

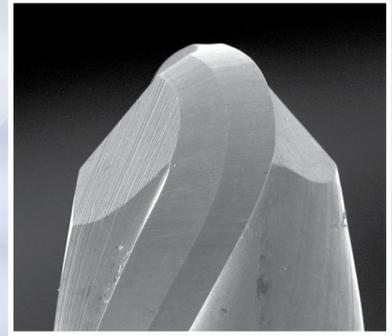
MICROX ULTRA

A NEW GENERATION
OF GRINDING MACHINES
ESPECIALLY DESIGNED FOR
MICRO CUTTING TOOLS

ANCA
CNC MACHINES

MICROX
ULTRA

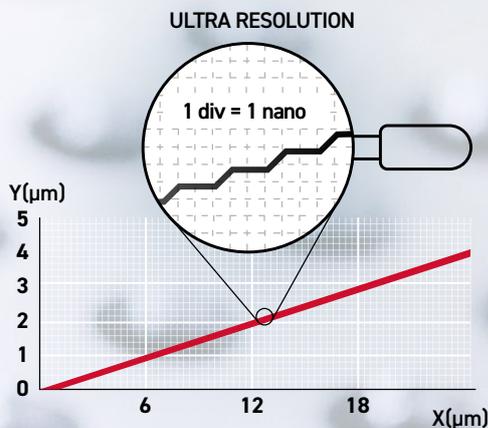
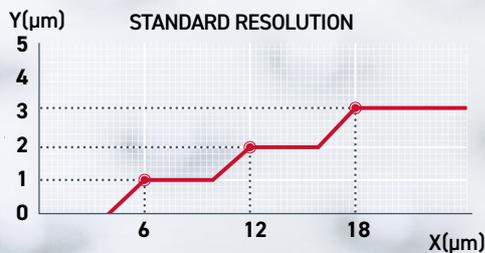
At ANCA, our vertical integration allows us to have control over the entire manufacturing process, from design to production, resulting in greater quality control and the ability to offer unique and cutting-edge solutions to the cutting tool industry.



The MicroX ULTRA is a cutting-edge grinding machine specifically designed for micro cutting tools. This new generation of grinding machines represents a significant advancement in the field, offering groundbreaking technologies that are exclusive to the cutting tool industry, especially for grinding micro tools.

Key technologies on this machine include:

- Nanometre axis resolution
- Optimised axes travel to grind tools to micrometre sizes
- Fast tool setup change including wheel change
- Fast wheel change and access to up to 8 grinding wheels
- Uninterrupted continuous micro tool production



