

MILL P 500



 **MIKRON MILL**

A member of UNITED MACHINING SOLUTIONS

PRECISION AND RELIABILITY FOR MOLD AND DIE APPLICATIONS

The vertical, three-axis MIKRON MILL P 500 delivers performance you can count on for every job, every time. It's designed for automation and built around a robust, symmetrical bridge-type structure with an internal cooling system. Its superior dynamics, ideal axis ratio, high accuracy and exceptional stability offer an affordable way to achieve the highest part quality and throughput. The MIKRON MILL P 500 is particularly well-suited for mold and die applications in the information and communications technology (ICT), electronics, medical packaging and automotive industry sectors.

Achieve perfect reproducibility even during extended periods of machining with thermal controls, oversize linear guideways and ball screws.

Shorten time to market by reducing time-consuming, manual polishing operations, with outstanding precision and advanced spindle technology.

Maximize ROI with fully integrated workpiece changers, tool magazine expansions and more for extended uninterrupted production.



Fast, accurate and reliable.
All day, every day.

TECHNOLOGY

High performance, uncompromising process security

- Long-term stability and precision ($\pm 4 \mu\text{m}$)
- Faster finishing operations ($R_a 0.02 \mu\text{m}$)
- Higher dynamics and greater speeds
- Automation-ready design for 24/7 unattended machining

SOLUTIONS

Exceptional productivity, designed to meet your needs

- Thermostabilized machine and components, including all principle heat sources
- Powerful, $42,000 \text{ min}^{-1}$ STEP TEC Spindle
- Internal magazine accommodates up to 60 tools
- Ergonomic and accessible design
- Automation-ready, including part loading at machine rear
- State-of-the-art FANUC or HEIDENHAIN control
- Advanced smart machine modules
- Polymer concrete machine base



