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# TENCAN

## Product Brochure



PLANETARY BALL MILL SERIES

# Vertical square planetary ball mill

**XQM-2~100**

Compact vertical square planetary ball mill for precise mixing, fine grinding, lab sample prep, and small-batch powder production.

<https://www.planetaryballmills.com/products/grinding-series/planetary-ball-mill/vertical-square-planetary-ball-mill.html>



## Product Overview

Compact vertical square planetary ball mill for precise mixing, fine grinding, lab sample prep, and small-batch powder production.





## Product Introduction

Vertical square planetary ball mill It is a powder device for mixing, fine grinding, sample preparation, new product development and small batch production of high-tech materials. Our planetary ball mill has small size, full functions, high efficiency and low noise. It is an ideal equipment for scientific research institutions, universities and corporate laboratories to obtain research samples (four samples can be obtained simultaneously for each experiment). Equipped with a vacuum ball mill tank, the samples can be ground in a vacuum state.





## Planetary Tilting Disc

360° flip-type rotation enables multidirectional movement and grinding of the milling jars.

## Control Panel

Simple and convenient control panel, flexible to operate.

### TCA-II Intelligent Controller



System Standby  
Total Time: 120 0 min  
Forward: 5 0 min  
Speed: 450 33.58r/min

Alarm/Fault

Start

Pause

Total Time Forward Rotation Reverse Rotation Interval Operation Stop



## Viewing Window

Clearly observe the operating condition through the window.

## Cooling Fan Vent

High-speed operation effectively enhances airflow and heat dissipation, ensuring stable machine operation.





Vertical square planetary ball mill Widely used in geology, mining, metallurgy, electronics, building materials, ceramics, chemical industry, light industry, medicine, environmental protection and other departments, suitable for electronic ceramics, structural ceramics, magnetic materials, lithium cobalt oxide, lithium manganate, catalysts, phosphors, long afterglow luminescent powder, rare earth polishing powder, electronic glass powder, fuel cells, zinc oxide varistors, piezoelectric ceramics, nanomaterials, wafer ceramic capacitors, MLCC, thermistors (PTC, NTC), ZnO varistors, dielectric ceramics, alumina ceramics, zirconia ceramics, phosphors, zinc oxide powder, cobalt oxide powder, Ni-Zn ferrite, Mn-Zn ferrite and other products.



## Technical parameters

### Basic configuration parameter table

model	Specification	Specification classification	Can be equipped with ball mill tank specifications	quantity	Available vacuum tank specifications	Equipment weight (kg)	Equipment volume (mm)
XQM-0.4	0.4L	Experimental model	25-100mL	4	Can be equipped with 50mL vacuum ball mill tank	35	550×300×360
XQM-1	1L	Experimental model	50-500mL	4	Can be equipped with 50-250mL vacuum ball mill tank	100	760×470×580
XQM-2	2L	Experimental model	50-500mL	4	Can be equipped with 50-250mL vacuum ball mill tank	100	760×470×580
XQM-4	4L	Experimental model	250-1000mL	4	Can be equipped with 50-750mL vacuum ball mill tank	100	760×470×580
XQM-6	6L	Experimental model	1-1.5L	4	Can be equipped with 50-1000mL vacuum ball mill tank	100	760×470×580
XQM-8	8L	Experimental model	1-2L	4	Can be equipped with 50-1500mL vacuum ball mill tank	168	900×600×640
XQM-10	10L	Experimental model	1-2.5L	4	Can be equipped with 1-2L vacuum ball mill tank	168	900×600×640
XQM-12	12L	Experimental model	1-3L	4	Can be equipped with 1-2L vacuum ball mill tank	168	900×600×640
XQM-16	16L	Experimental model	2-4L	4	Can be equipped with 1-3L vacuum ball mill tank	203	950×600×710
XQM-20	20L	Production model	2-5L	4	Can be equipped with 2-4L vacuum ball mill tank	392	1200×790×930
XQM-40	40L	Production model	5-10L	4	Can be equipped with 5L vacuum ball mill tank	656	1400×880×1070
XQM-60	60L	Production model	10-15L	4	Can be equipped with 10L vacuum ball mill tank	950	1600×1070×1250
XQM-80	80L	Production model	15-20L	4	Can be equipped with 15L vacuum ball mill tank	1300	1750×1140×1330
XQM-100	100L	Production model	20-25L	4	Can be equipped with 20L vacuum ball mill tank	1300	1800×1150×1140
XQM-200	200L	Production model	50L	4	Can be equipped with 25L vacuum ball mill tank	2725	2670×1600×2804

