MILL S/X

400 / 400 U / 500 / 600 / 600 U / 800

MIKRON MILL

DYNAMIC, PRECISE MACHINING FOR PERFECT FINISHES

DYNAMIC

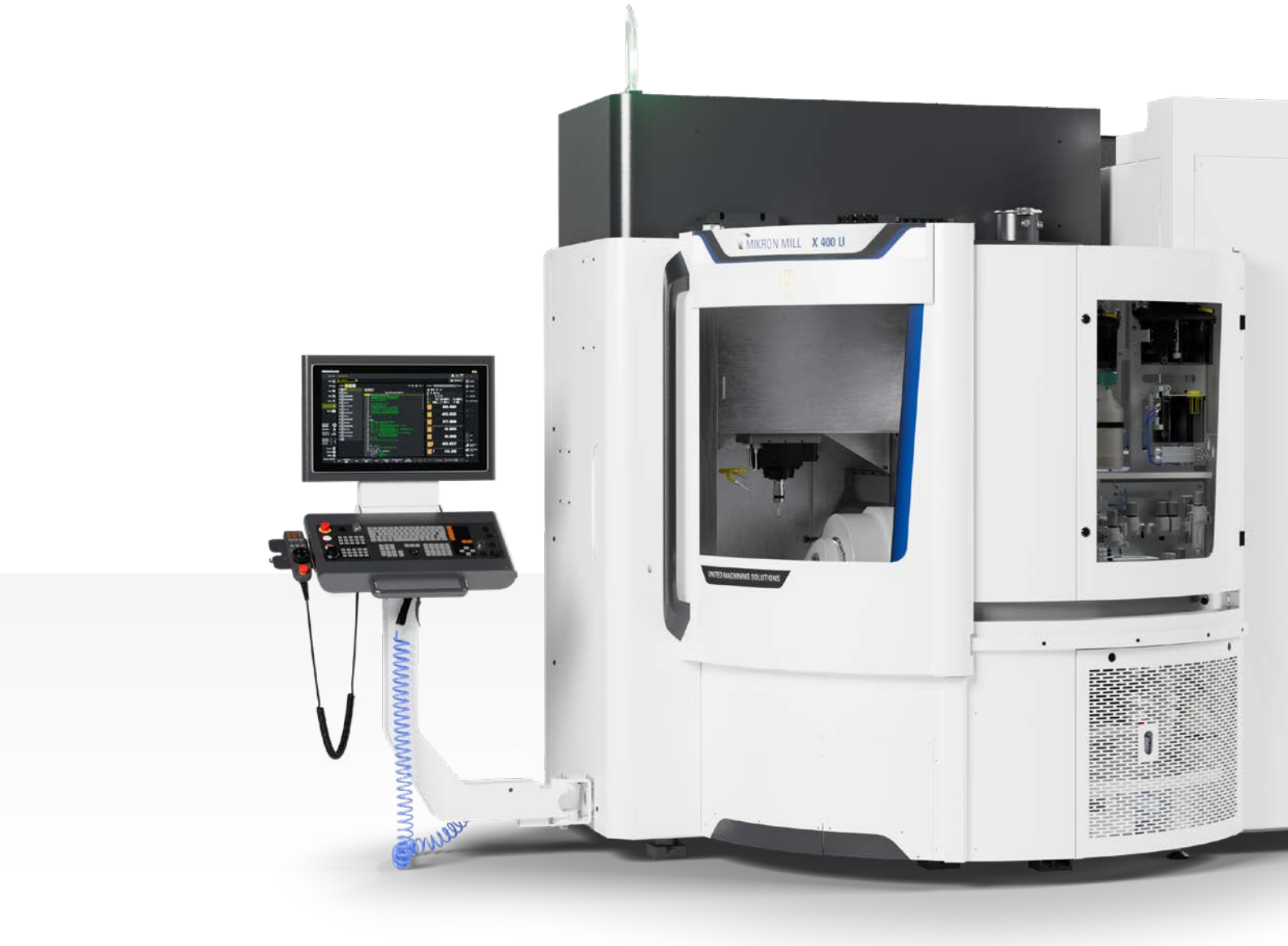
Answer growing part complexity, precision and cycle time demands with a five-axis strategy. Get the ideal combination of linear, rotating and swiveling axes and shorten your production time with direct Milling in one clamping operation as a substitute for other process steps. Profit from perfect surface quality and precision due to single-clamping production and perfectly aligned five-axis kinematics.

PRECISION AND HIGH SURFACE QUALITY

Perfect machine design with highest mechanical requirements provides the basis for high surface quality and repeatability. The reliable STEP TEC Spindle and linear motors in combination with Ambient Robust technology ensure always high surface quality on parts. Master the challenges of a wide range of application and short-term market requirements while maintaining high accuracy.

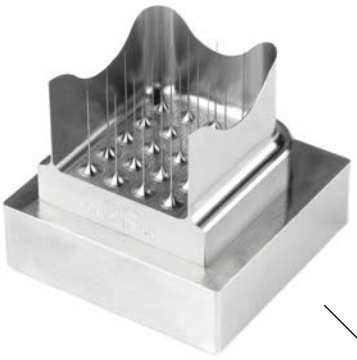
ICONIC ERGONOMICS AND DESIGN

The MIKRON MILL S/X series is very well-known on the market for its ideal ergonomics and fit in customers' workshops. The ideal machine design allows perfect machine setup and accesibility. Increase your return on investment (ROI) through perfect machine-robot connectivity and scalability.



High precision and surface finish in blow molding reduce steps and eliminate polishing.

Boost productivity by removing polishing and errors, with Automated Machine Calibration (AMC) ensuring process safety.



Chatter-free quality and repeatable processes enable confident machining and lower tool costs.

High-dynamic motion and surface finish cut costs, boost performance, and open new markets.

LINEAR AXES AND TORQUE TABLE

The linear axis motor and rotary swiveling torque table provide either a smooth or dynamic milling process. This allows machining accurate parts during short, medium, and long Milling processes.

