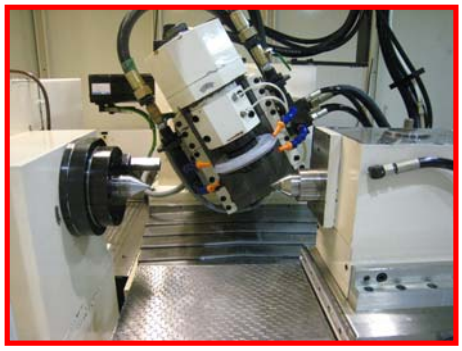
QC American
Creating Value in Workpiece Finishing Machine Tools, One Application at a Time.

QC YK7332-A

Horizontal CNC Form Gear Grinding Machine

The Model #YK7332A CNC Profile (or Form) Wheel Gear Grinding Machine is used for grinding precise, special cylindrical gears with an outside diameter of less than 320mm (12.6”). These types of gears are more commonly used in the automotive, rail transport, aviation and machine tool industries. This machine is especially suitable for grinding high-speed gears and clusters with requirements for profile and lead modification, as well as special fillet requirements for tip and root. These machines can also be used for grinding components *without* involute forms as well, such as cycloid gears, precision splines and worm workpieces.



The working principle of this machine is form grinding. The profile of the grinding wheel is modified via on an on-board wheel dressing system utilizing a diamond dressing wheel to facilitate grinding of the workpiece tooth forms precisely. The movements and operations of the machine are relatively simple and straightforward (especially when compared to generational-type grinding); but can be characterized by

extremely high machining accuracy and efficiency. The model #YK7332 orients the workpiece horizontally between centers for maximum workpiece design flexibility. This design philosophy more easily allows for spline and worm gear forms.

The Model #YK73 Series form grinding machine designs from QC American are known for their remarkable reliability, thermal stability and they are adaptable to automation. Featuring a full CNC-based control, these machines are capable of performing well in a variety of gear finishing applications, as well as being quite flexible where modifications are concerned. The #YK73 Series feature high power grinding spindles, standard precision components utilized from around the globe and closed loop feedback systems for high geometrical and positioning accuracy.

Main Characteristics

- Compact machine design featuring a ribbed one-piece cast iron bed
- Ergonomic design with complete machine access from the ground floor and through a well-designed and completely lit enclosure
- The on-board automatic dressing cycle of the grinding wheel which improves the uptime and efficiency
- NUM (Swiss Made – USA Serviced) 1050H PC Based CNC control – controlling six (6) axes.
- The special Human Machine Interface (HMI) was developed by QC according to the working characteristics of North American gear processing. Based on a conversational programming protocol, programming is simplified by entering work piece parameters and relevant technical parameters as called out by the operator.

Technical Data

Tip Diameter	Max /min	320/30mm	12.60”/1.18”
Distance between centers	Max	1100mm	43.34”
Number of Teeth		Any	
Module (Diametral Pitch)		1-16mm	25.4-1.59”
Helix Angle		±45º	
Stroke Length	Max	650mm	25.60”
Workpiece Load – Total	Max	80KG	180 lbs
Workpiece Face Width	Max	600mm	23.625”
Grinding Head Travel	Max	250mm	10”
Grinding Head Feed	Max	10m/Minute	32.8 FPM

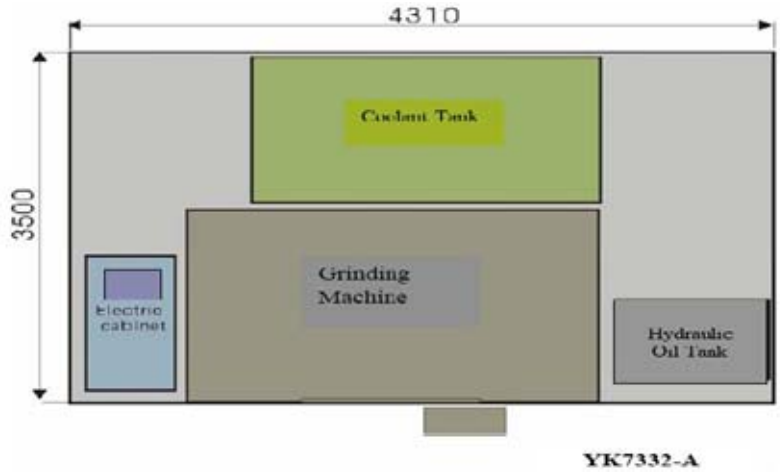
Grinding Wheel

Diameter	Min /max	200/50mm	7.87”/2”
Arbor Diameter(s)	75mm	32mm	16mm
Wheel Width	Max	35mm	1.38”
Speed	Max	50m/s	164 SFPM
Drive Power	Max	15KW	20.1 hp

Machine with Auxiliary Units

Total Connected Load		30KVA	30KVA
Net Weight	Approx	10,000 KG	22,000 lbs
Space Requirement LXWXH	Approx	4700X3600X2600 mm	185”X142”X103”
Voltage		460/480	460/480

Footprint/Floor plan



1 Base Machine

1.1 Assembly Groups

- **Machine Base** Ribbed design, made of cast iron, installed on leveling /vibration isolation pads.
- **Column** Made of cast iron with slide guideway.
- **Wheel Stock** made of cast iron**.** Wheel stock radial in feed utilizes precision ball screw, powered directly by an AC servo motor.
- **CNC Dressing Device** Automatic dressing by an on-board diamond dresser. The dressing paths are generated by the horizontal and the tangential grinding slide movement.

