

CNC Ball Valve Grinding Machine



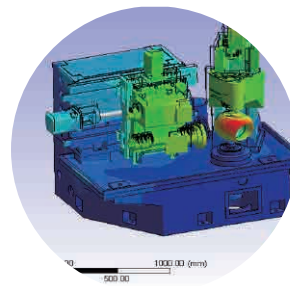
SMG32H

- This model is rigid and high accuracy for small size spherical surface;
- Closed column, triangular tailstock and bracket structure ensure the overall rigidity of the bed;
- The workpiece is tight by servo-driven, the layout is reasonable and advanced, the machine tool has good rigidity, easy to operation;
- This machine is suitable for grinding of 75-320mm size ball.



Structure Layout:

- The forward and backward movement of the column- Z-axis
- The headstock moves up and down -Y-axis
- The tailstock moves up and down- V-axis movement (servo control)
- The rotary motion of the table- B axis



Ball Grinding Range:

SΦ75-320mm

Max. Workpiece Weight:

350kg

Grinding Accuracy:

Roundness at sealing round cross section
 $\leq 0.008\text{mm}$

Surface Roughness:

$Ra \leq 0.4\mu\text{m}$



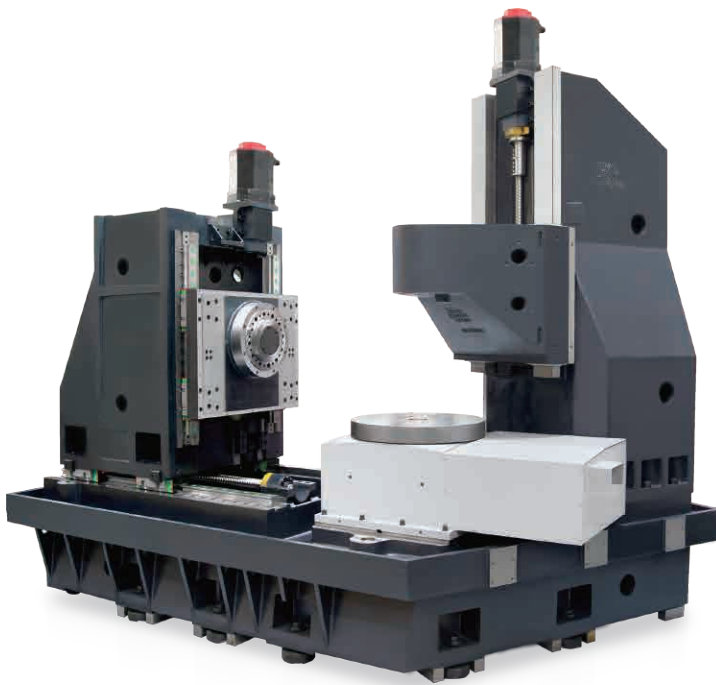
SMG63HA

Utility model patents:

High rigidity compact machine tool base structure

Patent Number: 201120517142.7

- This model adopts the "Fan Cheng" grinding method;
- adopts vertical clamping;
- Modular design, spherical diameter grinding from 320-630mm;
- This machine is suitable for grinding of 75-320mm size ball;
- Machine statics and modal analysis to ensure the overall static stiffness and dynamic characteristics of the machine;
- Easy operation, easy to access to the workpiece and spindle.



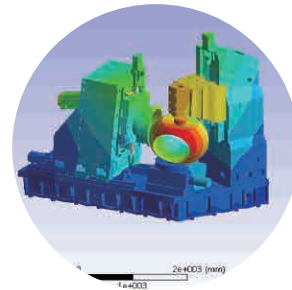
Structure Layout:

The Left and right movement of the column- Z-axis

The headstock moves up and down -Y-axis

The tailstock moves up and down- V-axis movement (servo drive)

The rotary motion of the table- B axis



Ball Grinding Range:

SΦ320-630mm

Max. Workpiece Weight:

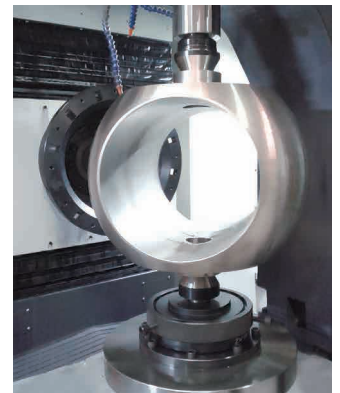
800kg

Grinding Accuracy:

Roundness at sealing round cross section
 $\leq 0.010\text{mm}$

Surface Roughness:

