



Universal Tool and Cutter Grinders

Models: UTG-300, 600, 1200, 1800, 2400

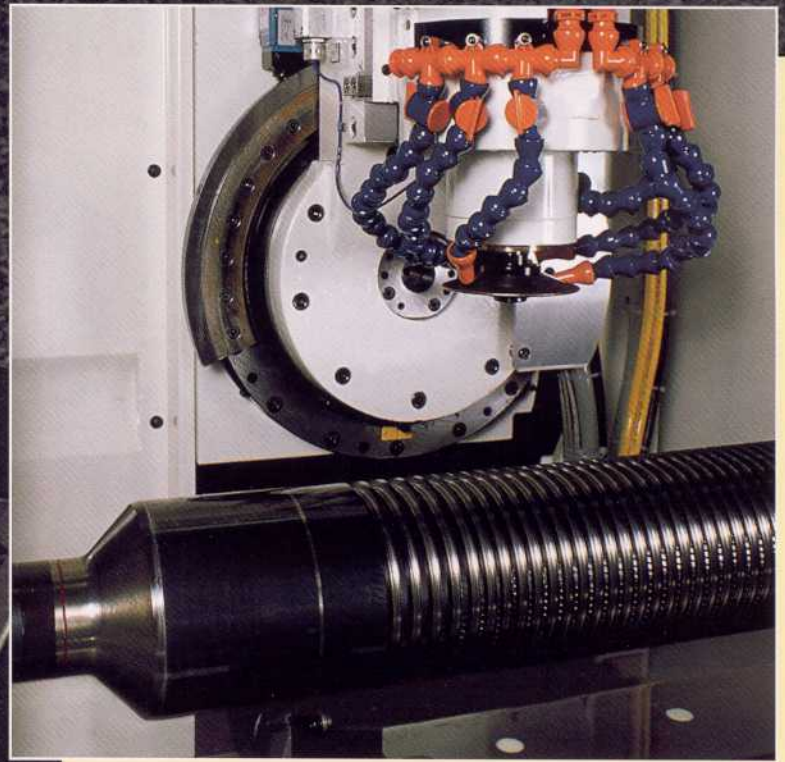


Star Universal Tool and Cutter Grinders, capable of grinding a wide variety of tools to meet or exceed industry standards.

