

MILL P 500 VHP



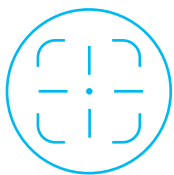
 **MIKRON MILL**

A member of UNITED MACHINING SOLUTIONS

PRECISION IN EVERY DETAIL, ACCURACY IN EVERY MOVE

The MIKRON MILL P 500 VHP (Very High Precision) excels in ultraprecise micromachining, consistently delivering exceptional surface finishes and accuracy over long production runs. Designed for stable and repeatable performance, it is the ideal solution for producing flawless mold inserts, high-quality automotive reflector molds, intricate fuel cell dies, and complex cavities for medical technology. Its reliability makes it a top choice for manufacturers in the information and communications technology (ICT) and automotive segments, where meeting tight tolerances and achieving superior results are critical.

VERY HIGH PRECISION



Experience microprecision

Achieve exceptional accuracy for the most demanding micromachining applications.



Discover new surface-quality levels.

Reach mirror surface finishes for optical and high-end mold components.



Reach highest dynamics

Combine speed and stability to meet tight deadlines.



Enhance ROI with automation

Boost uptime and reduce costs with integrated solutions.

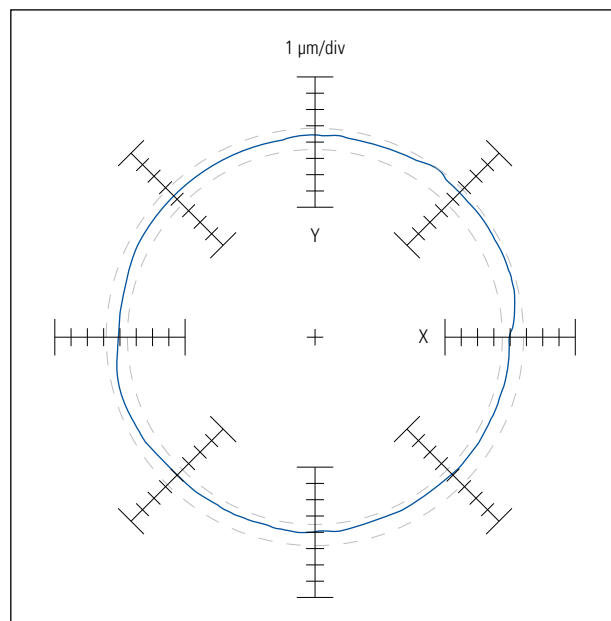
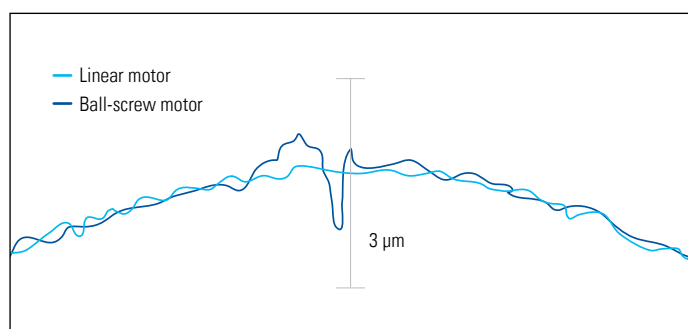
VHP



DYNAMIC MOTION WITH UNCOMPROMISED MICROMACHINING QUALITY

Backlash-free motion for microfinishes

Linear motors enable backlash-free motion, delivering exceptional positioning accuracy and repeatability. Their high dynamic response ensures smooth axis control, minimizing vibration and mechanical play, crucial for achieving ultrafine surface finishes and maintaining contour accuracy in micromachining applications.



