



*HANKUN QUALITY DRIVING THE FUTURE*

# HOSE PUMP

User Manual

## 1.Introduction

This manual is for the HH series hose pump and guides users in installation, operation, and maintenance. All persons,users and maintenance personnel must read this manual completely.

If you have any questions about this manual, please contact Hankun Fluid. Please also provide the following information:

- Model No.
- Series No.
- Order Information

## 2.Security and Guarantees

### 2.1 Use of the pump

The pump conforms to the national standard and is used for specific applications. Any other use which does not comply with envisaged use is not guaranteed. If you want to change your application, please consult Hankun Fluid in advance.

### 2.2 Responsibility

In any case, damage or wounds caused by non respect of security directives and maintenance instructions contained in this manual, or by negligence during the installation, use, service or repair is not covered by Hankun Fluid's warranty. In addition, safety instructions can be added according to working conditions or process needs. If you notice potential danger during the use of the pump, please contact Hankun Fluid or the distributor.

### 2.3 Reference

Users who install,use or repair pumps must read this manual in advance, and temporary operators must be supervised by skilled personnel. The operating sequence in this manual must be observed during operation, and this manual should be placed next to the pump for easy reference at any time.

### 2.4 Quality guarantee conditions

Except for hoses, seals, and shoes, the other parts of the pump provide a one-year warranty (damaged parts can be repaired or replaced free of charge), except for damage caused by illegal operations.

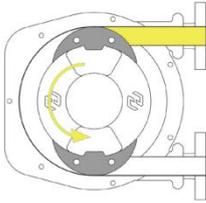
**Note: Hankun Fluid will not be able to accept a request of guarantee if the used parts are not of Hankun origin.**

## 3.Description

### 3.1 Nameplate of pump

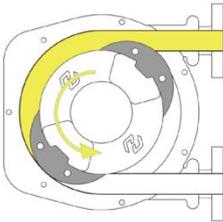
The nameplate is fixed on the bracket, including model No., serial No., flow rate, rotation(RPM), pressure, etc. The serial number contains a lot of information, such as: material, hose model, motor, reducer. There are corresponding nameplates on the motor and reducer, and you can find the speed ratio, voltage and other information.

## 3.2 Operating principle



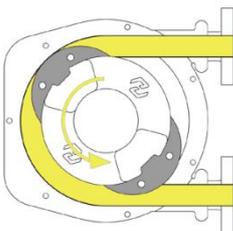
Stage 1

The hose is installed inside the pump casing and compressed by two pressing shoes assembled on the wheel. The first pressing shoe compresses the hose wall to generate a vacuum and suck the medium into the hose.



Stage 2

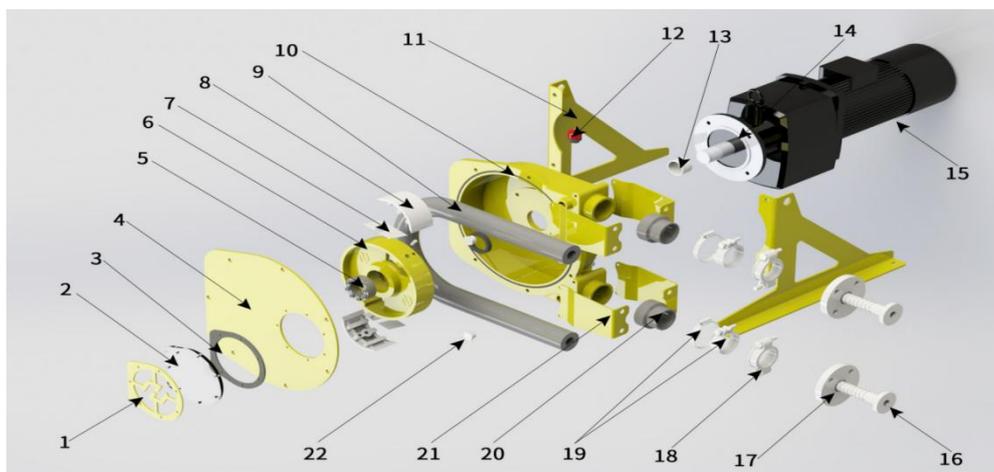
After the medium enters the hose, the second pressing shoe will continue to compress the hose and push the medium toward the outlet direction.



