MILL E

500 U / 700 U



MIKRON MILL

UNLEASH YOUR FULL POTENTIAL

The range of solutions is a second-generation successor to the HEM U range. It brings greater machining capacity and better machining performance to a more robust machine base. With the large swivel range from -65° to + 120° and the ability to load heavy parts up to 450 kg onto the tilting, swiveling table, these solutions U allows users to manufacture a wider range of parts and tools than any other machine currently on the market. It is based on a stiff and stable C-frame construction made out of cast iron. Thanks to large guideways, a double side-supported rotary table and an optimum chip removal rate, this machine delivers quality on parts and reliable operations. Whether you are a job shop or a part producer, these machines are the right solutions to help you tackle the many different requirements coming from the automotive, energy and power generation, and general mechanics industries.



BILLABLE AUTONOMY	MORE CAPACITY	HIGHER QUALITY	HEAVY-DUTY, PRECISE AND DYNAMIC MILLING
24/7	50%	100%	10%



Unleash your business.
Unleash your best.

TYPICAL APPLICATIONS

AEROSPACE: PLATE COVER

Market segment	Aerospace
Material	AL 7575

Wall thickness	0.5 mm
Surface finish	Ra 0.5 µm
Accuracy	± 0.05 mm
Repeatability	24/7 parts production



MEDICAL: SURGICAL SUPPORT DEVICE

Market segment	Medical
Material	AL 6061

Process time	6.5 h
Surface finish	Ra 0.3 µm
Production cost reduction	30%



MEDICAL: HOOK BONE PLATE

Market segment	Medical
Material	SS 17-4

Swivel range of	+120° to -65°
Surface finish	Ra 0.5 µm
Processing time	80 min



AUTOMOTIVE: AIRBAG SHOOTING DEVICE

Market segment	Automotive
Material	Material: AL 6082

Tools from	Ø 4 mm to Ø 40 mm
Removed material	0.021 m^3/min
Process time	23 h
Accuracy	± 0.03 mm



MOLD AND DIE: COOKIE BLISTER

Market segment	Mold and die
Material	AL 6082

Tool diameter	1.5 mm
Surface finish	Ra 0.5 µm
Removed rate	+ 210 cm^3/min
Accuracy	± 0.05 mm



MACHINERY AND GENERAL MECHANICS: COVER PLATE

Market segment	Machinery and general mechanics
Material	AL 6082

Wall thickness	< 1 mm
Removed rate	+ 210 cm^3/min
Accuracy	± 0.05 mm



HIGH-EFFICIENCY MILLING

The MIKRON MILL E U series is a dynamic, high-efficiency machine center for entry-level five-axis machining.

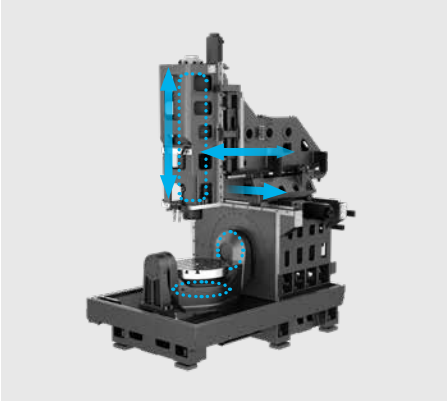
It provides highly efficient and productive processing for all kinds of materials, including aluminum alloys and stainless steel. This solution's economical design saves spaces and its ergonomics make it easy for your operator to use.

- Produce your workpieces in a process-secure and precise manner
- Increase reliability in unmanned operation
- Boost the service life of the machine
- Significantly reduce production costs



EFFICIENCY AND PRODUCTIVITY FOR 5-AXIS MACHINING

THE RIGHT SOLUTION—FOR YOU



Stiff machine construction



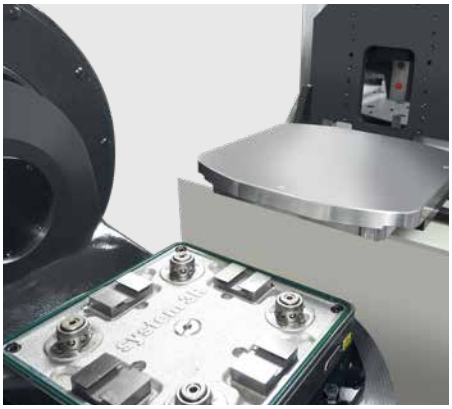
Double-supported rotary torque table



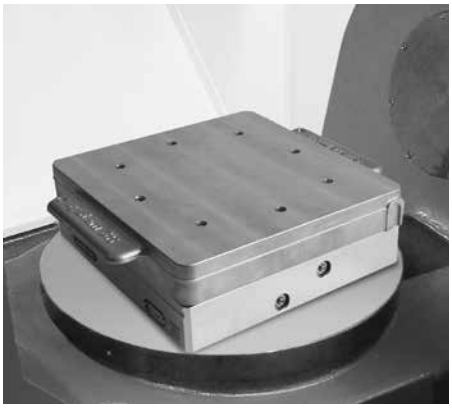
STEP TEC Spindle: 120 Nm, 20,000 rpm



Heidenhain TNC 640



Integrated Automation or third-party automation



Integrated palletization

CUSTOMER BENEFITS

- Benefit from the dynamic behavior essential to perfect part production.
- Machine under maximum load generates minimal noise and achieves top quality on your parts.
- Get the performance and Spindle power to execute all kinds of applications.
- Enjoy unmanned production—nights or weekends—with your favorite Automation system.

