



NIS/NISF/NISO

End-suction centrifugal pump



Teksol Group LLC.



Warm Reminder

Dear Customer,

Thank you for choosing us! We understand that the smooth operation of each pump carries your expectations for efficient and safe water use. Therefore, we are always committed to providing higher-quality products and services. Please be sure to read this manual thoroughly to ensure that the product is received, installed, started, maintained, and troubleshooted according to the guidelines.

Due to technological updates and changes in market demand, some content for certain models in the manual 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 a professional solution.

If you need further information about product specifications (including but not limited to performance parameters, installation dimensions, NPSH curves, sectional diagrams, etc.), please scan the QR code below to view the corresponding product brochure.

CONTENTS

I. Product Overview	
1.1 Product Advantages-----	4
1.2 Model Definition-----	4
1.3 Structural Description-----	5
1.4 Scope of Application-----	6
II. Receiving Products	
2.1 Product Inspection -----	6
III. Product installation	
3.1 Installation Requirements-----	7
3.2 Hoisting products-----	8
3.3 NIS/NISF/NISO Pump Mounting Base-----	10
3.4 Pipeline Connections-----	12
3.5 Electrical Connections-----	13
IV. Product Launch	
4.1 Pre-start checks-----	14
4.2 Operating Procedures-----	14
4.3 Precautions-----	14
V. Maintenance and Care	
5.1 Regular Inspections -----	15
5.2 Antifreeze measures-----	15
5.3 Long-term disuse and storage-----	15
5.4 Recommended Spare Parts -----	15
VI. Common Faults and Troubleshooting Methods	
6.1 Common Faults and Troubleshooting Methods Table -----	16
Appendix A -----	17

Please read the operation manual carefully before installing and using the product.

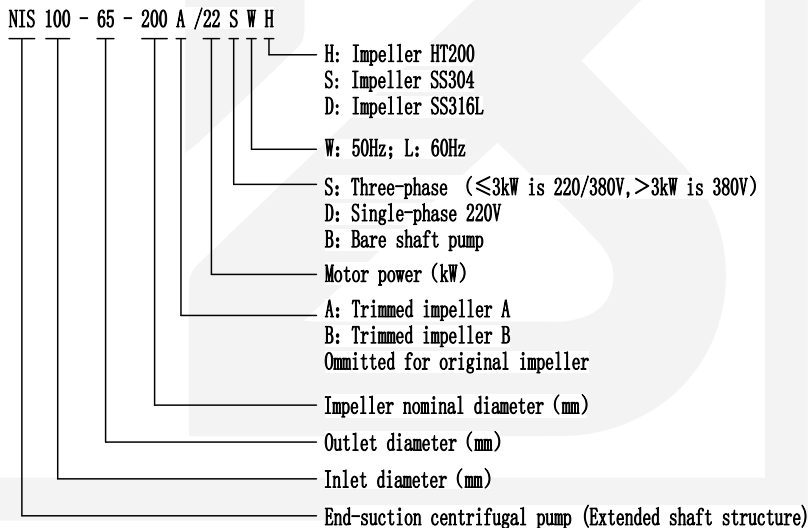
Product standard: Q/AS 009 "End-suction centrifugal pumps"

I. Product Overview

1.1 Product Advantages

NIS/NISF/NISO end-suction centrifugal pumps is a single-stage, non-self-priming, end-suction centrifugal pump designed according to ISO 5662 (ISO 2858) standards, with axial inlet and radial outlet. The pump's core hydraulic components, the impeller and casing, have undergone sophisticated simulation optimization design, resulting in superior performance and stable operation. All models can couple with a fully enclosed IEC standard motor. High-efficiency motors are more low-carbon and environmentally friendly to use.

