



Tubular Centrifuge

LB-100TC

Operation Manual

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1. Safety Measures

- The bowl is a main part of the centrifuge and has been balanced strictly before shipment. Hammer or direct heating to the bowl is not allowed. The bowl shall be placed on a special shelf and shall not be thrown or hit.
- Protect the head face and the screw thread very carefully during the bowl assembly and disassembly process by wear the protecting cap on the bowl top.
- The spindle should be hung up for storage; don't deform it.
- Don't put the sleeve on the special wrench when assembling and tightening the bowl and the drag assembly together.
- The wire joints shall not be bare. The machine should be earthed to the ground.
- Don't start the machine until the cover assembly is installed, otherwise, it will cause an accident.

2. Introduction

Tubular Centrifuge LB-100TC reaches a rotating speed of 20,000 r/min, ensuring precise and rapid bacterial separation. It achieves a maximum separation factor of 16,770, allowing for effective separation of fine suspensions. It includes a liquid-collecting tray for efficient collection of separated liquids. Our centrifuge supports PLC and touch screen installation for real-time speed and temperature monitoring.

3. Features

- High-speed rotation
- Compact vertical bowl
- Corrosion-resistant rotor
- Manual batch cleaning
- Low mechanical stress
- Heat radiation support
- Durable construction

4. Specifications

Model No	LB-100TC
Rotating Speed	20,000 r/min
Maximum Separation Factor	16,770
Sedimentation Volume	2.2L
Area of Heat Radiation	0.5 m ²
Motor Rotating Speed	2,840 r/min
Maximum Operating Pressure	1 MPa
Feeding Inlet Pressure	≥ 0.05 MPa
Feeding Nozzle Diameter	4.6 mm
Bowl Inner Diameter	75 mm
Bowl Height	450 mm
Throughput	≥ 500 kg/h
Power Consumption	1.5 kW
Product Dimension	760 × 450 × 1120 mm
Packaging Dimension	800 × 1100 × 1200 mm
Net Weight	220 kg
Gross Weight	550 kg

5. Applications

Tubular Centrifuge LB-100TC is ideal for high-speed separation of fine particles and bacteria in laboratory and industrial processes. It is widely used in microbiology, biochemistry, and pharmaceutical industries.

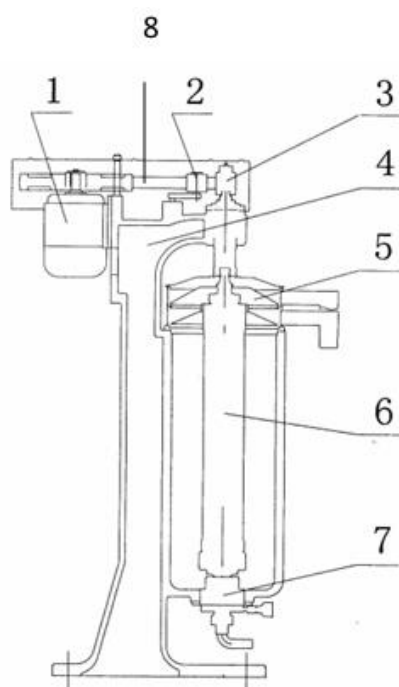
6. Instrument Introduction

6.1 Structure



Figure-1 Tubular Centrifuge Separator

6.2 Machine drawing



- 1) Motor
- 2) Bearing assembly
- 3) Spindle assembly
- 4) Machine body
- 5) Cover assemblies for liquid collection
- 6) Bowl assembly
- 7) Drag assembly
- 8) Drive belt assembly

Figure- 2 Machine Drawing

7. Installation

7.1 Assembly and center alignment

Note: The separator is delivered without complete assembly to avoid spindle damage caused by vibration during shipment. The bowl is not connected with the bearing assembly and the drag assembly. Take out the protection cloth from the cover assembly and the protection rubber plate from the bottom of the bowl before assembling the separator. Disassemble the bowl from the machine to make machine alignment.

