



YK7230

CNC Worm Wheel Gear Grinding Machine

YK7230 is the latest generation of CNC worm wheel gear grinding machine, it not only features great efficiency and accuracy, but also can achieve the function of simultaneous 5 axes in 9 axes. The integration of unique structure design and advanced technology, such as transmission, driving, perfect automatic tool alignment, automation (option) and high speed grinding makes the machine performance at a high level, improves the grinding efficiency with high accuracy greatly as well.



Main Features

- Compact machine design featuring a single, ductile cast iron bed. The YK7230 adopts a vertical structure design with grinding wheel dressing and workpiece grinding positions in the same plane, which highly maintain an excellent grinding accuracy.
- Direct drive grinding wheel spindle with integrated balancing device (see below) and built-in internal cooling for thermal stability.
- Built-in workpiece holding flexibility, featuring a table-type clamping system (similar to our vertically Oriented Form Grinding Machine), or a traditional arbor with a live center clamping system (similar to our traditional Generating Grinding Machine).
- Fully Automatic Control. 11 CNC axes in play, including automatic tool adjustment, coolant nozzle positioning, and workpiece load / unload (optional), etc.
- Direct drive workpiece spindle. Zero backlash, no friction and no wearing.
- Ergonomic design with complete machine access from the ground floor. A full closed enclosure with an auto door.
- SIEMENS 840D CNC control (German Made – USA Serviced).
- High Efficiency Grinding. With the application of multi-start grinding wheel with a linear velocity up to 63~80 m/s and the continuous shifting grinding technology, the machine can realize high speed grinding with large feeding, improve the grinding efficiency greatly.
- The Electric Gear Box (EGB). The EGB tech equipped on this machine can carry out a continuous synchronized rotate movement to the axes of workpiece and grinding wheel. This EGB also coordinates the workpiece and tangential feed axes. The Indexing Drive and Differential Drive coordination carry on a spur and helical gear grinding function.
- Profile and longitudinal modification. We can make special profile dressing diamond wheels for customer based on special requirement. The longitudinal modification is realized by simultaneously CNC controlling the radial feed and axial feed of workpiece. As a result, all manner of longitudinal profiles are obtained.
- The Human-Machine Interface (HMI) was developed according to the characters of continuous shift grinding feature. Based on a conversational



programming protocol, programming is simplified by entering work piece parameters and relevant technical parameters called out by operator.

- Multiple Grinding Model Selection. Manual grinding, fully automatic grinding or automatic grinding with manual clamping are available on this machine. The manual grinding cycle is suitable for grinding a single workpiece, clamping/unclamping workpiece and starting/stopping the feed of grind wheel. The automatic grinding cycle is suitable for mass production. Wide grinding wheel and tangential shift movements ensure grinding accuracy and uniformity of workpieces.
- The automatic dressing cycle of the grinding wheel improves the uptime and efficiency.
- An Acoustic Emission Monitoring Sonar (AEMS) sensor is equipped on the machine to carry out the automatic material removal dividing for workpiece. This system is provided by Dittel, Germany. AEMS system with its program is highly recommended for mass production/high throughput production. AEMS is unique for machines in this class.
- YK7230 is equipped with a Dittel, Germany and dynamic auto-balance system.

Technical Data

Tip Diameter	Max /Min	300/20mm	11.81"/0.79"
Number of Teeth		8-400	
Module (Diametral Pitch)		1-6mm	25.4 - 4.233
Max Face Width (Spur Gear)	Max	300mm	11.81"
Helix Angle		±45°	
Maximum Part Weight Total	Kg	100	220 Lb
Distance between Centers	Max /Min	958/318mm	37.72"/12.52"
Stroke Length Radial (X1 Axis)	Max	400mm	15.74"
Stroke Length Axial (Z1 Axis)	Max	450mm	17.72"
Distance from workpiece center to grind wheel centric axis	Max /Min	120/520mm	4.72"/20.47"
Tangential Stroke of Column (Y1)	Max	220mm	8.66"
Max. Speed of workpiece /gear	RPM	250	

Grinding Wheel

Motor	Max	15.5KWH	20.78HP
Size	Max	300X160X125mm	11.81X6.3X4.92"
Speed	Working	2,200-4,000 rpm	
Speed	Max	12,000 rpm	