Stage 3

When the pressing shoe in the outlet direction detaches the hose, the other pressing shoe is already compressing the hose, so as to avoid internal back flow leakage, and then suck the medium in sequence with the movement of the wheel.

## 3.3 The structure of pump:



NO.	NAME	NO.	NAME
1	Window holder	12	Breather plug
2	Window	13	Shaft seal ring
3	Sight glass seal	14	Reducer
4	Pump cover	15	Motor
5	Hub	16	Insert
6	Wheel	17	Flange
7	Shim	18	Clamp on hose
8	Shoe	19	Clamp on sleeve
9	Hose	20	Sleeve
10	Pump casing	21	Bracket
11	Frame	22	Oil plug

### 3.4 Hose

In order to ensure the best performance of the pump and the life of the hose, Hankun Fluid provide our customer seven different kind of hoses according to very strict specifications, they are: NR, NBR, EPDM, NR FDA, CSM, FKM, NBR FDA, the hose material must be compatible with the medium, please consult Hankun Fluid to choose the most suitable one for your application.

Space distance needed for hose replacement(mm)

Model	Distance
HH05	400
HH10	400
HH15	500
HH20	500
HH25	800
HH32	1000
HH40	1000
HH50	1400
HH65	1400
HH80	2000

HH series hose size(mm)

Model	IDφ	Thickness	Length
HH05	5	13.5	570
HH10	10	11	570
HH15	15	11	830
HH20	20	9	830
HH25	25	14.5	1090
HH32	32	15.5	1360
HH40	38	13.5	1360
HH50	51	15	1820
HH65	60	13.5	1850
HH80	80	21.5	2910

### **3.5 Reducer**

The standard reducer equipped with HIGHPUMP is determined according to the radial load of the pump.

### **3.6 Motor**

The standard motor of the pump is a squirrel-cage motor (220V/1Ph or 380V/3Ph). If the working environment has explosion-proof requirements for the equipment, please consult Hankun Fluids in advance.

## **4. Installation**

### **4.1 Unpacking and check**

Please check in accordance with the packing list and cargo acceptance sheet to ensure that there is no damage during transportation. If there is any damage, please contact Hankun Fluids in time.

### **4.2 Conditions of use**

The HH pump can work within the temperature range of  $-20\sim+45^{\circ}\text{C}$ . The surface of the pump is coated with  $150\mu\text{m}$  polyurethane paint. It can be used in corrosive environments indoors or outdoors. The default motor protection level is IP55.

### **4.3 Setting**

#### **Precautions before installation:**

- The pump is equipped with a frame provided with four anchoring hole. It must be fixed on a firm horizontal base, and the slope of 1 meter should not exceed 5mm.
- There must be sufficient maintenance space around the pump. If there is no enough space, the pump needs to be moved out during maintenance to obtain maintenance space.
- Ensure that the workshop is well ventilated and leave enough space behind the motor hood to facilitate heat dissipation.

### **4.4 Pipeline**

#### **Inlet pipeline:**

- The inner diameter of the inlet pipeline should be larger than the inner diameter of the hose.
- The pipeline must be short and straight, and minimize the number of elbows in the pipe.
- Install a shutoff valve on the inlet pipeline of the pump, especially if the pump load is larger.
- Ensure that the pipeline can withstand the working pressure of the pump, and the inlet pressure can reach up to  $-1\text{bar}$ .

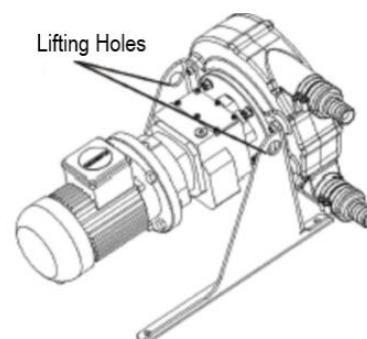
#### **Outlet pipeline:**

- The length of the straight pipeline at the outlet shall not be less than 20 times the inner diameter of the hose, and the pipe shall not be reduced in diameter.
- Minimize bending as much as possible.
- Reserve the installation space of the pulsation damper.
- The inner diameter of the pipeline is larger than that of the hose.
- Safety valve is recommended.
- Provide enough space for the installation of replacement of hoses and pulsation damper.
- Ensure that the pipeline can withstand the working pressure of the pump, the outlet pressure can reach up to 16bar.

