



# NB/NBF(50Hz/60Hz)

Vertical multistage  
centrifugal pump



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

Product standard: Q/AS001 "Light vertical multistage centrifugal pumps"

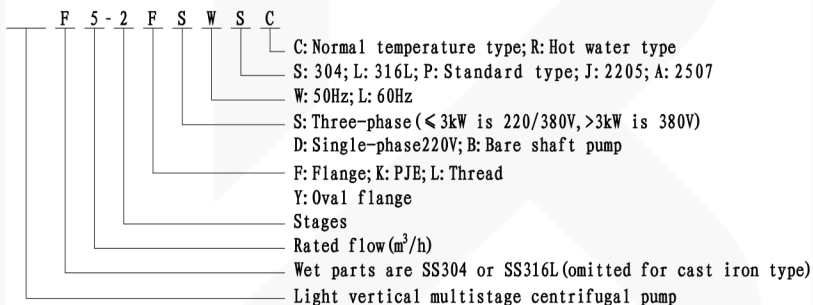
## I. Product Overview

### 1.1 Product Advantages

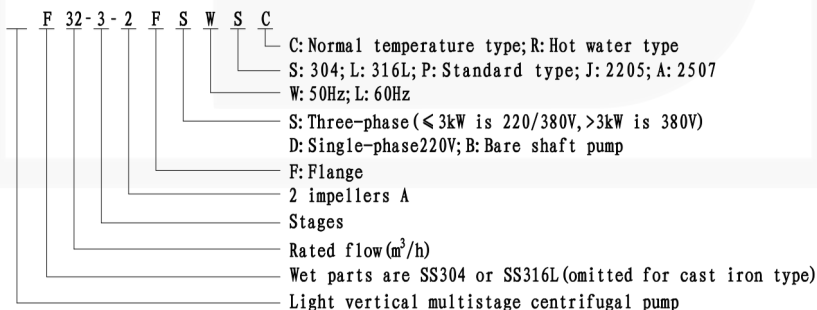
NB/NBF This is a non-self-priming, lightweight vertical multistage centrifugal pump (hereinafter referred to as the pump), which features high efficiency, low noise, resistance to mild corrosion, compact structure, beautiful appearance, small size, light weight, convenient use and maintenance, and reliable sealing performance.

### 1.2 Model Definition

NB/NBF1,3,5,10,15,20 and 25



NB/NBF 32,42,65,85,95,125,155,185,215,255,285,315,355 and 395



### 1.3 Structural Description

● The pump consists of major components such as motor, bracket, pump head, guide vane, impeller, cylinder, inlet and outlet chamber, pump shaft, and mechanical seal. See Appendix A for details of the components.

● Key pump components such as guide vanes, impeller, pressure-resistant cylinder, and shaft are all made of stainless steel. For NB pump, the pump head and inlet and outlet chamber is cast iron material, for NBF pump, the pump head and inlet and outlet chamber is made of stainless steel precision castings.

● The pump shaft seal is a cartridge-type single-end mechanical seal. The rotating ring and the stationary ring are made of cemented carbide/graphite. The guide vane bearing and shaft sleeve are made of cemented carbide.

● The basic type of pump and pipeline connection is a round flange connection, other different connection way can also be available on request.

### 1.4 Scope of application

● Medium temperature: Normal temperature type  $-15^{\circ}\text{C} \sim +70^{\circ}\text{C}$ ; Hot water type  $-15^{\circ}\text{C} \sim +120^{\circ}\text{C}$ ; ●

Medium pH range: pH 5~9;

● Maximum ambient temperature:  $+40^{\circ}\text{C}$ ;

● Highest altitude: 1000m;

● Minimum inlet pressure: Refer to NPSHr curve in the product catalog;

● Maximum working pressure: Refer to the maximum working pressure table in the product catalog.



When the specific gravity and viscosity of the liquid pumped by the pump are greater than the 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 check the model, 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.

● Exception handling process

If you find any abnormalities in the product, please contact us immediately, and we will respond promptly and provide a solution.

## III. Product Installation

### 3.1 Installation conditions



When installing the pump, the motor must never be hung upside down on a horizontal surface.

The pump should be installed in a well-ventilated and freeze-proof location, and the pump and motor should be at least 150mm from obstacles, to ensure sufficient airflow around the motor's cooling fan.

The pump should be installed on a concrete or similar foundation of suitable height, or on a fixed bracket on the ground or wall. Care should be taken not to force the weight of the piping onto the pump, to prevent damage to the pump.