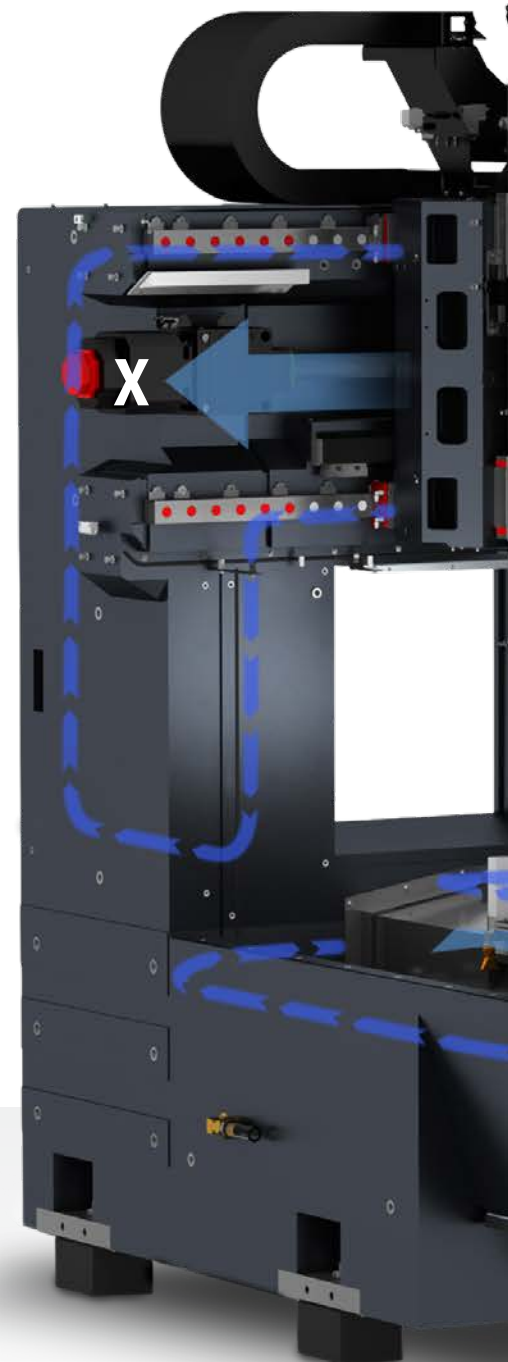
ROBUST AND PRECISE: THE SOLID FOUNDATION OF THE MIKRON MILL P 500

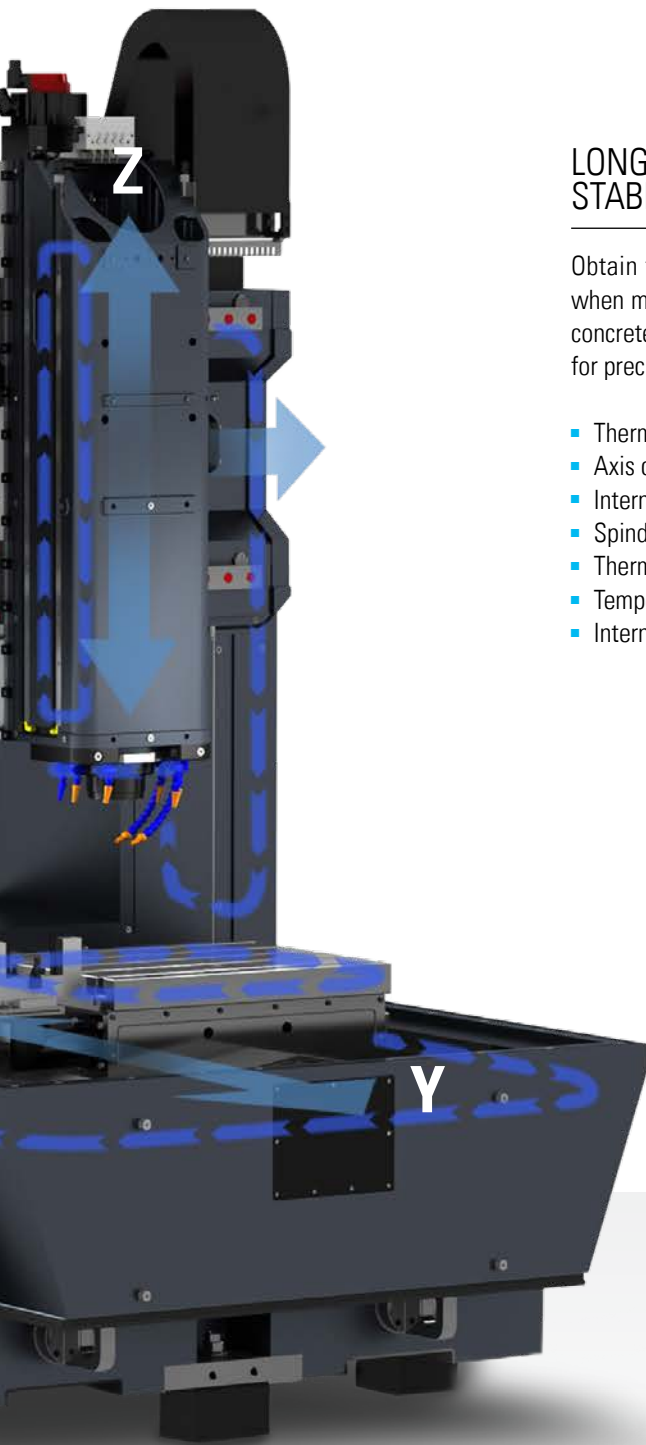
DURABLE CONSTRUCTION

Designed to meet the needs of mold and die producers, particularly in the ICT/EC sectors, the MIKRON MILL P 500 features a robust portal structure with exceptional stiffness. This enables shops to achieve outstanding positioning and contour accuracy for high-quality surface finishes.

EXCEPTIONAL PRECISION

With its highly dynamic 42,000 min⁻¹ STEP TEC Spindle, this machine has the power, speed and performance necessary for the most demanding applications. Shorten time to market, achieve fine surface finishes (finer than Ra 0.05 µm) and reduce the need for post-machining processes.