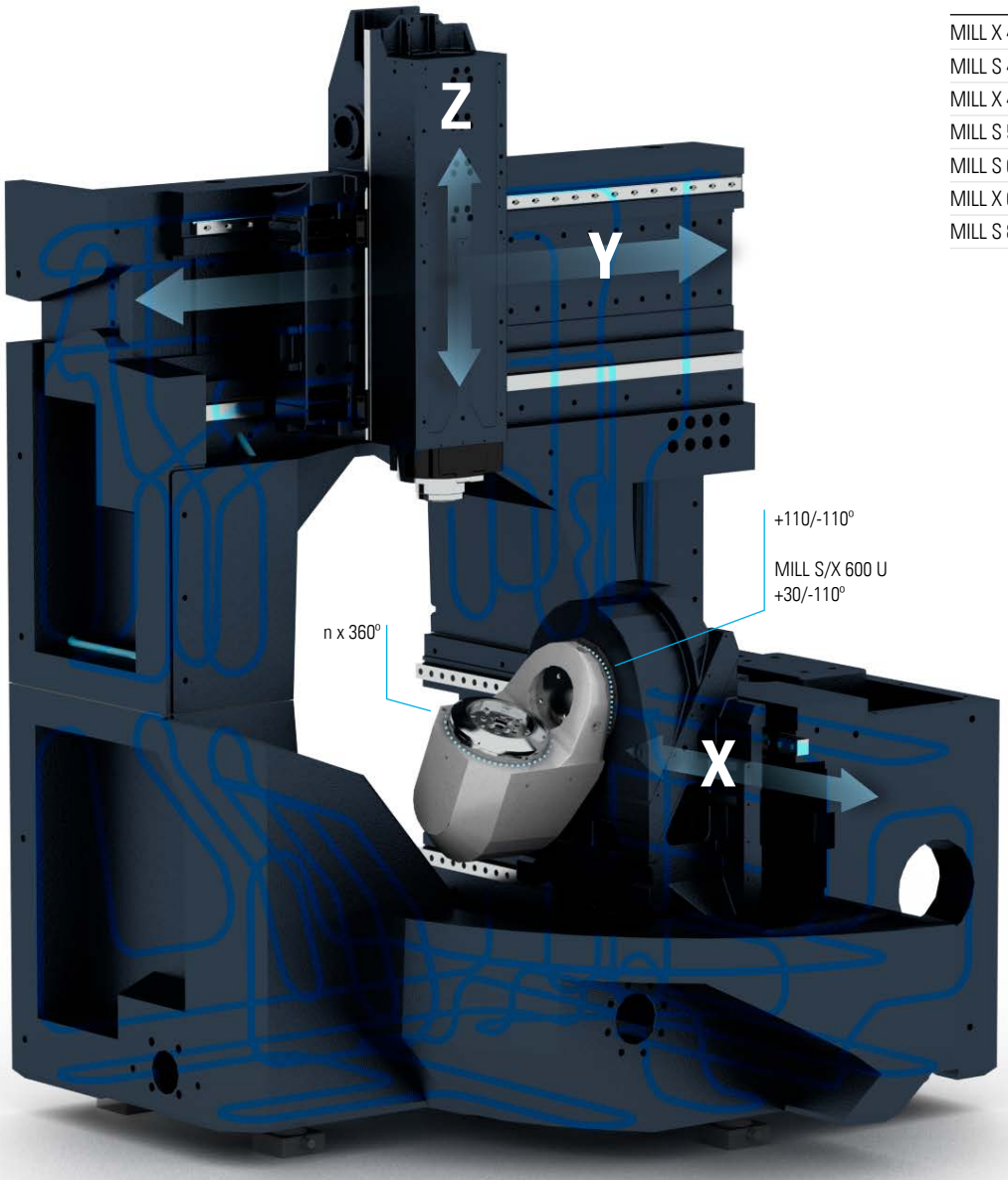
Benefits

- High accuracy
- High surface quality

The swiveling rotary torque table on all MIKRON MILL machines is built at our Biel, Switzerland, factory following a strict assembly.

Benefits

- High-quality components
- Reduced downtime
- Perfect table ergonomics



	X	Y	Z
MILL X 400	500	450	360
MILL S 400 U	500	450	360
MILL X 400 U	500	450	360
MILL S 500	500	450	360
MILL S 600 (U)	800	600	500
MILL X 600 U	800	600	500
MILL S 800	800	600	500

PRECISION OVER LONG RUNNING TIMES

The Econowatt smart machine module makes it possible to set the machine in a configurable standby and wake-up mode to achieve the perfect thermal conditions for the start of production and to reduce energy consumption.

AMC

AMC extended

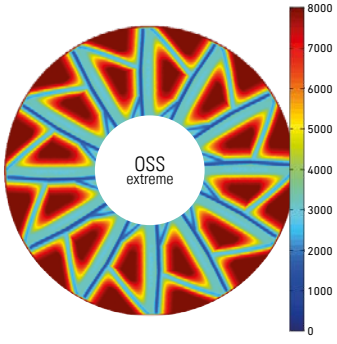
For optimum utilization of the machine's precision, machine geometry needs to be very well calibrated. AMC perfectly simplifies calibration by guiding the user through all steps.

Ambient robust

The Ambient Robust option ushers in a new era of precision cutting and defeats heat problems with a complex active cooling system and ingenious electronic assistance.

OSS extreme

The Operator Support System extreme (OSS extreme) smart machine module is software developed and patented by us for machining optimization. The module enables the selection of machine settings for adapted, optimal machining, taking into consideration the machining priorities and machine parameters.



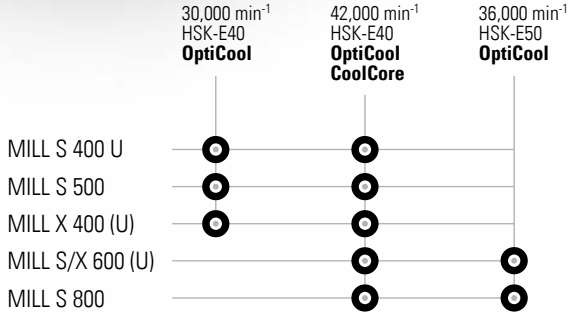
STEP TEC SPINDLES ALWAYS A STEP AHEAD

Through continuous improvement processes, STEP TEC develops and uses only the highest-quality components to ensure that our high-speed spindles run with full operational security.

Benefits
- Extend product life cycle
- No downtime
- Limited vibration at higher speed
- Limited heat at higher speed

Thermal behavior of STEP TEC Spindles is thoroughly analyzed and improved to avoid Spindle deformation and keep an homogeneous geometry during the Milling process. The thermal behavior of the different Spindle lines are checked and improved based on the physical hysteresis effect.

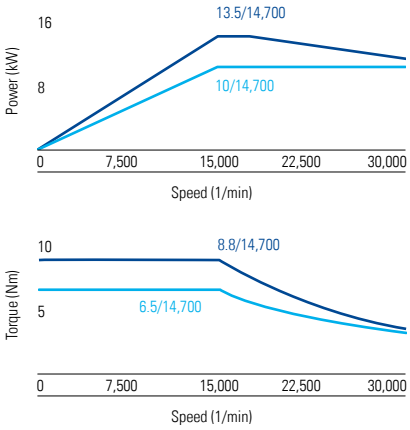
Benefits
- Secure milling process
- High accuracy at higher speed
- Excellent thermal behavior



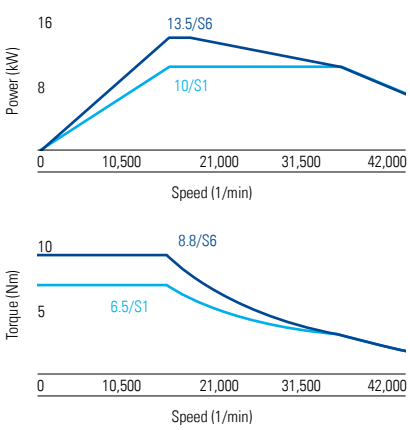
OptiCool
STEP TEC's OptiCool Spindle series ensures not only that the Spindle remains thermally stable, but that natural heat transfer to the Spindle support (e.g., Z axis) is limited to the lowest amount possible, in order to preserve the machine's geometry.

CoolCore
Where conventional stator cooling reaches its limits, STEP TEC's CoolCore Spindle goes beyond the ordinary to lower the temperature and minimize temperature fluctuations in the rotating shaft.

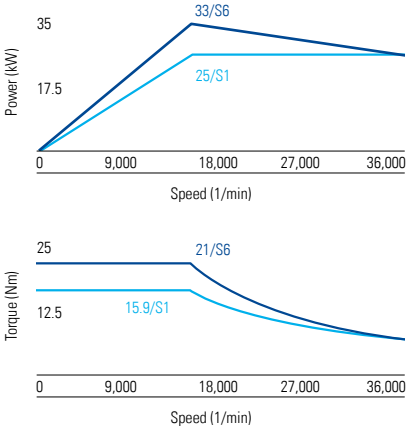
30,000 min^{-1}, HSK-E40



42,000 min^{-1}, HSK-E40



36,000 min^{-1}, HSK-E50



S1 — S6 40% ED ts=2 min.

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.