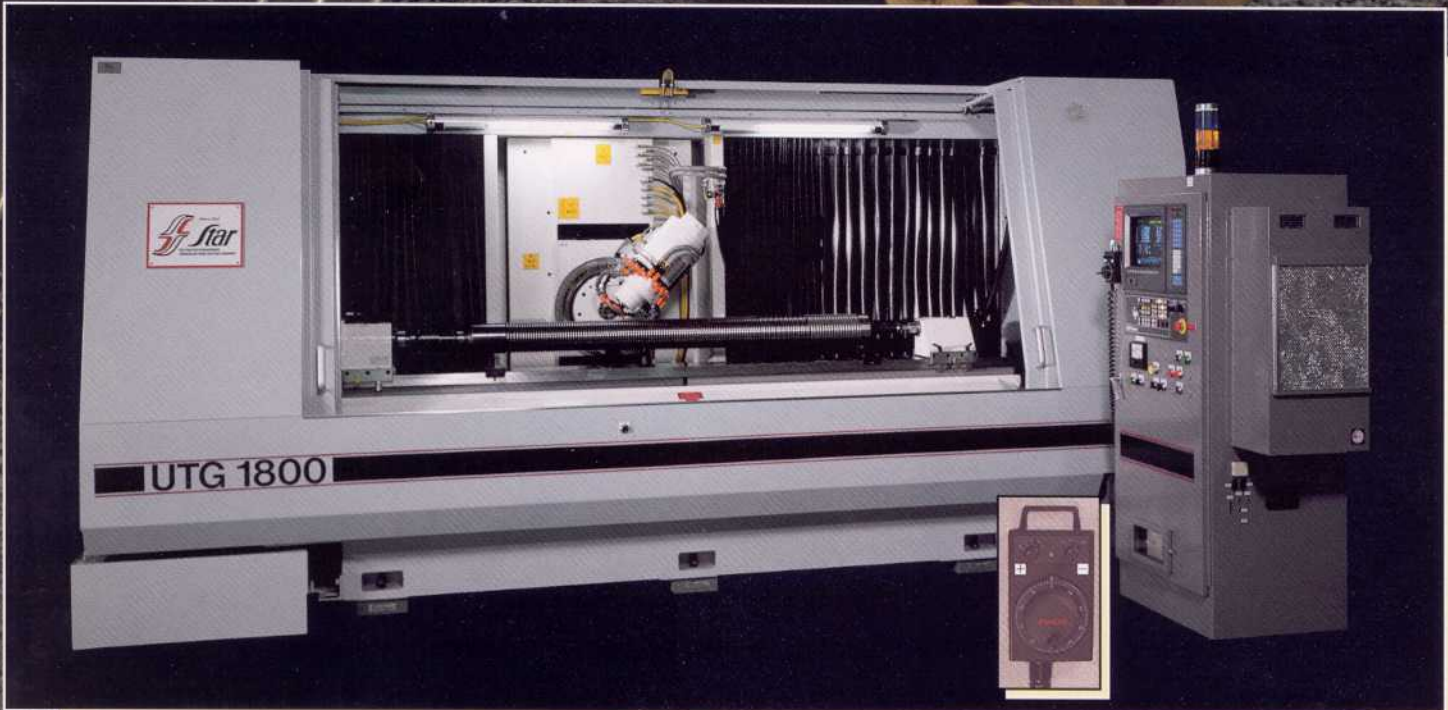
Introduction

The Star UTG series, five axis, CNC driven, Universal Tool Grinders are unsurpassed in accuracy, versatility and user-friendliness.

From the UTG-300 to the UTG-2400, the UTG family of Star grinders excel at grinding straight and spiral gash hobs, shaper cutters, round and flat broaches, spiral broaches, slab mills, rack gear cutters, worm gear hobs and step tools with diameters from 3 mm (1/8 inch) to 254 mm (10 inches). Our machines are all rugged, reliable and easy to use. Give us a call at 231-264-5661, we'll be glad to answer any questions regarding machine function or capability.



The round spiral broach is one of the many tools within the UTG's sharpening capability. The UTG family can handle tools up to 254 mm (10 inches) in diameter.



The grinding compartment, on all machines, is easily accessible. Sliding doors are designed to facilitate the use of overhead cranes for handling heavy parts. The inset shows the tethered hand pulse generator which can be used to quickly and easily jog any axis during set up. The tether allows the operator to be in close proximity to the workpiece while jogging axes.

The UTG family uses state-of-the-art CNC controllers for positioning the five axes. The machines feature glass scales, a dual probe system and Star's easy to use Man Machine Interface (MMI). We also offer the best warranty, service and training in the industry.

Standard Features

Each Star Universal Tool Grinder is equipped with many standard features. Our engineers will work closely with you to provide optional equipment to fit your exact requirements.

Star Dual Probe System

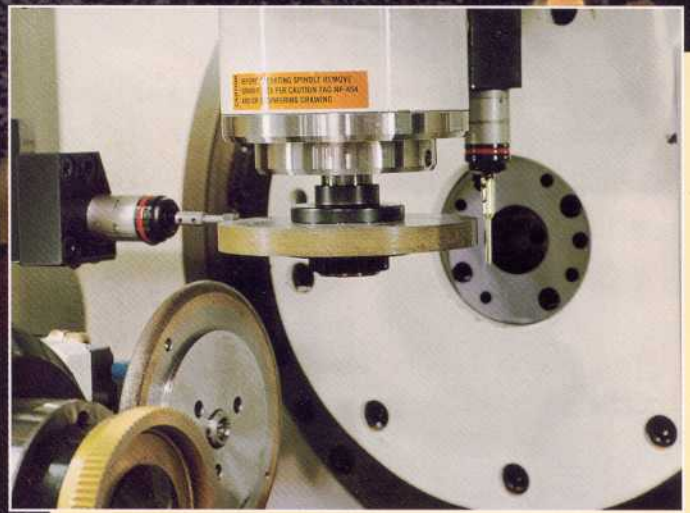
The part probe locates the cutting edges of the workpiece and references it to the machine. The wheel probe locates the grinding wheel relative to the workpiece. After the probing cycle is complete, wheel locations and probed measurements are stored for future use.

