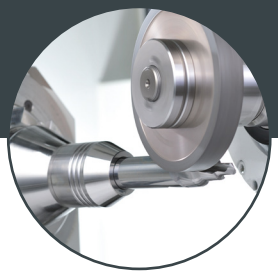
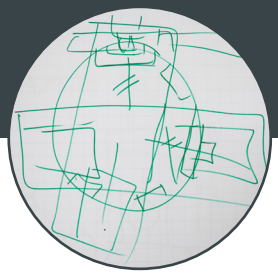
So small, so sassy ... so Haas: Multigrind® CU



Fits everywhere and grinds almost everything.



We just happened to reinvent the wheel

Do you have to reinvent the wheel when you engineer a new grinding machine? Yes, you do – if the new grinding machine is just 1,600 millimeters wide, has a 11.5 kW spindle output at 8,000 rpm and the tool changer provides room for 9 grinding wheels, each with a 200 millimeter diameter. May we introduce: the compact Multigrind® CU!

Multigrind® CU: extremely exact, highly compact

Time and again, machining tool manufacturers have asked us when we would finally build a “small” but authentic Adelbert Haas grinding machine for their needs. Granted, it has taken us a while, but the Multigrind® CU is built to grind not only precision cutting tools. This compact space-saver has room for tools and components up to 300 millimeters long, with a maximum diameter of 180 millimeters.

Precision tool manufacturers can produce milling tools, drills, tapping tools, inserts and reamers – true to dimension and economically – with the Multigrind® CU. For large series production, several grinding machines can be placed in a row. With best operator accessibility.

On a Multigrind® CU, you can produce a wide variety of precision cutting tools economically and to exact specifications

New axis arrangement, new advantages

Unlike its sisters CB and CA, Multigrind® CU has a classical gantry construction with a centered drive. But it wouldn't be an authentic Adelbert Haas grinding machine if we hadn't built in a few technical features to give users multiple advantages.

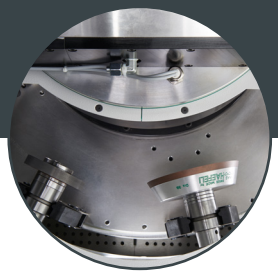
Since we wanted to build a lean, compact machine, we switched some of the axes. The C-axis moved from the top to the bottom, where it moves the A-axis with the machine table and the tool changer. In other words: We tucked the tool changer away, under the table.

Less rotating, faster grinding

Contrary to common practice, the C-axis of the Multigrind® CU does not turn the grinding spindle, but the machine table with the A-axis instead. This design with a fixed spindle means 50 percent less rotating movement in the machine. This eliminates disruptive Coriolis forces and reduces the travel times: 30 m/min in rapid motion.

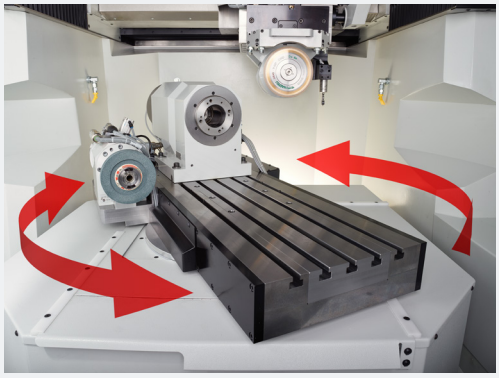
For our users, this means more stability and, with it, more accuracy when producing precision cutting tools to exact specifications on the one hand. On the other, less machining time because the process is faster. And because the tool changer is now under the table and easy to access from the front, operators can equip the machine more easily and have improved access to the grinding spindle.

Size is relative.



