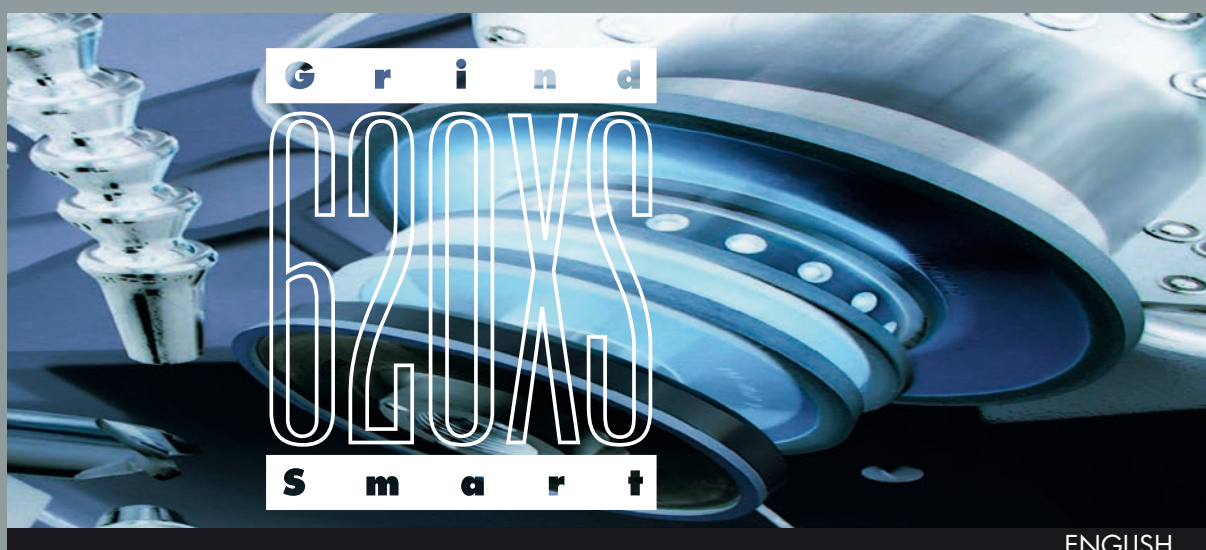


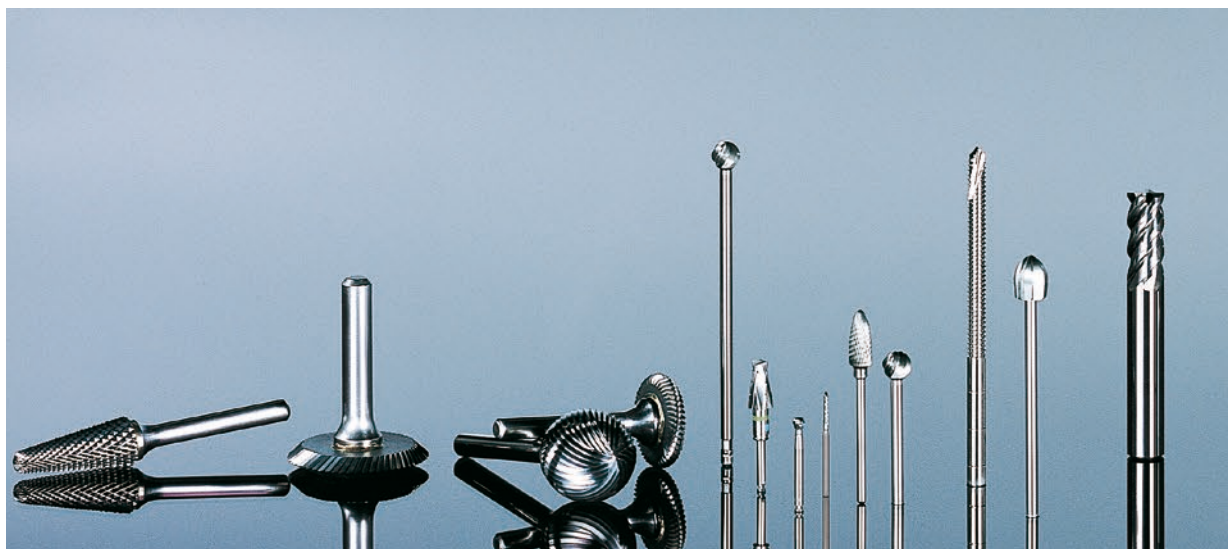
YOUR GRINDING SOLUTION



ENGLISH

[fact.1]

