Preface

This instruction manual is only applicable to the single vacuum pump and does not apply to the composite technology of the vacuum pump unit. However, this instruction manual is still applicable to the single pump on the vacuum pump unit.

Our company was founded in 1934 and is the birthplace of China's first vacuum pump. It is our company's consistent philosophy to provide users with high-quality products and strive to provide you with customer service for the entire service life of the product. The full-service life includes making you understand the working principle of the vacuum pump, the correct installation method of the equipment, the operation process of maintenance, equipment operation training, etc. It also includes providing you with vacuum technology solutions to relieve you of possible problems caused by being unfamiliar with the use of vacuum pumps and vacuum technology. Please be sure to read this instruction manual carefully.

In addition to keep maintaining product quality, our company also pays attention to technological innovation. The structure and appearance of our several products have obtained national patents. Due to the time point in the preparation of this manual, if there is any discrepancy between the product shape, product structure and this instruction manual, we will modify it in future reprints. Thanks for your understanding.

I. Structural Principles and Scope of Application

1. Structural Principles

W series reciprocating vacuum pump is also called piston vacuum pump. This series of vacuum pumps mainly consists of two parts. One is the mechanical transmission part. The second one is the cylinder part. All components of the mechanical transmission part are in a closed fuselage - the crankcase, and the connecting rod component connects the crankshaft component and the "crosshead" component.

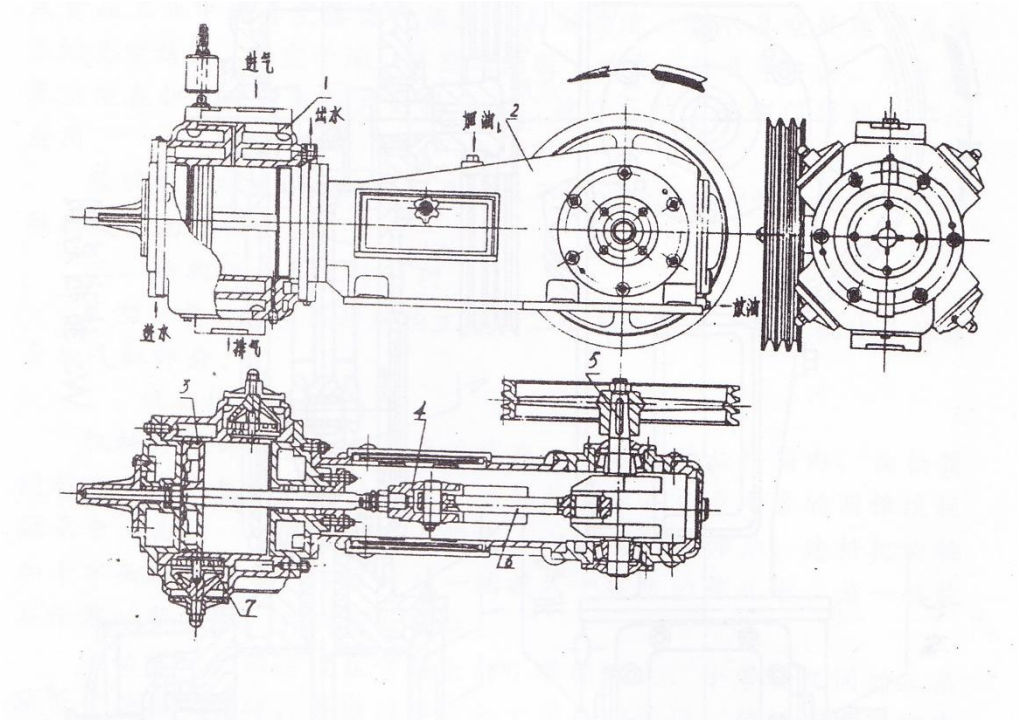
When the crankshaft connecting rod mechanism moves in the crankcase, the lubricating oil in the oil pool splashes to lubricate friction surfaces such as bearings, crankshaft journals, "crosshead" components, and guide rail surfaces. Therefore, always pay attention to the oil level in the oil pool and do not cut off the oil. There are oil filling ports and oil drain ports respectively on the top and rear of the fuselage. When water or oil-water mixture is precipitated in the cylinder due to the extraction of water vapor during operation, the drain valve under the cylinder can be opened to release it.

The cylinder body is designed with three parts: a cylinder, an air chamber, and a water jacket. The upper air chamber of the cylinder is equipped with an intake valve, which is connected to the air inlet. The lower air chamber of the cylinder is equipped with an exhaust valve. The exhaust valve is connected to the exhaust port. The intake valve and exhaust valve are one-way check valves composed of annular valve plates and coil springs. The intake valve can only complete the suction action, and the exhaust valve can only complete the exhaust action.