NANOMETRE LEVEL CONTROL

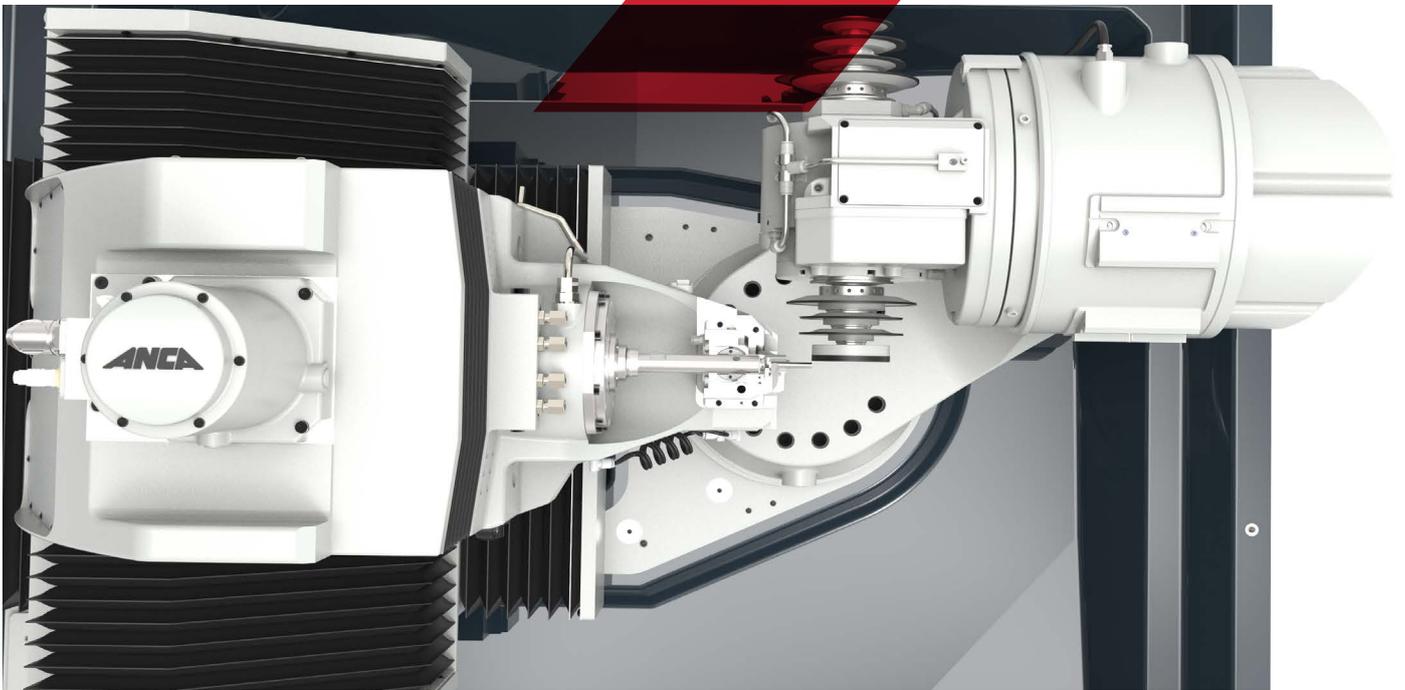
Micro tool grinding requires a nano level precision in its motion path.

ANCA's newly invented state-of-the-art servo control algorithm allows silky smooth motion of an axis with the use of a unique algorithm and nanometre measurement in the control system.

This unique algorithm allows an ultra-fast response to internal or external disturbances (such as irregularities coming from the linear rail, bearings or friction) being introduced into the machines.

This ensures outstanding tracking performance. It also allows ultra-performance of the servo system without using a complex, complicated, or expensive mechanical system.

Other benefits include significantly reduced reversal errors down to nanometre scale when an axis reverses its direction during grinding - removing any reversal marks on a tool.



iBALANCE

Best practices in grinding requires the wheels to be balanced as a pack on the spindle of use in the direction of use. iBalance software guides the user to monitor the amplitude and balance the grinding wheel pack at the required RPM.

This is all done inside the machine without having to utilise any external machines. A balanced grinding wheel pack will have reduced vibration and grinds tools to superior surface finish and minimises uneven wheel wear, resulting in high quality cutting tools.

LASERULTRA

The volume production of micro cutting tools poses unique challenges, particularly in maintaining a stable grinding process that ensures precise dimensional and profile tolerances. To address these challenges, MicroX ULTRA has been specifically engineered to meet these expectations. The LaserUltra takes process stability to an even higher level by closely controlling tolerances and incorporating in-process compensation mechanisms. This enables the system to account for wheel wear and other factors that may influence the grinding process, resulting in superior precision and reliability.

TOOL RUNOUT COMPENSATION

During the production of cutting tools, various factors such as work holding, work support, auto loading, and shank inaccuracies can contribute to tool blank runout errors.

These errors, in turn, lead to excessive runout in the tool geometry. To address and eliminate these issues, Tool Runout Compensation measures and corrects the tool path to align the geometry accurately with its actual tool axis.

MOTOR TEMPERATURE CONTROL (MTC)

MTC is a patent pending innovation built into the motor spindle drive firmware. Smart control algorithm actively manages and maintains the temperature of motorised spindles in the MicroX ULTRA.

Dramatically reduced machine warmup time means production can start sooner, once the machine has reached thermal stability. This improves productivity and machine use. Consistent thermal stability of the spindle over time regardless of changes in load or speed, or coolant temperature, greatly improves the dimensional stability of grinding results.



EXTENDED WARRANTY

The MicroX ULTRA comes with a 3-year extended warranty for parts and labour, and a 5-year warranty on linear motors - a unique ANCA technology innovation.