$Ra \leq 0.4\mu\text{m}$



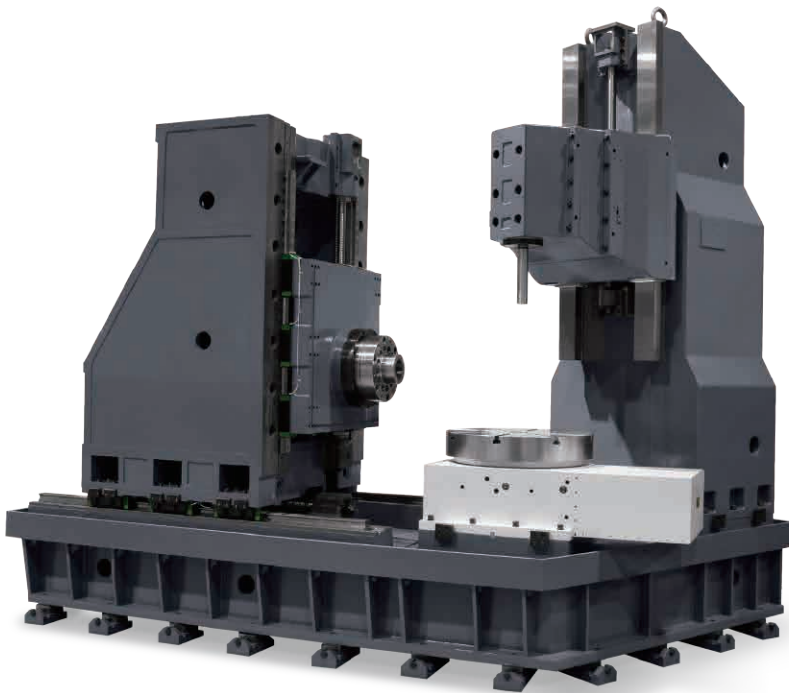
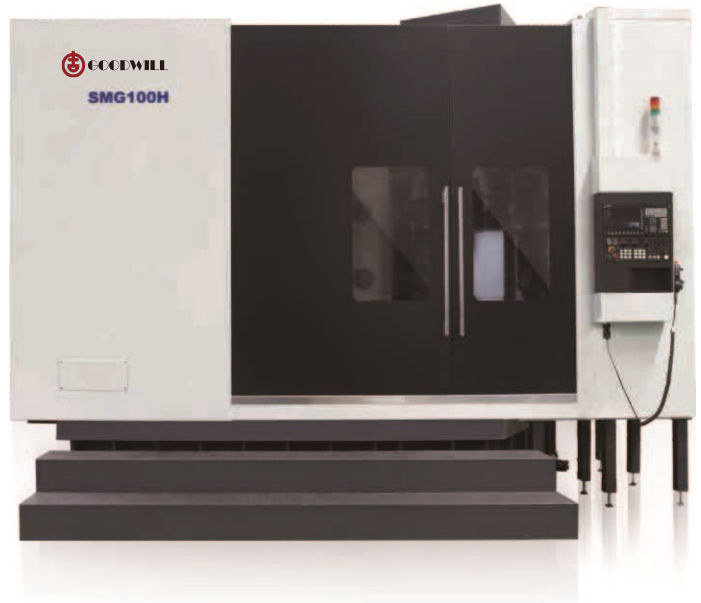
SMG100H

Utility model patents:

Radial adjustable device for center position of center

Patent Number: ZL2018 2 1314137.4

- This model adopts the vertical clamping of the sphere to avoid the Deformation caused by gravity due to horizontal clamping;
- High-power, high-precision grinding spindle unit and precision CNC rotarytable to ensure the high precision of the whole machine;
- Standard equipped with mist suction device, high-precision rotary table, double top positioning fixture.



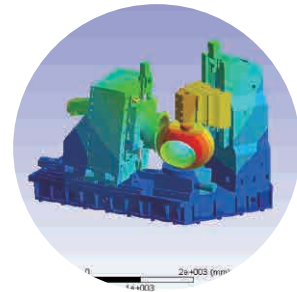
Structure Layout:

The left and right movement of the carriage -Z axis

The slide and the headstock -Y-axis

The tailstock move moment -V-axis .

The rotary motion of the table- B axis.