The piston is equipped with two piston rings to ensure the air tightness of the two ends of the separated cylinder. The piston and piston ring are driven by the "crosshead" component to reciprocate in the cylinder, constantly changing the volume of the two ends of the cylinder, sucking in gas when the volume expands, and discharging gas when the volume is reduced.

The cooling water flows in from the water inlet under the cylinder head at the front end of the cylinder, passes through the water jacket of the cylinder head, cylinder, and cylinder neck, and is discharged from the water outlet above the cylinder neck at the rear end of the cylinder.

See the working principle structure diagram:



1 Cylinder part 2 Body part 3 Piston part 4 Crosshead part 5 Crankshaft part 6 Connecting rod part 7 Valve part

Working principle structure diagram

2. Scope of application

This series of vacuum pumps are the main equipment for obtaining rough vacuum. They are used to

extract gas from sealed containers or reaction pots. This series of vacuum pumps is generally used in the chemical and food industries for vacuum distillation, evaporation, vacuum impregnation, liquid steel degassing, vacuum concentration, vacuum drying, and vacuum crystallization, since this series of vacuum pumps has relatively great pumping capacity.

Unless special measures are taken, it is generally not suitable to extract corrosive gases or gases containing medium granular dust.

II. Main Technical Performance and Specifications

Model	W-300	W3	W4-1	W5-1
Pumping rate (L/s)	300	55	100	200
Ultimate pressure (Pa)	2600	2600	2600	
Bore size × stroke (mm)	455×250	250×150		350×200
Motor power(kw)	30	5.5	11	twenty two
Motor speed (r/min)	285	300	530	430
Inlet and exhaust diameter	180mm	G2 ”	G4 ”	G5 ”
Water inlet and outlet diameter	G3/4 ”	G1/2 ”		G3/4 ”
Weight (without motor) (kg)	3000	600		1100
Oil consumption (L)	25	15	18	20

Note: Recommended oil grade: 68# vacuum pump oil

III. Installation Instructions

1. After unpacking, please check the contents of the box according to the "Packing List" and check the appearance of the pump to avoid possible damage during the transportation.

2. Please be sure to remove the protective packaging at the inlet and exhaust ports during installation.

3. The pump should be installed in a dry, ventilated and clean place, and a space of more than 300mm should be maintained between walls or other objects during installation. From delivery to use, the pump should be stored in the specified place (dry, clean, vibration-free room). If the storage time exceeds four years or the pump has not been stored in the specified place for more than two years, the bearings need to be cleaned before being put into use (to prevent the lubricant from drying out and failing) and add lubricant.

4. The pump and motor should be installed horizontally on the foundation. If the pump feet have mounting bolt holes, they should be fixed with anchor bolts. After tightening the anchor bolts, the level of the pump and motor must be rechecked to avoid tilting due to uneven floors.

Note: After the horizontal re-inspection, turn the belt by hand to check whether the pump rotates flexibly.

5. All connecting pipes must be free of leaks and must be cleaned first. There must be no foreign matter

such as iron filings, rust, welding slag, dust, etc. Therefore, it is recommended to install a fine mesh filter in the air intake pipe.

6. The diameter of the pipe connecting the pumped container should be greater than or equal to the diameter of the air inlet of the pump, and the installation distance and number of elbows of the pipe should be minimized. The leakage of the pipe should be checked after installation. If a rubber pipe is used for connection, it should be desulfurized.

7. The diameter of the pipe connecting the exhaust port of the pump should be equal to or smaller than the diameter of the air inlet of the pump. Otherwise, the exhaust pressure will increase and cause leakage in the sealing part of the pump.

8. For belt-driven pumps, please note that the large and small pulleys must be in the same vertical plane, and the triangle belt should be moderately tight.

9. When the pump is in working conditions containing dust: in order to prevent the pump from being damaged by dust, particles, or chemical gases, it is recommended that you install a suitable filter at the air inlet of the pump.

10. When the pump is in a working condition containing a large amount of steam: the extracted condensable gas will condense in the colder pipeline. Therefore, in order to prevent the condensed liquid from flowing back to the pump cavity, a condensation device and a drain valve should be installed during pipeline installation.

11. When the extracted gas is corrosive: you must propose nickel plating or other treatment measures when ordering.

12. When the temperature of the extracted gas is high (≥35℃): you must cool it before the air inlet of the pump.

13. When the extracted gas contains a large amount of liquid: you must install a gas-liquid separator in front of the air inlet of the pump.

14. When starting with a clear atmosphere, starting frequently, extracting high-pressure gas for a long time, or when the gas ballast is turned on, a small amount of oil mist will be discharged. You can use a pipe to connect the exhaust port to lead the oil mist away from the work area or install a suitable oil mist filter.