On-Board Truing

The wheel truing cycle is programmed into the machine. You simply enter the amount of stock removal and the machine does the rest.

Glass Scales

All CNC axes utilize digital AC servo motors and drives with Heidenhain rotary, or linear, glass scales for closed-loop positioning.



The wheel probe, on the left, locates the wheel position and diameter.

Machine Modem

The modem provides a direct connection to the engineers at our Elk Rapids, Michigan facility. Our engineers can use the modem to examine the files on your machine, troubleshoot the problem, and modify program files in a matter of minutes. Customers can access our Bulletin Board System (BBS) 24 hours a day to obtain revisions and support files.

Coolant System

Each coolant system is capable of operating using either water or oil-based coolants.

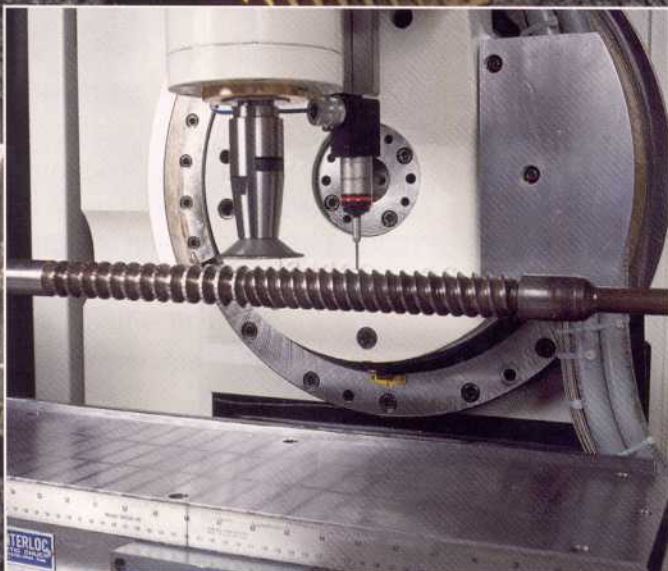
The coolant system provides up to 90 liters per minute (24 GPM) of filtered coolant into the grinding area during the grinding cycle.

Enclosed Grinding Area

The totally enclosed grinding area keeps the coolant and noise inside. Sliding doors allow easy access to load and unload parts. All machines come with a large viewing window to watch the grinding progress.

Mist Collector

Each machine is equipped with a mist collector to remove coolant mist and return it to the coolant reservoir.



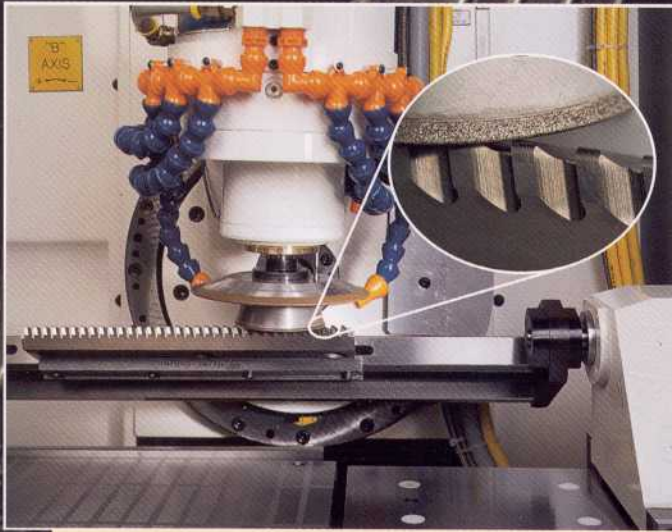
The part probe locates the tool features to accurately determine the starting point for the grind cycle.