1.2 Model Definition



NIS F 300 - 250 -315 /90 S W F

F: Wet parts SS304
L: Wet parts SS316L
J: Wet parts SS2205

W: 50Hz; L: 60Hz

S: Three-phase ($\leq 3\text{kW}$ is 220/380V, $> 3\text{kW}$ is 380V)

D: Single-phase 220V

B: Bare shaft pump

Motor power (kW)

Impeller nominal diameter (mm)

Outlet diameter (mm)

Inlet diameter (mm)

The flow-through components are made of stainless steel

End-suction centrifugal pump (Extended shaft structure)

NISO 100 - 65 -315 /11 S W H

H: Impeller HT200

S: Impeller SS304

D: Impeller SS316L

F: Wet parts SS304

L: Wet parts SS316L

J: Wet parts SS2205

W: 50Hz; L: 60Hz

S: Three-phase ($\leq 3\text{kW}$ is 220/380V, $> 3\text{kW}$ is 380V)

D: Single-phase 220V

B: Bare shaft pump

Motor power (kW)

Impeller nominal diameter (mm)

Outlet diameter (mm)

Inlet diameter (mm)

End-suction centrifugal pump (Long shaft coupled Structure)

1.3 Structural Description

Pump structure and dimensions are based on GB/T 5662 (ISO 2858) Standard Design

The NIS/NISF pump adopts a direct-drive connection between the pump shaft and the motor shaft. It mainly consists of the casing, impeller, pump cover, mechanical seal, O-ring, pump shaft, protective cover, base, and motor. See Appendix A for a list of specific components.

NISO The pump adopts a rear-mounted suspension structure design and mainly consists of a casing, impeller, pump cover, mechanical seal, and O-rings, suspension components, couplings, coupling covers, bases, and motors. The pump and motor are connected by a coupling.



BZT PUMPS

See Appendix A for a list of specific components.

Key pump components: casing, pump cover, impeller, can be made of cast iron or stainless steel. The bracket and suspension body are made of cast iron, and the pump shaft is made of stainless steel.

The sealing ring adopts a floating sealing ring structure, which provides good sealing effect and reliable operation.

Standard configuration includes O-rings and rubber bellows mechanical seals. Various materials are available for the dynamic and static rings and rubber seals, suitable for liquids of different temperatures and pH values.

1.4 Scope of application

A clean, thin, non-flammable, non-explosive liquid that does not contain solid particles or fibers.

Liquids with a temperature between -15 and +110

Maximum ambient temperature +40

Highest altitude 1000 meter

Maximum pressure 16bar



When the specific gravity and viscosity of the liquid pumped by the pump are greater than water, the shaft power will increase, so a motor that matches 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 optional solution.

III. Product Installation

3.1 Installation conditions

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, care should be taken to avoid concentrating the weight and stress of the pipeline onto the pump to prevent deformation.

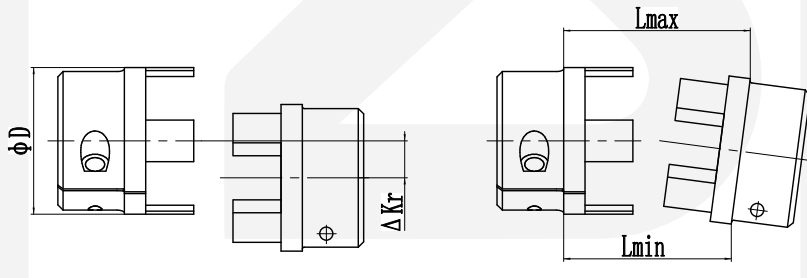
The electrical wiring should ensure that the pump unit is protected from damage caused by phase loss, voltage instability, leakage, and overload.

The pump rotates clockwise when viewed from the motor end.

For NISO pump, before operating the pump, the coupling must be aligned and adjusted to prevent damage to the pump due to misalignment. The axial and radial deviations of the coupling should conform to the table. 1. Requirements, dimensions shown in the following picture. 1.

Table 1

Dimensional deviation	Coupling specifications								
	φ55	φ65	φ80	φ95	φ105	φ120	φ135	φ160	φ200
Maximum Kr	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4
Maximum Lmax-Lmin	0.67	0.79	0.98	1.16	1.28	1.47	1.65	1.95	2.15



Picture 1

For detailed installation dimensions, please refer to the product catalog.

For pump tightening torque, please refer to Table 2 below.

