chamber serves as a barrier to prevent the medium from entering the motor through the pump shaft, blocking its penetration into the motor. If the first mechanical seal leaks, the oil chamber acts as a buffer, preventing the medium from directly entering the motor. At the same time, it lubricates and cools the friction surfaces of the two independent mechanical seals, ensuring more reliable operation. In addition, it dissipates heat generated by the lower bearing and some of the motor’s heat.

7. Bearings

The lower double-row angular contact bearings have a high load-carrying capacity and, together with the upper deep-groove bearings, provide reliable support for the motor-pump shaft. They offer a substantial load margin to accommodate the radial, axial, and other forces generated during the operation of the sewage pump, ensuring smooth operation and a long service life for the unit.

8. Cable and Sealing

1. The cable is a heavy-duty, rubber-sheathed flexible cable resistant to sewage. The cross-sectional area of the cable conductors is designed for long-term, reliable operation at an ambient temperature of 40°C and under full-load motor conditions. If the sewage pump operates with the motor running at less than full load or at an ambient temperature below 40°C, the service life will be even longer.
2. The rubber sheath of the cable is tightly sealed against the motor gland to prevent the medium from seeping into the motor cavity through the joint between the cable and the motor gland.
3. The cable sheath and conductors are bonded by vulcanized rubber; even if the rubber sheath is torn, it will still effectively prevent the medium from entering the motor through the cable sheath.

9. Motor Housing

The motor housing consists of the casing, upper end cover, and gland cover. Reliable static seals are provided at the joints between these components, and each unit undergoes rigorous hydrostatic testing to ensure absolute leak-tightness.

10. Internal Safety Protection (Operated via a Dedicated Electrical Control Cabinet)

1. Oil-water sensor: Installed in the oil chamber, it detects leaks from the first mechanical seal (within the medium). When the leaked medium enters the oil chamber and reaches a certain proportion, an alarm signal is triggered.
2. Float Switch: Installed inside the motor chamber, it detects leaks at the second mechanical seal. When oil (or an oil-water mixture) enters the motor, the float switch triggers an alarm signal and stops the pump.
3. Thermistor: Installed within the motor stator windings; if the motor is overloaded for an extended period or the motor winding temperature (or other causes of motor winding overheating) reaches a certain threshold, an alarm signal is triggered and the pump is shut down.

11. External Control System

The dedicated electrical control cabinet processes various signals from the pump to provide control, protection, audible and visual alarms, and various automated control functions for single-pump and multi-pump systems.

If the user provides their own electrical control cabinet, they should contact our company's electrical control cabinet specialist team for guidance on installing the protection controller within the user-supplied cabinet.

12. Optional

Forced Cooling System. A metal sleeve is installed on the motor housing to introduce a cooling water circulation system, thereby achieving forced cooling.

13. Performance Curves and Key Parameters

The actual portion of the curve on the performance curve chart indicates the pump's recommended operating range.The pump's shaft power increases as the flow rate increases. If the pump's flow rate exceeds the rated flow limit, the shaft power will exceed the motor's rated power. When the medium temperature is high or the motor is not adequately cooled, the motor cannot operate for extended periods. If the flow rate is less than the rated flow limit, the pump's shaft power is significantly lower than the motor's rated power, resulting in very low system efficiency; operating the pump under these conditions is highly uneconomical.

ZJQ Series Slurry Pump Clear-water Performance Table

Model	Flow (m^3/h)	Head (m)	Power (kw)	Speed (r/min)	Max. Permissible Solid Particle Size (mm)
ZJQ300-60	878	30	132	740	65
ZJQ200-45	276	30.4	45	980	50
	551	25.6	55		
	638	22.8	75		
	206	17	22	740	50
	410	14.2	30		
	475	12.7	30		
ZJQ150-60	218	66	90	980	45
	381	60	110		
	466	56.6	101.6		
	162	36.5	37	740	
	284	33.2	45		
	347	31.4	55		
ZJQ150-55	280	53.7	90	980	45
	517	48	110		
	630	46	132		
	209	30	37	740	
	387	26.8	45		
	471	25.7	55		

Note: The above performance parameters are for reference only. The design flow, head and matching power shall be selected according to actual site conditions.