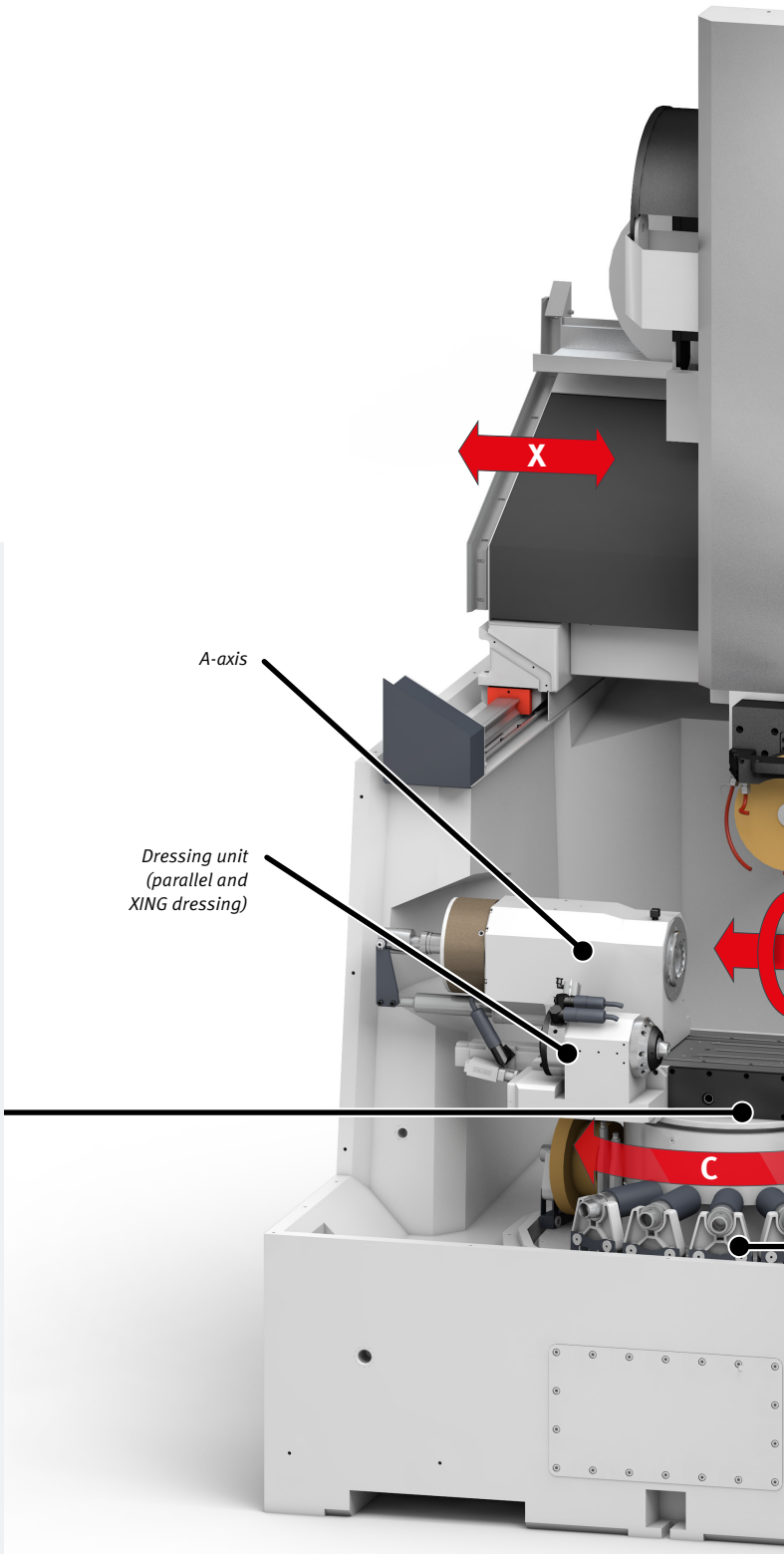
The axes have finally tied the knot

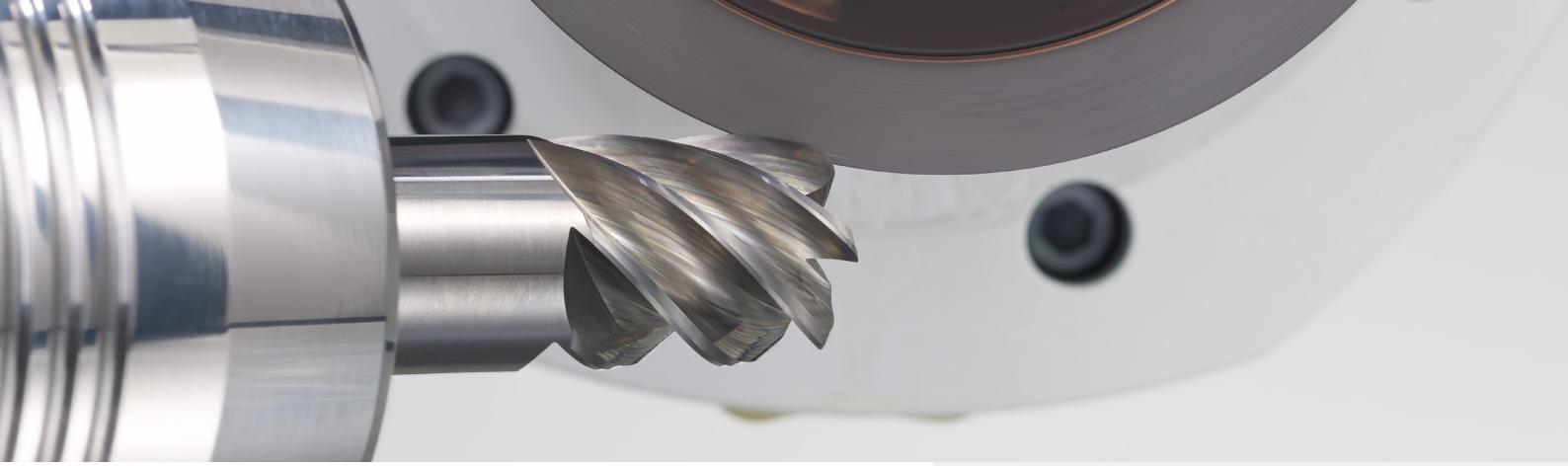
In addition to a well designed axis arrangement, the Multigrind® CU – like all machines from Adelbert Haas – has an accurately cast bed made of stable mineral composite. The coolant, whose three circuits run on a main cooling unit at the back of the machine, is located in the machine bed. This is not only economical, but also increases process stability. In conjunction with the machine enclosure, which covers all axes, this is how we create optimal climate conditions.