Ball Grinding Range:

SΦ630-1100mm

Max. Workpiece Weight:

3500kg

Grinding Accuracy:

Roundness at sealing round cross section
 $\leq 0.015\text{mm}$

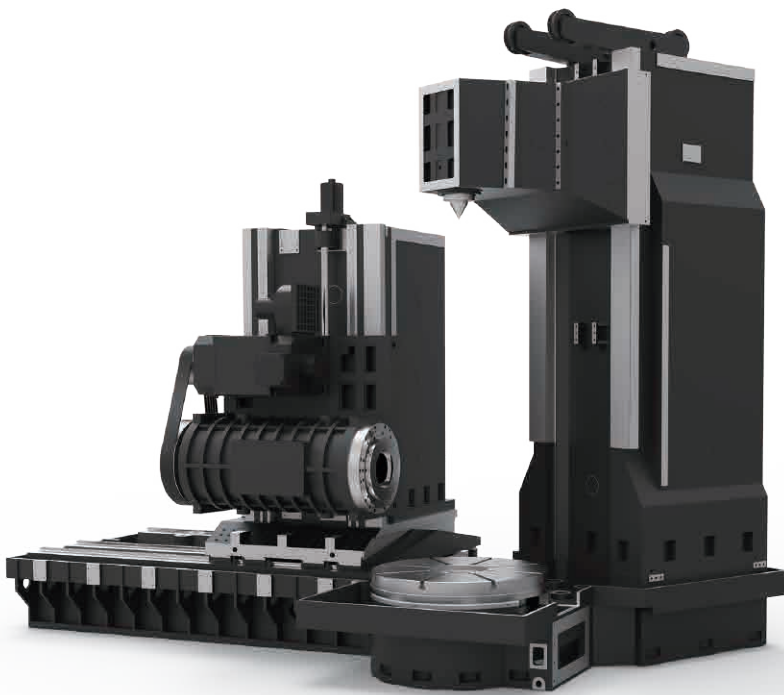
Surface Roughness:

$Ra \leq 0.4\mu\text{m}$



SMG240H

- This model adopts L-shaped bed, closed column, triangular tailstock and stepped bracket to ensure the overall rigidity and compact structure of the bed;
- Y-axis with hydraulic lock;
- V-axis with hydraulic lock;
- Workpiece is tight by hydraulic cylinder , and the pressure is adjusted according to the size of the sphere;
- Easy to operate.



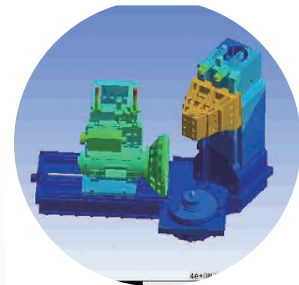
Structure Layout:

The forward and backward movement of the column-Z-axis

The headstock moves up and down -Y-axis

The tailstock moves up and down- V-axis movement (servo control)

The rotary motion of the table- B axis.



Ball Grinding Range:

SΦ900-2400mm

Max. Workpiece Weight:

25000kg

Grinding Accuracy:

Roundness at sealing round cross section $\leq 0.025\text{mm}$ (24" ~ 40")

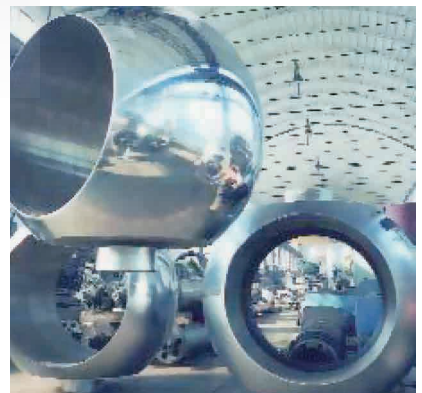
Roundness at sealing round cross section $\leq 0.035\text{mm}$ (42" ~ 64")

Surface Roughness:

$Ra \leq 0.4\mu\text{m}$



| Grinding Stone | Abrasive | The ball material |
|----------------|---------------------|------------------------------|
| | Carborundum | Carbon steel/Stainless steel |
| | Cubic boron nitride | Ni-based coating |
| | Synthetic diamond | Tungsten DLC Coating |



