

PTG-4
4 Station Wheel and
Coolant Manifold
Change System

PTG-4



A choice in process management

The PTG-4 with its dependable grinding wheel and coolant manifold exchange system, provides tool process management choices. Coolant delivery targeting can be preset with the corresponding wheels and manifolds can be automatically selected for the respective operations. The single end direct drive 20 hp grinding spindle (with auto HSK) positions the abrasives on the center line of the "B" axis pivot minimizing the moment of error for the most accurate of cutting tool specifications. The wheel pack can be automatically probed for diameter and linear position.

The PTG-4 is available with powerful, flexible and easy-to-use NUMROTOplus® software packages with standard 2D simulation and DXF form capability. The optional VERICUT simulations software package provides 3D simulation and machine collision protection.

The PTG-4 can be equipped with automated systems for flexible and fast autoloading.

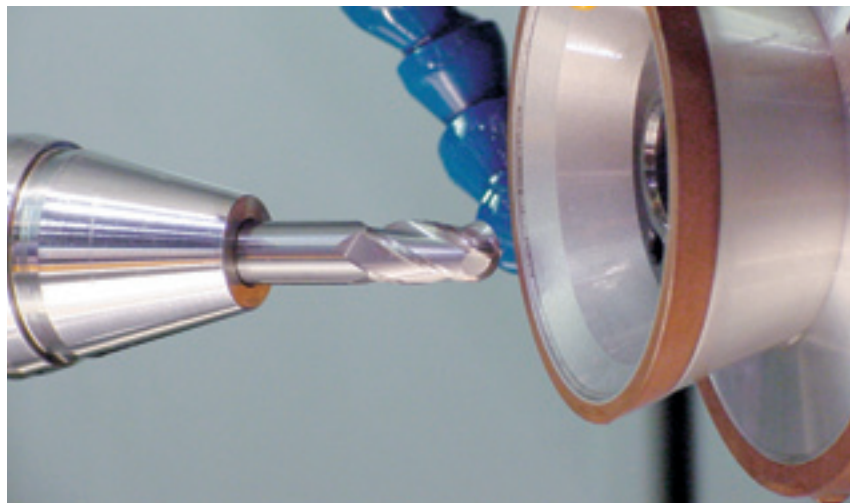
Five axis CNC featuring the most up-to-date software in the industry for the ultimate in flexibility grinding end mills, step drills, reamers, form cutters, gun-drills, burrs and shaper cutters. Programming of special orthopedic surgical tools and instrumentation is readily available.

Maintainability and reliability are assured through online preventive maintenance schedules and on-screen-diagnostics. A centralized compartment for all pneumatics and lubrication components with its modular design allows for fast and worry-free part replacement.

Our customers worldwide can expect and receive support and service at its best including ongoing software updates. We do not only sell productivity we support it.



PTG-4 with NUMROTOplus® software



PTG-4 grinding ball nose end mill

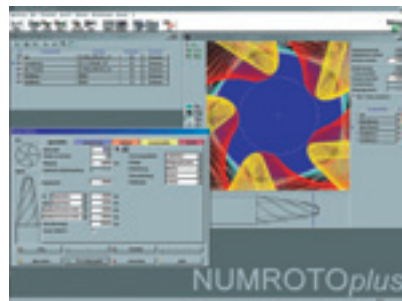


The PTG-4 allows you to grind a wide variety of tools

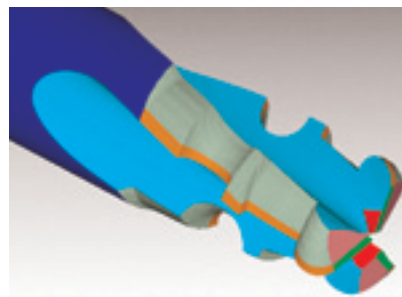
PTG -4 features:

- Five-axis, NUM CNC control.
- NUMROTOplus® operator interface running on Windows 2000 operating system with flat screen monitor.
- NUMROTOplus® 2D or optional 3D grinding simulation VERICUT®
- Dynamically stiff machine with digital servo motors, ultra precision head stock. Heidenhain glass scales on linear axes.
- CNC high-speed servo positioning and linear rail system for accurate axis positioning on precision ground ball screws.
- Automatic part probing system.
- Wheel probing system to precisely measure the grinding wheels sizes and locations, eliminating the need for time-consuming measurements each time wheels are changed.
- A wide of selection of optional coolant delivery and filtration systems with mist collection. The PTG-4 is Hi-pressure ready.