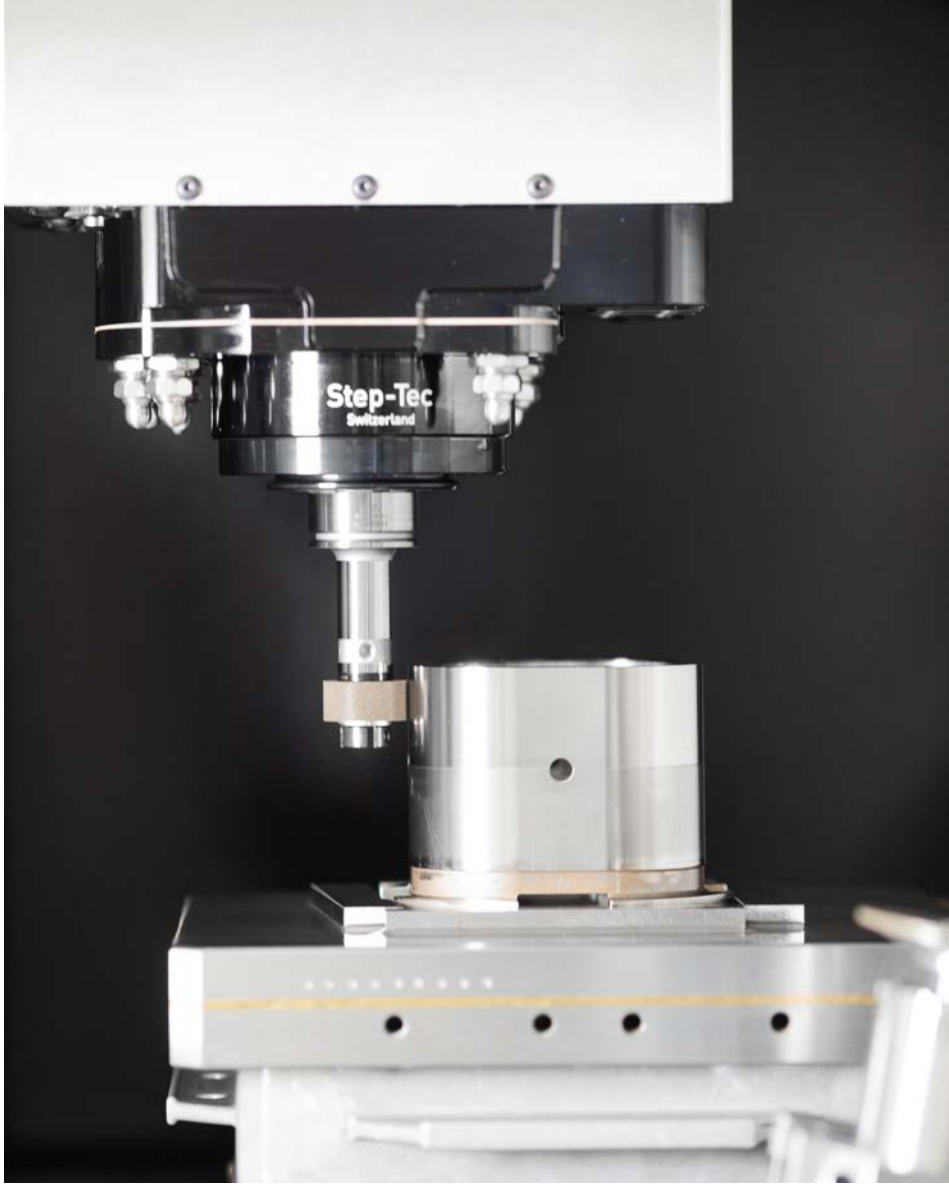
Spindle diagnosis

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 17.

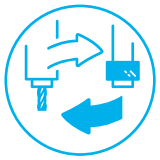
TWO-IN-ONE SOLUTION



MIKRON MILL S/X U machines are able to combine Milling and jig grinding on the same machine. The grinding setup into the machine has been well designed in order to maintain standard workpiece dimensions and clamping surface even for Automation. Nevertheless, the laser measuring system and the dressing spindle are located closer to the working area for a quick and fast grinding process.

Benefits

- No impact on the workpiece dimensions
- No impact on the clamping surface
- Quick grinding process setup



Through this two-in-one solution, we improve and significantly reduce customers' manufacturing processes. The combination of milling and grinding technologies, extremely high machine dynamics, and consistent thermal stability and accuracy provide fast ROI and high-end, quality products.

Benefits

- Reduce your parts and mold manufacturing processes.
- Accelerate your ROI significantly.
- Produce high-end, quality parts and molds every time.

Dressing spindle is equipped with an acoustic emission (AE) sensor to track and visualize on the Heidenhain control the signal during tool dressing. The machine can be equipped with an additional AE sensor to track grinding operations in order to further optimize the process.

Benefits

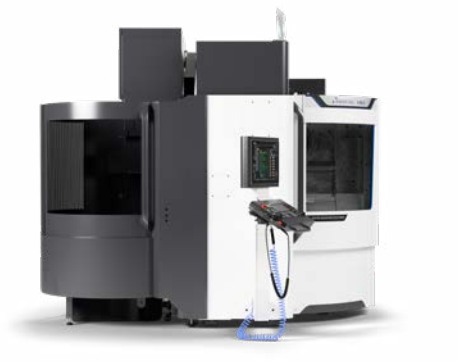
- Grinding monitoring
- Process improvment

The dressing spindle is mounted next to the three-axis table with a slight incline to allow dressing of any complex grinding tool. The dressing spindle speed can also be adjusted from 3,000 rpm to 20,000 rpm.

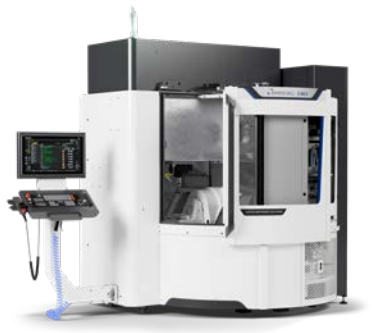
Benefits

- Dressing flexibility
- Application flexibility
- Grinding tool efficiency
- Process reliability

ERGONOMICS AND AUTOMATION



Pallet magazine



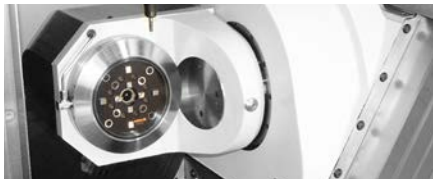
Working area

Tool magazine

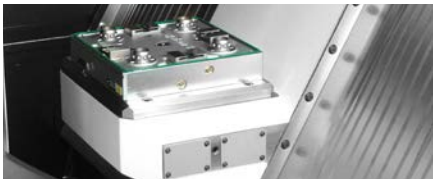
MIKRON MILL S/X machines are very well known on the market for their Milling performance, dynamics and unbeatable ergonomics. Due to the machines' user-friendliness, operators can easily access the pallet magazine, working area, tool magazine and maintenance section.

- Operator confort
- Quick Milling setup
- Excellent access and view of working area

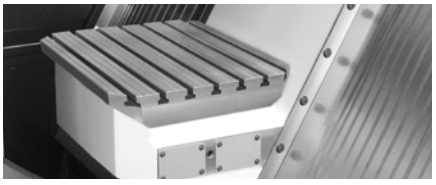
TABLE VARIANTS



MILL X 400 U 25 kg

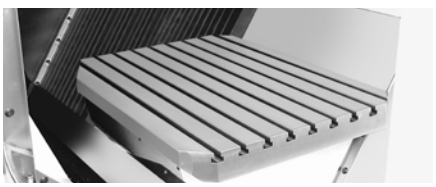


MILL X 400 120 kg



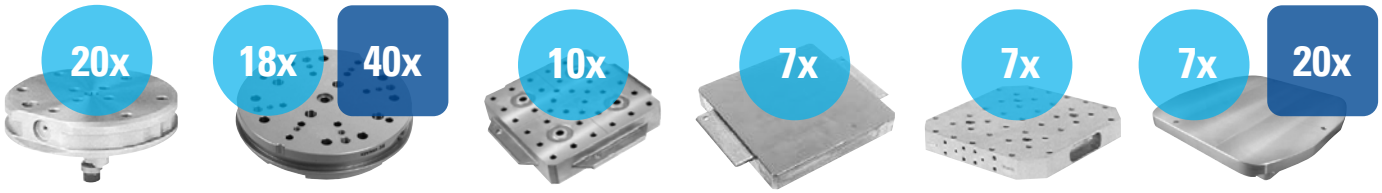
MILL S 500 200 kg

MILL S 600 U 120 kg
MILL X 600 U 120 kg



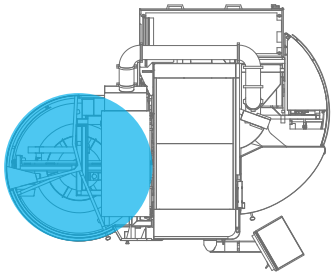
MILL S 600 500 kg
MILL S 800 1,000 kg

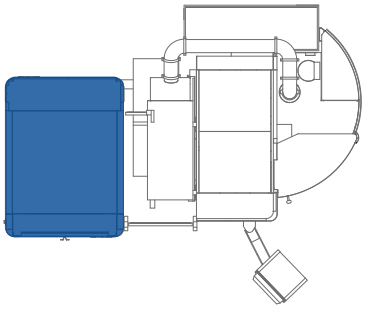
STANDARD PALLET MAGAZINE VARIANTS



Erowa **ITS** Ø 148 mm	System 3R **MacroMagnum** Ø 156 mm	System 3R **GPS** 240 x 240 mm	System 3R **Dynafix** 280 x 280 mm	Erowa **UPC** 320 x 320 mm	System 3R **Dynafix** 350 x 350 mm
MILL S/X 400 U		MILL S 600 U	MILL S/X 600 U		
			MILL X 400		

Disc-type magazine
MILL S/X 400 U
MILL X 400
MILL S/X 600 U





WorkPartner 1+
MILL S/X 400 U
MILL S/X 600 U

AUTOMATION

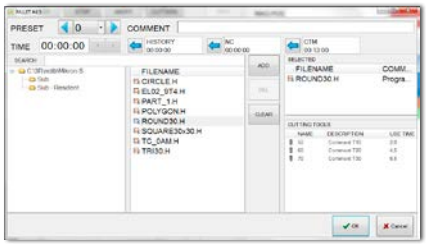
In addition to the ergonomics and user-friendliness, the MIKRON MILL S/X (U) line can easily be automated with different pallets magazines or third-party automation. The MIKRON MILL S/X (U) machines are highly flexible and ready for Automation to enable unattended machining in order to meet customers' expectations.