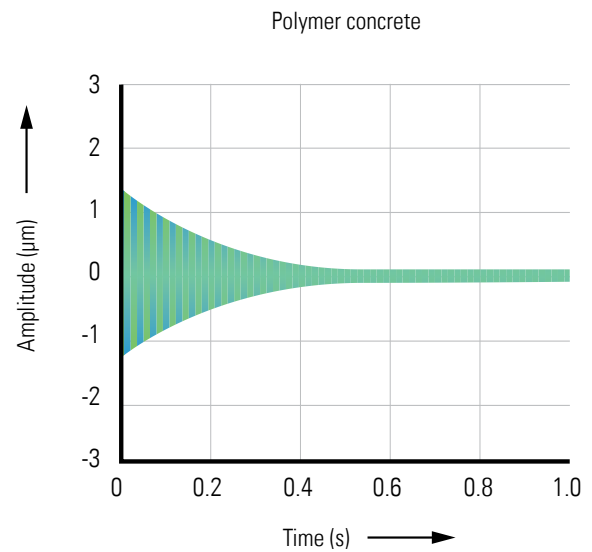
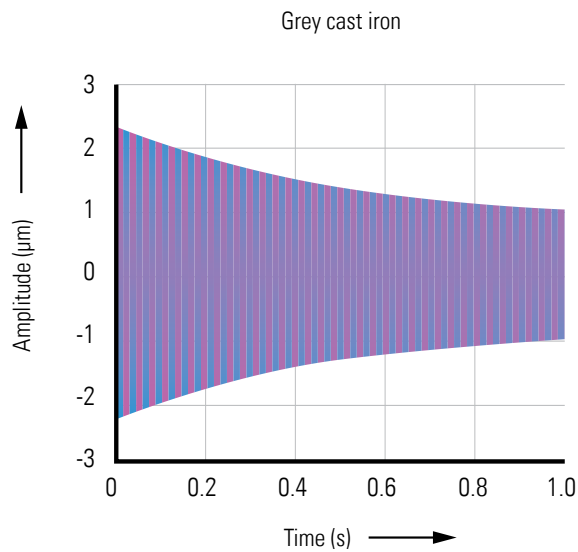
LONG-TERM STABILITY

Obtain the highest level of precision with long-term stability, even when milling the toughest materials. The symmetrical design, polymer concrete structure and high thermostability provide a reliable foundation for precision.

- Thermostabilized body
- Axis cooling system
- Internal ball screw nut cooling
- Spindle cooling system
- Thermal-controlled drive motors
- Temperature-controlled coolant
- Internal table cooling loop

X	Y	Z
500	450	350

RELIABLE ACCURACY AND PERFECT REPRODUCIBILITY



Trustworthy quality

Through extensive testing, the MIKRON MILL P 500 has been certified to maintain exceptional accuracy over extended machining periods. Our internal protocols for ensuring accuracy throughout the assembly process guarantees machines arrive at your facility ready for highly precise part production.

