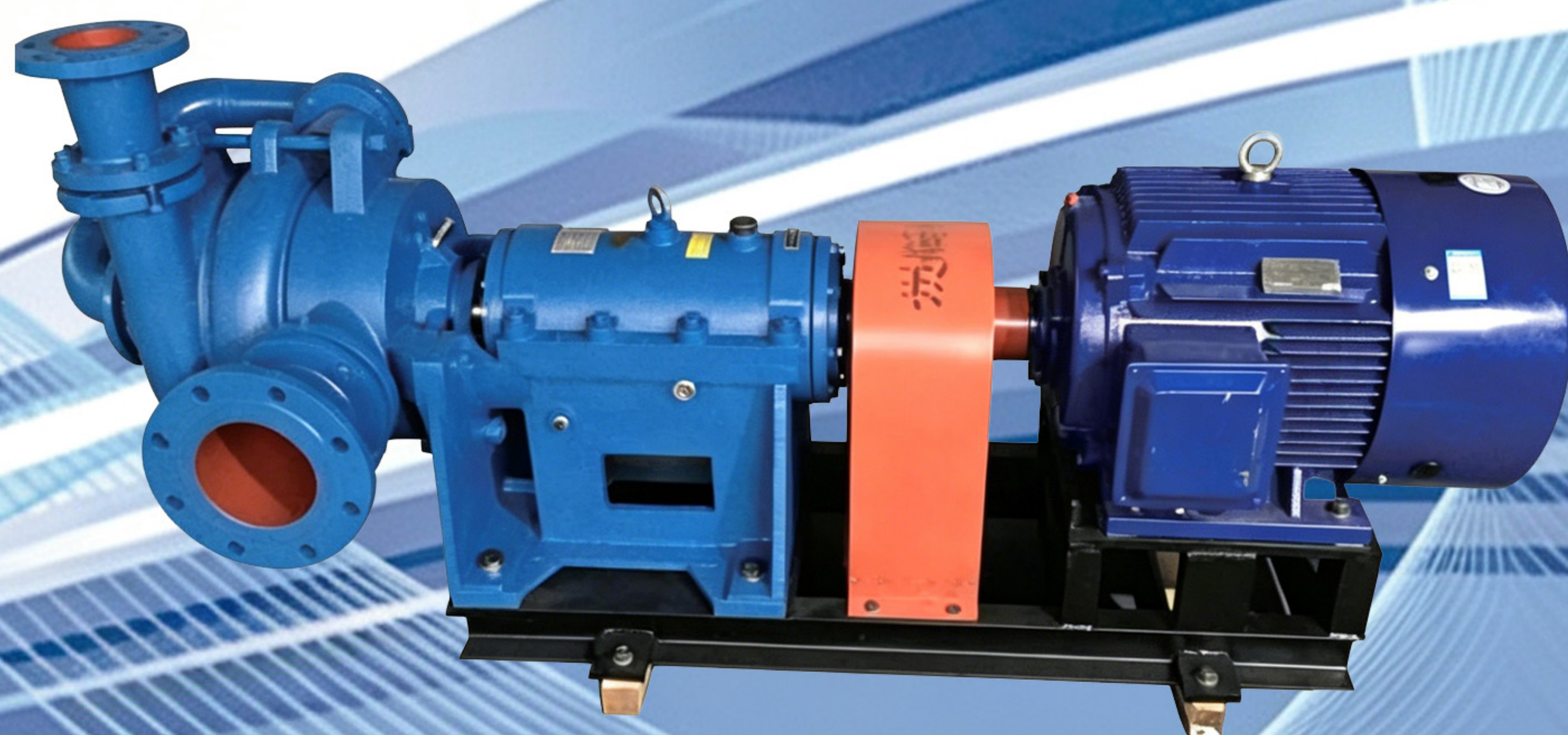


ZTS type filter press feed pump

User Manual



Hebei Ivy Pump Industry Co., Ltd.

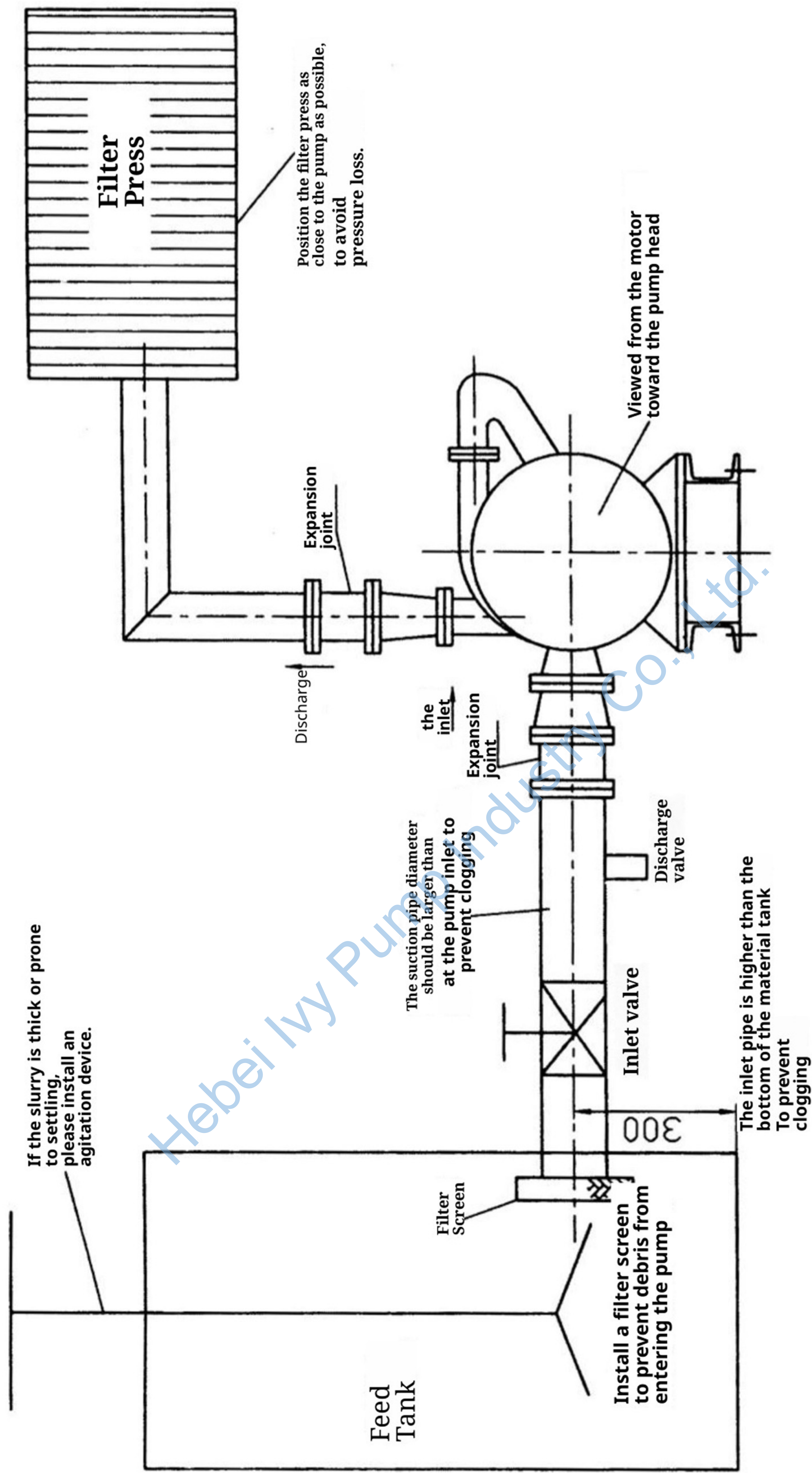
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I. Pump Installation

Never start the motor without proper verification. Ensure the motor is rotating in the correct direction before installing the coupling pins.

