



YK7236-A

CNC Worm Wheel Gear Grinding Machine

The YK7236-A CNC Worm Wheel Gear Grinding Machine utilizes a continuous generating or shift grinding principle similar to the experiences on a gear hobbing machine. The electric gearbox (EGB) transmission unique to this type of gear grinding machine shortens the length of the internal transmission chain and makes this machine highly efficient and accurate for its relative size. The design of this machine is ideally suited for batch production of grinded gears.



Main Features

- Compact machine design featured with a single, rigid ribbed cast iron bed.
- Ergonomic design with the complete machine accessed from the ground floor and through a well-designed full closed enclosure.
- NUM (Swiss Made – USA Serviced) 1050H Axium PC Base CNC control.
- Incorporated with the technology of continuous shift grinding, which was designed by Csepel (Hungarian) and successfully adapted into Reischauer AG

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brand machines and others such as Kapp Niles, our YK7236A and all YK72xx series worm wheel gear grinders have been greatly enhanced and improved with performance and efficiency of process of grinding gears. Roughly, in using a “single start” worm grind wheel, the continuous shift grinding process can be 3 to 5 times faster than that of the reciprocating grinding process in both semi-finishing grinding and finishing grinding. It will be even faster when using 3 or more “start” worm grind wheel!

- The EGB, Electric Gear Box, of this CNC grinding system can carry out the continuous synchronized movement of the workpiece axes and grinding wheel axes. This EGB also coordinates the workpiece and tangential feed axes. The indexing drive and differential drive coordination also allow for grinding of spur and helical gear designs.
- Profile curves and longitudinal modification. Per the requests of our customers, we can make special diamond wheels for profile dressing. The longitudinal modification is realized by the CNC system controlling the movements simultaneously of work piece radial feed axis and axial feed axis. As a result, all types of longitudinal profiles would be obtained.
- The special HMI (Human-Machine Interface) was developed according to the working characteristics of continuous shift grinding. Via a conversational CAM, programming a processing program is simplified by answering and entering the parameters of work piece and relevant technics.
- Equipped with standard selection feature of manual or automatic grinding cycles. The manual grinding cycle is suitable for grinding a single workpiece. The automatic grinding cycle is suitable for grinding workpieces in batch production. Wide grinding wheel and tangential shift movements ensure grinding accuracy and uniformity of workpieces.
- The on-board automatic dressing system greatly improves the uptime and efficiency.
- As an option, an AEMS (Acoustic Emission Monitoring Sonar) sensor with its program is equipped to carry out the automatic stock dividing of two flanks on the workpiece. This system is provided by SBS of Oregon, USA. It is highly recommended to use the AEMS for high throughput production.
- Featured with a SBS (USA) Internal grinding wheel balancing unit (Standard).

Technical Data

Tip Diameter	Max /Min	360/20mm	14.18”/0.79”
Number of Teeth		12-260	
Module (Diametral Pitch)		1-6mm	25.4 - 4.233
Max Face Width (Spur Gear)	Max	190mm	7.48”
Helix Angle		±45°	
Maximum Part Weight Total	Spur/Helical	60/30Kg	132/66Lb
Maximum Between Centers	Max	420mm	16.54”

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Distance Between Centers	Max /Min	420/180mm	16.54"/7.09"
Stroke Length	Max	200mm	7.87"
Distance from Slide Center to Wheel Axis	Max /Min	180/440mm	7.09"/17.32"
Travel of Wheel Slide	Max	260mm	10.24"
Travel of Dresser in Wheel Spindle Direction	Max (Axial)	165mm	6.50"
	Max (Radial)	85mm	3.35"
Tangential Shifting of Column		90mm	3.54"

Grinding Wheel (worm type)

Motor	Max	30 KW	40 HP
Size	Max	400X203X100mm	15.7X8.0X3.94"
Speed	Max	1000-1650rpm	

Machine with Auxiliary Units

Net Weight	Approx.	6,000KG	13,200 lbs.
Space Requirement L x W x H	Approx.	5400x3400x2500mm	212.6"x133.9"x98.4"
Total Connected Load	Amps	100	100
Voltage Requirement	Volts	460/480	460/480

1. Base Machine

1.1 Assembly Groups

- **Rigid machine base**, made of ductile cast iron, installed on vibration isolation levelling pads.
- **Rigid column**, made of ductile cast iron, sitting on linear guide way.
- **Grinding wheel headstock**, made of cast iron. The headstock radial infeed is driven by an AC servo motor via a precision ball screw.
- **CNC Dressing Device**. Automatic dressing by an on-board diamond dresser. The dressing curve paths are generated by the CNC controlled 'V' and 'U' axes.
- **Enclosure (Full)**. Multiple access points are built through enclosure to access the key areas of machine, facilitates loading/unloading workpieces, changing grind wheel, and accessing to dressing point, etc.

1.2 Power Supply

Operating power: 460/480 Volt/3Phase/60Hz.

