



High Speed Tubular Centrifuge

2021/07/23

Tubular Centrifuge

Introduction

Introduction



High Speed Tubular Centrifuge is a kind of fine separation equipment, which is especially suitable for the solid-liquid separation of suspensions with thin concentration, fine particles and small solid-liquid weight difference, or liquid-liquid-solid separation. It is necessary equipment for Industries of pharmaceutical, food, chemical, and biological products, fermentation broth, beverages, blood products, etc.

Its working principle is based on the centrifugal force to make the materials of different specific gravity receive different forces, so as to achieve the purpose of separation.

According to the function, high speed tubular centrifuge has two types: clarification type and separation type. The clarification type Tubular Centrifuge is mainly used for separation of liquid and solid, and the separation type Tubular Centrifuge is mainly used for separation of liquid (light phase), liquid (heavy phase), and small amount of solid.

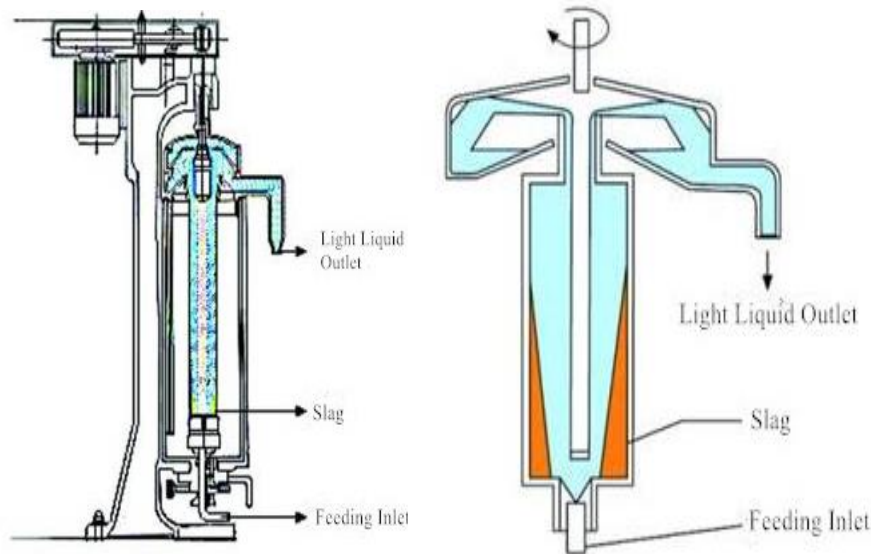
- GNGQ --- Clarification Type Tubular Centrifuge
- GNGF --- Separation Type Tubular Centrifuge

High Speed Tubular Centrifuges is artificial slag removal equipment, and the processing capacity is limited, so it is generally used for working conditions with low solid content and relatively small processing capacity.

Tubular Centrifuge

Working Principle- GQ (Clarification Type)

(GNGQ) Clarification Type Tubular Centrifuge



1. The centrifuge rotates at a high speed to reach a suitable working speed (the speed can be adjusted by the electric control panel), and the feeding inlet is continuously fed from the bottom, and a certain feeding pressure (greater than 0.05Mpa) is required.

2. The specific gravity of liquid phase in the feeding inlet is lighter, and it gradually spirals upward from bottom to top to continuously discharge from the clear liquid outlet at the upper part of the rotor.

3. The specific gravity of solid phase is relatively heavier, and it settles inside the rotor. After the solid is collected and full in the drum, the machine stops, and the rotor is manually removed for slag cleaning.

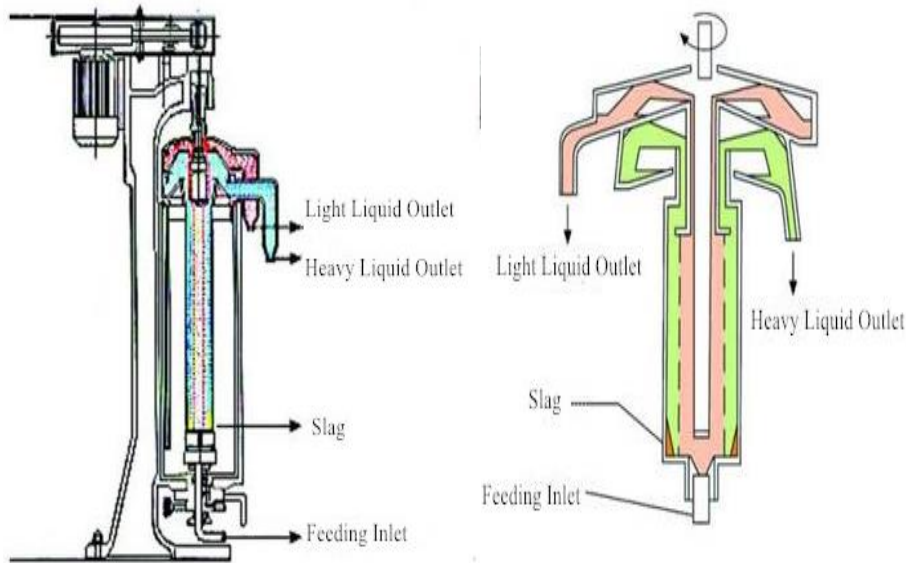
4. After the slag removal is completed, the rotor needs to be installed and reset, and then the next separation process begins.