Table 2

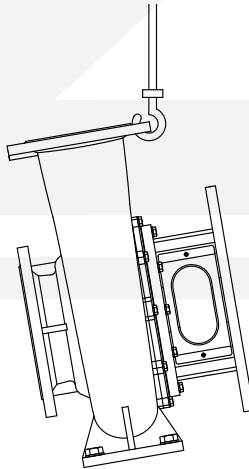
Fastener	Specification	Torque N · m	Product
Pump shaft and motor shaft set screws	M6	7 ~ 9	NIS/NISF end-suction centrifugal pump
	M8	14 ~ 16	
	M10	23 ~ 27	
	M12	38 ~ 42	
	M16	87 ~ 93	
Hex socket screws for couplings	M6	7 ~ 9	NISO end-suction centrifugal pump
	M8	11 ~ 13	
	M10	21 ~ 25	
	M12	38 ~ 42	
	M16	87 ~ 93	
	M20	116 ~ 124	
Connecting bolts and nuts	M8	11 ~ 13	All models
	M10	21 ~ 25	
	M12	38 ~ 42	
	M16	87 ~ 93	
	M20	116 ~ 124	
	M24	196 ~ 204	
Sealing clamp and casing / Pump cover	M4	3 ~ 5	All models
	M5	5 ~ 7	
	M6	7 ~ 9	

3.2 Hoisting products

When hoisting products, follow these guidelines

3.2.1 NIS/NISF Casing hoisting

Hook and lift the pump by slings



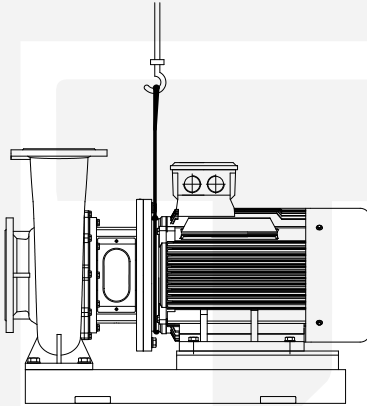
Proper hoisting of the casing

3.2.2 NIS/NISF Complete pump lifting

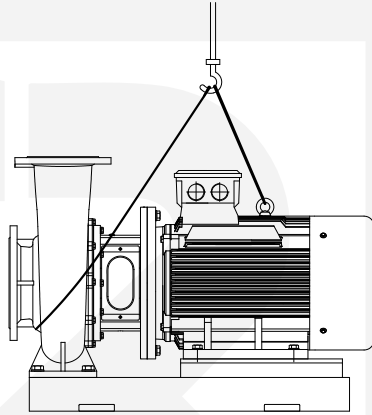
For pump motor power $\leq 2.2\text{kW}$: the pump should be lifted by slings at the motor flange.

For pump motor power $\geq 3\text{kW}$: Do not lift the entire pump by motor lifting ring; Lift the pump by slings on the pump flange and the motor lifting ring.

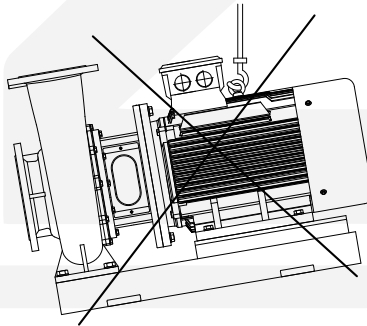
Note: Do not lift the entire NIS/NISF pump only by the motor lifting eye.



Proper hoisting of $\leq 2.2\text{kW}$ pumps



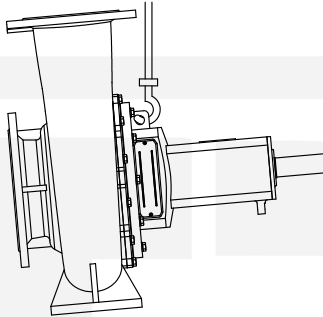
Proper hoisting of $\geq 3\text{kW}$ pumps



Improper hoisting of the entire pump

3.2.3 NISO bare shaft pump hoisting

Hook and lift the pump by slings.

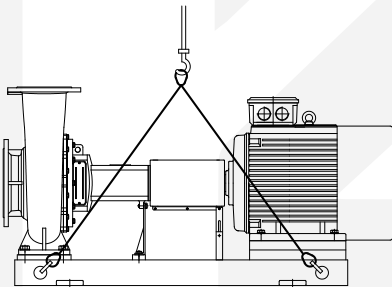


Proper hoisting of the bare shaft pump

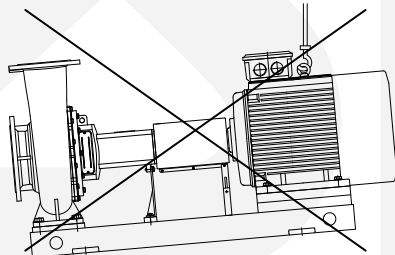
3.2.4 NISO Pump Installation

For NISO pump, there are lifting eye holes in the base frame. Lift the pump by slings on the lifting eye holes in the base frame.