For detailed installation dimensions, please refer to the product catalog. The pump tightening torque is shown in the table below.

| Series<br>NB/NBF | Base bolts                       |              | Flange bolts        |              |       |
|------------------|----------------------------------|--------------|---------------------|--------------|-------|
|                  | Bolt specifications              | Torque (N·m) | Bolt specifications | Torque (N·m) |       |
| 1-5              | M10 Or M12 (φ13<br>Through hole) | 40           | M10                 | -            | 50-60 |
|                  |                                  |              | M12                 | 60           | -     |
| 10-25            | M12(φ14<br>through hole)         | 50           | M12                 | 60           | 60-70 |
| 32-85            | M12(φ14<br>through hole)         | 65           | M16                 | 100          | 70-80 |
|                  |                                  |              | M20                 |              | -     |
|                  |                                  |              | M24                 | 150<br>200   | -     |
| 95               | M16(φ18.5<br>through hole)       | 100          | M16                 | 30           |       |
|                  |                                  |              | M20                 | 90           |       |
| 125-155          | M20(φ24<br>through hole)         | 190          | M20                 | 90           |       |
|                  |                                  |              | M24                 | 230          |       |
| 185-395          | 24(φ26.5<br>through hole)        | 130          | M20                 | 90           |       |
|                  |                                  |              | M24                 | 230          |       |
|                  |                                  |              | M27                 | 300          |       |

### 3.2 Hoisting products

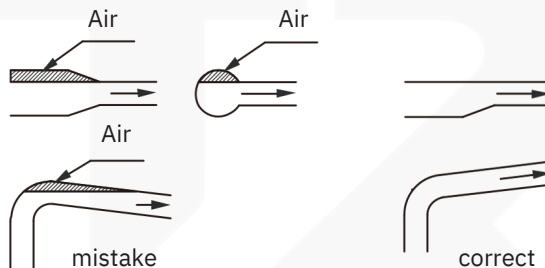
When hoisting a complete product containing a motor, follow these operating guidelines:

- Range: 0.37-2.2 kW pump with motor: Use slings or similar tools to lift the water pump from the motor flange .
- 3-315 kW pump with motor: The water pump is lifted by the eye bolts of the motor.

### 3.3 Pipeline connection

In principle, the diameter of the inlet pipe should not be smaller than the pump inlet pipe diameter. To minimize inlet friction loss, the inlet pipe should be as short as possible. Before pump installation, check there is a check valve installed in the piping system to prevent liquid backflow. If the pump is used for boiler water supply, a check valve must be installed on the delivery pipe between the pump and the boiler. The "→" mark at the pump inlet and outlet indicates the direction of liquid flow through the pump. Before starting the pump, check that the liquid can flow freely. Before pump installation, the inlet pipe should be cleaned. If it cannot be guaranteed that there are no particles in the pipe, it is necessary to install a filter at the location 0.5-1m before in the pump suction inlet, especially for the pump flow rates less than 8 m<sup>3</sup> /h, to ensure the pump operates freely.

When installing the water inlet pipe, care should be taken to prevent the formation of air pockets, as shown in the figure. 1



picture 1

If it is possible that the shut-off valve at the outlet is closed or flow 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.

### 3.4 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 have reliable grounding.

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

| Motor 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 way and voltage for three-phase motors are shown in the table below:

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

Adjust and disconnect the pressure. Check the motor's full-load current using a pressure switch; it should not exceed the maximum permissible current.

### 4.2 Operating Procedures



Read the warning sign on the pump pressure cylinder carefully before starting

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

Close the pump outlet valve, open the plug on the pump head, and slowly open the inlet valve until a steady flow of water emerges from the vent plug. Then tighten the vent plug. Fully open the check valve on the suction line.

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 inhalation line

Close the pump outlet valve, open the plug on the pump head, and inject liquid into the pump through the plug hole until the pump and suction pipe are completely filled with water. Then tighten the plug back on.



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

Switch on the power and observe the rotation direction, looking from the motor fan side, the correct rotation direction should be as shown by the arrow on the pump head, that is, when viewed from the motor drive end, the pump should rotate counterclockwise.

#### 4.3 Precautions

4.3.1 The pump should not be started too frequently. Recommended motor power, for motor power  $\leq 4\text{ kW}$ , not exceeding 100 starts per hour. For motor power  $\geq 4\text{ kW}$ , 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 systems where the water has been protected against freezing. 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 vent screw in the pump head and remove all drain bolts from one side of the pump base. Do not tighten the vent screw or replace 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)<br>every 2 years | Spare parts quantity (sets)<br>over 5 years |
|------------------------|----------------------------------------------|---------------------------------------------|
|                        | 1                                            | 2                                           |
| Mechanical seal        | 1                                            | 2                                           |
| O-Shape ring           | -                                            | 1                                           |
| Motor bearings         | 1                                            | 2                                           |
| Support guide vanes    | 1                                            | 2                                           |
| Shaft sleeve           | -                                            | 1                                           |
| Neck ring              | 1                                            | 2                                           |
| Balancing device       | -                                            | 1                                           |
| Guide vanes, impellers | 1                                            | 2                                           |
| Oval flange gasket     |                                              |                                             |

