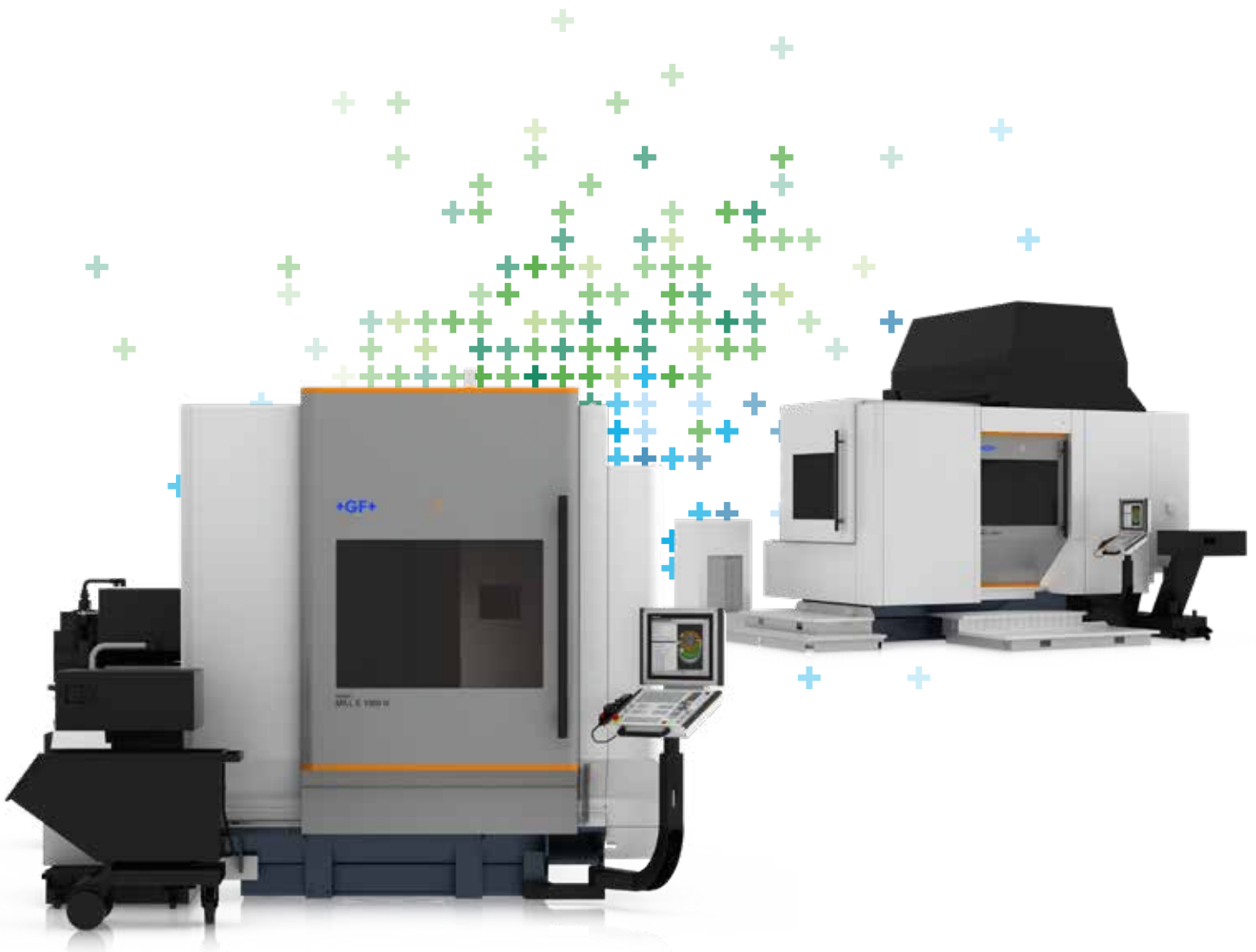


Mikron

MILL E

1000 U
1400 U
1900 U



Becoming better every day – since 1802

GF Machining Solutions

When all you need is everything, it's good to know that there is one company that you can count on to deliver complete solutions and services. From unmatched Electrical Discharge Machining (EDM), Laser texturing, Laser micromachining, Additive Manufacturing and first-class Milling and Spindles to Tooling and Automation, all of our solutions are backed by unrivaled Customer Services and expert GF Machining Solutions training. Our AgieCharmilles, Microlution, Mikron Mill, Liechti, Step-Tec and System 3R technologies help you raise your game—and our digital business solutions for intelligent manufacturing, offering embedded expertise and optimized production processes across all industries, increase your competitive edge.



+ We are Mikron Mill.
We are GF Machining Solutions.

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12	Tool magazine
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The Mikron MILL E 1000 U, MILL E 1400 U and MILL E 1900 U serve job shoppers looking for universality, great precision and efficient productivity as they deal with ever changing applications, ranging from tool making, prototyping to small series production.

Applications

Mikron MILL E U used for a broad spectrum of parts...





Bevel gear wheel

Hard machining
Transmission

- + High stability and precision
- + Very good surface quality
- + Absolute process security
- + Quality achieved: Q3



Suspension

Aluminium alloy
Car racing

- + High concentricity
- + 5-axis simultaneous machining
- + Precise bores at various angles



Turbines and compressor discs

Extreme high temperature resistant tough steels
Aerospace

- + High stability and precision
- + Very good surface quality
- + Absolute process security

Steering wheel mold

Automotive

- + Good surface qualities obtained, also for simultaneous machining
- + High machining performance
- + Machining all around the workpiece thanks to the large swivelling range



Technology

High-efficiency Milling

The Mikron MILL E U series is a compact and ergonomic high efficiency machine center serving job shoppers looking for universality

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.



Solutions

The right solution— for you



Stiff machine construction



Optimal accessibility

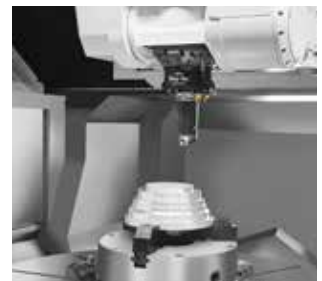


Step-Tec Spindle



Pallet changer 3 positions

- + Increase business opportunities with a two in one solutions
- + Easy load of big part thanks to an ergonomic concept
- + Get the performance and Spindle power to execute all kinds of applications.
- + Enjoy unmanned production—nights or weekends—with your favorite Automation system.
- + 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.



Simultaneous turning



Tool magazine from 30 to 336

Customer benefits

Robust and precise

A thought-through basic design for maximum rigidity

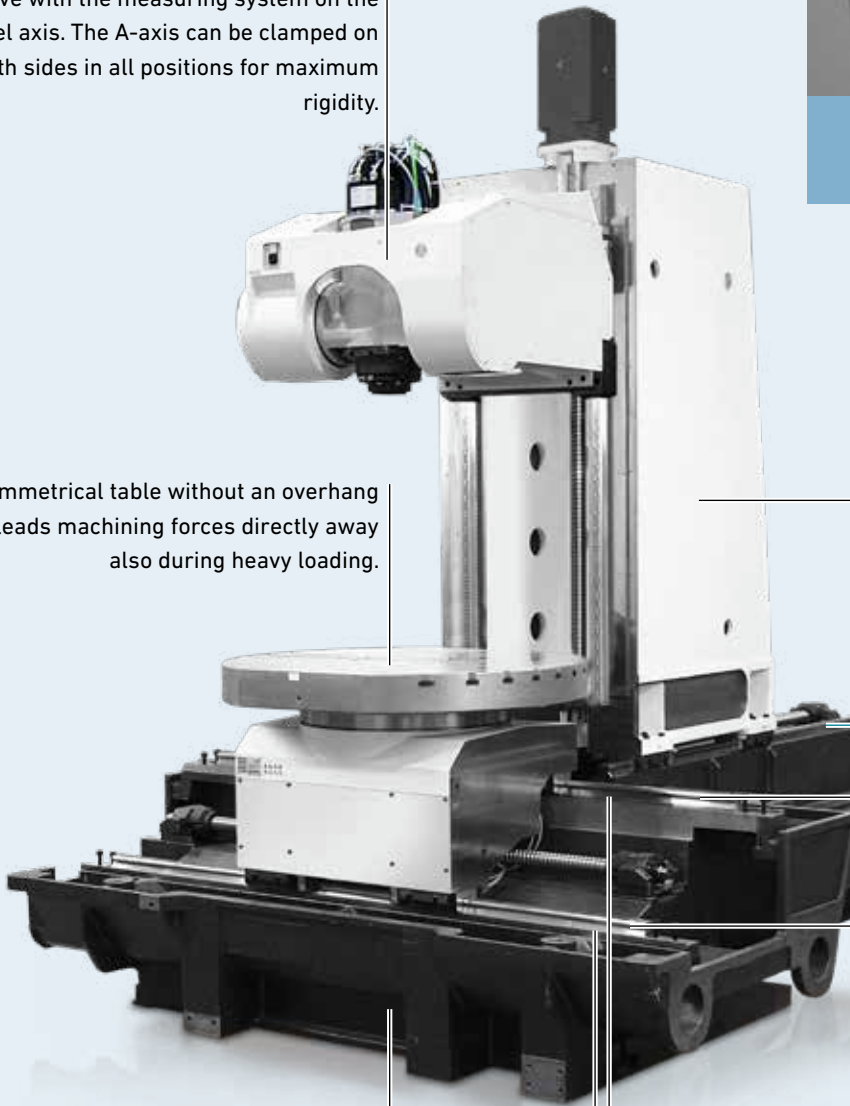
The swivelling head. A water-cooled direct drive with the measuring system on the swivel axis. The A-axis can be clamped on both sides in all positions for maximum rigidity.