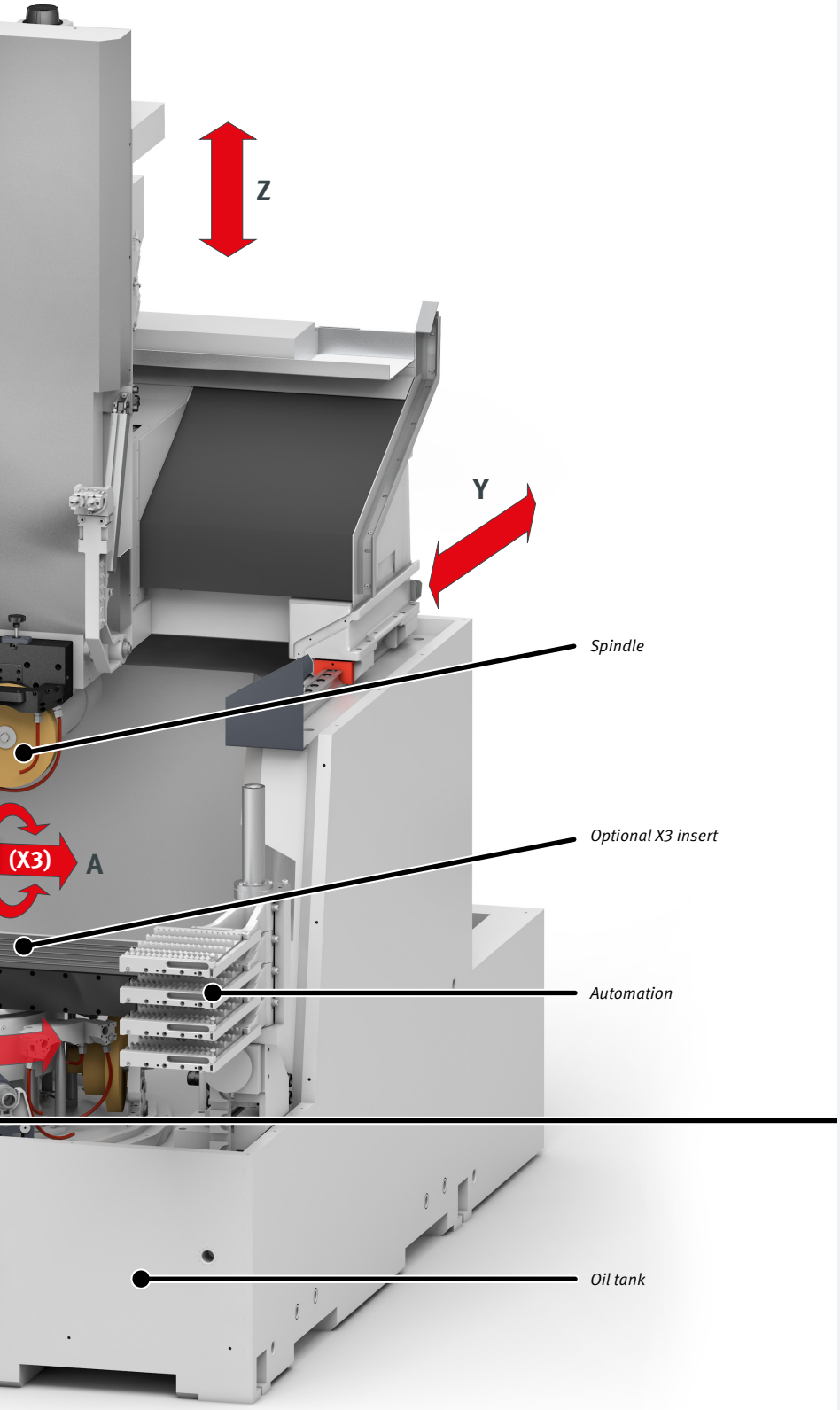


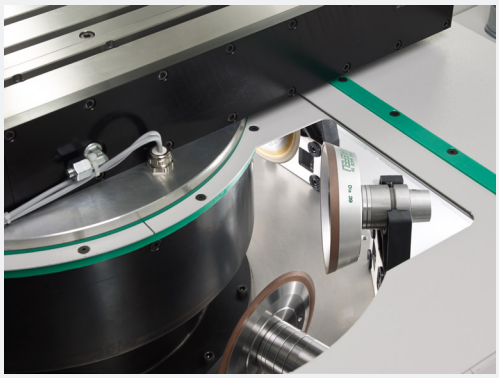
A machine table in C

For a grinding machine that's only 160 cm wide and 320 cm deep, the rotating machine table with a clamping surface of 800 mm × 290 mm provides sufficient space for a wide variety of precision tools and components. The A-axis workpiece clamp and the machine table move the workpiece in space, but it stays within a small work envelope. This means that the axes only have to track a little, making the process more accurate to a significant degree.









And the tool changer?

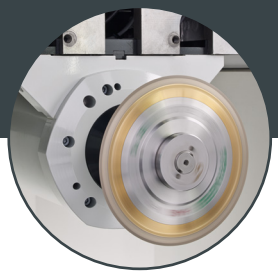
We've tucked it away, under the table

Flexible production processes are extremely important to both high volume manufacturers and regrinders of precision tools alike.

Driven by the C-axis and installed under the table, the tool changer of our Multigrind® CU grinding machines plays a key role in this grinding center's flexibility and performance. The changer offers different ways to load the machine with grinding wheels of various diameters.

The generously dimensioned wheel changer is optimally accessible for operators at the front, from the top. It no longer has a door, instead it has a cover – and no longer needs to travel to zero position during operation. Simply checking all the spaces in the changer once is all that is required after exchanging grinding wheels or reloading. Just like the entire machine, the changer is programmed and precision-controlled using our Multigrind® Horizon grinding software.

A series of good results.

