

Mikron

# MILL E 500 U

# MILL E 700 U



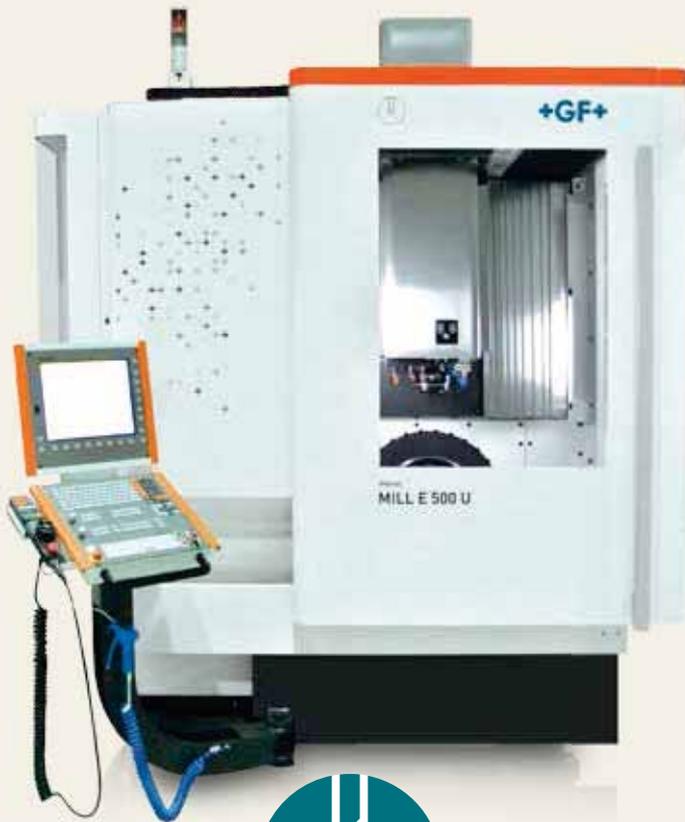
**GF Machining Solutions: all about you**

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 world-class electrical discharge machines (EDM), Laser texturing and Additive Manufacturing through to first-class Milling and Spindles, Tooling, Automation and software systems — all backed by unrivalled customer service and support — we, through our AgieCharmilles, Microlution, Mikron Mill, Liechti, Step-Tec and System 3R technologies, help you raise your game and increase your competitive edge.

# Passion for Precision

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The new Mikron MILL E machine range comprises efficient, five-axis machines in a stiff, stable, cast iron C frame construction. With its large-sized guideways and double-supported rotary table, this range delivers parts quality on parts and the optimum chip removal rate for users' best efficiency. The Mikron MILL E 500 U and 700 U are the right solutions for job shops and parts producers in the automotive, energy and power generation, and general machinery markets.

This high-efficiency machine targets customers producing parts in small to medium batches, including those looking for best price performance value with high reliability to lower their cost per part.

The machine provides ideal ergonomics for manual loading of workpieces, up to 450 kg, from the front or the side. Additionally, the machine can be equipped from the side with a pallet changer with a capacity of up to 200 kg to fully cover fully second or third shifts.