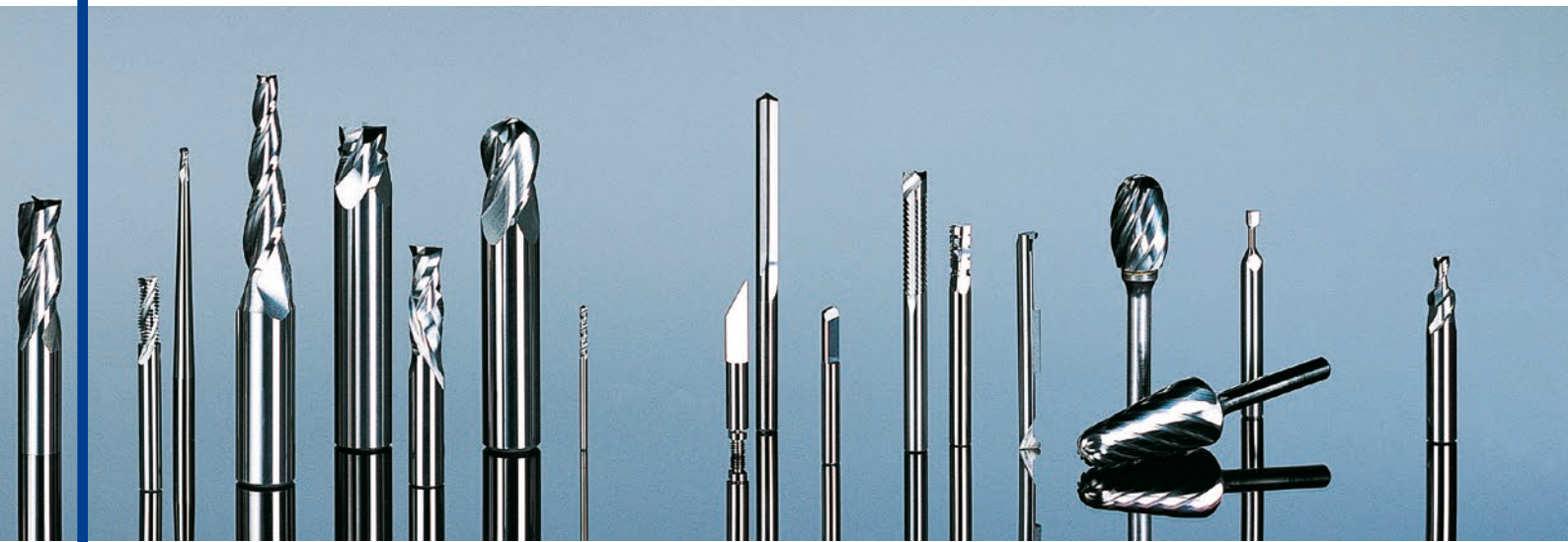
GrindSmart®620XS – The Excellence in Tool Grinding Solutions



Your Grinding Solution

APPLICATIONS

- INDUSTRIAL METAL CUTTING TOOLS
- MEDICAL & SURGICAL TOOLS
- DENTAL TOOLS
- PRINTED CIRCUIT BOARD TOOLS
- DEBURRING TOOLS
- WOODWORKING TOOLS
- SPECIALTY TOOLS