1. Remove grease and dirt from the pump base and place it on the foundation.
2. Insert the anchor bolts into the foundation holes in the base. Place one nut above and one below each anchor bolt in the base holes, and place support rails or shims (support height: 50 mm) under the base. Align the pump inlet with the suction pipe flange.
3. Use a level to roughly adjust the pump's level in both the longitudinal and transverse directions on the inlet and outlet flanges.
4. During the first grouting, ensure the anchor bolts remain vertical and do not come into contact with the equipment.
5. After the concrete has fully cured, evenly tighten the upper and lower nuts on the base, then perform the second grouting.
6. Remove the coupling guard and check the clearance between the couplings. There should be a certain amount of clearance between the couplings, typically 4 mm. Check whether the pump shaft and motor shaft are concentric, and adjust using thin shims. Measure the vertical and horizontal deviations on the outer circumference of the coupling; these must not exceed 0.1 mm. The difference between the maximum and minimum end-face clearances around the circumference must not exceed 0.3 mm.
7. The diameter of the suction pipe should be the same as or slightly larger than the pump's inlet diameter. This prevents cavitation in the pump and prevents slurry from depositing in the piping.
8. To minimize slurry buildup in the piping and volute, an opening should be provided in the section of piping running parallel to the suction line between the suction pipe and each gate valve, and a discharge valve should be installed (the valve size depends on the particle size of the medium) to allow for discharge after shutdown.
9. To facilitate pump maintenance, an inlet valve with a diameter equal to that of the pump's suction pipe should be installed. An expansion joint should be installed between the pump's suction inlet and the suction pipe to facilitate disassembly and reassembly.
10. The discharge pipe diameter should be the same as or slightly larger than the pump's discharge diameter.
11. The piping must have its own supports; the weight of the piping must not be borne by the pump to prevent damage to the pump.
12. When positioning the pump, it should be installed as low as possible below the liquid level to ensure optimal performance.



ZTS-Type Filter Press Feed Pump Installation Guide Diagram

II. Pump Operation, Maintenance, and Servicing

Start-up

1. Check that the lubricating oil level is at half the mark on the sight glass. (Lubricating oil is pre-filled at the factory.)
2. If a double-face mechanical seal (with a water chamber) is used, first fill the water chamber with clean water (or engine oil) to the specified level, then seal the chamber to ensure proper water circulation.
3. Briefly energize the motor to verify the correct rotation direction before installing the coupling pins. Do not start the motor without verification to prevent the impeller from falling out.
4. Open the inlet valve. Once the pump is fully filled with water (for mechanical seal pumps, also check that the mechanical seal reservoir or external water supply is functioning normally), connect the power supply. After the pump reaches normal speed, gradually open the discharge valve. Never start the pump with the discharge valve fully open.

Shutdown

Shut down the motor. If the pump will be out of service for an extended period, drain all liquid from the pump to prevent freezing damage during winter.

Maintenance and Care

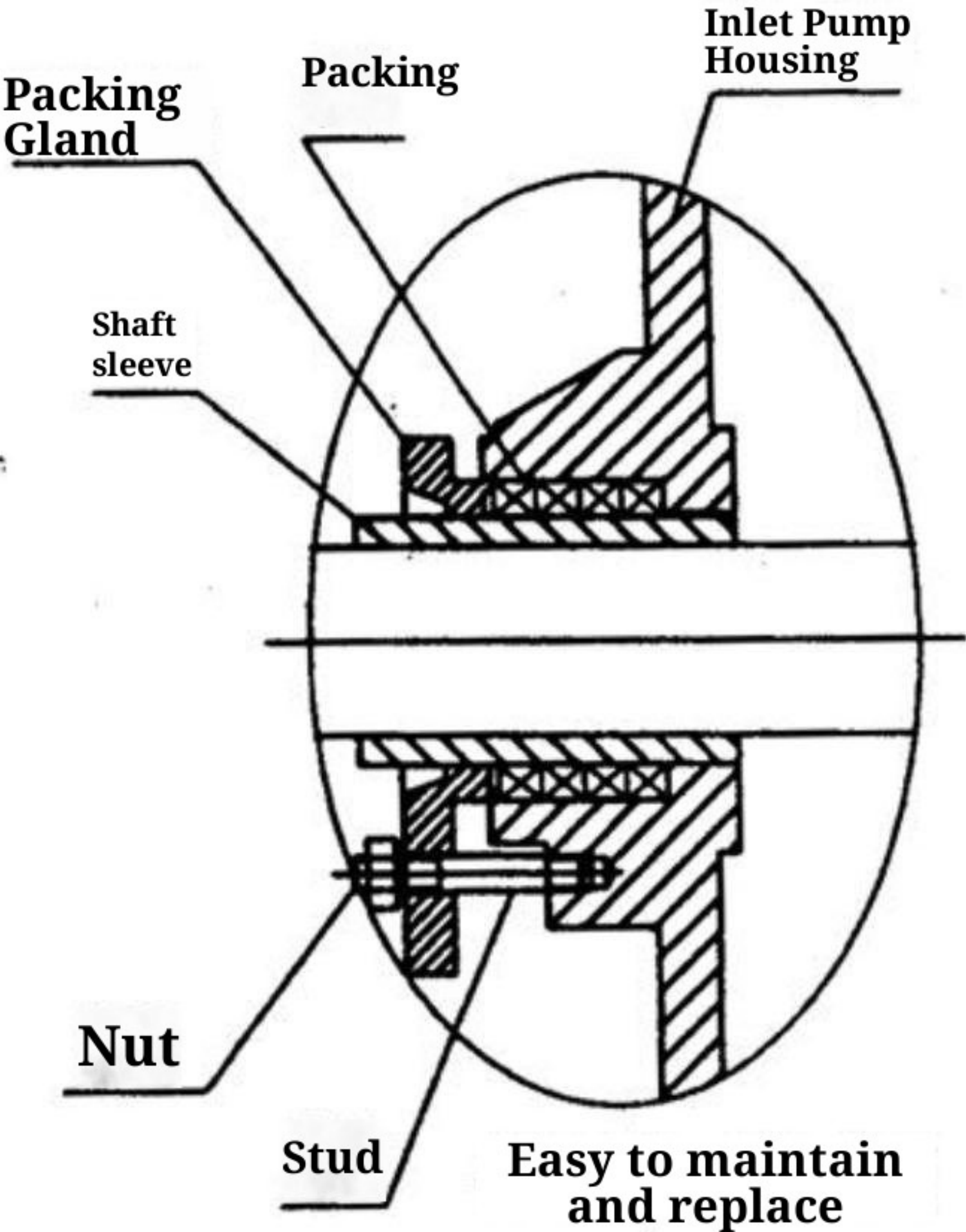
1. Replace the oil regularly every 2–3 months.
2. For packing seals, periodically check the amount of leakage from the shaft seal water supply. If leakage is severe, promptly adjust the packing gland or replace the packing to ensure the external water supply leaks only in drops.
3. For double-face mechanical seals, periodically check the water level and clarity in the water tank, and promptly top off the water or replace it with clean water.
4. If the pump is to be idle for an extended period during winter, close the inlet valve and run the pump dry for a few minutes to flush out any residual slurry, thereby preventing the pump housing from cracking due to freezing.