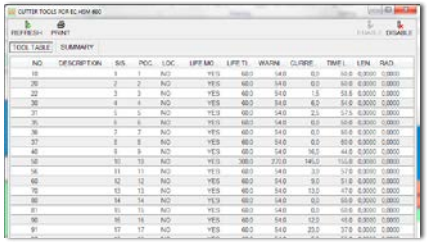
Benefits
- Automation flexibility
- Perfect Automation layout
- Excellent machine and Automation accesibility
- Increased workshop productivity
- Complete cell configure for you

FOR A SINGLE MACHINE WITH INTEGRATED AUTOMATION

JobToolManager (JTM) brings agility back to the shop floor
JTM is user-friendly software for one machine with an integrated pallet changer. Assign numerical control (NC) programs to pallet position by drag and drop on a touch screen close to the pallet changer.

Benefits
- Easily change priorities while the machine is working.
- Add or remove jobs while machining.
- Jobs for which cutting tools are missing will not be started.
- Estimated and present machining times for the magazine content are calculated.





TOOL MAGAZINE

User-friendly tool feeding
Productivity and process reliability are ensured by lateral tool feeding.
- Simultaneous machining and feeding
- Simple feed monitoring through large glass panel
- Ergonomic access

Tool Automation in every configuration level
- Simple, double-row disc magazine or ATC
- Reliable “pickup” changing system
- Feed control via light beam
- Orientation of the touch probe

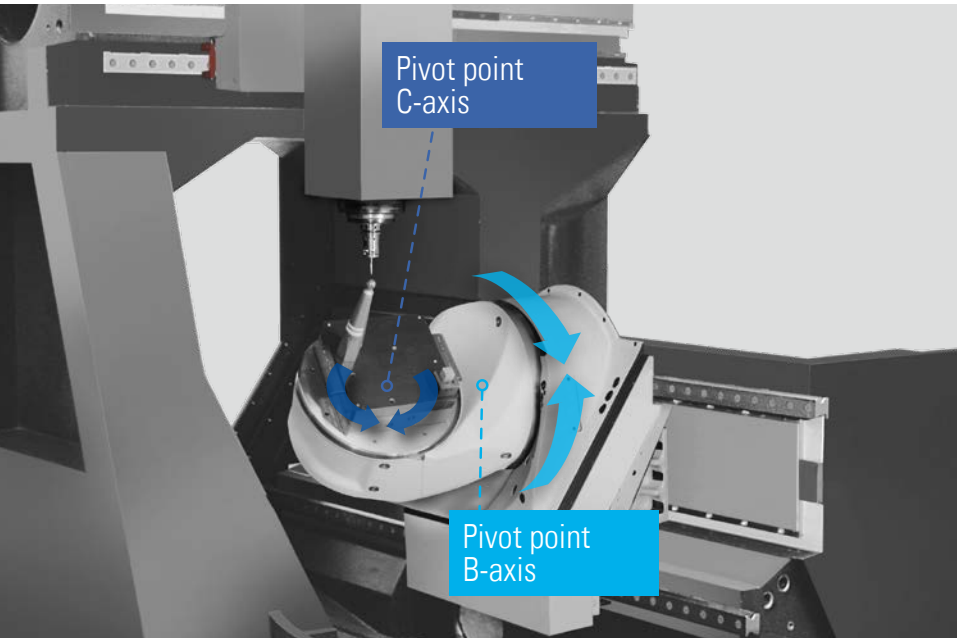
Optionally available in a variety of capacities
- MILL X 400, MILL S/X 400 U, MILL S 500
  HSK-E40: 68, 168 tools
- MILL S 600, MILL S/X 600 U, MILL S 800
  HSK-E50: 15, 30, 60, 120, 170, 220 tools
  HSK-E40: 68, 168 tools

Individual solutions tailored to your production needs

AUTOMATED MACHINE CALIBRATION (AMC)

Take your machine to the highest precision—anytime
Calibrate your Milling machine in minutes, not hours. Reduce your downtime between cycles with MIKRON MILL' standard Automated Machine Calibration (AMC). Calibrating your machine to ensure the stable, long-term precision required for high-quality parts is now as easy as pushing a button.

Get your machine ready for the next task!
Overall precision before and after the AMC recalibration process



AMC highlights
Because precision is not an option at MIKRON MILL, we offer AMC as a standard:

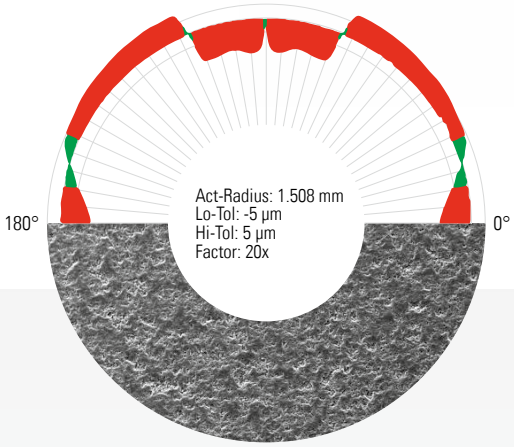
- Dialogue-guided software for easy and fast handling
- Get a consistent calibration process.
- Recover overall machine precision—every time
- Increase operator availability.
- Reduce human error in data management.

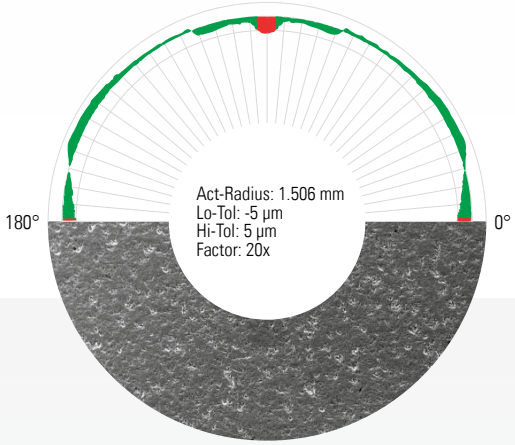
GR3 SOLUTION: THREE VISIONARY PARTNERS, ONE REVOLUTIONARY SOLUTION

The MIKRON MILL S/X series with the combination of Blaser coolant and Fraisa cutting tools allows you to easily machine graphite or copper electrodes without changing the machine setup, improving the electrode quality and extending the life cycle of the cutting tool. Use the right cutting strategy to reduce cutting tool wear while increasing graphite surface quality.

Benefits

- Improved surface quality
- No impact on EDM process afterward
- Less tool wear
- No need for expensive coated tools
- Save up to CHF 120,000 in a single shift





MIKRON MILL

Blaser. SWISSLUBE

fraisa

MIKRON MILL's latest innovation combines its top-of-the-line machines with a highly efficient centrifugal filter. The result is a complete setup that not only solves the issue of dust buildup, but also allows one single machine to be used for graphite, copper, and steel machining.

Blasogrind GTC 7 is the ideal cutting oil for this application. The oil excels at containing dust in solution, thereby providing a much cleaner shop environment and healthier working conditions for machinists. It also reduces tool wear and helps to achieve better surface finishes.