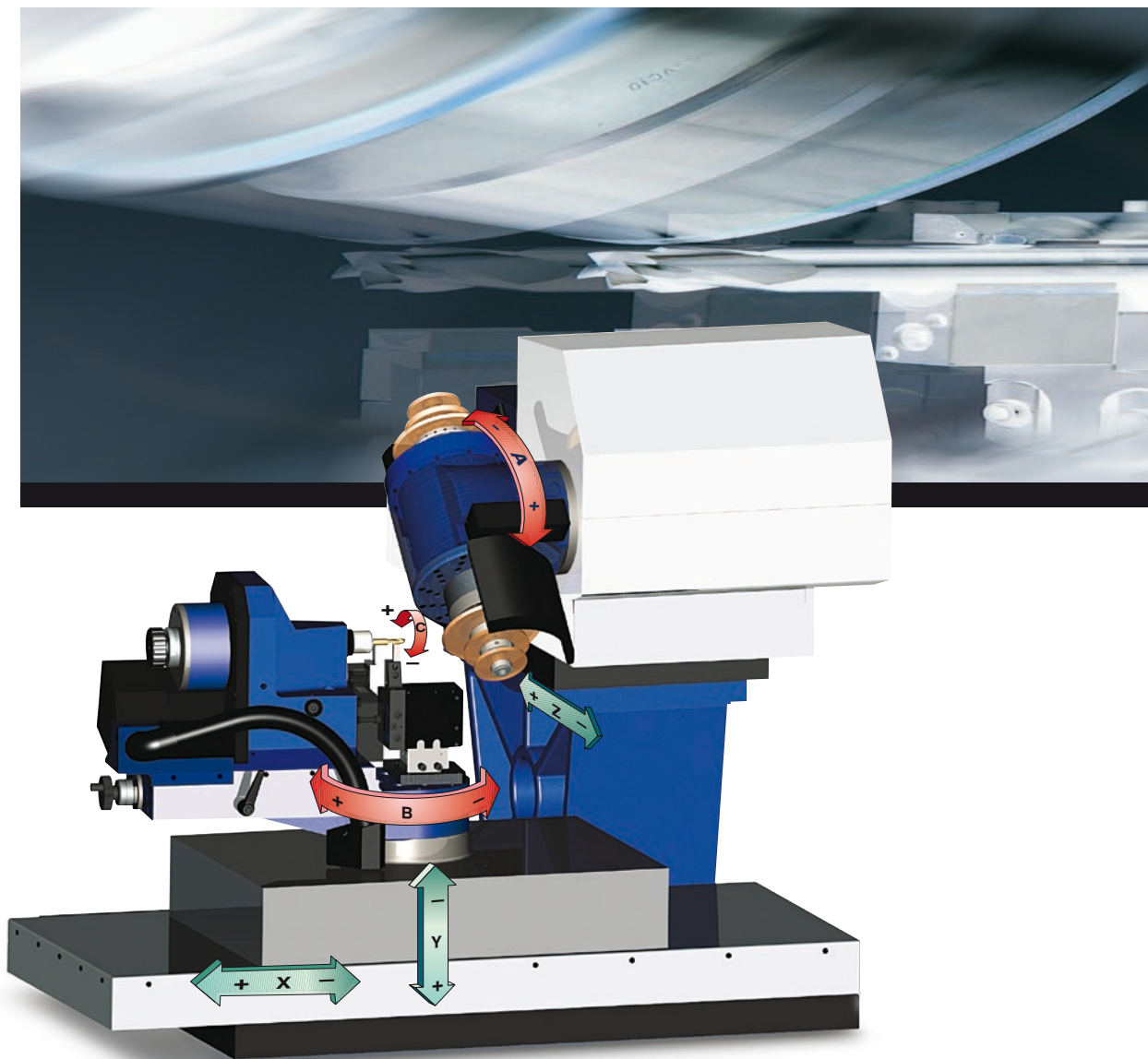
The GrindSmart®620XS is a fully automated 6-axis CNC Super Precision Grinding Center for manufacturing rotary cutting tools medium-size to micro-size in carbide, HSS and other materials in one clamping. The grinding range is from Ø 16.0 mm (5/8") down to Ø 0.1 mm (.004") Due to the unique "Desktop" Tool Design System with high-precision set-up features, all types of endmills, drills, reamers, step and form tools, medical and dental cutting tools and burs can be ground both in large and in very small batches with equally efficient set-up and cycle times. A high-speed robot loader running at 65 m/min. (2600"/min.) allows for unattended production of up to 1000 tools. Blanks up to 300 mm (12") overall length can be loaded automatically.

The machine includes unique mechanical design features such as V-block clamping, steady rest and many more which result in superior tool production both in terms of quality and reliability.

The GrindSmart®620XS is offered complete with a full package of all the Rollomatic software available including the powerful 3D simulator, integral robot and 24/7 warranty. This allows a user to achieve the highest ROI within a short time at highest quality.

[fact.2]

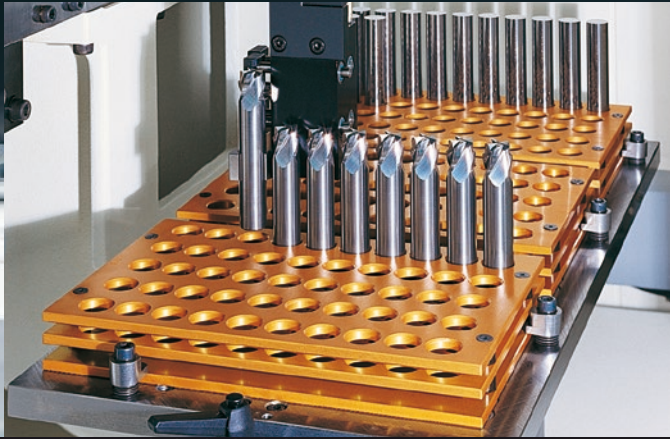
6 CNC Axes Interpolation & Integrated Load/Unload Robot



Machine Configuration

NEW DESIGN FEATURES

- Uses only 4.5 m² (40 sqft) of floor space including coolant tank and integral robot.
- New robot design, using belt-driven axis motion, allows fast and smooth transport, in turn reducing maintenance need and cost.
- Advanced protection features: air purge of grinding spindle, fully enclosed guide ways and central oil lubrication on the linear guide rails.
- Extended rotary axis B for workhead, with total movement of 210 degr., providing better access to the grinding wheels, and allowing left-hand tools to be fluted both in left or right positions.
- Grinding head movement is on one single axis. Compared with a cross-slide carrier, providing enhanced stability.