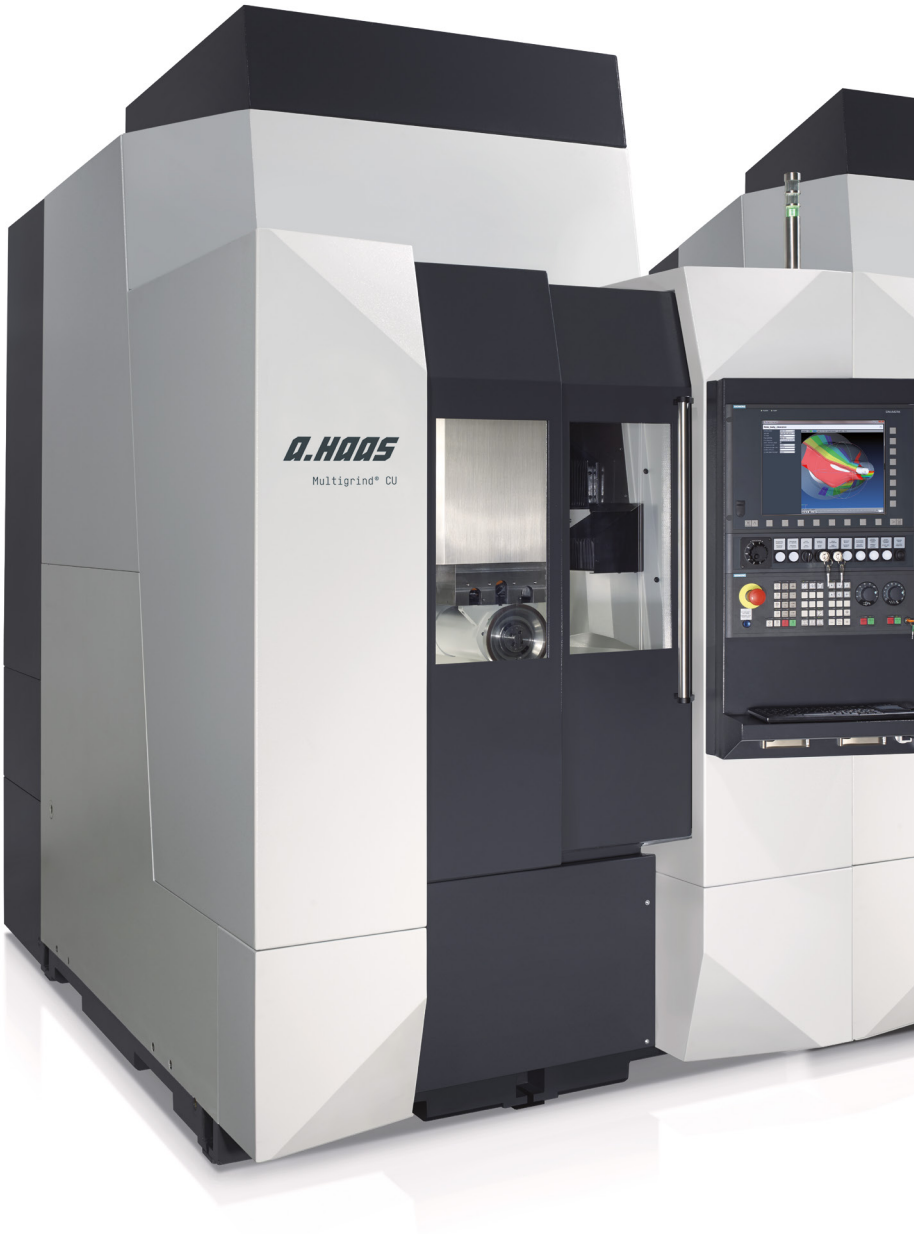


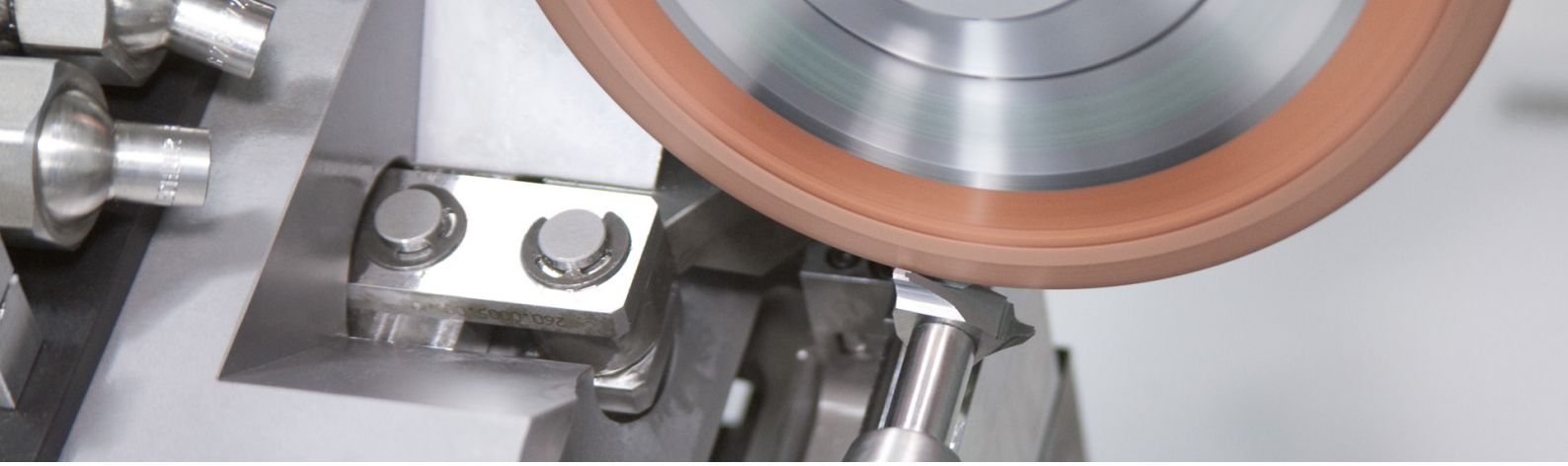
Typical Adelbert Haas:
they thought of everything

Today, hardly anyone can afford to order a new production hall or extension when they get a new machine. Time is money – and so is space. Tool manufacturers and regrinding operations agree: they want lots of machine in a small amount of space. We take this request seriously.
The Multigrind® CU sets an example in this area, impressing customers with its minimal space requirement. Only 1.6 meters wide and 3.2 meters long – this compact, powerful grinding center doesn't need more space.