III. Material Configuration

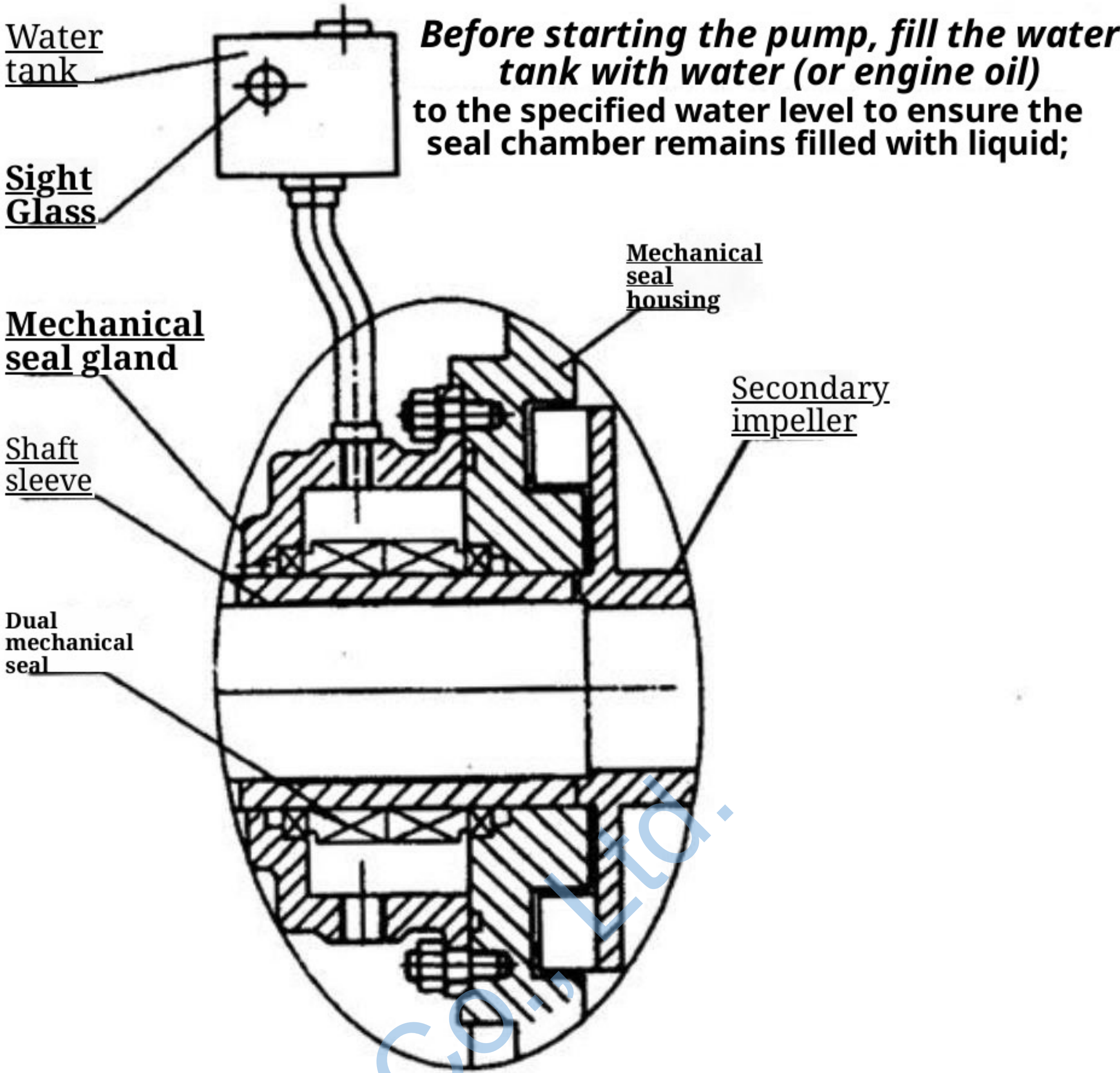
Material Part Name	Standard	Stainless Steel
Inlet Pump Housing	ZG270-450	304
Discharge Pump Housing I	Cr27	304
Discharge Pump Housing II	Cr27	304
Impeller I	Cr27	304
Impeller II	Cr27	304
Guard Plate	Cr27	304
Shaft	45	304
Sleeve	45 carburized	304
Secondary impeller	Cr27	304
Bearing housing	HT250	HT250

IV. Seal Types

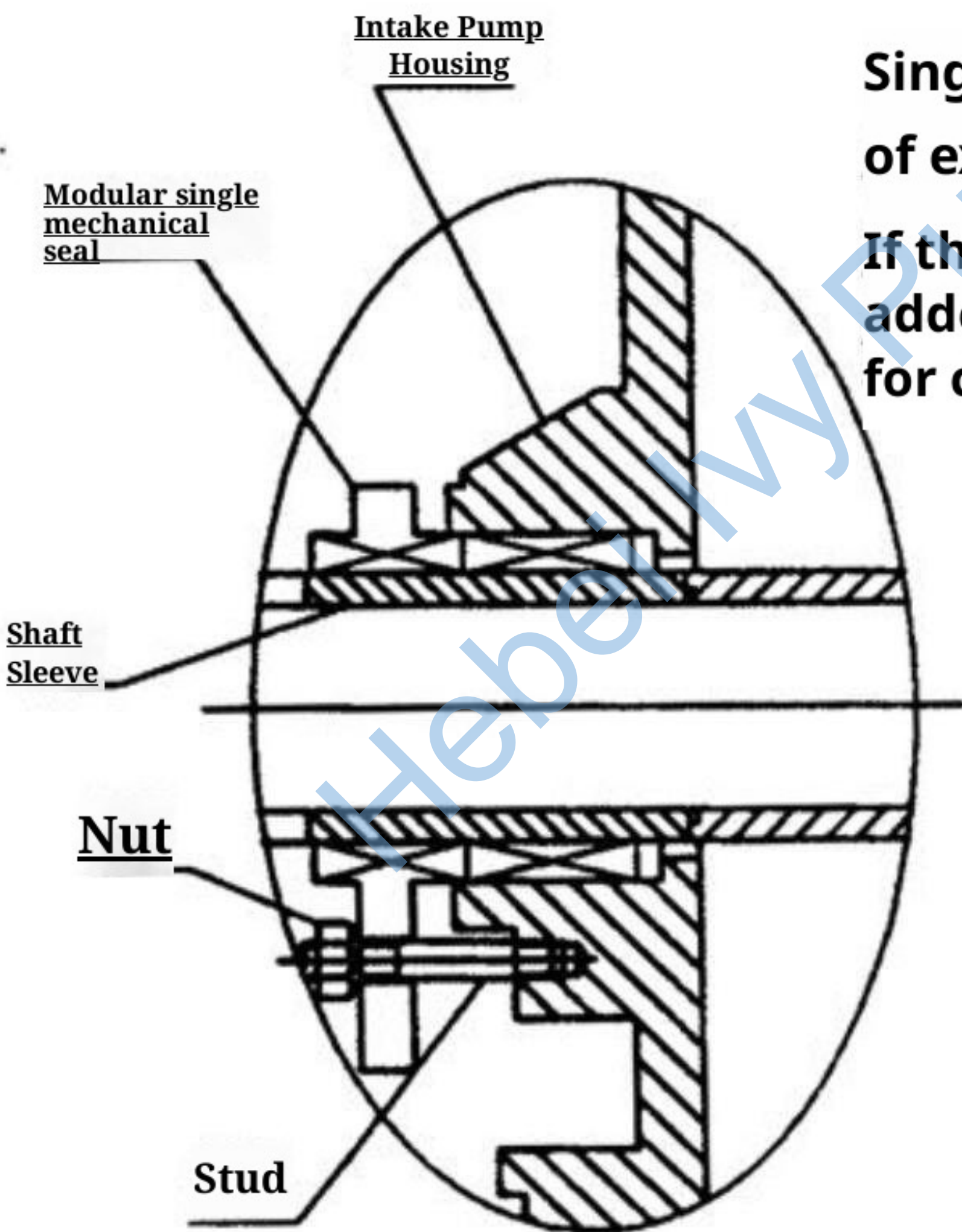
Different seal types can be selected based on specific operating requirements and the conditions of the pumped medium.