Note: Do not lift the entire NISO pump only by the motor lifting eye.



Proper hoisting of the entire pump



Improper hoisting of the entire pump

3.3 Base mounting for NIS/NISF/NISO pump

The pump is recommended to be installed on a flat and sturdy concrete base. The base must be sufficiently strong, stable and durable (see Picture 2 below).

The distance X from the pump base to the edge of the base should be ≥ 100 mm

The weight of the base should be $\geq$ the total weight of the pump 1.5 times

The minimum height of the base is calculated as follows:

$$h_f = \frac{m_{\text{pump}} \times 1.5}{L_f \times B_f \times \delta_{\text{concrete}}}$$

h_f represents the height of the base, in meters (m) . m_{pump} is the mass of the pump, in kg .

L_f is the length of the base, in meters (m) .

B_f is the width of the base, in meters (m) .

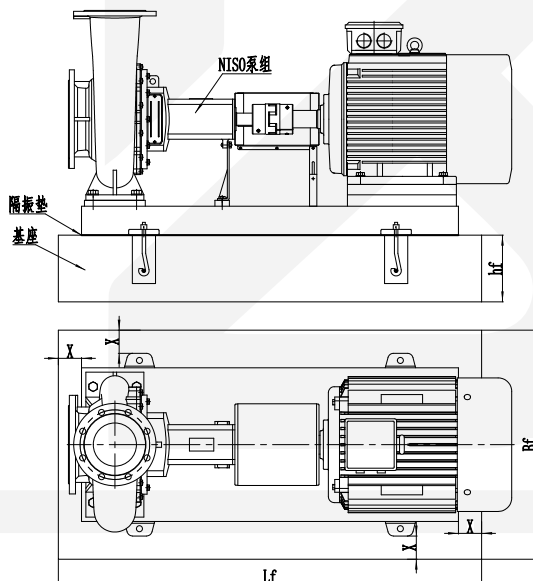
δ_{concrete} This is the density of concrete, expressed in kg / m^3 , typically taken as $2200 \text{ kg} / \text{m}^3$

3.3.1 NISO Pump base grouting

There are grouting holes in the NISO pump base. To prevent the transmission of vibration during pump operation, grouting the pump base depends on the number of poles and the power of the motor used in the pump, as detailed below:

For pump motor power $\leq 22\text{kW}$, for both 2-pole and 4-pole pumps, the pump base can be cement grouting or without grouting .

For pump motor power $\geq 30\text{kW}$, for the 2-pole pump, the pump base must be fixed with cement grouting. For the 30kW 4-pole pump, the pump base can be cement grouting or without grouting

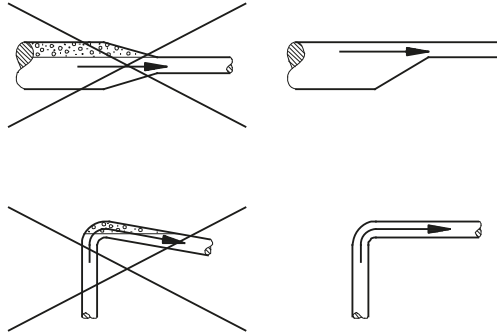


Picture 2

3.4 Pipeline connection

In principle, the inlet and outlet pipe diameters of the pipeline should not be smaller than the inlet and outlet pipe diameters of the pump. To reduce friction loss in the inlet pipeline, the inlet pipe should be as short as possible.

