

NHL/NHLF(T)(50/60Hz)

Horizontal Multistage Stainless steel
Centrifugal Pump



User Manual

Warm Reminder

Dear Customer:

Thank you for your choice! We understand that the smooth operation of every pump carries your expectations for efficient and safe use therefore, we are committed to providing higher quality products and services.

Please be sure to read this manual thoroughly to ensure that you operate properly during the receiving, installing, starting, maintaining, and troubleshooting of the product.

Due to technological updates and changes in market demand, some model's manuals may be updated. If you find any discrepancies between the actual operation and this manual, please contact us promptly, and we will provide you with professional solutions.

If you need to know more about the product parameters (including but not limited to performance parameters, installation dimensions, NPSHr curves, cross-sectional drawings, etc.).

Please read the user manual carefully before
installing and operating the product

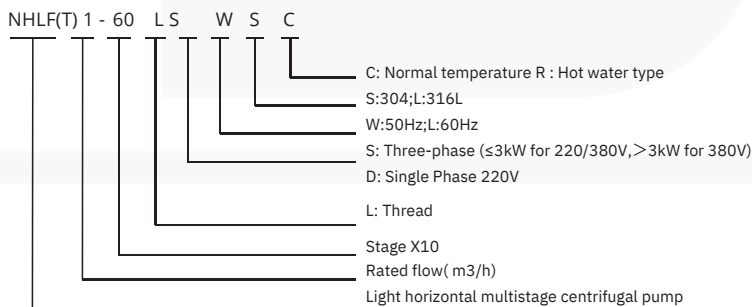
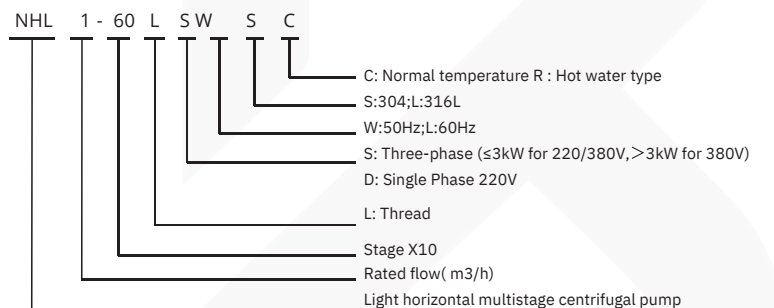
Product implementation standard: Q/AS 002 《Light
horizontal multistage centrifugal pump》

1. Product Overview

1.1 Product advantages

NHL/NHLF(T) pump is a non-self-priming light horizontal multi-stage centrifugal pump (hereinafter referred to as the pump), which has high efficiency, low noise, mild corrosion resistance, compact structure, beautiful appearance, small size, light weight, etc.

1.2 Model definition



1.3 Structure Description

● The pump is horizontal, multi-stage sectional type, the pump shaft is an extension of the motor shaft, and the pump is axial suction and radial discharge.

● The pump is composed of main components such as motor, seal seat, diffuser, impeller, chamber, mechanical seal and so on.

● The key parts of the pump, such as diffuser, impeller and chamber, are all made of stainless steel.

● The shaft seal for the pump is a single face mechanical seal, and the grinding block is Silicon carbide/graphite, and the grinding block of other materials can also be used according to customer needs.

● The basic type of pump and pipeline connection is in accordance with GB/T 7307 pipe threaded connection, and the pump structure is shown in the appendix.

1.4 Application

● The pump is suitable for low-viscosity, neutral, non-explosive, no solid particles or fibers of liquid, the liquid to be conveyed can not be chemically corrosive to the pump material (oil or oil-based liquid can be transported by special types of pumps)

● Circulation of air conditioning system

● Cooling system

● Water treatment (water purification)

● Industrial cleaning system

● Liquid transportation, circulation and lifting

● Hot and cold water

1.5 Scope

● Medium temperature: Normal temperature -15°C ~+70°C

Hot water type -15°C ~+105°C

● Max. pressure: 10 bar

● Medium alkalinity range: pH 5~9

● Maximum ambient temperature: +40°C

● Maximum suction pressure depends on max. working pressure..