Packing seal



Double-face mechanical seal



Modular Single Mechanical Seal

Single-face mechanical seal; simple structure; the injection of external circulating water cools and lubricates the seal
If the material allows for dilution, external water can be added; if it cannot be diluted, the medium itself is used for cooling

V. Selecting a Pump for Filter Press Feed

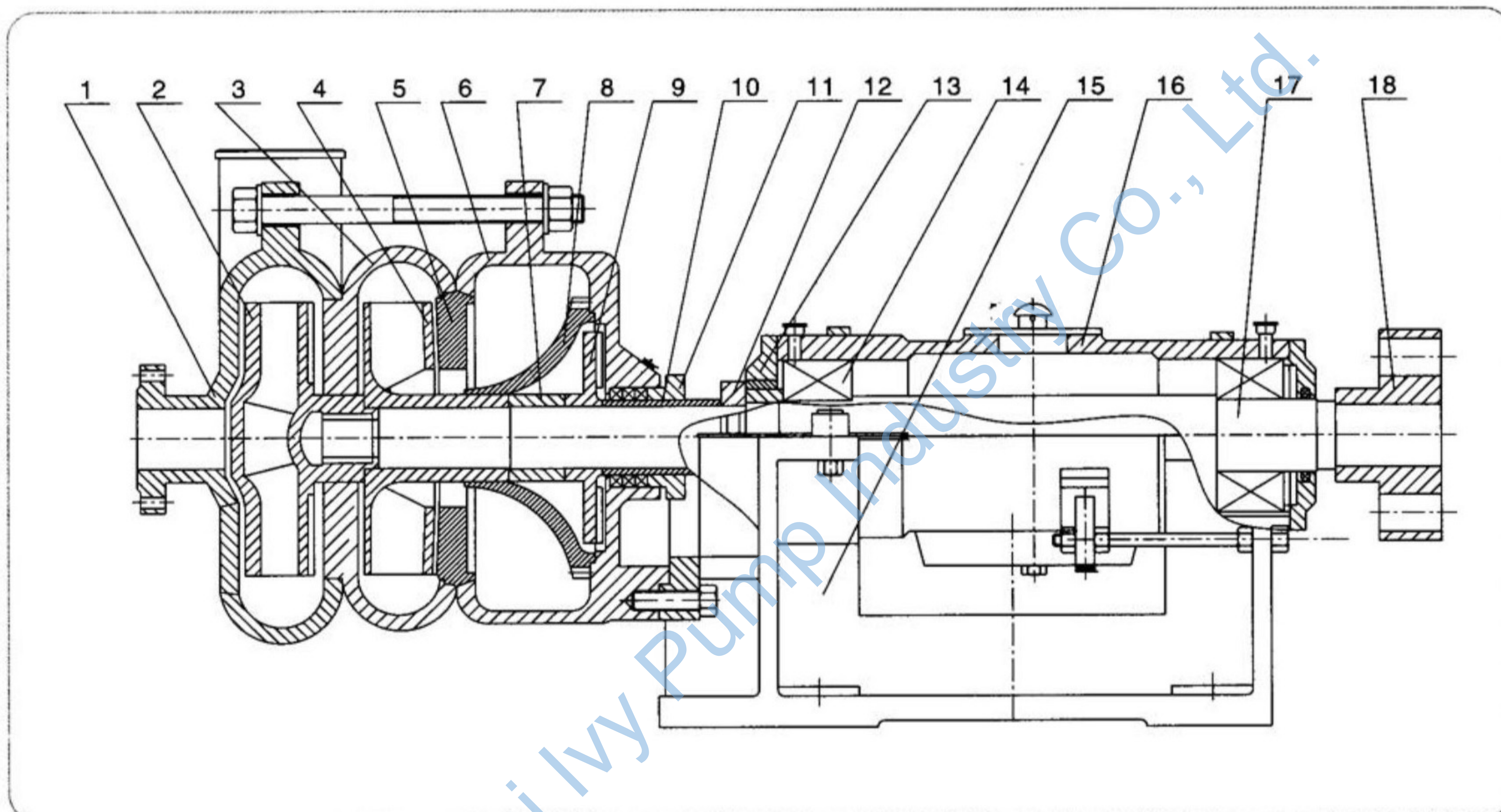
This differs significantly from the selection of general-purpose transfer pumps. For general-purpose transfer pumps, selection is typically based on the performance corresponding to a specific point or a very short segment of a flow rate-head curve. In contrast, the operating characteristics of a filter press involve the gradual formation of a filter cake within the filter chamber, which causes the feed resistance to increase accordingly. This requires the feed pump to automatically transition from a high flow rate and low head at the start to a low flow rate and high head toward the end of the process. Reflected on a curve, this requires a relatively long—or even a nearly complete—flow rate and head curve, with a steeper slope being preferable. In addition to this characteristic, the pump must operate at high pressure without requiring shaft seal water and without leakage, thereby creating the conditions for building an environmentally friendly facility.

VI. Determining the Power Rating for the Filter Press Feed Pump

The maximum power loss of the feed pump occurs during the initial stage of feeding; therefore, the minimum pressure required to inject the slurry from the feed pump into the filter press must be calculated in detail. Power should then be selected based on the flow rate and head corresponding to this minimum pressure, as this approach is more accurate and economical.

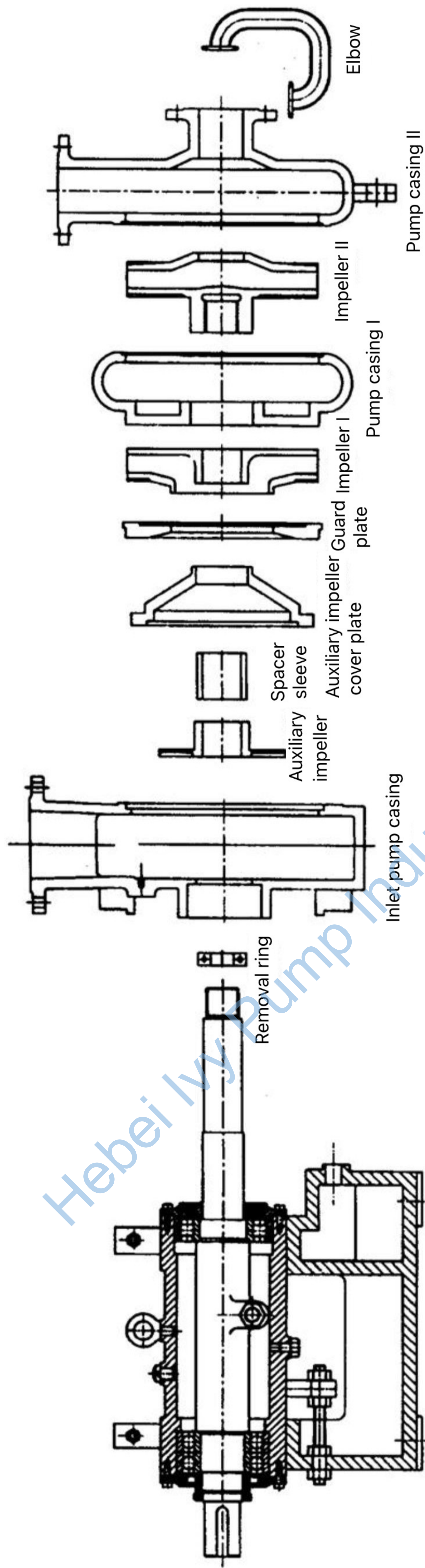
Due to variations in the actual layout of filter press systems across different plants, when the frictional resistance between the feed pump and the filter press is high (e.g., the pump is located far from the filter press, the pipe diameter is too small, there are numerous elbows and gate valves, or the slurry viscosity is high), the head loss of the feed pump increases, thereby reducing the cake formation pressure. Excessively high filter cake moisture content and prolonged single-cycle times significantly reduce the system's production efficiency; therefore, a reasonable piping configuration is essential.