15. The pump has a device to improve oil return after shutdown and to keep the pump port in a vacuum state for a short time to facilitate next startup. However, for situations where oil return causes trouble due to process reasons, it is recommended that you install an electric or manual vacuum stop valve and vacuum

charging valve at the air inlet of the pump. For the installation method, see Chapter 1, Section 1 "Structural Principles" Attention Clause. It requires that the new pump should not return oil to the air inlet of the pump within 4 hours after it is shut down.

16. If you install the pump in the chassis, be sure to leave an air inlet channel for the cooling fan of the pump and motor, and an exhaust channel for the exhaust outlet of the pump.

17. For the convenience of transportation, some series of pumps do not contain oil in the pump cavity. Please inject vacuum pump oil through the oil filler port after installation. The oil level should be above 1/2 of the oil window.

18. Installation inspection

After installation, all pipelines, especially the suction side pipelines, must be thoroughly cleaned to prevent welding slag, scale, rust, etc. from entering the pump. After installation or maintenance, check to ensure:

- The pump bearings should be adequately lubricated.
- The entire machine (pump head and motor) is installed and adjusted correctly.
- The drive elements are adjusted correctly according to their nature and are installed without axial stress (e.g. pre-tensioning of pulley drives, radial and axial stress of couplings).
- All fastening bolts and connecting elements are reliably combined.
- Correct protection against contact with rotating parts (e.g. coupling guard).

Note: If the oil level is too high, oil will spray; if the oil level is too low, abnormal exhaust sounds will occur. If abnormal exhaust sound occurs, refuel to a point 5mm above the center line of the oil level.

Install the power cord and switch according to the markings on the motor nameplate and junction box. Please pay attention to the direction of the motor. The fan should rotate clockwise when viewed from the fan end of the motor.

19. Preparation before test run

What is stated here only applies to a drained or dry pump (i.e. when starting up for the first time or after repairs or when restarting after a long shutdown in operation).

Initial technical status: All pumped gas and working fluid pipelines must be connected correctly, all valves and gate valves are closed, and there should be no gate valves and check valves on the exhaust side.

20. Start

It is recommended to follow the steps below to start:

Check whether the bolts of flanges, joints and valves on the pipeline are tightened.

Open the suction line gate valve, if installed.

Open the gate valve on the exhaust line, if installed.

When flushing the shaft seal externally: Open the sealing fluid valve.

Open the working fluid valve immediately after starting the motor.

- **Check operation when starting work**

After starting, read the status value of pressure or flow. Better to make a record.

When the pump is just started, check the temperature of the components (especially bearings and shaft seals, etc.) until the temperature reaches a stable state, and keep records.

21. Shut down

1) Turn off the motor, close the sealing fluid valve, and close the intake pipe gate valve.

2) Once the work stops, immediately close the exhaust pipe gate valve, if installed.

Note: If it is frost season, the liquid in the pump body, separator and all pipelines needs to be drained.

22. After you turn on the power, when looking from the fan end of the motor, the motor should rotate clockwise. If you find that it rotates in the opposite direction, you can connect any two of the three power cords interchangeably.

23. Safety protection:

WARNING: Rotating parts such as couplings, free shaft extensions and V-belt drives must be protected against contact. In installations prone to explosion hazards, the drive elements and their contact protection must be specially designed to prevent sparks and static electricity.

Note: The temperature of the parts close to the bearings can exceed 70°C. Therefore, no contact with these parts is allowed. Temperature-sensitive parts, such as electrical components, cannot come into contact with them, otherwise they must be protected.

IV. Instructions for Use

1. Check whether the oil level of the pump is at the center line of the oil mark before starting it every day. It is normal for the oil level line to fluctuate after starting the machine.

2. Check the pump oil every two weeks to see if the color of the pump oil is normal. If it turns black or white (emulsified), replace the vacuum pump oil in the pump immediately. The replacement method is: unscrew the oil drain plug, put the pump oil from the tank into the container you prepared, tighten the oil drain plug, then unscrew the refill screw plug, and add new vacuum pump oil to the center line of the oil

mark. It is recommended that when you refuel, the oil must be filtered to prevent debris from entering the pump and blocking the oil path. In particular, the reused vacuum pump oil must be filtered before it can be added to the vacuum pump tank.

3. Check the belts etc. every month to see if they are loose or damaged.

4. Check whether the bearings, piston rings and piston ring bushings are worn every six months.

5. When the pump is running in a vacuum system, please refer to the corresponding provisions of the "Safety Warning" when turning on and off the pump.

6. If the air inlet of the pump is equipped with a solenoid valve or vacuum stop valve and a vacuum charging valve, the solenoid valve or vacuum stop valve should be turned on and off at the same time as the pump.