Machine with Auxiliary Units

Net Weight	Approx.	9,000KG	19,800 lbs.
Dimension L x W x H	Approx.	4900x4350x2680 mm	193"x171"x106"
Total Connected Load	Amps		100
Voltage Requirement	Volts		460/480

1. Base Machine

1.1 Assembly Group

- **Rigid machine base**, made of ductile cast iron. Installation on leveling / vibration isolation pads.
- **Column with slide guide ways**, made of ductile cast iron.
- **Wheel Stock**, made of cast iron. Wheel stock radial feed utilizes precision ball screw, driven directly by an AC servo motor.
- **CNC Dressing Device**. Automatic dresser is designed in the same phase with workpiece /gear.
- **Enclosure (Full)**. Multiple access points through enclosure to key areas of machine facilitates easy dresser, grinding wheel and workpiece changeovers.

1.2 Electrical Equipment

1.2.1 Power Supply

Operating voltage is 460/480 Volt /3Phase /60Hz.

1.2.2 Siemens 840D CNC controller

Operator Features

- Operator station with TFT color flat screen and control panel in front of the machine.
- Hand-held operating panel for more convenient set-up of the machine.
- The machining program uses standard CNC conversational programming language, and the interface program uses SIEMENS software.
- Siemens Control is serviced all over the USA. QC American provides front-line service regardless.

1.3 Axis Information

Eleven (11) CNC Axes

- 'X1'-axis with linear guideways. Radial movement of the grinding wheel slide. Heidenhain LS487 linear scale with 0.0005mm resolution. 400mm travel, up to 300mm/min feed rate and 3000mm/min rapid feed.
- 'Z1'-axis with slide guideways. Axial vertical movement of the workpiece stock. Heidenhain LS487 linear scale with 0.0005mm resolution. 450mm travel, up to 300mm/min feed rate and 3000mm/min rapid feed.
- 'Y1'-axis with MV guideways. Tangential movement of the grinding

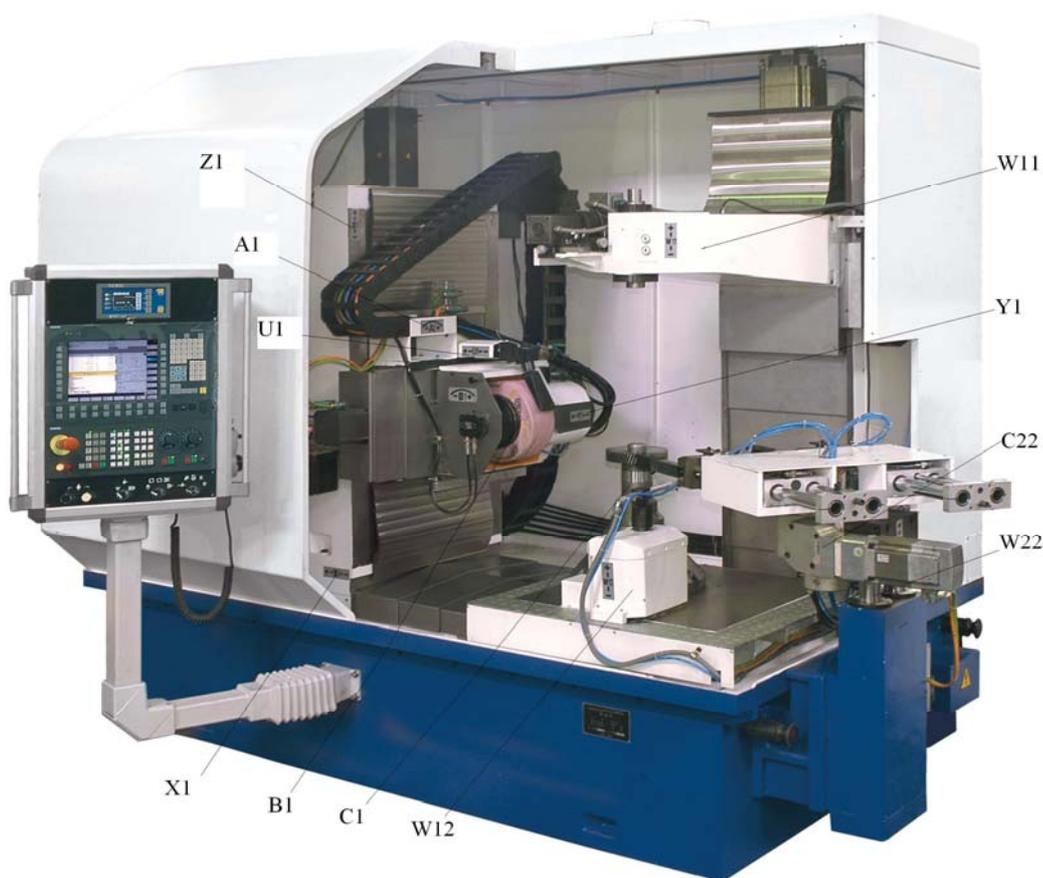
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Wheel. Heidenhain LS487 linear scale with 0.0005mm resolution. 220 mm maximum travel, up to 3000mm/min rapid speed.