VII. Structural Diagram of the ZTS-Type Dedicated Feed Pump



1. Secondary volute, 2. Secondary impeller, 3. Primary volute, 4. Primary impeller, 5. Guard plate, 6. Inlet body, 7. Positioning sleeve, 8. Auxiliary impeller cover plate, 9. Auxiliary impeller, 10. Shaft sleeve, 11. Packing gland, 12. Retaining ring (removal ring), 13. Water slinger, 14. Bearing, 15. Bracket, 16. Bearing housing, 17. Pump shaft, 18. Coupling

Disassembly and Assembly of the ZTS Filter Press Feed Pump



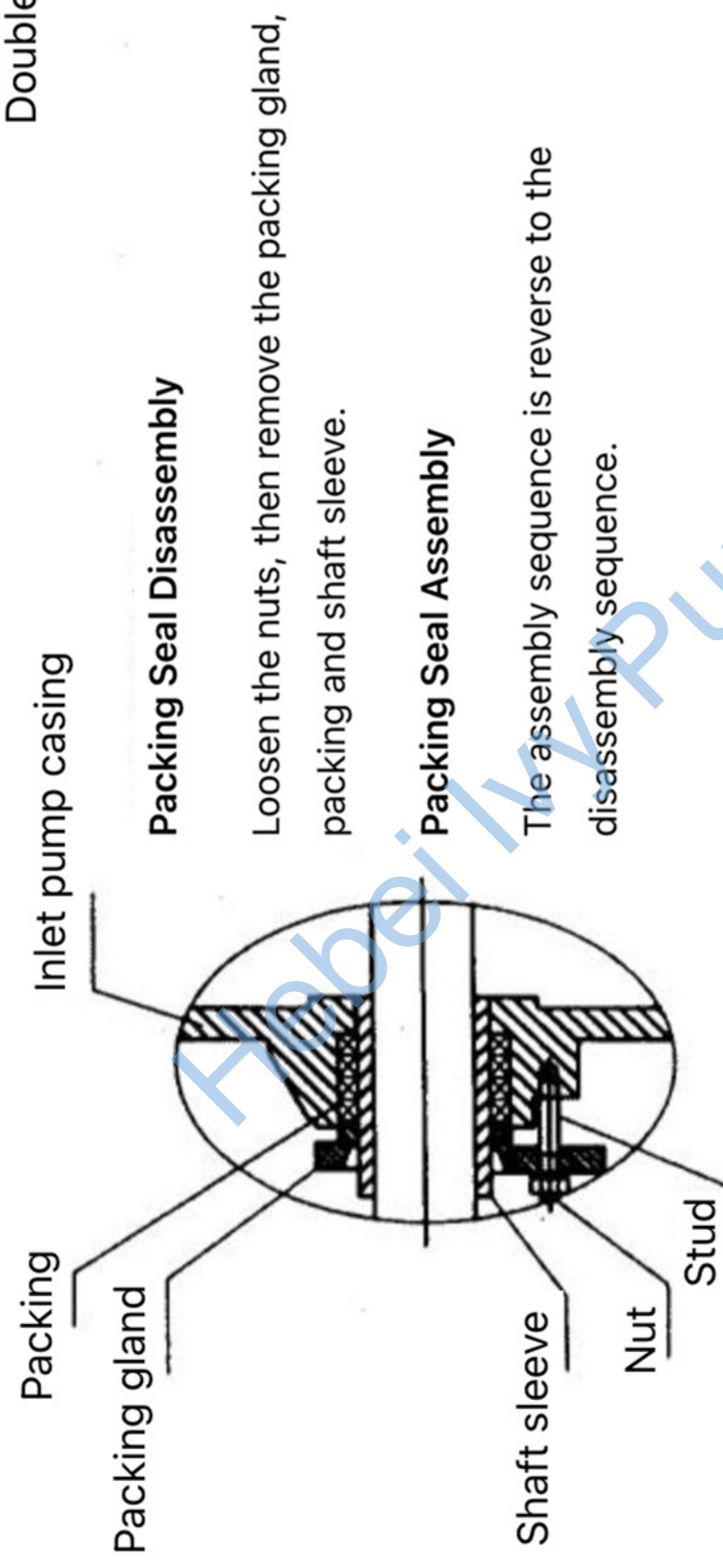
Pump Disassembly

1. Loosen the flange bolts of the outlet pump casing II, then remove the elbow.
2. Loosen the tie rod nuts and remove pump casing II.
3. Loosen the removal ring (loosen the three hex socket head cap bolts on the removal ring to split the ring).
4. Remove impeller II, pump casing I, impeller I and guard plate in sequence.
Viewed from the pump end, rotate impeller II counterclockwise for removal.
5. Loosen the connecting bolts between the cover plate and inlet pump casing, then remove the cover plate, auxiliary impeller and spacer sleeve.
6. Loosen the connecting nuts between the inlet pump casing and bracket, then remove the inlet pump casing (with seal assembly).