One after the other

Of course we kept the large series manufacturers in mind when developing the Multigrind® CU – they usually have several grinding centers of the same type in use. Our grinding machines are operated and loaded from the front and inspected and maintained from the back. The side surfaces are completely closed. This means that several Multigrind® CU can be put in a row, and thanks to its integrated automation unit (with four pallets each), it can be deployed economically in automated serial production.





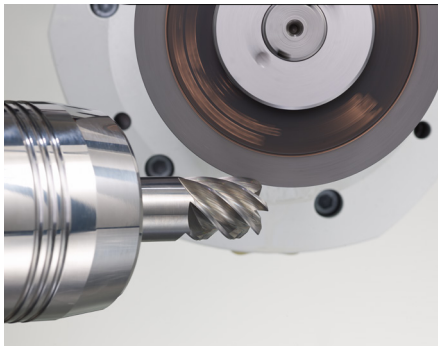
All good things come in twos, threes, fours ... or more. Thanks to the machine's well thought out concept, several Multigrind® CU can be operated as a compact production unit.

Easy-care down the line

To us, user friendliness not only means intuitive, easy-to-use software such as Multigrind® Horizon, but optimal access for supplying, inspecting and maintaining the grinding center. The main coolant unit, the maintenance cabinet and the electronics unit are all on the back of the Multigrind® CU to provide easy, fast access. All the control instruments and filling spouts are ergonomically positioned and easy to read. The data flows are distributed via a central bus and thus fail-safe. The integrated coolant unit supply all three cooling circuits in the Multigrind® CU.

Do you have to be able to do everything? Not everything – almost everything.

Grind

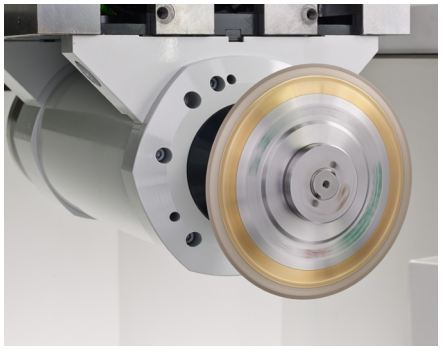


On a Multigrind® CU, you can grind a wide variety of precision cutting tools or precision components in a variety of industries. For example:

- Milling tools
- Drills
- Taps and thread molders
- Cutting, profile and die plates
- Inserts
- Hollowing tools
- Reamers
- Hobs

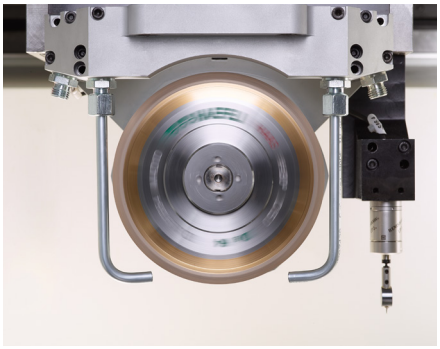
The Multigrind® CU has a well thought out axis arrangement, so its kinematics fulfill almost all expectations – even when it comes to full-sequence machining in one clamping.

Grinding spindles



With the Multigrind® CU, you can choose between different grinding spindles. Depending on what you want to grind. An HSK 50 E spindle with 12 kW and an output of 8,000 rpm is standard. We also offer spindles with different rpm ranges and upon request, a high-speed spindle.
We at Adelbert Haas develop and produce all of the direct-driven spindles in-house. The rotating components are all finely balanced and some feature hybrid bearings. This makes grinding precision within the micrometer range possible. All Multigrind® CU spindles are equipped with single-end autoclamping HSK interface.

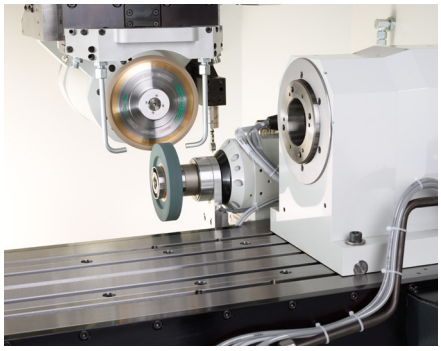
Coolant nozzle block



A manual coolant nozzle unit is our standard equipment for the Multigrind® CU. The central quick release makes it easy to replace the coolant nozzle unit simply and quickly.

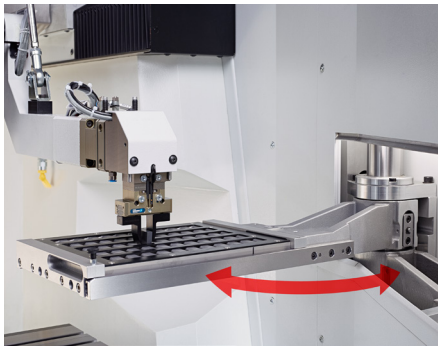
As an option two coolant nozzle units can be changed automatically. Controlled via Multigrind® Horizon and the Siemens 840D sl controller, the grinding spindle fetches the correct coolant nozzle unit.

Dressing



The condition of the grinding wheel is also key to excellent grinding results. If you want to grind to micron levels of precision, you need grinding wheels whose geometry is perfect. The dressing unit is mounted on the machine table in the Multigrind® CU, which makes it highly accessible. You can use it for parallel dressing or even put the perfect geometry back into tapered wheels with the XING dressing process. To do this, the dressing unit and machine table are moved to the grinding spindle, which has more than a large enough stroke thanks to the Z-axis. Multigrind® Horizon controls the dressing unit with high precision.

