

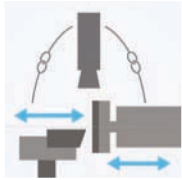


COBORN
ENGINEERED SOLUTIONS



RG SERIES

AUTOMATION ACCESSORIES



The Vision System

Faster than contact probes, the ultra-high-speed vision system gives integrated, closed loop control of the machine using the image from the camera.

The high resolution camera enables:

- Automatic alignment of the tool before grinding commences
- Automatic detection of the brazed PCD/PcBN blank position to eliminate crashes and minimise cycle times by reducing 'air-grinding'
- In-situ, intermediate and final inspection of angles, flanks and radii, measuring to an accuracy of $\pm 2\mu\text{m}$



CNC Programming

Each custom program is developed, either on or off the machine, by building the required sequence of 'blocks'. Operator training takes just 3 days for the basic five-axis machine and an additional 2 days for the rotary/helical programming course. The RG9A is a multi-tasking system and programs can be run whilst new programs are developed or old ones modified.

Programming the RG9A is simplicity itself. The software is:

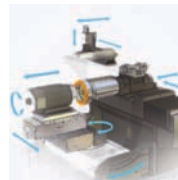
- Menu driven and intuitive
- Designed with PCD/PcBN tool manufacture in mind
- Follows the steps associated with manual tool grinding



Rotary and Helical Tool Manufacture

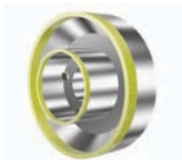
The RG9A software enables complete control of the simultaneous movement of all axes. With coordinated movement of the rotary (RM) and linear (LM) axes, it is possible to grind the PCD edge of multi-

tooth reamers where the PCD is laid on a helix angle. Since wheel infeed position can also be controlled simultaneously, it is possible to create cutters which are both helical, and have a convex radius.



Machine Axes

With the optional rotary module (RM) and the linear module (LM) axes fitted, the RG9A has 7 CNC machine axes and 3 CNC camera axes.



Dual Wheel

With this optional grinding software the RG9A can be configured to accept two grinding wheels mounted concentric to one another, facilitating rough and finish grinding in one set up. Additionally if

the optional advance K-Land software is purchased complex geometry rotary tools can also be manufactured.



Robot

The RG9A is supplied 'robot ready' and the optional Stäubli 6 axis robot can be added to the machine to facilitate fully autonomous 'lights out' production of tools.

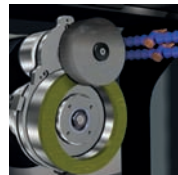
The programming and setting of the robot couldn't be easier, with custom written macros embedded into the main control and a library of work holding accessories to choose from.



Peripheral Grinding

The RG9A can be configured for the peripheral grinding of standard ISO series inserts, complete with K-Lands. More complex geometry tools can also be ground using the optional dxf. Import Software.

The inserts can be either attached to an anvil by a screw, and ground using the RM unit, or alternatively if the insert is solid it can be held between anvils which are hydraulically clamped using a tailstock unit, robot loading is also possible using the TSU3.