## 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                                    | reason                                                     | Elimination methods                                             |
|----------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------|
| The motor cannot start                                   | 1. Power supply failure                                    | 1. Check the power supply                                       |
|                                                          | 2. Motor overload                                          | 2. Inspection System                                            |
|                                                          | 3. There is a problem with the control circuit.            | 3. Inspect the control electrical components.                   |
| The pump is not discharging water.                       | 1. Water pump reverses                                     | 1. Adjust the motor wiring                                      |
|                                                          | 2. The water level is not deep.                            | 2. Lower the water pump installation position                   |
|                                                          | 3. Insufficient water in the pump chamber                  | 3. Increase water storage capacity and purge air.               |
| Insufficient flow                                        | 1. Pipe blockage                                           | 1. Clean the water pump and pipelines.                          |
|                                                          | 2. The neck ring is worn out.                              | 2. Replace the neck ring                                        |
|                                                          | 3. Incorrect pump selection                                | 3. Re-selection                                                 |
| The pump costs too much power.                           | 1. Too much flow                                           | 1. Reduce the flow rate                                         |
|                                                          | 2. The motor bearings are severely worn.                   | 2. Replace the motor                                            |
| The internal sound is abnormal and water is not flowing. | 1. Liquid level too low                                    | 1. Check the position of the pump inlet and the liquid level.   |
|                                                          | 2. The temperature of the liquid being pumped is too high. | 2. Reduce the water absorption height or lower the temperature. |
| Excessive noise                                          | 1. Motor bearings damaged or internal pump parts damaged   | 1. Replace the motor bearings or internal pump parts.           |