Automation



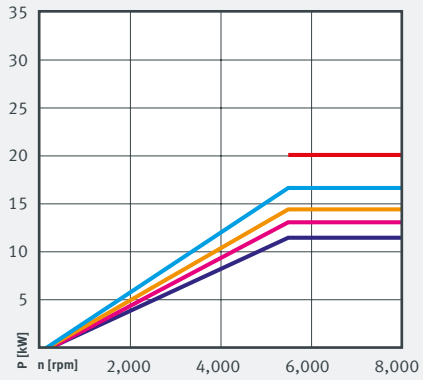
Regardless of whether you are a small, medium-sized, or mass producer of machining tools, you are always well-served with the Multigrind® CU's integrated automation. It is equipped with up to four pallets with a pivot drive and gripper arm for rapid loading and unloading. As a result of its five NC axes and two "half" axes, the Multigrind® CU has levels of freedom that come close to that of a robot. In contrast to a robot cell, the automation in the Multigrind® CU does not require any extra floor space. Workpiece pallets and the tool changer are loaded from the front side, which is ergonomic and saves time. Extending and retracting the pallet as well as loading and unloading the workpieces is reliably controlled using Multigrind® Horizon.

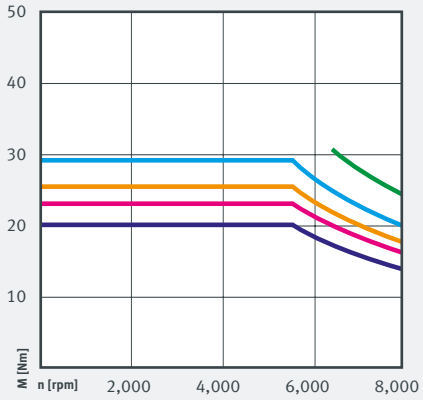
Technical data

Comparison of spindle drives

HSK 50 E

Spindle speed	8,000 rpm
Power rating P_N	11.5 kW
Torque rating M_N	20 Nm

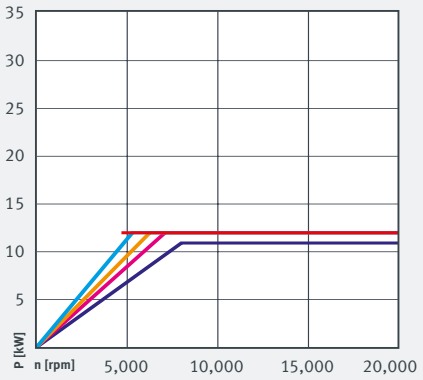


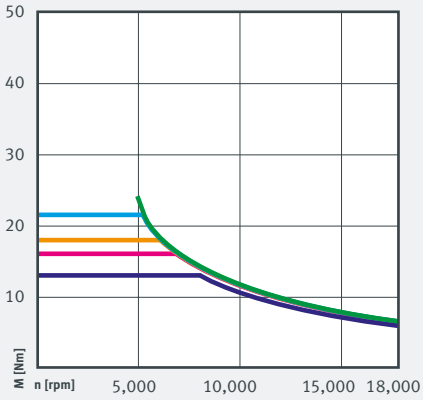


P-limit
M-limit
S6-25 % (55A)
S6-40 % (44A)
S6-60 % (37A)
S1 (30A)

HSK 50 E

Spindle speed	18,000 rpm
Power rating P_N	11 kW
Torque rating M_N	13 Nm

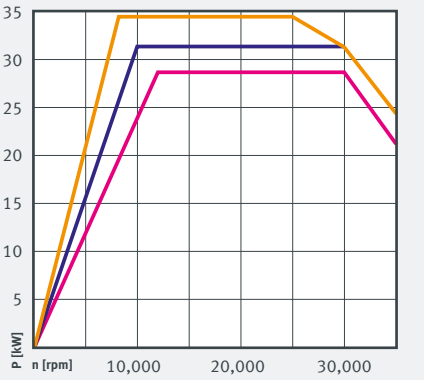


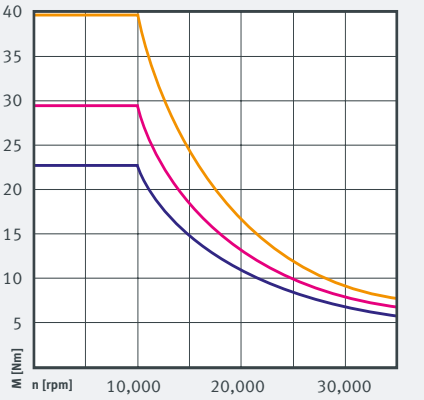


P-limit
M-limit
S6-25 % (33A)
S6-40 % (26A)
S6-60 % (22A)
S1 (20A)