Integral automated robot loader/unloader



Robot loading capability on special tools with equal precision and reliability

GREATER ACCURACY

- The 3 linear machine axes X, Y and Z are controlled by linear glass scales, and the grinding head axis A is fitted with a rotary glass scale for accurate positioning of the grinding wheels. All axes move with the Fanuc "Nano interpolation".
- The axes are driven by a direct-drive AC servo motor and an additional rotary encoder for higher positioning speed. Direct-drive AC motors coupled directly to the ball screws provide enhanced dynamic behavior leading to the highest interpolation accuracy, while glass scales eliminate any temperature variations to which balls screws, linear guide rails, and other transmission elements are exposed to.
- The rotary axes A and B have a backlash-free drive system with a pre-loaded transmission ratio of 1:100.
- The workholding axis C is driven by precision-ground gearing and has a rotation speed of up to 1000 RPM for fast positioning and cylindrical grinding operations.

RELIABLE AUTOMATION

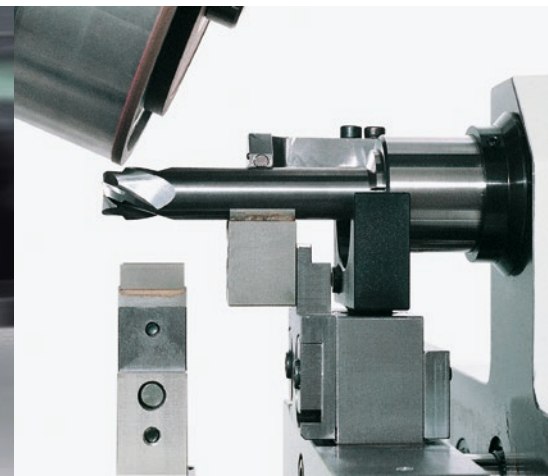
- The key word in unattended production is total reliability. The Rollomatic machines have consistently proven to be the most reliable automatic machines, due to the unique and simple design of the loader. The level of uptime achievable on the Rollomatic machines is unequalled.

[fact.3]

Real Versatility in Quality Tool Grinding



The 2 wheel arbors with up to 8 grinding wheels



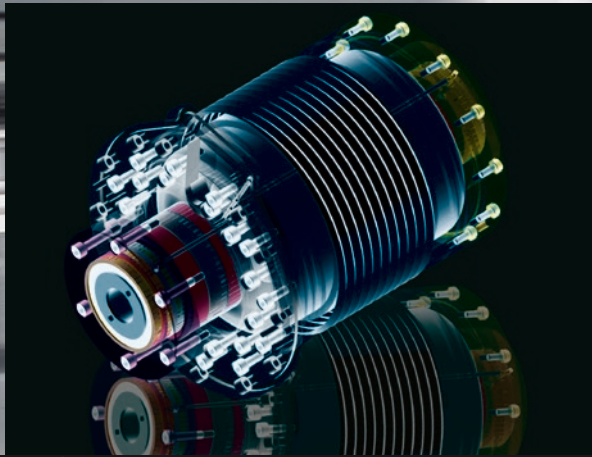
Step relieving with inclination of A axis



Advanced Grinding Concept

PROVEN VERSATILITY

- The design of the A axis allows for inclination and rotation of the grinding spindle, utilizing both ends of the spindle. Different wheel arbors are available to allow an array of various wheel shapes to be used.
- Inclination of the grinding spindle is useful (and in some instances essential) for grinding step tools and step drills, ballnose endmills and high-performance drill points.
- Grinding the shoulder relief of a step tool using an inclined cup wheel, allows grinding over the top with high accuracy of shoulder angle and continuous use of the steady rest (drills).



Direct drive motor



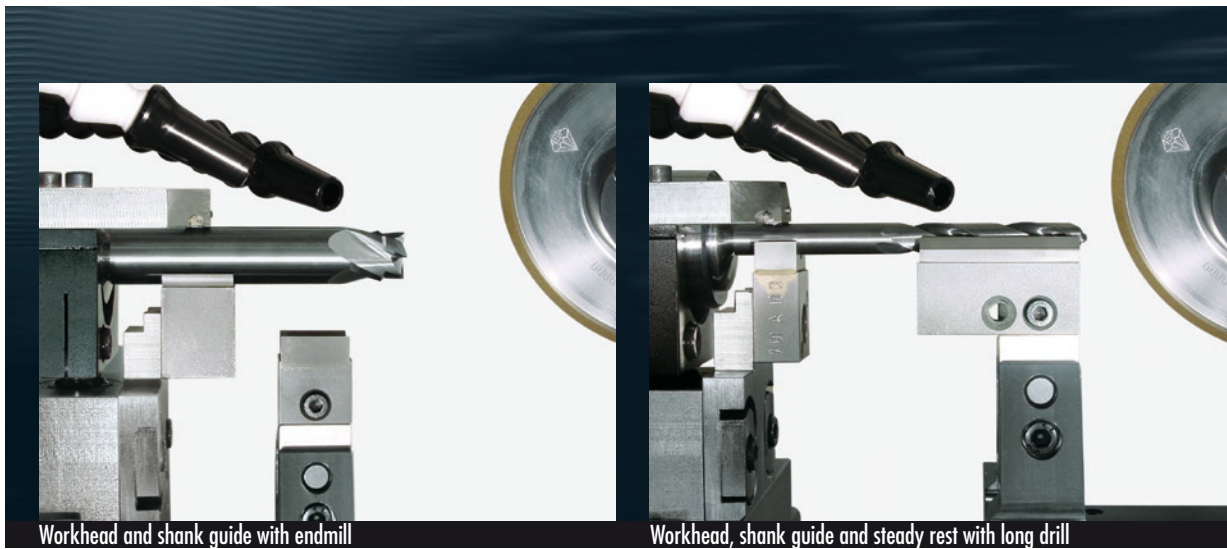
2 Wheel arbors with dynamic wheel balancing system