Polymer concrete performance

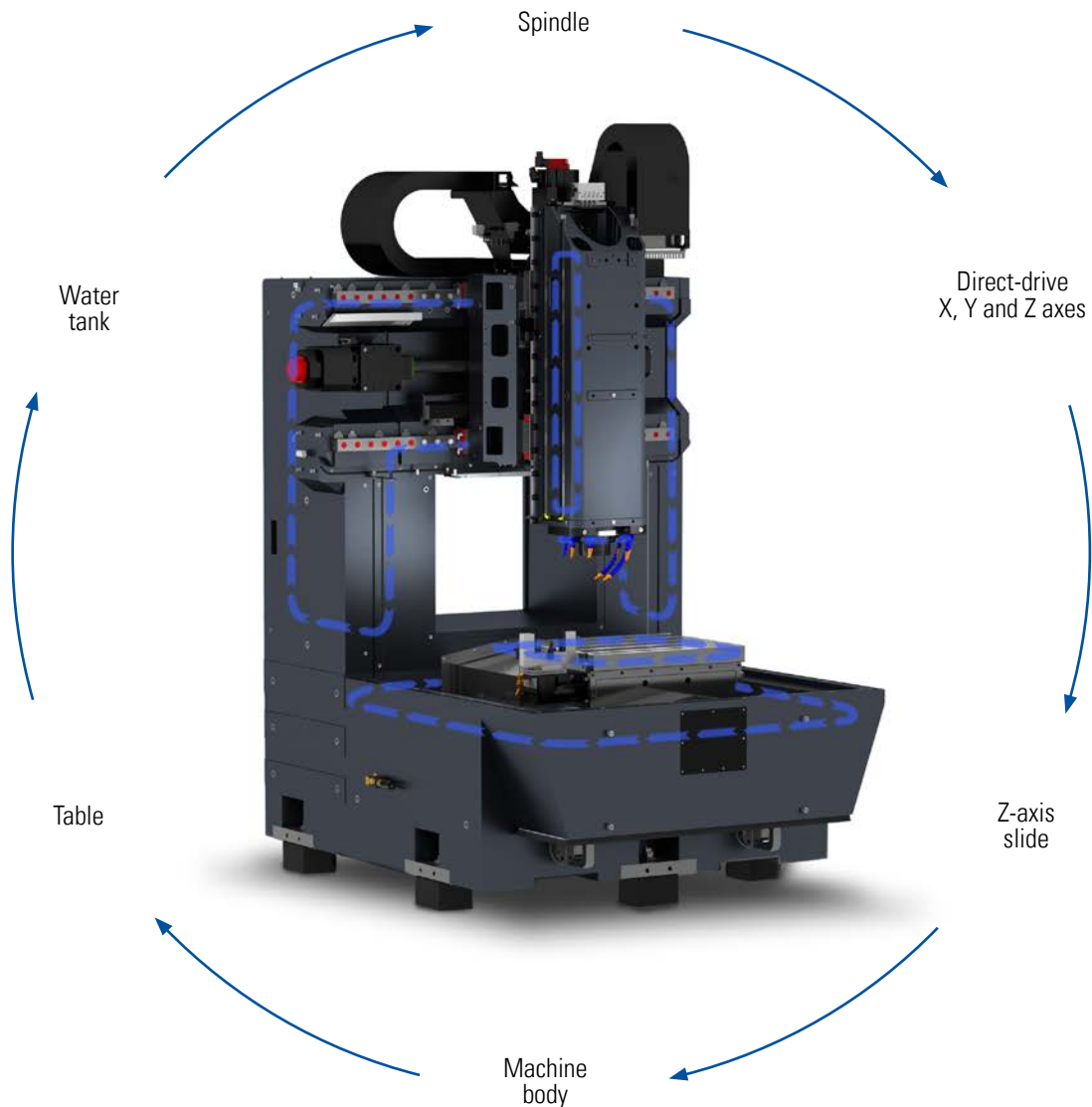
For reliable process stability, the MIKRON MILL P 500 is built around a 4.5 polymer concrete machine bed, which significantly outperforms cast iron in rigidity and damping behavior. This helps manufacturers secure processes, speed up production and reach higher levels of accuracy for the most challenging applications.

- Internal cooling system and isolated machine bed
- Rigid, symmetrical gantry-style design
- Polymer concrete machine bed

Precision at any temperature

When your milling accuracy must be within fractions of a micron, even the smallest change in temperature can result in a scrapped part. But to achieve the most accurate parts, simply controlling ambient temperatures isn't enough. The heat produced by the machine itself must also be controlled, especially during long production cycles for precision molds and dies.

The advanced thermostability features in the MIKRON MILL P 500 creates a stable environment to protect your processes. An advanced internal cooling system is designed to address every heat source and critical element in the machine, from axial movement and spindle rotation to servo motors and table motion.