ZJQ Series Slurry Pump Clear-water Performance Table

Model	Flow (m^3/h)	Head (m)	Power (kw)	Speed (r/min)	Max. Permissible Solid Particle Size (mm)
ZJQ200-45	230	33.5	75	980	45
	396	30.2	90		
	561	25.4	110		
ZJQ150-50	123	44.6	37	980	45
	221	40.1	45		
	279	37.2	55		
	92	24.7	15	740	
	165	22.3	22		
	208	20.6	30		
ZJQ150-35	198	17.9	30	980	15
	332	13.2	30		
	364	12.1	30		
	147	10	11	740	
	247	7.3	11		
	271	6.7	11		
	119	6.5	7.5	590	
	200	4.8	7.5		
	219	4.4	7.5		

Note: The above performance parameters are for reference only. The design flow, head and matching power shall be selected according to actual site conditions.

ZJQ Series Slurry Pump Clear-water Performance Table

Model	Flow (m^3/h)	Head (m)	Power (kw)	Speed (r/min)	Max. Permissible Solid Particle Size (mm)
ZJQ100-60	152	147	160	1450	32
	256	138.5	200		
	305	131.7	220		
	101	65	45	980	
	170	61.2	75		
	203	58.1	75		
ZJQ100-45A	100	83.5	55	1450	32
	195	71.6	75		
	228	66	90		
	66	36.6	18.5	980	
	129	31.4	30		
	151	29	30		
ZJQ100-45B	88	76.4	55	1450	32
	166	65.2	75		
	219	54.3	90		
	57	32.8	18.5	980	
	109	28	22		
	144	23.3	30		

Note: The above performance parameters are for reference only. The design flow, head and matching power shall be selected according to actual site conditions.

ZJQ Series Slurry Pump Clear-water Performance Table

Model	Flow (m^3/h)	Head (m)	Power (kw)	Speed (r/min)	Max. Permissible Solid Particle Size (mm)
ZJQ100-40	129	61	45	1450	32
	219	56.1	75		
	268	53.6	75		
	85	26.2	15	980	
	144	24.1	22		
	176	23	22		
ZJQ100-35	163	46	45	1450	14
	278	41.5	55		
	323	39.2	55		
	107	19.7	15	980	
	182	17.8	18.5		
	212	16.8	18.5		
ZJQ100-34	157	36.8	45	1450	14
	214	32.6	45		
	293	24.4	45		
	103	15.8	15	980	
	140	14	15		
	192	10.5	15		

Note: The above performance parameters are for reference only. The design flow, head and matching power shall be selected according to actual site conditions.

ZJQ Series Slurry Pump Clear-water Performance Table

Model	Flow (m^3/h)	Head (m)	Power (kw)	Speed (r/min)	Max. Permissible Solid Particle Size (mm)
ZJQ100-33	119	41.6	30	1450	14
	202	37.8	37		
	225	36.5	45		
ZJQ 100-40	82.8	24	37	980	
	147	22.5	45		
	214	20	22		
ZJQ80-45	124	80.5	75	1450	12
	235	66	75		
	284	56	75		
	81	34.6	22	980	
	154	28.3	22		
	186	24	22		
ZJQ80-36	105	45.5	45	1450	12
	144	41.4	45		
	201	32.5	45		
	69	19.5	15	980	
	94	17.8	15		
	132	14	15		

Note: The above performance parameters are for reference only. The design flow, head and matching power shall be selected according to actual site conditions.