RIGID HEAD UNIT & OPTIMUM NUMBER OF GRINDING WHEELS

- A built-in 7 kW (10 hp) direct drive spindle motor with internal cooling and air purge on both ends guarantees smoothest rotation and highest torque at any cutting speed.
- 2 wheel arbors clamping up to 8 grinding wheels for optimal grit size selection and wheel shape definition provide the highest flexibility and versatility without having to change wheel packs, with superior accuracy, better surface finish, more reliable performance, greater wheel longevity and shorter cycle time.
- Rollomatic's original "Dynamic wheel balancing system" ensures very precise wheel balancing easily.
- The fluting wheel can be up to 150 mm (6") in diameter. Wheels packs are removed from the machine for dressing and replaced in less than 5 minutes, allowing for more frequent and accurate dressing, giving better and more consistent tool geometry and improved surface finish.
- The peripheral speed of each grinding wheel is calculated by the program and can be set individually for each operation. Manual override with graphic display and display in RPM is also available. The power consumption is both graphically displayed and the consumption is presented on the screen in percentage. An alarm can be set for any level of power consumption so that the operator has the opportunity to intervene and stick the wheels. The spindle can be programmed for both clockwise and counter-clockwise operation between 0 and 10,000 RPM.
- The 6th axis A provides ultimate versatility of grinding, with simplified dressing and gives almost unlimited grinding combinations.

[fact.4]

Real Advantages in Precision Tool Grinding



Workhead and shank guide with endmill

Workhead, shank guide and steady rest with long drill



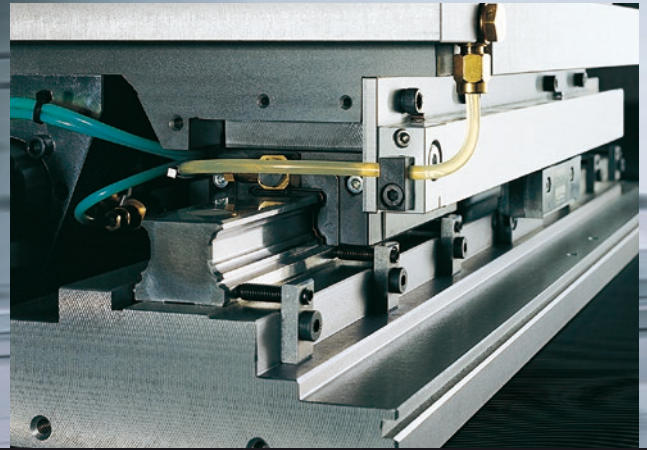
Unique Special Features

FASTER SETUP

- Fast machine set up due to the VirtualGrind[®] desktop tool design, allows off-line programming using free wheel definition and tool fine tuning by means of a full 3-dimensional simulator. This 3D Simulator includes nano-precision accuracy for even the smallest tools, and measuring capabilities.
- The 6th axis on the GrindSmart[®] increases the flexibility for grinding with standard wheel shapes, thus enhancing set-up times substantially.
- Trimos wheel presetter. Grinding wheels can be scoped directly on this presetter using VirtualGrind[®] which is the identical software system for teach-in as used on the machine. VirtualGrind[®] is then networked directly in the server and into all the machines on the shop floor.



3D probe locating blank with coolant channels



Principle of motion guide and linear glass scale system

SUPER PRECISION TOOL SUPPORT SYSTEM

- Rollomatic V-Shank Guiding system assures the optimisation of tool quality, proven production provides a Ø 1.0 mm (.040") ball nose endmill with 1 to 2 µ (.00004 to .00008") concentricity on the O.D. and the ball relief.
- The hydraulic movable and programmable steadyrest (with fine adjustment) can be used to minimize deflection allowing faster grinding feeds and better quality tools.
- Flexible enough to grind tools with long flutes such as drills, medical tools and endmills with extended flute length most accurately.
- Glass Scales on all 3 linear axes and Rotary glass scale on wheel head rotary A axis.
- The linear motion guides and linear glass scales with Nano precision resolution for guaranteed best surface finish and tool diameter control.
- 3D Renishaw probe can locate coolant holes on blanks, and is also used for locating pre-fluted tools, cross holes, shank flats, inserted hard-metal blades, etc. With automatic loading however, the probe is not used for probing the end of the blank, as the loader movement includes mechanical front positioning in a much shorter time than a probe.