MILL E 1000 U
MILL E 1400 U

A symmetrical table without an overhang leads machining forces directly away also during heavy loading.

Precision sustainability is guaranteed during the whole machining process due to the thermo-symmetrical structure used.



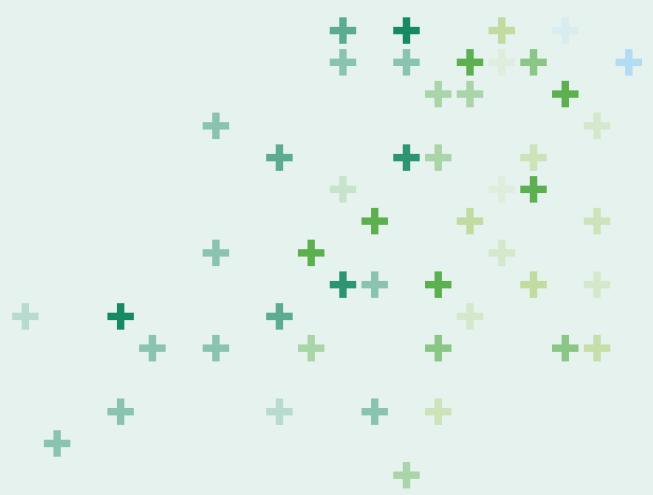
For the highest levels of precision: scraped support surfaces on the linear guides

The machine bed is cast out of one piece. It stands on 3 main feet.

The torsional rigidity of the X-axis is increased significantly by having the guideways on two levels. This particularly plays a role when heavy workpieces cannot be clamped centrally on the rotary table and these are turned.

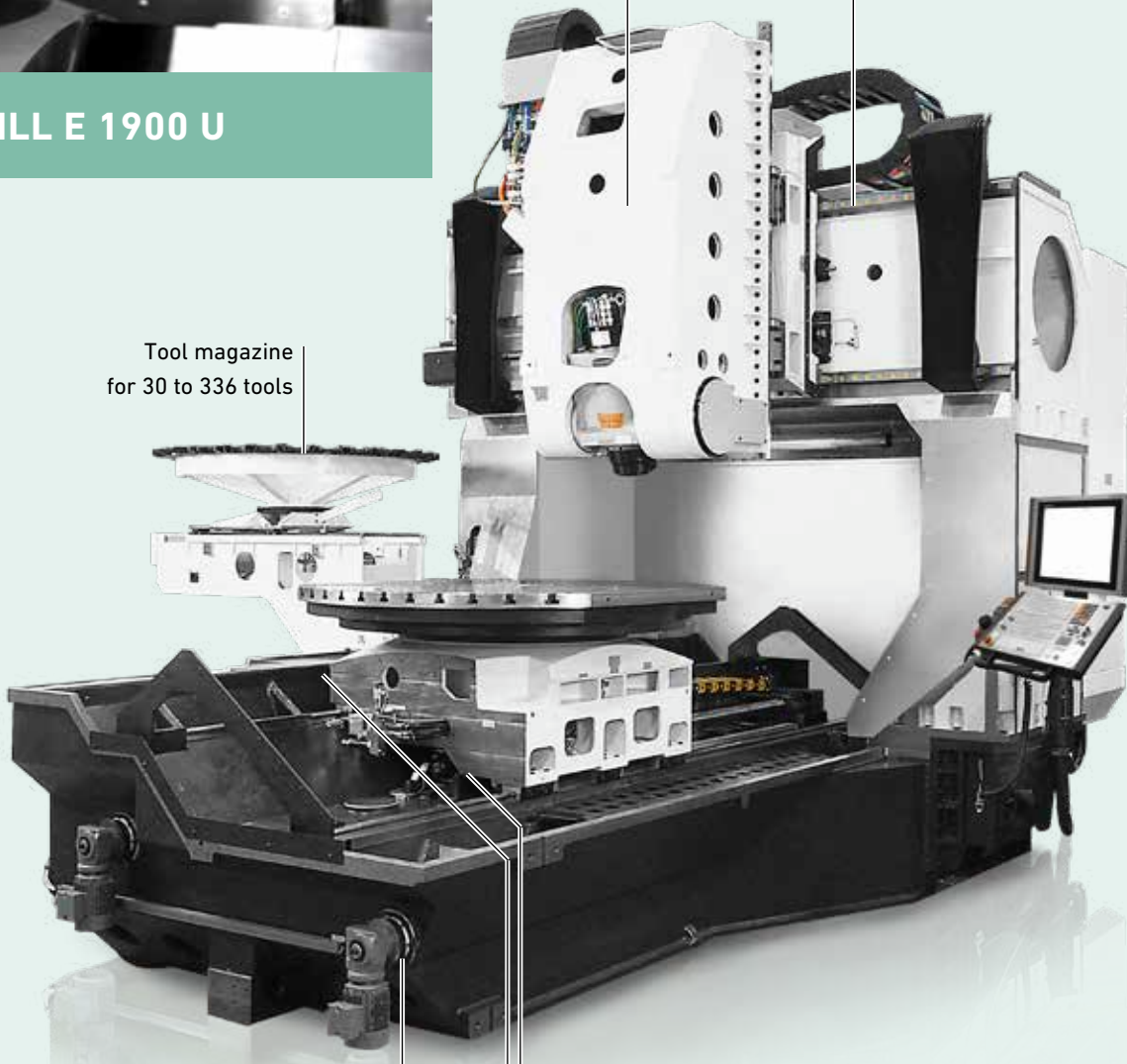


MILL E 1900 U



A new-type of construction of the Z-axis.
300 kg lighter than a comparable axis made out of a casting for the same stability and even better vibration damping.

Low temperature influences due to the interconnected mechanical gantry



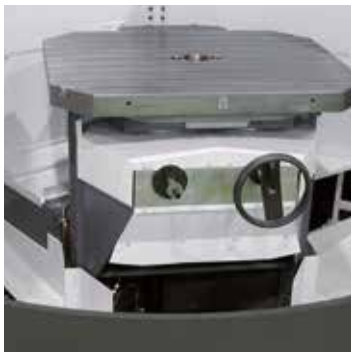
Tool magazine for 30 to 336 tools

The machine bed is cast out of one piece and stands on 3 main feet. This leads to a shorter start-up time.

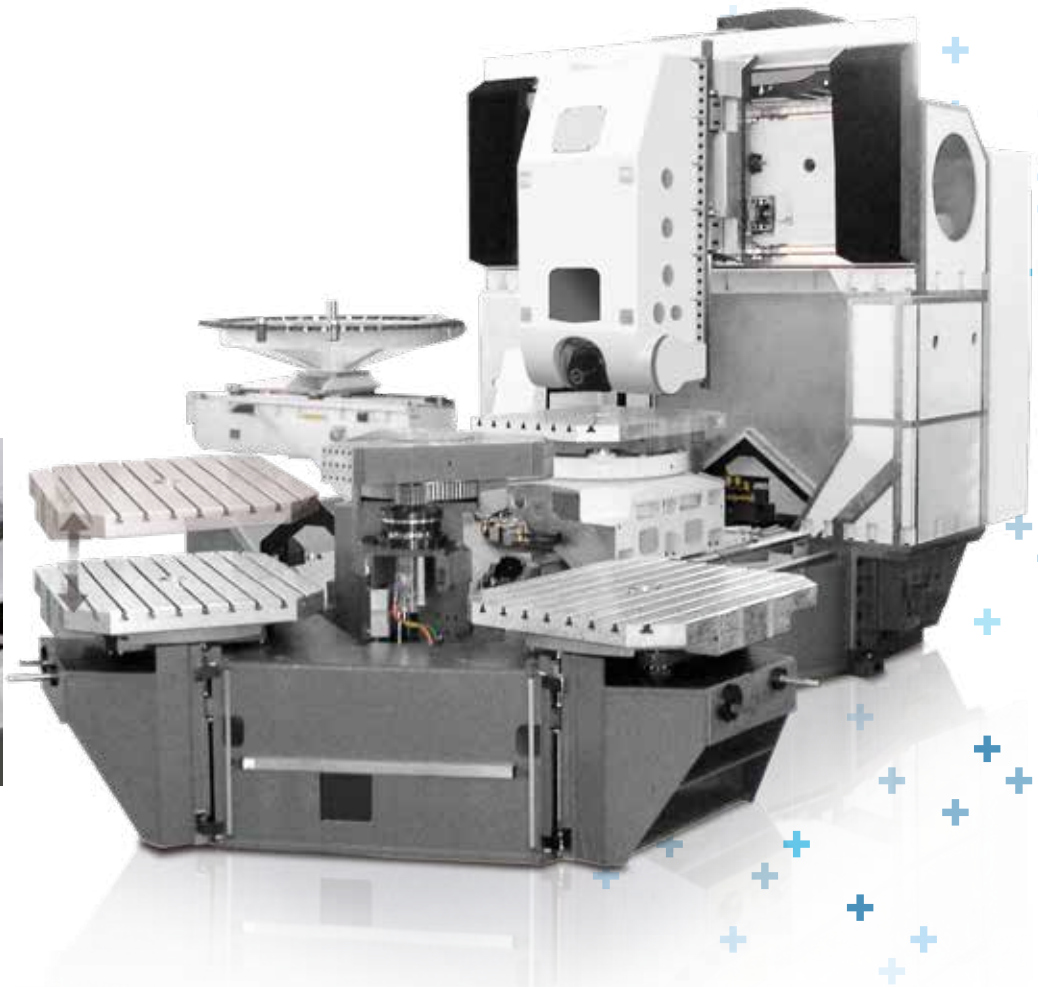
Two levels and distance between the guideways of more than 800 mm in the X-axis guarantees absolute torsional rigidity and stability during rough machining.