MEDICAL: FACE MASK

Market segment	Medical
Material	S136 HRC 52
Dimension	100 x 100 x 60 mm

Surface finish $Ra < 0.05 \mu m$

Overall accuracy $< 3 \mu m$





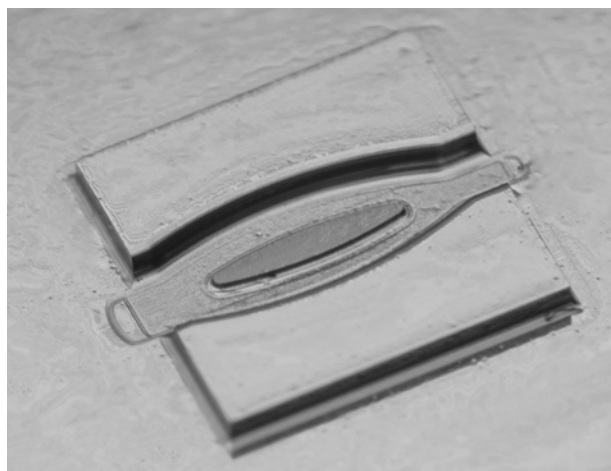
Travel speed
30 m/min

Acceleration
5 m/s²

ELECTRONICS: CONNECTOR

Market segment	Automotive
Material	Solid carbide HRA89.5
Dimension	3.5 x 3.5 mm

Surface finish	Ra < 0.1 µm
Overall accuracy	< 1.5 µm



ADVANCED STABILITY FOR LONG CYCLE TIMES

The MIKRON MILL P 500 VHP ensures consistent reproducibility by combining a robust, symmetrical bridge-type structure with a fully internal active cooling system, preventing thermal drift in all directions during long production cycles.