MILL E 500 U / 700 U CORE COMPONENTS

UP TO 60 TOOLS INTEGRATED. 215 TOOLS ON A TOOL TOWER

Easy loading during operation

20,000 RPM MOTOR SPINDLE WITH 120 NM

Best surface finish for both roughing and finishing

DIRECT DRIVE ROTARY AND TILTING TABLE

High positioning accuracy and repeatability thanks to direct drive technology

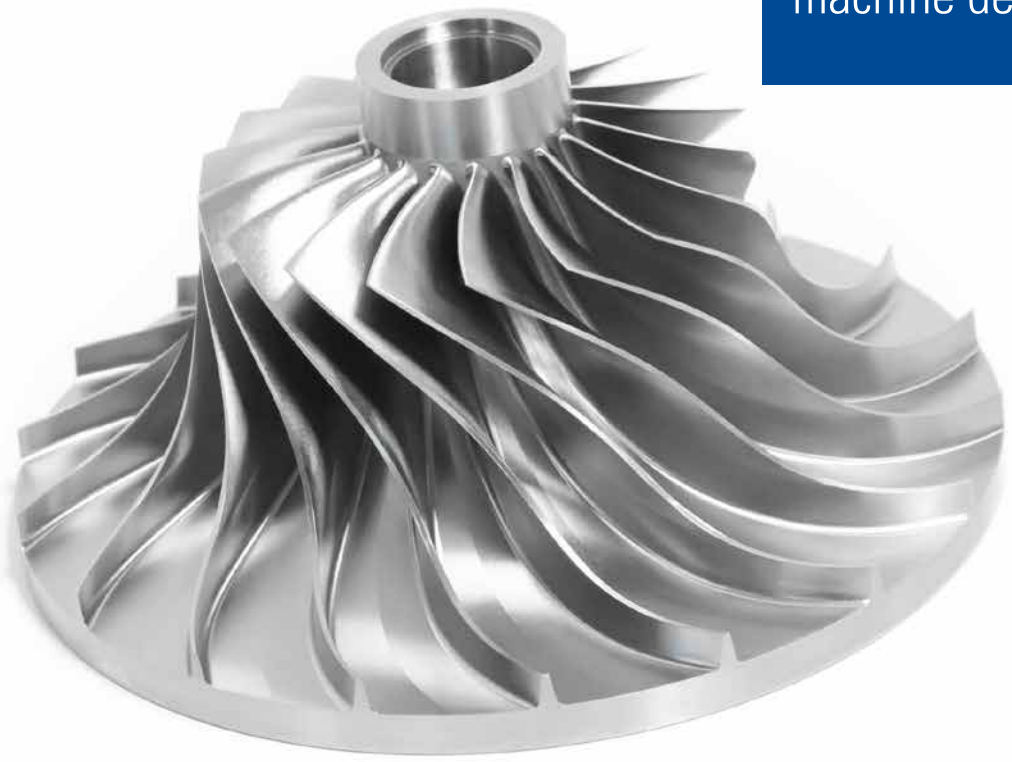
COMPACT FOOTPRINT AND ERGONOMIC ACCESS

Highest efficiency and ergonomics on smallest space

LARGE SWIVEL RANGE FROM -65° TO +120°

Allows perfect access with the optima l tool length to the part

More than 50 years legacy of machine design expertise



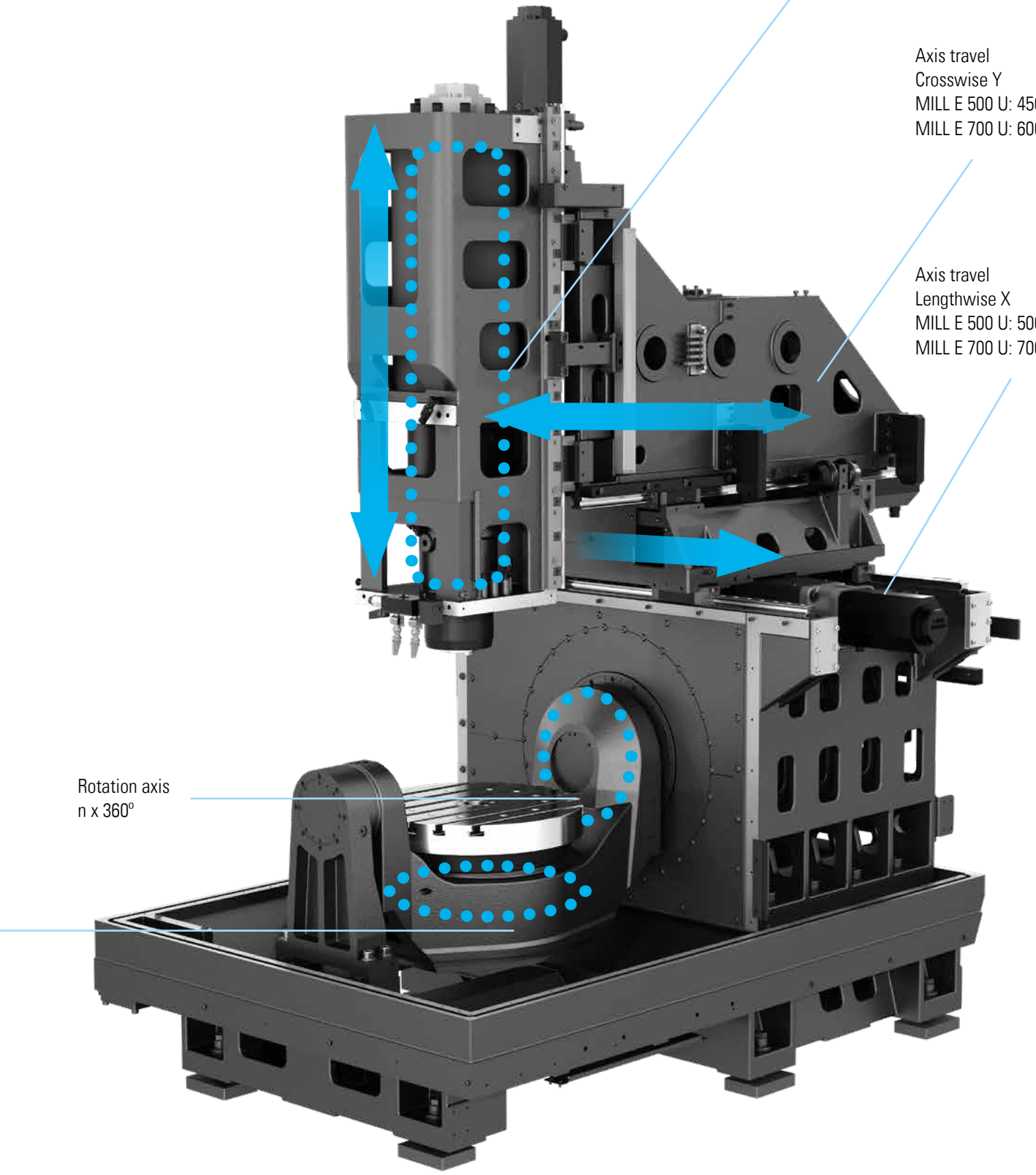
Swivel axis
MILL E 500 U: -65 / +120°
MILL E 700 U: -65 / +120°

Axis travel
Vertical Z
MILL E 500 U: 400 mm
MILL E 700 U: 500 mm

Axis travel
Crosswise Y
MILL E 500 U: 450 mm
MILL E 700 U: 600 mm

Axis travel
Lengthwise X
MILL E 500 U: 500 mm
MILL E 700 U: 700 mm

Rotation axis
n x 360°



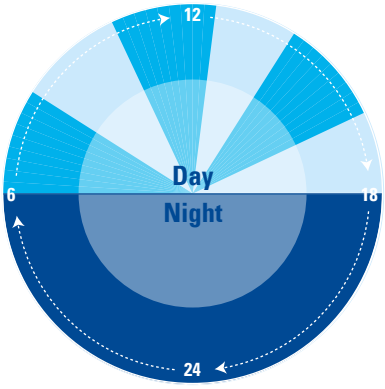
RAMP UP YOUR PRODUCTIVITY AND FLEXIBILITY

You'll run additional shifts 24/7 at lowest cost.

Execute small, express jobs with the same efficiency and profitability as mid-size series or repeat orders.

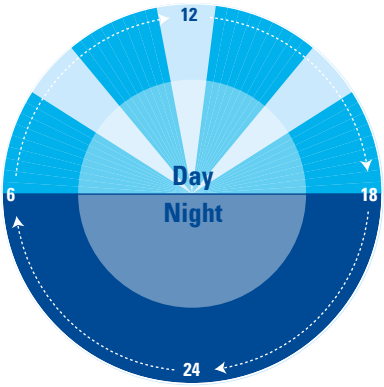
Your progress to higher productivity:

Step 1
Move from three-axis, multi-clamping Milling to five-axis, one-clamping Milling.



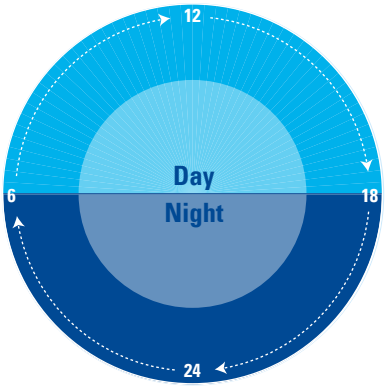
+46%
productivity

Step 2
Upgrade the machine:
clamping with System 3R



+20%
productivity

Step 3
Extend your system:
pallet magazine and clamping with System 3R



+16h
additional capacity daily

- Fast setup time
- Lowest machine downtime
- High profitability
- Broad flexibility
- Efficient productivity

Generate a fast return on invest with a MIKRON MILL E U series with 20,000 rpm Spindle, simultaneous torque table and our own pallet MIKRON MILL pallet Automation with up to seven pallets.





INTEGRATED PALLETIZATION

Take your productivity to new levels while reducing your costs with our superior Automation solution. The pallet magazine's generously dimensioned door allows optimum pallet access for loading light parts by hand and heavy parts by crane. Larger windows allow a good view into the pallet area, and pallets are managed by using the machine control.



Ergonomic door design for easy loading of parts up to 200 kg

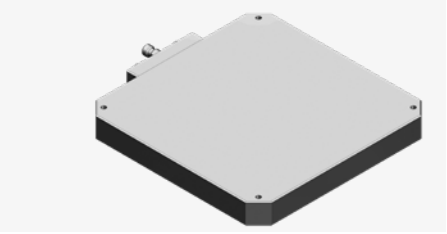
Five-sided processing in one clamping

5-Axis processing offers significant advantages for large and small components. Using 5-Axis technology, it is possible to process different shapes and surfaces with one clamping device.

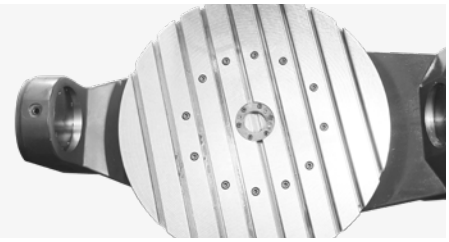
- Rotary swiveling table available as a pallet version: System 3R (Dynafix/Delphin)
- Rotary swiveling table available as a generously dimensioned tabletop version (Ø 500 / 630 mm with parallel T-grooves)
- Cartesian (right-angled) arrangement of the axes results in easily understood tool/workpiece movements during the Milling process
- Direct measurement on the B and C axes
- Machine available as 5-Ax or 5-Axis simultaneous versions



Dynafix pallet Automation



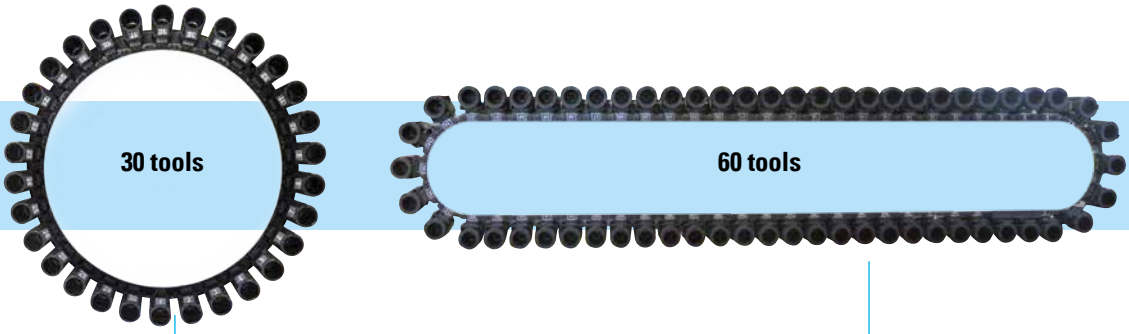
Delphin pallet Automation



Rotary swiveling table with parallel grooves

WE HAVE THE SOLUTION FOR YOUR NEEDS

- Ergonomic and user friendly
- Ensures productivity and process reliability
- Parallel machining and tool loading
- Easy tool loading possibilities thanks to an ergonomic tool loading door