**BZT PUMPS**  
the best solution

## Appendix A

Figure A.1 Exploded view of NB1, 3, and 5

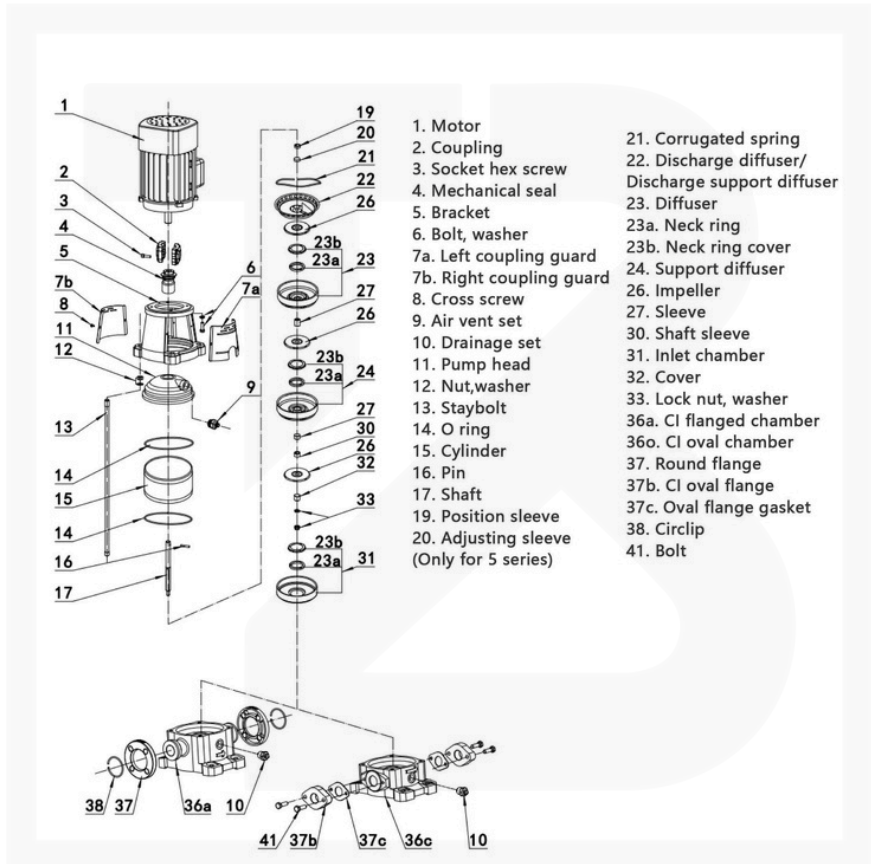


Figure A.2 Exploded view of NBF1, 3, and 5