This process can achieve solid-liquid separation.

Tubular Centrifuge

Working Principle- GF (Separation Type)

(GNGF) Separation Type Tubular Centrifuge



1. The centrifuge rotates at a high speed to reach a suitable working speed (the speed can be adjusted by the electric control panel), and the feeding inlet is continuously fed from the bottom, and a certain feeding pressure (greater than 0.05Mpa) is required
2. There is difference in specific gravity of the two liquid phases in the feeding inlet, and they are incompatible with each other. The two liquid phases gradually spiral upward from bottom to top until the upper part of the rotor. The liquid phase with lighter specific gravity is discharged from the light liquid outlet, and the liquid phase with heavier specific gravity is discharged from the heavy liquid outlet
3. The specific gravity of solid phase is the heaviest, and it settles inside the drum. After the solid is collected and full in the drum, the machine stops, and the rotor is manually removed for slag cleaning
4. After the slag removal is completed, the rotor needs to be installed and reset, and then the next separation process begins.

This process can achieve liquid-liquid-solid separation.

Tubular Centrifuge

Configuration Parameters



Model	GNGQ076	GNGQ105	GNGF105	GNGF105G	GNGQ142G
G force (G)	17000	15000			15760
Rotor Diameter(mm)	76	105			142
Rotor Length(mm)	430	740			820
Rotor Volume (L)	2	6			11
Speed (rpm)	20000	16000			14000
Hydraulic Capacity (m3/h)	0.6	1.2			1.5
Power (Kw)	1.5	3			3
Weight (Kg)	180	500			900
Dimension (mm)	650x380x1150	800x450x1620		780x460x1640	910x620x1770

Remark: The above information is for reference only. "G" means square casing.

Tubular Centrifuge

Features



Square Casing

- Available for model GNGF105G, GNGQ142G)
- The surface of the box applies stainless steel 304
- Door-opening design is easy for disassembling and assembling the rotor, save time, and does not affect the separation effect
- According to the field of application, the equipment can be explosion-proof type and cooling type



Round Casing

- Available for model GNGQ076, GNGQ105, GNGF105
- The surface of the box applies stainless steel 304
- Door-opening design available for model GNGQ105 and GNGF105, which is easy for disassembling and assembling the rotor, save time, and does not affect the separation effect
- According to the field of application, the equipment can be explosion-proof type and cooling type

Tubular Centrifuge

Features

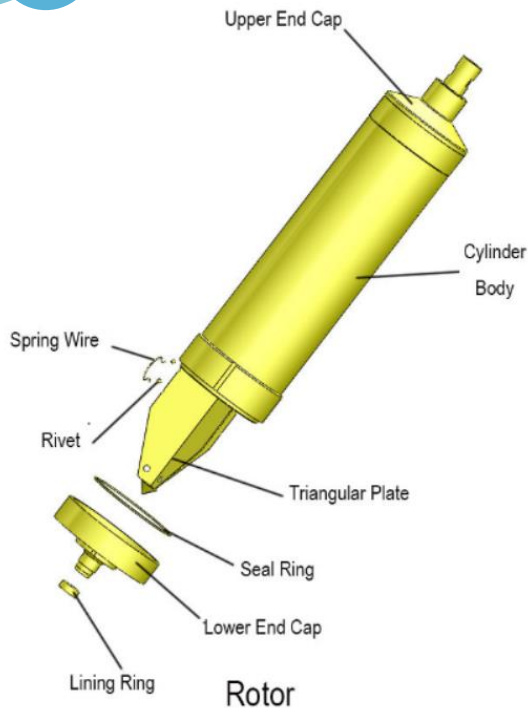


- Rotor material stainless steel 316L
- Frequency-Conversion Control Cabinet is optional, frequency converter start, adjustable speed, reduce the starting current and the damage of transmission parts and vulnerable parts, and improve the service life of equipment and motors.
- The Control Cabinet can be equipped with PLC and touch screen, with speed display and temperature display
- Mobile integrated base is optional