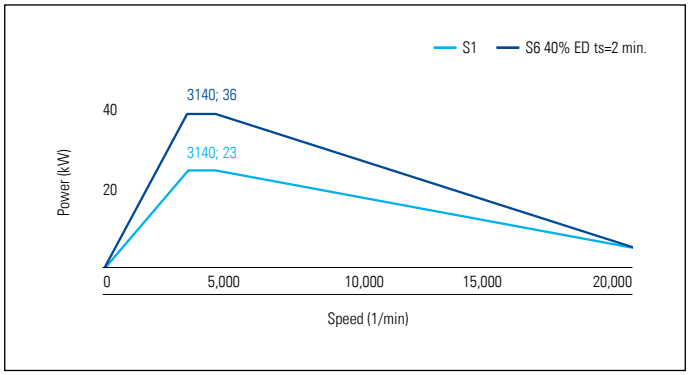
120, 170 or 215 tools

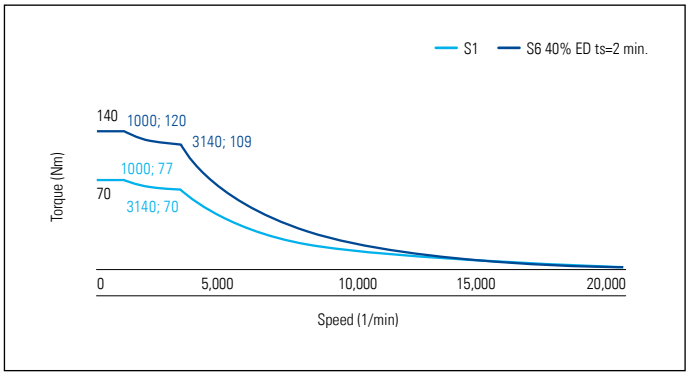
Circular magazine design with handling system



HIGH-EFFICIENCY MILLING AND EFFECTIVE PROCESSING

The high-performance Spindles on the MIKRON MILL E 500 U / 700 U series are designed to do heavy roughing and Milling to best surface finish all at once. With a bearing design with three preloaded hybrid ball bearings in the front and a thermally robust hybrid cylindrical roller bearing on the back, you are guaranteed a super-rigid rotating system that enables Milling with extra-long tools reaching into deep cavities. Ramp up your chip removal, thanks the feed rates made possible by this solution's absorption of high Milling forces at the tool tip.





The 20,000 min-1 Spindle features the well-proven OptiCool principle that keeps the front bearing area cool while the extra heat barrier cooling loop keeps the motor heat away from the Spindle nose. That results in a thermally balanced Spindle thus assuring a high level of precision, repeatability and surface finish.

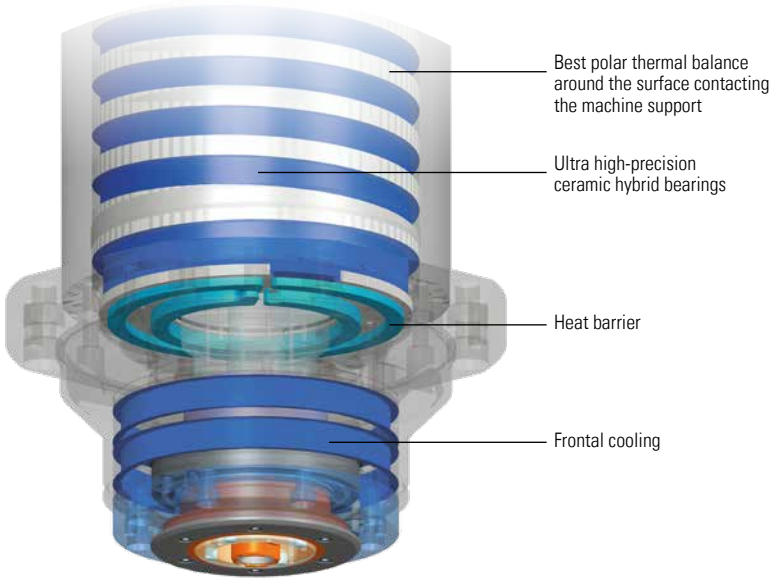


OptiCool

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.

- Highest precision due to optimized thermal balance of the entire machining head
- Satisfies the toughest requirements in surface finish, repeatability and reliability

Stator cooling circuit



SLOTTING OPERATION

DESCRIPTION

- Slotting with a depth of 1.5xD is a challenging task for the machine.
- The feed rate was set to a spindle load of 85%.
- Tests with more speed brought the machine to soar up.

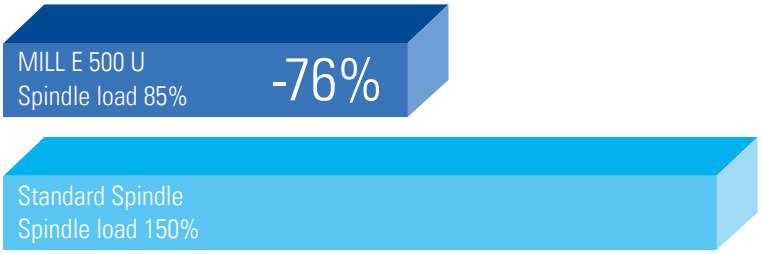


TOOL

- Type: Ø 16 mm end mill
- Manufacturer: FRANKEN (2615AZ.016)

DESCRIPTION

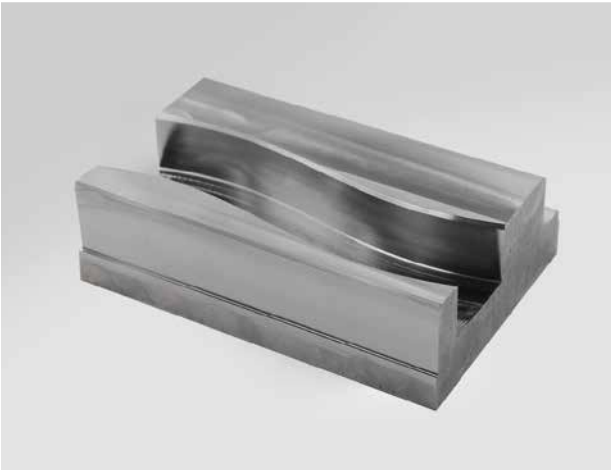
- Spindle speed: 2,586 min-1
- Feed rate: 1,034 mm/min
- Cutting depth: 24 mm
- Step over: 16 mm
- Material removal rate: 397 cm3/min



MACHINERY AND GENERAL MECHANICS

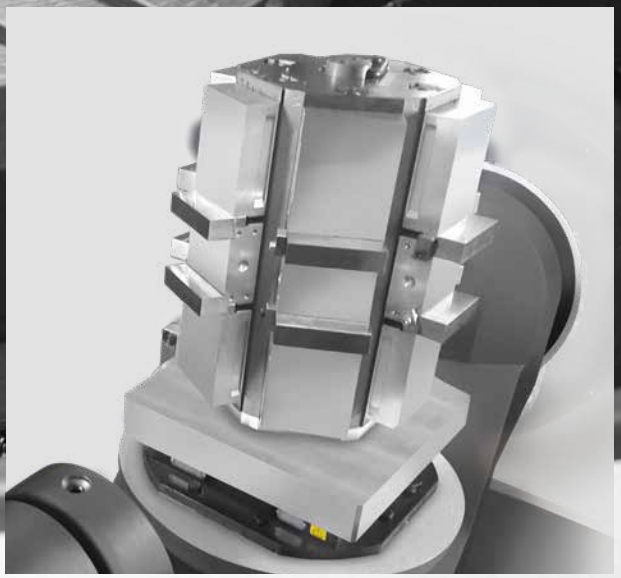
Market segment	Machinery and general mechanics
Material	X153CrMoV12

Removed material	+160 cm^3/min
Removed material	397 cm^3/min
Spindle load	-76%



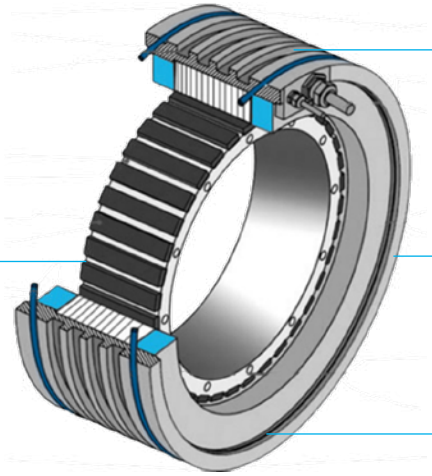
The standard version of the swivelling table is ideally suited to the machining of workpieces in multiple clamping devices.

- No wear
- High dynamics
- High accuracy
- No backlash



DIRECT DRIVE ROTARY TILTING TABLE

Direct torque drive technology allows excellent precision and surface finish on the workpiece. The fact that there are no mechanical transmission elements involved in the force transmissinon means that friction and wear as well as reduction in dynamic and rigidity are things of the past. All rotary tables are designed and manufactured in-house by MIKRON MILL.