- **Enclosure (Full)** Multiple access points through enclosure to key areas of machine facilitates easy dresser, grinding wheel and workpiece changeovers.

1.2 Electrical Power Supply

Operating voltage is 460/480 Volt/3Phase/60Hz (can be modified to 50 Hz as customer require)

1.3 NUM Axium Power 1050H CNC Controller

Operator Interface Features

- Operator station with TFT color flat screen and control panel in front of the control cabinet. Integrated keyboard with a team of horizontal and vertical soft keys.
- Hand-held operating panel for more convenient set-up of the machine.
- The machining program uses standard CNC conversational programming language fully developed by QC, and the interface program uses NUM standard MMI TOOL software.
- Swiss-owned NUM is serviced out of Naperville, IL. QC American provides front-line service.

Control Interface Features

- Windows 2000 Operating System.
- 586MB Pentium processor.
- 30GB hard drive.
- 128M RAM.
- 56K modem.
- Two USB Ports for archiving user and machine data or running peripherals.
- 3.5” floppy drive.
- Parallel interface for connecting a printer.
- Serial interface for common use.
- Ethernet interface.

Service Functions

- Integrated modem for remote diagnostics connection between QC computers.
- Graphical display of processing data.

1.4 Software for PC Based NUM Control

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

- **Gear parameters calculation module – Input and storage of workpiece**

data. This module consists of a conversational interface for geometrical parameter data entry, technical parameters and measuring parameters to facilitate computing of standard gears, gears with addendum modification, modified spur (helical) cylindrical gears. Basic work piece data is recorded into a database for later editing or processing.

- **Profile computing module for grinding wheel – Profile and Lead modification.** This module serves to gather data in order to generate the correct wheel profile through an editable series of dressing cycles using the on-board dressing wheel system. Based on data entered about the workpiece and special requirements on gears to be machined; including profile, lead modification and fillet curve parameters, the profile of the grinding wheel can be automatically computed to meet the task at hand.

- **Conversational Control Design.** The G code will be automatically created based on the gear processing and grinding parameters entered by the user. In addition, the customers can even directly use and upload straight G code if desired.
- **Customer can add specific modifications to suit their applications.**

1.5 Functions for Grinding of Worm and Spline Forms.

On-board software supports these two forms, along with wheel stock and grinding wheel changeovers.

1.6 Axes

Six (6) CNC Axes

- 'X'-Axis. Wheel head movement axis, with Linear guide way. Powered directly by an AC servo motor. Drive by ball screw. Linear scale Type: LS486 Heidenhain; Resolution: .0001mm.
- 'Z'-Axis. Wheel head feed axis, with Linear guide way. Powered directly by an AC servo motor. Drive by ball screw. Linear scale Type: LS486 Heidenhain; Resolution: .0001mm.
- 'A'-Axis. Rotary movement of the grinding wheel headstock, Type and resolution of rotary axis by Heidenhain RON785/ .0001mm
- 'C'-Axis. Rotary movement of workpieces. Type and resolution of rotary axis by Heidenhain RON785/ .0001mm.
- 'S1'-Axis. Rotation of Grinding Wheel.
- 'S2'-Axis. Rotation of diamond dressing wheel.

1.7 Peripherals

1.7.1 Hydraulics/Lubrication

- Complete hydraulic system for clamping and tailstock stroke.
- S-axis with oil mist lubrication.
- Z, X-axes with grease lubrication.
- C, A-axes with oil lubrication.

1.7.2 Coolant Filtration System

The coolant filtration includes the following:

- Temperature controlled for grinding fluid utilizing a chiller–type oil cooler.
- Filter capacity=120L/min.
- Oil mist recovery and electrostatic air filter.

1.8 Standard Machine Accessories

01	High speed spindles, (3) Each, 75mm, 32mm & 16mm Arbors	1set
02	Special tools; wrenches & tools specific to the machine.	1set
03	Balance blocks, Set	40pcs
04	Grinding wheel – To Suit Application	2pcs
05	Diamond dressing wheel (2pc)	1set
06	Grinding Wheel Flanges, 75mm & 32mm.	2sets
07	Workpiece Centers (2pcs per Set) 5 Morse	1set
08	Dressing Wheel Assembly	1set
09	Leveling pads for machine foundation	1set
10	Standard gear	1pc
11	Operation manual, set	1set

1.9 Machine Color

Machine and peripheral: Blue

Doors: White

2. Machine Warranty

12 Months warranty including labor and parts.

3. Delivery

In stock with immediate delivery

4. Operator Training

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