## 4.5 Lifting

There are two lifting holes on the upper part of the frame. Pay attention to the following points when lifting:

- When lifting the pump, hoisting the reducer and motor as a whole, and using a sling or sling with an appropriate load.
- Never exceed the upper limits of lift in the table below.
- It is forbidden to use non-lifting holes for lifting.



**Schematic Diagram**



**Due to the center of gravity of the pump, it will tilt towards the pump head when hoisting, do make sure that people stand in a safe area to avoid personal injury.**

**HH series weight table (weight is for reference only, it will be different depending on the configuration)**

Pump models	HH05	HH10	HH15	HH20	HH25
Weight (Kg)	25	25	40	40	80
Pump models	HH32	HH40	HH50	HH65	HH80
Weight (Kg)	130	145	335	350	950

## 4.6 Flow regulation:

1.If the pump equipped with a frequency converter, the flow rate can be changed by adjusting the frequency of the frequency converter. The flow rate is linearly proportional to the frequency. When the frequency converter is 50Hz, it corresponds to the maximum flow rate of the pump (if you need to set the over frequency, please do it under the guidance of Hankun Fluid) . For the detailed instructions of the converter, please refer to "HIGHPUMP Hose Pump Inverter Instructions".

2.If the reducer is equipped with a mechanical viarator, the flow rate can be changed by rotating the hand wheel, and the flow rate is proportional to the scale on the dial.

## 5.Startup

### 5.1 Preparations

- 1.Qualified personnel connect the motor power supply in accordance with local electrical standard.
- 2.Ensure that the lubricating oil in the HH series pump reaches to the position of the window. If necessary, add lubricating oil through the breather plug or the window.
- 3.Check the rotation of the pump, it is recommended to configure the motor forward and reverse function to facilitate the replacement of the hose.



### 5.2 Startup

- Install pipes at the inlet and outlet of the pump.
- Make sure that the inlet and outlet valves are open.
- Start and observe the direction of rotation from the sight glas.

## 6.Maintenance

### 6.1 Empty and fill lubricating oil

- 1.Stop the pump
- 2.Place an oil tray under the oil drain plug.
- 3.If necessary, a throttle and drain line can be installed at the drain plug.
- 4.Make sure that the oil tray can hold the drained lubricating oil.
- 5.Unscrew the oil plug to drain the lubricating oil.
- 6.After draining, wrap the oil drain plug with PTFE band or apply waterproof glue to tighten it and close the drain tap.

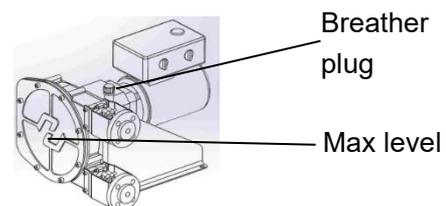
**Note: If the pump is installed with the inlet and outlet upwards, drain the oil through the screw holes in the lower part of the pump cover.**

7.Remove the sight glass and its seal and fill it with HIGHPUMP lubricating oil.

It is also possible to add lubricating oil through the breather cap located on the back of the pump,the required lubricant level is underneath the bottom edge of the sight glass (see the figure below).

8.Check the state of the seal, and reinstall the sight glass or tighten the breather cap.

Note: The breather of HH05-HH20 is located on the top of the pump.



### 6.2 Cleaning of the hose

Hose cleaning can be done without removing the hose, and can be done with water

or cleaning fluid (check compatibility with the hose material). With the transportation of a large amount of medium, especially the medium with high viscosity, easy to crystallize or with particles, it is necessary to clean up after use to prevent the medium from hardening inside the hose.

## 6.3 Hose replacement

- 1.This work must be performed by a technician familiar with this manual.
- 2.Power off the pump and close the inlet and outlet valves to reduce medium loss.
- 3.Wear the necessary protective clothing according to the medium.
- 4.Operating in accordance with the requirements of safety and environmental regulations for medium.
- 5.You can also ask Hankun fluid for the hose replacement video, which is convenient for further understanding the hose replacement process in detail.