7.1.1 Foundation preparation and center alignment

The foundation for the separator installation shall be prepared as per the foundation drawing before separator installation to ensure the safe operation. The foundation should be kept at a flat level. The gravity center of the separator should coincide with the gravity center of the foundation. The positioning plate and line fall supplied together with the separator shall be used for center alignment. Ensure that both the upper hole and the bottom hole of the machine body are in the vertical line when installing the separator on the foundation.

7.1.2 Power Supply Connections

- Connect the separator to an air switch according to the wiring diagram on the motor termination box. The position of the air switch shall be visible and easy to operate. Do not mount the air switch on the machine body.
- Check the voltage of the local power supply to see whether it is the same as the technical data of the motor nameplate.
- Check the rotating direction. The rotating direction of the bowl should be clockwise when viewed from the top to the ground.

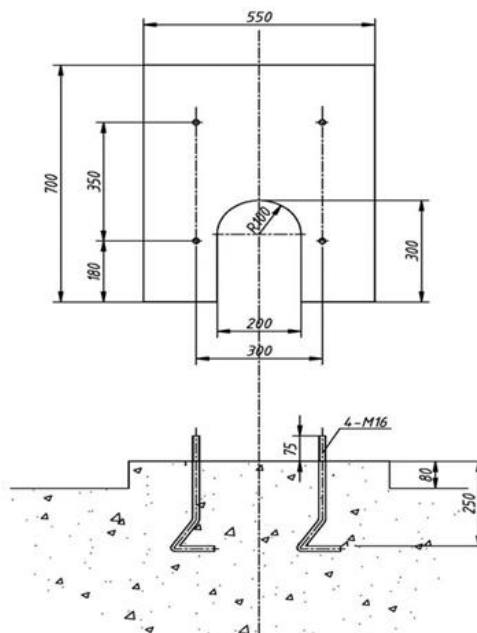