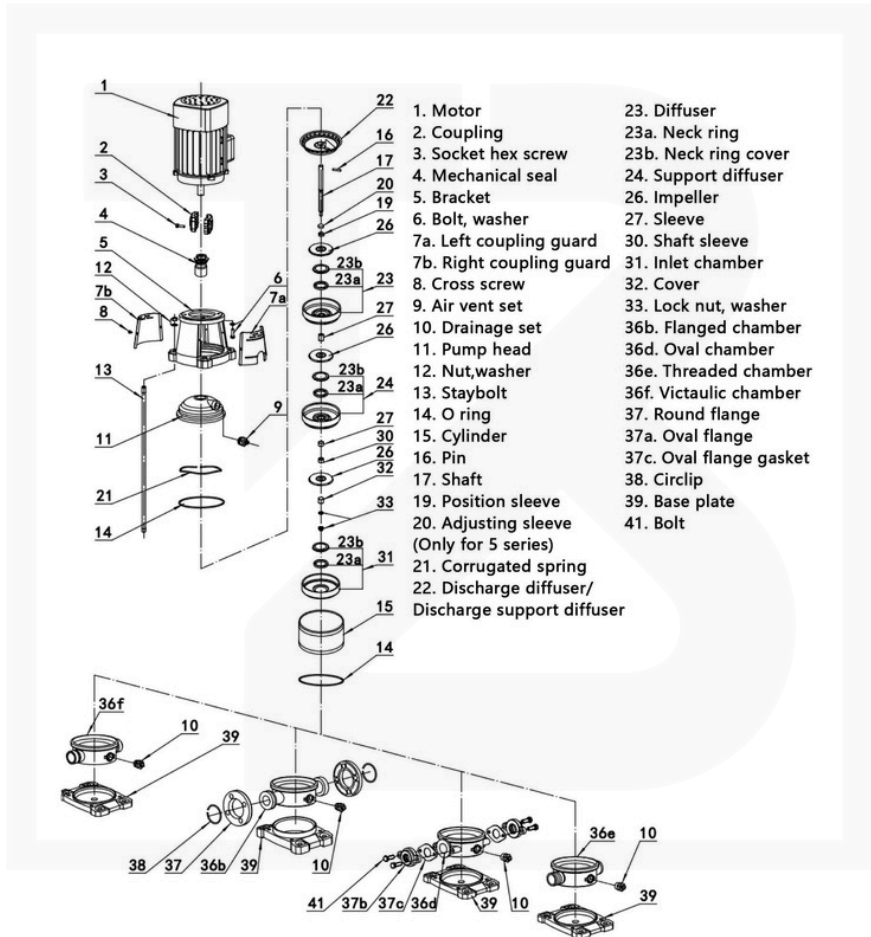


Figure A.3 Exploded view of NB10

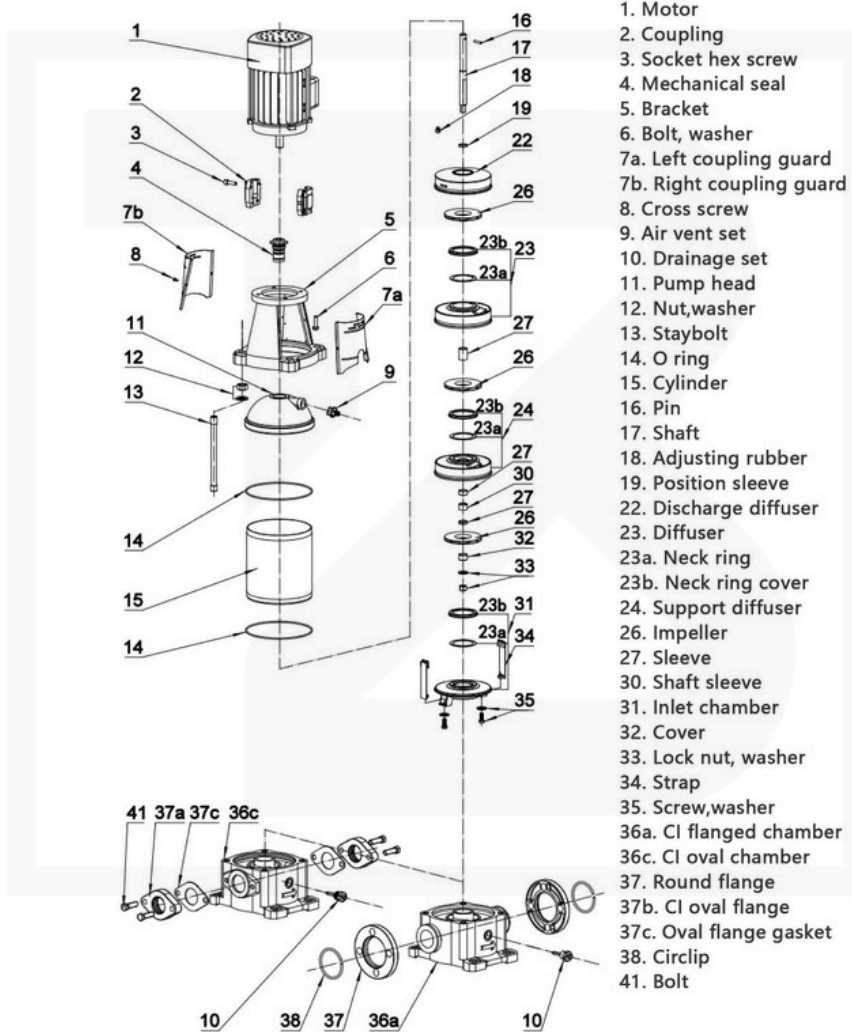


Figure A.4 Exploded view of NBF10