Fraisa's high-quality milling tools can now be used without expensive graphite-specific coatings. Machinists can achieve increased productivity, amazing tolerances, and pristine surface finishes, all at a fraction of the price of traditional graphite tooling.

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 lifecycle.

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 lifecycle. 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

	BRONZE	SILVER	GOLD
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 check-up on the core machine components		✓	✓
Discounts Preferred prices for parts and labor		✓	✓
Extended Warranty For up to five years			✓

TECHNICAL DATA: MIKRON MILL X 400 – MIKRON MILL S/X 400 U – MIKRON MILL S 500

WORK AREA

		MILL X 400	MILL S/X 400 U	MILL S 500
Longitudinal (X)	mm (in)	500 (19.68)	500 (19.68)	500 (19.68)
Lateral (Y)	mm (in)	450 (17.72)	450 (17.72)	450 (17.72)
Vertical (Z)	mm (in)	360 (14.17)	360 (14.17)	360 (14.17)
Swiveling axis	°	-	+110/-110	-
Rotary axis	°	-	n x 360	-

FEED RATE

Rapid traverse (X,Y,Z)	m/min (in/min)	100 (3,937)	61/100 (2,401/3,937)	61 (2,401)
Rapid traverse (swivel)	min^{-1}	-	165	-
Rapid traverse (rotary)	min^{-1}	-	250	-

WORKING SPINDLE (40% ED, S6)

42,000 min^{-1}, HSK-E40	kW/Nm	13.5/8.8	13.5/8.8	13.5/8.8
30,000 min^{-1}, HSK-E40	kW/Nm	13.5/8.8	13.5/8.8	13.5/8.8

WORK TABLE

Table	mm (in)	-	-	590 x 450 (23.23 x 17.72)
Pallet/clamping surface	mm	Dynafix 280 x 280/350 x 350 UPC 320 x 320	MacroMagnum 156 ITS 148	-
Max. table load	kg (lbs)	120 (264)	25 (55)	200 (441)

TOOL MAGAZINE

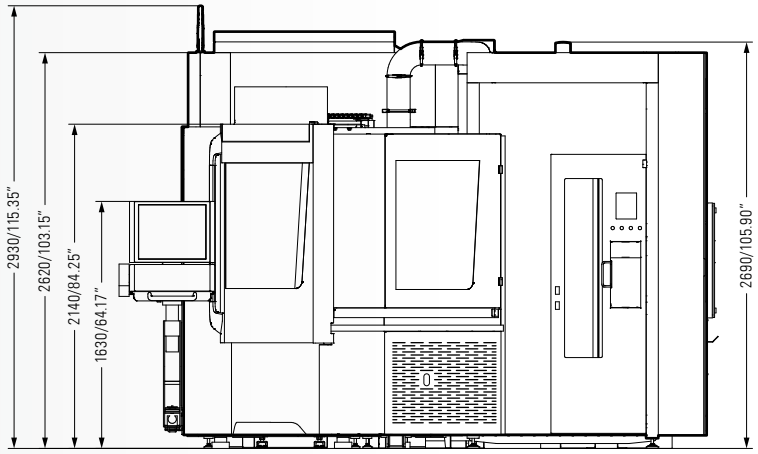
HSK-E40	piece	68/168	68/168	68/168

WEIGHT

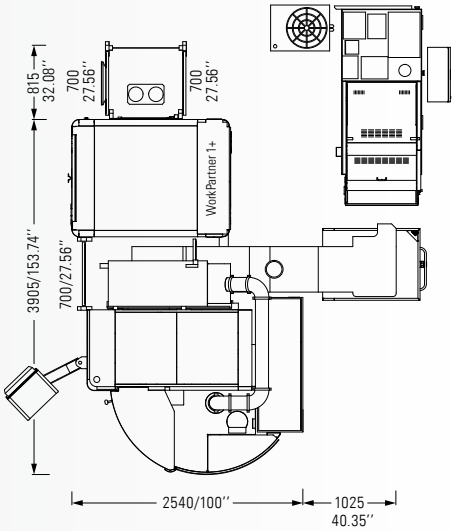
Machine	kg (lbs)	6,800 (14,991)	7,000 (15,432)	6,800 (14,991)

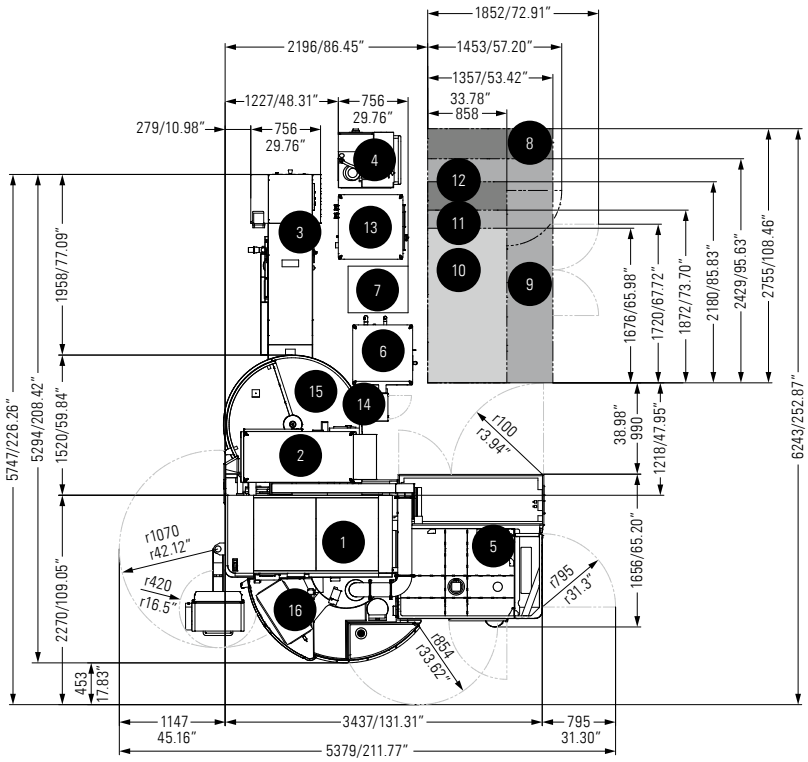
CONTROL UNIT

Heidenhain		TNC 7	TNC 7	TNC 7
Siemens		SINUMERIK ONE	SINUMERIK ONE	SINUMERIK ONE



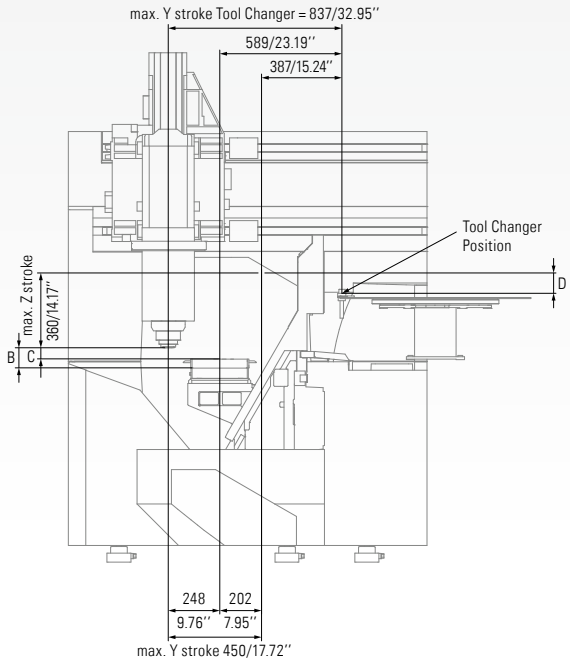
MILL X 400 – MILL S/X 400 U – MILL S 500