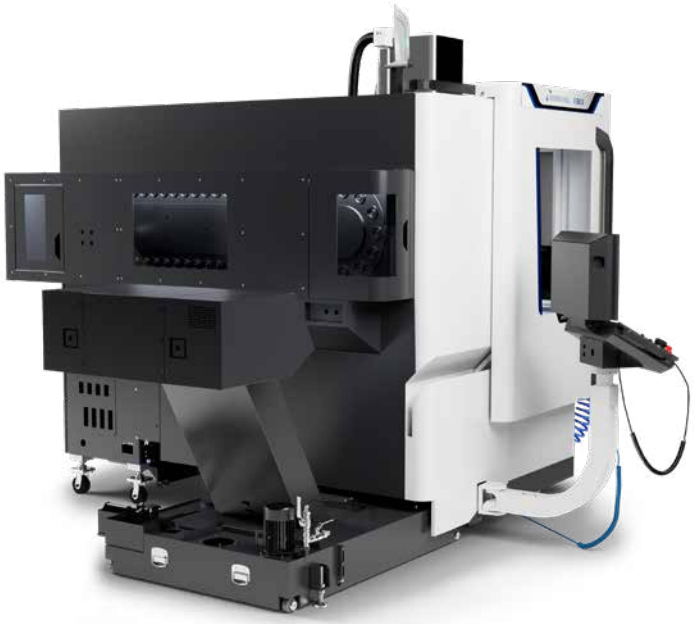
AUTOMOTIVE: CONCENTRICITY CHALLENGE

Market segment	Automotive
Material	CK45 steel

Warm-up cycle	30 min
Thermal stability	24/7
Repeatability within	10 µm
Concentritcty of two holes	< 10 µm
Bore length	2x 150 mm



CLEAN MACHINING, WET OR DRY



ADAPTED CHIP MANAGEMENT

- Solution for high-volume small and light chips with lift-up scraper chip conveyor and coolant unit with fine filtration
- Solution for high-volume steel Milling chips with lift-up scraper chip conveyor and coolant filtration unit



OPTIONS

- Through-Spindle coolant
- Wash-down system
- Oil skimmer

- Optimum chip flow to steep and smooth cabin walls
- Wash-down nozzles for all corners to prevent chip accumulation
- Professional lift-up scraper to transport 43 l/h chips out of the working area





EFFICIENT PROCESSING WITH FAST RETURN ON INVESTMENT

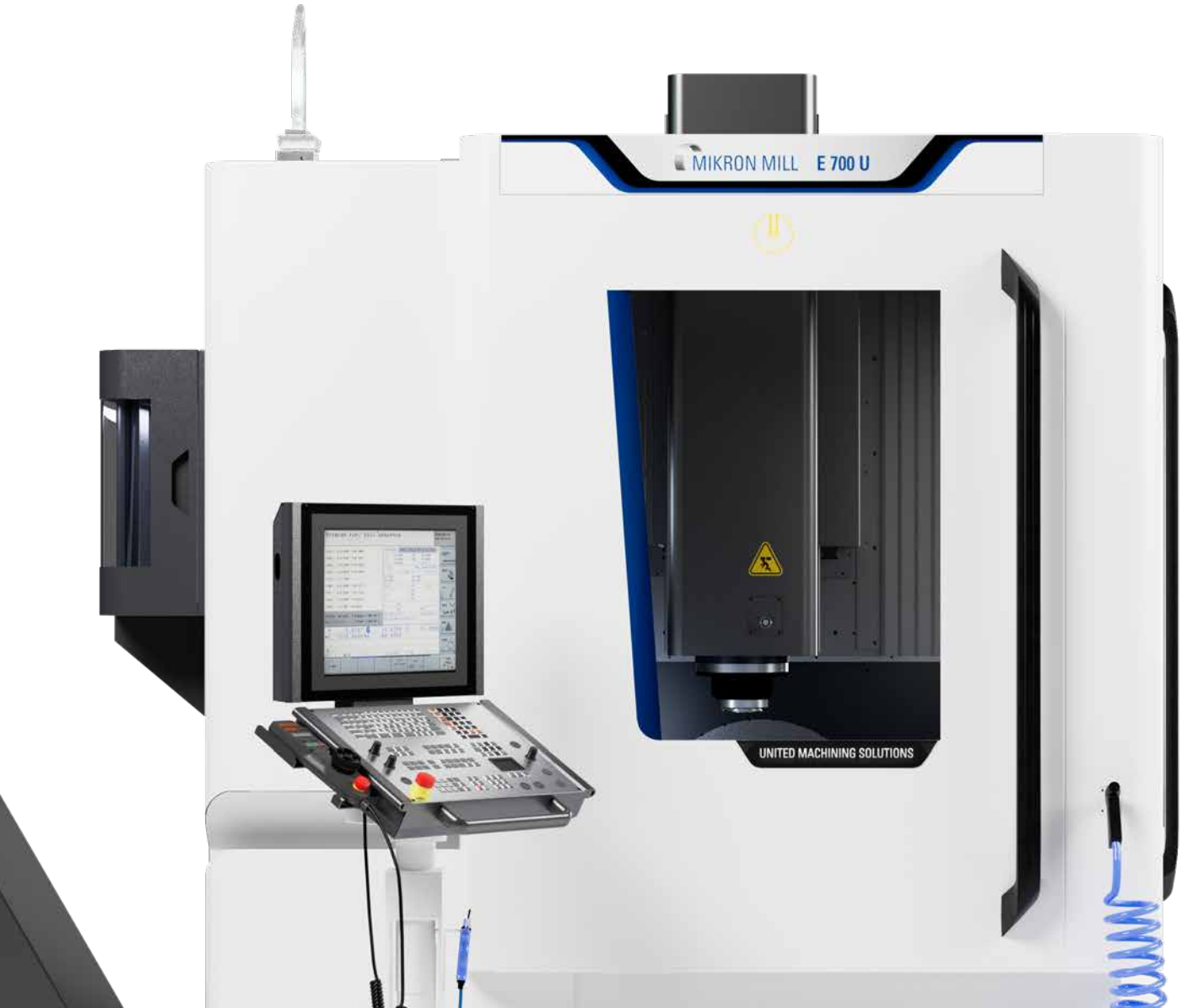
OPTIMAL MACHINING TO ENHANCE YOUR PROCESS BEYOND PROGRAM AND MACHINE SETUP

This includes a range of modules collectively referred to under the generic term “smart machine” and that fulfill various functions. In order to make the Milling process “intelligent,” various requirements have to be implemented.

1 is establishing comprehensive communication between man and machine, which makes available precise information that the operator requires to assess the Milling process.
2 is supporting the operator in the optimization of the process, which considerably improves the performance.
3 is the machine optimizing the Milling process, which improves process safety and workpiece quality—especially important in unmanned operation.

The Heidenhain TNC 640 control provides flexibility and efficiency from job preparation until part is milled. Mounted on a pivot arm to give more operator’s accessibility, the touchable screen allows the operator to quickly navigate through the control. Thanks to an user-friendly and practical interface in combination with several functionalities, the TNC 640 support operators in their daily job giving to them more availability for other tasks.

- Produce your workpieces in a process-secure and precise manner
- Increase reliability in unmanned operation
- Boost the service life of the machine
- Significantly reduce production costs



SMART MACHINE CONSTRUCTION KIT SYSTEM

Select task-specific modules that best suit your workflow and improve your process.

Saving energy
Cut energy use up to 50% for environmentally friendly economic advantages.

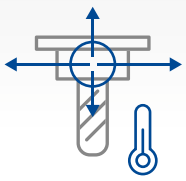
Time
Boost your output while you improve surface finish and accuracy with ISM and software tools, including My rConnect.

Precision
Achieve part precision down to 5 µm with base support of your machining center through ITC.

Protection
Protect and extend the lifetime of your machine and your tools with PFP and ISM.

ITC

Intelligent Thermal Control
With ITC the machine has the thermal process knowledge. Automatic recalibration.



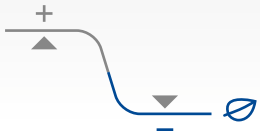
PFP

Power Fail Protection
Protects against power failures and voltage drops. Safety through a controlled process.



ECONOWATT

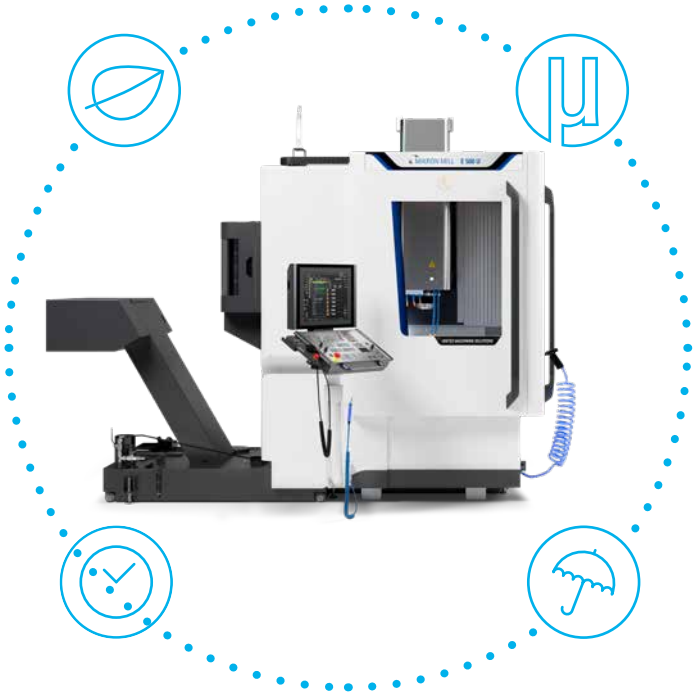
Econowatt
Saving energy: an ecological necessity and an economic advantage.