ZJQ Series Slurry Pump Clear-water Performance Table

Model	Flow (m^3/h)	Head (m)	Power (kw)	Speed (r/min)	Max. Permissible Solid Particle Size (mm)
ZJQ80D-36	86	47.1	30	1450	12
	151	42	37		
	167	40	37		
	56	20.2	11	980	
	99	18	11		
	109	17.1	11		
ZJQ65-40	71	63.2	37	1450	8
	141	57.5	45		
	159	54.6	45		
	47	27.1	11	980	
	92	24.7	15		
	104	23.5	15		
ZJQ65-30	38	34.7	18.5	1450	8
	58	31.9	18.5		
	98	26	18.5		
	25	14.8	5.5	980	
	38	13.6			
	64	11.1			
ZJQ65-S24Q	26.28	12.8	3	1450	8
	46.8	11.4	4		
	65.88	9.8	5.5		
	39.6	29.3	18.5	980	
	70	26	22		
	100	22.7	22		

Note: The above performance parameters are for reference only. The design flow, head and matching power shall be selected according to actual site conditions.

ZJQ Series Slurry Pump Clear-water Performance Table

Model	Flow (m^3/h)	Head (m)	Power (kw)	Speed (r/min)	Max. Permissible Solid Particle Size (mm)
ZJQ65D-30	44	35.6	15	1450	8
	79	32.6	18.5		
	99	30.7	22		
	29	15.2	5.5	980	
	51	13.9	5.5		
	64	13.1	5.5		
ZJQ65-A30	47	34.8	11	1450	8
	62	34	15		
	79	32	15		
ZJQ65-A27	42	28.2	11	1450	
	56	27.5	11		
	71	26	11		
ZJQ50-40	31	58.3	30	1450	8
	47	51			
	65	37.9			
	21	25.4	11	980	
	31	22.2			
	43	16.5			
ZJQ50D-40	33	51.7	18.5	1450	8
	68	43.4	30		
	76	40.8	30		
	22	22.5	5.5	980	
	45	19	7.5		
	50	17.7	7.5		
ZJQ50-35	39	47.1	22	1450	8
	64	40.9			
	86	32.2			
	26	20.5	75	980	
	42	17.5			
	57	14			

Note: The above performance parameters are for reference only. The design flow, head and matching power shall be selected according to actual site conditions.

ZJQ Series Slurry Pump Clear-water Performance Table

Model	Flow (m^3/h)	Head (m)	Power (kw)	Speed (r/min)	Max. Permissible Solid Particle Size (mm)
ZJQ50-30	34	36.3	11	1450	8
	55	32	15		
	78	26.4	18.5		
	22	15.7	4	980	
	36	13.8	5.5		
	51	11.4	5.5		
ZJ Q50-20	10.8	4.3	11	980	8
	15.6	3.7			
	24	2.4			
	17.1	10.7	4	1450	
	24.7	9.2			
	38	6			
ZJ Q50-20	37	46.2	30	2950	8
	56	38.3			
	70	24.3			
	18	11	4	1450	
	28	9.1			
	34	5.8			
ZJ Q40-35	19.7	48	18.5	1450	8
	39.4	41.7			
	47.6	35.8			
	12.9	20.5	5.5	980	
	25.7	17.8			
	31.1	15.3			

Note: The above performance parameters are for reference only. The design flow, head and matching power shall be selected according to actual site conditions.

ZJQ Series Slurry Pump Clear-water Performance Table

Model	Flow (m^3/h)	Head (m)	Power (kw)	Speed (r/min)	Max. Permissible Solid Particle Size (mm)
ZJQ40-25	10.1	21.5	5.5	1450	8
	18.4	19			
	22.9	16.8			
	6.6	9 .2	1.5	980	8
	12	8.1			
	15	7.2			
ZJQ40-25A	35.5	88.6	30	2950	8
	58.8	73 . 5	37		
	74.7	60.8	37		
	17.3	21.1	4	1450	8
	28.7	17.5	5.5		
	36.5	14.5	5.5		
ZJQ40-21	9.5	17	4	1450	8
	20.3	15.3	4		
	26	14.1	4		
ZJ Q40-20	10.44	11.5	1.5	1450	12
	18	10.5	2.2		
	25.2	9	3		
ZJQ40-20	16.6	57.5	11	2950	8
	33.3	5	15		
	37.1	47.1	15		
	8.1	13.7	1.5	1450	8
	16.3	12	2.2		
	18.1	11.2	2.2		