● Minimum inlet pressure: Refer to NPSHr curve



When the specific gravity and viscosity of the pumped liquid are greater than that of water, the shaft power will increase, so a

motor that matches the shaft power must be used.

2. Receiving Products

2.1 Inspect product

● Order information verification

Please check the model, specifications, serial number and other information on the product nameplate to ensure that they are exactly the same as the order.

● Appearance integrity check

Carefully check the appearance of the equipment to confirm that there is no visible damage such as bumps, scratches or rust.

● Check the water pump

Turn the pump to confirm that it rotates freely without any sticking or abnormal noise.

● Abnormal handling process

If you find any abnormality with the product, please contact us immediately and we will respond immediately and provide a solution.

2.2 Lifting

When hoisting the entire product including the motor, follow the following instructions:

● 0.37-2.2 kW Pump: Lift the pump by the motor flange with a lifting strap or similar.

● 3-7.5 kW Pump with motor: Lift the pump by the eyebolts of the motor.

3. Install the product

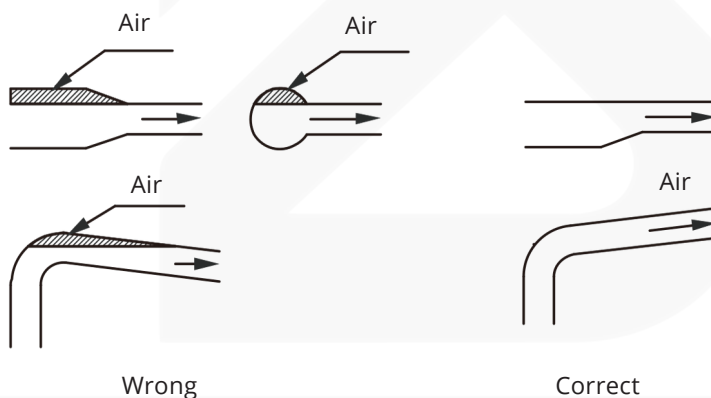
3.1 Installation conditions

The pump should never be installed with the motor upside down on a horizontal plane. The pump should be installed in a well-ventilated and ice-proof area, and the pump and motor should be at least 150mm away from obstacles so that there is enough air around the cooling fan of the motor. The pump should be installed on concrete or similar at a suitable height, or on a fixed ground or on a fixed bracket on the wall. Be careful not to concentrate the weight of the tubing on the pump to prevent damage to the pump.

3.2 Pipeline connection

In principle, the diameter of the inlet pipeline shall not be less than the diameter of the pump inlet. In order to minimize inlet friction losses, the inlet line should be as short as possible. Before installing the pump, check whether the piping system is equipped with a check valve to prevent liquid backflow. If the pump is used for boiler water supply, a check valve must be installed on the transport piping between the pump and the boiler. The "→" sign at the inlet and outlet sections of the pump indicates the direction in which the liquid passes through the pump. Before the pump is turned on, check whether the liquid can pass freely. Before the pump is installed, the inlet pipe should be cleaned, if it can not ensure no particle in the pipeline, it is necessary to install a strainer at 0.5-1m in front of the pump suction inlet (especially suitable for pumps with a flow rate of less than $8\text{m}^3/\text{h}$) to ensure the normal operation of the pump.

The inlet pipe should be installed to prevent the formation of air bags, see Picture 1



Picture 1

If it is possible that stop valve at the outlet is closed or the flow rate drops to zero, a bypass line needs to be installed on the outlet pipeline to ensure sufficient lubrication and cooling water passes through the pump.

3.3 Electrical connections



Before removing the motor terminal box cover and disassembling the pump, it is essential to ensure that the power supply has been turned off.