DYNAMIC PERFORMANCE

Reduce production costs,
cut down on finishing
operations

**Achieve higher machine performance
with dynamic features:**

- Axial rapid traverse speeds of 30 m/min
- Axial acceleration: 6 m/s²
- 42,000, 36,000 or 24,000 rpm STEP TEC spindle
- High-precision linear roller guide ways
- Rigid, stiff machine bed
- Optimized force distribution



Travel speed
30 m/min

Acceleration
6 m/s²

SPINDLE: SPEED AND PRECISION, ALL DAY AND ALL NIGHT

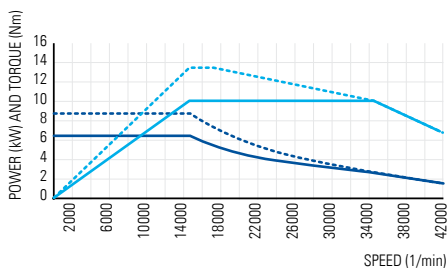
High-performance STEP TEC Spindles can handle everything from roughing to fine surface finishes. With advanced hybrid ball bearings and thermally robust hybrid cylindrical roller bearings, these super-rigid rotating systems enable milling with extra-long tools, aggressive material removal rates and higher feed rates.



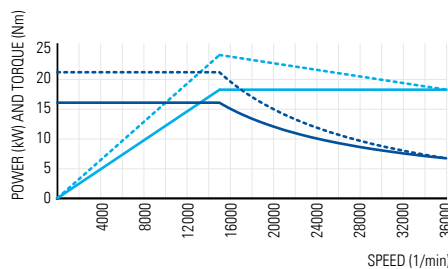
The MIKRON MILL P 500 can be equipped with a 42,000 min⁻¹ HVC-140, 36,000 min⁻¹ HVC-150 or 24,000 min⁻¹ HPC-150 spindle to provide outstanding precision and accuracy for high-speed milling applications in the mold and die industry. With advance lighthouse factory features and integrated sensors, your operators can continually monitor vibrations, temperatures, and more to maximize productivity and performance.

- Ensures the highest degree of thermal stability with sophisticated design built around OptiCool principle (OCS).
- Includes full range of sensors for relevant machining parameters for smart machine integration.
- STEP TEC's highest ever static/dynamic stiffness enables the least amount of runout for challenging mold and die applications.
- Dust dry spindle nose allows for greater application flexibility and tool life.

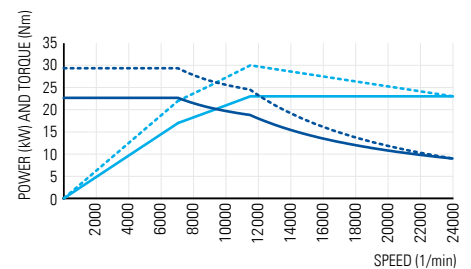
42,000 min⁻¹, HSK-E40



36,000 min⁻¹, HSK-E50



24,000 min⁻¹, HSK-E50



POWER — S1 S6-40% ED ts = 2 min
TORQUE — S1 S6-40% ED ts = 2 min

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.

A TOOL MAGAZINE FOR EVERY NEED



Featuring internal disc-type or chain magazines, the MIKRON MILL P 500 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





FANUC 31i-MODEL B



HEIDENHAIN TNC 640 (Gen.3)

EXPERT CONTROLS

The FANUC FS31iB and HEIDENHAIN TNC 640 (Gen.3) control on the MIKRON MILL P 500 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.

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	13.5 kW / 8.8 Nm
36,000, HSK-E50	33 kW / 21.3 Nm
24,000, HSK-E50	30 kW / 29.8 Nm

WORK TABLE

T-slot table	600 x 500 mm (23.62 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 (HSK E40 only)
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
HEIDENHAIN	TNC 640 (Gen.3)