## 6.4 Hose remove

- 1.Disconnect and remove the inlet and outlet pipes.
- 2.Drain the lubricating oil.
- 3.Loosen clamps on hose and sleeves at the entrance . (Figure 1)

Remove the insert and remove the flange. (Figure 2)

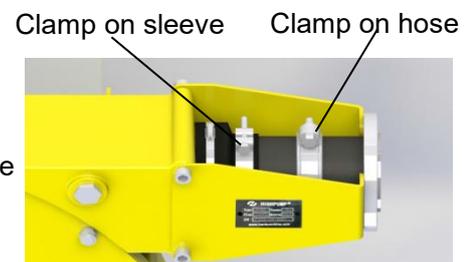


Figure 1

For HH05-HH20 pumps (plug-in type), remove the circlip, remove the bracket, and remove the insert.(Figure 3)



Figure 2

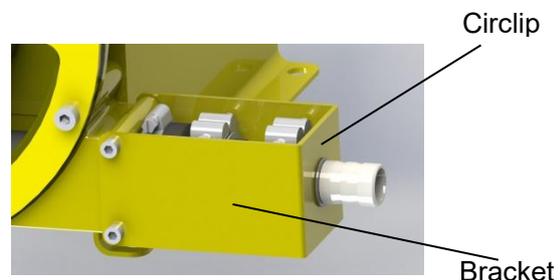


Figure 3

- 4.Loosen the hose clamp at the outlet, take out the insert and remove the flange and bracket(Figure 4),Remove the hose clamp on sleeve.(Figure 5)

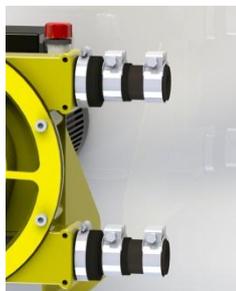


Figure 4

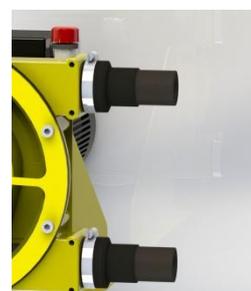
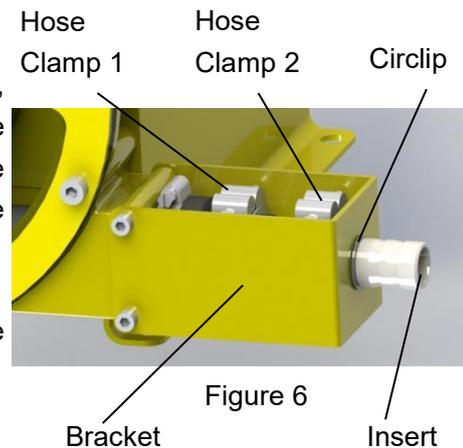


Figure 5

For pumps of model HH05-HH20 (insert threaded), loosen hose clamp 1 and 2 at the pump outlet. Take out the circlip and remove the bracket, pull out the insert, and remove the hose clamps 1, 2. Reference Figure 6



5. Jog run the motor to push out the hose on the outlet side of the pump casing.



**The hose can come out of the pump casing very fast and cause harm, check that nobody is in front of the pump's orifices while removing the hose.**

## 6.5 Pump casing cleaning

**Note: This operation is very necessary when the hose has been ruptured and the medium has contaminated the internal of pump casing.**

1. Unfasten cover screws by leaving two screws partly fastened to the casing, withdraw the pump cover slightly, and fix a lifting ring on the highest hole (see the picture below), the pump HH80 is equipped with a lifting ring, connect it here and slightly raise the pump cover, loosen the two remaining screws, and withdraw the pump cover.



2. Check the state of the cover seal and replace it if necessary.

3. Check the wear condition of the pressing shoes and replace if necessary.

4. When transporting abrasive medium, if the hose is broken, the shaft seal and seal ring may be damaged. Replace these parts if necessary.

5. Wash the pump casing with clean water or cleaning fluid and clean up the residue.

6. Dry the pump casing thoroughly.

7. Replace the cover seal into the seal groove.

8. Reassemble the pump cover.

## 6.6 Reassemble the hose



**The hose can't be assembled without the pump cover mounted.**

1. Clean the new hose carefully, slightly coat it with HIGHPUMP lubricant, and lightly lubricate the inside of the sleeve.