Figure 3 Foundation Drawings

7.1.3 Idler Assembly

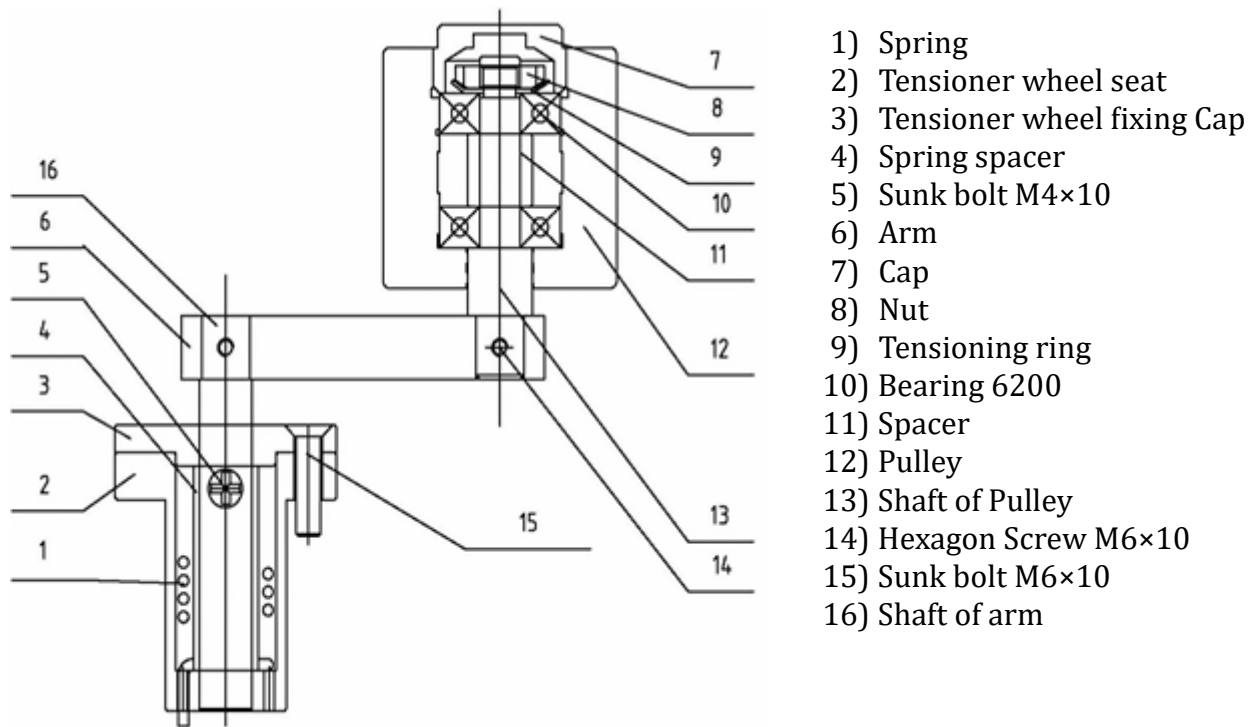


Figure-2 Idler assembly

7.1.4 Bearing Assembly

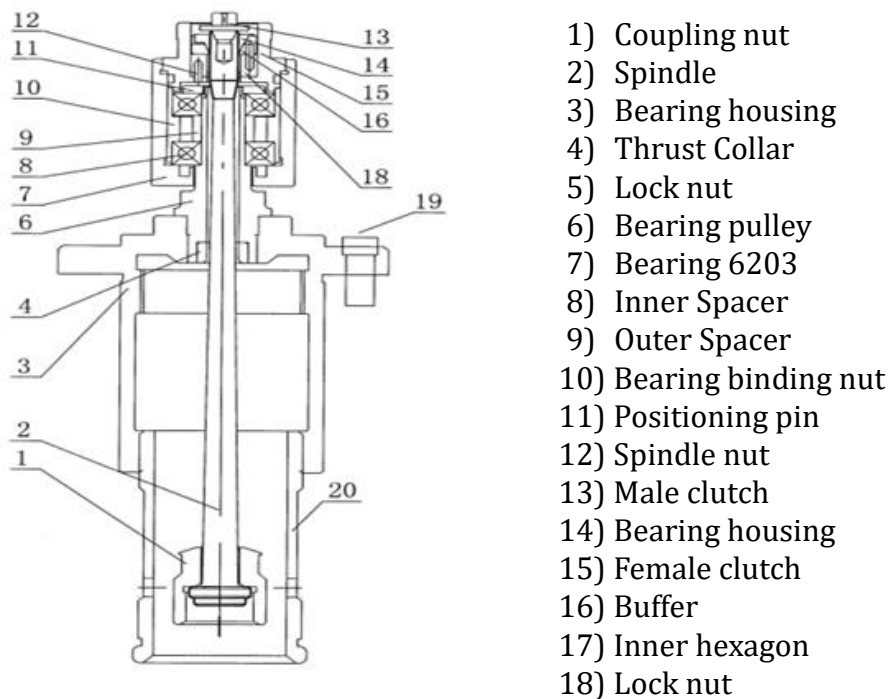


Figure-3 Bearing assembly

7.1.5 Bowl assembly

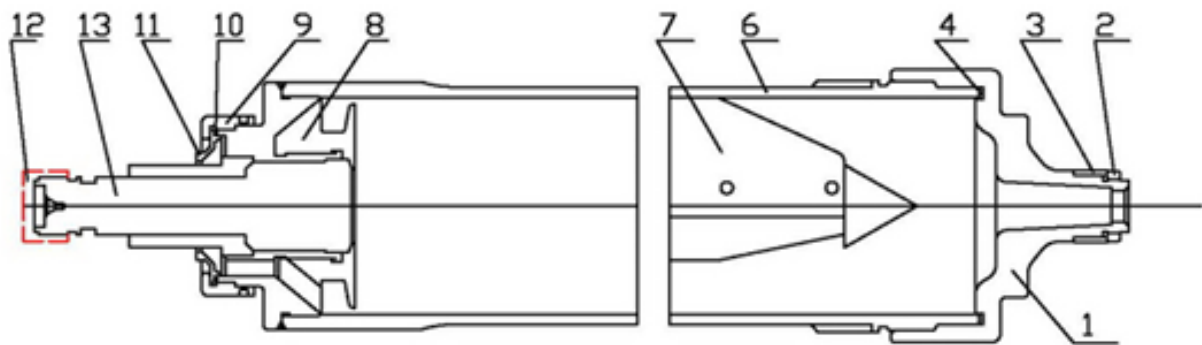


Figure-4 Bowl assembly

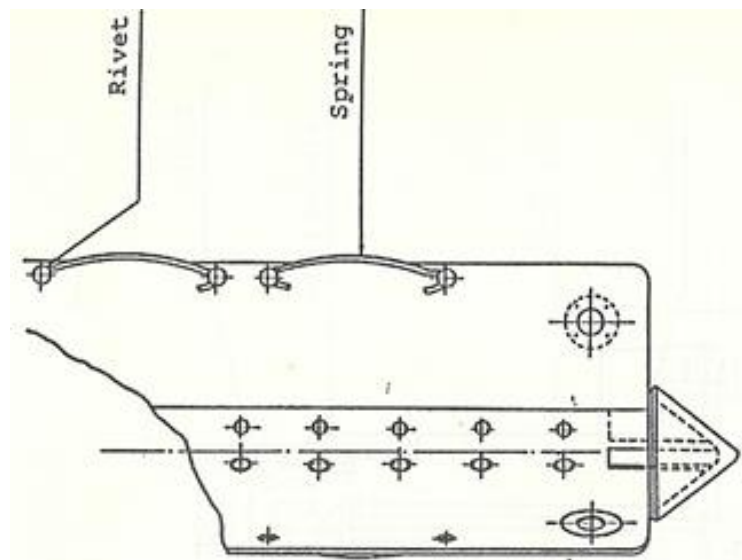


Figure-5

- 1) Bowl Bottom
- 2) Srew cap
- 3) Boss Sleeve
- 4) Bowl bottom gasket
- 5) Bowl wall
- 6) Three wings
- 7) Inner separating ring
- 8) Ring dam nut
- 9) Ring dam gasket
- 10) Outer separating ring
- 11) Protecting cap
- 12) Separating head