This particularly plays a role when heavy workpieces cannot be clamped centrally on the rotary table and these are turned.

Increased productivity through an ergonomic design



The normal work table height is reached without a platform through hydraulic lowering.



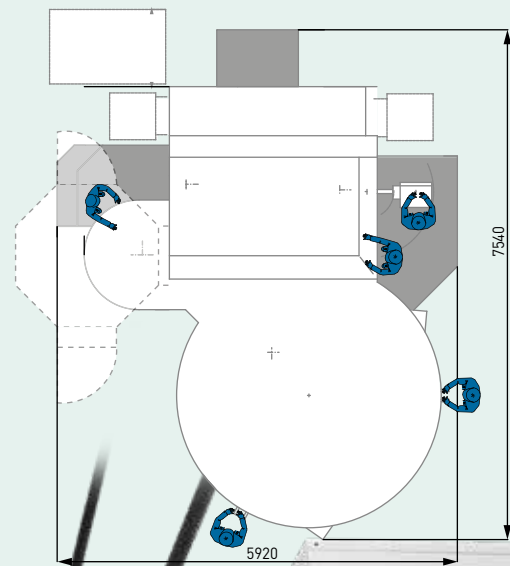
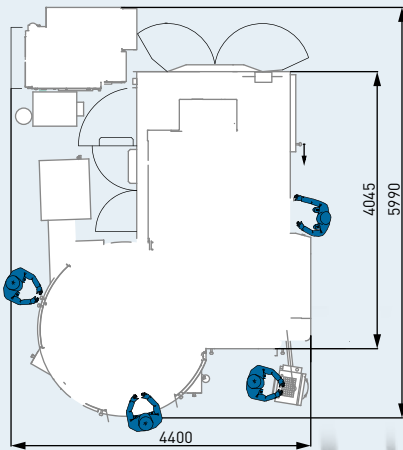
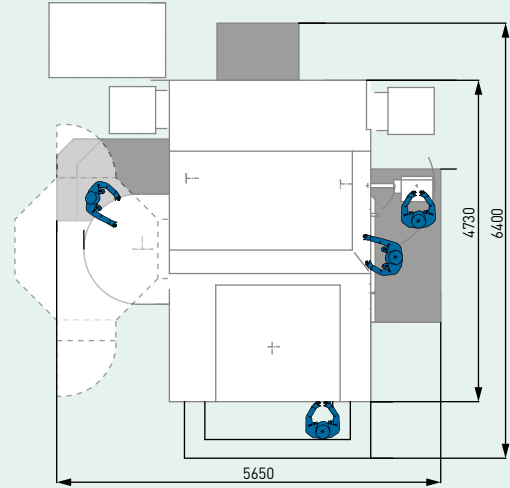
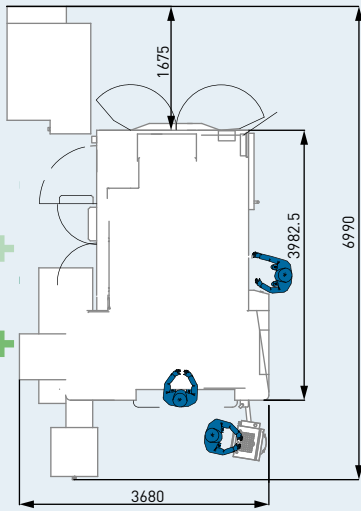
Flexibility

Special parts can be clamped on and prepared during the main operating time, also during series production.

Automated machines can be kept in continual use, also when only one shift is being worked in the production area. A significantly longer running time per day is possible in this way compared to a machine without a pallet magazine.

Ergonomics

- + The pallets in the 2 equipping places are lowered hydraulically to a height which is comfortable for the operator
- + The lifting and lowering movements of the pallets are very well absorbed vibrations and do not disturb the milling process
- + The pallets can be turned manually within the two equipping places 360° and locked in position 8x (45°)
- + There is no need for a platform
- + A space-saving design
- + No additional steps or gratings
- + Optimal working conditions for the operator



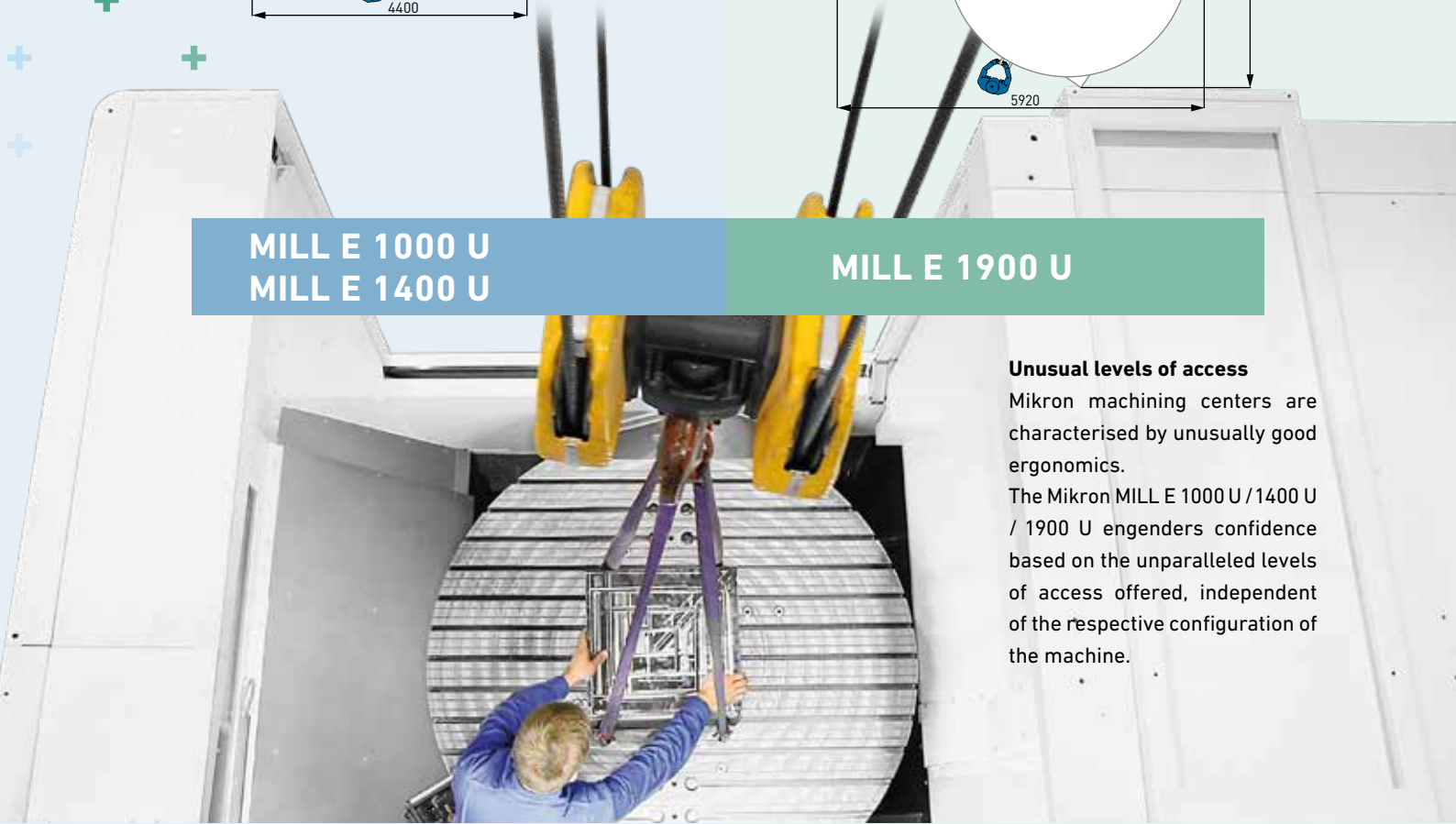
**MILL E 1000 U
MILL E 1400 U**

MILL E 1900 U

Unusual levels of access

Mikron machining centers are characterised by unusually good ergonomics.