## Performance parameter table

model	Device power supply	Power connector	Motor power (kW)	Speed regulation method	Run settings Total time(min)	Alternate forward and reverse operation Time(min)	Planetary disk speed (rpm)	Grinding tank speed (rpm)	Speed ratio	noise (dB)
XQM-0.4	220V 50Hz	single phase	0.25kW	Frequency conversion speed regulation	1-9999	1-999	0-435	0-870	1:2	58±5
XQM-1	220V 50Hz	single phase	0.75kW	Frequency conversion speed regulation	1-9999	1-999	0-335	0-810	1:2	60±5
XQM-2	220V 50Hz	single phase	0.75kW	Frequency conversion speed regulation	1-9999	1-999	0-335	0-810	1:2	60±5
XQM-4	220V 50Hz	single phase	0.75kW	Frequency conversion speed regulation	1-9999	1-999	0-335	0-810	1:2	60±5
XQM-6	220V 50Hz	single phase	0.75kW	Frequency conversion speed regulation	1-9999	1-999	0-335	0-810	1:2	60±5
XQM-8	220V 50Hz	single phase	1.5kW	Frequency conversion speed regulation	1-9999	1-999	0-290	0-580	1:2	60±5
XQM-10	220V 50Hz	single phase	1.5kW	Frequency conversion speed regulation	1-9999	1-999	0-290	0-580	1:2	60±5
XQM-12	220V 50Hz	single phase	1.5kW	Frequency conversion speed regulation	1-9999	1-999	0-290	0-580	1:2	60±5
XQM-16	380V 50Hz	Three phases	3kW	Frequency conversion speed regulation	1-9999	1-999	0-255	0-510	1:2	65±5
XQM-20	380V 50Hz	Three phases	4kW	touch screen	1-9999	1-999	0-215	0-430	1:2	65±5
XQM-40	380V 50Hz	Three phases	5.5kW	touch screen	1-9999	1-999	0-195	0-390	1:2	68±5
XQM-60	380V 50Hz	Three phases	7.5kW	touch screen	1-9999	1-999	0-174	0-260	1:1.5	68±5
XQM-80	380V 50Hz	Three phases	11kW	touch screen	1-9999	1-999	0-151	0-242	1:1.5	68±5
XQM-100	380V 50Hz	Three phases	11kW	touch screen	1-9999	1-999	0-151	0-242	1:1.5	68±5
XQM-200	380V 50Hz	Three phases	22kW	touch screen	1-9999	1-999	0-143	0-215	1:1.5	68±5

### • Capacity requirements

- **laboratory grade** : Choose 1-4L small equipment, suitable for 50ml-1L ball mill tank, suitable for sample preparation.

- **production grade** : Large-scale equipment above 20L (such as XQM series) supports mass production and needs to be equipped with hoisting and vibrating screening and discharging devices.
- **Material selection**
  - **Grinding jar material** : Choose stainless steel (anti-pollution), corundum (corrosion-resistant) or zirconium oxide (high hardness) according to material characteristics.
- **Control method**
  - Priority is given to models with variable frequency speed regulation and programmable control to improve experimental repeatability.
- **Security and Maintenance**
  - Pay attention to the equipment's lubrication system (such as liquid oil self-lubrication) and gear durability to ensure long-term stable operation.
- **special needs**
  - If grinding in a vacuum or inert gas environment is required, a vacuum ball mill tank and sealing device are required.

## Working Principle

The vertical square planetary ball mill achieves efficient grinding of materials through the planetary motion mechanism:

1. **planetary motion** : The main turntable drives the four ball mill jars to revolve around the central axis. At the same time, each jar rotates in reverse direction around its own axis, forming a composite motion trajectory.
2. **grinding mechanism** : The grinding ball in the tank produces collision, shearing and friction during high-speed movement to crush and mix the materials. It is suitable for dry/wet method and vacuum environment.
3. **Granularity control** : By adjusting the rotation speed, grinding time and grinding ball ratio, the material can be crushed to the nanometer level (0.1 micron).

## Product Features

The equipment shell adopts square design elements and is stamped with high-precision molds. It is generous and refined, high-end and stable.; The machined parts adopt CNC processing technology, the planetary disk is integrally cast and formed, and the transmission gears are made of special materials and precision gears to ensure smooth and quiet operation of the equipment at high speeds. ; The grinding tank holding device is easy to operate, safe and reliable.

- **structural design**

- **Square body** :Using high-precision mold stamping and molding, taking into account both appearance and stability, and effectively reducing equipment vibration.
- **planetary transmission system** : The planetary gear and the sun gear cooperate to realize the compound movement of revolution and rotation of the grinding jar, improving grinding efficiency.

- **Performance advantages**

- **Efficient grinding** : Control the speed through frequency conversion speed regulation to meet the particle size requirements of different materials.
- **Versatility** : Supports dry grinding, wet grinding, vacuum grinding and low-temperature grinding, and is suitable for ball mill tanks made of various materials (such as stainless steel, corundum, zirconia).
- **Intelligent control** : Equipped with LCD touch screen, programmable grinding time, forward and reverse cycles and rotation speed, supporting multi-task monitoring and data recording.

- **Safety and convenience**

- **Security protection** : Electromagnetic door lock design, opening and closing protection switch and anti-loosening nut ensure safety during high-speed operation.
- **Noise reduction design** : The gearbox adopts solid-state lubrication or liquid oil self-lubricating system to reduce operating noise to less than 60 decibels.

## Accessories & Customization



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### **Accessories**

Grinding jars, heating elements, sample holders, control modules and other matching accessories can be selected according to the product configuration.

### **Customization**

For voltage, capacity, chamber size, process temperature or application requirements, please contact TENCAN for a suitable configuration.