Note: The above performance parameters are for reference only. The design flow, head and matching power shall be selected according to actual site conditions.

ZJQ Series Slurry Pump Clear-water Performance Table

Model	Flow (m^3/h)	Head (m)	Power (kw)	Speed (r/min)	Max. Permissible Solid Particle Size (mm)
DO-40PV	7.20	5.5	1.1	980	8
	12.6	5	1.1		
	18.00	4.3	1.1		
	10.44	11.5	1.5	1450	8
	18.00	10.5	2.2		
	25.20	9	3		
ZJ Q-65QV	26.28	12.8	3	980	8
	46.8	11.4	4		
	65.88	9.8	5.5		
ZJQ-65QV	39.6	29.3	18.5	1450	8
	70.2	26.1	18.5		
	100.08	22.7	22		
ZJQ-100RV	82.8	24	37	980	14
	147.6	22.5	45		
	214.2	20	22		
ZJQ-150SV	230.4	33.5	75	980	15
	396	30.2	90		
	561.6	25.4			

Note: The above performance parameters are for reference only. The design flow, head and matching power shall be selected according to actual site conditions.

Pump Operating Instructions and Precautions

1. Before use, carefully inspect the cable for damage, check that fasteners are not loose or missing, and verify that the pump has not been deformed or damaged during transportation, storage, or installation.
2. Use a 500V megohmmeter to measure the insulation resistance between the motor windings and between the windings and ground. The value should not be less than 2 megohms; otherwise, the motor stator windings must be dried. The drying temperature must not exceed 120°C.
3. When the pump is powered on, it should rotate counterclockwise as viewed from the inlet. If the electric pump rotates in the opposite direction, simply swap the positions of any two wires in the cable.
4. The electric pump's housing ground wire must be properly connected in strict accordance with relevant regulations. To ensure personal safety during operation, personnel in the vicinity are strictly prohibited from entering the water while the electric pump is running.
5. Unless under special circumstances, the electric pump must be equipped with a fully automatic pump control system. Never connect the pump directly to the power grid or use a knife switch to supply power; ensure the electric pump operates normally.
6. Do not operate the electric pump for extended periods at low head (generally, the operating head should not be less than 60% of the rated head). It is best to keep the head within the recommended operating range to prevent the motor from burning out due to overload.
7. Pumps without a self-circulating cooling system must not be operated with the entire unit exposed above the water surface for extended periods to prevent damage caused by overheating.
8. This pump is available with an optional variable-frequency drive, making it suitable for a wider range of industrial and mining applications. *

Maintenance and Care

1. The electric pump should be managed and operated by designated personnel, who should regularly check whether the insulation resistance between the windings and the pump housing is normal.
2. After each use—especially when pumping thick or viscous slurries—the electric pump should be run in clean water for several minutes to prevent sediment buildup inside the pump and ensure it remains clean.
3. If the electric pump is not used for an extended period, remove it from the water; do not leave it submerged for long periods to reduce the risk of moisture damage to the motor stator windings and extend the pump's service life.
4. Under normal operating conditions, add or replace the engine oil (Grade 10-30) in the oil chamber every 300-500 hours of operation to maintain proper lubrication of the mechanical seal and extend its service life.
5. After disassembly or maintenance, the pump casing assembly must undergo a 0.2 MPa air tightness test to ensure the motor seal is reliable.
6. The sealing ring between the impeller and the pump body serves a sealing function; if damaged, it will directly affect the pump's performance and should be replaced as necessary.

