



State High-tech Enterprise

MS/MSS

Light Stainless Steel Horizontal Single-stage Centrifugal Pump

Operation Manual



Nanfang Pump Industry Co., Ltd.

E090101
subject to amendments



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Read this manual carefully before install, start the pump.
 Standard:Q/HNB010 (MSS Light stainless steel horizontal single-stage centrifugal Pump)

I. General

MS Series of pump is horizontal single stage centrifugal pump. It is connected with the motor by direct connection. The overall structure is very compact. The flow components of the pump are made of stainless steel. It can resist slight corrosion. Main components of the pump is made of pressed thin plate with the feature of light weight. Screwed inlet and outlet is provided for convenient connection.

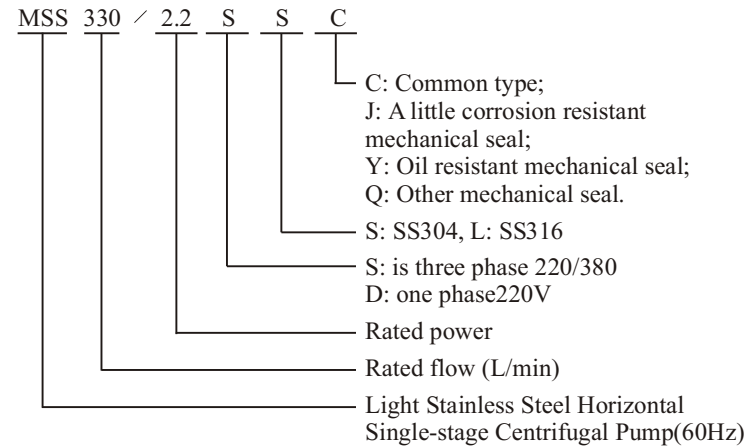
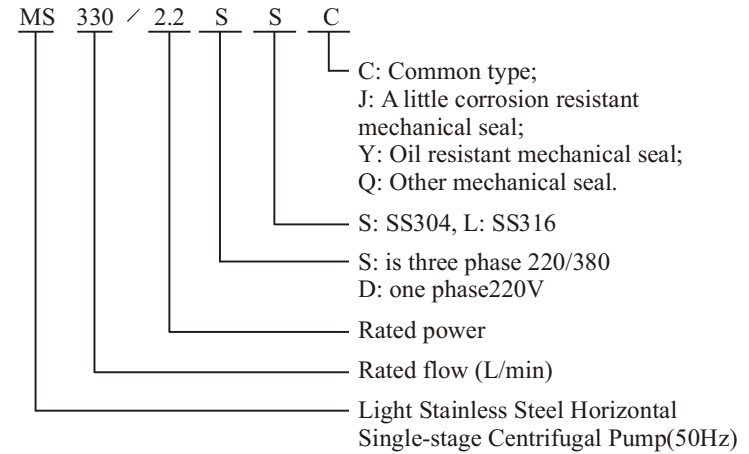
This pump is widely applicable to pressurization and feeding of industrial and civilian clean water or other liquids; water treatment system; water circulating system; agricultural irrigation, etc.