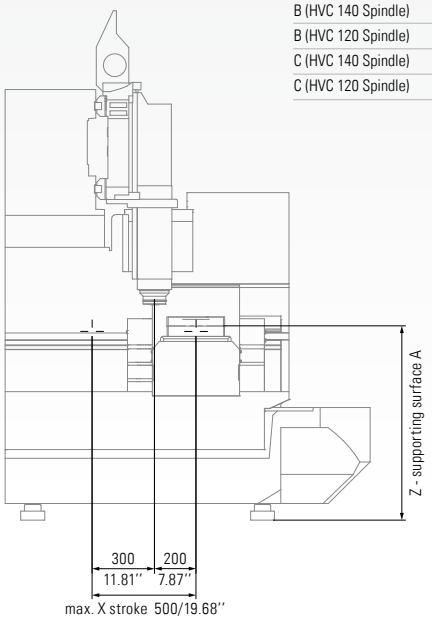




1. Machine
2. Mist extraction unit
3. Lift-up chip conveyor (scraper and slat band-type)
4. Wet graphite centrifuge
5. Tool magazine tower
6. Cooling unit
7. CoolCore cooling unit
8. Endless belt filter system (950 liters)
9. Band filter system (950 liters)
10. Basket filter system (450 liters)
11. Band filter system (450 liters)
12. Endless belt filter system (450 liters)
13. Coolant thermal control
14. CO_2 fire extinguishing system
15. Pallet magazine
16. Pressure-relief damper

MILL X 400

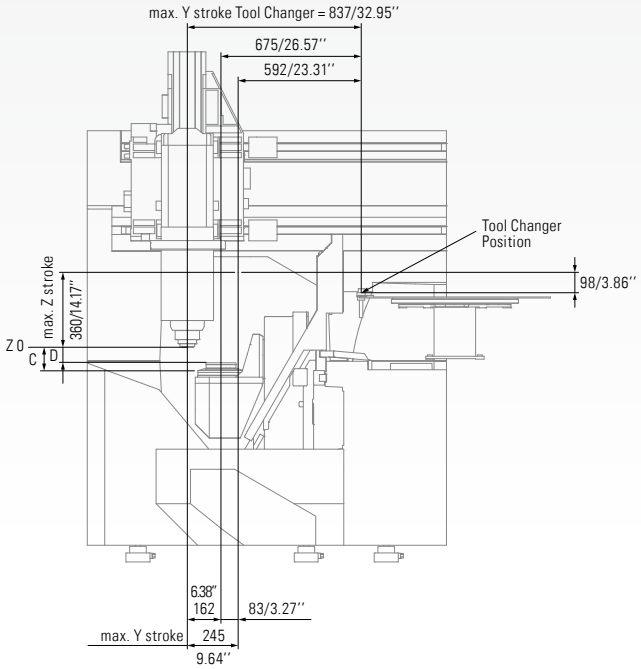


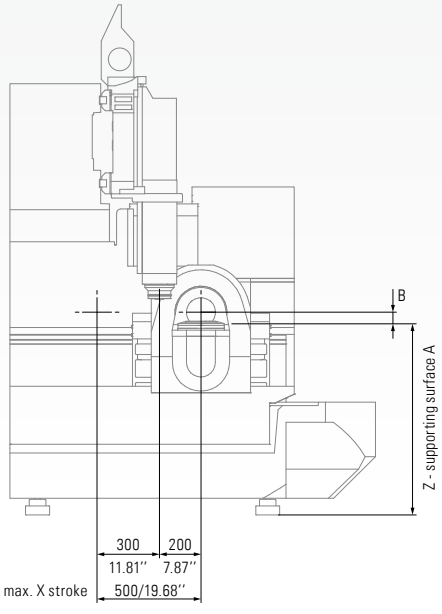


	UPC 320	Dynafix	GPS 240
A	936/36.85''	936/36.85''	937/36.89''
B (HVC 140 Spindle)	128/5.04''	128/5.04''	127/5''
B (HVC 120 Spindle)	98/3.86''	98/3.86''	97/3.82''
C (HVC 140 Spindle)	88/3.46''	84/3.31''	79/3.11''
C (HVC 120 Spindle)	58/2.28''	54/2.12''	49/1.93''

D (HVC 140 Spindle)	128/5.04''
D (HVC 120 Spindle)	98/3.86''

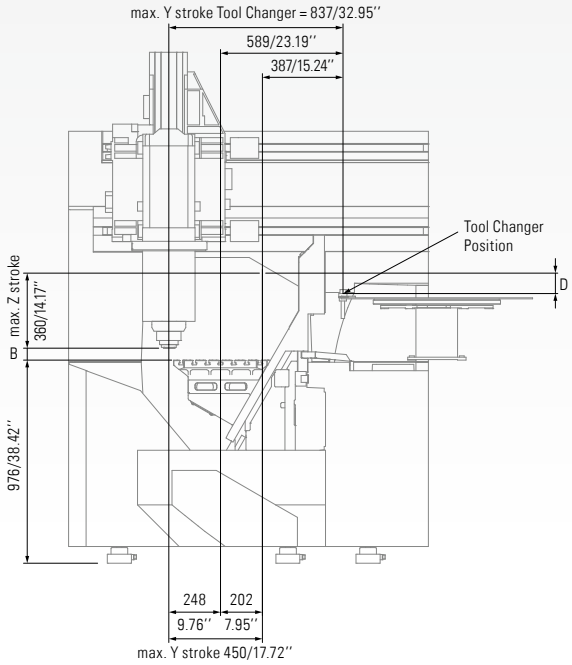
MILL S/X 400 U

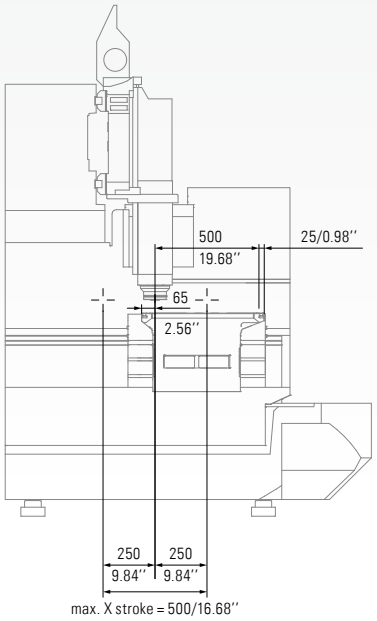




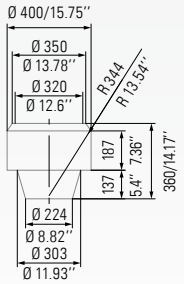
	ITS 148	MacroMagnum
A	921/36.26''	927/36.5''
B	55/2.16''	49/1.93''
C	114/4.5''	108/4.25''
D	74/2.91''	74/2.91''

MILL S 500



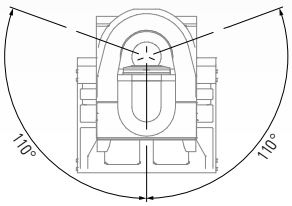


B (HVC 140 Spindle)	88/3.46''
B (HVC 120 Spindle)	58/2.28''
D (HVC 140 Spindle)	128/5.04''
D (HVC 120 Spindle)	98/3.86''



Max. machinable workpiece
at B-Axis 0° and 90°
(HVC 140 / ITS 148)
Tool length 70 mm

Simultaneous machining
only possible by radius
smaller than R 344
Max. workpiece dimension
with WPC1
7x UPC 320 x 320 = Ø 320



TECHNICAL DATA: MIKRON MILL S 600 – MIKRON MILL S/X 600 U – MIKRON MILL S 800

WORK AREA

		MILL S 600	MILL S/X 600 U	MILL S 800
Longitudinal (X)	mm (in)	600 (23.62)	800 (31.5)	800 (31.5)
Lateral (Y)	mm (in)	600 (23.62)	600 (23.62)	600 (23.62)
Vertical (Z)	mm (in)	500 (19.68)	500 (19.68)	500 (19.68)
Swiveling axis	°	-	+ 30/-110	-
Rotary axis	°	-	n x 360	-

FEED RATE

Rapid traverse (X,Y,Z)	m/min (in/min)	61 (2,401)	61/100 (2,401/3,937)	61 (2,401)
Rapid traverse (swivel)	min^{-1}	-	60	-
Rapid traverse (rotary)	min^{-1}	-	150	-

WORKING SPINDLE (40% ED, S6)

42,000 min^{-1}, HSK-E40	kW/Nm	13.5/8.8	13.5/8.8	13.5/8.8
36,000 min^{-1}, HSK-E50	kW/Nm	33/21	33/21	33/21

WORK TABLE

Table	mm (in)	900 x 600 (35.43 x 23.62)	-	900 x 600 (35.43 x 23.62)
Pallet/clamping surface	mm	-	Dynafix 280 x 280/350 x 350 UPC 320 x 320	-
Max. table load	kg (lbs)	500 (1,102)	120 (264)	1,000 (2,204)

