

NZS

Stainless Steel Horizontal Single-Stage Centrifugal Pump

Operation Manual



I. Product Overview

1.1 Product Advantages

NZS stainless steel horizontal single-stage centrifugal pump is manufactured from stainless steel plates using advanced processes such as stamping, bulging, and welding. Axial water inlet, radial water outlet. It features a compact structure, aesthetically pleasing appearance, high efficiency and energy saving, safety, and reliability.

1.2 Model Definition

NZS 65 - 40 - 125 / 2.2 S S C

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- C: Ambient temperature type
- S: 304; L: 316L
- S: Three-phase (3 kW) is 220/380V, $>3\text{ kW}$ is 380V)
- D: Single-phase 220V; B: Pump body
- Motor power (kW)
- Impeller nominal diameter (mm)
- Discharge diameter (mm)
- Suction diameter (mm)
- Stainless steel horizontal single-stage centrifugal pump

1.3 Structural Description

- The pump mainly consists of the pump casing, impeller, bracket, bracket liner, pump shaft, mechanical seal, base, O-ring, and other main components; see Appendix A for specific components.
- The pump is connected to the motor through the bracket and installed on the base; the motor uses an extended pump shaft to drive the impeller to rotate and perform work.
- Critical components: the pump casing adopts stainless steel plate stamping, bulging, and welding forming processes; the impeller adopts stainless steel plate stamping forming and laser welding forming processes; the pump shaft and bracket liner are made of stainless steel; the bracket is made of cast iron.
- Standard configuration BIA rubber bellows mechanical seal; dynamic ring, static ring, and rubber ring are available in a variety of materials, suitable for liquids of different temperatures and different pH values.

1.4 Scope of Application

- Clean, thin, non-flammable, and non-explosive liquids containing no solid particles and fibers.
- Liquid temperature between -20°C and $+100^{\circ}\text{C}$.
- Maximum ambient temperature: $+40^{\circ}\text{C}$.
- Maximum altitude: 1000 m.
- Maximum system pressure: 10 bar.



When the specific gravity and viscosity of the conveyed liquid are greater than those of water, the shaft power will rise, so a motor matched to the shaft power must be used.

II. Receiving Products

2.1 Inspect the product

Order information verification

Please verify the model number, specifications, serial number, and other information on the product nameplate to ensure they are completely consistent with the order list.

Appearance integrity inspection

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

Inspect water pump components

- Rotate the rotor to confirm that it rotates freely without jamming or abnormal noise. Check the mechanical seal, bearings, and other vulnerable parts for damage.
- Abnormality handling process
- If you find any abnormalities in the product, please contact us immediately, and we will respond promptly and provide a replacement solution.

III. Product Installation

3.1 Installation conditions



When installing the pump, it is strictly prohibited to let the motor hang upside down below the horizontal plane.

- The pump should be installed in a well-ventilated and freeze-proof location.
- The suction pipe should be as short as possible, and air pockets should be prevented.
- In principle, the diameter of the inlet pipe should not be smaller than the diameter of the pump inlet pipe.
- It is necessary to install a pressure gauge and regulating valve at the pump outlet to observe and control the pump's operation.
- When installing the pump, pay attention to the height difference between the suction liquid level and the pump inlet to ensure that the pump does not exceed its allowable suction lift during operation.
- When installing piping, care should be taken to avoid concentrating the weight and stress of the pipeline onto the pump to prevent deformation.
- The electrical wiring should ensure that the pump unit is protected from damage caused by phase loss, voltage instability, leakage, and overload.
- The pump rotates clockwise when viewed from the motor end.

For specific pump installation dimensions, refer to the product catalog; pump tightening torque is shown in the table below:

Fastener	Specifications	Torque N·m
Pump shaft and motor shaft set screw	M6	5~11
	M8	12 ~ 18
	M10	22 ~ 28
	M12	37 ~ 43
Connecting bolt, nut	M8	9~15
	M10	20 ~ 26
	M12	37 ~ 43
	M14	61 ~ 67
	M16	57 ~ 93

3.2 Lifting the Product When hoisting the entire product including the motor, follow these operating instructions:

- Pumps equipped with 1.1-2.2 kW motors: Lift the pump from the motor flange using slings or similar tools.
- Pumps equipped with 3-37 kW motors: Lift the pump using the eyebolts on the motor.