7.1.6 Drag assembly

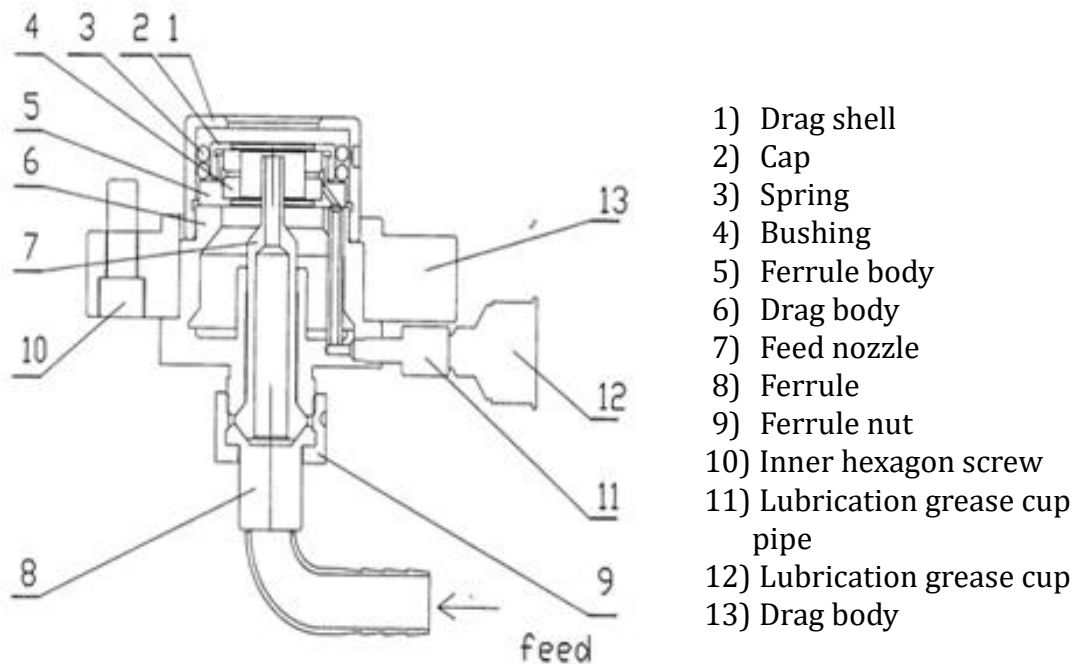


Figure-6 Drag Assembly

7.1.7 Installation of the belt

When installing the belt, the pulley should be turned about 180° in the direction of the arrow. If the new belt can't run in the middle of the pulley, the upper and lower bolts fixed on the motor shall be adjusted.

7.2 Disassembling of the bowl

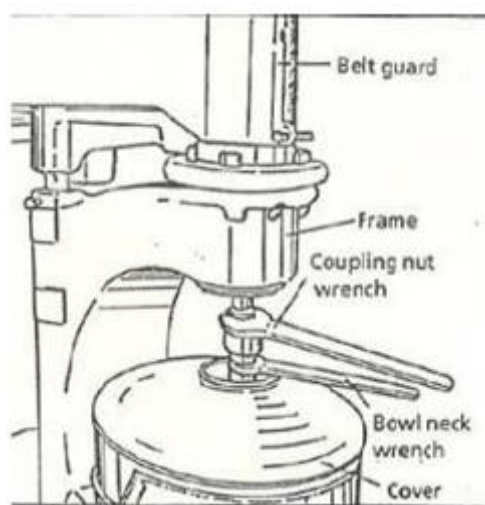


Figure-7

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- 1) Release the connection between the bowl and the coupling nut and push the spindle upward, then fit the bowl protecting cap into the threaded part of the bowl.
- 2) Remove the covers one by one and pull out the bowl gently from the frame, and place it on the cleaning table.
- 3) To remove the bowl bottom, fit the groove under the bottom of the shell into the bowl Vise, and strike the handle of the bowl bottom wrench with a hammer.

Note: Careless handling of the stainless-steel bowl may cause engagement at the threaded part, resulting in the unbalance.