- HSK quick release grinding wheel pack allows wheel pack changes in under one minute while providing the necessary locating repeatability for off-line wheel dressing.
- HSK quick-release precision hydraulic chucks with sleeve available for precision chucking of tools from 1/8 to 1-1/4 inch diameter range.
- Cat 50 collet chuck and collet set available for chucking tools from 1/8 to 1 inch diameter range.
- Capability of sharpening extended-length tools such as gundrills and gun reamers by moveable direct-drive headstock for tools up to 21 inch OAL.
- Direct drive head stock with up to 1000 rpm for cylindrical grinding of a wide range of diameters while maintaining 350 inch pounds of torque for the quick and accurate fluting of large diameter solid carbide tools.



Standard NUMROTOplus 2D Software



Optional NUMROTOplus VERICUT 3D visualization Software

NUMROTOplus® Software

NUMROTOplus® makes it easy for operators to grind parts in the following ways:

- Sequentially walks the operator through the graphical interface during the tool description process.
- Generates a custom grind program for each tool.
- Shows tool geometry using a 2D, scale representation of the tool.
- Provides immediate feedback as the operator enters each dimension.
- Simulates grinding to show cross-sectional details.
- Based on the feed rates selected and the parameter entered, the software automatically calculates a grinding time for each operation and a total cycle time for the part program.
- Minimizes wheel changes and boosts productivity by letting the operator use wheels for multiple operations.
- For even more flexibility, NUMROTOplus® can be supplied optionally with the Vericut 3D visualization.

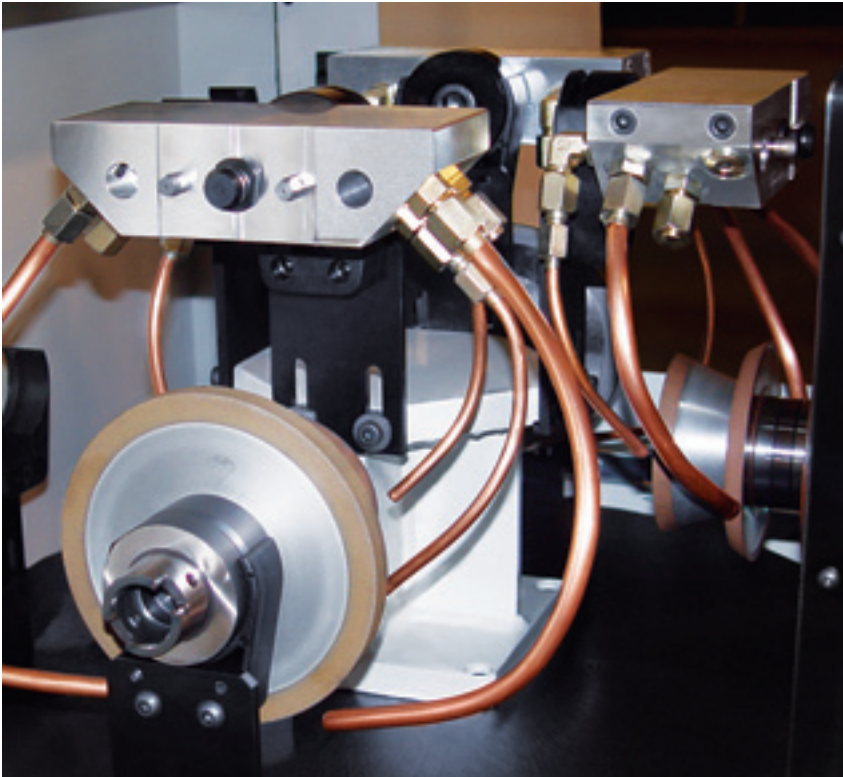


Vericut works hand in hand with NUMROTOplus® to provide the operator with a virtual representation of the tool before the operator ever puts the workpiece in the machine. The operator can test the program, view, measure the virtual part and even tell whether or not there are collision problems with other wheels. When the operator is satisfied with the virtual part, it is a simple matter to upload the grind program to the machine and start the grinding cycle.