The Mikron MILL E 1000 U / 1400 U / 1900 U engenders confidence based on the unparalleled levels of access offered, independent of the respective configuration of the machine.





Tool magazine

We have the solution for your needs

The tools are loaded on the side of the machine in the tool magazine.

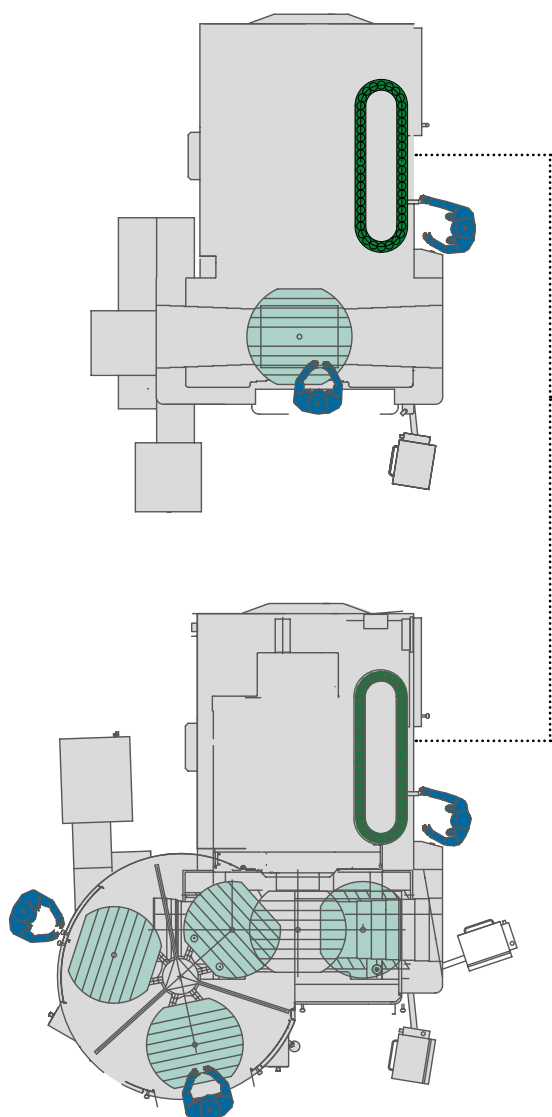
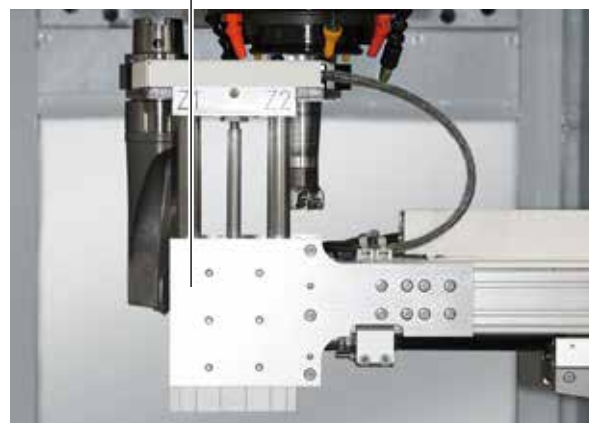
The tool magazine has its own operating panel in order to call up the desired tool.

No tool is needed to remove and load the tool holder.

The tools can be loaded and unloaded using this unlocking system



Tool change takes place using a double gripper.



- + 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



Circular magazine design with handling system

Capacity of tool magazines

Mikron MILL E 1000 U

Mikron MILL E 1400 U

	Internal	External	Max. length up to 500 mm
HSM 63	30, 46, 92	116, 212, 336	Max. weight up to 25 kg
HSK 100	32, 64	90, 130, 175	

Mikron MILL E 1900 U

	Internal	External	Max. length up to 500 mm
HSK 63	45	116, 212, 336	Max. weight up to 25 kg
HSK 100	30	90, 130, 175	

High-performance spindles

High-efficiency Milling and turning in a effective processing

The high-performance Spindles on the Mikron MILL E 1000 U / 1400 U / 1900 U series are designed to do heavy roughing and Milling to best surface finish all at once as well as turning. 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.

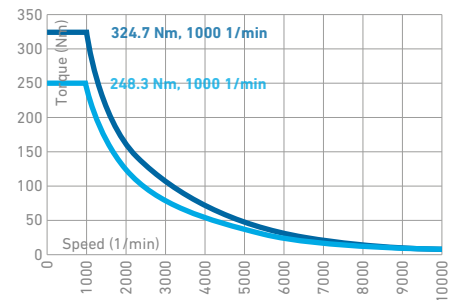
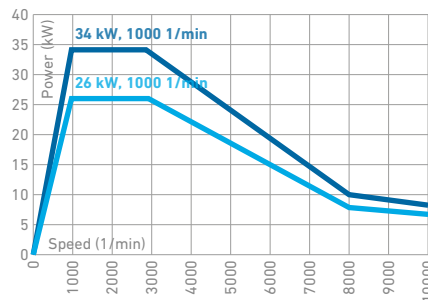
Milling and turning

Step-Tec Spindle

10'000 rpm

HSK-A100

HSK-T100



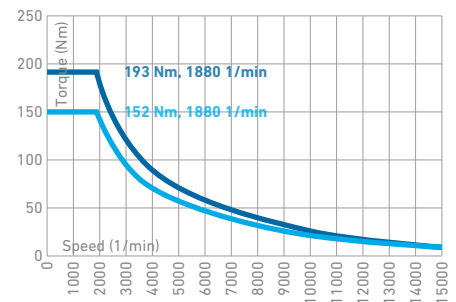
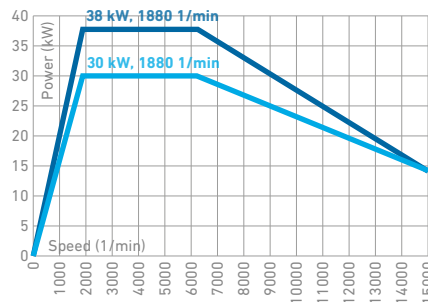
Milling and turning

Step-Tec Spindle

15'000 rpm

HSK-A63

HSK-T63

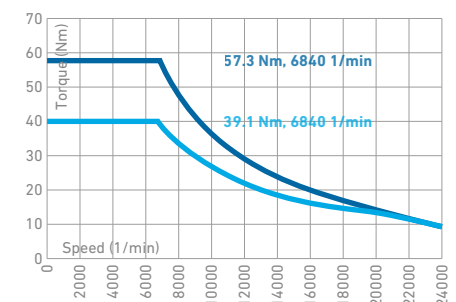
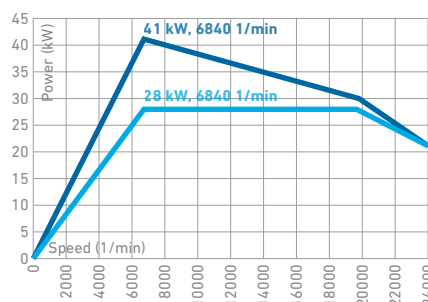


Milling

Step-Tec Spindle

24'000 rpm

HSK-A63





Since 1955, Step-Tec has developed, manufactured, sold and repaired motor-driven Spindles for leading manufacturers of machining centers for milling, drilling and turning applications. Step-Tec is in a position to manufacture rapidly running and at the same time, very precise high performance Spindles with an integrated motor. The machining times for obtaining optimal quality have been drastically reduced using these high quality motor-driven Spindles.



Whatever machine configuration you choose you will always obtain the latest tool spindles with your Mikron MILL E U.

Mikron MILL E 1400/1900 U ST

Turning. Roughing. Finishing.

One clamping operation.

Quick and precise

Complete machining on the Mikron MILL E 1400/1900 U ST quickly produces more accurate workpieces. Unnecessary rechucking results in a more precise runout, faster workpiece handling and setup time.

Most compact

Reduced investment and operating costs, thanks to space-saving, complete machining center.

Quality

Simultaneous turning allows a permanent positioning of the tool in its optimal cutting position, perpendicular to the work piece surface. This ensures the best precision and surface quality.