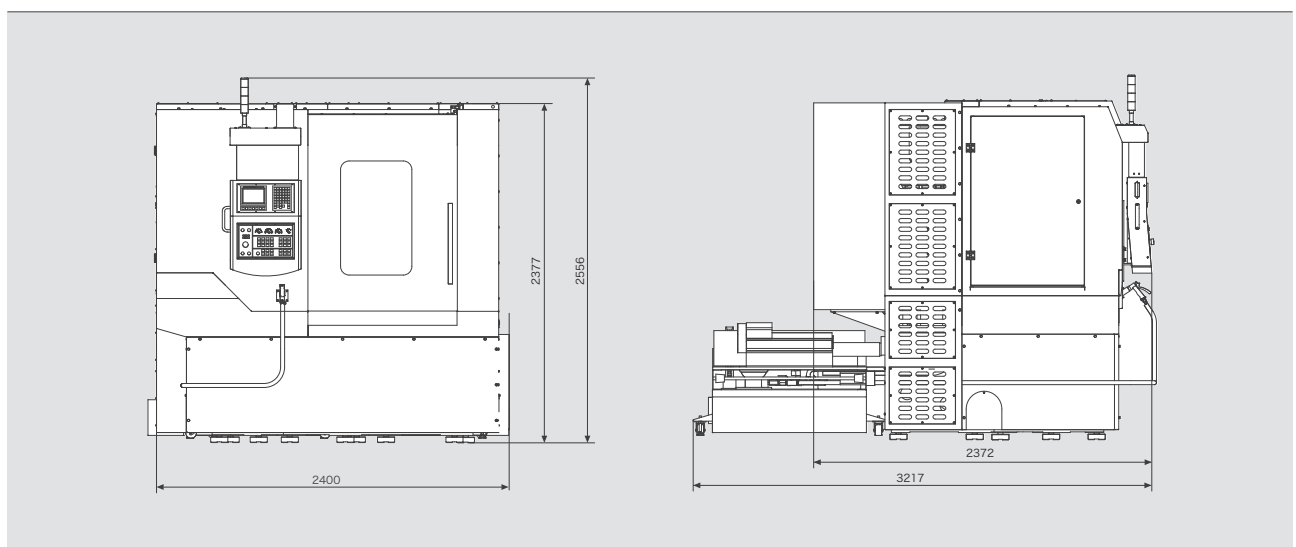
Parameter

| Item | | Unit | SMG32H | SMG63HA | SMG100H | SMG240H |
|------------------------|---|-------|-----------------------------|-------------|-------------|--------------|
| Capacity | Machining sphere outside diameter range | mm | Φ75~320 | Φ320~630 | Φ630-1100 | Φ900-2400 |
| | Hole diameter in machined sphere | inch | 2"~8" | 8"~16" | 16"~28" | 24"~64" |
| Grinding wheel spindle | Motor power | kW | 15 | 15/18.5 | 28 | 80 |
| | Rated torque | N.m | 96 | 98 | 267 | 1910 |
| | Max. spindle speed | rpm | 6000 | 2000 | 1500 | 500 |
| Workpiece spindle | Motor power | Kw | 3.7 | 5.5 | 7.5 | 55 |
| | Rated torque | N.m | 24 | 36 | 49 | 709.8 |
| | Max. spindle speed | rpm | 60 | 30 | 15 | 10 |
| Travel | Y/Z | mm | 200/500 | 200/500 | 400/900 | 800/2000 |
| Rapid travel speed | Y/Z | m/min | 18/20 | 12/20 | 16/16 | 6/4 |
| Accuracy | Positioning accuracy (Y/Z) | mm | 0.008/0.008 | 0.008/0.008 | 0.011/0.016 | 0.020/0.016 |
| | Repeatability accuracy (Y/Z) | mm | 0.004/0.004 | 0.004/0.004 | 0.006/0.009 | 0.012/0.009 |
| Other | CNC system | - | SIEMENS 828D/FANUC Oi-TF(G) | | | SIEMENS 828D |
| | Machine weight | kg | 6000 | 7500 | 22000 | 85000 |

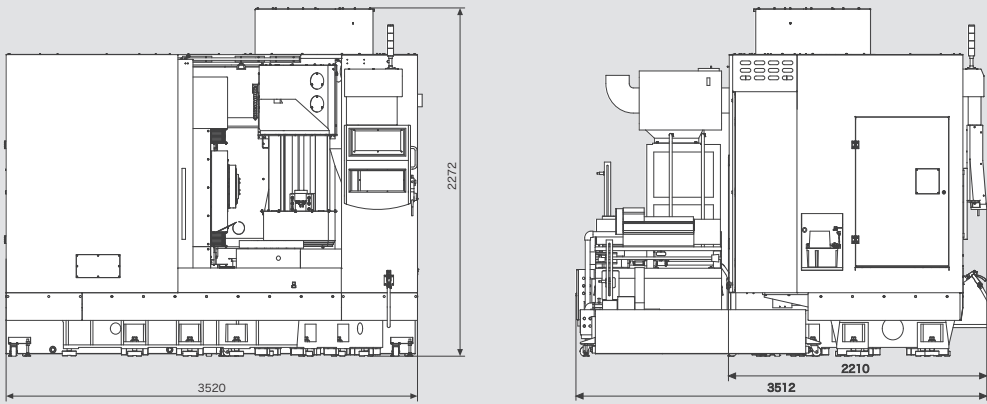
External Dimensions

(Unit: mm)