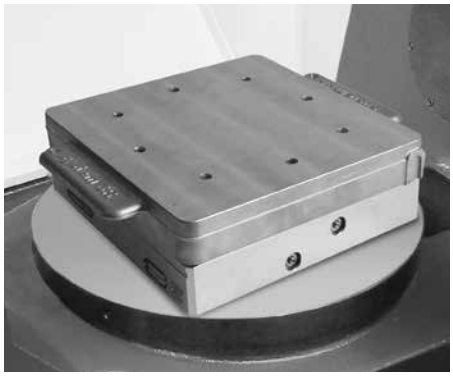
ISM

Intelligent Spindle Monitoring
3D Spindle vibration monitoring system. React adequately to the given situation.

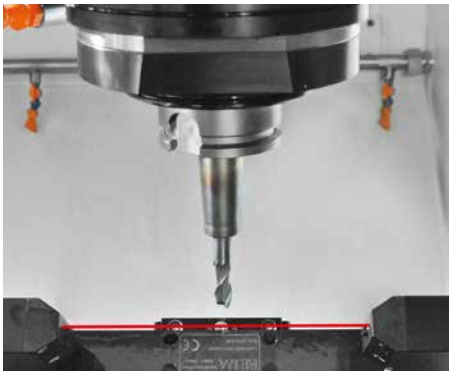




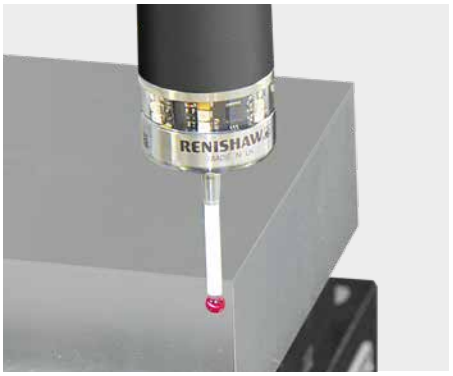
MULTIPLE OPTIONS TO DRIVE YOUR SUCCESS



Pallets



Laser tool measuring system



Infrared measuring probe



Mist extraction



Air through Spindle/coolant through Spindle



Wash down system



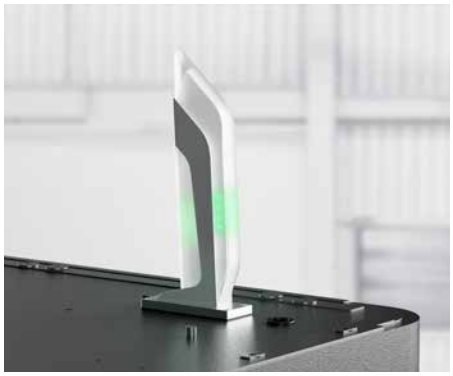
TSC belt filter system (20 or 50-70 bar)



Rotating inspection window



Operation mode 3



Signal light

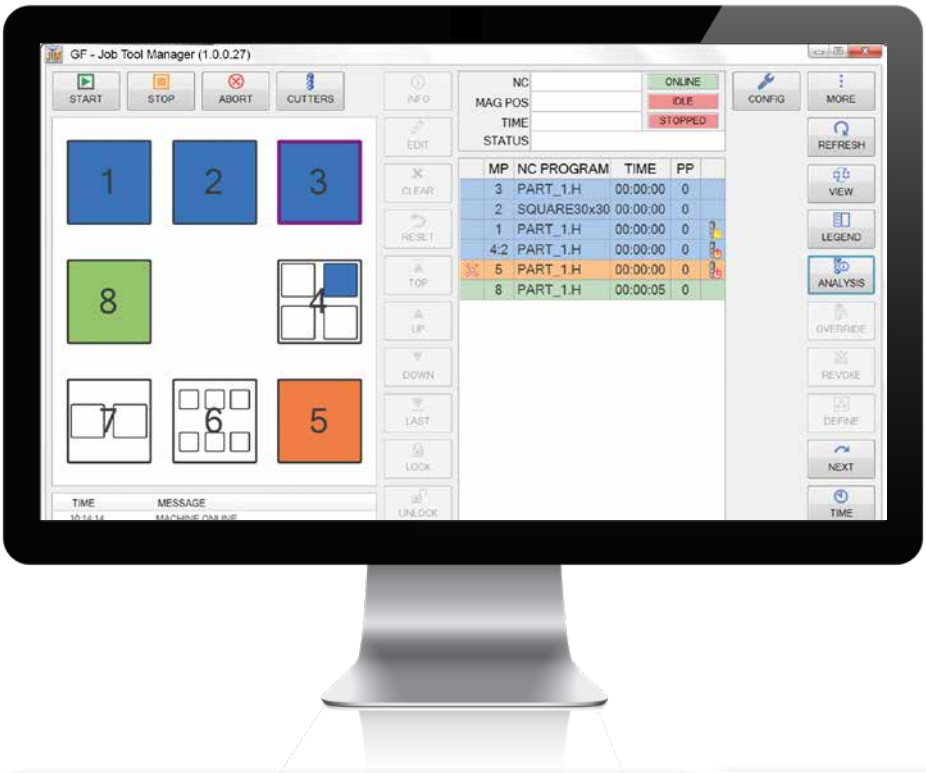
- Extended warranty
- Mimimal quantity lubrication
- Scratched proofed window
- Oil skimmer
- Robot interface

Additional options

- ISM
- ISM extended
- ITC
- PFP
- EconoWatt
- DNC
- KinematicsOpt

smart machine

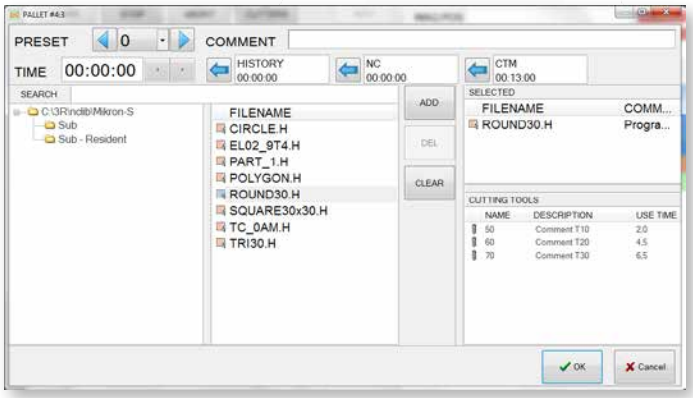
JOBTOOLMANAGER (JTM)

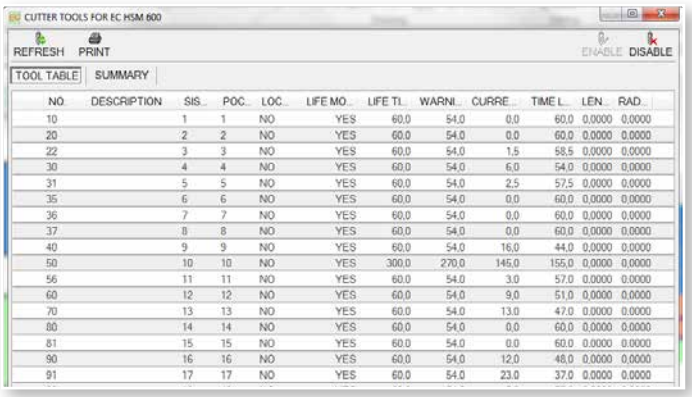


User friendly software for one machine with integrated pallet changer. Assign NC programs to pallet position by drag and drop on a touch screen, close to the pallet changer.

ADVANTAGES

- Easy to change priorities when the machine is working
- Add or remove jobs while machining
- Jobs where cutters are missing will not be started
- Estimated and present machining time for the magazine content are calculated.





Assign NC file, check tool capacity, schedule

By selecting the NC program, JobToolManager register the tools used in the in the program. Time is stored if the NC program defines the time for the entire machining or if each tool has its use time. If the program has been used earlier, it automatically displays the last recorded time.

Manage tools upon jobs to be done

Each time a new job is started, JobToolManager checks the machine tool table to see the availability of tools. If a tool is broken and no sister tool is available, will the job be blocked.

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

	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 checkup on the core machine components		✓	✓
Discounts Preferred prices for parts and labor		✓	✓
Extended warranty For up to five years			✓

TECHNICAL DATA: MIKRON MILL E 500 U – MIKRON MILL E 700 U

WORK AREA

		MILL E 500 U RTT 5-Axis simultaneous	**MILL E 700 U** RTT 5-Axis simultaneous
Longitudinal (X)	mm (in)	500 (19.68)	700 (27.56)
Lateral (Y)	mm (in)	450 (17.72)	600 (23.62)
Vertical (Z)	mm (in)	400 (15.75)	500 (19.68)
Swiveling axis	°	-65 / +120	-65 / +120
Rotary axis	°	n x 360	n x 360
Axis		5-Axis simultaneous	5-Axis simultaneous

SPINDLE

Spindle type		Motor	Motor
Max. rotations	min^{-1}	20,000	20,000
Max. torque	kW/Nm	36/120	36/120
Tool interface		HSK-A63	HSK-A63

FEED RATE

Rapid traverse (X,Y,Z)	m/min (in/min)	30 (1,181)	30 (1,181)
Rapid traverse (B)	min^{-1}	32	32
Rapid traverse (C)	min^{-1}	112	112

AUTOMATION

Integrated tool magazine	unit	DT 30 / CT 60	DT 30 / CT 60
Tool tower	unit	120 / 170 / 215	120 / 170 / 215
Pallet magazine	unit	5 Delphin 400/400 or 5 MTS 400/400 or 7 Dynafix 350/350 or 7 UPC 320/320	5 Delphin 400/400 or 5 MTS 400/400 or 7 Dynafix 350/350 or 7 UPC 320/320
Pallet changing time	sec.	30	30
Robot interface		Available	Available