Channel surface
 $Ra < 0.2 \mu m$

Surface flatness
 $< 3 \mu m$

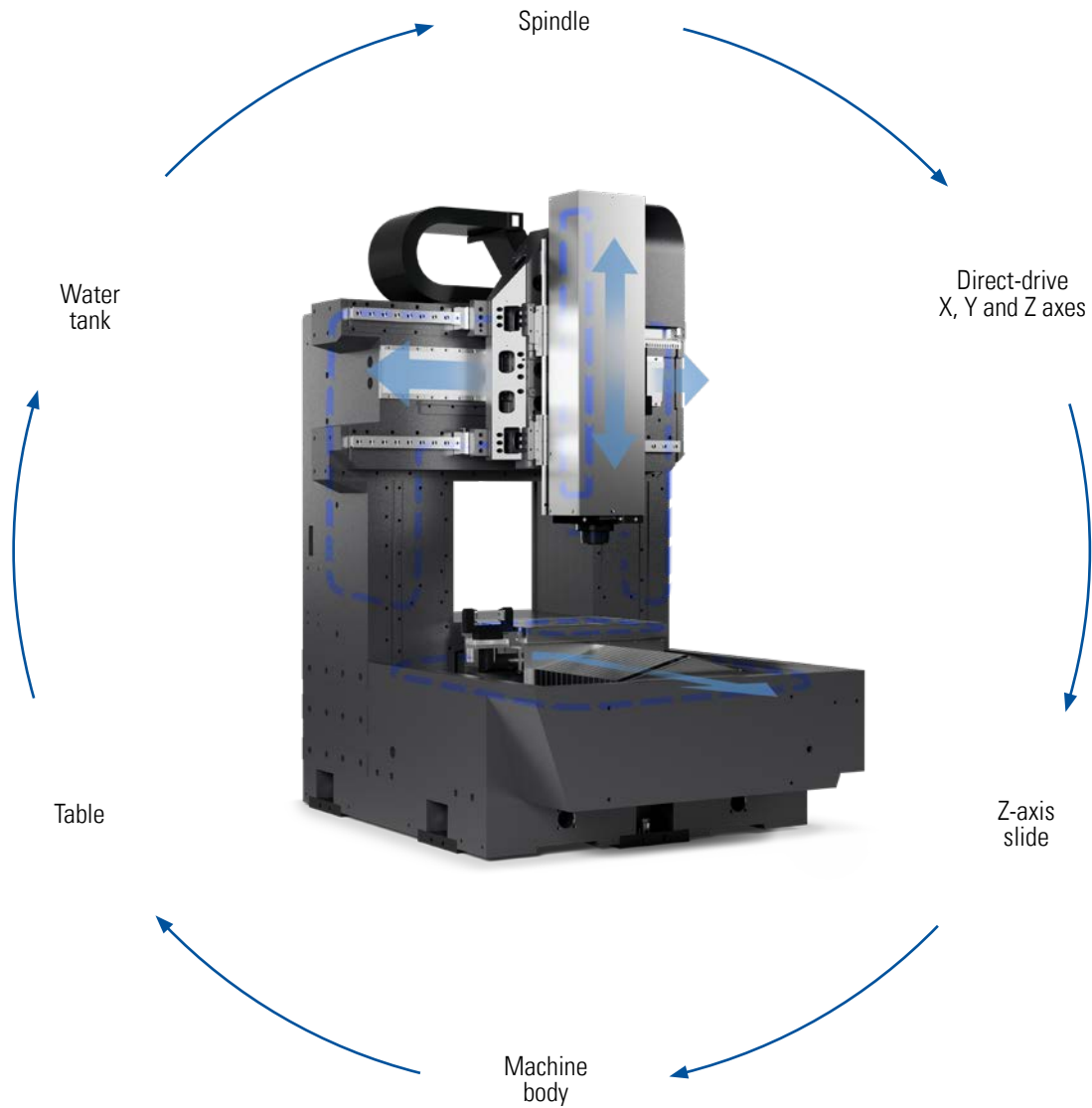
Overall accuracy
 $\pm 2 \mu m$



AUTOMOTIVE: BIPOLAR PLATE

Market segment	Automotive
Material	S136 HRC 58-62
Dimension	470 x 180 x 40 mm





Advanced thermal control

The MIKRON MILL P 500 VHP's active internal cooling system (Ambient Robust) circulates temperature-controlled fluid, ensuring precise thermal management. This enables consistent accuracy and stability throughout long micromachining cycles.

Symmetry for stability

Its robust, symmetrical bridge-type structure evenly distributes heat and reduces mechanical distortion. This inherent balance delivers exceptional rigidity and repeatability, enabling ultraprecise micro-machining with reliable long-term stability.



Enclosed with thermally insulating materials, the MIKRON MILL P 500 VHP is shielded from external temperature influences. This added layer of protection ensures maximum thermal stability and sustained precision in any production environment.

Cooled elements

- Machine base and column
- Spindle
- Direct-drive X, Y and Z axes
- Z-axis slide
- Table
- Laser measuring support
- Water tank

ERGONOMICS DESIGNED FOR PRODUCTIVITY

Accessible tool changer

The tool changer is easily accessible, streamlining machine setup and optimizing milling processes for faster changeovers and increased productivity.

Flexible numerical control for optimal ergonomics

The numerical control console is equipped with a pivoting mechanism and adjustable keyboard inclination, allowing operators to personalize their workspace for improved comfort and usability. These ergonomic features support efficient and comfortable daily operations.



Easy loading and perfect visibility

Designed for effortless part loading, the machine offers excellent visibility and unhindered access to the working area, supporting the application engineer in performing daily tasks efficiently and comfortably.

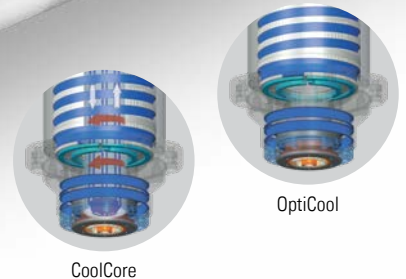
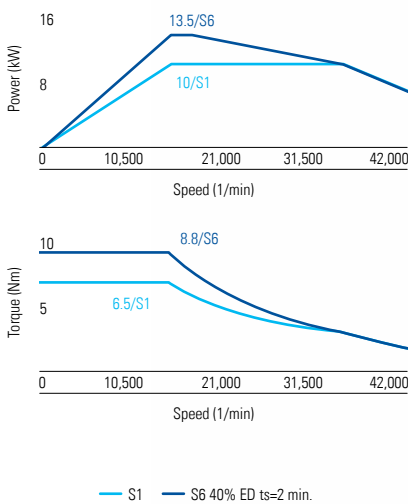
PRECISION ENGINEERED FOR EXTREME MICROMACHINING

STEP TEC high-speed spindles combine premium components and advanced thermal design to ensure stability, prevent deformation, and deliver precise, vibration-free micromachining — even at high speeds. Ideal for micromachining applications in automotive, electronics (EC), and medical sectors.