Tubular Centrifuge

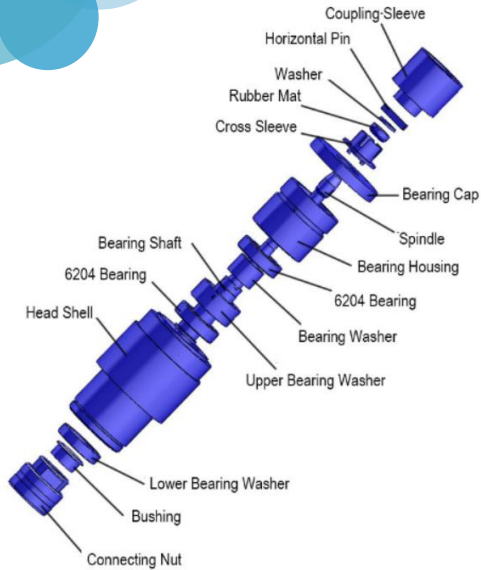
Rotor

Tubular Centrifuge Rotor

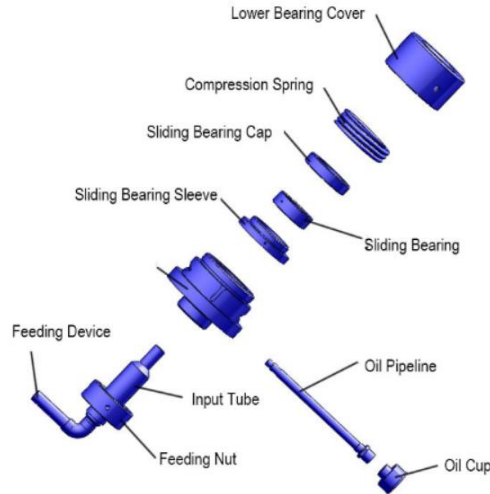


- The rotor material of the tubular centrifuge is 316L (with the third-party inspection report). The cylinder is processed after two heat treatments, and then the dynamic balance correction of the cylinder and the dynamic balance correction of the triangular plate are carried out. Finally, in order to ensure the smoothness of the rotor, the electrolytic polishing process is adopted, which can reach 0.5 microns, which fully meets the hygienic requirements of GMP and makes the centrifuge run more stably, Safe and reliable;
- The rotor has no reinforcing hoop to reduce the sanitary dead angle and facilitate cleaning;
- The rotor is the core component of the tubular centrifuge. In essence, it is a cylinder. The upper part is a top cover that can discharge liquid but cannot be removed. The lower cover can be removed for unloading and cleaning. There is a sealing ring between the lower cover and the cylinder, and there are three-edge plate or four-edge plate in the cylinder.
- The thread and cylinder block at the top of the rotor are used for connecting the nut and the main shaft for purpose of connecting rotor and positioning. In order to ensure the coaxiality after the connection between the main shaft and the rotor, please protect the thread and the cylinder block.