ROTARY SWIVEL TABLE

T-groove table	mm (in)	500 (19.68)	630 (24.80)
Workpiece weight (3/5)	kg (lbs)	300/200 (661.39/440.92)	450/450 (992.08/992.08)

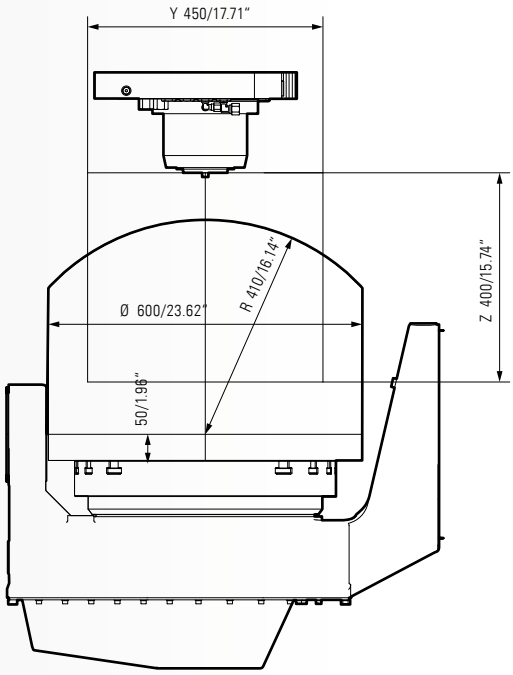
WEIGHT

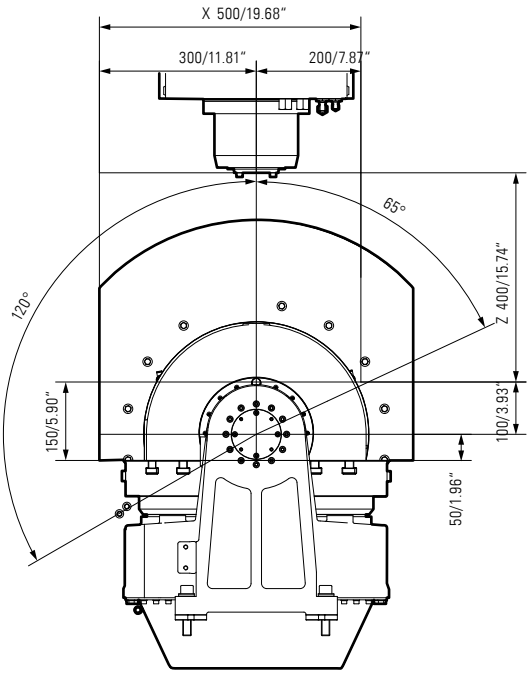
Machine weight	kg (lbs)	6,030 (13,293.87)	8,060 (17,769.26)