7. After the pump has been running for 30 minutes, see the corresponding column of Chapter 2 "Main Technical Performance and Specifications" for the ultimate vacuum parameters of the pump.

8. When the ambient temperature is high, the oil temperature in the pump cavity will also increase, the viscosity of the vacuum pump oil will decrease, and the saturated vapor pressure will increase. At this time, the ultimate pressure will decrease. It is recommended that you strengthen ventilation and heat dissipation of the pump, or replace the vacuum pump oil with a higher grade.

9. There should be no impact sound or abnormal sound during the operation of the pump, otherwise it should be stopped immediately for inspection.

10. When starting up, the machine should be idle for more than 15 minutes in winter and should be idle for more than 5 minutes in other seasons.

11. When the pump just starts, the needle valve of the oil cup should be opened wide so that the inner wall of the cylinder, piston and other parts can be quickly lubricated. After the pump operates normally, adjust the needle valve of the oil cup to make the falling speed of the oil droplets to be within 10-20 drops/minute. But the above dropping speed doubles within 1000 hours of operation of the new pump.

12. All operating parts must be properly lubricated regularly.

13. Preparations before driving

a. Check and clean the debris in the crankcase and other parts.

b. Open the oil cup needle valve to inject oil into the cylinder drop by drop.

c. Open the cooling water valve.

d. Open the three-way valve to allow smooth communication between the pump and the atmosphere.

e. Unscrew the drain plug at the bottom of the cylinder.

f. The large pulley of the manual rotary pump should rotate several times and it should feel easy and smooth without any obstruction.

14. Precautions during operation

a. Turn on the power and start the vacuum pump.

b. Close the pool water cock and turn the three-way valve to connect the pump to the pumped container system.

c. Pay attention to the dripping speed of the oil cup.

15. Parking

a. Close the air intake valve and cut off the power supply.

b. Close the needle valve of the oil cup, open the drain plug, and close the cooling water inlet valve after parking for about 10 minutes.

c. The cooling water must be drained out in winter to avoid freezing and cracking the cylinder.

V. Maintenance

1. Change oil

- After the new pump has been running for 100 hours, please replace the vacuum pump oil, and then replace it every 1000-1500 hours.
- The vacuum pump oil does not turn black or white. Replace the vacuum pump oil every 6 months.
- How to change the oil: Start the pump and run it for 30 minutes. When the vacuum pump oil becomes thinner, stop the machine and drain the oil from the oil drain hole, then open the air inlet.

Run for 10-20 seconds. At this time, slowly add a small amount (30-50 ml) of new vacuum pump oil from the air inlet. If the vacuum pump oil flowing out is very dirty, repeat the process until cleaner vacuum pump oil flows out.

Note: Do not use cleaning fluid for flushing; do not mix diesel, gasoline and other oils with high saturated vapor pressure to avoid lowering the ultimate pressure.

2. Safety precautions when repairing pumps and piping systems

Make sure that the repairs to be performed will not have adverse consequences on the system.

Make sure that the motor is switched off and cannot be started accidentally.

Make sure there is no pressure in the corresponding piping system and there are protective

measures.

Make sure that the pumped or supplied media does not cause any dangerous situation when opening the piping system.

3. Regular inspection

In order to detect and correct possible faults as soon as possible, regular and careful maintenance and inspections are very necessary to avoid further harm.

1) Since working conditions vary greatly, only the usual inspection and maintenance cycles can be recommended. These inspection and maintenance cycles must be changed based on the specific installation site and taking into account factors such as the degree of shoddy working conditions, frequency of equipment startup, and load.

2) Check the tightness of the belt. Adjust it once 8 hours after the first start, and periodically thereafter.

3) Under normal operating conditions, it is recommended to check the pump every month. The inspection items are as follows:

There is no obvious contamination in the pumped medium or working fluid (see Cleaning).

The technical data meet the requirements (power and temperature, etc.).

No obvious leaks occurred.

Whether the pump runs smoothly and whether the bearing rotation noise is normal.

There are no foreign objects in the valves, filters and screens; otherwise, remove them and determine the next inspection cycle.

When the cleaning cycle of the exhaust chamber or filter screen and filter is not very short, maintenance under specified operating conditions can be carried out together with the addition of lubricating oil or the replacement of lubricating oil.

In addition to the above inspections, you also need to check during the inspection process:

All fastening bolts are not loose (except those on the packing gland).

4. Maintenance and care points

Note: Disassembly and installation work should be performed by masters with experience in repairing equipment.

When disassembling the pump for maintenance or cleaning, attention must be paid to the disassembly steps to avoid damaging the pump parts.