3.3 Piping Connection In principle, the pipe diameter of the inlet and outlet lines must not be smaller than the inlet and outlet diameters of the pump. To reduce friction loss in the inlet pipe, the water inlet pipe should be as short as possible. When installing piping, avoid vapor lock, especially on the suction side of the pump. (See Figure 1 below) Install an isolation valve at each end of the pump so that the system does not need to be drained when cleaning or servicing the pump. (See Figure 2 below)

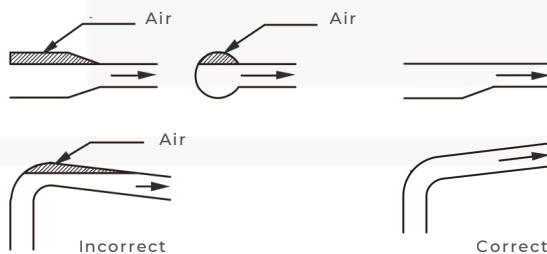


Figure 1

Ensure that adequate support is provided for the piping on both the pump suction and discharge sides as close to the pump as possible (see Figure 2 below). The mating flanges should fit snugly against the pump flanges without being subjected to tensile force, to prevent tensile stress from damaging the pump.

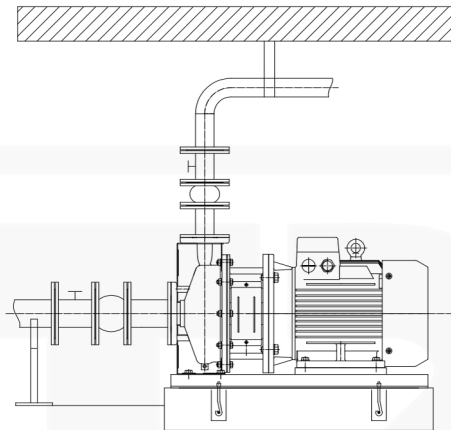


Figure 2

If there is a possibility that the shut-off valve at the outlet end may be closed (or the flow rate drops to zero), a bypass line must be installed on the discharge piping to ensure sufficient lubricating and cooling water passes through the pump.

3.4 Electrical Connection



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

The connection of electrical circuits must be operated by a certified electrician. Verify whether the motor matches the power supply used. The motor lead wires must be connected to the power supply in accordance with the wiring diagram affixed to the terminal box and the regulations on the motor nameplate. The motor must be connected to a fast and effective motor starter to protect the motor from damage caused by phase loss, voltage instability, and overload. Reliable grounding measures should be provided for the pump motor. Cable lock nut specifications are shown in the table below:

Frame Size	Lock Nut Specifications
71	M20x1.5-6H
80-132	M25x1.5-6H
160-180	M32x1.5-6H
200	M50x1.5-6H

The default connection methods and voltage rules for three-phase motors are shown in the table below:

Power Range	Voltage	Number of phases	Connection method	Default connection method	Default voltage	Description
≤3kW	220/380V	Three-phase	Delta / Y	Three-phase Y	380V	Delta connection voltage 220V
>3kW	380/660V	Three-phase	Delta / Y	Delta	380V	Y connection voltage 660V

IV. Starting the Product

4.1 Pre-start Inspection

Before starting the pump, check:

- Check whether the anchor bolts are tightened;
- Whether the pump is filled with water;
- Whether the grid 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 water inlet pipe is completely open; the outlet valve should be opened slowly after the pump has already started;
- If a pressure gauge is installed, check the operating pressure;
- All controls required for normal operation. If the pump is controlled by a pressure switch, check and adjust the start and disconnect pressures. Check via the pressure switch that the motor full-load current does not exceed the maximum allowable current.

4.2 Operating Steps



Read the warning label on the pump carefully before starting.

a: Priming the pump in a flooded suction system: The pump must be filled with water (or the conveyed liquid) before starting. Close the discharge valve, open the air vent valve on the pipeline, and slowly open the inlet valve until a steady stream of water flows out of the air vent valve on the pipeline (the pump casing chamber is completely filled with water), then close the air vent valve. b: Priming the pump in an open system where the liquid level is lower than the pump:



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

Close the pump discharge valve, disconnect the connection between the pump discharge flange and the pipe flange, and pour water into the pump from the pump discharge until the pump chamber is completely filled with water. Then properly reconnect the pump discharge flange and the pipe flange.