CONTROL

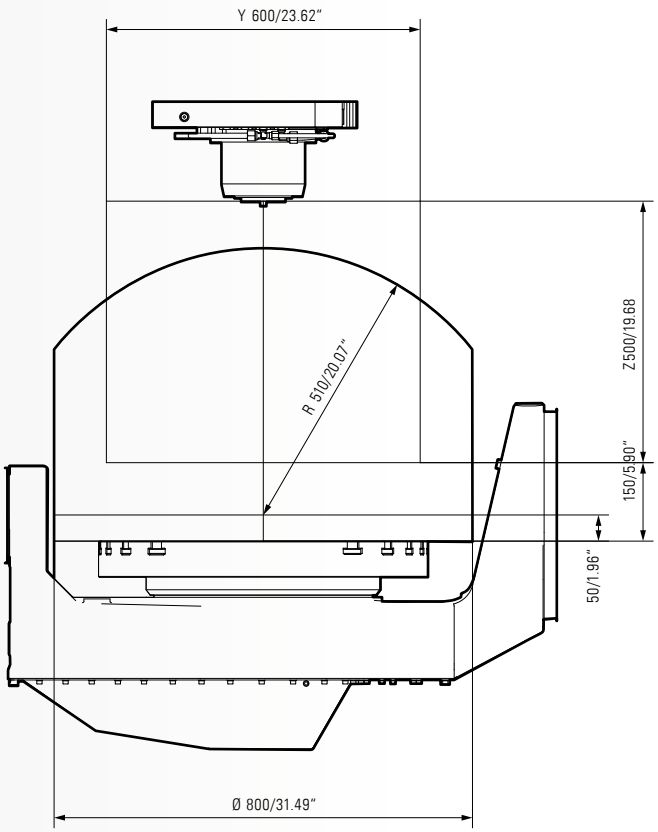
Heidenhain		TNC 640	TNC 640

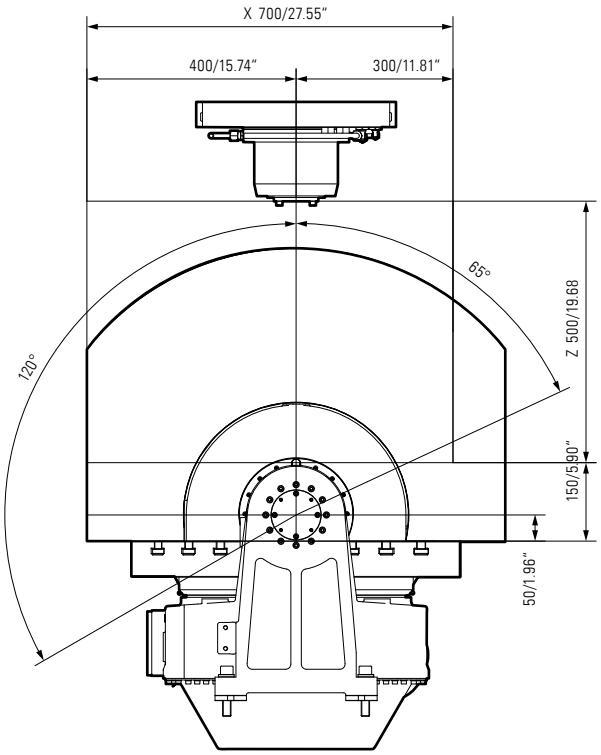
MILL E 500 U



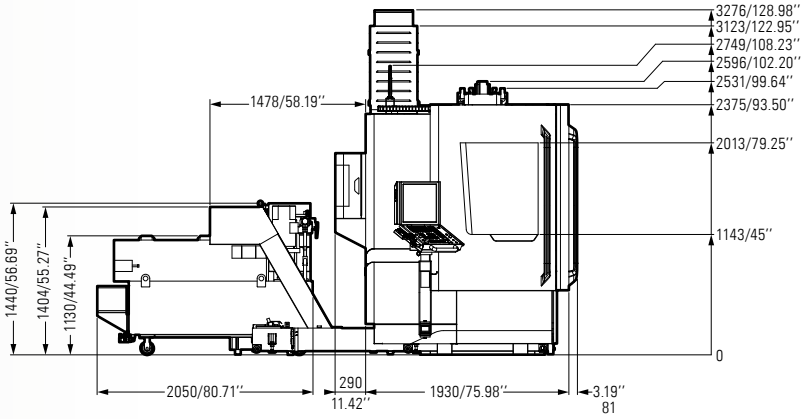


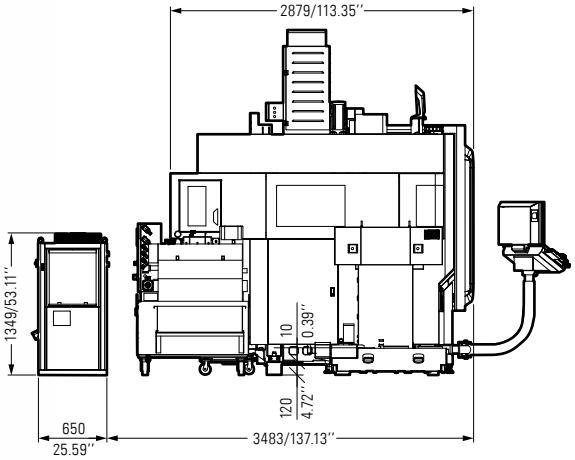
MILL E 700 U

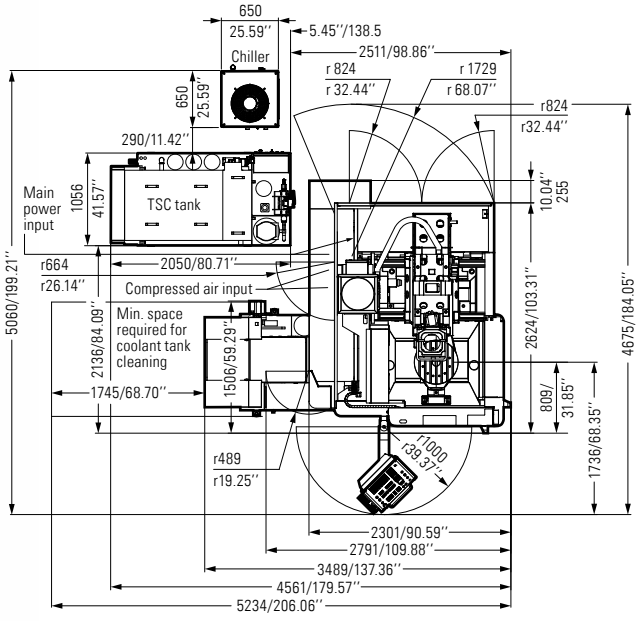




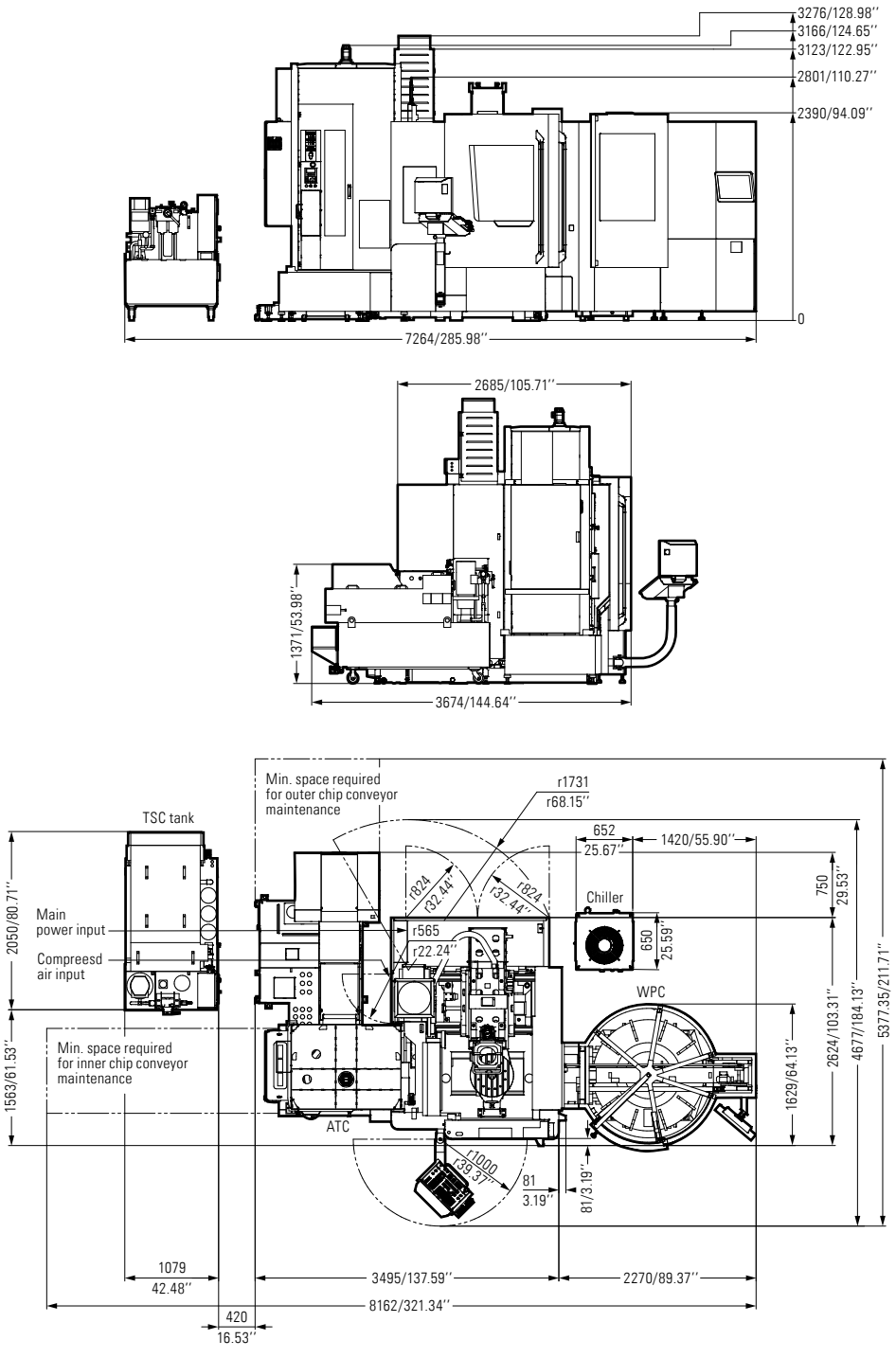
MILL E 500 U


3276/128.98''
3123/122.95''
2749/108.23''
2596/102.20''
2531/99.64''
2375/93.50''
2013/79.25''
1143/45''
0
1478/58.19''
1440/56.69''
1404/55.27''
1130/44.49''
2050/80.71''
290
11.42''
1930/75.98''
3.19''
81

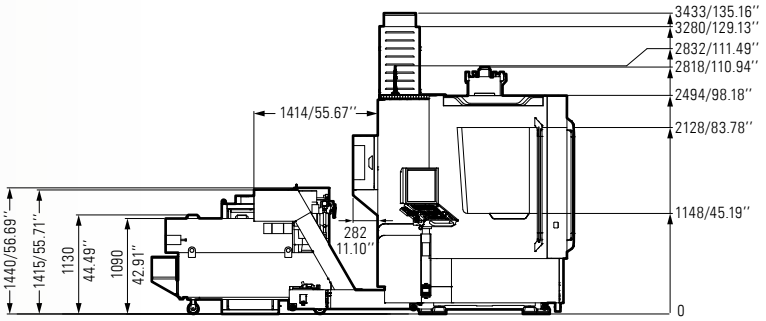

2879/113.35''
1349/53.11''
10
0.39''
120
4.72''
650
25.59''
3483/137.13''

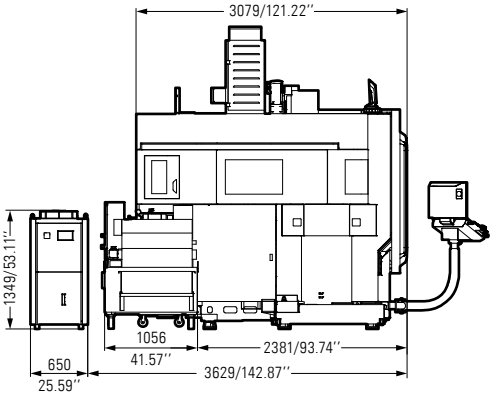

650
25.59''
5.45''/138.5
2511/98.86''
Chiller
r 824
r 32.44''
r 1729
r 68.07''
r824
r32.44''
650
25.59''
290/11.42''
Main
power
input
1056
41.57''
TSC tank
10.04''
255
r664
r26.14''
2050/80.71''
Compressed air input
5060/199.21''
Min. space
required for
coolant tank
cleaning
2136/84.09''
1506/59.29''
2624/103.31''
4675/184.05''
1745/68.70''
809/
31.85''
1736/68.35''
r1000
r39.37''
r489
r19.25''
2301/90.59''
2791/109.88''
3489/137.36''
4561/179.57''
5234/206.06''

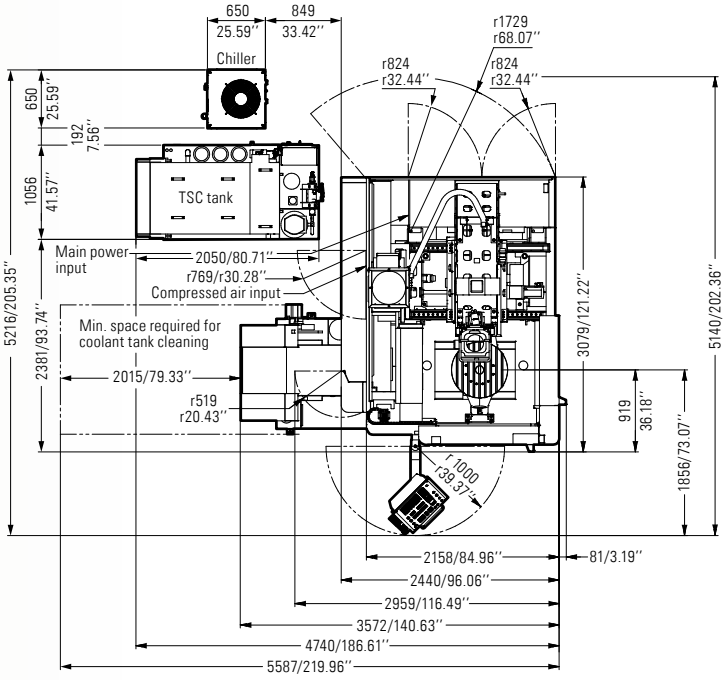
MILL E 500 U with pallet magazine and tool magazine 120, 170 or 215 tools



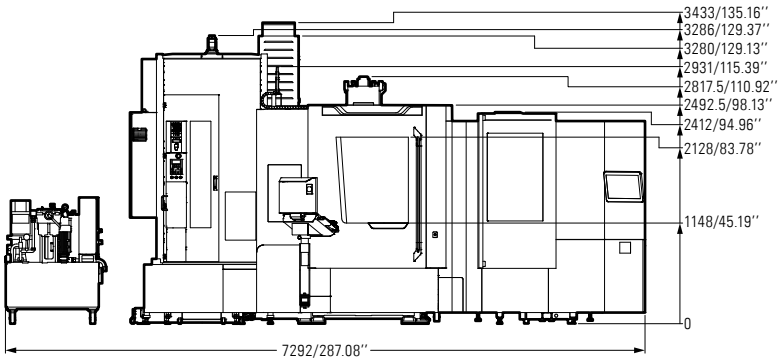
MILL E 700 U

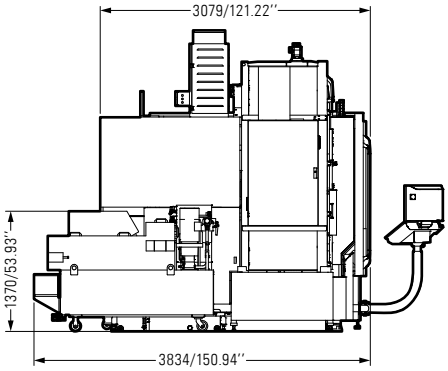

3433/135.16''
3280/129.13''
2832/111.49''
2818/110.94''
2494/98.18''
2128/83.78''
1148/45.19''
0
1414/55.67''
282
11.10''
1440/56.69''
1415/55.71''
1130
44.49''
1090
42.91''