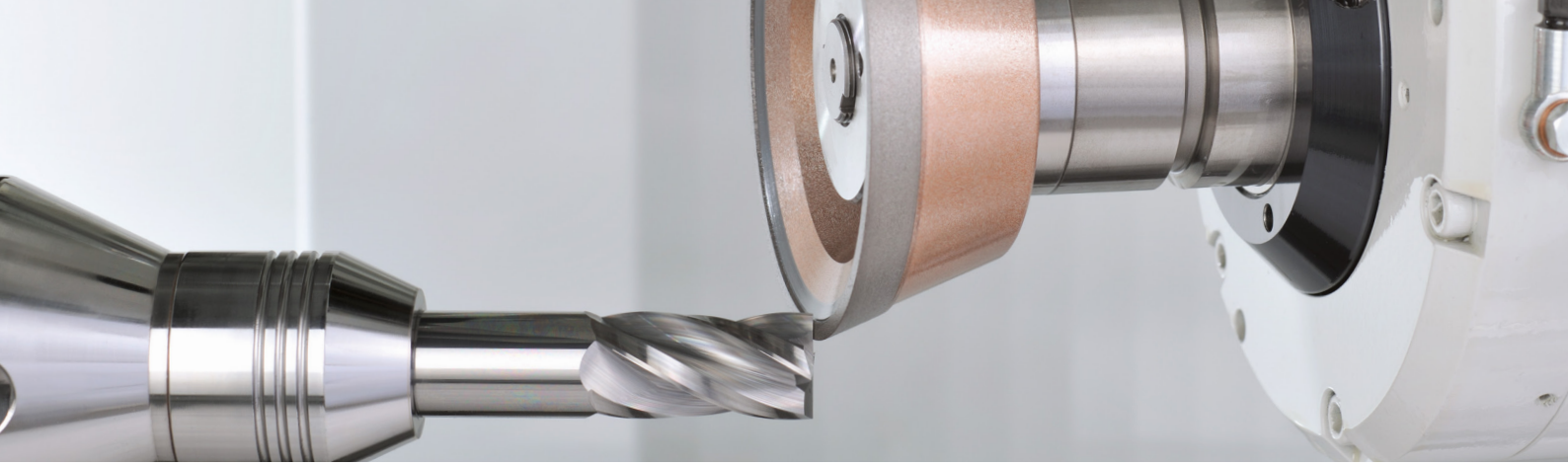
HSK 50 E

Spindle speed	35,000 rpm
Power rating P_N	21 kW
Torque rating M_N	20 Nm





Maximum torque (108A)
S3-60 % 1 Min (71,1A)
S1 (55,5A)



Grinding spindles

Interface HSK 50 E	
Power 100 %	11.5 kW
Standard speed	8,000 rpm
Interface HSK 50 E	
Power 100 %	11 kW
Standard speed	18,000 rpm
Interface HSK 50 E	
Power 100 %	21 kW
Standard speed	35,000 rpm
Interface HSK 25	
Power 100 %	4 kW
Standard speed	70,000 rpm

Machine table

Clamping surface		800 × 290 mm
T-slots:	Quantity	5
	Distance	50 mm
	Width	12H7 mm

Travel range

X-axis	630 mm
Y-axis	465 mm
Z-axis	630 mm
C-axis rotation range	300°
Optional: X3-auxiliary axis	Travel range 150 mm

Measuring system and feed

Linear axis resolution	0.0001 mm
Linear axis rapid feed	30 m/min
Rotary axis resolution	0.001°
C-axis speed	0 - 50 rpm

Rotary axis (A-axis)

Standard center height	175 mm
Speed as a spindle	1,000 rpm
Optional	2,500 rpm
Standard taper	ISO 50 / center 70H5
Frontal drill pattern:	pitch circle Ø 85 M8 (x4)
	pitch circle Ø 79 M5 (x6)

Workpiece size

Ø	180 mm
Length	309 mm
Max. workpiece weight	120 kg

Tool changer (Unit: Standard)

Options for tool trays	*Number × diameter*
P1:	9 × Ø 200 mm
P2:	7 × Ø 200 mm + 2 × coolant nozzle
P3:	36 × HSK25E

Automation

Spindle handling	integrated
Storage space	Without extra cabin, separate from working space
Storage medium	Haas pallets, 259 × 200 mm
Robot unit	Fanuc M10iA
Storage medium	2 Paletts, 300 × 300 mm

Electrical supply

Voltage rating	400 V/50 Hz fused with 63 A

Control

Siemens continuous path control system	Sinumerik 840D sl

Software

Grinding software	Multigrind® Horizon

Pneumatics: Operating pressure 6 - 10 bar

Weight:

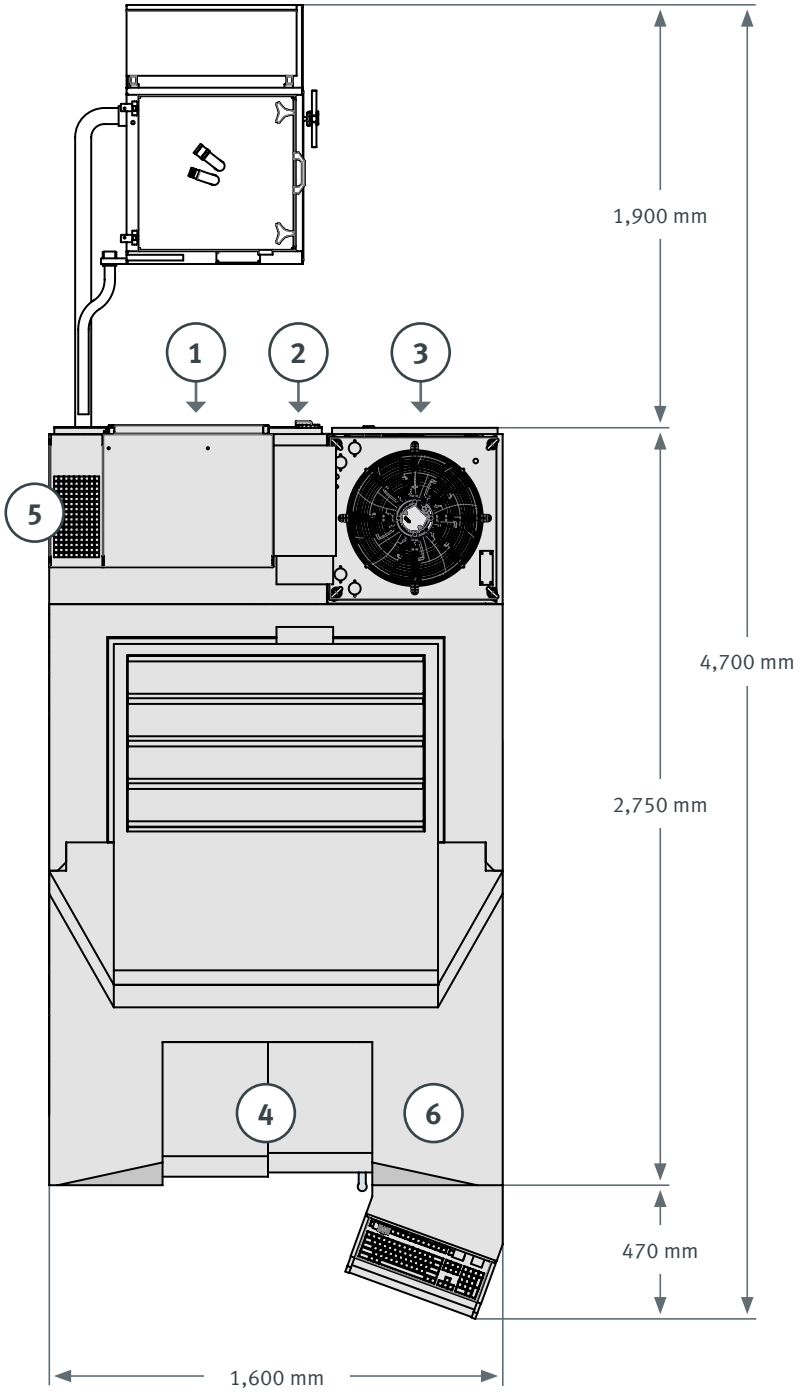
Total weight depending on equipm.	from 7,500 kg