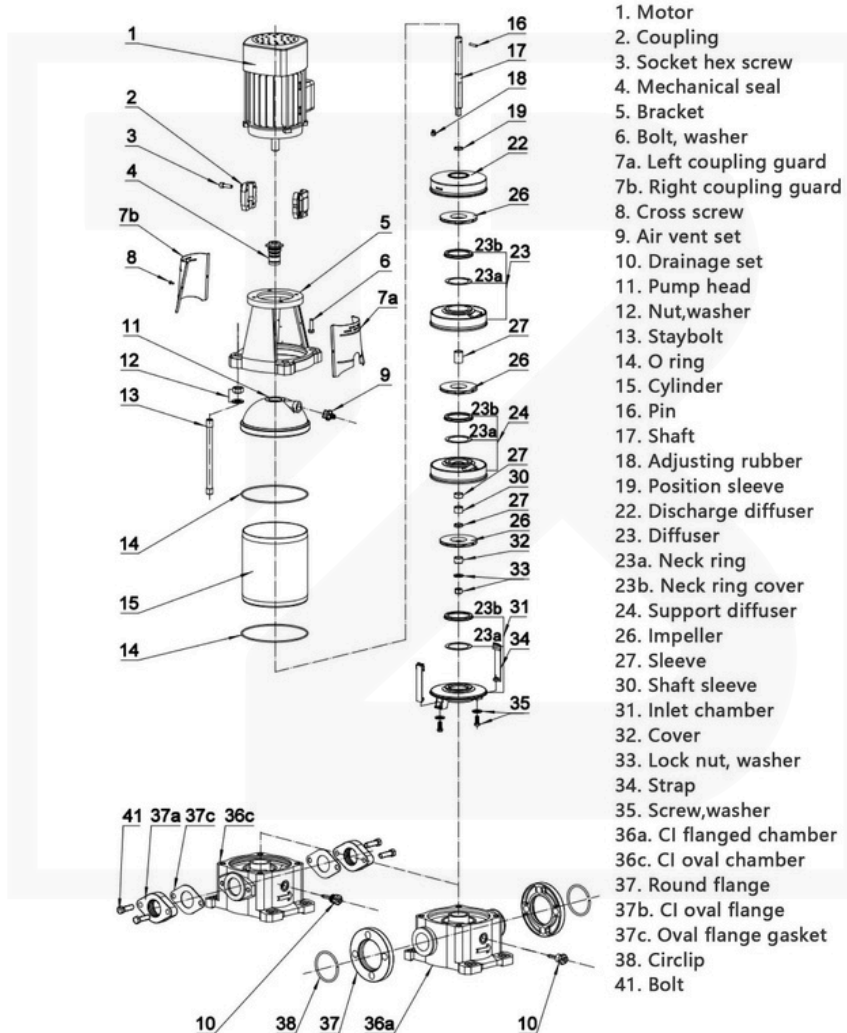


Figure A.5 Exploded view of NB15, 20, 25

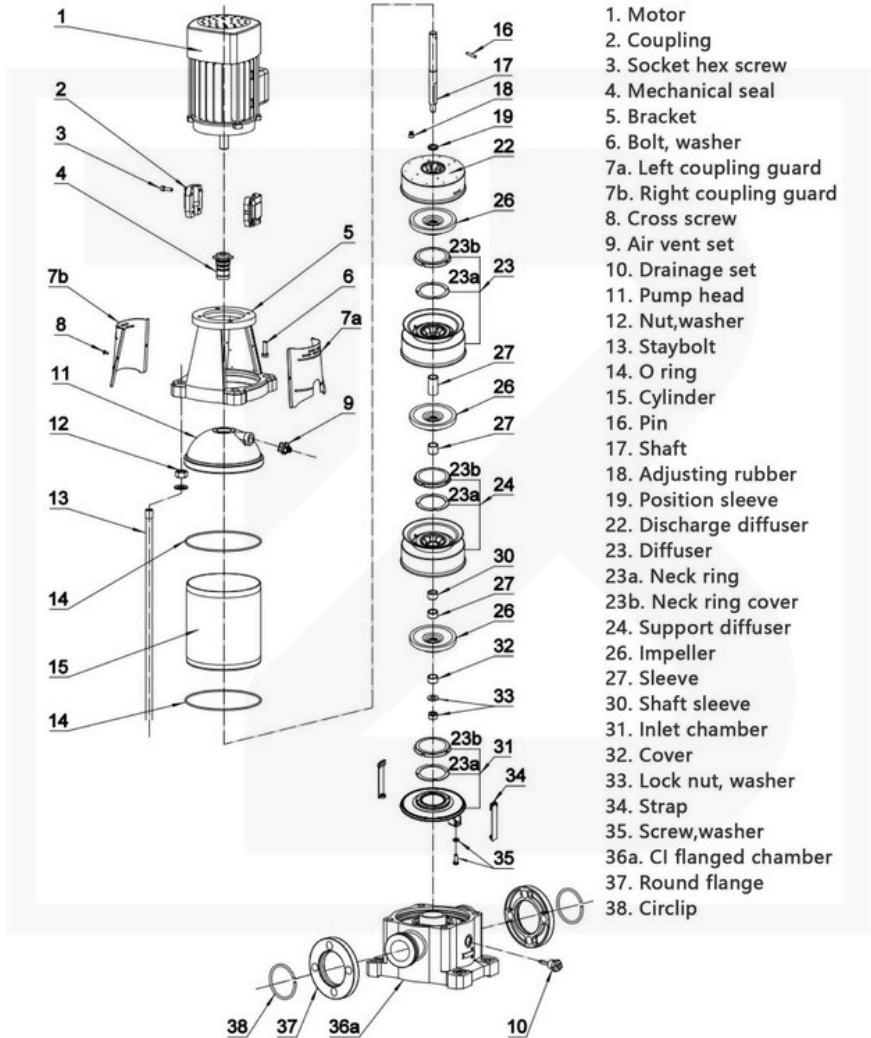


Figure A.6 Exploded view of NBF15, 20, 25