In Process Dressing

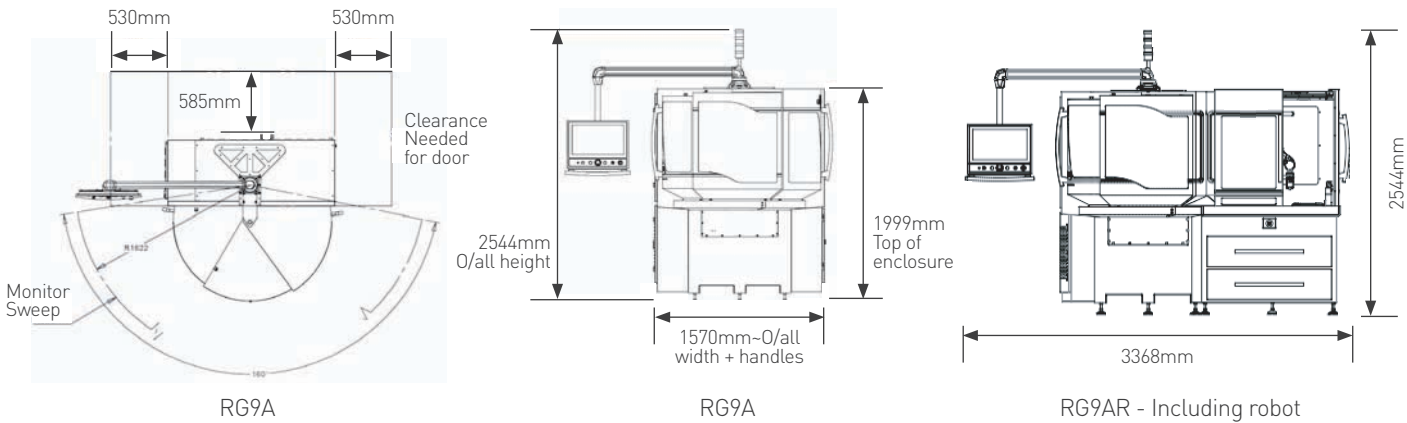
Dressing the grinding wheel regularly is important to keep it flat, the DA12 allows the wheel to be dressed using an adjustable pressure with both a programmable frequency and duration, this occurs in process, giving minimal disruption to the grinding cycle.

RG9A TECHNICAL SPECIFICATION

Area	Specification
Machine dimensions (w x d x h)	1570mm x 1540mm x 2544mm
Machine weight	1750kg
CNC control system	CNC control with Intel i7 processor running Coborn .net software on a Windows platform
Grinding wheel spindle	2.2kW 500 - 4000 rpm programmable
Grinding wheel	Ø 150mm - 220mm 6A2 different styles available on request
Dressing system	Coborn in-process dressing system
Lubrication	Centralised automatic lubrication system
Process measurement	Coborn integrated camera measuring system +/- 0.002mm resolution
Electrical requirements	380/220 3phase 50/60 Hz 20Amps
Mechanical options	Robot loading system (ALS), Rotary axis (RM), Linear module (LM), Work piece clamping systems (TH), Tailstock units (TSU)
Software options	Peripheral grinding software, Heli/Rad convex, High precision location block, K-land +, dxf. import (profile grind), dual wheel
Pneumatic requirements	5.5 to 8 bar

Axis	Description	Feedback Resolution	Program Resolution	Travel
X	Wheel head traverse	0.0005mm	0.01mm	300mm
Y	Wheel head infeed	0.0001mm	0.001mm	70mm
B	Boom tilt	0.001°	0.01°	-0.5 to 25°
C	Pivot table	0.0002°	0.001°	+/- 100°
TPX	Pivot cross slide	0.0001mm	0.001mm	40 mm
TPY	Linear module	0.0001mm	0.001mm	50 or 100mm
A	Rotary module	0.0002°	0.001°	360°/continuous

DIMENSIONS AND FOOTPRINT



MULTI-FUNCTIONAL CAPABILITIES

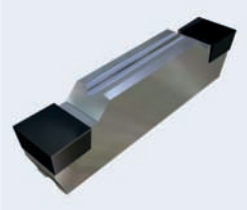
The RG9A is an extremely versatile machine, which can make small or large batches of tools, to exactly suit your customer order.

The RG9A features simple, user-friendly software, where simple programming blocks can be built step-by-step to produce the tool forms and geometries you need.

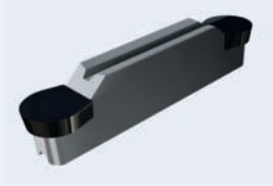
TOOL FORMATS

- Single point turning/milling inserts and shank type tools
- Simple radius and multiple blended radius tools
- Grooving tools with blended radii
- Large radius wiper inserts
- Multiple clearance angles
- Tools with K-land chamfers
- Rotary tools: end mills, reamers, single and multi-tooth cutters and saw blades
- Straight helical and radial helical cutters