Production service package

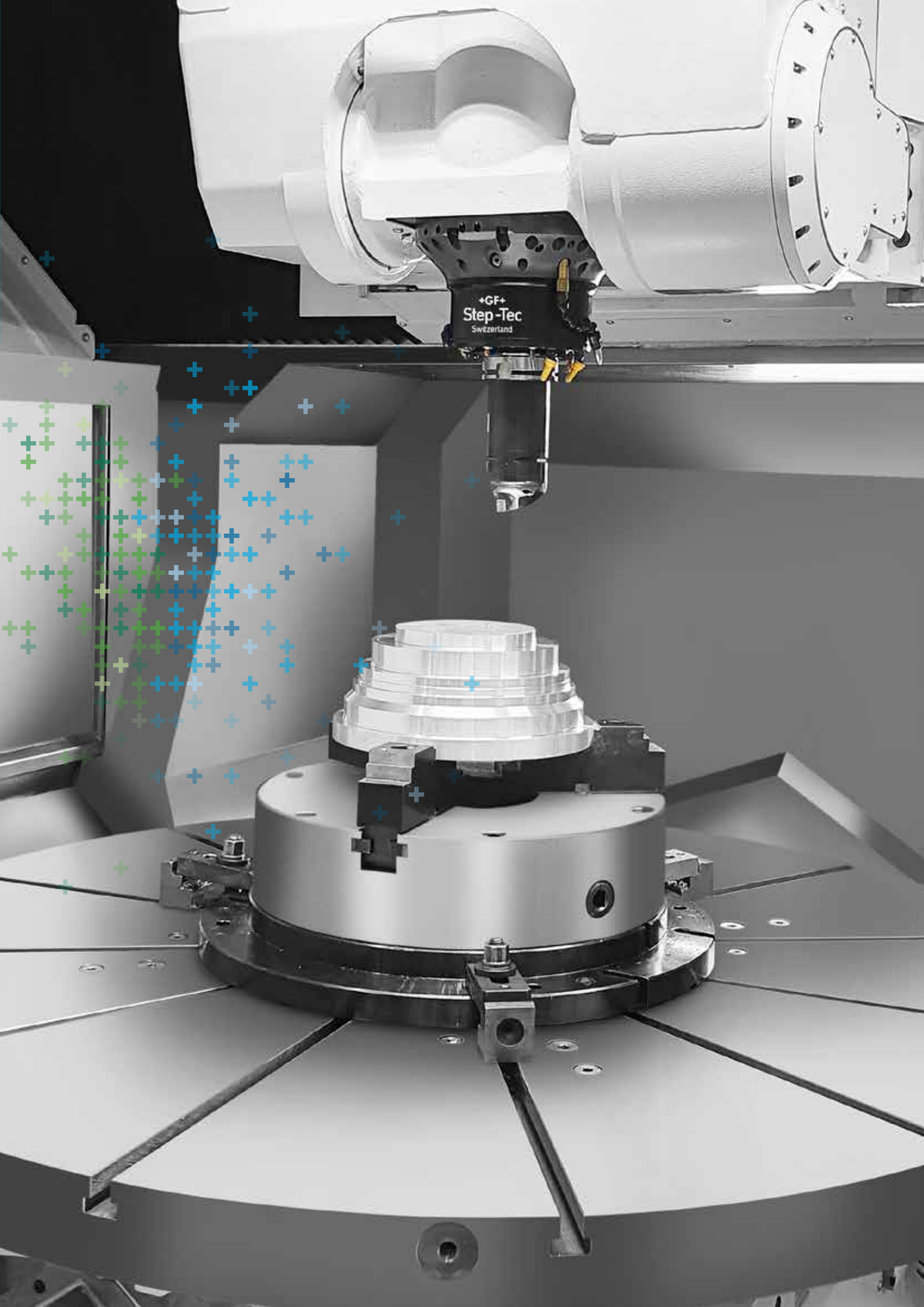
Specific services and maintenance options are to be considered for this solution, in relation to safety and continuous operation matters.

Ask us.

Visit our website: www.gfms.com

- + Meet challenging requirements in an easier and faster manner: Reduce your setup hurdle by more than 50% and convert it into billable production time
- + Reduce your cost: Rough faster by turning while achieving savings on tool cost with a ratio of 1/100
- + No compromise on process productivity and precision: Our safe enclosure does not impact the axis motion performance.





Optimal machining to enhance your process beyond program and machine setup

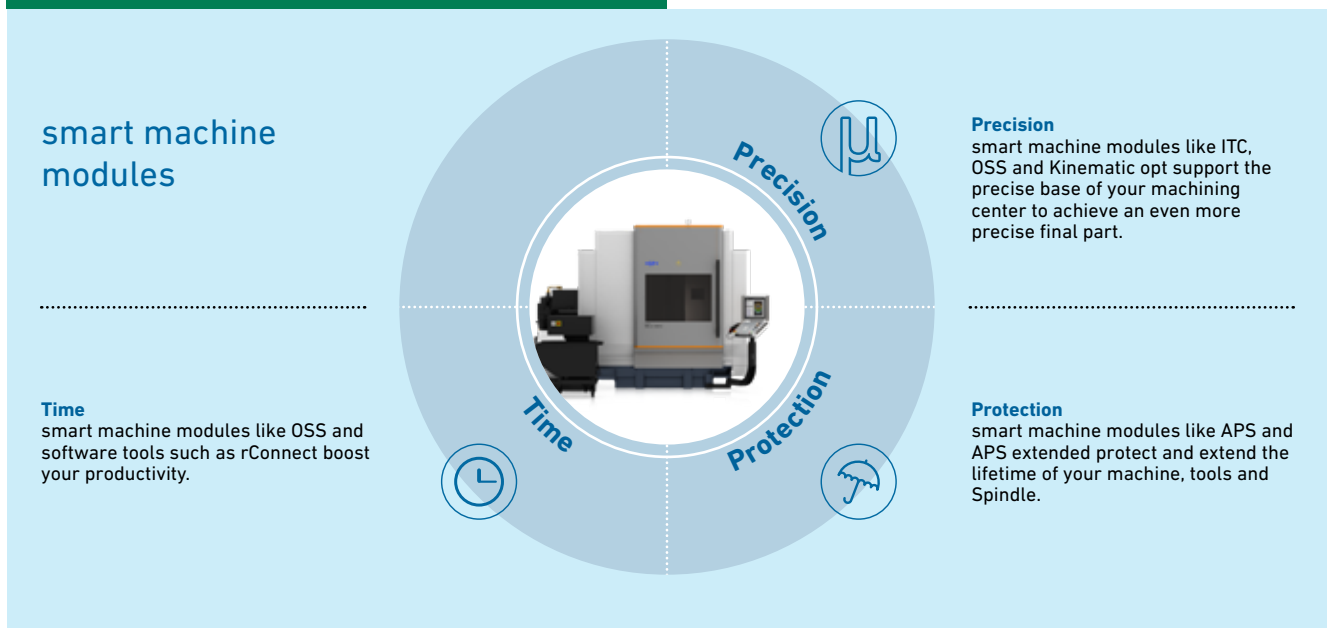
This includes a range of modules collectively referred to under the generic term “smart machine” and that fulfill various functions. In order to make the Milling process “intelligent,” various requirements have to be implemented.

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



- + 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.

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.



Options

Our machines are prepared for a large number of options



Touch probe radio RMP 60



Laser tool measurement



Minimum quantity lubrication and cooling



Operating modes 3+4



A rotating viewing window



Suction removal of mist



Internal tool cooling



A belt filter plant



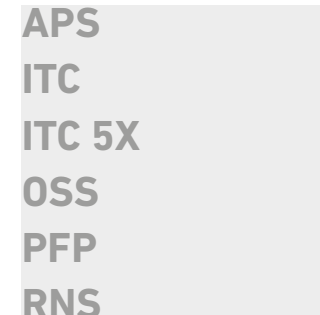
Tool magazine
 HSK-A/T100: 30 tools
 HSK-A/T63: 45 tools