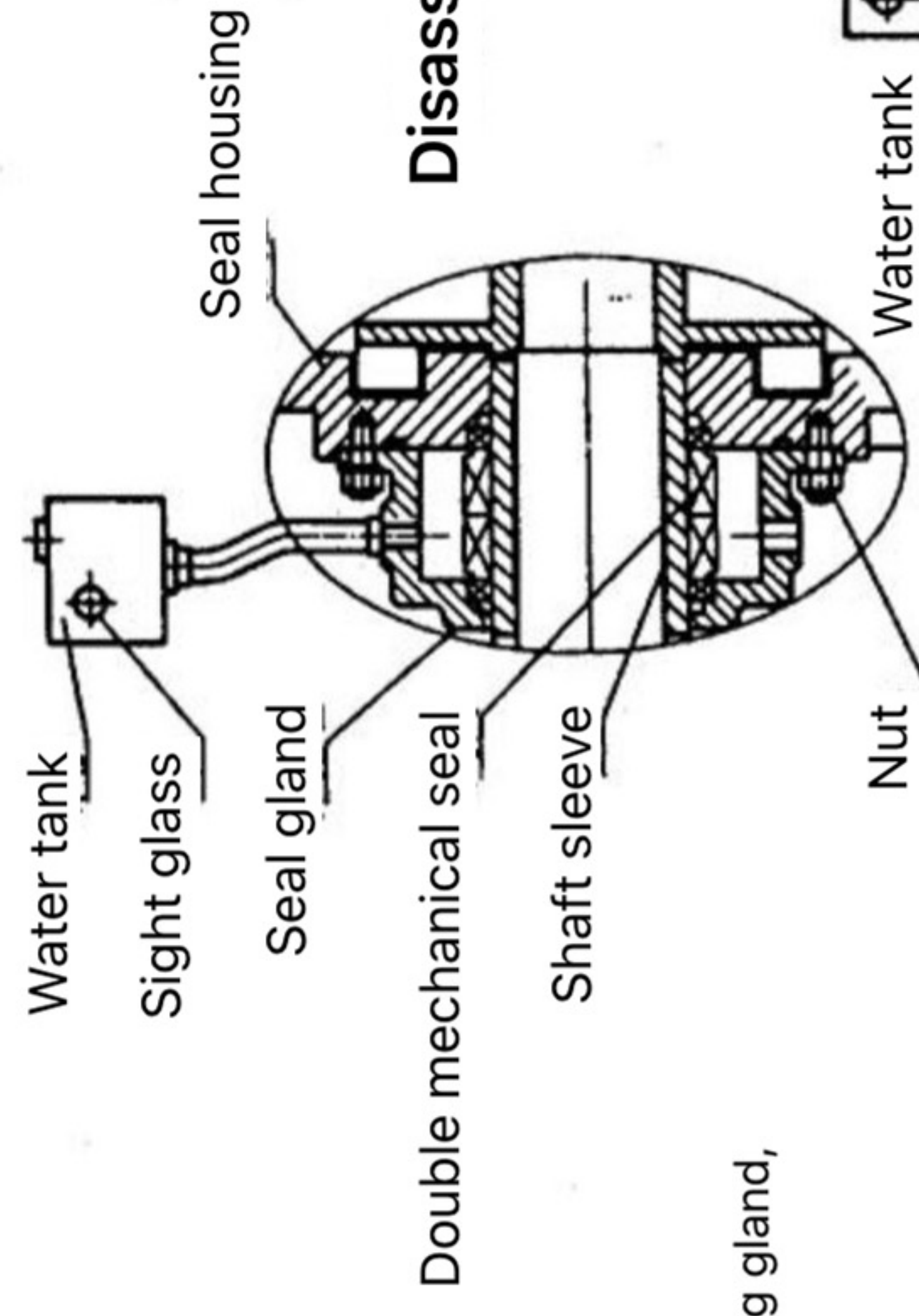
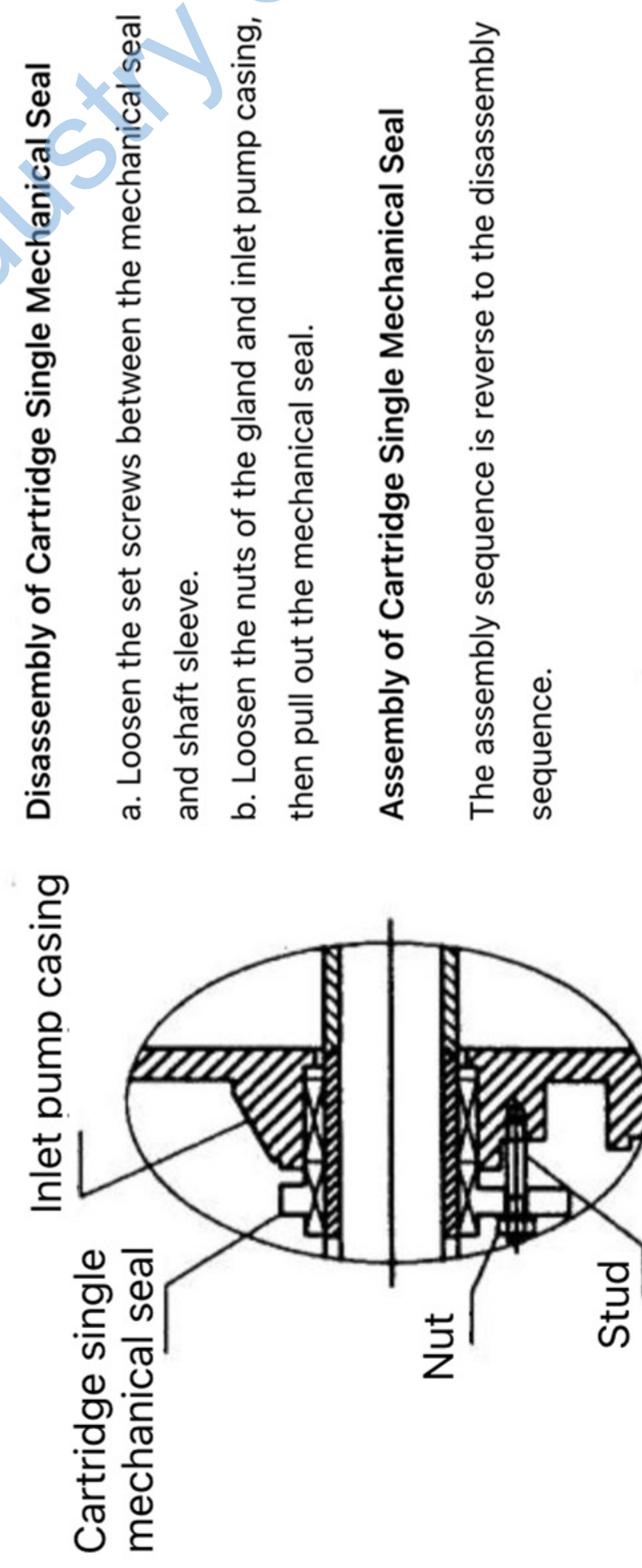
Pump Assembly

The assembly sequence of the pump is basically the reverse of the disassembly sequence.
The removal ring shall be installed in place after the water deflector is fitted.