1.3 NUM 1050H CNC control

- Movable Operator Station with TFT color flat screen and control panel is attached to the front of the machine.
- Handheld operating panel for more convenient setup of the machine.
- The machining program will be made by use of standard CNC conversational programming language, and the interface program uses NUM standard MMI TOOL software.
- NUM control (Swiss-owned) service center is in Naperville, IL. But QC

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American provides front-line service regardless.

1.4 CAM software running on NUM 1050H PC based control

The software package enables the user to generate, edit and optimize grinding programs and analyze processing data by the PC on the machine or a PC detached from machine. The software interface is identical with the machine control menu and even can be used for rudimentary training purposes.

- **Gear data calculation module – Input and storage of workpiece parameters.** This module consists of a conversational interface for entering the data of geometrical parameters, technical parameters and measuring parameters to facilitate computing of standard gears, gears with addendum modification, modified spur, helical, cylindrical gears. The fundamental data of workpiece is recorded into a database for later editing or processing.
- **Profile and Lead Modification.** Profile and Lead modifications are finished by an on-board diamond dresser and automatic dressing cycle.
- **Conversational Control Design.** The G code will be automatically created by CAM based on the tech process and parameters of machining the gear entered by the operator. In addition, if desired, customer can directly compose, upload and run the G code.

1.5 Automatic Balancing System

Dynamic balancing system for automatic balancing of grinding wheel. Grinding Wheel Balancing system manufactured by SBS Systems of Oregon, USA.

1.6 Acoustic Emission Monitoring System

SBS Systems also manufactures an Acoustic Emission Monitoring System (AEMS) that facilitates automatic and rapid stock division and enhanced wheel dressing cycles. There is a sonar-type sensor for measuring the proximity of the grinding wheel to the workpiece. Both the automatic balancing system and the AEMS have been fitted by SBS to the machines in stock on our floor.

1.7 Axis Information

Five (5) CNC Axes

- ‘X’-axis, radial infeed movement of the grinding wheel, running on linear guideways, grease lubrication. Feedback: Heidenhain #LS477 scale with the resolution of 0.0001mm.
- ‘Y’-axis, the tangential infeed movement of the grinding wheel, running on roller/slide combine guideways, grease lubrication. Feedback: built-in rotary encoder with 0.0001 degree resolution.
- Z’-axis, axial vertical movement of the workpiece stock, the stroke to form

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the widths of gears, running on slide guideways, grease lubrication.

- A'-axis, swaying of column to mesh with helical angle of grinding wheel for grinding helix gear. Grease lubrication. Operated manually.
- 'B'-axis, rotary movement of the grinding wheel, grease lubrication. Driven by an AC servo motor directly, the revolution is feed backed by a Heidenhain #ERN180 with the resolution of 0.001 degree.
- 'C'-axis, indexing and rotary movement of the work piece stock, oil lubrication. Feedback: Heidenhain #RON285/9000 with the resolution of 0.0001 degree.
- 'U'-axis, dresser radial infeed action, working with roller guideways.
- 'V'-axis, dresser axial infeed action, working with linear guideways. Feedback: built-in rotary encoder with 0.0001 degree resolution. Oil Lubrication.

2. Peripherals

2.1 Hydraulics/Lubrication

Complete hydraulic system for clamping/unclamping, tailstock operation and lubrication.

The rotational axis of workpiece (C Axis) is oil lubrication. Other axes are grease lubrication.

2.2 Coolant sys and Filtration sys

The machine is equipped with a complete coolant sys for both grinding wheel and the machine body base.

The coolant filtration system cleans the coolant using a centrifugal machine design and includes the following:

- Filter capacity = 200L/min.
- Multiple circuit coolant chilling equipment: automatic temperature control for cooling oil.
- Oil mist recovery and electrostatic air filter.

2.3 Machine Color

Machine and peripheral units: Blue

Doors: White

3. Standard Machine Accessories & Options

3.1 Standard

01	A set of 14 pieces in total of change gears used for adjusting transmit to mesh the right module number of workpiece that will be grinded on the machine.	1set	
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02	Special Tools – to adjust machine base.	1set	
03	Extended length Live Center	1set	
04	Adjustable Live Center	1set	
05	Center adjusting tool	1set	
06	Workpiece holding Collet	1set	
07	Paper Hydraulic Filters	6pcs	
08	Diamond dressing wheel (Pair)	1set	
09	Grind wheel flange 200mm ID	3sets	
10	Gage for wheel	1pc	
11	Grinding wheel, Winterthur 400X203X100	3pcs	
12	Diamond pen (for dressing special grinding wheel)	1pc	
13	Coolant Chiller device for coolant tank	1set	
14	Workpiece arbor for inspection	1set	
15	Leveling Pads	1set	
16	Operation Manual	2sets	

3.2 Options

- Grinding wheel gauge: M1 – M6
- Air blowing unit
- AEMS – Automatic stock dividing sys (SBS USA)
- Extra grind wheels and flanges

4. Machine Warranty

12 Months warranty including labor and parts.

5. Delivery

In stock with immediate delivery

6. Operator Training

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