2. Insert the hose from the sleeve.



Figure 7

3. Jog run the motor and push in the hose and basically align the inlet and outlet ends. (Figure 7)
4. Assemble hose clamps at the inlet and outlet, put them on the hose but do not tighten them. (Figure 8)
5. Put the insert into the hose and tighten the hose clamp on the inlet end.
6. Assemble the bracket with bolts.
7. Jog run the motor to bring the bracket against the flange, then tighten the clamps and fasten the bracket and flange with bolts.
8. On the outlet end, tighten the clamps as well, reverse the motor to bring the bracket against the flange, fasten the bracket and flange with bolts. (Figure 9)  
For HH05-HH20 pumps (insert threaded), assemble the insert into the hose and tighten the clamps, then fix the bracket on the pump casing and fix them with a circlip.
9. Inject HIGHPUMP lubricating oil.
10. Remove the temporarily installed flange bolts and fix the inlet and outlet pipes.
11. Open the inlet and outlet valves.
12. Check the direction of rotation of the pump. Check for any possible lubricant leakage by the inserts, sleeves or pump cover.



Figure 8



Figure 9

## 7. Store

### 7.1 Storage of pump

The pump should be stored in a sheltered, dry place, and the storage room temperature is between  $-20^{\circ}\text{C} \sim +40^{\circ}\text{C}$ . To protect the pump, the inlet and outlet orifices can be blocked if necessary.

If the HH series pump stays without working for more than one month, withdraw the hose from the pump or withdraw one shoe, position the wheel so that the second shoe can be seen through the window. For pump models HH05-HH20, keep one lobe of the cam immersing in the lubricant.

**Note: If you can't withdraw the hose or one of the shoes, run the pump 5 minutes a week.**

### 7.2 Storage of hoses

Hoses must be stored sheltered from sunlight in a cool place. The performance of the hose will be reduced after more than 2 years, and the life of the hose will be greatly shortened due to aging.

## 8.Troubleshooting

Problem	Possible Reason	Solutions
Pump does not work	No power supply	Check whether the power to the pump has been switched on
		Check the connection of the motor
	The wheel stalls	Check the fixing of the hose
		Check the outlet pressure is not too high
Lubricant level detector alarm	Check the medium, hasn't sedimentate in the hose	
Low flow and pressure	Lubricant level detector alarm	Check the reason of detector alarm, if the hose has burst, replace the hose in time
	Insufficient shims under the shoe (HH)	Add shims according to shim tables, consult the manufacturer for details
	Air leakage at the pump inlet	Check the tightening of the clamps on hose and the sealing of the inlet pipe
	Inlet valve closed or partially closed	Fully open the valve
	Hose wear	Replace hose
	The medium is too viscous	Consult Hankun Fluid
Hose life is too short	The inlet is blocked or partially blocked	Unblocked the pipe at inlet to ensure the good flow of the medium
	The hose is not compatible with the medium	To ensure the compatibility of medium and hoses, consult Hankun Fluids
	Outlet pressure is too high	Check that the outlet pressure of the pump does not exceed 16bar (HH05 to HH20 does not exceed 10bar), check that the outlet pipeline is not blocked, and all valves are open
		Ensure that the safety valve is working properly
		Ensure that the friction loss of the pipeline does not exceed the value requested for an appropriate functioning of the pump
	Pump speed is too high	Slow down the speed
	Wrong shims (HH)	Check and adjust the shims
Medium temperature is too high	Consult Hankun Fluid	
Lubricant leakage around the pump cover	Bolt is not tight	Tighten the bolts
	Seal wear	Replace the seal

Problem	Possible Reason	Solutions
Lubricant leakage in the drainage channel	Worn shaft seal or seal ring	Replace these parts
Lubricant leakage at the sleeve	Deficient tightening of clamps or sleeve damaged	Tighten the clamps or replace the sleeves
Pulsations in pipeline	Deficient tightening of the pipe	Fix the pipeline

## 9. Shoe Shimming Table

Refer to table below to reduce or add shims. The following table indicates the necessary number of shims under every shoe according to the speed, pressure and temperature of medium. Follow these directions closely to optimize hose life and avoid internal parts possible damage.