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

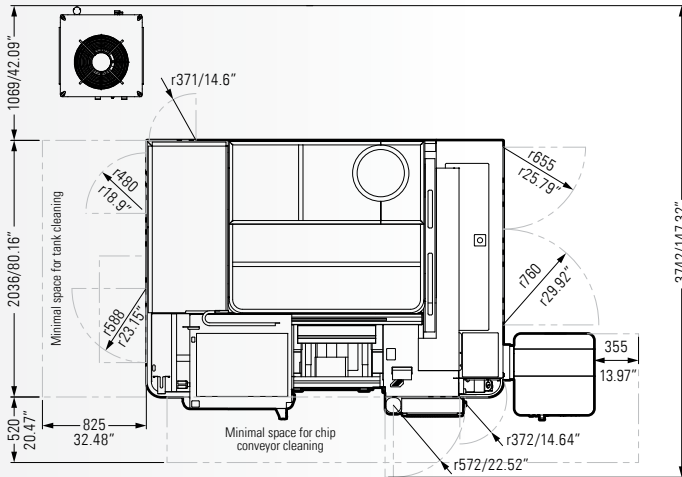
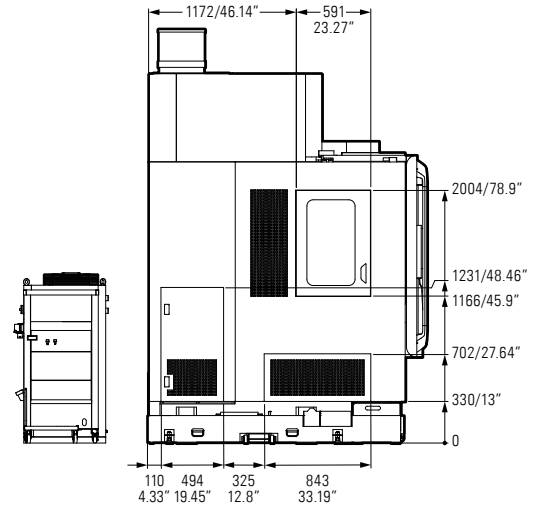
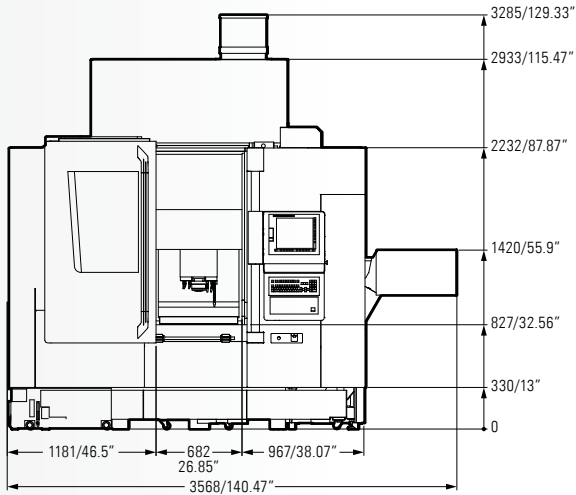
Hexagon M&H LTS35.65
BLUM Digilog LC-50
Touche probe (THERMO-LOCK)

Chips and coolant management

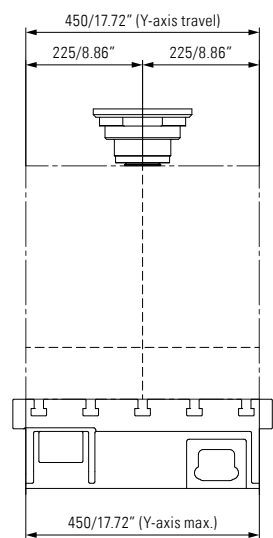
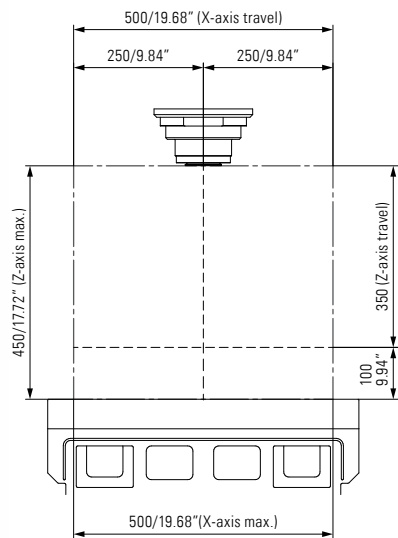
Lift-up chip conveyor - scrapper
Lift-up chip conveyor - Slat band
Band filter system 20 bar
Band filter system 50 to 70 bar
Wash down system
Oil skimmer
Mist extraction unit
TSC - Through Spindle Coolant
Rotating windows