[fact.5]

GE Fanuc Control & Ethernet Networking



Powerful GE Fanuc control 160iMB for both machine set up and robot set up



CNC Control & Solutions

POWERFUL CNC CONTROL

- All 8 axes are controlled by the powerful and reliable CNC control, GE Fanuc 160iMB. GE Fanuc has a worldwide service network and provides service for all CNC elements, directly from the manufacturer.
- The complete built-in diagnostic system together with the Rollomatic control panel test window allow for a quick and easy trouble shooting of all the control elements.
- Robot control is integrated into the main CNC control as the 7th and 8th axes, which makes loader setup and operation very easy and simple.
- Standard control, not custom made, for guaranteed fast worldwide service and lowest maintenance cost.
- All VirtualGrind software for WindowsXP included.



Control swivels with ease of access in machine set up and robot set up position

PROCESS CONTROL

- The Rollomatic graphic windows make it very easy to program tool parameters 100% off line on the PC, or directly on the control. Dialogue system allows for precise, easy selection of operations and their sequences.
- New interface with graphic tool description and 3D model.
- Throughout operation, the control keeps track of cycle times, operations performed and grinding load on the spindle. Admissible and maximum load are programmed to warn the operators when a grinding wheel needs truing and will automatically stop if no attention is given.
- Information is automatically recorded, allowing for optimum use of the cycle. Input signals such as coolant pressure and temperature in the grinding area can be monitored for safe unattended production.
- The tool dimensions can be corrected very easily through a grinding wheel offset window, visualizing the correction made directly on the wheel drawing.

ETHERNET NETWORK

- Windows operating system for full network capability, as well as easy and safe tool file management.
- In a production environment, a large number of the machines (clients) are connected to a central PC (server) which stores and downloads all the necessary data for tool specifications and wheel geometries.
- This guarantees that the updated production data is stored in one location and can be used on any machine with total compatibility. The backup of all the data is made on the server only.

[fact.6]

Rollomatic's Production Method

- Designing/Development
- Virtual Grinding
- Manufacturing
- Total Quality Management
- Database Management

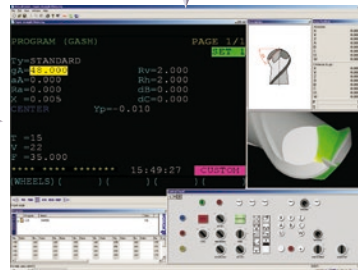
Tool Database Input

4 Flute Carbide End Mill									
Solid Carbide End Mills									
Single-End, Center-Cutting									
Code	d1	h	d2	h	z	M5043		C536	
160	2	7	6	38	3	•		•	
165	2.5	8	6	39	3	•		•	
180	3	8	6	39	3	•		•	
200	3.5	10	6	41	3	•		•	
220	4	11	6	42	3	•		•	
240	4.5	11	6	42	3	•		•	
260	5	13	6	44	3	•		•	
280	5.5	13	6	44	3	•		•	
300	6	13	6	44	3	•		•	
311	6.5	16	8	48	3	•		•	
331	7	16	8	48	3	•		•	
351	7.5	16	8	48	3	•		•	
391	8	19	8	51	3	•		•	
410	8.5	19	10	56	3	•		•	
420	9	19	10	56	3	•		•	
430	9.5	19	10	56	3	•		•	
490	10	22	10	59	3	•		•	

Wheel Presetter



Rollomatic VirtualGrind®

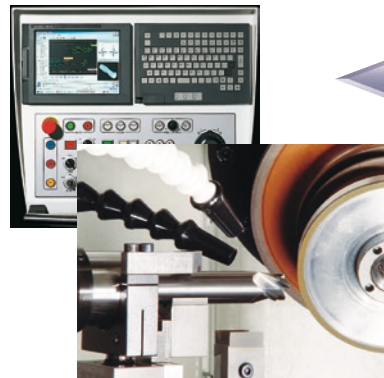


Networking &

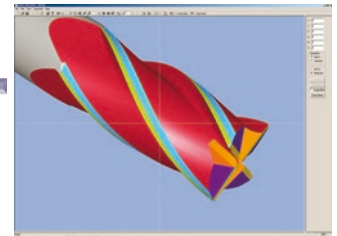
Tool File Management



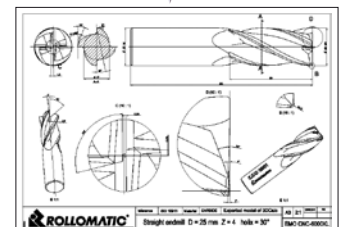
Rollomatic Tool Grinding Center



3D Tool Simulation



CAD Export



High Precision Tools



Send to Tool Data Bank
for Future Development

VirtualGrind® Software

VirtualGrind®

Software for WindowsXP and WindowsVista, consists of Rollomatic's FluteCalc®, BurCalc®, TaperCalc® and 3DCalc®. The entire package and upgrades come complete with your machine purchase.