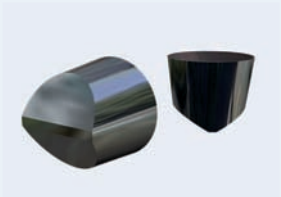
TOOLING



PCD/PcBN Square Grooving Tools



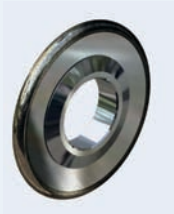
PCD/PcBN Radius Grooving Tools



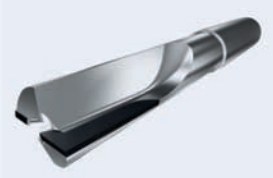
Peripheral Ground Solid Inserts



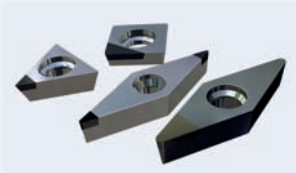
PCD Step Drills



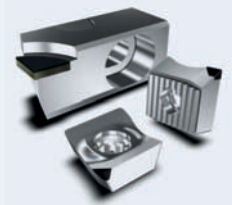
CVD Dresser Roll



PCD Helical Rotary Tool



PCD/PcBN ISO Inserts



PCD/PcBN Cassettes



PCD Drilling Head Inserts



Multi-tipped Cutters

RG9A

Control System

- CNC Control System
- Industrial PC, Intel i7 processor, Windows platform
- 3 Phase, multi voltage / frequency supply

Graphical User Interface (GUI)

- 21.5 inch touch screen monitor
- Coborn .net software
- Remote diagnostic / support

Linear Axis

- Optional LM50 or LM100 units
- Helical / stepped tool production
- 0.001mm program resolution

