

Introduction

Thank you for purchasing our YXQM series ball mill. To ensure the proper use of the equipment, please read the instruction carefully before you use the equipment.

1. Safety

Must comply with safety specifications at all stages of operation and maintenance equipment. You must follow the instruction when using the ball mill. If not, it will cause the equipment failing to work properly and cause equipment damaging.

2. Take care of using the power

Before connect the power, please make sure that the voltage is the same as the voltage required by the equipment ($\pm 10\%$ deviation). And ensure that the rated load of the power outlet is not less than the requirements of the equipment and confirm the power outlet is connected with a reliable ground line

3. Take care of using the power line

This ball mill has the power line which we provided. If the power line is broken, please replace and not repair. When replaced the power line, the same type and specification would be acceptable. No other things on the power line. Don't put the power line on the place where many people movement.

4. Security Environment

This equipment should be placed in a cool, ventilated, dry, dust-proof and level position.

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1.Summary

1.1.Main application

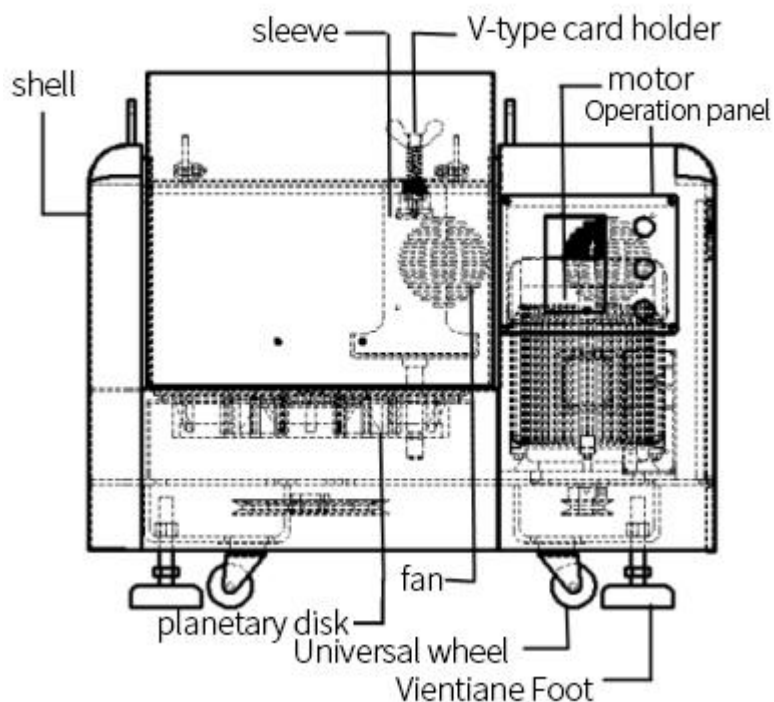
The products are mainly used in the fields of electronic ceramics, structural ceramics, magnetic materials, catalysts, biology, medicine, metallurgy, ceramics, lithium batteries, new materials, etc.

1.2.Operation principle

Planetary Ball Mill has four ball grinding jars installed on one turntable. When the turntable rotates, the jar axis makes planetary movements that the ball mill jar revolution around the axis of the rotary disc and at the same time it rotation around its axis. The balls and samples inside the jars are impacted strongly in high speed movement, and samples are eventually ground into powder. Various kinds of different materials can be ground by the mill with dry or wet method. Minimum granularity of ground powder can be as small as $0.1\mu\text{m}$ ($1.0 \times 10\text{mm}^{-4}$).

Working mode: Two or four ball milling jars working at the same time and the maximum sample loading amount: Volume of ball milling jar $\frac{2}{3}$, feeding granularity: soil material $\leq 10\text{mm}$ other material $\leq 3\text{mm}$ discharge granularity: the minimum can up to $0.1\mu\text{m}$ (i.e. $1.0 \times 10\text{mm}^{-4}$).

1.3.Equipment structure diagram



1.4. Technical parameters of planetary ball mill

Model	Power	Voltage KW	Ball mill jar	Vacuum jar	Rotation Speed(RPM)		Noise≤db(A)
					Revolution (adjustable)	Rotation(adjustable)	
YXQM-0.4L	110V 60HZ	0.55KW/ 0.73HP	100ml/ 0.03gal	/	30-450	60-900	<60db
YXQM-1L	110V 60HZ	0.55KW /0.73HP	250ml/ 0.07gal	100ml/ 0.03gal	30-450	60-900	<60db
YXQM-2L	110V 60HZ	0.75KW /1HP	500ml/ 0.13gal	250ml/ 0.07gal	30-400	60-800	<60db
YXQM-4L	110V 60HZ	0.75KW /1HP	1000ml/ 0.26gal	500ml/ 0.13gal	30-400	60-800	<60db

2.Operation steps

Operation procedure:checking accessories ,equipment installation,add the oil,balls selection,feeding materials,installing jars,start power,set up the frequency converter,grinding,stop,discharging jars,cleaning equipment,switch it off

2.1. Checking accessories

After unpacking, check the packing list to see if the accessories are completely,and check whether the equipment is damaged during transportation. If there is any shortage or damage, please contact our company immediately.