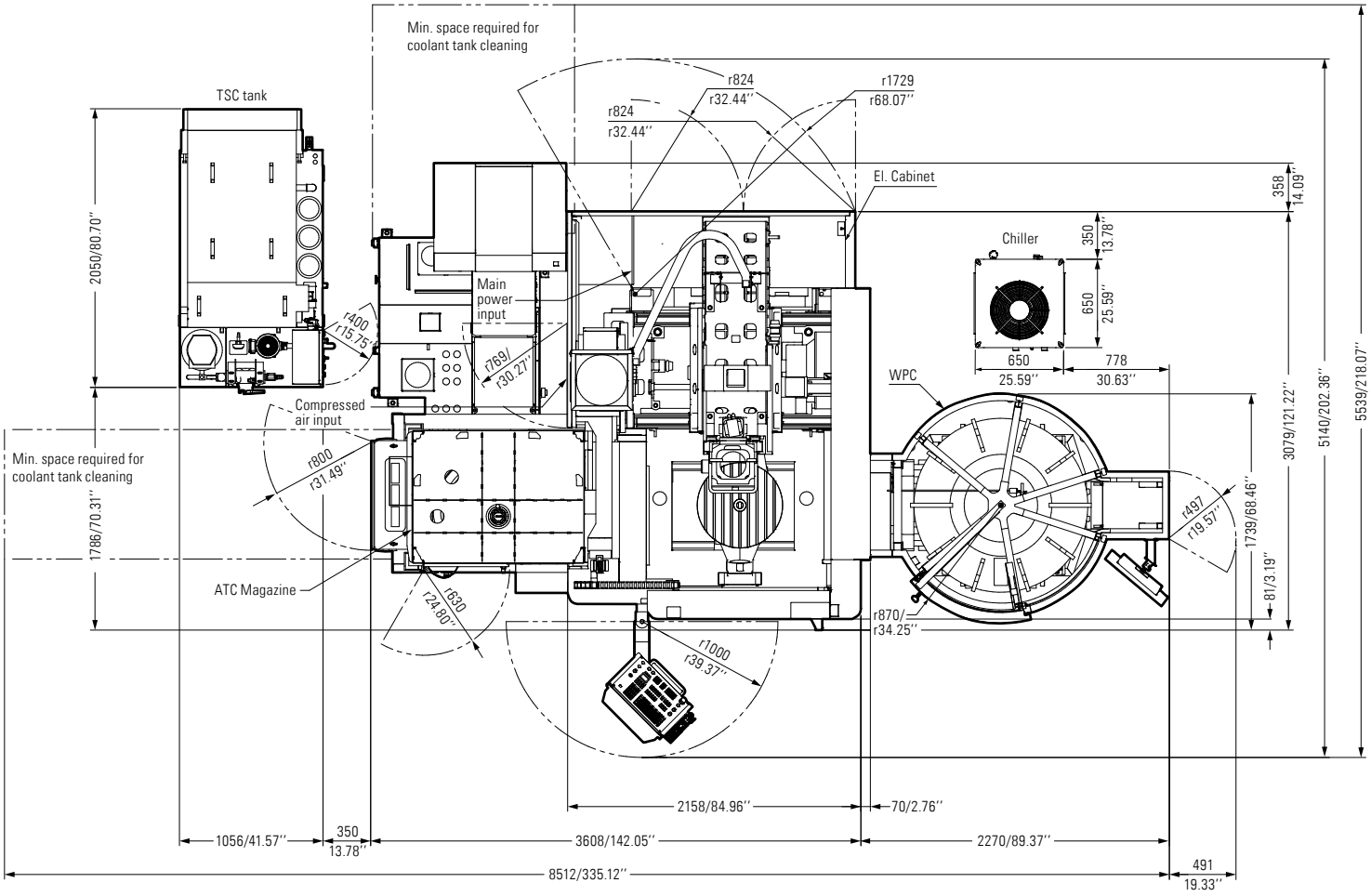

3079/121.22''
1349/53.11''
1056
41.57''
2381/93.74''
650
25.59''
3629/142.87''


650
25.59''
849
33.42''
Chiller
r1729
r68.07''
r824
r32.44''
r824
r32.44''
650
25.59''
192
7.56''
1056
41.57''
TSC tank
Main power input
2050/80.71''
r769/r30.28''
Compressed air input
Min. space required for coolant tank cleaning
2015/79.33''
r519
r20.43''
5216/205.35''
2381/93.74''
3079/121.22''
5140/202.36''
919
36.18''
1856/73.07''
r1000
r39.37''
2158/84.96''
81/3.19''
2440/96.06''
2959/116.49''
3572/140.63''
4740/186.61''
5587/219.96''

MILL E 700 U with pallet magazine and tool magazine 120, 170 or 215 tools







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

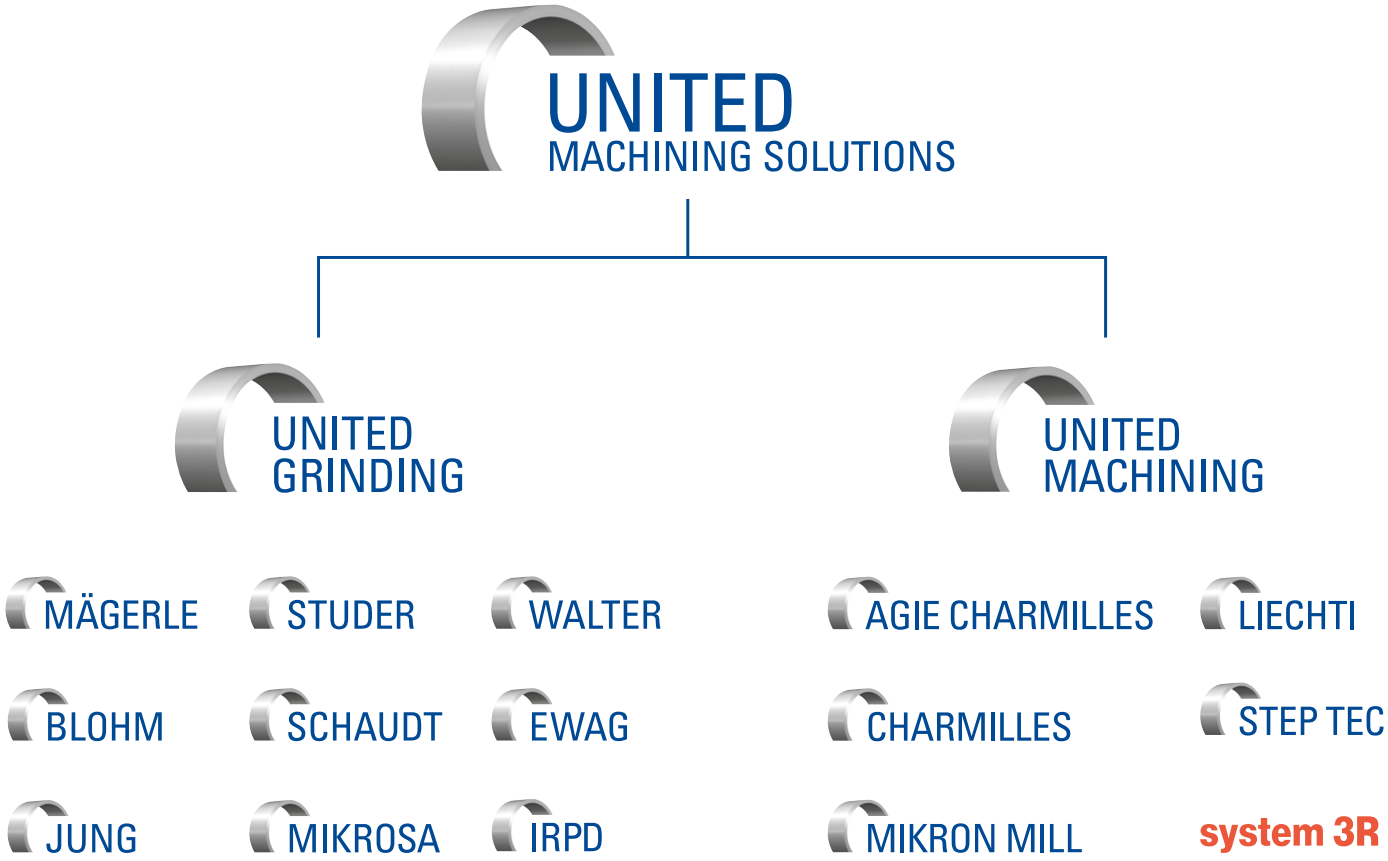
UNITED MACHINING SOLUTIONS

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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info@machining.com

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