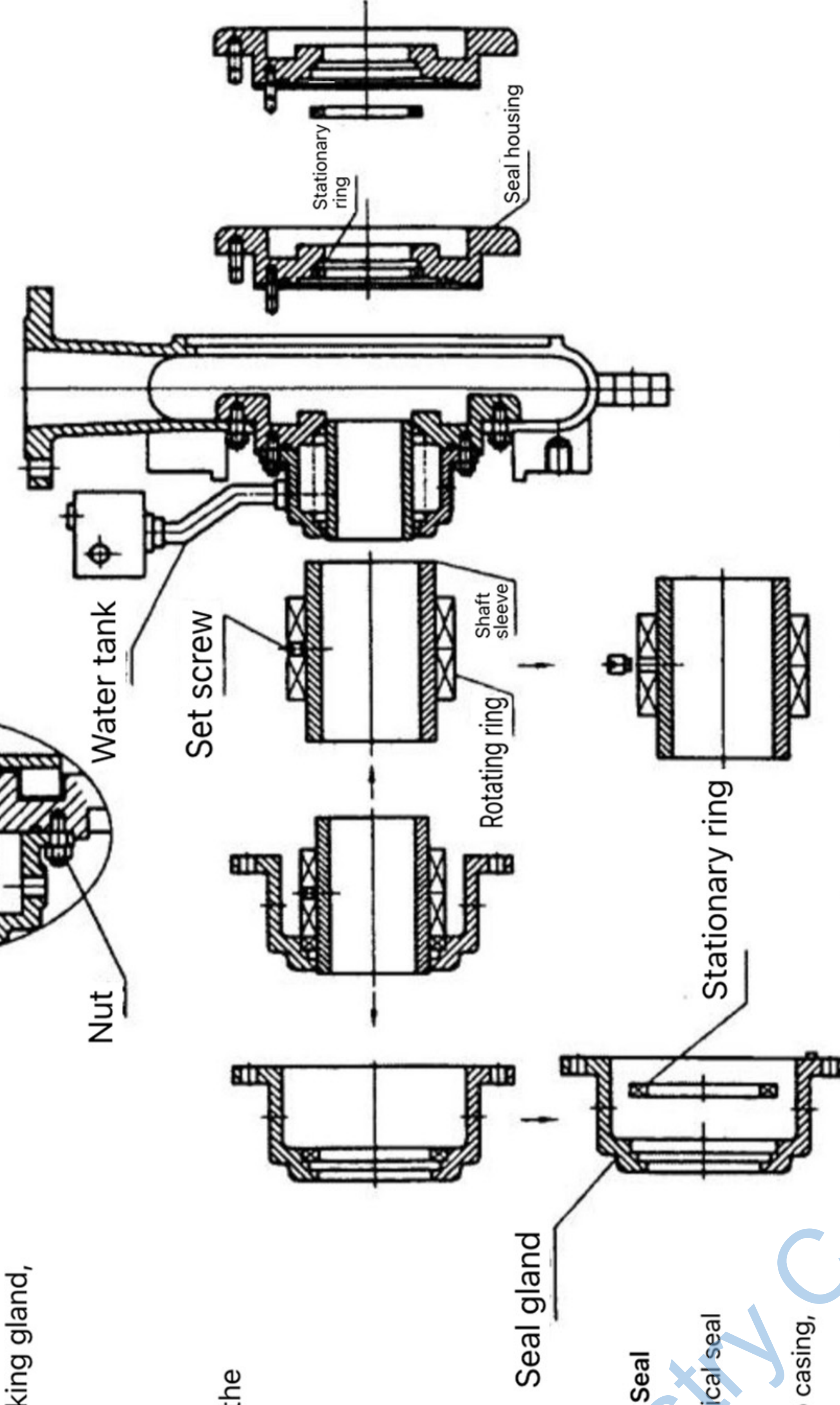
Packing Seal Disassembly and Assembly



Disassembly and Assembly of Cartridge Single Mechanical Seal



Disassembly and Assembly of Double Mechanical Seal



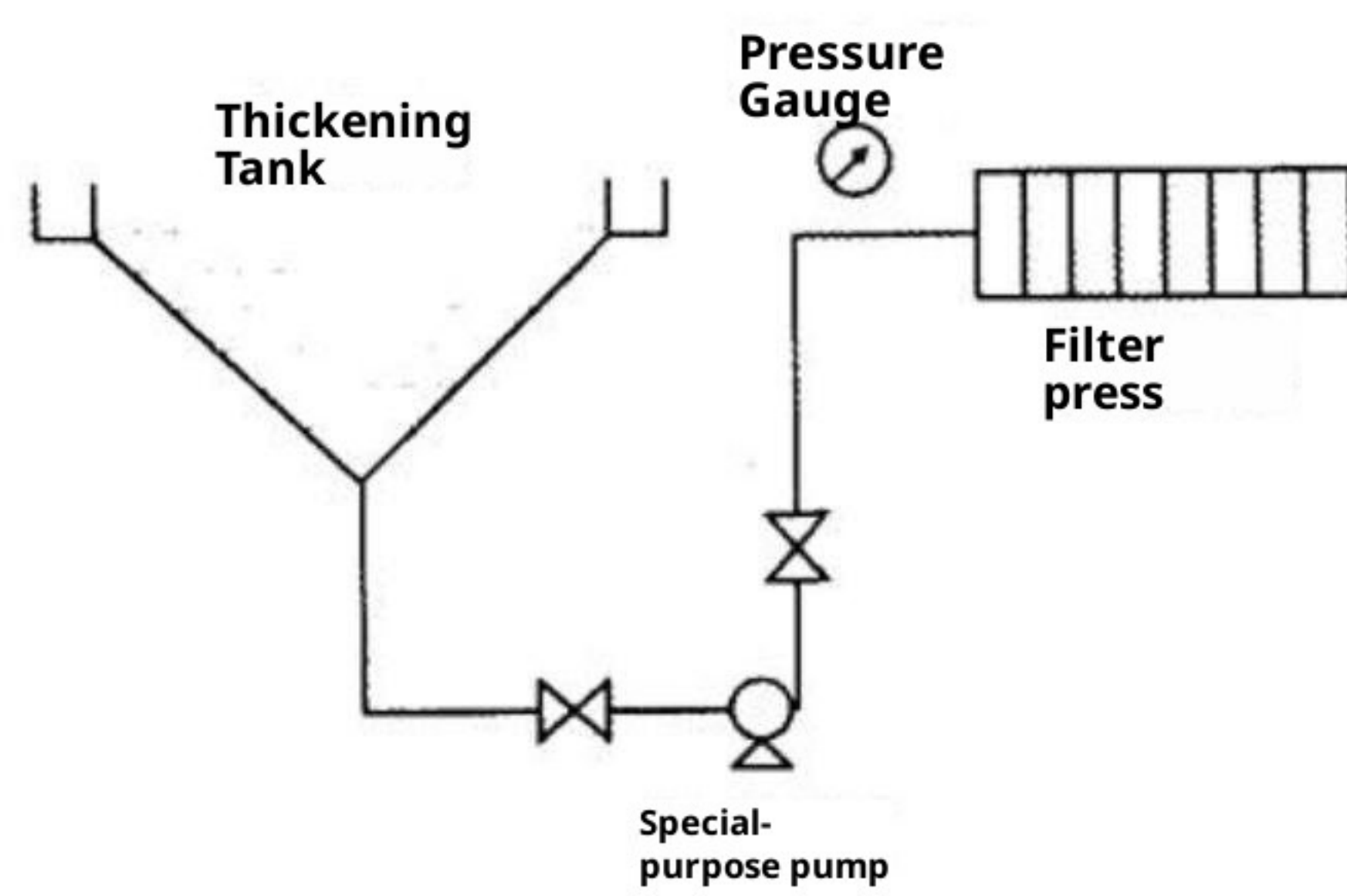
Disassembly of Double Mechanical Seal

- Loosen the nuts of the water tank and seal gland.
- Loosen the nuts between the seal housing and seal gland, remove the seal gland together with stationary ring, shaft sleeve and rotating ring.
- Loosen the set screws between rotating ring and shaft sleeve, take off the rotating ring.
- Loosen the nuts between seal housing and inlet pump casing, remove the seal housing (with stationary ring).

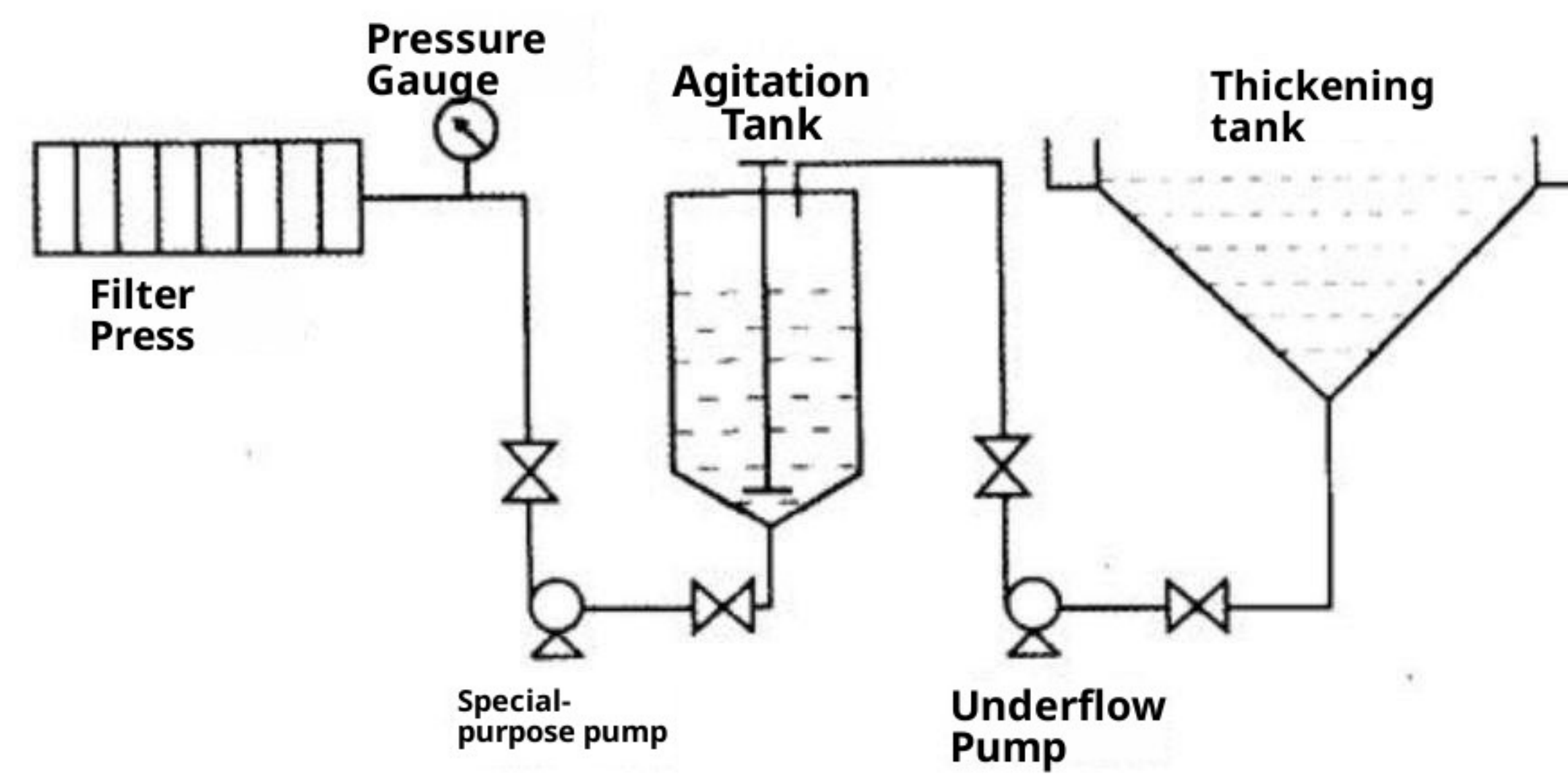
Installation of Double Mechanical Seal

The installation sequence is reverse to the disassembly sequence.