Before disassembly, please mark the assembly positions of the components to reduce the possibility of misassemble and shorten your running-in time.

Try not to hit with a brute force heavy hammer, and the removed parts must not be damaged or lost.

1） Drain oil: See the relevant description in Chapter 4 "Instructions for Use" Section 2.

2） Remove the belt and pulley.

3) Open the observation window of the fuselage components and check whether the guide rail surface and crosshead components are fully lubricated. If any roughening or grinding is found, damage should be repaired in time.

4) Check the crosshead, bearings and other parts. If there are signs of overheating or traces, they should be repaired in time.

5) Check the packing of the piston rod and adjust the tightness in time.

6) Check and clean the air groove passage of the cylinder and air valve.

7) After the pump runs for about 2,500 hours, it must undergo maintenance. All parts must be disassembled, cleaned, and reassembled. Gaps must be adjusted.

8) After repair, the position of the piston must be adjusted. When the piston is at the upper and lower dead centers, it should maintain an equal gap of about 1.2-2mm with the end faces of the cylinder head and cylinder neck.

9) Other parts and components that need to be inspected and cleaned during maintenance:

- Clean the pump chamber.
- Clean the suction filter, oil and gas separator, and oil filter.
- Clean the air intake and exhaust pipes and clean and inspect pipe valves.
- Clean the fuel tank.
- Check, clean or replace bearings.
- Check the shaft seal.
- Clean other parts.

5. Bearing lubrication

Under normal operating conditions and the ambient temperature is less than 40°C, the lubrication cycle of the grease is 4000 hours.

The grease replacement cycle and grease addition cycle are suitable for situations where the load is normal, the operating vibration is low, the ambient gas is roughly neutral, and the high-grade roller bearing grease in the application table is selected. These greases contain lithium grease as a thickener and a composition basic mineral oil, which satisfy the defined lubrication intervals. Greases containing different

thickeners and base oils cannot be mixed.

1) Lubricating and re-lubricating: Before lubricating the bearing, wipe the grease nozzle clean, then use an oil gun to press in the grease, and rotate the shaft evenly to make the new grease evenly distributed in the bearing. The bearing temperature will increase significantly at first. Once the excess grease is squeezed out, the bearing temperature will return to normal. Fill the bearing spaces with grease. To avoid overfilling with grease, do not grease the bearing cap.

2) Installation

When installing, make sure the axial sealing ring (V-ring) is installed correctly and lubricate its sliding surface:

When installing the external sealing ring and when the outer edge of the V-ring is on the same plane as the sealing surface of the bearing cover, it indicates that the axial installation position of the V-ring has been achieved. It is recommended to use an appropriate installation tool.

The installation position of the internal sealing ring is determined by the locating groove on the shaft.

6. Inspection after maintenance and before start-up

1) Check the overall leakage of the pump operating system.

2) Check the rotation direction of the motor.

3) Measure the ultimate pressure at the pump port.

4) After the pump is installed in the system, check for leaks in the inlet and outlet pipes, valves, etc.

VI. Causes of Faults and Troubleshooting Methods

Fault	Reason	Method of exclusion
Insufficient pumping speed	1. Insufficient pipeline conduction capacity 2. The pumping speed of the backing pump decreases	1. Increase the diameter of the pipeline 2. Check, repair or replace the backing pump
Ultimate vacuum fails to meet technical requirements	1. Air leakage in pipelines and systems 2. Pump leaks 3. The overflow valve is leaking 4. Oil seal wear 5. The vacuum pump oil is contaminated or the brand does not match 6. The ultimate pressure of the backing pump drops (vacuum unit system) 7. The air inlet filter is clogged 8. Oil pipe leakage 9. O-ring rubber aging 10. The oil hole is clogged	1. System check and eliminate Clean pipes and pipe valves 2. Check the pump for leaks 3. Clean the overflow valve 4. Replace the oil seal 5. Replace or filter vacuum pump oil 6. Check, repair or replace the backing pump 7. Clean the air inlet filter 8. Replace the oil pipe or reassemble the oil pipe 9. Replace the O-ring 10. Loosen the pressure plate of the oil