GRINDING BEST PRACTICES

Experienced application engineers train and educate your team in the best grinding practices to make sure the ULTRA can produce high quality tools from the first day of production.





- High capacity loader
- Software
- Handheld pendant
- Control panel
- Micro tool and wheel measurement
- Compact and rigid design XYZ stack
- Linear motors (LinX)
- Polymer base (ANCAcrete)

Fast setup change workholding and work support system

Grinding wheel tilt axis with a fast wheel changer

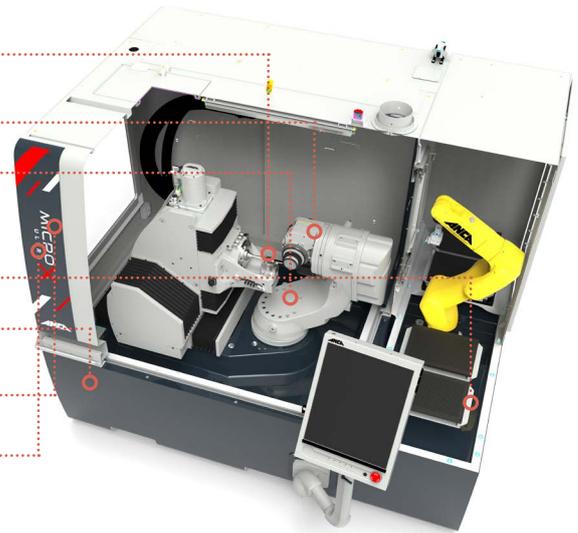
Optimised linear axes travel with the ballnose grinding wheel point above the wheel rotation centreline

Uninterrupted continuous micro tool production

Grinder is separated from the canopy and loader

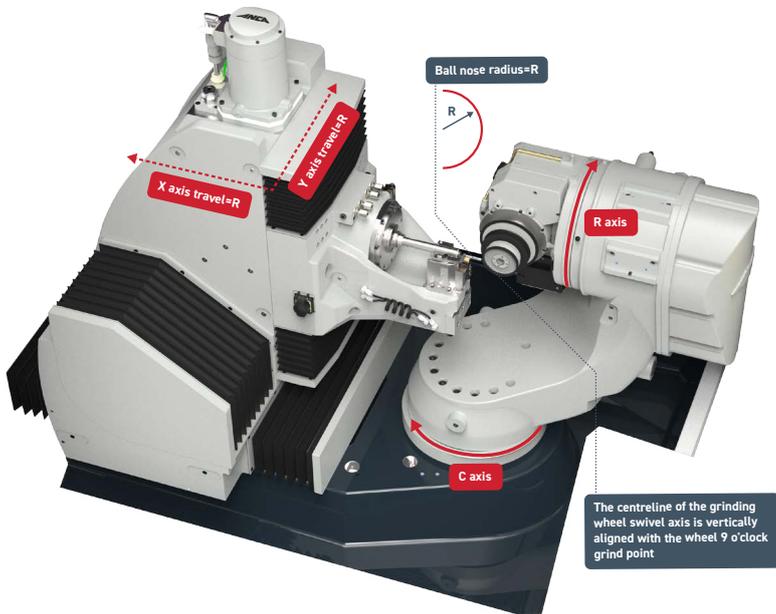
Nanometre resolution and nanometre control on all axes

ANCA Machine Learning and MTC Ready



OPTIMISED LINEAR AXES TRAVEL WITH BALLNOSE GRINDING WHEEL POINT

The C-axis refers to the wheel swivel axis centerline, which is aligned with the wheel's 9 o'clock grind point. This specific design is critical in the grinding of ballnose, corner radius and profile tools. In the case of a ballnose tool, the X and Y interpolations during the grinding process will be nearly equal to the radius of the ballnose tool.