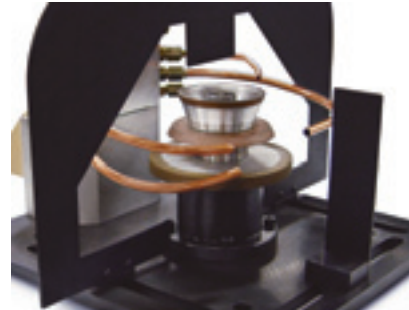
The NUMROTOplus® software easily integrates with the ZOLLER "GENIUS" inspection machine.

A powerful personal computer with flat panel monitor is used as operator interface and provides the necessary speed for running 3D simulations at the machine. Naturally it allows for quick and inexpensive upgrades as new technology becomes available.

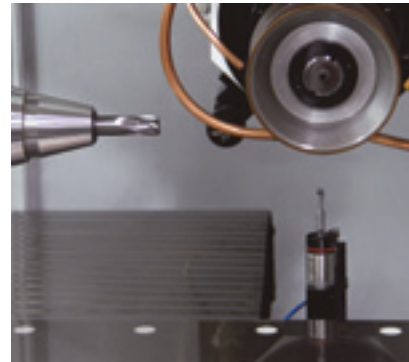
PTG-4



Operator access to the wheel changer is gained from the rear of the machine



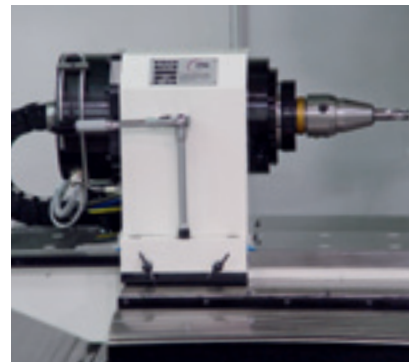
Wheel pack/manifold setup fixture provides envelope to position coolant lines so any 'in-machine' interference is eliminated prior to loading wheel pack and coolant manifold in machine