This is a software for the basic working environment for tool design and simulation on a PC. It provides the interface used to configure, control and maintain all machine operations as well as the programming facility for many types of tools using basic grinding operations like flute, relief, corner radius, corner chamfer, gash, heel, and more.

Advanced features for the tool makers are :

- Excel sheet fast data input : Import tool specifications directly from Excel sheet or use the Rollomatic tool templates.
- Wheel Presetting : Wheel qualification is made simple with the Trimos EasySetup presetter. All qualifying data can then be transferred to VirtualGrind via a serial cable.
- Standard CAD export from 3DCalc : 3DCalc can export simulated tool models in STEP format, industry standard recognized by most commercially available CAD software packages. After the model is imported into a CAD system it can be used for such typical tasks as Finite Element Analysis, Product Data Management and many more. By generating 2D projections and cross sections from the imported model the tool designer can create tool drawings with precision and level of detail unavailable earlier.
- Desktop Tool Grinding : allows complete tool design alleviating unproductive machine time and wasted tool blanks.

FluteCalc®

FluteCalc is a software designed to calculate flute grinding and relieving operations on end mills, drills and routers, with a true cross-section simulation of the tool and postprocessors for all Rollomatic machines with fluting capabilities. It can be used independently or in conjunction with VirtualGrind, where data is automatically transferred between the two applications.

TaperCalc®

TaperCalc is similar to FluteCalc with added features that allow calculation of tapered tools maintaining a constant helix and a constant rake. Multiple cross-section views verify results.

BurCalc®

BurCalc is a simulation and calculation software, designed for industrial, aluminum, medical and dental burs. The sophisticated and fully customizable graphic representations of grinding paths, OD shape and cuttings edges, give the operator complete control over sectioning of tools at any position for a true cross sectional simulation. To quickly achieve accurate results a large set of tool templates have been designed by Rollomatic application engineers.

3DCalc®

3DCalc is a simulation software that provides a true 3D verification of the ground tools. Rotate, pan, zoom, cross-section and measure the virtual model in any plane, it is also possible to simulate grinding wheel movement allowing for collision and error detection.

The incorporation of 3DCalc into VirtualGrind allows the simulation of customized ISO code and complex tool types. Significantly decrease down time, setup time and the number of wasted blanks, by fine tuning the tool geometry before the actual grinding process.

ISOEasy

A new feature for 620XS users. ISOEasy allows for the creation and use of "drag and drop" descriptive text blocks to create ISO (G&M) code programs. Each text field can be linked to a picture, thus making training simple. An operator can create special tools by choosing from this library of customized grinding operations. No programming in ISO is needed.

GrindSmart® 620XS

Specifications

SPECIFICATIONS

GRINDING RANGE

Diameter range 0.1 – 16.0 mm (.004" – .63")

CONTROL

X axis	Stroke	300 mm (11.81")
	Fast travel	12 m/min. (473"/min.)
	Encoder	Absolute glass scale 0.00005 mm (.000002")
Y axis	Stroke	220 mm (8.6")
	Fast travel	12 m/min. (473"/min.)
	Encoder	Absolute glass scale 0.00005 mm (.000002")
Z axis	Stroke	180 mm (7")
	Fast travel	12 m/min. (473"/min.)
	Encoder	Absolute glass scale 0.00005 mm (.000002")
A axis	Stroke	-195° to 30° (225°)
	Fast rotation	10800°/min.
	Encoder	Absolute glass scale 0.00005°
B axis	Stroke	-75° to 135°
	Fast rotation	10800°/min.
	Encoder	Rotary, on AC motor 0.0001°
C axis	Stroke	Tool rotation
	Fast rotation	1000 rpm
	Encoder	Rotary, glass scale 0.0004°

GRINDING MOTOR

Power	7 kW (10 HP), direct drive
Rotation speed	2000 – 10000 rpm
Grinding wheels	Up to 8 wheels Ø Max. 150 mm (6")

TECHNICAL SPECIFICATIONS

Position Accuracy	≅ 0.005 mm
Repeatability	≅ 0.002 mm
Max. Wheel	
Periphery Speed	78 m/s

CLAMPING

Clamping collets	W20
Range	0.5 – 20.0 mm (.02" – .75")
Type	Hydraulic

ROBOT LOAD & UNLOAD

Number of tools	Up to 1000 (3 cassettes)
Shank diameter	1.0 – 16.0 mm (.04" – .63")
Max. overall length	300 mm (12") (max. Ø 8 mm, Ø.315")
Option	400 mm (15.75") with magazine loader
Speed	65 m/min. (2560"/min.)
Clamping	Hydraulic