Common Faults and Troubleshooting Methods

Fault	Cause	Troubleshooting
Insufficient flow or no water output	1. Motor rotating in the wrong direction 2. Impeller passage or piping clogged 3. System head is too high, or the selected pump's head is significantly lower than actual requirements 4. Impeller severely worn 5. Liquid level is too low, causing the pump to draw in air 6. Check valve installed in the wrong direction	1. Correct the motor rotation direction 2. Remove debris from the impeller or piping; it is best to install a strainer around the pump(but do not install a strainer at the pump inlet) 3. Reduce the system head (e.g., by using larger-diameter or smoother pipes, reducing the number of elbows, or increasing the elbow radius) or switch to a pump with a higher head capacity. 4. Replace the impeller 5. Adjust the position of the float switch so that the minimum liquid level meets the installation requirements. 6. Correct the direction of the check valve.
Failure to Start	1. Phase loss 2. Impeller jammed 3. Open circuit in winding connections or cable 4. Stator winding burnout 5. Control electrical component failure 6. Power supply voltage too low	1. Inspect the wiring and resolve the missing phase issue 2. Remove debris; it is best to install a strainer around the pump (but do not install a strainer at the pump inlet) 3. Check with an ohmmeter and then repair 4. Perform repairs; replace the windings or stator 5. Inspect the control panel; repair or replace electrical components 6. Address the power supply voltage issue accordingly
Stator Burnout	1. Operation without protective control devices; running with a missing phase or starting under a missing-phase condition; impeller seizure or detachment; excessive medium concentration; cooling system blockage 2. Water ingress into the motor due to seal failure 3. Water ingress into the motor caused by loose fasteners 4. Prolonged operation with the motor exposed above the water surface	After repairing the motor, the following must be done before use: 1. Install protective control devices and: inspect the wiring to resolve phase loss faults; remove debris; tighten the impeller mounting screws and stainless steel spring washers; dilute the medium with water; flush and clear the cooling system 2. Replace the mechanical seal or O-ring 3. Tighten all fasteners 4. Ensure the minimum liquid level is not lower than specified in the installation dimension drawing
Excessive Current	1. The density or viscosity of the pumped liquid is too high 2. The selected pump's head significantly exceeds actual requirements, or operating conditions have changed—resulting in a substantial reduction in system head, causing the pump to operate beyond the recommended flow rate 3. Bearing failure 4. Foreign matter is trapped between the impeller and the pump casing (e.g., at the wear ring) 5. Power supply voltage is too low	1. Adjust the density or viscosity of the pumped liquid 2. Close the discharge valve to reduce flow rate, use a smaller impeller, or replace the pump with one that has a lower head 3. Replace the bearings 4. Remove foreign objects 5. Address the power supply voltage issue accordingly
Vibration, Excessive Noise	1. The selected pump's head significantly exceeds actual requirements, or operating conditions have changed. A significant reduction in system head causes the pump to operate at a flow rate exceeding the recommended range 2. The liquid level is too low, causing the pump to draw in air 3. Improper piping configuration, such as installing a valve immediately after the pump discharge and partially closing it; installing an elbow immediately after the pump discharge; or a sudden reduction in the diameter of the discharge pipe immediately after the pump discharge.The diameter of the pump's suction line is smaller than the inlet diameter of the suction elbow 4. The bearings are lacking grease or are damaged 5. Foreign matter is jammed between the impeller and the pump casing (accompanied by increased current)	1. Close the discharge valve to reduce flow, use a smaller impeller, or replace the pump with one with lower head 2. Adjust the position of the float switch so that the minimum liquid level meets the requirements of the installation dimension drawing 3. Identify and resolve specific issues with the piping configuration 4. Lubricate the bearings with grease or replace the bearings 5. Remove foreign objects