Safety

- Fully enclosed grinding compartment with safety interlock switches.
- The two hand safety requires the operator to use both hands to start the machine cycle.
- A load meter, connected to the grinding spindle motor, monitors grinding wheel pressure and is designed to stop the wheel feed in case of grinding spindle overload.
- Access doors are equipped with safety interlocks to prevent the operator from coming in contact with energy sources or moving parts.
- The mist collector removes airborne coolant mist from the grinding compartment.



The UTG-300 and UTG-600 models come with an attached operator panel, eliminating the need for a freestanding enclosure, saving floor space. All controls are within easy reach of the operator.



Special fixturing is available for flat broaches of all sizes.

Reliability

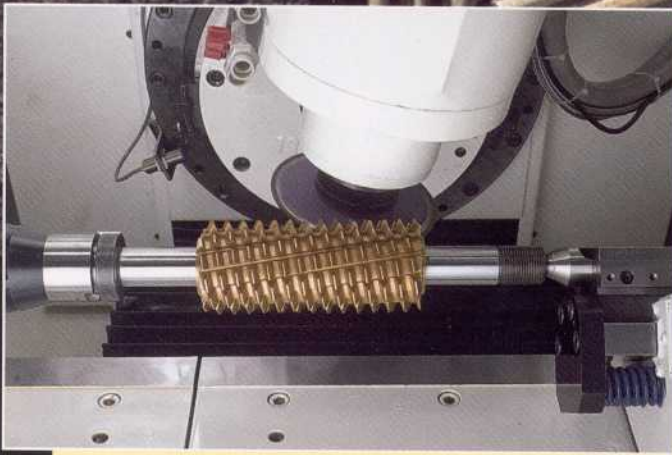
- Heavy duty construction features Teflon coated rail pockets and hardened, ground, hand-lapped rails.
- Precision ground ball screws and digital AC servo motors provide for smooth axis travel.
- The CNC-controlled lubrication system incorporates lube cycle and low level switches to make sure the machine has adequate lubrication to the rails and ways.
- Ball screws and ways are covered to protect them from grinding grit and foreign objects.
- Our proven design has demonstrated low life cycle costs.

Accuracy

- The rigidly-designed base weldment provides vibration dampening and extreme rigidity.
- Computer-controlled, GE Fanuc, digital, AC servo motors, coupled with Heidenhain glass scales on each axis, provide unsurpassed closed-loop positioning.
- Rotary axes incorporate a Star-designed traction drive that features zero backlash.
- Precision ground ball screws on linear axes for accurate positioning.
- The grinding spindle is extremely rigid and is powered by a 5 horsepower or an optional 7 horsepower motor. The standard grinding spindle runs at 3600 RPM base speed up to a maximum of 7200 RPM. An optional spindle is capable of speeds up to 14,400 RPM. The high speed spindle is used with wheels as small as 38 mm (1.5 inch) to achieve 5600 SFPM.
- The machine is capable of grinding tools to tolerances exceeding industry standards.

Maintainability

- On-line preventative maintenance schedules.
- We stock a complete line of spare parts at our Elk Rapids Engineering facility.
- Maintenance manuals and a complete parts list come with each machine.
- The coolant system uses easy-to-replace cannister filter cartridges.
- On-screen diagnostics.
- All components are easily accessible.
- Large rear doors swing open for easy inspection and maintenance.
- Modular design allows quick part replacement.