II. Working conditions

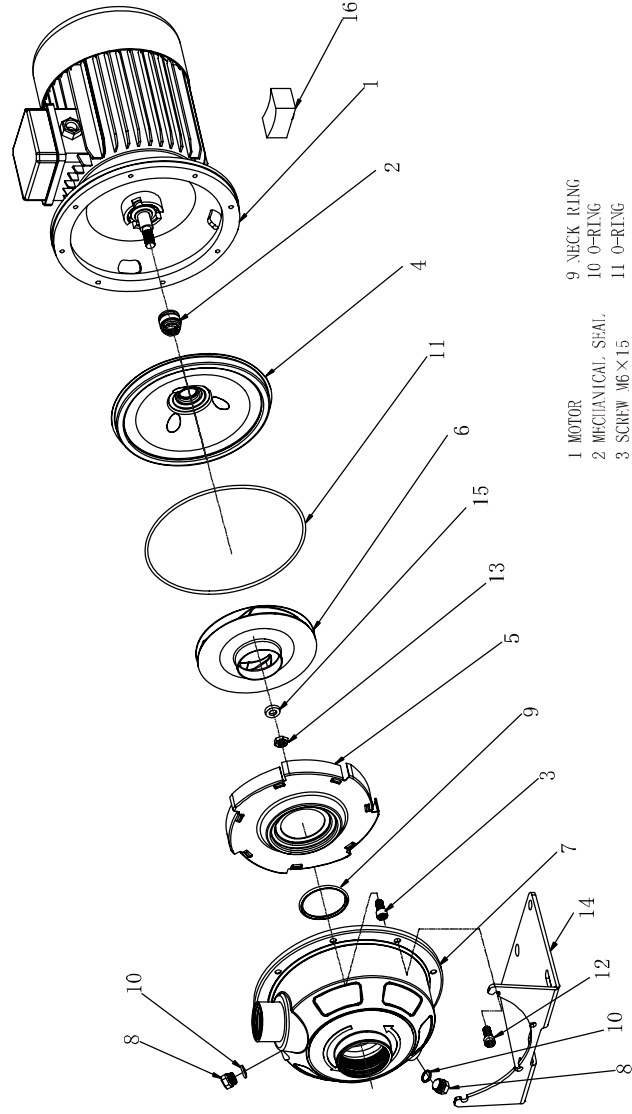
- Thin, clean, non-flammable and explosive, not containing the liquid with solid particle fiber;
- Able to transfer light corrosive medium(relative to the content of chloride ion in the medium, concentration of acid or alkali, whether rot to the rubber and mechanical seal materials);
- When the density or viscosity of the delivered medium is larger than that of clean water, large power motor is required;
- Liquid temperature -10°C to +85°C ;
- Ambient temperature: up to +40 ;
- Altitude: up to 1000m;
- Max. Pressure of the system is 8bar;
- Maximum suction stroke: It is determined in accordance with NPSH of the pump, medium temperature, sea level height of the installed position, losses of inlet pipeline, etc;
- Maximum inlet pressure: It is restricted by maximum work pressure.

III. Model definition

For example



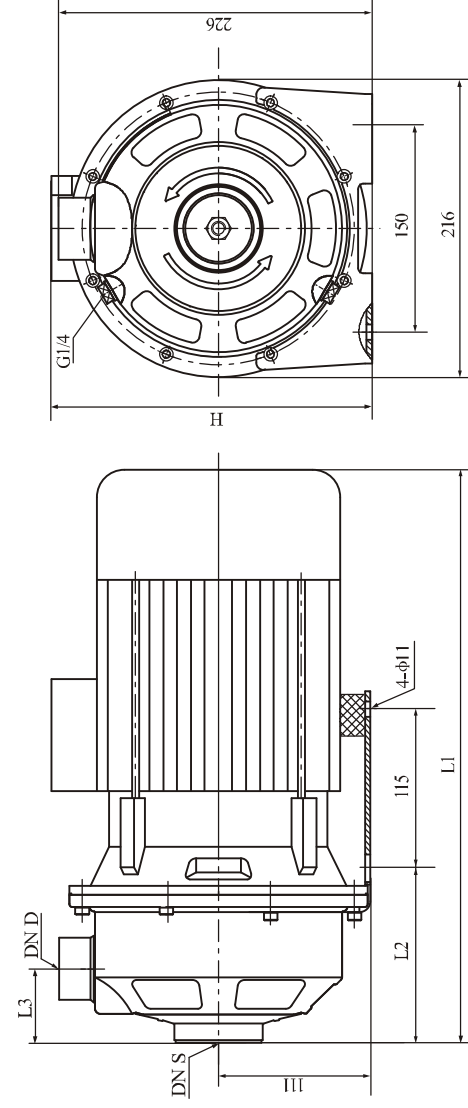
IV. Structure drawing



- | | |
|-------------------|-----------------|
| 1 MOTOR | 9 NECK RING |
| 2 MECHANICAL SEAL | 10 O-RING |
| 3 SCREW M6×15 | 11 O-RING |
| 4 SEAL BASE | 12 SCREW M6×20 |
| 5 DIFFUSER | 13 NUT |
| 6 IMPELLER | 14 BRACKET |
| 7 CASTING | 15 SPACER RING |
| 8 GAG | 16 SUPPORT FOOT |