2.2. Equipment installation

Pushing the ball mill to a specified position with a universal wheel,adjusting the supporting foot to the right height with a wrench,until the supporting foot braces the machine above the roller to prevent it from moving and lock nut after supporting foot full contact with the ground. Open the white rubber and then injecting lubricating oil into the main tank. The volume of the lube oil would be 800ml. The grade of lubricating oil 15W-40(This means the temperature under 15 degrees to 40 degrees) . The oil could be the oil in your car. The oil replace half a year.



2.3.Balls

Match the grinding balls of several specifications according to the experimental scale.The following data for your reference:Crushing experiment according to

big,middle,small(20%;30%;50%);Grinding experiment according to big,middle,small(10%: 30%: 60%)

2.4.Feeding

The capacity of experiment material is 1/3 capacity of ball milling jar. The feeding granularity of the experimental sample should be less than 3 mm and the soil was not more than 10 mm.The materials,balls and grinding space accounted for 1 / 3 respectively.

2.5.Put the ball mill jar into the planetary ball mill(see video operation)

Installing the jar which filled with grinding balls and materials to the ball mill jar sleeve,then install V lock holder,locking seat fastening device.

This is an extremely important step and make sure it's locked.We suggest to use the principle of metal sleeve lever to reinforce v-clamp.(We have given metal sleeve rod)

A: Installation of Non-vacuum Jar

To put a sealing ring on the lid and pay attention to whether there are balls or powders at the opening of the jar before the lid is closed.

B: Installation of vacuum Jar

There will be one or two valves above the vacuum jar.With one valve on the jar which is used in inlet and also outlet.With two valve on the jar, one valve is used for the vacuum and other valve is used for injecting inert gas.

Ball mill jars must be symmetrically installed and no single or three jars to running.The specific gravity of two opposing ball mill jars is $\pm 100g$.Ball mill jar must be placed in the center of ball mill jar sleeve.If not,the V clamp can't hold the ball mill jar when running at high speed.There are 6 positioning holes in the bottom of 8L and bigger ball mill jar sleeve.Must be aligned to avoid a safety accident when the ball mill jar will thrown out of the sleeve.

2.6. Start power supply

Plug in---Turn on the safety switch---Turn on the emergency stop button---Press start switch---Adjust the frequency converter knob to the revolution speed required by the experiment.Screen displayed as planetary revolution speed.

When you see the indicator light “run” light up on the panel,it is running.When see the “stop” light up,it is stop

2.7.Frequency converter parameter setting(see attachment)

2.8.Grinding material

2.8.1.Planetary high-speed rotation belongs to breaking speed(80% or more of the maximum rotational speed of the machine).It is recommended to use high speed in the first five minutes when the raw material is in granular state(60-70% of the maximum rotational speed of the machine),

Recommend low speed for mixing speed(50 % to 60 % of the highest speed of the machine)

2.9.Closing down

Press the stop button,when the planet's main disk stops completely, it's the end

2.10.Unloading jars

Open the V clamp holder. (A: Self-locking type,open gear buckle and anticlockwise opening. B:Nut type, open it counterclockwise with a wrench) unload V-type holder,take out the ball mill jar. The temperature will be high of jars after long time grinding.So dry grinding to prevent scald, wet grinding to prevent to scald experimenter with the exhaling liquid which from internal air pressure.

2.11.Cleaning the equipment

Clean up the powder or liquid sprayed on the machine after each used.

The planetary master disk must be cleaned so as not to allow the powder to enter the planet's main disk and damage the gears and bearings inside.

3. Introduction of ball mill jar and ball specification

3.1.Material characteristics of each ball mill jar

A: Polyurethane jar is a seal jar, no sealing ring, no using of organic solvents.

B: Nylon has high wear resistance,and can use alcohol as an auxiliary liquid.

C: PTFE has high corrosion resistance and thermostability

D: Stainless steel jar with 304 material,higher heat,when grinding,please avoid to scald by the liquid. Must clean the water to avoid rust.

E: Corundum pot is made of 92% alumina.In the first using the corundum jar,the grinding ball must be placed in the ball mill to polished slowly of alumina powder after firing.

F: The density of cemented carbide jar is high, and it is easy to produce heat. This jar is used in special experiment.

G: Agate jar is from Brazil,a natural material.All agate jars from our factory have been strictly scanned.All that looks like a crack is actually an agate pattern.It can be safely used without replacement.