Tool magazine
 HSK-A/T63: 120 tools



Tool magazine
 HSK-A/T100: 170 tools
 HSK-A/T63: 238 tools



APS
 ITC
 ITC 5X
 OSS
 PFP
 RNS
 smart machine Module



Control unit HEIDENHAIN



Control unit SIEMENS

Technical data

Mikron MILL E 1000 U Mikron MILL E 1400 U Mikron MILL E 1900 U



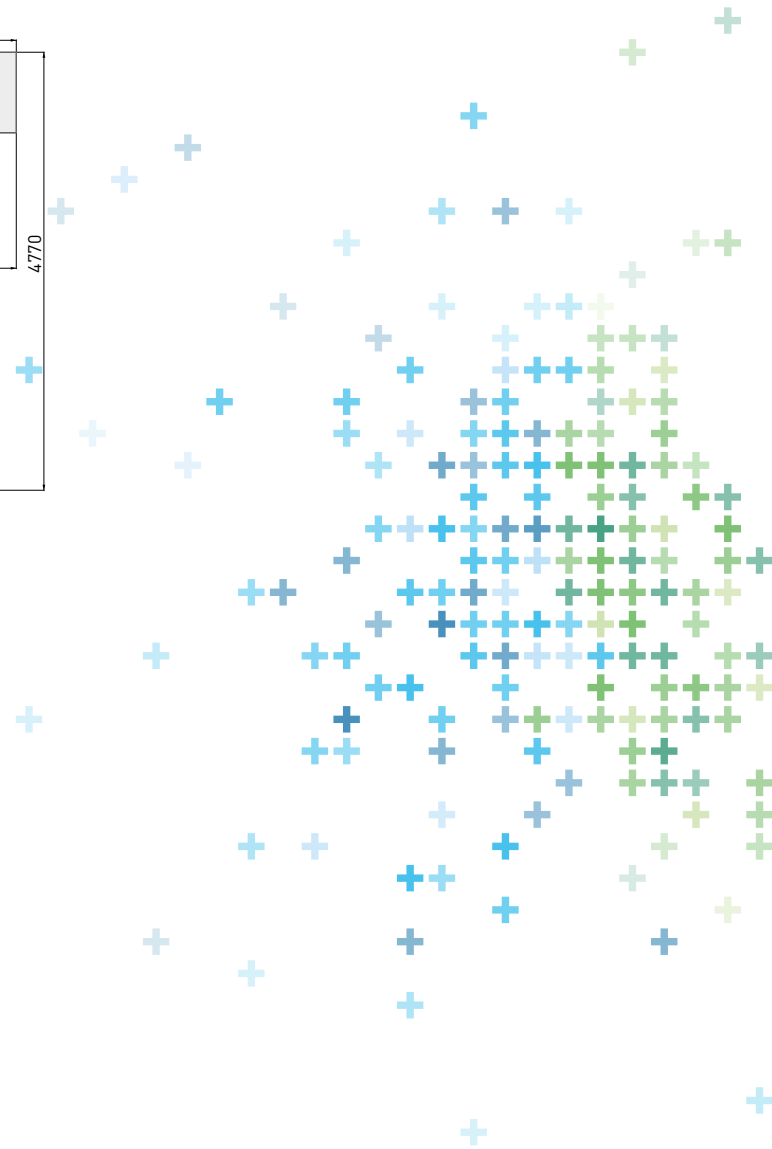
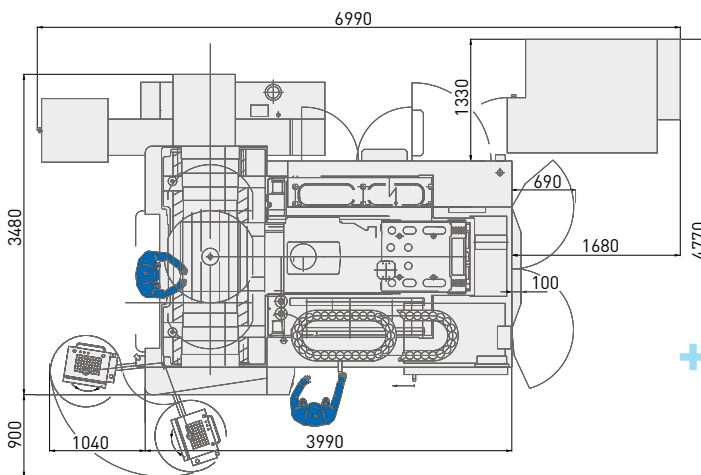
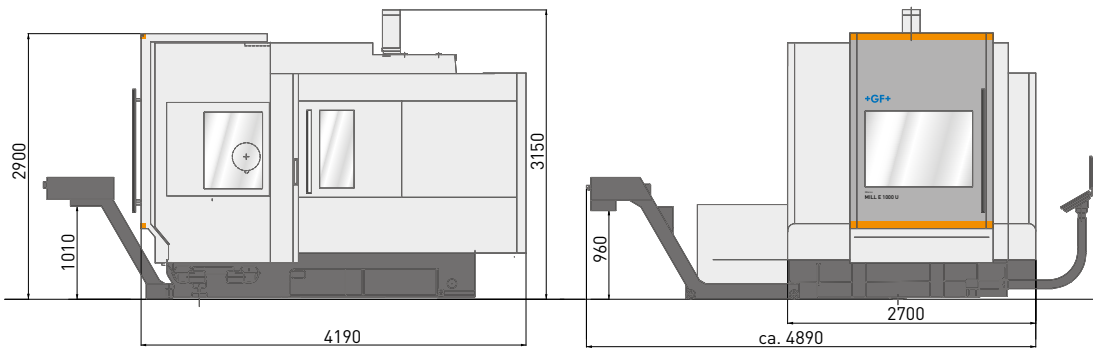
		MILL E 1000 U	MILL E 1400 U	MILL E 1400 U ST
Travel				
X-axis	mm	1000	1380	1380
Y-axis	mm	1150	1150	1150
Z-axis	mm	900	900	900
B - axis	°	16°....-120° HSK 63 16°....-110° HSK 100	16°....-120° HSK 63 16°....-110° HSK 100	16°....-120° HSK 63 16°....-110° HSK 100
C - axis	°	n x 360°	n x 360°	n x 360°
Working spindle				
Drive type		Motor spindle	Motor spindle	Motor spindle
rpm	min ⁻¹	10'000; 15'000; 24'000	10'000; 15'000; 24'000	10'000; 15'000; 24'000
Spindle tool interface	Standard	HSK A/T -63, HSK A(T) -100	HSK A/T -63, HSK A(T) -100	HSK A/T -63, HSK A(T) -100
Distance from table top to spindle nose	mm	729 ..747	729..747	719..737
Feed drives				
Rapid traverse	X / Y / Z m/min	32 / 32 / 32	32 / 32 / 32	32 / 32 / 32
Acceleration	X / Y / Z m/S ²	4	4	4
Feed force	X / Y / Z kN	10	10	10
Tool magazine				
Values depending on magazine				
Capacity	pcs.	HSK 63: 30, 46, 92, 116, 212, 336	HSK 63: 30, 46, 92, 116, 212, 336	HSK 63: 30, 46, 92, 116, 212, 336
	pcs.	HSK 100: 32, 64, 90, 130, 175	HSK 100: 32, 64, 90, 130, 175	HSK 100: 32, 64, 90, 130, 175
Max Tool weight	kg	8 (10, 15, 25)	8 (10, 15, 25)	8 (10, 15, 25)
Max Tool length	mm	300 (500)	300 (500)	300 (500)
Work table				
T-slot table size	mm	18	18	18
Max. work piece dimensions	mm	Dm 1100(1350)x 1000	Dm 1200(1350)x 1100	Dm 1200 (1350)x 1100
L x B x H	mm			turning: Dm 1000x 1000
Maximum payload on table	kg	1400	1800	1500 (miling) 1000 (turning)
Max table height	mm	1120	1120	1120
Speed of table				
in turning mode (max.)	min ⁻¹	40	40	400
Max feed force	B (A) axis Nm	S1: 460 Max.: 920	S1: 460 Max.: 920	S1: 460 Max.: 920
Max. feed force	C axis Nm	S1: 1250 Max.: 1650	S1: 1120 Max.: 1750	S1: 1300 Max.: 2400
Coolant				
Coolant tank ca.	l	650	650	650
Machine weight				
Machine weight (WPC)	kg	12'300	12'600 (17'000)	12'600
Control units available				
Supplier / Type		Heidenhain TNC 640 Siemens SINUMERIK ONE	Heidenhain TNC 640 Siemens SINUMERIK ONE	Heidenhain TNC 640 Siemens SINUMERIK ONE