MSS-080701

V. Installation



50Hz

Model	Motor		L1	L2	L3	H (3PH/1PH)	DN S	DN D	Weight
	Phase	Power kW							
MS60/0.37	3PH/1PH	0.37	328	113	51	216 / 230	G1 $\frac{1}{4}$	G1	10
MS60/0.55		0.55	328	113	51	216 / 230	G1 $\frac{1}{4}$	G1	12
MS60/0.75		0.75	361	113	51	223 / 245	G1 $\frac{1}{4}$	G1	14
MS100/0.55		0.55	328	113	51	216 / 230	G1 $\frac{1}{4}$	G1	12
MS100/1.1		1.1	361	113	51	223 / 245	G1 $\frac{1}{4}$	G1	16
MS160/0.75		0.75	375	127	54	223 / 245	G1 $\frac{1}{2}$	G1 $\frac{1}{4}$	14
MS160/1.1		1.1	375	127	54	223 / 245	G1 $\frac{1}{2}$	G1 $\frac{1}{4}$	16
MS250/1.1		1.1	375	127	54	223 / 245	G1 $\frac{1}{2}$	G1 $\frac{1}{4}$	16
MS250/1.5		1.5	415	127	54	232 / 253	G1 $\frac{1}{2}$	G1 $\frac{1}{4}$	20
MS250/2.2		2.2	415	127	54	232 / 253	G1 $\frac{1}{2}$	G1 $\frac{1}{4}$	23
MS330/1.5		1.5	415	127	54	232 / 253	G2	G1 $\frac{1}{4}$	20
MS330/2.2		2.2	415	127	54	232 / 253	G2	G1 $\frac{1}{4}$	23

60Hz

Model	Motor		L1	L2	L3	H (3PH/1PH)	DN S	DN D	Weight
	Phase	Power kW							
MSS100/0.75	3PH/1PH	0.75	361	113	51	223 / 245	G1 $\frac{1}{4}$	G1	14
MSS100/1.1		1.1	361	113	51	223 / 245	G1 $\frac{1}{4}$	G1	14
MSS100/1.5		1.5	401	113	51	232 / 253	G1 $\frac{1}{4}$	G1	20
MSS160/1.1		1.1	375	127	54	223 / 245	G1 $\frac{1}{2}$	G1 $\frac{1}{4}$	16
MSS160/1.5		1.5	415	127	54	232 / 253	G1 $\frac{1}{2}$	G1 $\frac{1}{4}$	20
MSS160/2.2		2.2	415	127	54	232 / 253	G1 $\frac{1}{2}$	G1 $\frac{1}{4}$	23
MSS250/1.1		1.1	375	127	54	223 / 245	G1 $\frac{1}{2}$	G1 $\frac{1}{4}$	16
MSS250/1.5		1.5	415	127	54	232 / 253	G1 $\frac{1}{2}$	G1 $\frac{1}{4}$	20
MSS250/2.2		2.2	415	127	54	232 / 253	G1 $\frac{1}{2}$	G1 $\frac{1}{4}$	23
MSS330/1.5		1.5	415	127	54	232 / 253	G2	G1 $\frac{1}{4}$	20
MSS330/2.2		2.2	415	127	54	232 / 253	G2	G1 $\frac{1}{4}$	23