VIII. Common Pump Feeding Methods for Filter Press Systems



1 Direct Feed



2 Indirect Feeding

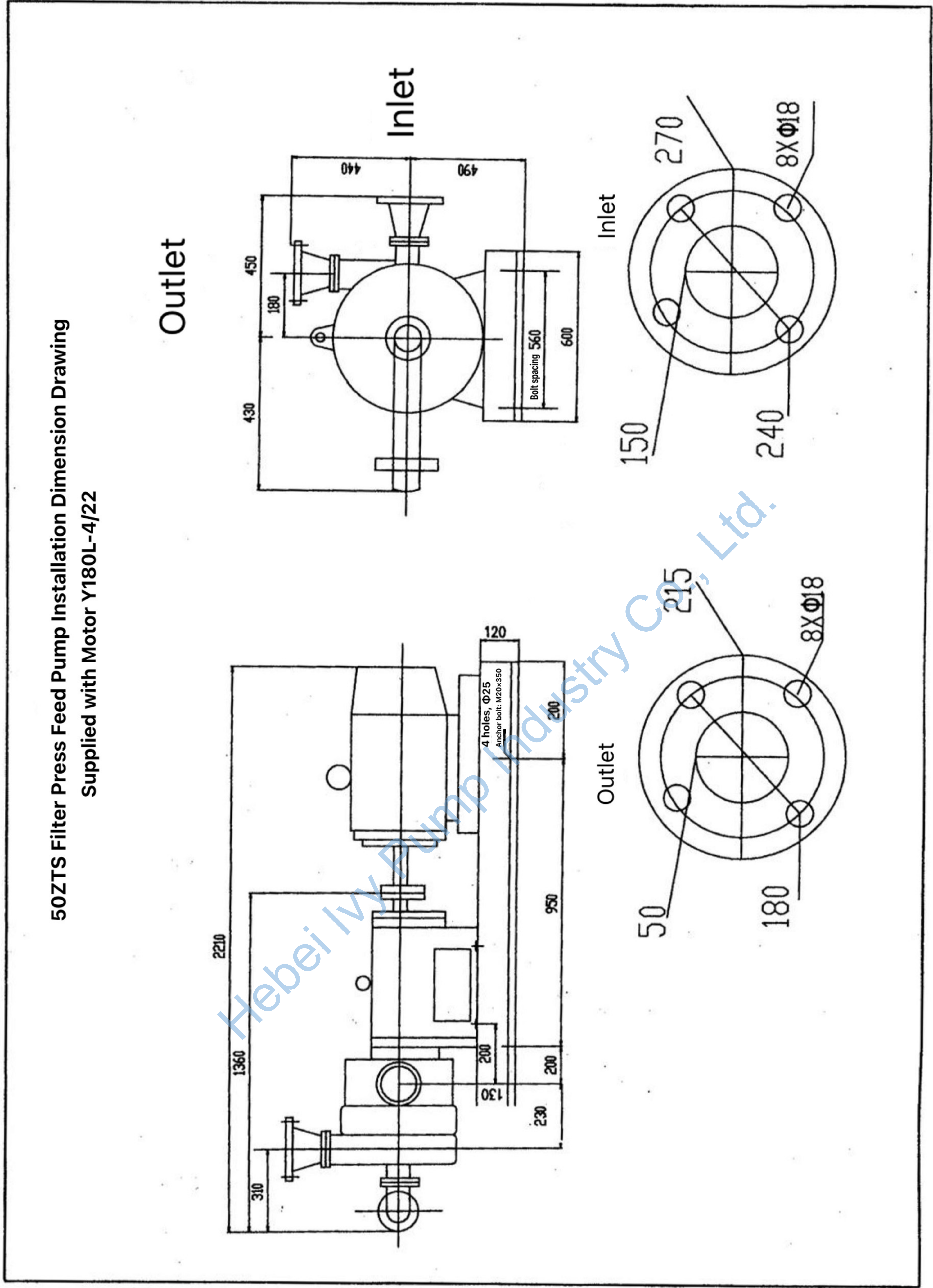
Causes of Malfunctions and Solutions

Failure	Original Image	Solution
The pump is not delivering water, and the pressure gauge and vacuum gauge needles are fluctuating wildly	The pump is not filled with water The suction line is blocked or not fully open Air is leaking into the pump's suction line, gauges, or stuffing box	Fill the pump with water Open the inlet valve and clear any blockages in the piping Seal any air leaks and check that the packing is moist and tightly packed
The pump is not delivering water, and the vacuum gauge indicates a high vacuum	The inlet valve is not open or is clogged The suction line has excessive resistance or is clogged The suction lift is too high	Open the inlet valve or clear the blockage Redesign the suction line or clear the blockage Lower the installation height
The pump is not delivering water, but the pressure gauge shows pressure	Excessive resistance in the discharge piping Impeller clogged Insufficient rotational speed	Inspect and adjust the discharge piping Clean the impeller Increase the pump speed
Pump is not running	The volute is clogged with hardened deposits	Clear the blockage
Insufficient flow	Impeller or inlet/outlet piping is blocked Impeller is severely worn Speed is below the specified value Pump is improperly installed or there is air leakage in the suction line Delivery head is too high, resulting in excessive pressure loss in the piping Inlet valve is closed too tightly or obstructed Air is leaking into the suction inlet Pump is improperly sized	Clean the impeller or piping Replace the impeller Adjust the rotational speed Reinstall or seal the air leak Lower the delivery head or reduce resistance Open the valve wider Tighten the gland Re-select
Pump motor is overloaded	The pump's head exceeds the head required by the operating conditions; the operating point shifts toward higher flow rate The specific gravity of the slurry was not considered when selecting the motor The packing is too tight	Partially close the discharge valve, trim the impeller, or reduce the speed Reselect the motor Adjust the packing gland nut
Pump vibration	Cavitation Impeller passages are blocked Pump shaft and motor shaft are misaligned Fasteners or foundation are loose	Adjust the discharge valve, lower the installation height, and reduce inlet resistance Clean the impeller Realign Tighten the bolts and reinforce the foundation

IX. Main Technical Specifications for Direct-Drive Transmission

Item Model	Speed r/min	Flow rate m ³ /h	Head m	Max. Shaft Power	Reference Motor	
					Model	Power (kw)
50ZTS30-30	1480	30	76.0	15	Y180L-4	22
		40	72.2			
		50	66.1		Y200L-4	30
		58	56.0			
		70	43.5			
65ZTS40-37	1480	41.4	76.0	22.3	Y225S-4	30
		55.2	72.2			
		69.0	66.1		Y200L-4	37
		80.0	56.0			
		100	43.5			
80ZTS60-45	1480	60.0	76.0	32	Y225S-4	37
		80.0	72.2			
		100	66.1		Y225M-4	45
		115	56.0			
		135	43.5			
100ZTS85-55	1480	85.0	100.00	49	Y225M-4	45
		113	92.00			
		150	80.00		Y250M-4	55
		169	76.00			
		175	70.00			
125ZTS105-75	1480	105	73.5	62.5	Y250M-4	55
		140	71.6			
		186	68.6		Y280S-4	75
		245	61.9			
		265	48.5			
125ZTS120-90	1480	119	80.0	78.2	Y280S-4	75
		159	78.0			
		211	74.8		Y280M-4	90
		279	67.5			
		305	52.9			
125ZTS90-90	1480	87.0	91.8	64.7	Y280S-4	75
		116	89.1			
		154	85.7		Y280M-4	90
		203	77.3			
		215	60.6			

X. Pump Outline and Installation Dimension Drawing



Pump Outline and Installation Dimension Drawing