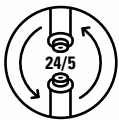
Benefits

- Superior thermal stability
- Reliable, downtime-free operation
- Low vibration and heat at high speed
- Longer spindle life with consistent accuracy

42,000 min⁻¹, HSK-E40



DEDICATED SPINDLE SERVICES



Spindle Exchange Program

Exchange your defective standard motor spindle for a refurbished or new spindle at a fixed price.

Available within 24 hours,
full warranty conditions apply



Warranty extension

Based on your machine's specific usage, we offer a tailored warranty extension for your spindle, helping you avoid unexpected costs.

(1) As a stand-alone option focused exclusively on the spindle. (2) Included in the Gold Success Pack* for up to five years after commissioning.



Spindle diagnosis

Our experts assess your spindle's condition by performing preventive maintenance between 3,000 and 5,000 operating hours to prevent leakage and fluid ingress.

Included in the Silver and Gold Success Packs*.

*The Gold Success Pack offers comprehensive coverage for the entire machine, including parts and labor. Alternatively, you can opt for the Spindle Warranty Extension, which provides spindle-only coverage (parts only). For more information, please contact your sales representative. More details on page 15.

AUTOMATION

Automation from the back, full access from the front

Deliver parts faster, increase operator availability and increase your overall productivity with the automation-ready design of the MIKRON MILL P 500 VHP.

A TOOL MAGAZINE FOR EVERY NEED



Featuring internal disc-type or chain magazines, the MIKRON MILL P 500 VHP offers capacities of up to 60 tools.

- Ergonomic and user-friendly design
- Ensures high productivity and process reliability
- Parallel machining and tool loading
- Provides touch probe orientation flexibility





EFFECTIVE CHIP CONTROL FOR UNINTERRUPTED PRODUCTIVITY



Adapted chip management (1)

The vertical stainless-steel sheet metal enclosure prevents chip accumulation in the working area.

Lift-up chip conveyor

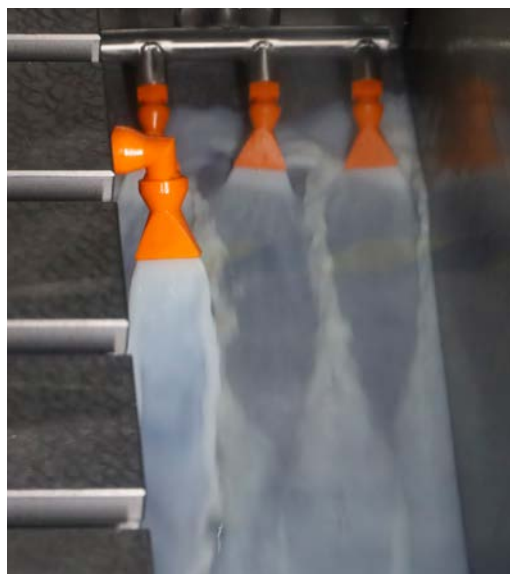
Clean machining (2)

- Steep and smooth machine envelope walls optimize chip flow.
- Wash-down nozzles cover all corners and prevent chip accumulation.
- Large and heavy-duty chip augers transport high volumes of chips.

1



2



EXPERT CONTROLS

The FANUC FS31iB Plus control on the MIKRON MILL P 500 VHP enables world-class part production. The control's intuitive interface offers a wide range of functions designed to ensure greater reliability and performance. State-of-the-art hardware is combined with diverse software packages to give your operators the ability to take on other tasks and add more value.