TOOL MAGAZINE

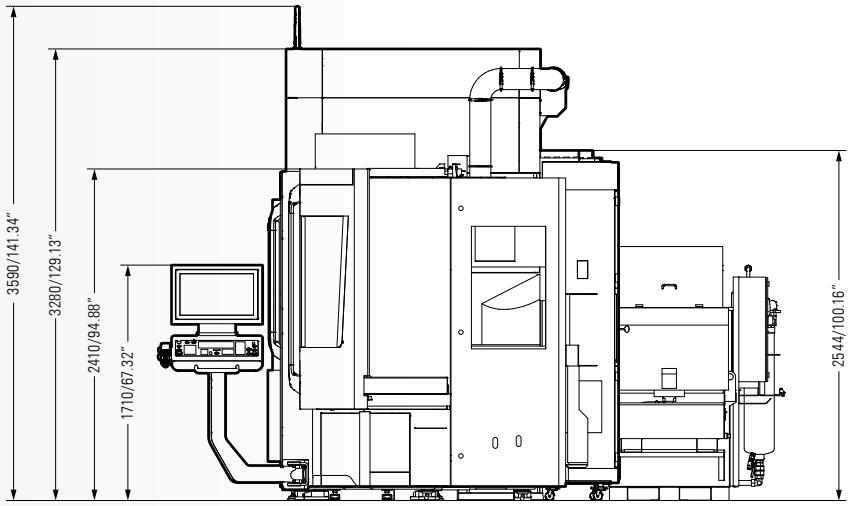
HSK-E40	piece	68/168	68/168	68/168
HSK-E50	piece	15/30/60/120/170/220	15/30/60/120/170/220	15/30/60/120/170/220

WEIGHT

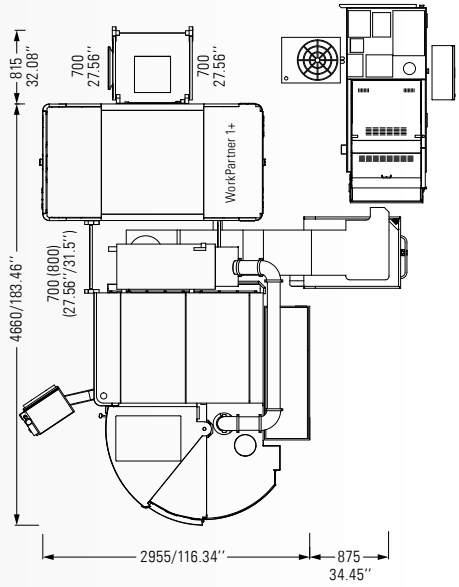
Machine	kg (lbs)	9,900 (21,825)	9,900 (21,825)	9,900 (21,825)

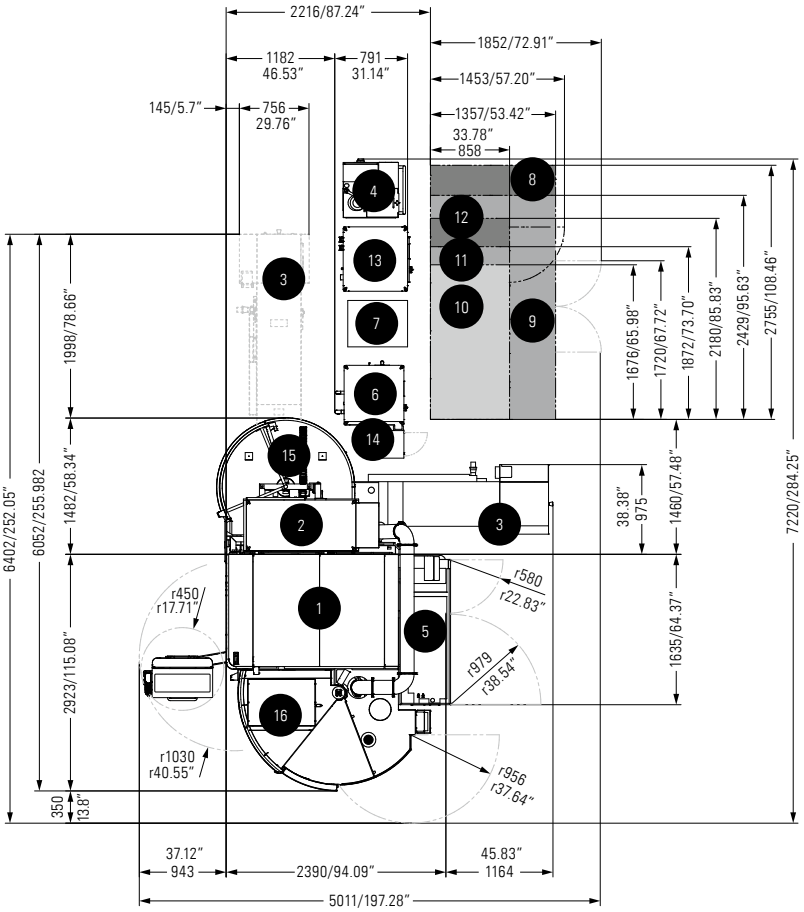
CONTROL UNIT

Heidenhain		TNC 7	TNC 7	TNC 7
Siemens		SINUMERIK ONE	SINUMERIK ONE	SINUMERIK ONE



MILL S 600 – MILL S/X 600 U – MILL S 800



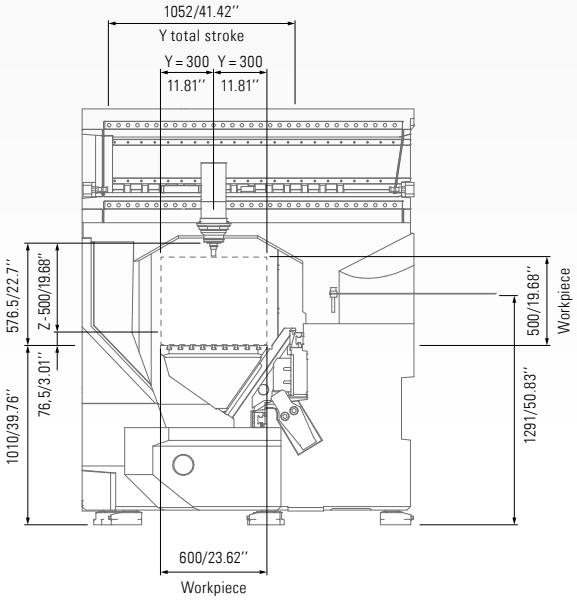


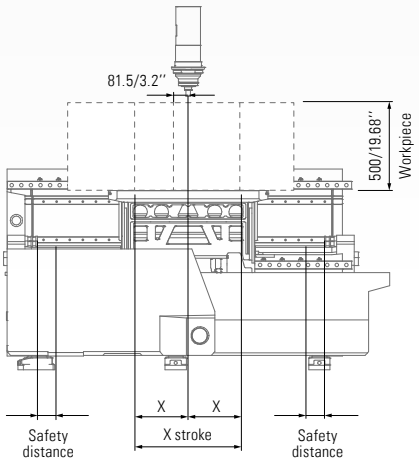
1. Machine
2. Mist extraction unit
3. Lift-up chip conveyor (scraper and slat band-type)
4. Wet graphite centrifuge
5. Tool magazine tower
6. Cooling unit
7. CoolCore cooling unit
8. Endless belt filter system (950 liters)
9. Band filter system (950 liters)
10. Basket filter system (450 liters)
11. Band filter system (450 liters)
12. Endless belt filter system (450 liters)
13. Coolant thermal control
14. CO_2 fire extinguishing system
15. Pallet magazine
16. Pressure-relief damper