- ‘B1’-axis. Rotary movement of the grinding wheel. Direct drive AC Motor with Heidenhain #ERN180 Rotary encoder with 0.0036 Degree Resolution.
- ‘C1’-axis. Indexing and rotary movement of the work piece stock. Heidenhain #RON786 with 0.0001 degree resolution. Torque motor drive directly.
- ‘W11’-axis. Axial movement of tailstock. Max. travel 640 mm.
- ‘A1’-axis. Swing of grinding wheel head for grinding helical gear. $\pm 45^\circ$ travel @ 1000°/min speed max.
- ‘U1’-axis. Extension and retraction of coolant nozzle.
- ‘W12’-axis. Up and down movement of probe for automatic tool setup.
- ‘C22/W22’-axes. Automatic load/unload work piece. (**Option**)
- The positioning feedback devices of each rotary axis are high-precision encoders.



1.4 Peripherals

1.4.1 Hydraulics/Lubrication

- Complete hydraulic system for lubrication, clamping, and tailstock operation.
- Common operating hydraulic system.
- The rotary axes are lubricated by oil.
- Other linear axes are lubricated by grease.

1.4.2 Coolant Filtration System

The coolant filtration system cleans the coolant using a Positive Pressure type enforce filtering system and includes the following:

- Filter capacity = 200L/min.
- Multiple circuit coolant chilling equipment: With automatic temperature regulation for cooling oil.
- Oil mist retrieving by electrostatic air filter.

1.5 Automatic Balancing System

Equipped with dynamic grinding wheel balancing system (made by Dittel, Germany).

1.6 Acoustic Emission Monitoring System

The Acoustic Emission Monitoring System (AEMS) performs automatic and rapid material removal dividing (stock dividing) and enhanced wheel dressing cycles. There is a sonar-type sensor for measuring the proximity of the grinding wheel to the work-piece.

1.7 Software for Siemens 840D Control

The software package enables the user to generate, edit and optimize grinding programs and analyze processing data on the PC in the machine and the remote PC as well. The software interface is identical with the machine control menu and can be used for rudimentary training purposes.

2 Accessories

2.1 Standard Machine Accessories

01	Special Tools	1set	
02	Diamond Dressing Wheel M=1-2; 2-4; 3-6	1set	
03	Grinding Wheel Flange	3sets	
04	Grinding wheel, 300X160X125	3pcs	
05	Gauge for wheel (Total: 16pcs)	1set	
06	Diamond pen	1pc	
07	Oil chiller for coolant tank	1set	
08	Leveling pads	1set	
09	Upper Live Center	1set	

10	Lower Arbor Dead Center	1set	
11	Operation Manual	1set	

2.2 Optional Machine Accessories

- Auto load/unload mechanism for **option** (C22/W22).
- Power-off Protection System for **option**

2. Machine Color

Machine and peripheral: Blue
Doors: Light Gray

3. Machine Warranty

12 Months warranty including labor and parts.

4. Delivery

In stock with immediate delivery

5. Installation and Operator Training

We offer free installation and a 2-3 days operator training, at either customer site or our facility.