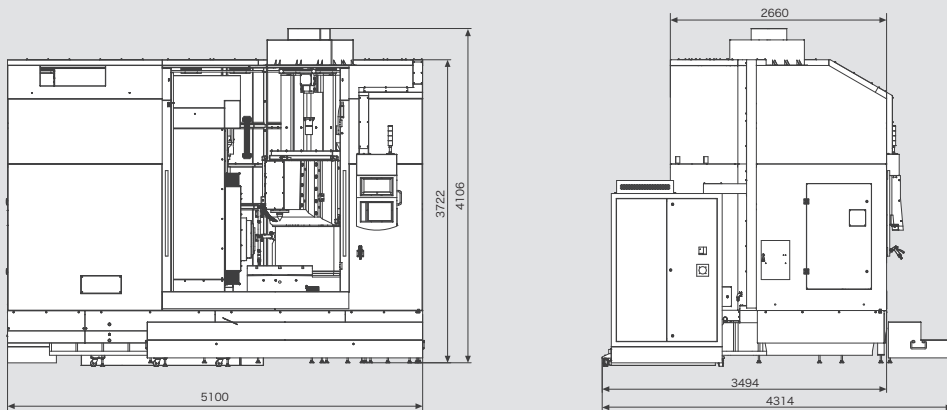
SMG32H



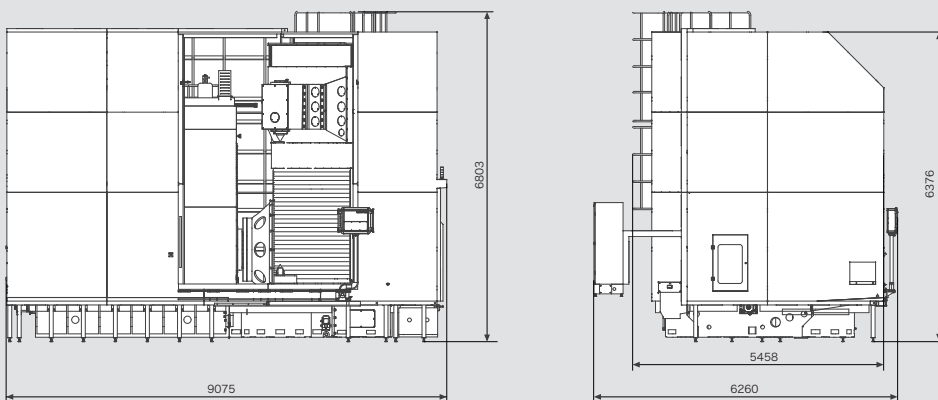
SMG63HA



SMG100H

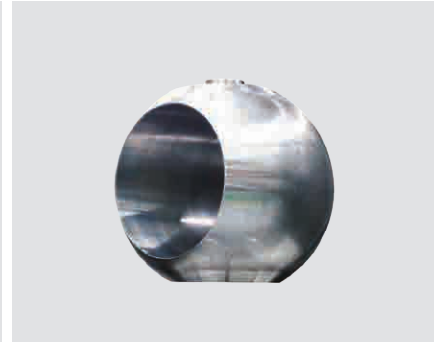


SMG240H



Industry Application

This series of machine tools is particularly suitable for the grinding of balls in the field of ball valves. Ball valves are one of the important valve types and are widely used in petrochemical, long-distance pipeline, power generation, papermaking, nuclear power, aerospace and other industries.



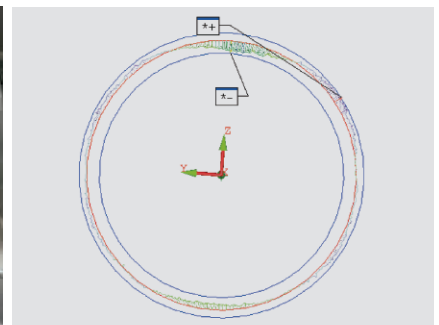
Sphere Detection



Roundness inspection by CMM
(Coordinate Measuring Machine)



Surface mirror level
finishing $Ra \leq 0.4 \mu m$



Least square method for
the roundness of a sphere

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