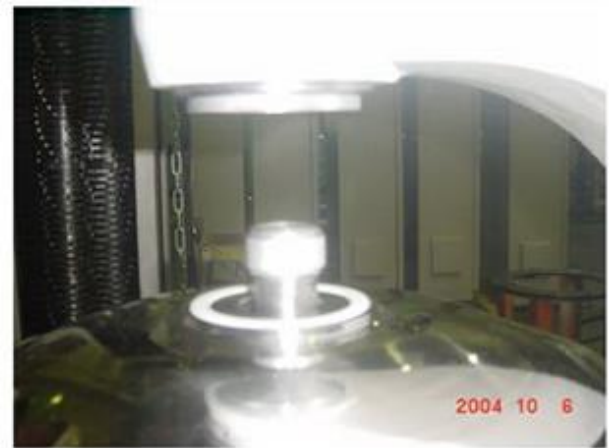


Figure-8

7.3 Removing solids and cleaning the bowl

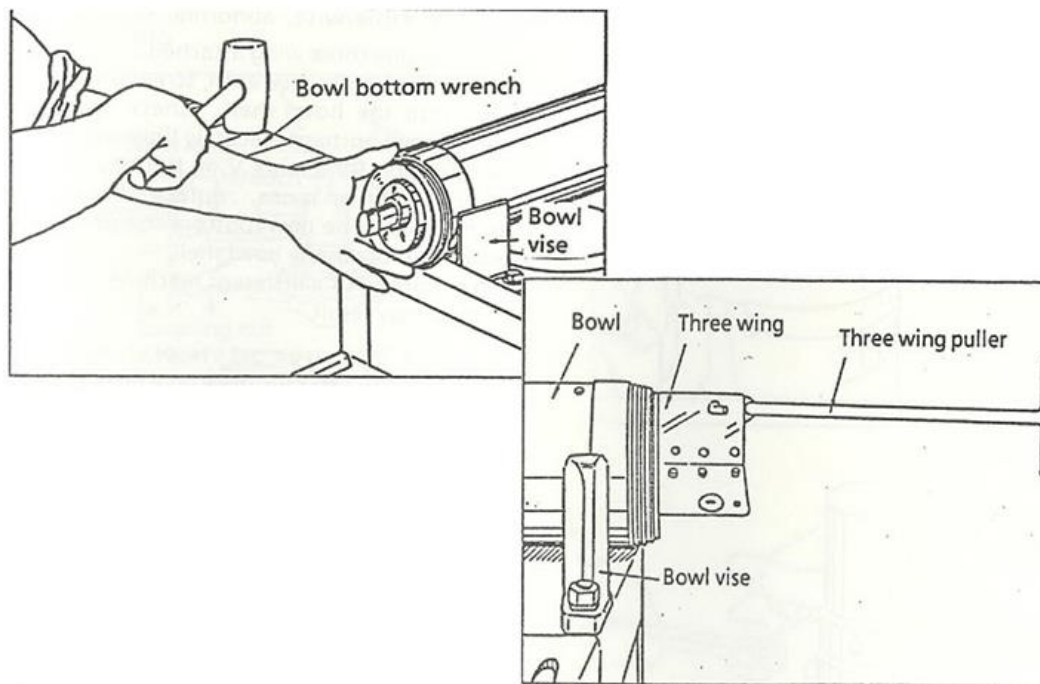


Figure-9



Figure-10

7.4 Assembling the bowl

The order of assembly of the bowl is in reverse from the disassembly of the bowl.

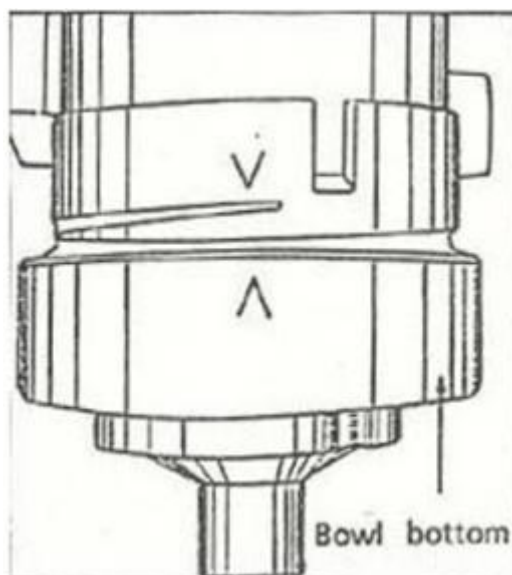


Figure-11

- 1) Push the three wings until they reach the inside dam disk
- 2) Using the bowl bottom Wrench screw the bowl bottom into the bowl shell. Check the V mark when the bowl bottom is securely tightened. If the deviation from mark V on the bowl shell is about 25 mm or more, replace the bowl bottom gasket. The bowl bottom should be of the same number as the bowl shell. If the bottom of a bowl is a different machine, unbalance may result.
- 3) Fit suitable discharge screw or ring dam depending on the specific gravity of two liquids to be separated. at this time be sure to install the discharge screw gasket or ring dam gasket and securely tighten it to be free of leakage.