Fault	Reason	Method of exclusion
	11. The air grooves of the intake and exhaust valves are blocked. Damaged seal 12. Poor contact between piston and cylinder 13. The cylinder neck packing is loose or damaged.	nozzle, pull out the oil inlet nozzle, and clear the oil hole. 11. Remove the intake and exhaust valves for cleaning Replace seals 12. The piston ring is stuck in the groove. The contact should be removed and corrected. 13. Inspect, adjust or replace
Motor overload	Air inlet pressure is too high	Adjust and control population pressure
Pump outer wall overheating	1、 Inlet pressure too high 2、 Poor cooling 3、 Gearbox lubricant level too high 4、 Insufficient pump oil 5、 Poor lubrication of bearings and oil seals 6、 Pump oil deteriorates and deteriorates	1. Adjust and control the inlet pressure 2. Unblock or increase the cooling water flow 3. Adjust the oil volume, usually to near the center line of the oil window 4. Add pump oil to near the center line of the oil window 5. Adjust the oil volume 6. Change oil
Abnormal sound and loud noise	1、 Improper assembly 2、 Inlet pressure too high 3、 Bearing wear	1、 disassemble, reassemble 2、 Adjust and control inlet pressure 3、 Replace bearings
There is a loud exhaust sound	1. The oil level is too low to seal the exhaust valve. 2. The external pipes at the pump port, containers and test instrument pipes and joints are leaking, and there is gas discharged from the exhaust port.	1. Come on 2. Find air leakage points and eliminate them
Bearings and gears suffer early wear and tear	1、 Lubricating oil is contaminated 2、 Not enough lubricant	1、 Change lubricating oil 2、 Add lubricant
Pump cannot start	1、 Insufficient voltage 2、 Pump or motor stuck 3、 The ambient temperature is too low and the vacuum pump oil viscosity is too high	1、 Measure voltage 2、 Separate the pump and motor, manual disk, transfer test 3. Heat the pump oil
Pump stuck	1、 Pump without lubricant 2、 The motor turns incorrectly for a long time 3、 Bearings lack lubricating oil for a long time	1、 Add lubricant 2、 Check and correct motor steering 3、 Check, replace and oil bearings
Body deformation	1. The "cross head" parts are too tight, causing hair to bite and death during movement. 2. The pump is not level during installation	1. Adjust the fit of the "crosshead" components Adjust the fuselage to eliminate fuselage deformation 2. Detect and adjust the installation horizontal position of the pump.
There is an impact sound in the cylinder	1. Check whether the nut on the piston rod is loose	1. During inspection, unscrew the drain cock and use soft lead wire to check the gap between the dead points at both ends of the piston. If loose, remove and tighten the nut

VII. List of Wearing Parts

Reciprocating Vacuum Pump	W-300	V-shaped sealing ring 86.5×43.5×15 (W300-10-08); V-belt D4953; piston ring W300-30-05; Piston rod bushing W300-10-09; valve disc 140/110×1 (W300-70-01), valve disc 95/65×1 (W300-70-08); Exhaust spring W300-70-02A, intake spring W300-70-02B; crankshaft W300-50-01; crankshaft bearing 7618; Connecting rod bushing W300-60-06; connecting rod bearing upper piece W300-60-02A, connecting rod bearing lower piece W300-60-02B
	W3	V-belt B3048; piston ring 3W-30-02; piston rod packing 3W-10-29; piston 3W-30-01; intake valve plate 3W-80-09; Exhaust valve plate 3W-80-03; exhaust spring 3W-80-05, intake spring 3W-80-10; crankshaft 3W-50-01; crankshaft bearing 7610; Piston rod bushing 3W-10-25, connecting rod bushing 3W-60-07; connecting rod bearing upper piece 3W-60-02A; connecting rod bearing lower piece 3W-60-02B; Cross head 3W-40-01
	W4-1	V-belt C3048; piston ring 4W-30-03; piston rod bushing 4W-10-33; piston ring packing 4W-30-38; bushing 4W-10-34; piston 4W-30-01; annular valve plate 4W -70-04(Φ65/Φ39×1); Ring valve 4W-70-05(Φ100/Φ74×1); Exhaust spring 4W-70-07; Intake spring 4W-70-06; Crankshaft 4W-50-01; Crankshaft bearing 7610; Piston rod bushing 4W-10-33; Connecting rod bushing 4W-60-07; Connecting rod bushing 4W-60-07; Rod bearing upper piece 4W-60-02A; connecting rod bearing lower piece 4W-60-02B; cross head 4W-40-01
	W5-1	V-shaped sealing ring 5W-10-08; piston 5W-30-04; piston ring 5W-30-05; cross head 5W-40-01; crankshaft 5W-50-01; connecting rod bearing upper piece 5W-60-02A ; Connecting rod bearing lower piece 5W-60-02B; Connecting rod bushing 5W-60-06; Exhaust spring 5W-70-02A; Intake spring 5W-70-02B; Valve plate 5W-70-01 (Φ110/ Φ140×1); Valve plate 5W-70-08 (Φ95/Φ65×1); V-belt C3048; Piston rod bushing 5W-10-09; annular crankshaft bearing 7610; bushing 5W-10-25;