- The connections of electrical circuits must be performed by a qualified electrician.
- Make sure the motor is compatible with the power supply used. The motor leads must be connected to the power supply according to the wiring diagram attached to the terminal box and the regulations on the motor nameplate.
- The motor must be connected to a fast and effective motor starter, which ensures that the motor is not damaged by phase loss, unstable voltage and overload. The pump motor should be reliably earthed.

4. Start the product

- Check whether the pump is fixed firmly;
- Whether the pump is filled with water and whether the liquid can pass freely;
- Whether the power supply voltage is correct;
- Whether the direction of rotation is correct;
- Whether all pipelines are tightly connected and whether the pipelines can supply water normally;
- Whether the valve on the inlet pipeline is fully open;
- The outlet valve should be opened slowly after the pump has been started;
- If a pressure gauge is installed, check the working pressure;
- Check controller if there is. If the pump is controlled by a pressure switch, check and adjust the start-up and stop pressures. Check the full load current of the motor by the pressure switch should not exceed the maximum allowable current.

4.2 Procedure



Reading the warning sticker.

- The pump must be filled with water (or pumped liquid) to start.
- Check the direction of rotation.
- Fill the pump with water in the backfill system

Close the pump outlet valve, open the screw plug on the pump casing, slowly open the water inlet valve until the steady flow of water gushes out of the exhaust screw, and then tighten the exhaust screw plug. Fully open the check valve on the suction pipe.

- Fill the pump with water in an open system where the liquid level is lower than the pump:



Note: A check valve must be installed on the suction line.

Close the pump outlet valve, open the air release plug on the inlet and outlet chamber, inject the liquid into the pump through the air release hole, and re-screw the air release plug until the pump and suction line are completely filled with water.



The pump must not be started until it has been filled with liquid and completely vented the air.

Check the rotation direction.

Turn on the power and observe the rotation direction (look at the fan). The correct rotation direction should be as indicated by the arrow on the pump head.

That is, viewed from the motor drive end, the pump should rotate counterclockwise.

4.3 Precautions

- Slowly open the outlet valve and adjust to the desired working condition.
- The pump cannot be started too often. No more than 100 starts per hour is recommended;
- The use of the pump refers to the performance range of the thickened curve to prevent overheating caused by too small flow rate, overload of the motor due to excessive flow, etc.
- Pay attention to whether there is any noise when the pump is running, and stop the machine immediately for inspection and eliminate it in time if any abnormality is found.

5. Maintenance

5.1 Periodic Inspections

- Working and operating pressure of the pump
- Possible leaks
- Possible overheating of the motor
- Remove and clean / replace the filter (if the filter is installed)
- Disconnection time of motor overload
- Frequency of start-up and shutdown
- All control operations

5.2 Antifreeze measures

Pumps can be used in systems where water is already protected from freezing. If the pump is installed in a place prone to freezing, the appropriate amount of antifreeze must be added to prevent the liquid from damaging the pump due to freezing. If antifreeze is not available, the pump should be shut down in the event of a possible frost hazard. When the pump is decommissioned, the pump and the water in the system must be drained.

5.3 Long-term deactivation and storage

- When the pump is out of service for a long time, it should be cleaned and properly stored.
- The pump should be protected from rust and damage during storage.

6. Common faults and solutions



Before removing the cover of the motor terminal box and disassembling the pump, ensure that the power supply has been switched off.