FANUC FS31iB Plus

SMART MACHINE: INTELLIGENT MILLING FOR MODERN PART PRODUCTION

- Achieve optimized part production with powerful smart machine modules.
- Produce workpieces with unsurpassed precision and process security.
- Increase reliability during unmanned operations.
- Automatically optimize various aspects of milling process.
- Significantly reduce production costs.



Saving energy

Econowatt makes it possible to save up to 50 percent on energy consumption, an ecologically friendly way to realize greater profitability.



Precision

Intelligent Spindle Monitoring (ISM) and Intelligent Thermal Control (ITC) promote greater stability for the most precise parts, even during unattended operations.



Time

Operator Support System (OSS), in combination with software tools, boosts your productivity.



Protection

Power Fail Protection (PFP) protects and extends the lifetime of your machine tools and secures your processes.

SERVICE + SUCCESS

Our Service + Success experts deliver end-to-end support with proactive expertise, digital tools, and hands-on service to ensure your machines perform at their best throughout their life cycle.

Secure your sustainable machining success

A huge network of highly-trained experts delivering preventive maintenance and advanced support

Grow your people skills

Performance oriented training academy with a human-centric and hands-on approach of knowledge transfer

Realize the full potential of your equipment

Advanced diagnostics, certification, upgrades, training, and financial solutions



My rConnect

Digital services for all your UNITED MACHINING machines, anytime, anywhere

My rConnect is your gateway to advanced digital assistance. Enjoy simple navigation and direct access to UNITED MACHINING support, for all connected and unconnected machines, regardless of their age.

Free standard features

- Asset overview
- Service case management
- Conferencing and communication
- Machine documentation

On-demand features

- Remote access
- Live data



SUCCESS PACKS: TAILORED SERVICE SOLUTIONS FOR EVERY NEED

Success Packs are three annual subscription levels designed to support your machines throughout their life cycle. Whether you aim to reduce downtime, prevent issues, or avoid unexpected repair costs, there's a plan to match your needs.

BRONZE

For full responsiveness

Fast reply services to ensure machines are swiftly back up and running

SILVER

For peak performance

Periodic maintenance services to keep your machines in optimal condition

GOLD

For guaranteed peace of mind

Extended warranty coverage to mitigate financial risks and focus on your core business

CHOOSE YOUR PACK



Speedy access

Fast track for support



Extended remote support

24/5 expert support through My rConnect



Certified preventive maintenance

Annual machine service performed under UNITED MACHINING standards



Core components diagnosis

Annual checkup on the core machine components



Discounts

Preferred prices for parts and labor



Extended warranty

For up to five years



TECHNICAL SPECIFICATIONS

AXIS TRAVEL

Longitudinal X	500 mm (19.69 in)
Lateral Y	450 mm (17.72 in)
Vertical Z	350 mm (13.78 in)

TRAVEL SPEED

Rapid transverse X	30 m/min (1.181 ipm)
Rapid transverse Y	30 m/min (1.181 ipm)
Rapid transverse Z	30 m/min (1.181 ipm)

TOOL SPINDLE (40% ED, S6)

42,000, HSK-E40 S6	13.5 kW / 8.8 Nm
42,000, HSK-E40 Cool-core S6*	13.5 kW / 8.8 Nm

WORK TABLE

T-slot table	620 x 500 mm (24.40 x 19.68 in)
Max. table load	300 kg (661 lbs)
Distance spindle to table	100 mm (3.93 in) / 450 mm (17.71 in)

TOOL MAGAZINE

HSK-E40 tool holder	DT 30	CT 60
Max. tool diameter with adjacent pots occupied	50 mm (1.96 in)	50 mm (1.96 in)
Max. tool diameter with adjacent pots empty	100 mm (3.93 in)	100 mm (3.93 in)
Max. tool length	120 mm (4.72 in)	120 mm (4.72 in)
Max. tool weight	3 kg (6.61 lbs)	3 kg (6.61 lbs)

WEIGHT

Machine	DT 30	CT 60*
	7800 kg (17,196 lbs)	8300 kg (18,298 lbs)