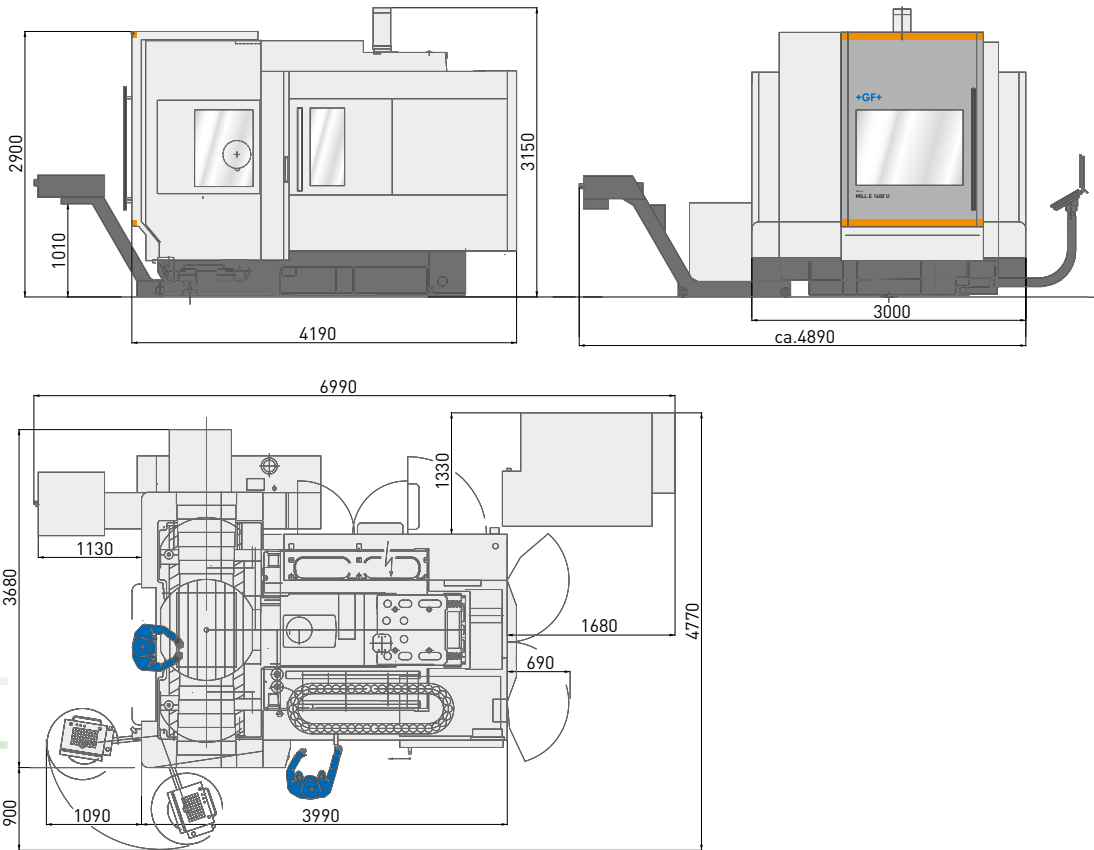
MILL E 1900 U	MILL E 1900 U ST
1880	1880
1400	1400
930	930
-20°...120° HSK 63	-20°...120° HSK 63
-20°...110° HSK 100	-20°...110° HSK 100
n x 360°	n x 360°
Motor spindle	Motor spindle
10'000; 15'000; 24'000	10'000; 15'000; 24'000
HSK A/T -63, HSK A(T) -100	HSK A/T -63, HSK A(T) -100
746...920 (738...815 WPC)	746...920
41/41/41	41/41/41
4,5	4,5
16	16
HSK 63: 45, 116, 212, 336	HSK 63: 45, 116, 212, 336
HSK 100: 30, 90, 130, 175	HSK 100: 30, 90, 130, 175
8 (10, 15, 25)	8 (10, 15, 25)
370 (500)	370 (500)
18	18
Dm 1850x 745 (830, 895)	Dm 1850x 745 (830, 895)
Mit WPC: Dm 1400x 730, 795)	turning: Dm 1500x 745 (830, 895)
4000 (5000)	4000 (milling)
	2400 (turning)
955	955
30	300
S1: 460	S1: 460
Max.: 920	Max.: 920
S1: 3550	S1: 4900
Max.: 4650	Max.: 7300
650	650
25'000 (31'000)	25000
Heidenhain TNC 640	Heidenhain TNC 640
Siemens SINUMERIK ONE	Siemens SINUMERIK ONE



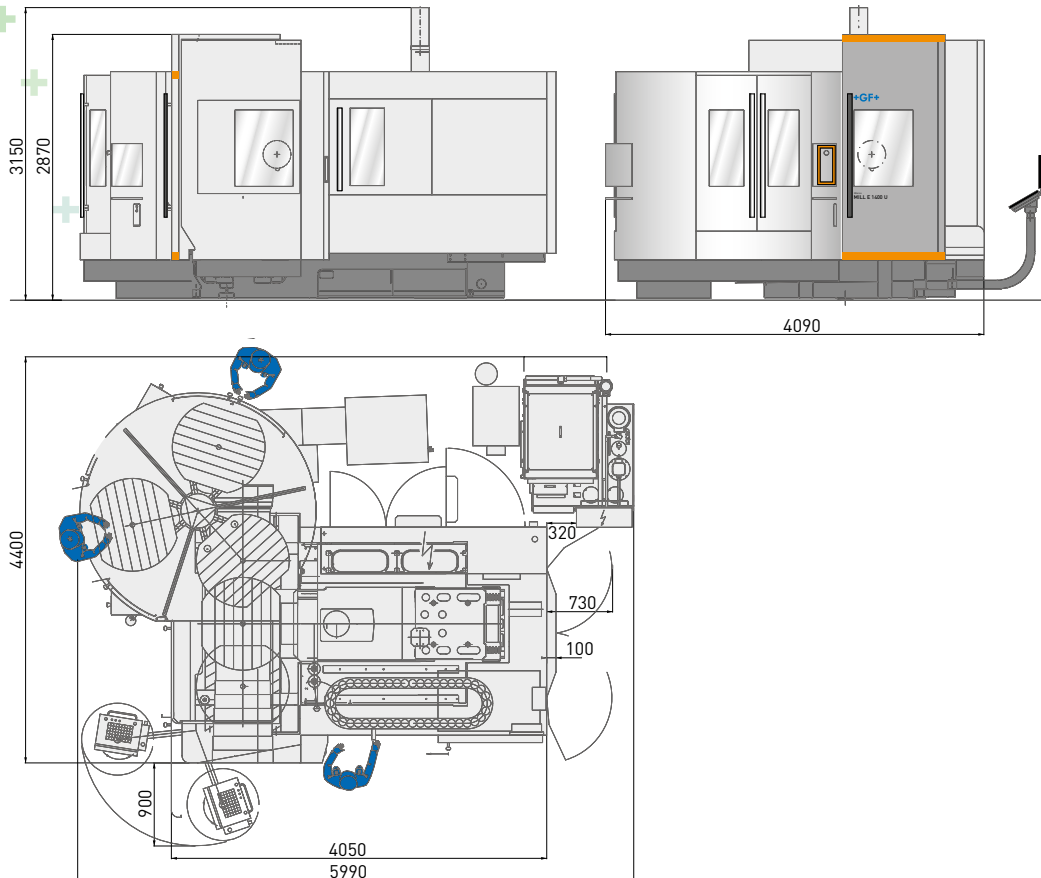
Mikron MILL E 1000 U without pallet magazine



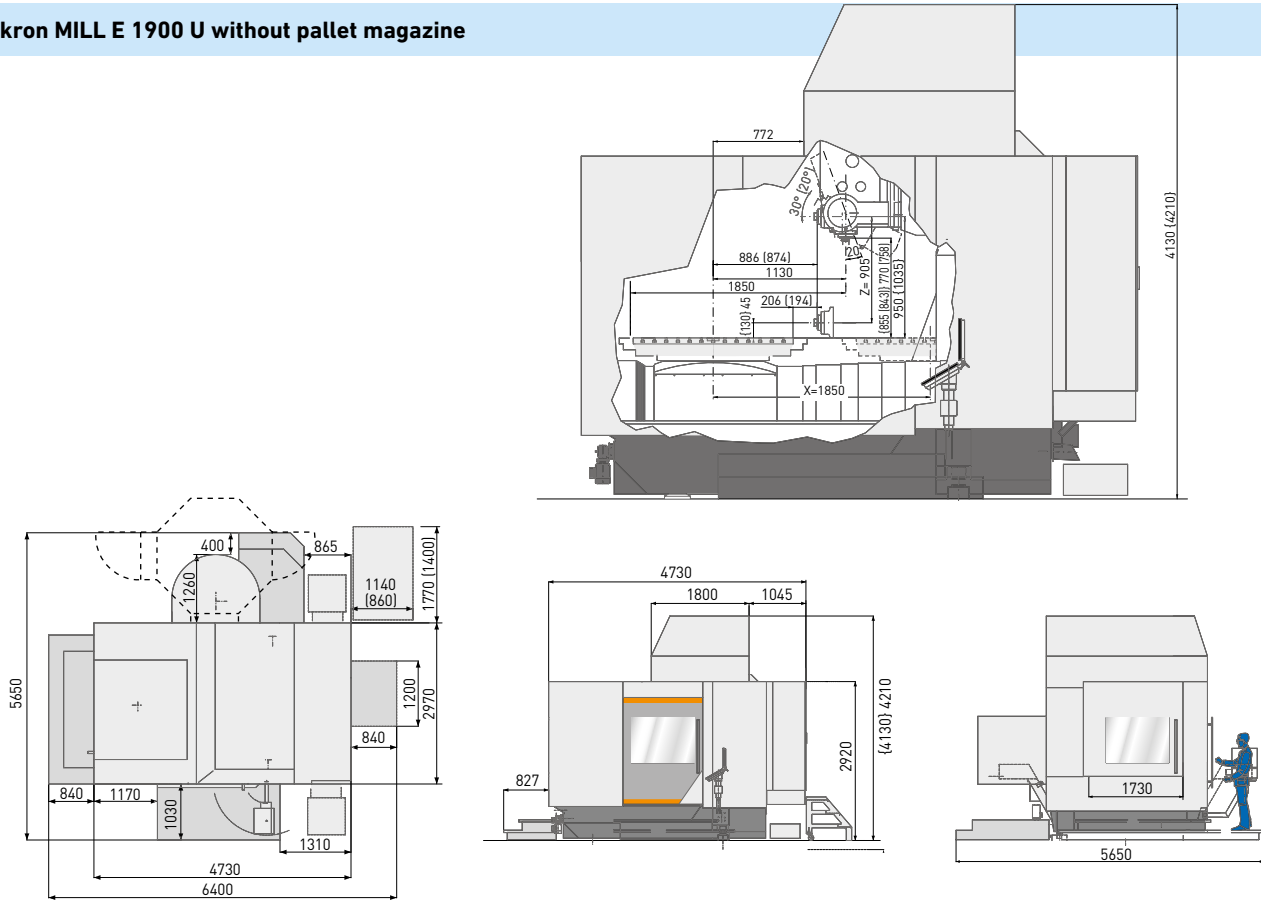
Mikron MILL E 1400 U without pallet magazine