VI. Pump installation

1. The pump shall be installed on the place with good ventilation, free of freezing, free of sun and rain;
2. The pipeline of suction inlet shall be as short as possible. An elbow shall be used in the corner to reduce the loss of pipeline;
3. It is better that the suction pipe should be larger than the inlet of the pump. Connect it with the pump after changing the diameter;
4. The suction pipe shall not be higher in the front and lower in the rear to prevent the air locks;
5. The suction end of the suction inlet shall be fully immersed into the liquid and ensure the joints to be well sealed to prevent from air in.
6. The mounting height of the pump shall not exceed its allowable suction height;
7. To avoid the distortion of the pump due to the gravitation from the pipeline, suction pipeline and discharge pipeline shall have separate support device;
8. Pressure gauge shall be installed on the outlet of the pump for observation and controlling the operation of the pump;
9. In case suction liquid level is lower than the suction inlet of the pump, the bottom valve shall be installed;
10. The motor shall be earthed. Electric devices shall be ensured not to be damaged by phase shortage, unstable voltage and overload;

Warning - Electrical connection and safety devices

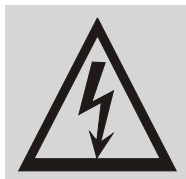
- The pump units should be connected to the power supply by the appropriately rated power cables according to the motor ratings.
- The pump units should always be equipped with safety devices as required in the standards (EN 809 and/or EN 60204-1) as well as by the national rules of the country where the pump is used.
- Despite the rules of any country, the power supply to the pump unit must be equipped with at least following electrical safety devices with appropriate ratings:
 - Emergency switch
 - Circuit breaker (as a supply disconnecting (isolating) device as well as an overcurrent protective device)
 - Motor overload protection

The following table is for suggestion:

380V(50Hz/60Hz)						
No.	Power input (kW)	Cable connection	Input current (A)	Cable spec (mm ²)	Circuit breaker (A)	Thermal protector (A)
1	0.37	Y	1	0.75	5	1.2
2	0.55	Y	1.4	0.75	5	1.7
3	0.75	Y	1.8	0.75	5	2.2
4	1.1	Y	2.6	1	5	3.1
6	1.5	Y	3.5	1	10	4.2
8	2.2	Y	4.9	1.5	10	5.9

The acoustic noise emission is around 75 dB(A).

Before open the terminal box, please shut off the power supply to prevent from power shock.



VII. Operation

1. Preparation before operation

1) Check whether the foot bolts are connected firmly with each components;

2).Close the outlet valve and various meters, screw off the water inlet gag, fill in the pump fully then tighten the casing cap again.

2. Start and run

1).Start the motor and confirm that the turning direction of the motor is identical with the direction indicated by the arrow on the pump, then slowly open the outlet valve and adjust it to required working condition. The flow rate shall be controlled within the scope of over striking curve of the performance Curve;

2).Check the fluctuation of outlet pressure gauge and the vibration of the pump. When confirmed that the liquid in the pump contains air, timely loosen air vent screw to vent the air.

3).Observe whether there is noise during operation. In case of abnormal cases, stop the pump and inspect it timely to solve it.

3. Stop the pump

Slowly close the outlet valve and various meters, then cut off the power.

VIII. Maintenance

1. It is the foreshadow of accident when pressure, voltage, vibration, noise, etc. has large difference with normal condition. Immediately stop operation and check it;

2. The temperature of the motor bearing cover should not exceed 70 degree;

3. Under normal condition, the leakage of mechanical seal shall not exceed 3ml per hour. After normal operation, in case water leakage exceeds this stipulation and increases gradually, please immediately stop the pump and inspect it;

4. In case the pressure of the pipeline on the pump is too large or foundation bolts are loose, intense vibration will generate during operation;

5. Strictly prohibit the operation without medium or not evacuating the air. Otherwise, it will result in the damage of mechanical seal;

6. Strictly prohibit the operation beyond the upper limit of stipulated flow rate (refer to performance curve) to avoid the burnt of the motor;

7. The pump shall not be started frequently. Starting times per hour shall not exceed 40 times at best;

8. The pump shall not be operated with closing the valve for a long time;

9. When power is off, the power supply shall be cut off to prevent the danger caused by sudden start of the pump when switch it on;

10. In case of freezing, after stopping the pump, the liquid in the pump shall be discharged;

11. Stand-by pump shall be operated periodically to make it available

12. When serve the pump; power supply should be switch off.

IX. Disassemble and assemble

The following steps should be done by the professional staff.