CONTROL

FANUC	FANUC FS31iB Plus
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OPTIONS

Automation

Pallet size / Number	Delphin 400 x 400 mm (15,74 x 15,74 in)
Max. additional load	200 kg (441 lbs)

Measuring system

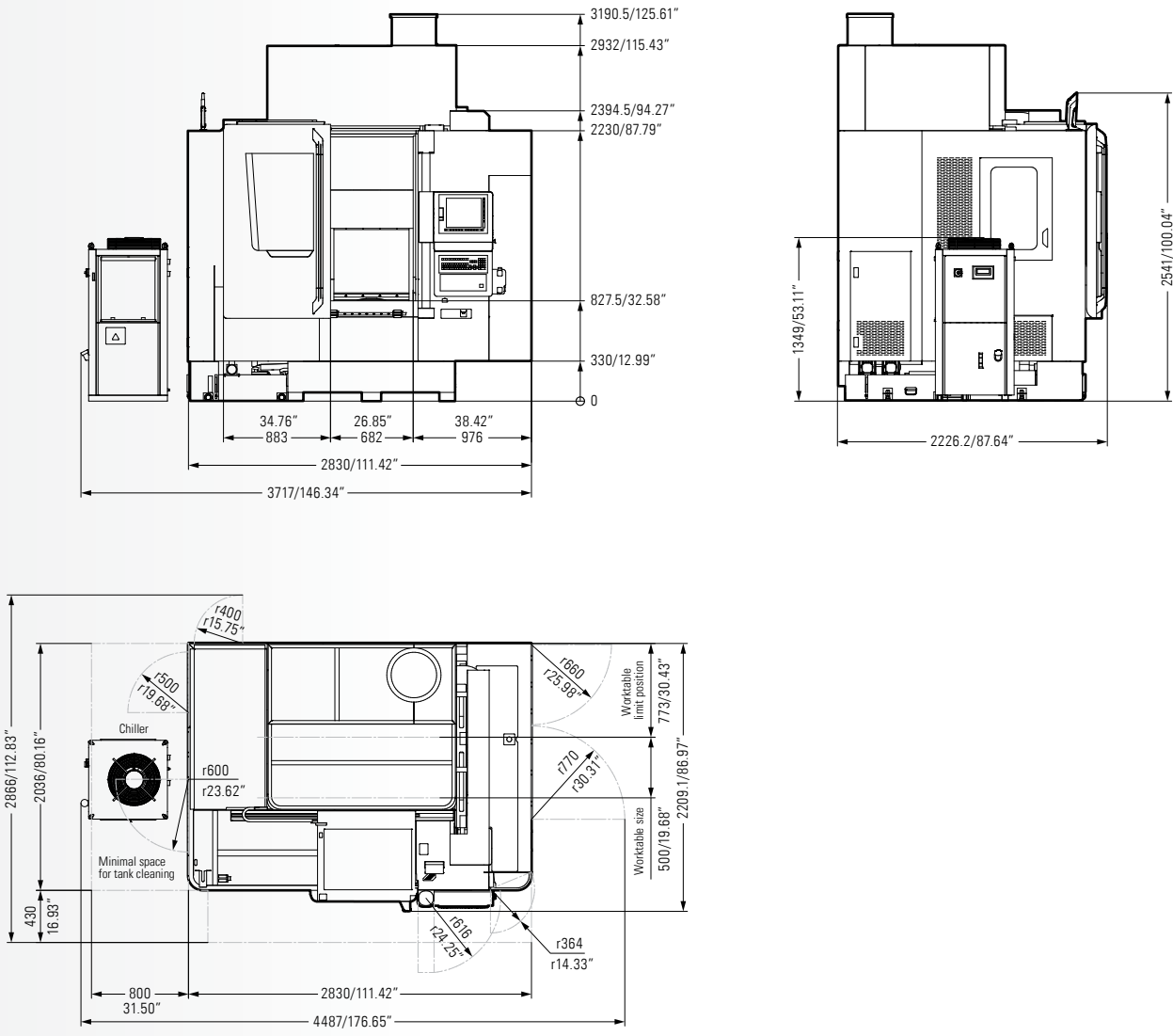
Hexagon M&H LTS35.65
BLUM Digilog LC-50
Touche probe (THERMO-LOCK)