When installing piping, avoid creating air locks, especially on the pump inlet side. (See picture 3 below)

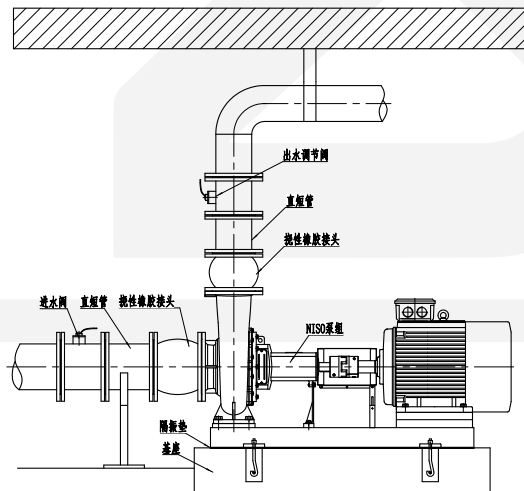


Picture 3

Install an isolation valve at each end of the pump so that the system can be drained when cleaning or maintenance of the pump is required. (See diagram below) 4)

Ensure that the piping is adequately supported as close to the pump as possible (both the pump inlet and outlet sides).

The counter flange should fit snugly against the pump flange without being subjected to tensile force, to prevent damage to the pump from tensile force.



4

3.5 Electrical connection



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

Electrical wiring connections must be made by a qualified electrician.

Ensure that the motor is compatible with the power supply. The motor leads must be connected to the power supply according to the wiring diagram posted on the terminal box and the specifications on the motor nameplate.

The motor must be connected to a quick and effective motor starter to ensure that it is not damaged by phase loss, voltage instability, or overload. The pump motor should be reliably earthed.

The specifications for cable locknuts are shown in the table below:

Frame size	Locking nut specifications
71	M20x1.5-6H
80-132	M25x1.5-6H
160-180	M32x1.5-6H
200-225	M50x1.5-6H
250-315	M63x1.5-6H
355	M72x2-6H

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

Power range	Voltage	Number of phases	Connection	Default connection	Default voltage	Remark
≤ 3kW	220/380V	Three-phase	/Y	Y	380V	connection voltage 220V
> 3kW	380/660V	Three-phase	/Y		380V	Y-connection voltage 660V

IV. Product Launch

4.1 Pre-start checks

Before starting the pump, check

Check if the anchor bolts are tightened;

Is the pump full of water?

Is the mains voltage correct?

Is the rotation direction correct?

Check that all pipes are securely connected and that the water supply system is functioning properly;

Check if the valve on the inlet pipe is fully open; the outlet valve should be opened slowly after the pump has started.

If a pressure gauge is installed, check the working pressure;

All controls required for normal operation. If the pump is controlled by a pressure switch, check and adjust the start-up and disconnect pressures. Check the motor's full-load current using the pressure switch; it should not exceed the maximum permissible current.

4.2 Operating Procedures

a: Filling the pump with water in a backflow system: The pump must be filled with water (or the liquid being transported) before it can be started.

Close the outlet valve, open the air vent valve on the pipeline, and slowly open the inlet valve until a steady flow of water flows out of the air vent valve on the pipeline (the pump chamber is completely filled with water), then close the air vent valve.

b: In an open system, fill the pump with water when the liquid level is lower than the pump level.



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

Close the pump outlet valve and disconnect the connection between the pump outlet flange and the pipe flange. Pour water into the pump from the pump outlet until the pump chamber is completely filled with water. Then reconnect the pump outlet flange and the pipe flange.



Do not start the pump until it is fully filled with liquid and all air has been purged! Pay attention to the direction of the vent plug on the air release hole, and be careful to ensure that spilled water does not injure people or damage the pump or other components. Extreme caution in hot water applications to avoid the risk of scalding!

c: Check the direction of rotation

Turn on the power and observe the rotation direction (look at the fan). The correct rotation direction should be as shown by the rotation arrow pasted on the motor. That is, when looking from the motor drive end to the casing end, the pump should rotate clockwise.

4.3 Precautions

4.3.1 The pump should not be started too frequently. It is recommended that for motor power < 4kW, not exceeding 100kW per hour 100 starts; for motor power ≥ 4 kW, no more than 20 starts per hour. If too frequent starts are found, the control equipment must be adjusted to reduce the start-stop frequency. At this point, it is necessary to check the installation.

4.3.2 Refer to the performance range of the bolded curve in the product catalog when using the pump to prevent overheating due to insufficient flow or motor overload due to excessive flow.