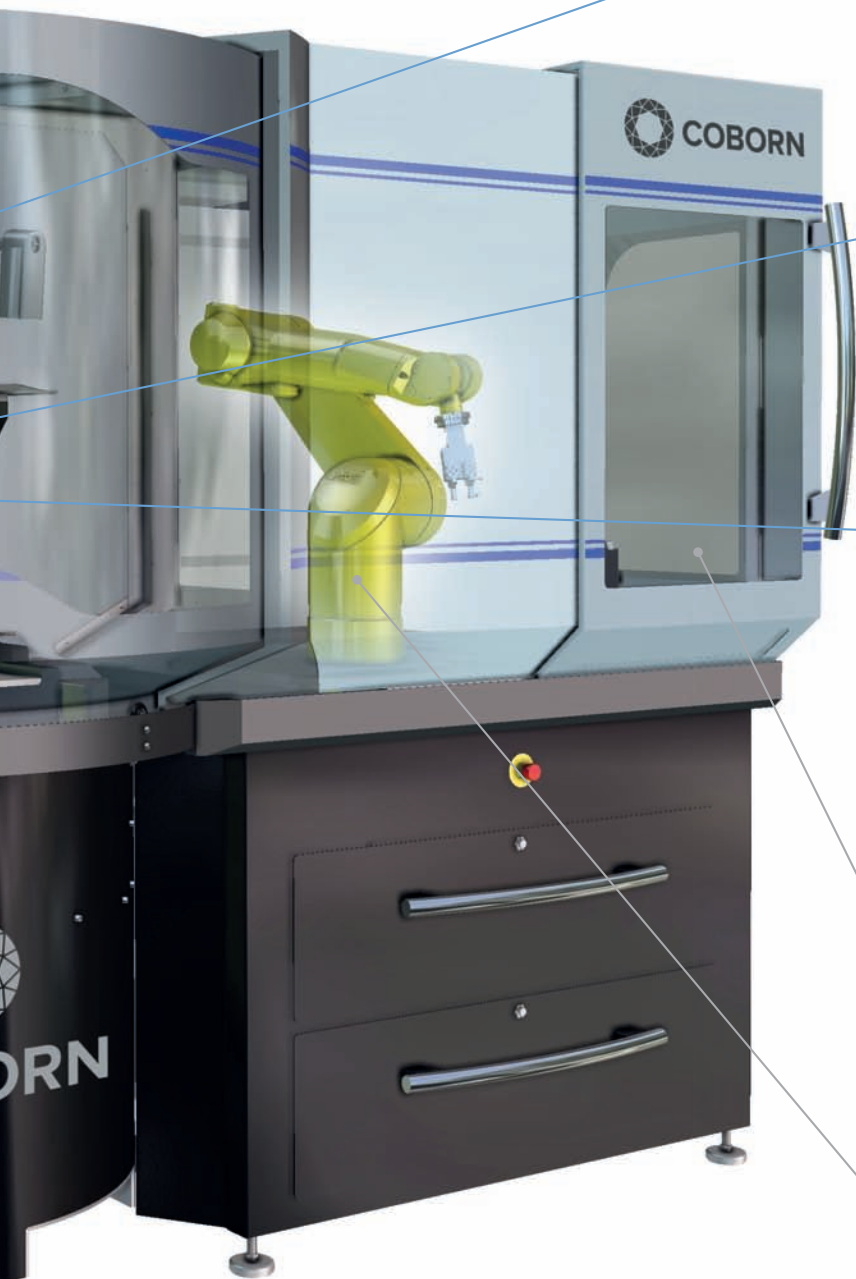
Pivot

- Coborn high precision spindle
- High dynamic stiffness
- 0.001° program resolution

Composite Granite Base

- Optimum vibration damping
- Excellent thermal stability
- High stiffness





Vision System

- Integrated closed loop measuring / inspection
- High resolution GigE camera
- System mounted on X / Y stages 0.0001mm resolution

Dressing

- In process wheel dressing
- Electrically driven with programmable speed
- Variable contact pressure

Rotary Axis

- Optional RM130 or RM250 units
- Continuous or indexing 0.001° programme resolution
- Hydraulic, HSK and ISO adaptors

OPTIONAL

Automation

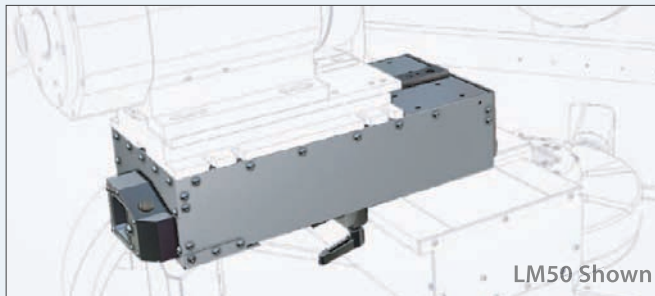
- The RG9A is 'Robot ready' and the robot can be added on a 'plug-and-play' basis
- Pallet / conveyor options for un-manned loading and un-loading
- Pneumatic / Magnetic gripping systems
- Integrated post process operations

Robot

- Stäubli 6 axis robot system
- Nominal load capability 2kg
- Integrated to main control system
- Standard pick and place grippers

OPTIONAL FIXTURES

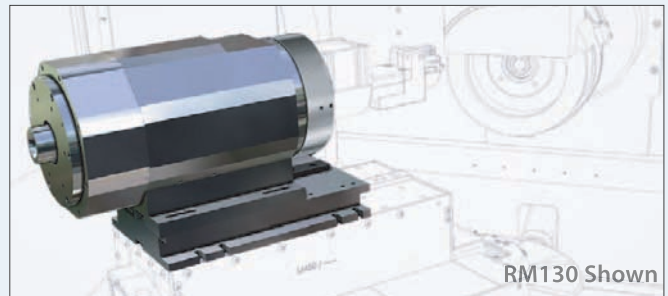
Many optional fixtures are available and the most common are shown below. Coborn can also design and supply custom fixtures and tool holding solutions according to customer requirements.



LM50 Shown

LM50 & LM100: Linear Axis

- Full CNC control
- Used with RM rotary axis for helical tool grinding
- 50mm or 100mm linear motion, respectively
- 0.1µm resolution



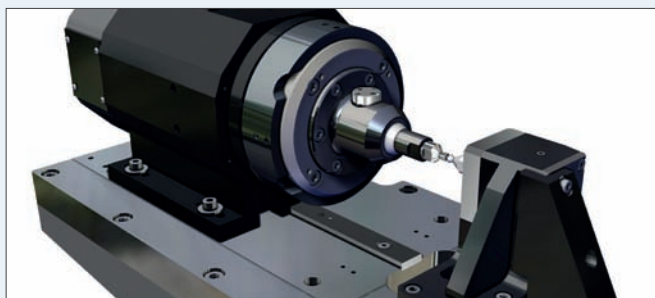
RM130 Shown

RM130: Rotary Axis

- Full CNC control
- Indexing to 0.001° resolution or continuous rotation
- Face plate design for hydraulic chucking systems, HSK and ISO adapters
- Custom adapters available to special order