Smart Machine Module

ISM - Intelligent Spindle Monitoring
ITC - Intelligent Thermal Control
OSS - Operator Support System
PFP - Power Fail Protection
EconoWatt



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

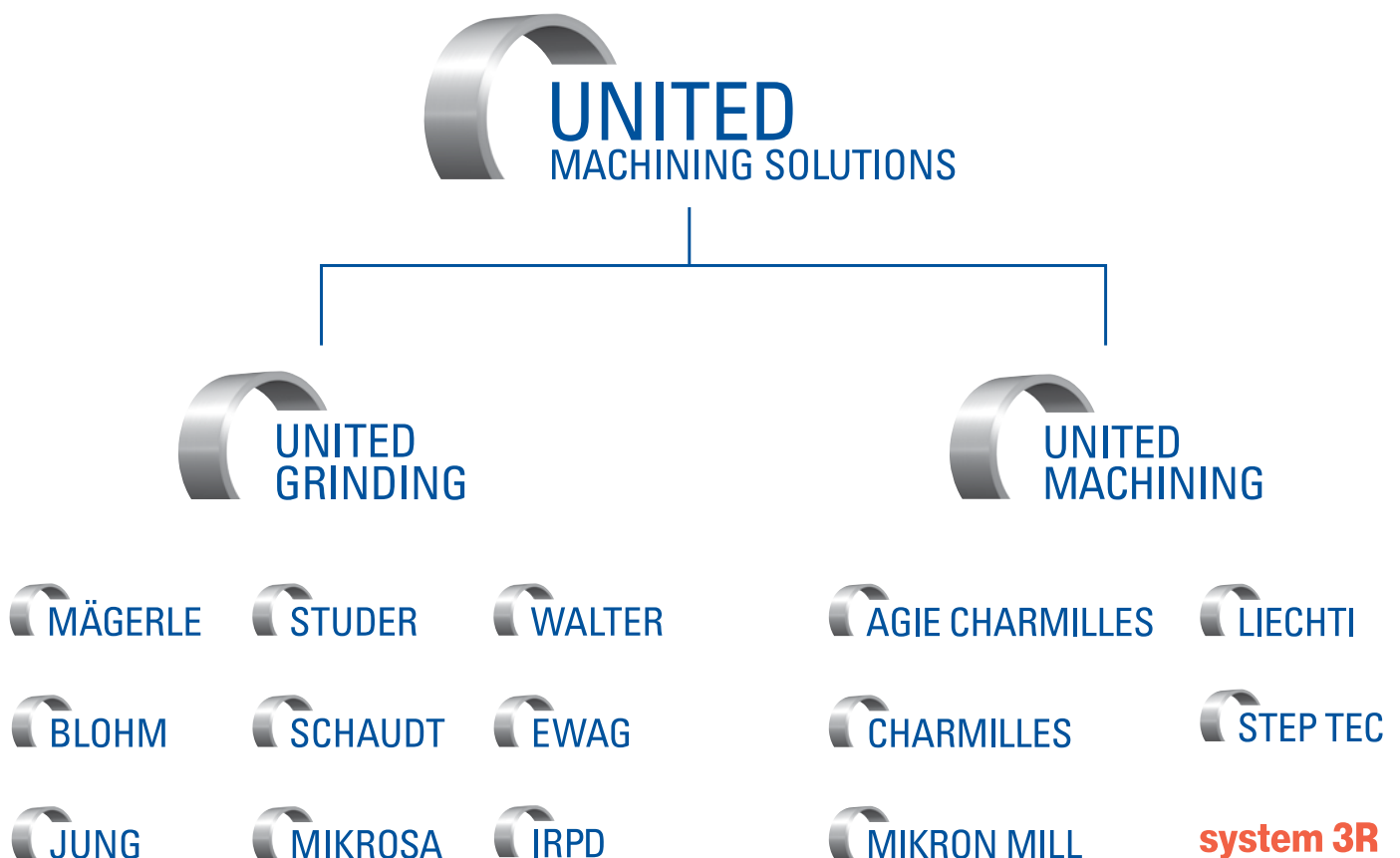
UNITED MACHINING SOLUTIONS

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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