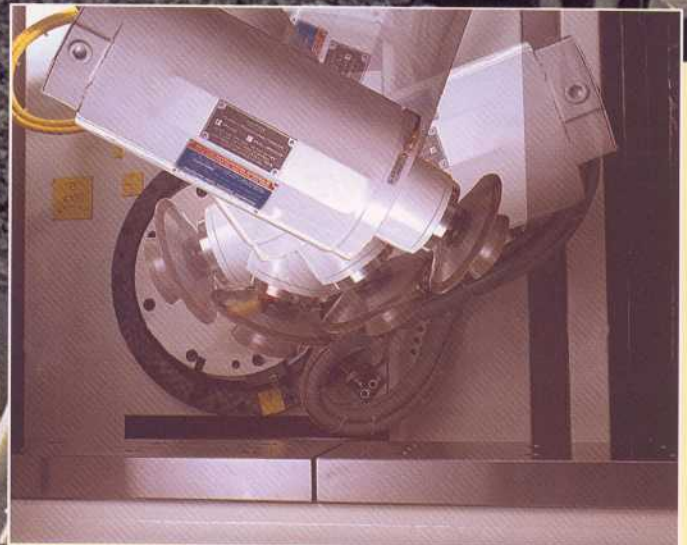
The UTG family is capable of grinding both straight and spiral gash hobs to AGMA "AA" tolerances.

Ergonomics

- The lighted grinding compartment has large sliding doors for easy access and operator convenience.
- The sliding doors are designed to facilitate using a crane to load and unload heavy tooling.
- A manual pulse generator, located within easy reach of the grinding compartment, is standard equipment.
- Fully enclosed grinding compartment helps keep the machine extremely quiet.
- A recessed machine base allows for adequate foot clearance.
- The machine centerline is at a convenient height and located toward the front of the machine.

Flexibility

- Our Universal Tool Grinders are capable of grinding a wide variety of tools from hobs to shaper cutters, to broaches, to shank type tools with minimal change-over time.
- Our UTG machines are capable of grinding tools up to 254 mm (10 inches) in diameter and lengths of 3200 mm (10.5 feet) between centers.
- The coolant system is capable of handling either water-soluble or oil coolant.
- Sharpens high speed steel and carbide tools.
- Our engineers have designed a wide variety of fixturing to accommodate hundreds of different tools. We will work with you to meet your special fixturing requirements.
- Each machine is capable of handling a range of wheel sizes from 38 mm (1.5 inches) to 203 mm (8 inches) in diameter.
- Anti-vibrational pads allow machine placement without special foundational requirements.



The B-axis rotates through a wide range of motion to grind many different types of tools.

Software By Star

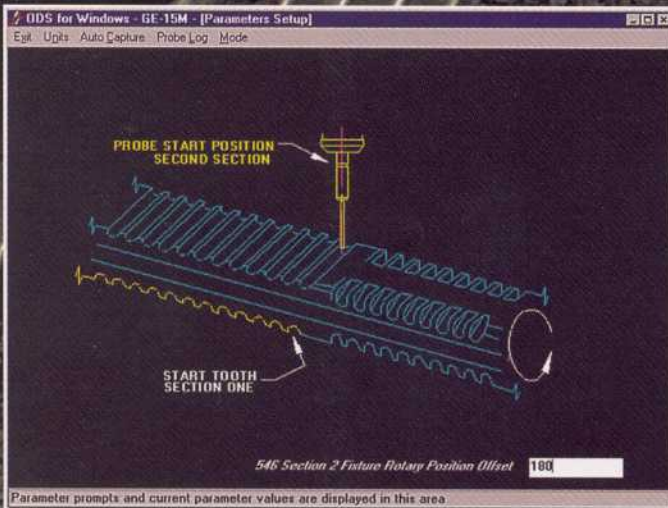
Our experienced software engineers and our graphical Man Machine Interface (MMI) offer a complete, user-friendly software package.

Star's, PC based, graphical MMI provides the following advantages:

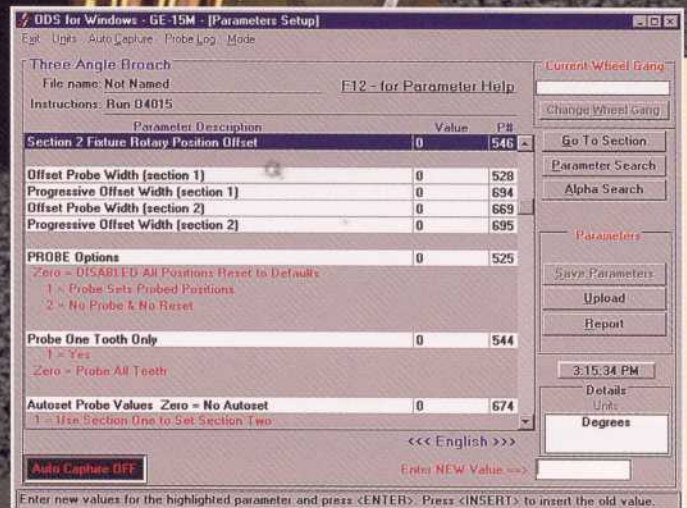
- Quick, easy retrieval and storage of part definition files.
- Management of machine tool grind programs.
- Wheel gang library management.
- On-line help that includes comprehensive text and graphics.
- Networking capabilities.
- Runs under a standard operating system.