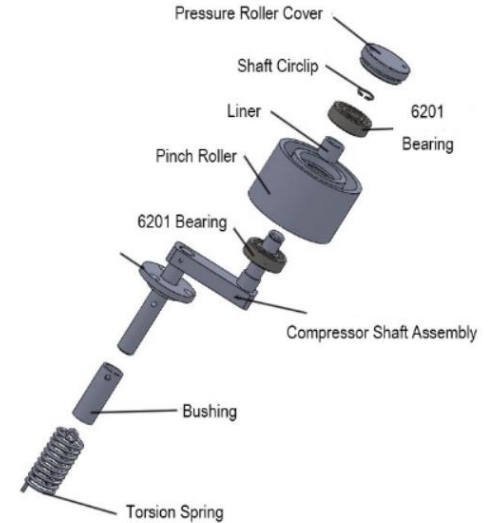
Transmission Components



Host Head Assembly



Lower Bearing Assembly



Pinch Roller Assembly

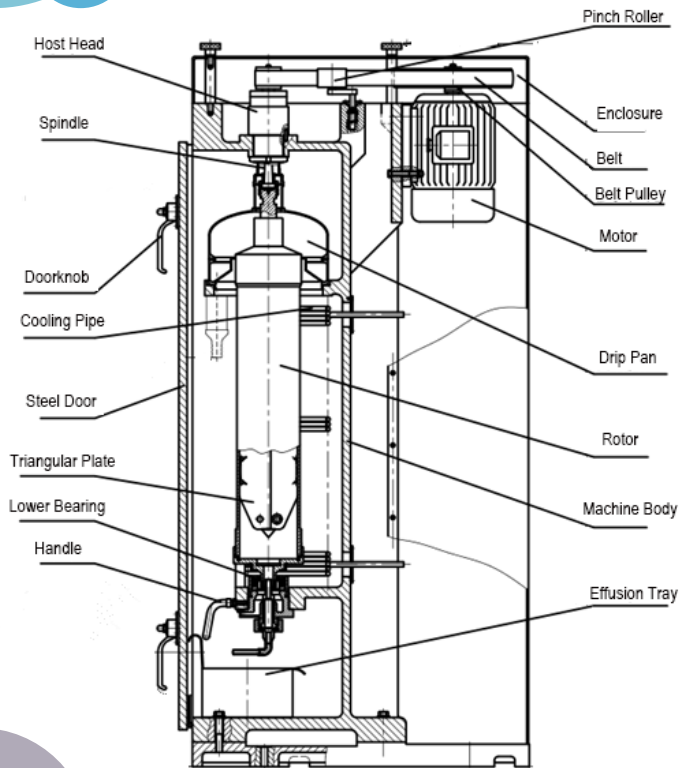
Transmission Components:

1. Two pole motor is used to drive the centrifuge to rotate at high speed through belt drive (made of Habiast in Switzerland);
2. The spindle disturbance system of the head part is adopted to make the tubular centrifuge run more stably when rotating at high speed;
3. The bearing has large supporting length and good bearing performance. The main shaft bearing adopts German fag, with long service life, stable operation and low noise;

Tubular Centrifuge

Safety Protection

Safety Protection



1. The centrifuge is equipped with vibration alarm device:

- When the centrifuge vibrates too large during operation and reaches the set value of 1, the alarm device will alarm to remind the operator to pay attention;
- When the vibration of the centrifuge is too large and reaches the set value of 2, the centrifuge will shut down automatically to ensure the safety of the operator and the centrifuge;

2. The centrifuge is equipped with door lock protection device:

- When the door of the centrifuge case is opened and operated by personnel, the centrifuge cannot be started;
- When the centrifuge case door is closed and the centrifuge is started, the case door cannot be opened to ensure the safety of operators and centrifuge;

3. Motor:

- Explosion proof motor and on-site explosion-proof button can be configured according to customer requirements;
- The motor and belt protective cover are conventionally configured to effectively protect the motor during cleaning of the machine;

Peristaltic Pump

Tubular Centrifuge Feeding Pump



Model	GNRB-10
Speed (r/min)	200~700
Flow (L/min)	4~10
Pressure (MPa)	0.15
Motor (w)	220
Hose Inner/Outer Diameter (mm)	Φ10x16.5
Weight (kg)	12
Dimension (mm)	460x200x210

Peristaltic pump is used to transfer liquid by peristaltic rubber hose caused by rotating roller. The conveyed liquid only flows in the rubber hose, does not contact with other parts of the pump, and has no cleaning dead angle, so as to avoid possible pollution. The material of the hose is strictly selected and made of non-toxic silicone rubber or polychloroene material, which meets the hygienic standards in biochemical and medical fields. This kind of pump is with novel design, simple structure, step-less speed change to adjust the flow, suitable for working in humid environment, easy to operate, and easy to clean and disinfect.

Peristaltic pump is widely used in hospitals, biochemistry and other industries to pump blood and other liquids. It can also be used for transporting liquids in other industries. It is suitable to be used as a feed pump for high-speed tubular centrifuges.

GN Facilities



No. 1 Factory: Headquarter Office



No. 2 Factory: Centrifuge & Pump Manufacture



GN Facilities

Centrifuge Workshop

GN[®]
SEPARATION



GN Facilities

Fabrication & Coating



Laser Cutting



Plasma cutting



Parts to be Assembled



Welding



Powder Coating



Finished Tubular Centrifuge

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GN Solids America



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