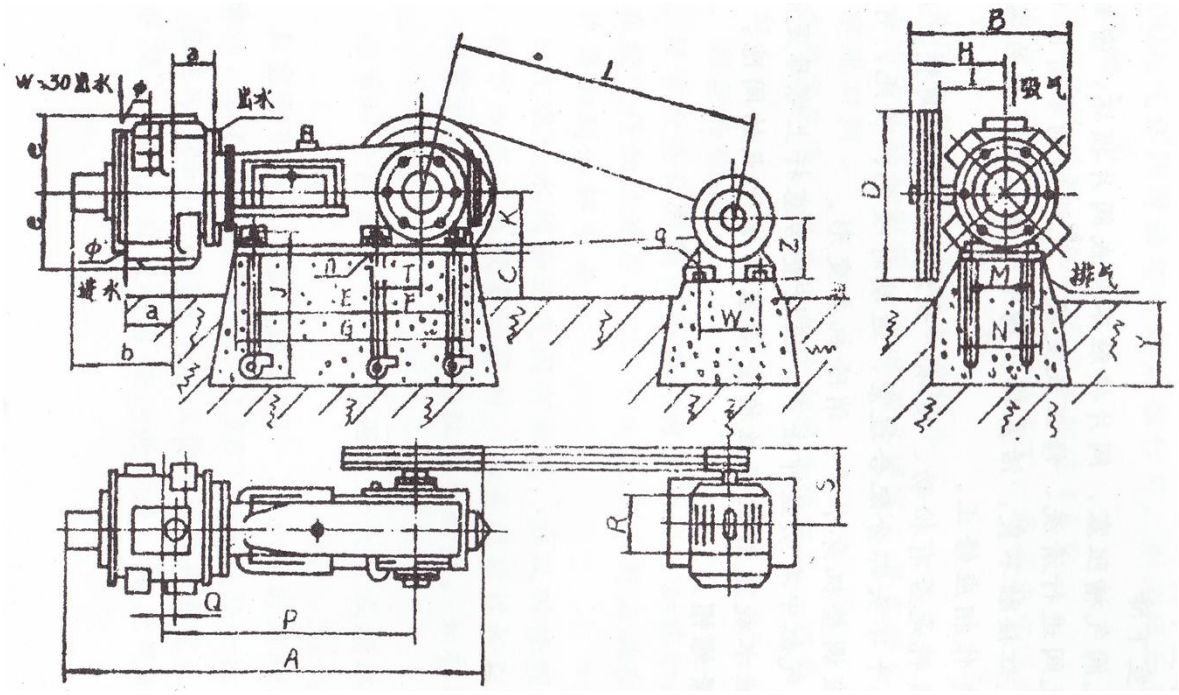
Note: The contents of this wearing parts list are not equivalent to the necessary accessories for random packaging.