Space required

Length × width	3,200 × 1,600 mm
Height during operation	3,100 mm

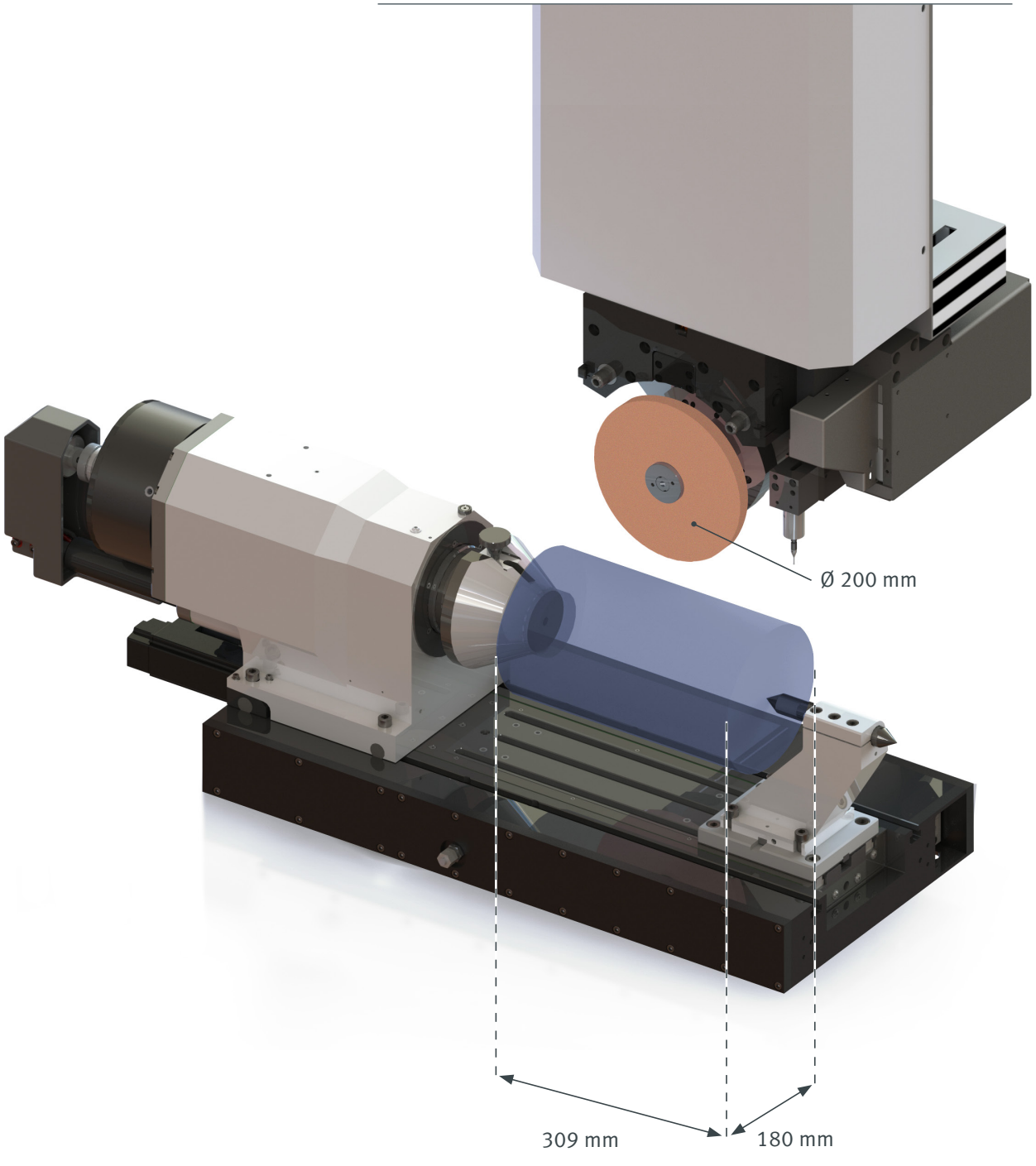
Errors, omissions and technical changes excepted. Date: 1/2023

Multigrind® CU dimensions



1 - Electrical cabinet
2 - Supply cabinet
3 - Cooling unit
4 - Tool changer
5 - Oil mist extraction
6 - Automation unit

Multigrind® CU travel range



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01.2023-CU-EN