Do not start the pump before it is fully filled with liquid and air is completely purged! Pay attention to the direction of the air vent plug hole, and be careful to ensure that overflowing water does not injure people or cause damage to the pump and other components. In hot water applications, take special care to avoid the risk of scalding!

c: Check rotation direction

Turn on the power supply and observe the direction of rotation (look at the fan). The correct rotation direction should follow the rotation arrow affixed to the motor; that is, looking from the motor drive end toward the pump casing end, the pump should rotate in a clockwise direction.

4.3 Precautions

4.3.1 The pump must not be started too frequently. It is recommended that for motor power $< 4\text{kW}$, starts do not exceed 100 times per hour; for motor power $\geq 4\text{kW}$, starts do not exceed 20 times per hour. If the start frequency is found to be too high, the control equipment must be adjusted to reduce the start-stop frequency. At this point, it is necessary to check the installation conditions. 4.3.2 Pump operation should refer to the performance range of the thickened curve in the product brochure to prevent overheating caused by excessively low flow or motor overload caused by excessively high flow.

V. Maintenance and Servicing

5.1 Periodic Inspection

The pump requires the following regular inspections:

- Pump operating and running pressure;
- Potential motor overheating;
- Motor overload disconnection time;
- All control operations;
- Possible leakage;
- Remove and clean/replace all strainer meshes;
- Frequency of starting and stopping;

If any fault is found, check the system according to "Common Faults and Troubleshooting Methods".

5.2 Freeze Protection Measures

The pump can be used in systems where antifreeze measures have been implemented for the water. If the pump is installed in an area prone to freezing, an appropriate amount of antifreeze must be added to prevent the liquid pumped from freezing and damaging the pump. If there is no antifreeze, the pump should be stopped when there is a risk of frost; when the pump is stopped, the water in the pump and system must be completely drained. To drain the pump, loosen the drain plug at the lower end of the pump casing. Do not tighten the drain plug unless the pump is to be used again.

5.3 Long-term Disuse and Storage

- When the pump is to be out of use for an extended period, it should be thoroughly cleaned and properly stored.
- Pumps should be protected from rust and damage during storage.

5.4 Recommended Spare Parts

Part Name	Spare parts quantity (sets) every 2 years	Number of spare parts (sets) over 5 years
Mechanical seal	1	2
O-ring	1	2
Motor bearings	-	1
Sealing ring	-	1

VI. Common Faults and Troubleshooting Methods



Note: Before opening, repairing, disassembling, or moving the pump, ensure that the power supply has been disconnected and cannot be accidentally reconnected. For parallel pump installations, slow rotation of the standby pump is normal.

Fault	Cause Analysis
The motor cannot start	a) Power failure b) Blown fuse c) Motor starter tripped d) Motor starter contacts do not touch or have poor contact e) Control device fuse blown f) Motor fault
The motor starter trips immediately after turning on the control switch	a) Circuit fault b) Motor starter fault c) Loose cable connection d) Motor winding fault e) Mechanical jamming inside the pump f) Overload setting is too low
Motor starter trips occasionally	a) Overload setting is too low b) Periodic fluctuation of circuit voltage value c) Pressure difference between pump inlet and outlet is too low
The motor starter has not tripped, but the motor does not start	a) Power circuit fault b) Blown fuse c) Motor starter main wire and start coil fault d) Control circuit fault
Unstable pump flow	a) Pump inlet pressure is too low b) Inlet piping or pump inlet is blocked by debris c) Air is sucked into the pump
The pump is not discharging water	a) Inlet piping or pump inlet is blocked by debris b) Fault in the foot valve or check valve c) Suction piping leakage d) Air exists in the suction piping or pump e) Motor runs in reverse

Fault	Cause Analysis
Runs continuously (suddenly rotates or stops)	a) High pressure difference in the piping during shutdown b) Actual water consumption is greater than expected c) Leakage in the discharge pipe d) Incorrect pump installation direction e) Pipelines, valves, or strainers are blocked by debris f) Pump controller failure
Noise	a) Pump is running dry b) Pump shaft position is incorrect; pump cannot operate normally c) Rotor resonates with the unit d) Foreign matter inside the pump
Shaft seal leakage	a) Pump shaft position is incorrect b) Shaft seal quality problem
Extended periodic shutdown (suddenly rotates or stops)	a) High pressure in the piping during shutdown b) Flow rate is greater than expected c) Pump components jammed or entangled d) Pipelines, valves, or strainers are blocked by debris e) Discharge pipeline leakage
Pump rotates in reverse when the switch is disconnected	a) Suction pipeline leakage b) Foot valve or check valve failure c) Foot valve or check valve stuck in fully open or partially open position