All machines are built in our climate-controlled shop to keep tolerances within specifications.



Our team of engineers provides operators with detailed graphical help for each grind program.



Our proprietary interface provides operators with a convenient method of entering and storing information for each tool.

Star CNC Software

Star has software to sharpen a variety of tools including the following:

- Straight Gash Hobs • Spiral Gash Hobs • Slab Mills • Shaper Cutters • Flat Broaches • Round Broaches •
- Spiral Broaches • Worm Gear Hobs • Step Tools • Rack Gear Cutters • Reamers • End Mills •

From simple round and flat broaches to the complex three angle broach (in a single setup) to the round spline/spiral broach, our expertise in cutting tools and related geometry can provide custom software tailored to satisfy your most demanding requirements.



The UTG-300 and UTG-600 operator panel with the G.E. Fanuc controller.

CNC Controller

Star Cutter uses state-of-the-art G.E. Fanuc CNC controllers. The high speed processor is capable of simultaneously controlling all five axes for grinding complex tool geometry. The CNC also controls many machine functions such as the lubrication and coolant systems, and safety circuits.

Battery backup protects the ladder logic and program files in case of power outage.

Our interface lets the operator easily upload grind programs and parameter files to the CNC.

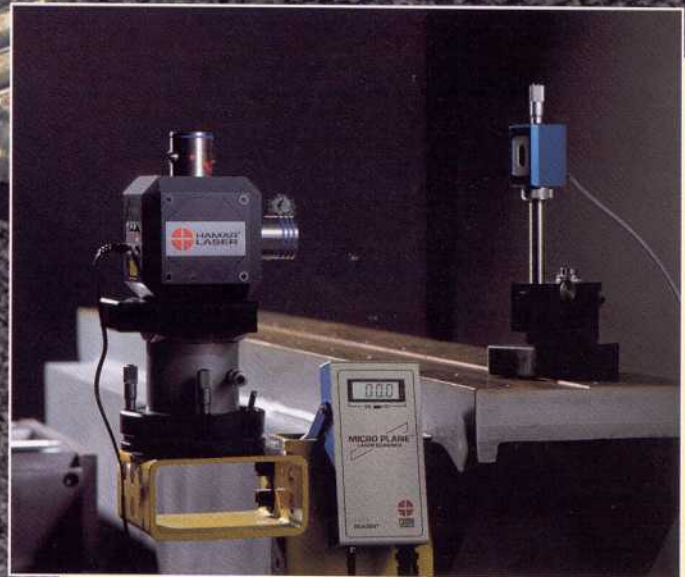
Training and Service

Operators are invited for a week of training before your machine leaves our plant. During that time, our engineers will train operators how to use the full capabilities of each purchased grind program as well as our Man Machine Interface (MMI). Our training is tailored to meet your needs; you provide the tools and we'll show you how to sharpen them. Additional training is also available, either on-site or in our plant.

Our service representatives will promptly and courteously reply if you need assistance. If your machine is down, we guarantee a service engineer will be in your plant* within 48 hours from the time you call.

We also offer excellent, ongoing telephone support for our machines and software. We can correct problems and download new software from our facilities, directly to your machine.

* Any place in North America.



Our machine tool builders use laser alignment equipment to check the accuracy of rails and ways on each machine.

Two Year Warranty

Star Cutter builds machines with the best warranty in the business. We offer a full two-year warranty. That's two years at 24 hours per day, seven days a week, 365 days a year.