Chips and coolant management

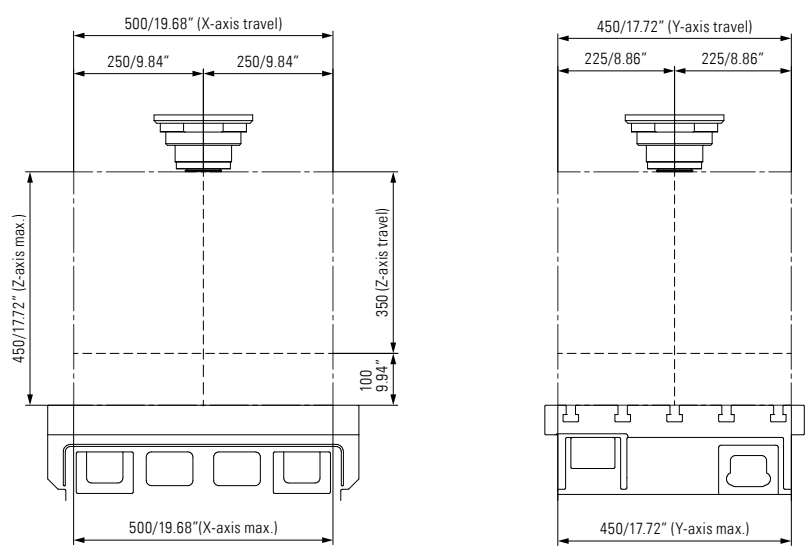
Lift-up chip conveyor - scrapper
Lift-up chip conveyor - Slat band
Band filter system 20 bar
Band filter system 50 to 70 bar
Wash down system
Oil skimmer
Mist extraction unit
TSC - Through Spindle Coolant
Rotating windows

Smart Machine Module

PFP - Power Failure Protection



AXIS TRAVEL RANGE



MIKRON MILL

MIKRON MILL is a global expert in vertical milling and the inventor of high-speed milling. Renowned for dynamic precision and free-form accuracy, our automation-ready machines deliver top performance in complex applications. MIKRON MILL stands for innovation, agility, and lasting value.

Year of foundation 1908

Head office Biel, Switzerland

Dynamic precision and ergonomic automation define the MIKRON MILL DNA. Frictionless torque motors enable ultra-smooth 5-axis movement for outstanding surface finishes.

Customers seeking fast ROI benefit from the efficient and affordable MILL E series. The MILL P machines deliver above-average productivity with high performance and automation. Our iconic MILL S/X series represents the peak of high-speed milling, offering unmatched surface finish, precision, and cycle time for complex parts. Optional grinding functionality expands application possibilities. Smart features like OSS, Automated Machine Calibration (AMC), and Econowatt make complex part production easier, even for skilled operators.