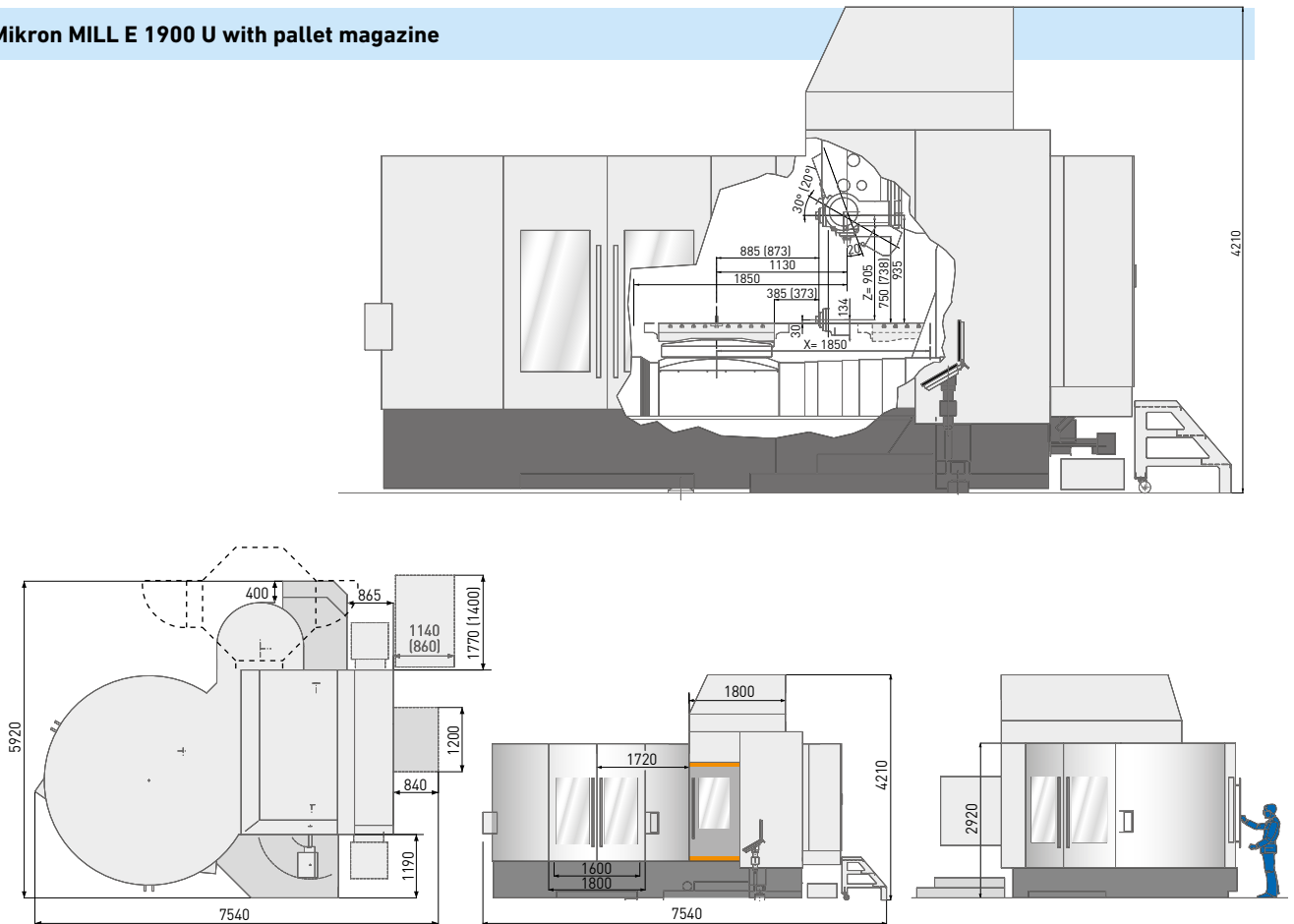
Mikron MILL E 1400 U with pallet magazine



Mikron MILL E 1900 U without pallet magazine



Mikron MILL E 1900 U with pallet magazine



Customer Services

New digital service possibilities

GF Machining Solutions Customer Services continues to push technological boundaries to deliver the future of services to you—today.



rConnect is the digital services platform available for all GF Machining Solutions technologies. Following a modular approach, rConnect comprises a range of services that empower you to increase your manufacturing productivity. Certified with the TÜViT Trusted Product Certificate.

rConnect Messenger, we deliver machine data to your mobile device to keep you constantly informed about your production. You can supervise your workshop from your smartphone.

rConnect Live Remote Assistance (LRA), our expert engineers rapidly respond to your service requests. LRA allows effective face-to-face assistance using audio, video, chat and many more functionalities.



About GF Machining Solutions

Multi-technology solutions provider

Our commitment to you and your specific applications is proven by the value-adding intelligence, productivity and quality delivered by our multi-technology solutions. Your success is our chief motivator. That's why we are continuously advancing our legendary technical expertise. Wherever you are, whatever your market segment and whatever the size of your operation, we have the complete solutions and the customer-centric commitment to accelerate your success—today.

EDM (electrical discharge machining)



Wire-cutting EDM

GF Machining Solutions' wire-cutting EDM is fast, precise and increasingly energy efficient. From ultraprecise machining of miniaturized components down to 0.02 mm to powerful solutions for demanding high-speed machining with respect to surface accuracy, our wire EDM solutions position you for success.

Die-sinking EDM

GF Machining Solutions is revolutionizing die-sinking EDM with features like iGAP technology to dramatically boost machining speed and reduce electrode wear. All of our die-sinking systems offer fast removal and deliver mirror finishes of Ra 0.1 µm (4 µin).

Hole-drilling EDM

GF Machining Solutions' robust hole-drilling EDM solutions enable you to drill holes in electrically conductive materials at a very high speed—and, with a five-axis configuration, at any angle on a workpiece with an inclined surface.

Milling



Milling

Precision tool and mold manufacturers enjoy a competitive edge with our Mikron MILL S solutions' fast and precise machining. The Mikron MILL P machines achieve above-average productivity thanks to their high performance and Automation. Customers seeking fastest return on investment benefit from the affordable efficiency of our MILL E solutions.

High Performance Airfoil Machining

Our Liechti turnkey solutions enable the highly dynamic manufacturing of precision airfoils. Thanks to their unique performance and our expertise in airfoil machining, you increase productivity by producing at the lowest cost per part.

Spindles

As part of GF Machining Solutions, Step-Tec is engaged in the very first stage of each machining center development project. Compact design combined with excellent thermal and geometric repeatability ensure the perfect integration of this core component into the machine tool.

Advanced manufacturing



Laser texturing

Aesthetic and functional texturing is easy and infinitely repeatable with our digitized Laser technology. Even complex 3D geometries, including precision parts, are textured, engraved, microstructured, marked and labeled.

Laser micromachining

GF Machining Solutions offers the industry's most complete line of Laser micromachining platforms optimized for small, high-precision features to meet the increasing need for smaller, smarter parts to support today's leading-edge products.

Laser Additive Manufacturing (AM)

GF Machining Solutions and 3D Systems, a leading global provider of additive manufacturing solutions and the pioneer of 3D printing, have partnered to introduce new metal 3D printing solutions that enable manufacturers to produce complex metal parts more efficiently.

Tooling and Automation



Tooling

Our customers experience complete autonomy while maintaining extreme accuracy, thanks to our highly accurate System 3R reference systems for holding and positioning electrodes and work pieces. All types of machines can easily be linked, which reduces set-up times and enables a seamless transfer of workpieces between different operations.

Automation

Together with System 3R, we also provide scalable and cost-effective Automation solutions for simple, single machine cells or complex, multi-process cells, tailored to your needs.

Software



Digitalization solutions

To drive its digital transformation, GF Machining Solutions acquired symmedia GmbH, a company specialized in software for machine connectivity. Together, we offer a complete range of Industry 4.0 solutions across all industries. The future requires the ability to adapt quickly to continual digital processes. Our intelligent manufacturing offers embedded expertise, optimized production processes, and workshop Automation: solutions for smart and connected machines.

Customer Services



Worldwide for you

Ensuring the best performance throughout the lifetime of our customers' equipment is the goal of our three levels of support. Operations Support offers the complete range of original wear parts and certified consumables. Machine Support includes spare parts, technical support, and a range of preventive services to maximize machine uptime. Business Support offers customer-specific business solutions.



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Losone
Geneva
Flawil
Langnau

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www.gfms.com/de

United Kingdom, Coventry
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