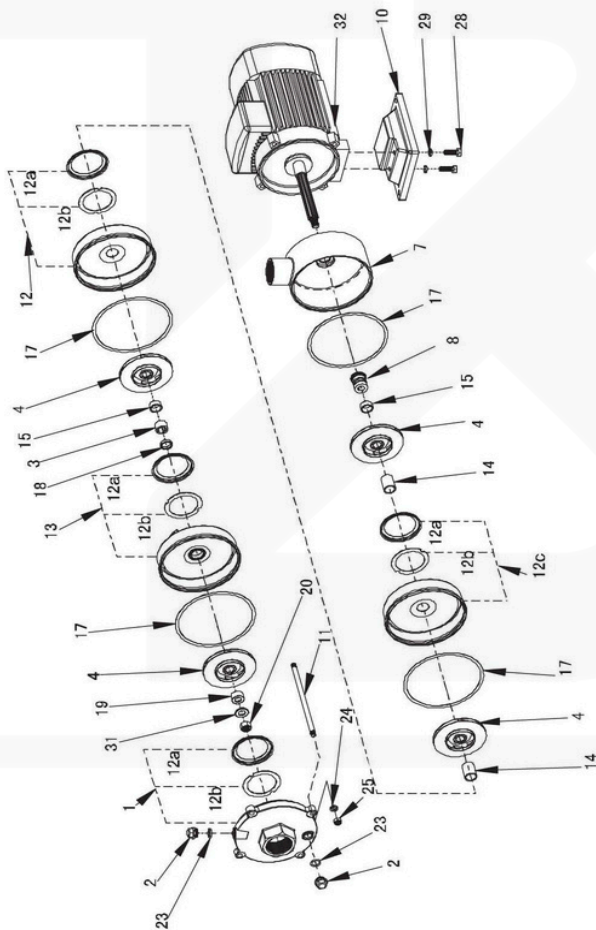
Fault	reason	Troubleshooting	Remark
The motor cannot start when switch on	a) Power failure	a) Check the power supply	
	b) The fuse is broken	b) Replace the fuse	
	c) Motor overload	c) Check the system	
	d) The starter is not in good contact or there is a problem with the coil	d) Replace the starter	
	e) There is a problem with the control circuit	e) Check the control circuit	
Starter overload, tripped out (motor powered on but tripped out immediately)	a) The fuse is broken	a) Replace the fuse	d) e) The user shall not dismantle and repair without authorization
	b) There is a problem with the contact of the overload device	b) Check the starter	
	c) The cable wiring is loose or there is a problem with the power supply	c) Check the cable wiring and power supply	
	d) There is a problem with the motor coil	d) Replace the motor	
	e) The mechanical part of the pump is blocked	e) Check the pump	

Starter overload, tripped out (motor powered on but tripped out immediately)	a) The fuse is broken	a) Replace the fuse	d) e) The user shall not dismantle and repair without authorization
	b) There is a problem with the contact of the overload device	b) Check the starter	
	c) The cable wiring is loose or there is a problem with the power supply	c) Check the cable wiring and power supply	
	d) There is a problem with the motor coil	d) Replace the motor	
	e) The mechanical part of the pump is blocked	e) Check the pump	
The overload device occasionally tripped out	a) The overload setting is too low	a) Reset	
	b) Periodic power failures	b) Check the power supply	
	c) Low voltage during peak demand	c) Voltage stabilizer	
The overload device didn't tripped out, but the pump didn't work	a) The starter is not in good contact or there is a problem with the coil	a) Replace starter	
	b) There is a problem with the control circuit	b) Check the control circuit	
Pumped water is not stable	a) The inlet line is too small	a) Enlarge the inlet pipeline	
	b) At the pump inlet, there is not enough water	b) Improve the system and find ways to increase the amount of water	
	c) The liquid level is too low	c) Try to raise the liquid level	
	d) The inlet pressure is too little compared to the water temperature, pipeline head loss and flow rate	d) Improve the system and try to increase the inlet pressure	
	e) The inlet pipe is partially blocked by impurities	e) Inspection and cleaning	
The pump is running but no water out	a) The inlet pipe is clogged by impurities	a) Inspection and decontamination	
	b) The foot valve or check valve is fully closed.	b) Check the foot valve and check valve	
	c) Leakage of inlet pipe	c) Check the inlet pipeline	
	d) There is air in the inlet pipe or pump	d) Refill the liquid and remove the air	
When power off, the pump runs reversely	a) Leakage of water inlet pipe	a) Check the inlet pipeline	
	b) The foot valve or check valve is faulty	b) Check the foot valve and check valve	
	c) The foot valve is blocked in the open or partially open position	c) Check the foot valve	
	d) There are air pockets in the inlet pipe	d) Check the inlet pipeline and remove the air	
The pump got abnormal vibration and noise	a) Leakage of water inlet pipe	a) Check the inlet pipeline	e) The user shall not dismantle and repair without authorization
	b) The inlet pipe is too small or partially clogged by impurities	b) Enlarge or check the inlet line	
	c) There is air in the inlet pipe or pump	c) Refill and remove air	
	d) NPSHa is not good	d) Improve the system or re-selection	
	e) The mechanical parts of the pump are rubbing	e) Check the pump	