ABOUT US

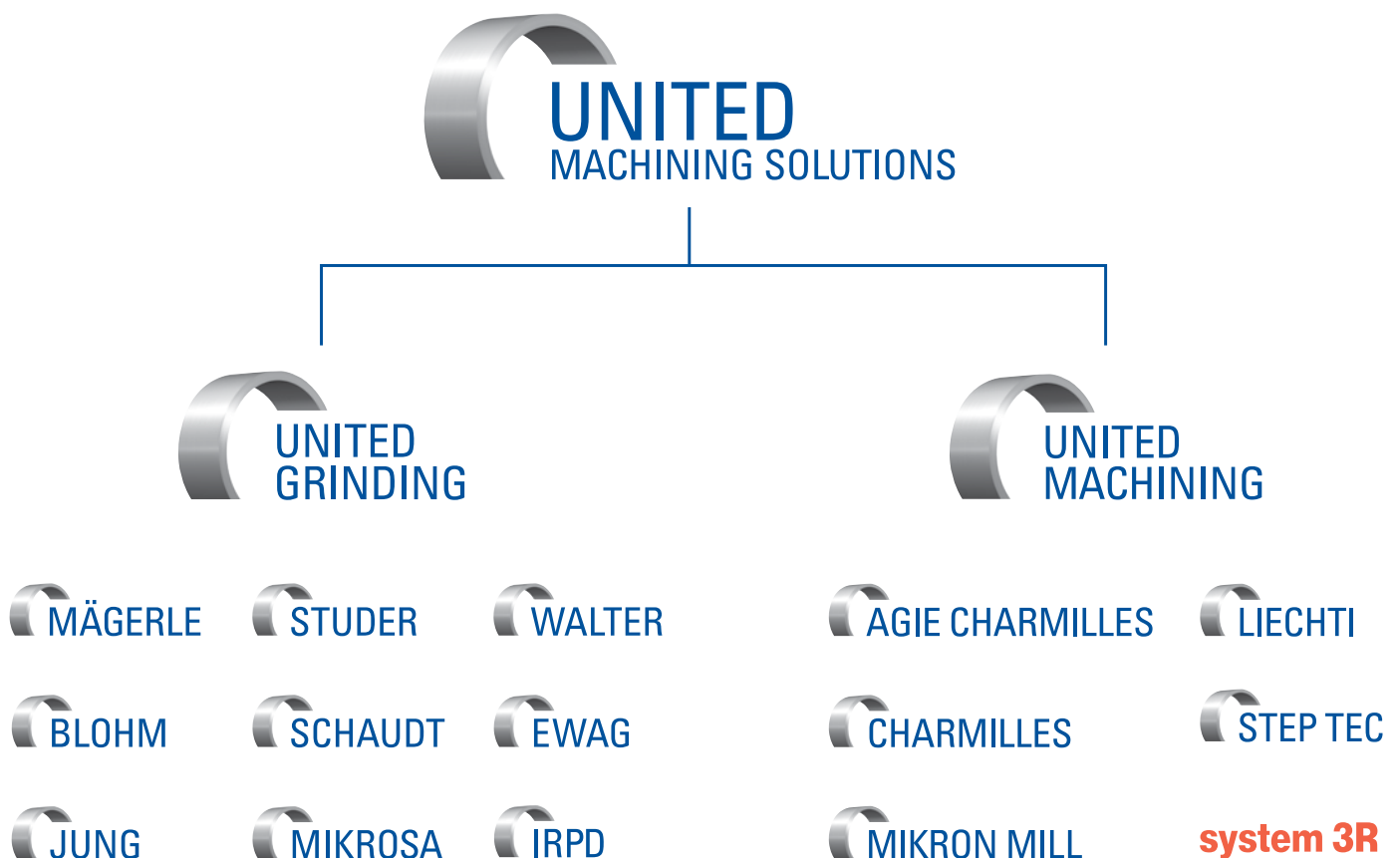
UNITED MACHINING SOLUTIONS

UNITED MACHINING SOLUTIONS is one of the largest machine tool manufacturers in the world. With around 5,000 employees at over 50 global production, service and sales locations, UNITED MACHINING SOLUTIONS is close to its customers and highly efficient. The group is organized into two divisions: UNITED GRINDING and UNITED MACHINING.

UNITED GRINDING includes the brands MÄGERLE, BLOHM, JUNG, STUDER, SCHAUDT, MIKROSA, WALTER, EWAG and IRPD. Its technologies include surface and profile grinding machines, cylindrical grinding machines, machines for tool machining and machine tools for additive manufacturing.

The UNITED MACHINING division includes the brands AGIE CHARMILLES, CHARMILLES, MIKRON MILL, LIECHTI, STEP TEC and SYSTEM 3R. It includes machines for EDM (Electrical Discharge Machining), high-speed milling and laser technology as well as spindle production and automation solutions.

«We want to make our customers even more successful»





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