H: Silicon carbide jar belong to ceramics,low density,fast heat dissipation , the performance is between corundum and zirconia jar

I: The zirconia is high purity,high density, high energy, stable performance in all aspects. Be careful not to take too long to use.We suggest to obtain different experimental samples indirectly.

3.2.Type of conventional ball milling pot

Material/ capacity	50ml	100ml	250ml	500ml	1L	2L	3L	5L	10L	15L	20L
Polyurethane	※	※	※	※	※	※	※	※	※	※	※
Nylon	※	※	※	※	※	※	※	※	※	※	※
PTFE	※	※	※	※	※	※	※	※	※	※	※
Stainless steel	※	※	※	※	※	※	※	※	※	※	※
Corundum/ Alumina	※	※	※	※	※	※	※	※			
Zirconia	※	※	※	※	※	※	※	※			
Agate	※	※	※	※	※	※	※				
Hard alloy	※	※	※	※	※	※	※				
Carborundum	※	※	※	※	※						

※: Represents regular specifications

3.3.Matching of ball milling jar and grinding ball

Ball mill jar\grinding ball	stainless steel ball	agate ball	Zirconia ball	Alumina ball	Hard alloy ball	Polyurethane ball	Silicon carbide ball
Polyurethane jar			※				
Nylon jar			※				
PTFE Jar			※				
SS jar	※						
Corundum jar			※				
Zirconia jar			※				
Hard alloy jar					※		
Agate jar		※					
Carborundum jar							※

※Represent the best collocation

Notice: The choice of grinding jar and ball are directly related to the final purity, fineness of powder and performance in all respects

4. Common fault diagnosis and countermeasures

When there is a failure or abnormal failure of the device, you should check and record the failure in detail as following sheet.

No.	Classify	Failure type	Treatment
1	Mechanical and transmission parts	A sudden abnormal sound occurred in the process of running	Stop immediately, check if the ball mill jar is tight
		Excessive noise	Check if the bearing and gear is damage, replace of new lubricating oil
		Frequency converter has rotating speed, but the machine is not running	Check if the belt is damage, replace of new belt
2	Electrical part	Equipment cannot start	1. Check if the power line plugged in
			2. Does the safety switch start
			3. Check if emergency stop key is open
			4. Check if the switch is pushed by the door.
			5. Check if the switch accessory is damage.
			6. Check the pilot light is light up.
3	Frequency converter part	Error code	Provide error code and contact our company

5. Maintain

5.1: Daily maintenance

The equipment must be installed and operated in strict accordance with the specifications. Due to the influence of environment, temperature, humidity, vibration and aging and wear of internal components, the equipment may cause potential malfunction. In order to ensure long-term and stable operation of the equipment, the equipment must be maintained on a regular. The equipment lubricating oil unloading port is at the left bottom of the equipment (the inner 50mm), open the valve and unload the oil.

No.	Check classification	Failure type
1	Mechanical and transmission parts	Check regularly to see if the connecting bolts are loose
		Check regularly if the ball mill jar sleeves are loose
		Regular inspection of bearing wear
		Regular inspection of belt wear
		If the gear is lubricated after 200 hours or 2 months running

2	Electrical part	Check regularly if the power cord is broken and if the terminal is loose
		Check the control box if the cooling fan is working properly
		Regularly clean the frequency converters and control switches and ensure cleanliness and dryness

6. Notices:

6.1. Keep the electrical parts dry, strictly prohibit using the wet hand touching the power supply.

6.2. When the equipment is ready for using, the power must be turned off to guard against accidents.

6.3. Check and maintain regularly to ensure that the lubricating degree of the transmission part and the connection of the electric appliance part are good

6.4. Keep equipment clean and clean in time

6.5. Overload operation is strictly prohibited

6.6. Before the equipment starts running, please reconfirm whether the grinding jar is locking as required

6.7. As the energy of planetary ball mill is high, it is not recommended to use for more than 6 hours in a continuous high speed state. We suggest to choose intermittent work mode in order to safety. And the reaction effect of the powder in a high - speed and high - temperature environment is mastered in advance

6.8. The machine should pay close attention to the temperature of the ball mill tank in operation. If the temperature exceeds 80 degrees, it should be stopped to cool down. After the machine is stopped, let the ball mill jar cool before opening to prevent the material from spewing out and scald. If entering some materials powder above 600 mesh, spontaneous combustion will occur easily.

High active hazardous materials need vacuum atmosphere protection jar and professional operation grinding. Factory technicians' opinions are for reference only, not for final reference. The physical or chemical reaction risks that will occur during the powder grinding process need to be assessed by the experimenter himself to avoid an accident. The accident caused by the material will be borne by the user himself. We hope the experimenter will be careful.