

Professional
Powder Equipment
Manufacturer



Powder
Equipment



Milling
Technology



Powder
Materials

TENCAN

Product Brochure



PLANETARY BALL MILL SERIES

Planetary ball mill (semi-circular model)

XQM-0.4~16A

Efficient and precise laboratory-grade powder preparation equipment

<https://www.planetaryballmills.com/products/grinding-series/planetary-ball-mill/planetary-ball-mill-semi-circular-model.html>



Product Overview

Efficient and precise laboratory-grade powder preparation equipment





Product Introduction

Planetary ball mill is an efficient and precise laboratory-grade powder preparation equipment, mainly used for crushing, mixing, dispersing materials and preparing nanomaterials. Its core structure includes planetary disk, ball mill tank (semi-circular or circular), grinding ball, drive system and safety device. The equipment achieves efficient grinding of materials through the compound motion of the planetary wheel's revolution and rotation, combined with high-energy impact and friction. The semicircular ball mill tank design further optimizes space utilization and grinding efficiency, and is suitable for small batch and high-precision experimental requirements.





Four-Jar Grinding

High grinding efficiency;
can grind four samples
at one time.

Control Panel

Simple and convenient
control panel,
easy to operate.

TCA-II Intelligent Controller



Alarm / Fault

System Standby

Total Time:	120	min
Forward:	5	min
Reverse:	5	min
Speed:	450	33.58 r/min

Start

Pause

Total
TimeForward
RotationReverse
RotationInterval
Time

Stop

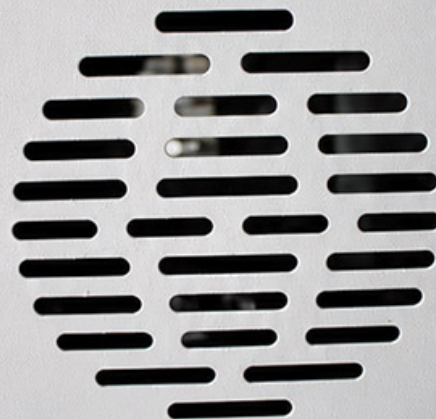


Viewing Window

Clearly observe the
operating status inside.

Cooling Fan Vent

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





Vertical semicircular planetary ball mill is a 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 a powder equipment for scientific research institutions, universities and corporate laboratories to obtain research samples (four samples can be obtained simultaneously in each experiment). Equipped with a vacuum ball mill tank, the samples can be ground in a vacuum state.

Vertical semicircular 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.

- **Materials Science Research** : Preparation of nanomaterials, composite materials and metal/non-metal ultrafine powders.
- **Medical field** : Mixing of drug ingredients, cell disruption and biological sample preprocessing.
- **Ceramics and Glass Industry** : Uniform dispersion of raw materials and preparation of ceramic slurries such as kaolin.
- **Electronics and Metallurgy** : Fine processing of metal powder, semiconductor materials and magnetic materials.
- **Environmental protection and agriculture** : Soil/geological sample analysis, waste treatment and agricultural product quality testing.

Technical parameters

Basic configuration parameter table

model	Specification	Can be equipped with ball mill tank Specification	quantity	Can be equipped with vacuum tank Specification	Equipment weight (kg)	Equipment volume (mm)
XQM-0.4A	0.4L	25-100mL	4	Can be equipped with 50mL vacuum ball mill tank	29	500×300×340
XQM-1A	1L	50-500mL	4	Can be equipped with 50-250mL vacuum ball mill tank	85	760×470×600
XQM-2A	2L	50-500mL	4	Can be equipped with 50-250mL vacuum ball mill tank	85	760×470×600
XQM-4A	4L	250-1000mL	4	Can be equipped with 50-500mL vacuum ball mill tank	85	760×470×600
XQM-6A	6L	1-1.5L	4	Can be equipped with 50-1000mL vacuum ball mill tank	85	760×470×600
XQM-8A	8L	1-2L	4	Can be equipped with 50-1500mL vacuum ball mill tank	150	880×560×642
XQM-10A	10L	1-2.5L	4	Can be equipped with 1-2L vacuum ball mill tank	150	880×560×642
XQM-12A	12L	1-3L	4	Can be equipped with 1-2L vacuum ball mill tank	150	880×560×642
XQM-16A	16L	2-4L	4	Can be equipped with 1-3L vacuum ball mill tank	205	950×600×710