When the temperature over 60°C, withdraw a shim compared to the table below.

For media with a viscosity over 3000CP or a concentration over 300g/l, remove a shim by comparing it with the table below.

For self-priming over 4m, add a shim as per the table below.

HH25		
Bar(PSI)	RPM	Number of Shims
$\Delta P \leq 5$	0-40	0
	40-160	0
$5 \leq \Delta P \leq 7.5$	0-40	2
	40-125	1
$7.5 \leq \Delta P \leq 10$	0-40	3
	40-105	2
$10 \leq \Delta P \leq 15$	0-40	4
	40-90	3

HH32		
Bar(PSI)	RPM	Number of Shims
$\Delta P \leq 5$	0-45	0
	45-140	0
$5 \leq \Delta P \leq 7.5$	0-40	2
	40-140	1
$7.5 \leq \Delta P \leq 10$	0-40	3
	40-110	2
$10 \leq \Delta P \leq 15$	0-40	4
	40-80	3

HH40		
Bar(PSI)	RPM	Number of Shims
$\Delta P \leq 5$	0-40	0
	40-120	0
$5 \leq \Delta P \leq 7.5$	0-40	2
	40-95	1
$7.5 \leq \Delta P \leq 10$	0-40	3
	40-75	2
$10 \leq \Delta P \leq 15$	0-40	4
	40-60	3

HH50		
Bar(PSI)	RPM	Number of Shims
$\Delta P \leq 5$	0-30	0
	30-100	0
$5 \leq \Delta P \leq 7.5$	0-30	2
	30-65	1
$7.5 \leq \Delta P \leq 10$	0-30	3
	30-50	2
$10 \leq \Delta P \leq 15$	0-30	4
	30-42	3

HH65		
Bar(Psi)	RPM	Number of Shims
$\Delta P \leq 5$	0-30	0
	30-90	0
$5 \leq \Delta P \leq 7.5$	0-30	2
	30-55	1
$7.5 \leq \Delta P \leq 10$	0-30	3
	30-48	2
$10 \leq \Delta P \leq 15$	0-30	4
	30-40	3

HH80		
Bar(Psi)	RPM	Number of Shims
$\Delta P \leq 5$	0-30	0
	30-90	0
$5 \leq \Delta P \leq 7.5$	0-30	2
	30-55	1
$7.5 \leq \Delta P \leq 10$	0-30	3
	30-48	2
$10 \leq \Delta P \leq 15$	0-30	4
	30-40	3

## 10. Lubricant Table (HH Series)

The table shows the amount of lubricating oil required for each type of pump. The hose pump only uses HIGHPUMP lubricating oil. Please refer to section 6.1 Empty and fill lubricating oil.

Pump specifications	HH05-10	HH15-20	HH25	HH32	HH40	HH50-65	HH80
Capacity(Liter)	0.2	0.8	2	3	3	13	40

## 11. Noise and Temperature

Noise:  $\leq 85$ dB

Temperature: Because of hose friction or high temperature of the medium, the pump cover and pump casing may become hot. If you need to control the temperature of the pump, please contact Hankun Fluid.

## 12. Pump Pressure Rating

Pump HH05-HH20 are limited to a maximum outlet pressure of 10bar.

Pump HH25-HH80 are limited to a maximum outlet pressure of 16bar

Using the pump beyond the specified working range is regarded as abnormal operation of the pump, which will cause the surface temperature of the pump casing to be higher than the maximum surface temperature T allowed by the safety level certification. The user must use the hose pump correctly within the specified pressure range.

### Safety protection

The temperature of the medium and the heating of the pump casing directly affect the hose life. The working temperature of the hose (and the heating of the pump) must be known and controlled, which depends on the following three parameters:

- The temperature of the medium
- Rotations of pump
- Outlet pressure

## 13. Security Control Measures

### 13.1 Mechanical risk

All protective measures (including cover, sight glass, ventilation hoods, coupling protection etc.) must be in place before operating the pump. Unless the hose is replaced, the power must be disconnected before other maintenance.