WORKHOLDING DESIGNED SPECIFICALLY FOR MICRO TOOLS



Shank size change

- Replace the collet
- Replace the shoe without any requirement to adjust its position

WORK SUPPORT DESIGNED SPECIFICALLY FOR MICRO TOOLS



Tool support shoe change

- Slide the support system to the required position along the length of the blank
- Replace/fine adjustment of the shoe position

UNINTERRUPTED CONTINUOUS MICRO TOOL PRODUCTION

In a volume production setting, micro tools are manufactured using an uninterrupted continuous loading system. This system allows for the removal of a pallet containing ground tools and the seamless loading of a pallet with blanks into the process, all without the need to halt the grinder. With a diameter of D3mm and the use of three full pallets, the production capacity amounts to 2520 tools. However, the most significant advantage of this added feature is that it unlocks the potential for an unlimited production capacity.

TECHNICAL SPECIFICATIONS

CNC DATA

ANCA AMC5 G2 High Performance CNC, High Speed SSD, Ethercat, Intel Processor, Windows 10

MECHANICAL AXES

	X-axis	Y-axis	Z-axis	C-axis	R-axis	A-axis
Resolution	0.000001 mm 0.000000039"	0.000001 mm 0.000000039"	0.000001 mm 0.000000039"	0.000001 deg	0.000001 deg	0.000001 deg
Travel	210mm 8.26"	250mm 9.84"	190mm 7.48"	195 deg	220 deg	360 deg

SOFTWARE AXES (PATENTED)

B, V, U, W

WORKPIECE*

D0.03 - D12.7mm (Productive up to D6mm)

DRIVE SYSTEM

ANCA Digital AMC5x (Ethercat standard)

MACHINE DATA RANGE

Grinding spindle:

ANCA bi-directional
12000 RPM and HSK40F taper
Integral Direct Drive
Double ended spindle induction - Synchronous motor

Spindle Power:

4.5kW (6HP) peak

Grinding wheel: Max D125mm

Grinding wheel arbour: D31.75, D32, D20mm options (Max 4 wheels per pack)

Grinding wheel stepped arbour: D20/D30/D40/D50 (Max 4 wheels per pack)

AUTOMATION RANGE

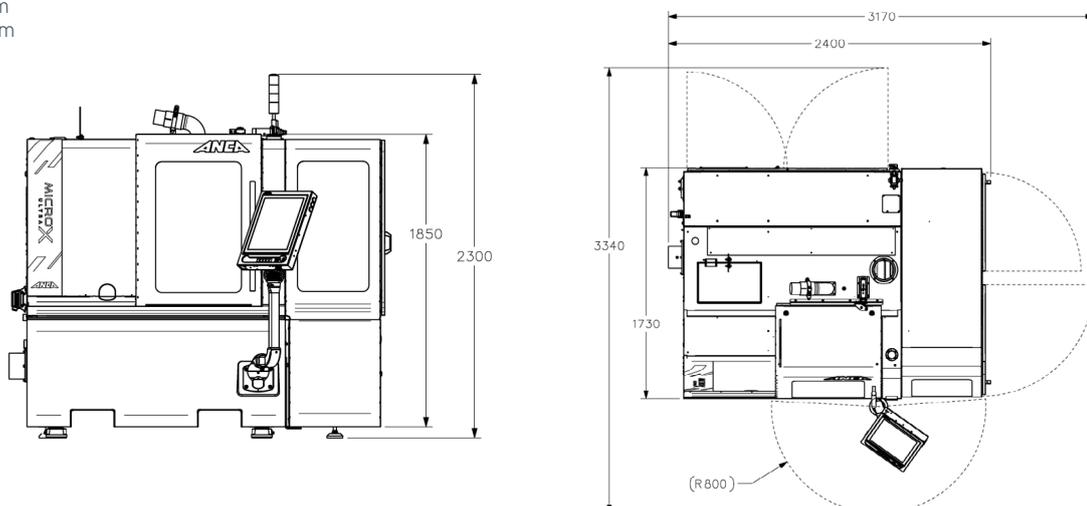
Fanuc Standard pallets - Max capacity 2520 tools (D3 mm) (Three full and one empty)

Mini Pallets - Max capacity 3500 tools (D3mm) (Seven full and one empty)

OTHER DATA

Floor plan:

Width: 2400mm
Depth: 1730mm
Height: 1920mm



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