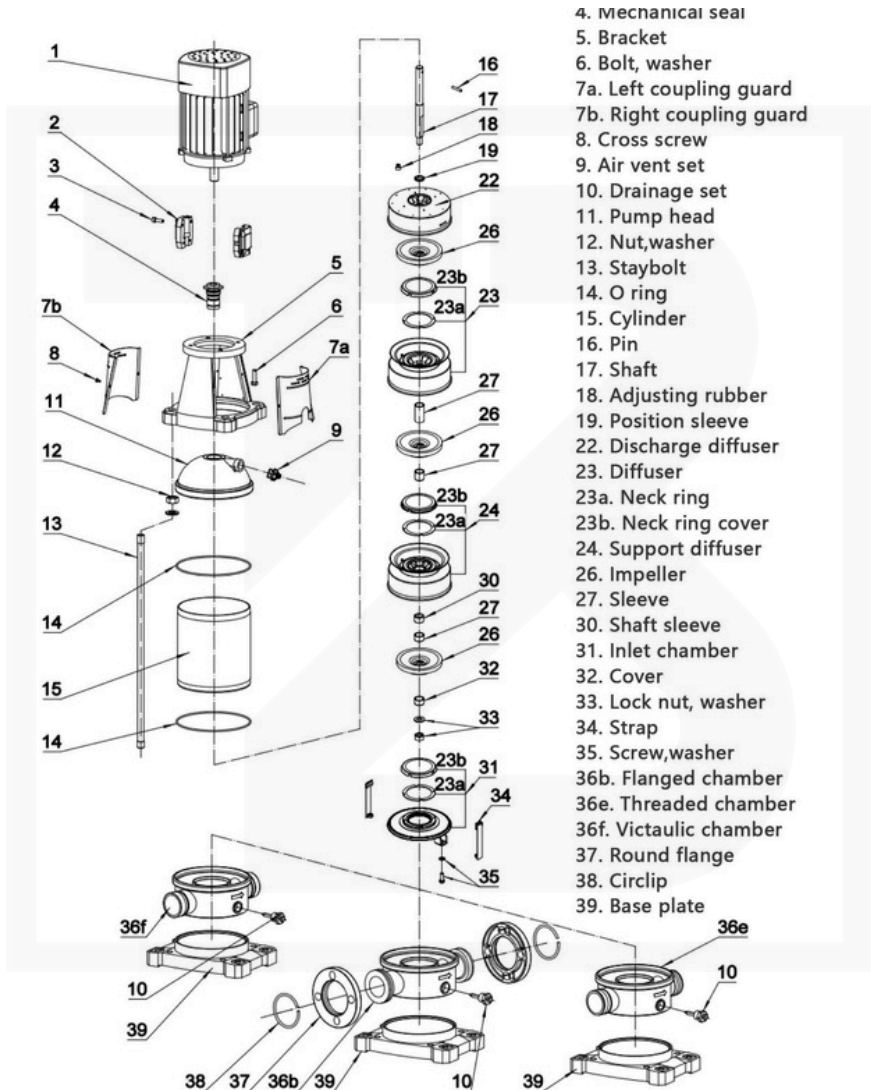


Figure A.7 Exploded view of NB32, 42, 65, 85

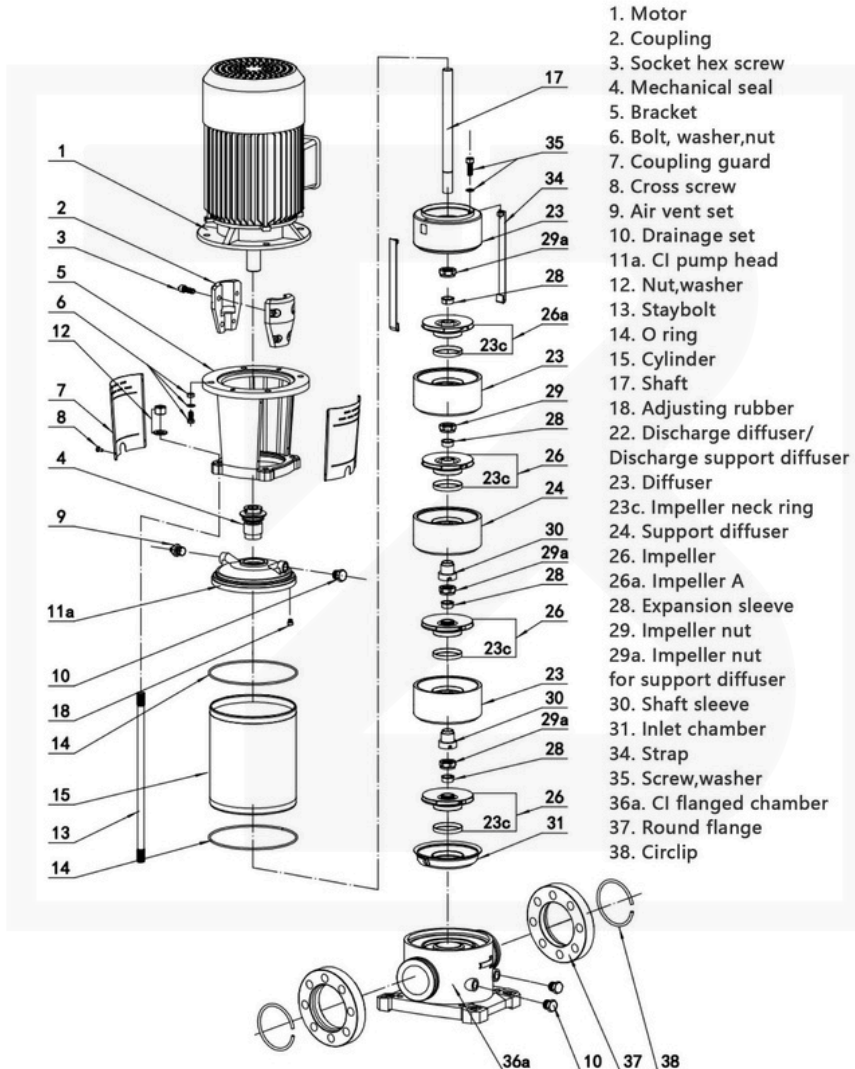


Figure A.8 Exploded view of NBF32, 42, 65, 85