VIII. Appearance and Installation Location and Dimensions

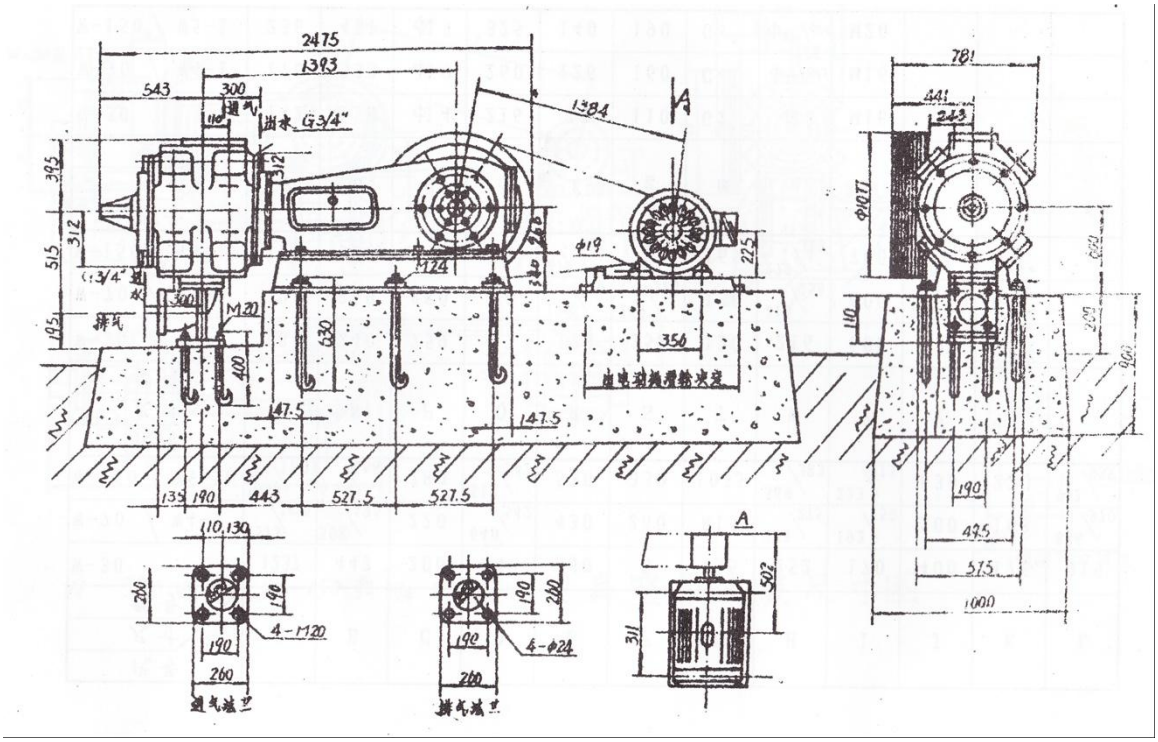
Unit: mm

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	R
W-3	1402	615	195	640	430	260	815	280	185	450	186	907	200	260	882	/	140
W4-1	1486	495	220	542				275	150	500	168	970			880	50	210
W5-1	1801	668	280	650	520	330	1035	383	213	630	220	935	260	326	1109	83	305

	S	T	W	X/Y	Z	Φ	a	b	d	e	f	g	m	q	n
W-3	240	130	216	235	132	G1/2”	170	/	Φ19	/	/	/	/	Φ12	M16
W4-1	326		254	600	160			333		260	126	160	G4”	Φ12/Φ15	
W5-1	495		318	700	200	G3/4 ”	236	431		325	140	190	G5 ”	Φ15/Φ19	M20



W-3, W4-1, W5-1 appearance and installation position diagram



W-300 appearance and installation position dimensional drawing

VIIII. Packing List

Model	W-300	W-3	W4-1	W5-1
Pump	1	1	1	1
Manual	1	1	1	1
Motor model/quantity	Y225M-6/1	Y182S-4/1	Y160M-4/1	Y200L 2-6 /1
V-belt model/quantity	D4953/5	B3048/4	C3048/3	C3048/6
Number of motor end pulleys	1	1	1	1
Anchor bolts/quantity	M24×630/6; M20×400/4	M16×500/6		M20×630/6
Nut specifications/quantity	M24/ 12; M20 /4	M16/12		M20/12
Washer specification/quantity	Φ24/6; Φ20/4	Φ16/6		Φ20/6

Product Quality and Warranty

Dear Respected User:

Hello!

In order to safeguard your legitimate rights and interests, repay your concern and love for the "Shangzhen" brand, and to better provide you with after-sales service, our company will comply with the relevant provisions of the "Product Quality Law" of the People's Republic of China. With this warranty and valid invoices, we will provide you with high-quality after-sales service. Our company promises the following:

The warranty period for the whole machine is one year, including three months for the rubber parts. The warranty period is calculated from the date of issuance of the invoice. During the warranty period, repairs are mainly performed.

After our company receives your repair information, we will arrive within 24 hours in cities located in Zhejiang Province and within 72 hours in other provinces and cities, except for special reasons such as weather and natural disasters. For users outside China, our arrival time will be discussed accordingly.

One of the following scenarios does not fall within the scope of our warranty, but the company can provide paid services:

1、 The product does not meet the factory technical specifications due to your use;

2、 Due to your production process, corrosive gases such as dust, ammonia, acid, etc. enter the pump chamber;

3、 Without the consent of the company, you disassemble it yourself, resulting in the product not meeting the factory technical specifications;

4、 No sales or valid invoice;

5、 The product model and machine number filled in the three-guarantee warranty are inconsistent with the product sent for repair;

6、 Exceeding the warranty period.

SHANGHAI VACUUM PUMP WORKS CO., LTD

Warranty

Product Name		Product Number		Quantity	
Product Number		Invoice Date		Date of Manufacture	

Purchase Unit Name		Certificate Number		Invoice Number	
Quality Issues					
Your Usage Conditions					

Unit (signature):_____Unit address:_____

Postal code:_____Telephone:_____

Contact person:_____Contact mobile phone:_____

To facilitate our door-to-door service for you, please fill in the walking route in detail:

_____

Repair date:_____Year_____Month_____Day

Information Feedback Form

Dear Respected User:

Hello!

Thank you for using our company's products. In order to provide you with after-sales service in a more timely and effective manner, please fill out the "Information Feedback Form" after receiving the goods and mail, fax or email it to our company. Appreciate!

Company Name				Postal Code	
Company Address				Contact Person	
E-mail		Telephone		Fax	
Product Model	Product Number	Certificate Number	Purchase Date	Quantity	Supplier Name

Remark					

SHANGHAI VACUUM PUMP WORKS CO., LTD

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