8. Working Principle

Working Scheme

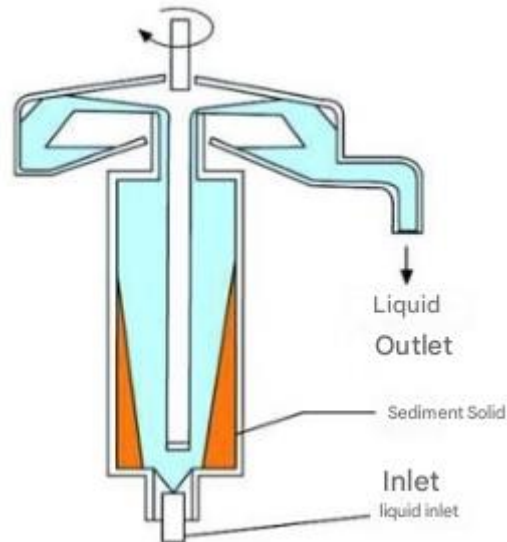


Figure-12

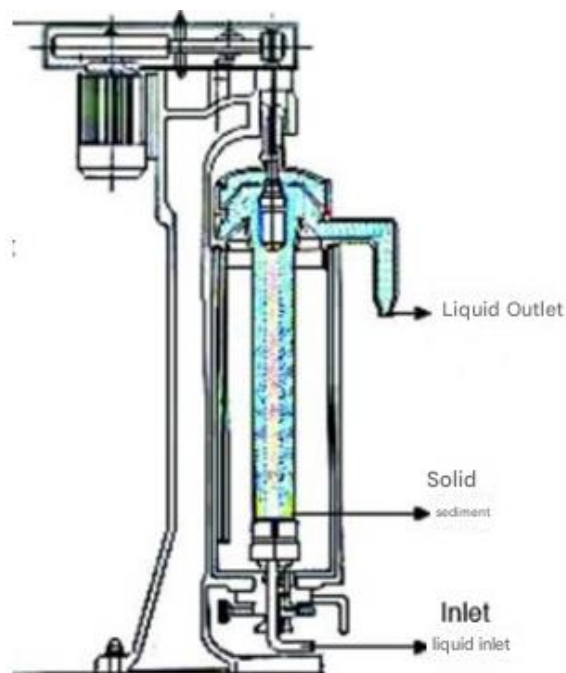


Figure-13 LB-100TC (Clarification type) working principle and structure again

The working principle of the LB-100TC tubular centrifuge separator only has one outlet for drainage out of one liquid phase.

9. Operations

9.1 Preparation before starting separation

- The machine can get the most ideal separation result and can operate for a long time when the impurities or the solids contained in the liquid are less than 5%. It is better to clarify the liquids first if the solids percentage is over 5%.
- **Feeding methods:** A Tank positioned higher than 1.2m from the foundation level can be used for material feeding. The feeding shall be controlled via a hand-operated valve equipped on the material feeding pipe. If the viscosity of the liquid is high, the pump can be used for feeding.
- **Determination of inlet pressure**
The pressure for feeding liquid materials into the bowl of the centrifuge through the nozzle shall be determined according to the properties of the materials to be separated. The materials shall be sprayed up to a level that must be higher than half of the bowl height. If the pressure is too low, part of the liquid could not be sprayed into the bowl and will flow out from the overflow port of the drag assembly at the bottom of the separator. If the pressure is too high, it could affect the separation result and could cause vibration of the machine.
- The inner diameter of the feeding pipe should be big enough. The feeding rate can be controlled by a hand-operated valve according to the flow rate and the output capacity.

9.2 Nozzle selection

There are three kinds of nozzles with different diameters, which are chosen depending on the separating result of the materials and the output. The small nozzle should be used if the separating result is the best with less output; vice versa.

9.3 Starting Operation

- Switch on the motor power. After about 80 seconds, the bowl can reach the working speed. The starting current of the motor is generally below 40A.
- The feeding valve can be opened after the full speed of the machine. Open the feeding valve a little bit first. After the clarification, liquid flows out from the outlets of the liquid collecting pans, opening the valve to the position where the flow has been pre-determined, and clarifying liquids. You'd better not stop feeding during separation.
- Analyze whether the liquid flow is normal or not, and observe whether the clarity can meet the requirements of clarification during operation. Stop the machine to remove the impurities which deposited in the bowl when the liquids (light liquid and heavy liquid) flow out from the outlets and begin to get turbid.

9.4 Stopping the machine

The feeding valve must be shut down first before stopping the machine. Don't turn off the machine until the liquids stop flowing into the liquid collecting pan. The method for stopping the machine is: power dump, and the machine will stop by itself.