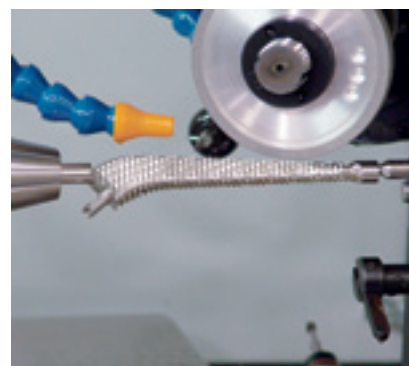
Automatic grinding wheel probing system



NUMROTOplus software integrates with the Zoller 'Genius' inspection machine



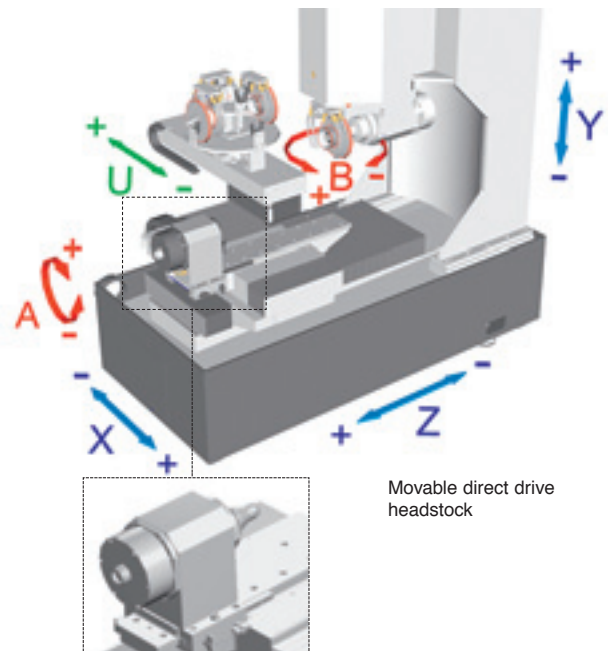
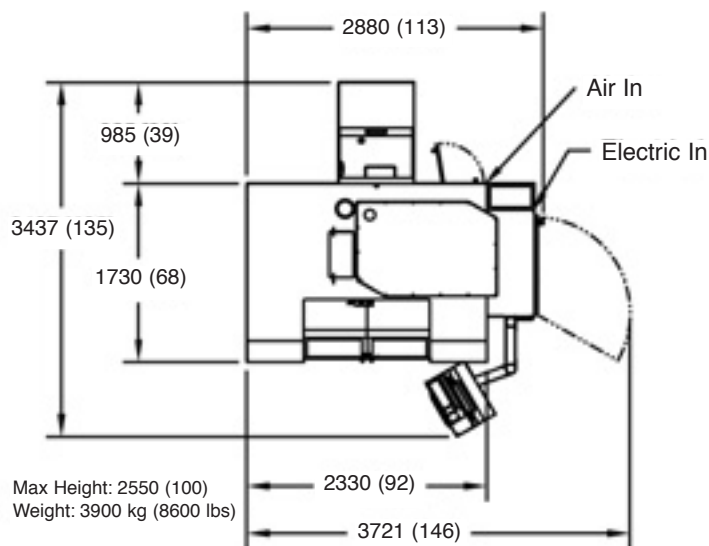
PTG-4 movable direct drive headstock



PTG-4 grinding medical tools

Technical Data

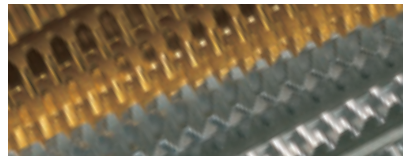
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|---|--------------------|---------|
| Machine capacity PTG-4 | | |
| Max. workpiece diameter | 100 | mm |
| Max. workpiece length | 530 | mm |
| A - axis workhead spindle rotation | 40 (1000) | rpm |
| B - axis grinding spindle swivel | 16 | rpm |
| X - radial travel work spindle slide | 300 | mm |
| Y - vertical travel tool head slide | 285 | mm |
| Z - axial travel tool spindle column slide | 500 | mm |
| Grinding spindle | 20 | HP |
| Maximum grinding spindle speed | 10,000 | rpm |
| Maximum grinding wheel diameter | 254 | mm |
| Smallest programmable movement: linear | .0001 | mm |
| Linear axis glass scale feedback resolution | .00001 | mm |
| Smallest programmable movement: rotary | .0001 | degrees |
| Rotary axis feedback resolution: A-axis | .0000001 | degrees |
| Rotary axis feedback resolution: B-axis | .0000005 | degrees |
| Main dimensions, base machine (l x w x h) | 2,88 x 3,44 x 2,55 | m |
| Total weight, base machine | 3,900 | kg |



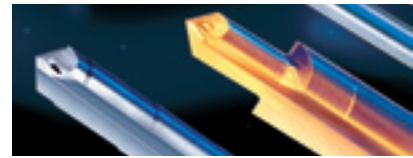
System technology from one source



Cylindrical gear hobbing
 Bevel gear cutting
 Shaping
 Profile grinding
 Continuous generating grinding
 Honing/shave grinding
 Shaving cutter grinding
 Hob grinding
 Universal tool grinding
 Carbide tool grinding
 Chamfering and deburring



HSS and carbide hobs
 Shaper cutters
 Broaches
 Milling cutters
 Rack and saw cutters
 Shaving cutters
 Profile grinding wheels
 Master gears
 Chamfering and deburring tools



Single and double flute gundrills
 Solid carbide gundrills
 Two-fluted milled style deep hole drills

Solid carbide drills and reamers
 Pressure coolant drills and reamers
 "PCD" drills and reamers
 Integrated holder "PCD" tooling

Regrinding of gear cutting tools
 Coating of gear cutting tools
 Decorative coatings
 Replating of grinding wheels
 Grinding of compressor rotors, gears of special design, worms and cams



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 ● Service Center