V. Maintenance and Care

5.1 Regular inspection

The pump needs to be checked regularly in the following ways:

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

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

5.2 Antifreeze measures

Pumps can be used in an antifreeze system. If the pump is installed in an area prone to freezing, an appropriate amount of antifreeze must be added to prevent the pumped liquid from freezing and damaging the pump. If antifreeze is unavailable, the pump should be shut down in cases of potential frost hazard, and the pump and the water in the system must be drained when the pump is not in use.

To drain the water pump, loosen the drain plug at the bottom of the 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	2

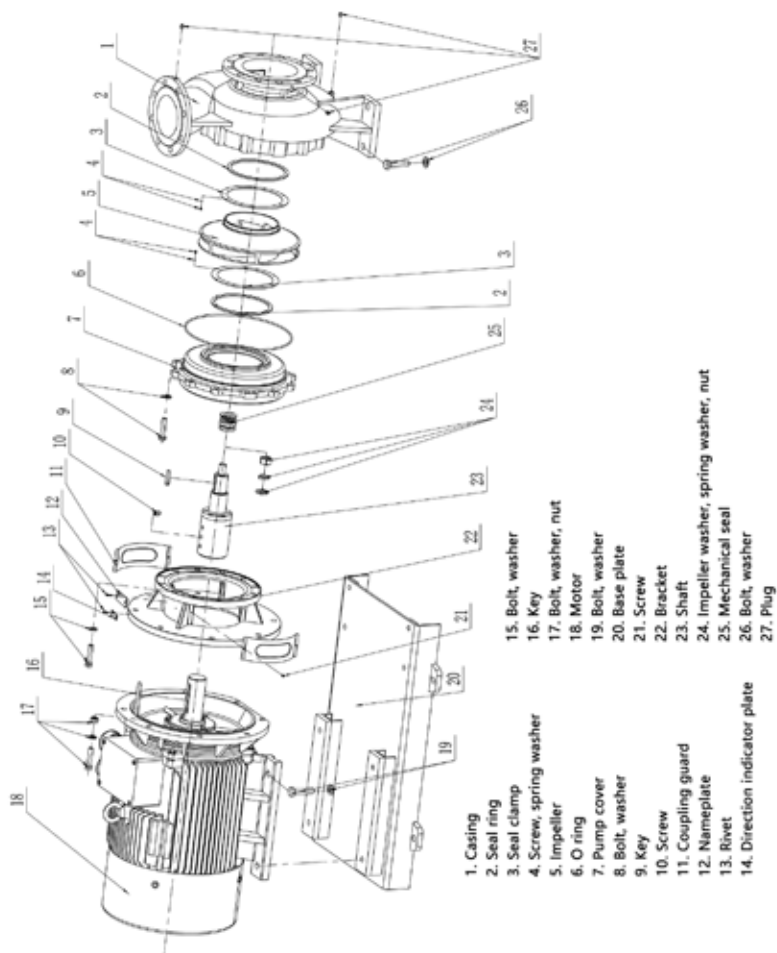
VI. Common Faults and Troubleshooting Methods



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

Fault characteristics	Possible reasons	Way
The motor cannot start	1. Power failure 2. Motor overload 3. Control circuit problem	1. Check the power supply. 2. Inspection system 3. Inspect the control circuit.
The pump is not discharging water.	1. Reversed running 2. Excessive suction range 3. Insufficient water in the pump chamber 4. Close the intake and exhaust valves. 5. There is air in the water inlet pipe or pump.	1. Adjust the motor wiring. 2. Lower the pump installation position 3. Increase water storage capacity 4. Open the valve 5. Refill with liquid and purge air.
Insufficient pump flow	1. Pipe blockage 2. Wrong selection 3. Air is drawn in through the water inlet pipe. 4. Casing or impeller wear	1. Clean water pumps and pipelines 2. Re-selection 3. Inspect the piping. 4. Replace the casing or impeller.
The pump consumes too much power.	1. Too much traffic 2. The motor bearings are severely worn.	1. Reduce the flow rate 2. Replace bearing
Excessive noise	1. Damaged parts inside the pump 2. Motor bearing wear out 3. NISO The pump motor shaft and the pump shaft are not on the same center line.	1. Replace pump internal parts 2. Replace bearing 3. Adjust the connection position between the motor and the pump.

Appendix A



NIS, NISF



- OSIN