7. Appendix

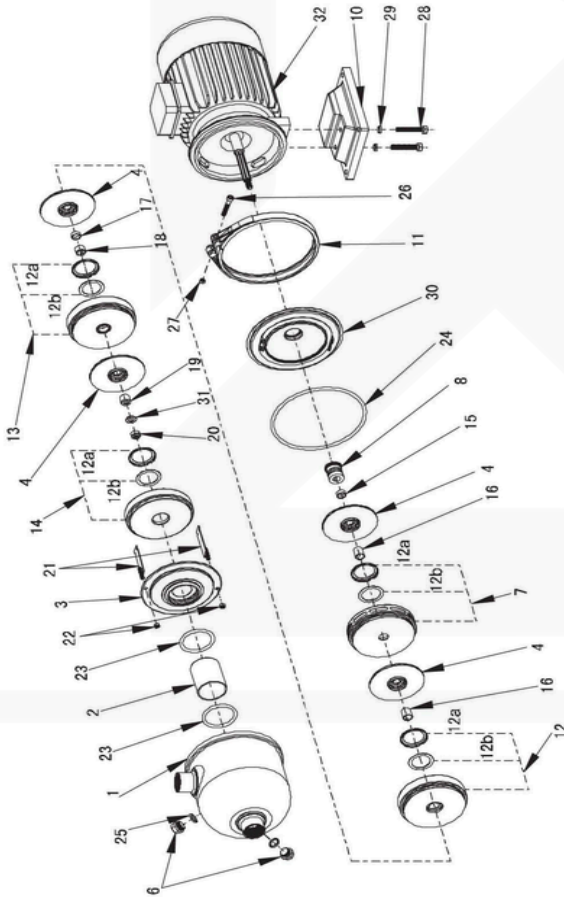
7.1 Exploded view.

- 1、 Suction 2、 Plug 3、 Bearing 4、 Impeller 7、 Discharge 8
- Mechanical seal 10 、 Base plate 11、 Staybolt 12、 Diffuser 12a、 Neck ring retainer 12b、 Neck ring 12c 、 Last diffuser 13 、 Support diffuser 14 、 Impeller sleeve 15 、 Impeller sleeve(L) 17 、 Seal ring 18 、 Impeller sleeve(S) 19、 First impeller cover 20、 Nut 23 、 O ring 24 、 Washer 25 、 Nut 28 、 Screw 29 、 Spring washer 31 、 Washer 32、 Motor



Picture 2 NHLF(T)1-25T

1. Inlet&outlet chamber
2. Connection pipe
3. Clamp plate
4. Impeller
6. Plug
7. Discharge diffuser
8. Mechanical seal
10. Base plate
11. Spannband
12. Diffuser
- 12a. Neck ring retainer
- 12b. Neck ring
13. Support diffuser
14. Inducer
15. Sleeve 1
16. Impeller sleeve
17. Impeller sleeve(S)
18. Bearing
19. First impeller cover
20. Nut
21. Staybolt
22. Nut
23. O ring
24. O ring
25. O ring
26. Screw
27. Nut
28. Screw
29. Spring washer
30. Seal plate
31. Washer
32. Motor



Picture 3 NHL1-20T