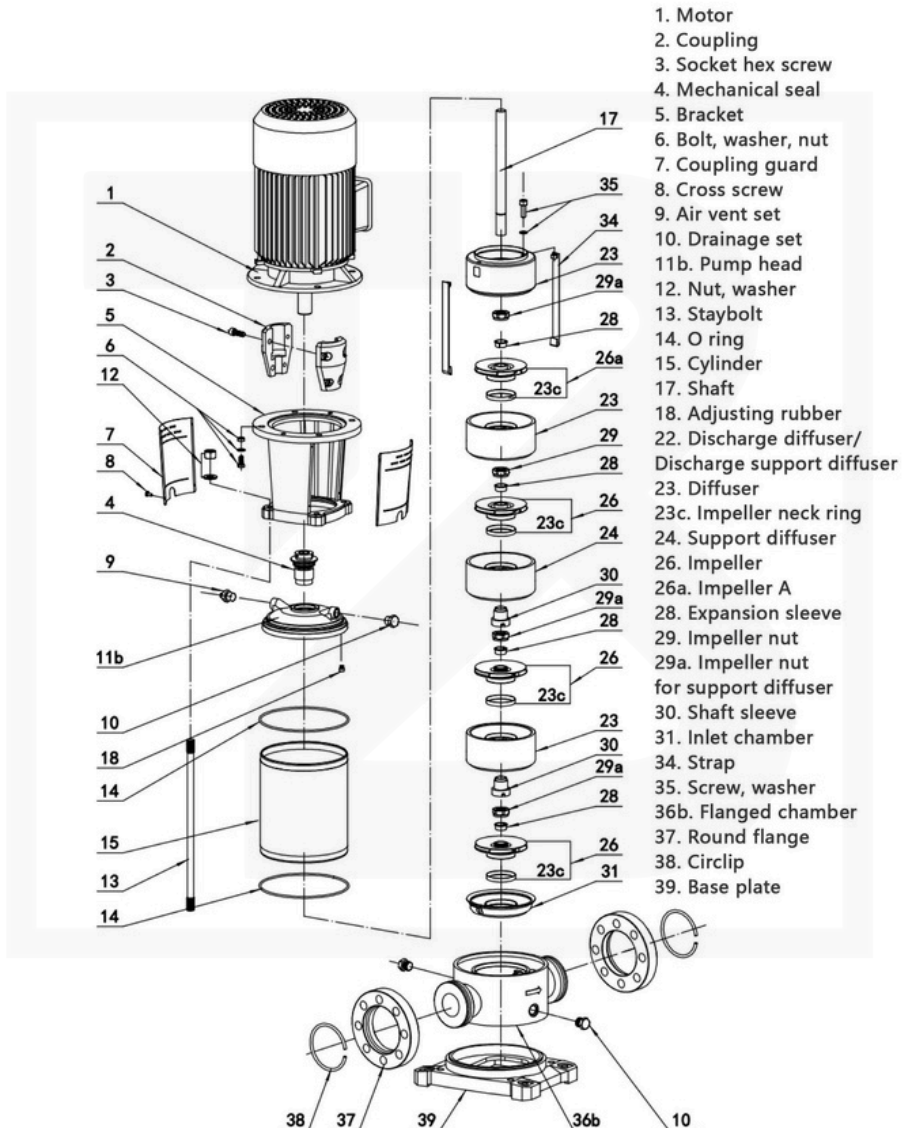


Figure A.9 Exploded view of NB95-395

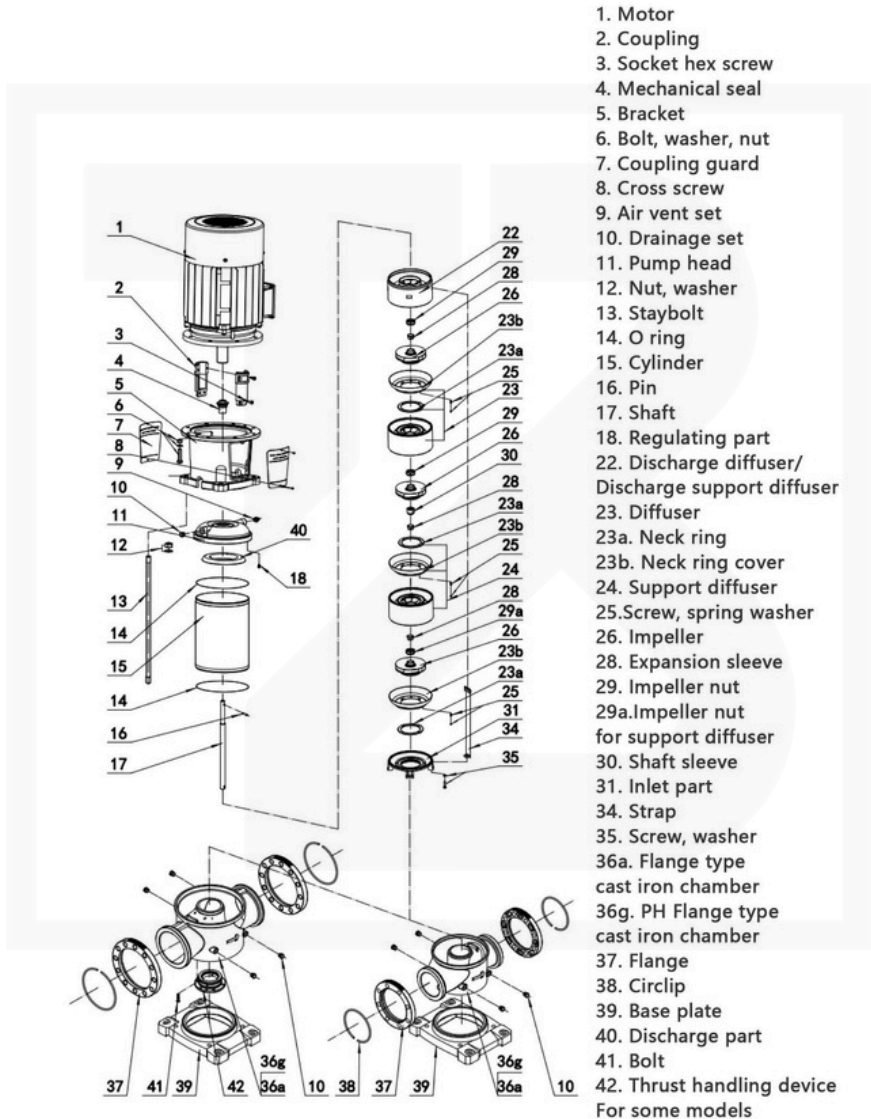


Figure A.10 Exploded view of NBF95-395