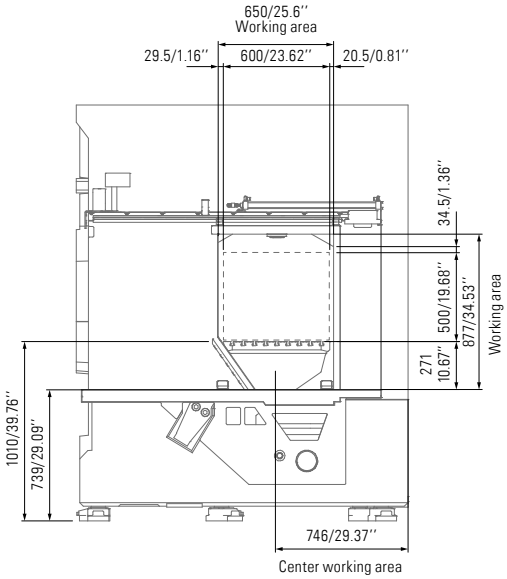
MILL S 600 – MILL S 800

	MILL S/X 600	MILL S 800
X	300/11.81''	400/15.75''
X stroke	600/23.62''	800/31.5''
Safety distance*	105/4.13''	5/0.2''

* SW to HW end position



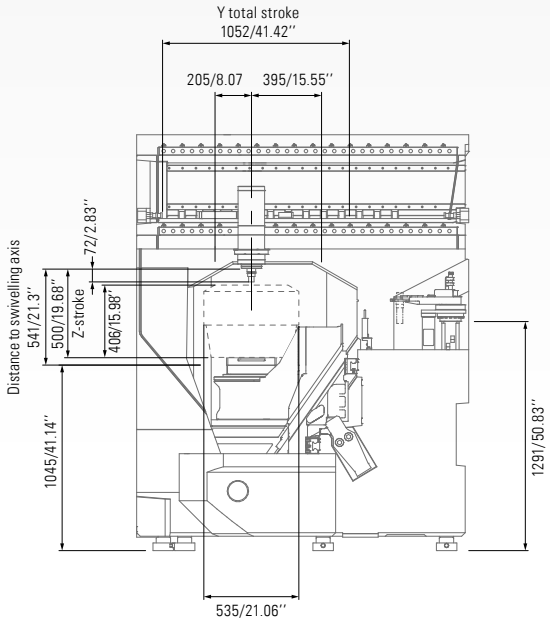


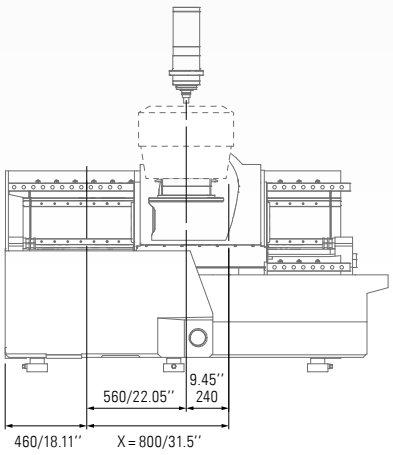


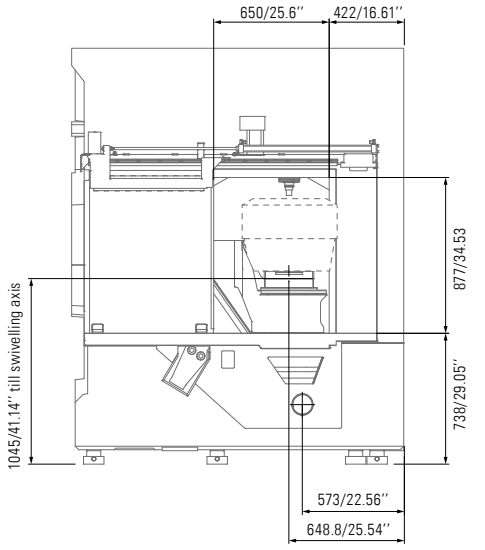
MILL S/X 600 U

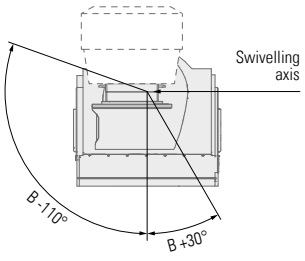
Max. machinable workpiece
at B-Axis 0° and 90° (Dynafix/UPC)

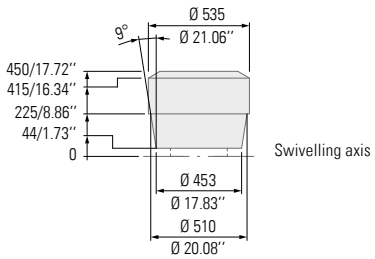
Caution:
Max. workpiece dimensions
not valid for pallet magazine (WPC)











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

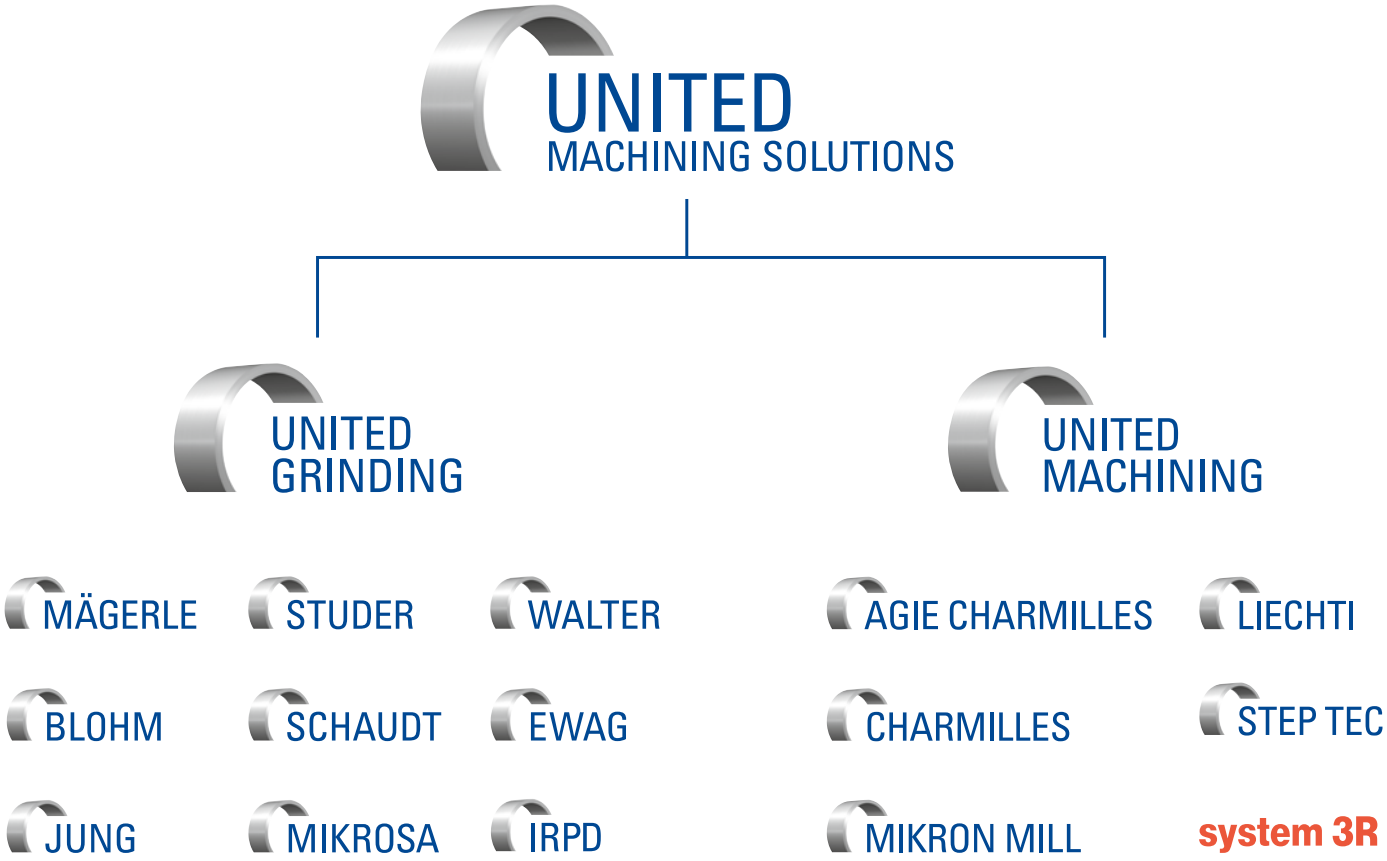
UNITED MACHINING SOLUTIONS

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»



MIKRON MILL

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BLUeCOMPETENCE
Alliance Member
Partner of the Engineering Industry Sustainability Initiative