RM250: Rotary Axis

- As RM130
- Designed for grinding larger workpieces such as CVD rotary dressers and saw blades up to 150mm in diameter



TSU1: Manual Tailstock Unit

- Provides a dead centre for supporting long / slender tools
- Allows PcBN inserts to be OD ground and the K-land also applied

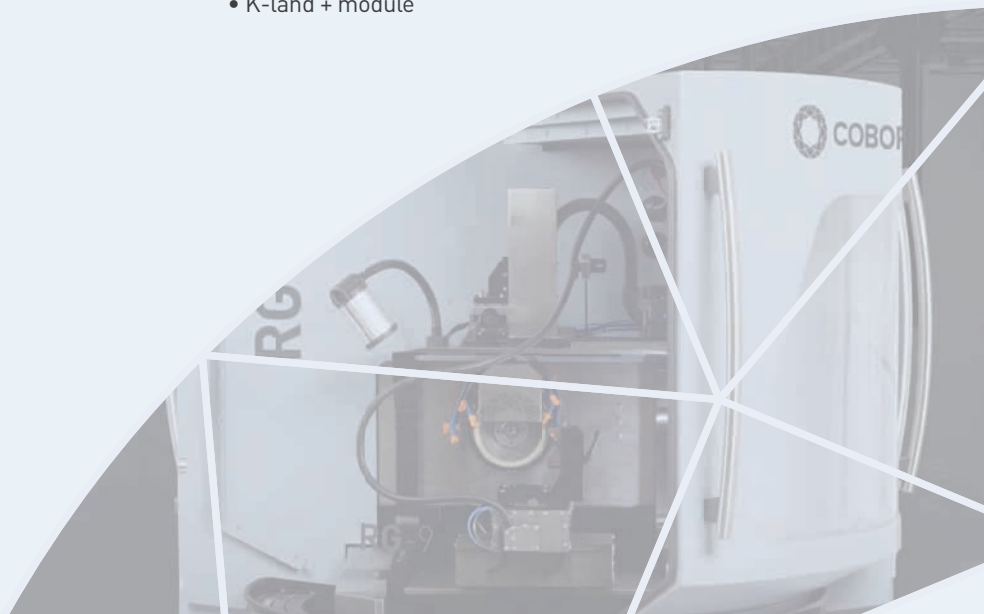
TSU3

- Designed to facilitate robot loading of inserts

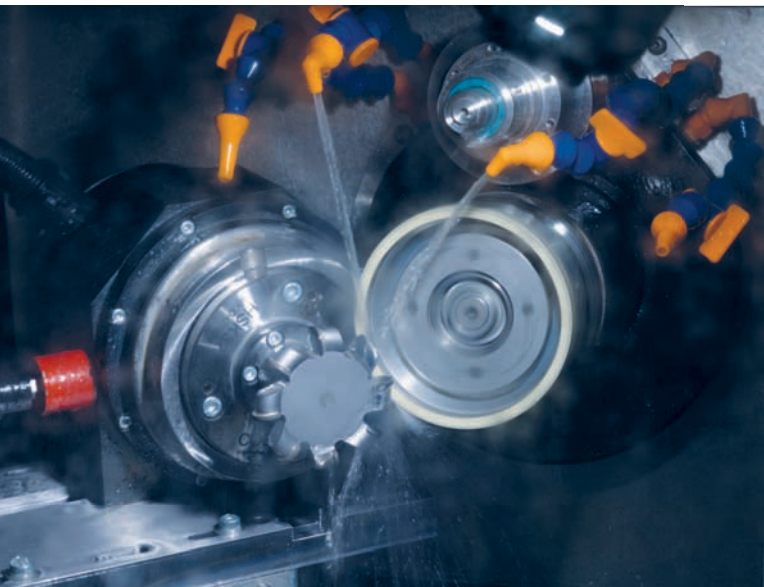


Optional Software Modules

- Peripheral grinding module
- Helical radial convex grinding module
- High precision (<2µm) location and measurement module
- CAD file import (dxf) module
- Dual wheel module
- K-land + module



RG SERIES



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