When replacing the hose, you must install the pump cover, wear protective clothing according to the medium requirements, and remove your hands from the bracket, inlet and outlet flanges.

During the maintenance of the pump, lift it correctly.

The pump frame must be firmly fixed on the horizontal base.

### 13.2 Electrical risk

Ensure that the electrical installation conforming to the standards required in the country of use especially regarding earth and thermal protection.

### 13.3 Operational risk

Check the compatibility of the products pumped

The shortened hose life or loss of medium caused by hose rupture is not covered by the warranty of Hankun Fluid. It is the operator's responsibility to prevent pumped liquid loss with additional hose rupture detectors or automatic shutdown valves. Ensure that the pump is compatible with the process requirements, and ensure that the pressure applied at the inlet and outlet is compatible with the pump. The rupture of the hose and its consequences must be considered:

- The pump casing will be filled with medium.
- If the inlet pipe is on load, the medium will be directly discharged into the pump casing and leak out of the pump.
- If the outlet pipe is under pressure, the medium will be forced back to the pump casing and leak out of the pump.

In order to prevent the above consequences, it is recommended to use a leak detector and an automatic shut-off valve. While draining the pump after the hose ruptured, pay attention to the pollution caused by the lubricant and the medium.

As a positive displacement pump, HIGHPUMP may cause severe over pressure when the outlet pipe is partially blocked.

Before each use, check the rotation direction of the pump and mount the window screws with airtight glue to prevent air leakage (HH series).

## 14. Instructions for Use of Reducer

1. When using for the first time, the rubber strip on the breather cap must be pulled off.
2. The reducer has been filled with the specified lubricating oil before leaving the factory.
3. The working environment temperature of the reducer is between  $-25^{\circ}\text{C} \sim +45^{\circ}\text{C}$ , and it should not be used beyond the range.
4. According to the working conditions of the reducer, the surface, lubricating oil and parts of the reducer may reach to a high temperature. Be careful of burns.

5. Unless otherwise specified, the lubricant is L-CKC220.
6. Stepless speed reducer must be adjusted during running, otherwise the parts will be damaged.
7. Stepless speed reducer must use UB-1 or UB-3 traction fluid instead of engine oil or gear oil, otherwise it may cause the output torque of the reducer to decrease or damage the parts.
8. Lubricant replacement time:  
The first use: 500 hours after running, after that it will be replaced every 4000 hours
9. Regularly check the oil level through the reducer sight glass. If the oil quantity is not up to the standard, please make up for it in time.
10. If the reducer has abnormal phenomena such as excessive noise, high temperature, oil leakage, etc., please stop the pump for inspection in time, or contact our after-sales service department.

## **15. Instructions for Use of Motor**

1. Normally the rated voltage of the motor is 380VAC or 220VAC, and the frequency is 50Hz or 60Hz.
2. The working mode of the motor is continuous working system (S1).
3. The protection class of the motor is IP55.
4. The normal working environment temperature of the motor is  $-25^{\circ}\text{C} \sim +45^{\circ}\text{C}$ , except for special requirements.
5. The relative humidity of the working environment of the motor should not be greater than 90%, otherwise the motor is prone to malfunctions.
6. The wiring terminal mark of the main outlet box is U.V.W, if there are special circumstances, please refer to the motor wiring diagram.
7. Wiring: Verify that the nameplate data is consistent with the power supply connected to the motor. The power supply cable should be selected according to the voltage, current, and power supply distance to ensure power supply safety. Perform star or delta wiring according to the instructions on the motor junction box. Retighten all fasteners and the grounding wire must be firm.
8. For motors used in explosion-proof areas, flameproof cable glands must be used at the outlet of the junction box and sealed tightly.
9. The on-site hose pump control cabinet should have thermal protection and short-circuit protection devices, and adjust its setting value according to the motor nameplate current.
10. If the motor has high temperature, excessive vibration, abnormal noise, or failure to start, please stop it for inspection in time, or contact our after-sales service department.

# **HIGHTPUMP<sup>TM</sup>**

## **HANKUN QUALITY DRIVING THE FUTURE**

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Version 1.3

Note :As the products improvements, specifications are subject to change without notice.Please kindly contact us for latest information.