10. Maintenance

Lubrication of the machine

- The high-speed lubricant grease should be filled into the lubricant grease cup on the drag assembly every two or three months.
- The ball bearings in the drag assembly are self-lubricating ones. During each operation, rotate the grease cup a little bit to fill the grease lubricant into the inner surface of the bearings.
- **Clean Grease Cup Threads:** Periodically clean the threads of the grease cup and its seating area to prevent contamination of the grease and ensure smooth rotation.
- **Avoid Overfilling:** Do not overfill the grease cup, as excess grease can migrate into unwanted areas of the assembly, causing buildup and potentially affecting performance.
- **Inspect for Leaks:** During monthly checks, inspect around the drag assembly and grease cup for any signs of grease leakage, which may indicate worn seals or improper assembly.
- **Replace Grease at Intervals:** Every 12 months, completely remove the old grease from the cup and internal components and replace with fresh grease to prevent degradation or hardening.

11. Troubleshooting

Fault	Checking Parts	Solution
The vibration intensity measured at the center of the machine is over	Check the joint between the bowl and the spindle.	Restore the dent and scratch well with an oil stone. Set up the two ends of the bowl with V-blocks. Measure the radial run-out of the spindle at its outer end with a Centimeter to ensure the radial run-out of the spindle is within 0.15mm in any direction of assembly.
	Check if the spindle is bent.	Jack up the center holes of the two ends of the spindle and measure the radial run-out of each part to ensure the radial run-out of the spindle is less than 0.05mm.
	Check if the shaft sleeve on the bed shaft of the bowl is damaged.	Change a new shaft sleeve if it is worn and torn seriously.
	Check if the sliding bearing in the liquid-in bearing seat is damaged.	Change a new sliding bearing if the gap between the sliding bearing and the shaft sleeve is up to 1 mm.
	Check if the spring is damaged or fatigued.	Change immediately if the spring is damaged.
	Check if the two marks between the bowl and the bed shaft are aligned	Change a new gasket if the position difference is up to 20mm and to align the two marks between the bowl and bed shaft.
	Check if the buffer is damaged.	Change
	Check the vibration condition of the tensioner in operation.	Adjustment

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	Check the running condition of high-speed bearings in the spindle driving parts.	Hearing: It screams if it is damaged Touch: The temperature of the pulley is high Measurement: Measured by centimetres to determine whether the machine vibration is irregular or higher.
	Check if the locking screw of the spindle is loose	Tighten it
Tubular separator technical specifications”, Reduction of bowl speed: Allow 1% of no-load deceleration; Load to allow deceleration 3%	Check if the power voltage meets the requirement.	Elimination
	Check if the motor speed meets the requirement.	Repair or change
	Check if the liquid outlet is jammed by residue.	Cleaning
	Check if the driving belt is seriously worn or has skidded because of oil stain of the surface	Change
	Check if the connection cap of the spindle is loose.	Tighten it

12. Accessories

Standard Accessories

Accessories	Quantity
Drum Gasket	1
Steel Ring	1
Cone Screw	
Buffer	1
Upper and Lower Connection Seat	1
High Speed Wheel Bearings	2
High Speed Wheel Spacer Sleeve	1
High Speed Wheel Inner Sleeve	1
Hollow Shaft	1
Main Shaft	1
Spindle Cap	1
Torsional Spring	1
Copper Sleeve	1
Big Pressure Spring	1
Belt	1

Optional Accessories

Accessories	Quantity
Drum Backup Cap	1
High Speed Wheel Assembly	1
Small Belt Pulley	1
Tensioning Wheel Assembly	1
Tightening Wheel	1
Tensioning Wheel Bearing	2
Tightening Wheel Pressure Cap	1
Tighten The Wheel Axle	1
Tightening Wheel Spacer Sleeve	1
Feeding Nozzle	1
Oil Cup	1
Control Box (with Siemens Touch Screen)	
Skid-Mounted	



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