Machine Specifications

| | <u>Max. Length</u> <u>Between Centers</u> | <u>Z-Axis</u> <u>Grinding Stroke</u> | <u>Overall</u> <u>Length</u> | <u>Overall</u> <u>Width</u> | <u>Approximate</u> <u>Weight</u> |
|-----------------|--|---|---------------------------------|--------------------------------|-------------------------------------|
| | mm (inches) | mm (inches) | mm (inches) | mm (inches) | kg (lbs.) |
| UTG-300 | 910 (36) | 630 (24.8) | 3060 (120) | 3800 (150) | 11,400 (25,000) |
| UTG-600 | 1100 (43) | 880 (34.6) | 3360 (140) | 3800 (150) | 12,300 (27,000) |
| UTG-1200 | 2000 (79) | 1480 (58.3) | 4370 (172) | 3800 (150) | 14,100 (31,000) |
| UTG-1800 | 2600 (102) | 2080 (81.9) | 4980 (196) | 3800 (150) | 15,900 (35,000) |
| UTG-2400 | 3200 (126) | 2680 (105.5) | 5590 (220) | 3800 (150) | 18,200 (40,000) |

Linear Axis Travel:

X-Axis 340 mm 13.40"
 Y-Axis 240 mm 9.43"

Feedrate

X-Axis and Z-Axis (Linear) 4980 mm/min. 0 - 196 IPM
 Y-Axis (Linear) 3810 mm/min. 0 - 150 IPM
 A-Axis Work Spindle (Rotary) 0 - 50 RPM
 B-Axis Grinding Spindle Vertical Pivot (Rotary) 0 - 3 RPM

Rotary Axis Travel:

A-Axis (Continuous Rotation) 0° to 360°
 B-Axis (Vertical Equals 90°) Clockwise to -5° Counter Clockwise to 164°

Workpiece Diameter 3 to 254 mm 0.12" to 10"

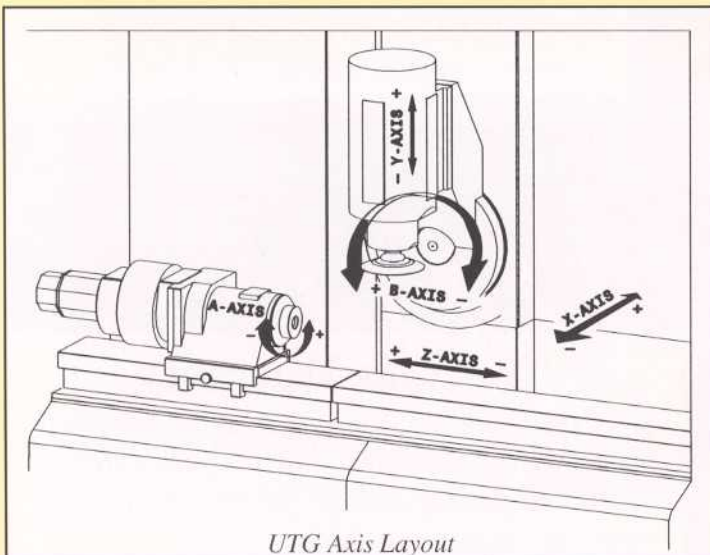
Motorized Grinding Spindle

Motor Horsepower 5 HP from 3600 to 5400 RPM
 Grinding Wheel Speed Range 1800 to 7200 RPM

Optional High Speed Spindle with Ceramic Bearings

Motor Horsepower 7 HP from 3600 to 5400 RPM
 Grinding Wheel Speed Range 1800 to 14,400 RPM

Grinding Wheel Type Diamond or CBN
 Grinding Wheel Diameter 8" Maximum
 Smallest Programmable Movement (Linear) 0.001 mm 0.0001"
 Feedback Resolution (Linear) 0.0005 mm 0.00002"
 Smallest Programmable Movement (Rotary) 0.001°
 Feedback Resolution (Rotary) 0.0005°



UTG Axis Layout



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