1. Disassemble

1). Screw off 8 socket head cap screws connecting the casing and motor, take off the bracket, casing and O ring for casing. If necessary, take off the diffuser and O ring for impeller;

2). Hold the pump shaft from the fan blade end using 2mm strap clamp, release the nut for impeller with socket wrench, then take off the impeller.

3). Take off the traveling ring of mechanical seal and be careful not to damage it;

4). Take off the seal base plate and stationary ring of mechanical seal. If necessary, disassemble the stationary ring of mechanical seal from the seal base plate. Be careful not to scratch the friction surface of mechanical seal.

2. Assemble

1). Clean the mounting hole of the seal stationary ring on the seal base plate and press in the seal stationary ring by hand;

2). Shaft extension of the motor shall be upwards. Encase the pump shaft into the seal base plate. Be careful not to make the pump shaft knock against the stationary ring of mechanical seal;

3). Encase the stationary ring of mechanical seal, and be careful to clean the friction surface firstly;

4). Hold the pump shaft by strap clamp, fit impeller, impeller cover, tighten nut.

5). Mount the pump seal ring on the seal base plate;

6). Mount the diffuser, neck ring for impeller on the casing and make the axial clearance of the neck ring as small as possible and move flexibly;

7). Mount the casing on the motor flange. Make the discharge of the pump aligns with the terminal box of the motor as well as ensure good match of the neck ring for impeller with the casing.

8). Fasten the pump and bracket by screws. Turn the impeller from the suction inlet by hand to ensure flexible running and without metal friction.

X. Trouble and trouble shooting

Faults	Possible reason	Solution
Motor's failed to start	<ol style="list-style-type: none"> 1. Power supply faults 2. Overload 3. Power cables faults 4. Pump is blocked by impurities 	<ol style="list-style-type: none"> 1. Check power supply. 2. Check system 3. Check cables. 4. Disassemble and get rid of impurities.
Insufficient flow	<ol style="list-style-type: none"> 1. Pump runs reversely. 2. Too big suction 3. There is air in the suction or in the pump. 4. Pipes bloc or there is air bag. 5. Neck ring wears out. 6. Valve is not open or not open correctly. 7. Low rotations. 8. Choose the wrong model. 	<ol style="list-style-type: none"> 1. Change the motor cables. 2. Lower the install position. 3. Vent air or re-fill water. 4. Service pump 5. Replace neck ring. 6. Open valve. 7. Check if the power voltage is too low. 8. Re-choose the model
Pump consumes too big power	<ol style="list-style-type: none"> 1. Too big flow 2. Motor bearing wears out. 	<ol style="list-style-type: none"> 1. Adjust flow 2. replace bearing or change motor.
There is noise in the pump and no water out	<ol style="list-style-type: none"> 1. Excessive high resistance in the suction pipeline 2. Bad sealing of the suction pipe or air leakage due to insufficient immergence of the suction end 3. Excessive high liquid temperature 	<ol style="list-style-type: none"> 1. Check suction pipeline 2. Eliminate the leakage 3. Reduce the suction height or liquid temperature
There is big noise with the pump	<ol style="list-style-type: none"> 1. Motor bearings wear out. 2. Pump parts wear out. 	<ol style="list-style-type: none"> 1. Replace the bearing 2. Replace the parts
Water leakage	<ol style="list-style-type: none"> 1. Wrong installation of the mechanical seal. 2. Mechanical seals wear out or damaged. 	<ol style="list-style-type: none"> 1. Reinstall mechanical seal 2. Replace mechanical seal
Motor temperature is too high or smoke out.	<ol style="list-style-type: none"> 1. Overload running. 2. Wrong voltage. 3. Wrong connection way. 4. Not good electric contact 5. Fan is blocked by impurity. 	<ol style="list-style-type: none"> 1. Adjust the discharge valve 2. Rectify the voltage 3. Make connection again 4. Make connection again 5. Remove impurity

XI. Important notice

1. Customers will not be advised if this manual is updated.
2. Pump will be guaranteed for one year under normal operation with the correct model. Wearing parts are not included.
3. Users shall be responsible for the damage if they disassemble the pumps by themselves in guaranteed period.