TOOL SUPPORTS

Shank support	"V" clamping, Hydraulic
Cutting portion support	"V" or Halfmoon

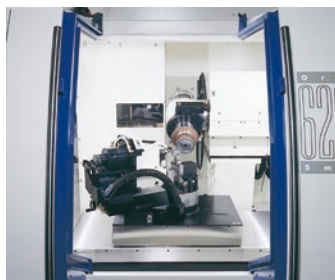
MACHINE

L x W x H	2160 x 1600 x 2151 mm (85" x 63" x 85")
Weight	3500 kg (7716 lbs)
Total power	Maximum 18 kW

OPTIONS

- >> Grinding Wheel Dresser
- >> Tailstock System
- >> Edge Gap Sensor

* Specifications are subject to change without notice

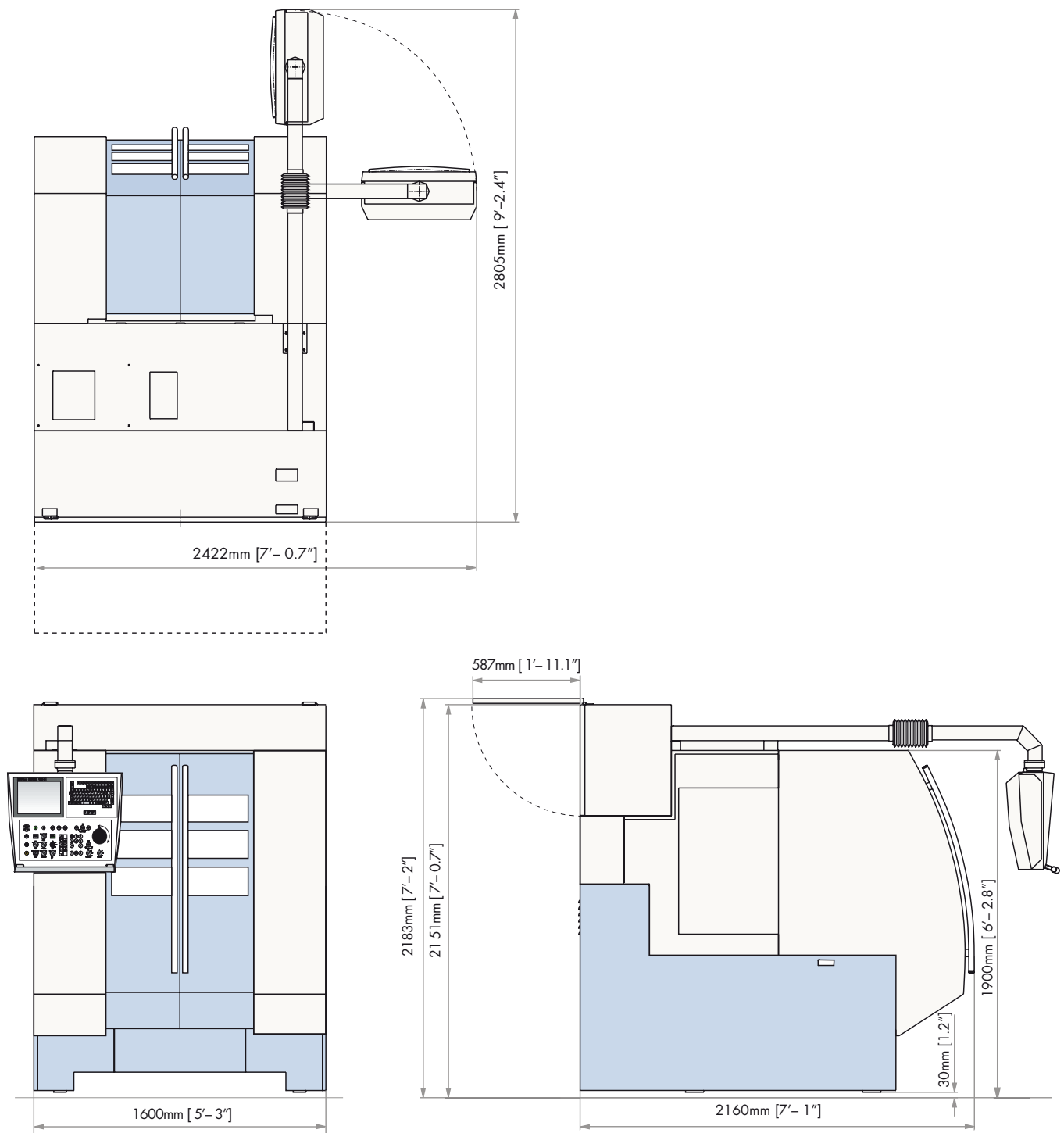


Your Grinding Solution

[fact.9]

GrindSmart® 620XS

Foot print



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