Performance parameter table

model	Device power supply	Power connector	Motor power (kW)	Speed regulation method	Run settings Total time(min)	Alternate positive and negative Running time(min)	Planetary disk speed (rpm)	Grinding tank speed (rpm)	Speed ratio	Noise(dB)
XQM-0.4A	220V 50Hz	single phase	0.25kW	Frequency conversion speed regulation	1-9999	1-999	0-435	0-870	1:2	58±5
XQM-1A	220V 50Hz	single phase	0.75kW	Frequency conversion speed regulation	1-9999	1-999	0-335	0-810	1:2	60±5
XQM-2A	220V 50Hz	single phase	0.75kW	Frequency conversion speed regulation	1-9999	1-999	0-335	0-810	1:2	60±5
XQM-4A	220V 50Hz	single phase	0.75kW	Frequency conversion speed regulation	1-9999	1-999	0-335	0-810	1:2	60±5
XQM-6A	220V 50Hz	single phase	0.75kW	Frequency conversion speed regulation	1-9999	1-999	0-335	0-810	1:2	60±5
XQM-8A	220V 50Hz	single phase	1.5kW	Frequency conversion speed regulation	1-9999	1-999	0-290	0-580	1:2	60±5
XQM-10A	220V 50Hz	single phase	1.5kW	Frequency conversion speed regulation	1-9999	1-999	0-290	0-580	1:2	60±5
XQM-12A	220V 50Hz	single phase	1.5kW	Frequency conversion speed regulation	1-9999	1-999	0-290	0-580	1:2	60±5
XQM-16A	380V 50Hz	Three phases	3kW	Frequency conversion speed regulation	1-9999	1-999	0-255	0-510	1:2	65±5

- **Sample properties** : Hard materials require a wear-resistant tank (such as tungsten carbide), and brittle or heat-sensitive materials require a low-temperature grinding mode.
- **Throughput** : Choose a single tank or four-tank configuration according to experimental requirements, and the filling volume should not exceed 2/3 of the tank volume.
- **grinding target** : Nanoscale grinding requires high rotation speed (≥ 500 rpm) and small particle size grinding balls (such as zirconia balls).
- **Equipment parameters** : Pay attention to the motor power (such as 0.75-2.2 kW), maximum centrifugal acceleration and timing function.
- **Security and Maintenance** : Give priority to models with automatic shutdown, fault alarm and easy-to-disassemble design to reduce maintenance costs.

Working Principle

- **planetary motion mechanism** : The turntable drives the ball mill tank to revolve around the main axis, and at the same time, the tank itself rotates at high speed, forming a composite centrifugal force field.
- **grinding action** : The grinding balls in the tank collide with the materials at high speed under the action of centrifugal force, generating shear, impact and friction to achieve crushing and mixing.
- **Parameter control** : Precisely control the particle size of the finished product by adjusting the rotation speed (such as 200-800 rpm), grinding time and ball-to-material ratio.

Product Features

- **Efficiency** : Planetary motion mode (revolution + rotation) provides high energy density, and the grinding efficiency is significantly improved compared to traditional equipment.
- **Uniformity** : The three-dimensional movement trajectory ensures that the materials are fully mixed and the particle size distribution is uniform (the minimum can reach 0.1 micron).
- **Versatility** : Supports dry/wet grinding, suitable for ball mill tanks made of different materials (such as stainless steel, ceramics, polyurethane).
- **Safe and reliable** : Equipped with safety switch, overload protection and low-noise design, complying with laboratory safety standards.
- **Intelligent control** : Frequency control, timing forward and reverse, LED display and programmed operation to improve the repeatability of experiments.





Vertical semicircular planetary ball mill: The equipment shell adopts semi-circular 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.

Core technical advantages:

- The entire series adopts frequency conversion speed regulation technology to achieve stepless speed change.

- Supports alternating forward and reverse operation, grinding more evenly
- The running time can be accurately set, up to 9999 minutes
- The revolution and rotation speeds are precisely matched to ensure the best grinding effect.

Safety protection design:

- All models comply with noise control standards
- Motor overload protection device
- Emergency shutdown function
- Wide voltage adaptability range and strong stability

Application scope covers:

- A full range of needs from laboratory small batches to industrial production
- Compatible with various specifications of ball milling tanks, including vacuum ball milling tanks
- Applicable to many fields such as materials science, chemistry, pharmaceuticals, etc.

Accessories & Customization



Accessories & Customization

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.