# Typical applications



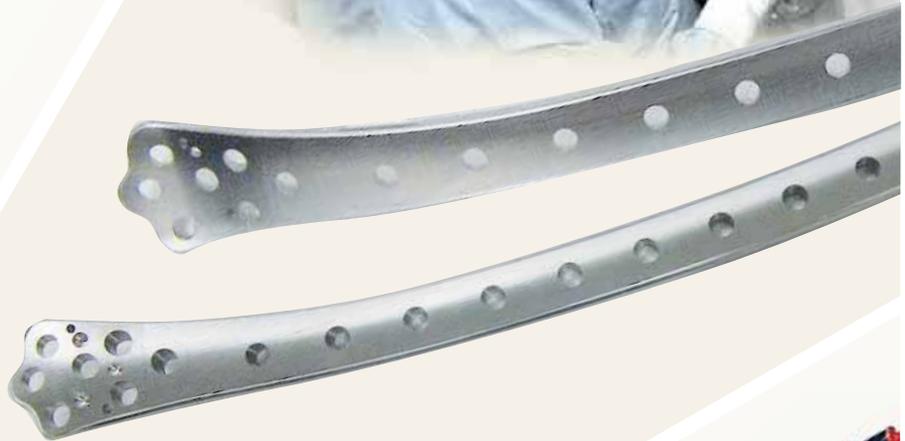
**Automotive**

**Home appliances**

**Packaging**



**Energy  
and power  
generation**



**Medical  
and dental**



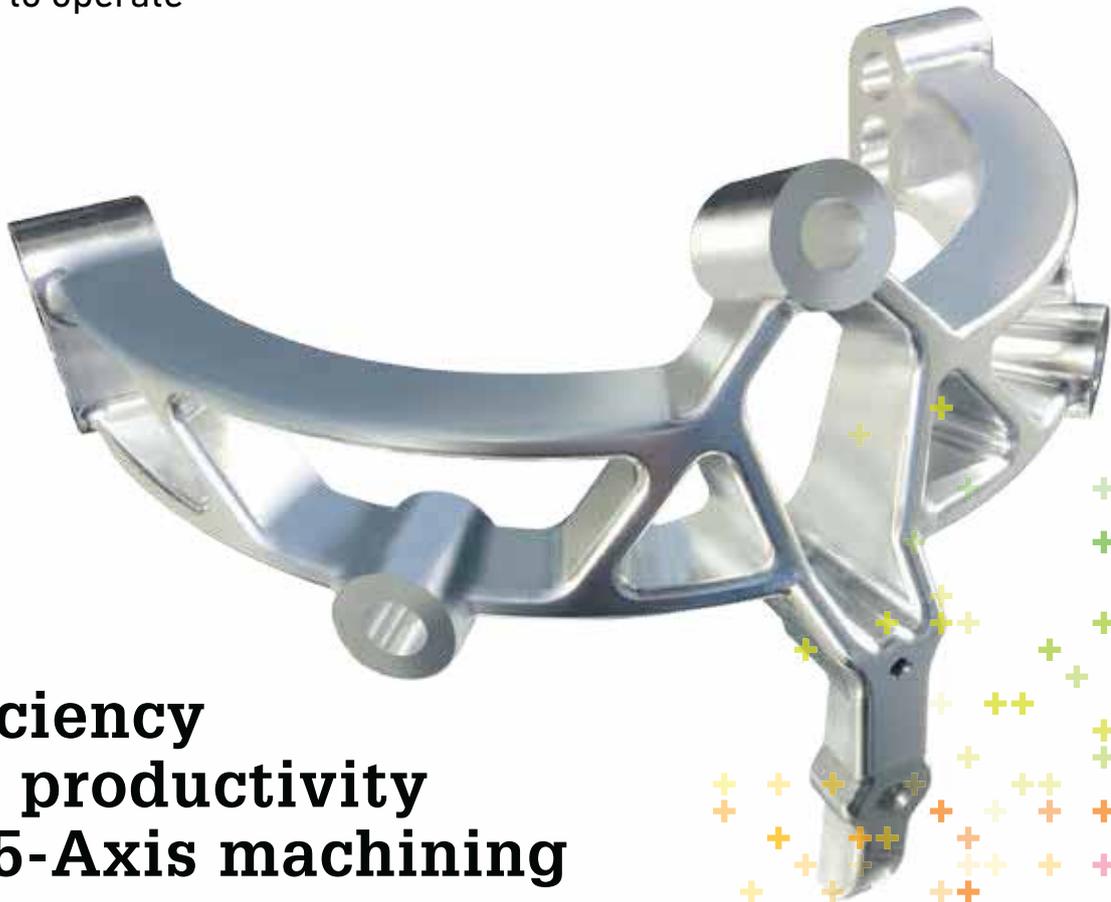
**General  
machinery**



Technology

# High-efficiency Milling

- + Flexible for all kinds of material
- + Efficient processing
- + Economical
- + Simple to operate



**Efficiency  
and productivity  
for 5-Axis machining**

# The right solution— for you

- Benefit from the dynamic behavior essential to perfect part production.
- Machine under maximum load with minimal Milling noise and still achieve top quality result 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.

- + Stiff machine construction
- + Double-supported rotary table
- + Pre-clamped, large-sized ball screw
- + Large-sized roller guides
- + High-quality components
- + Step-Tec Spindle
- + Heidenhain and Fanuc control
- + Integrated Automation or third-party automation
- + Wide range of pallets
- + Rotary joint trough table



Ramp up your productivity and flexibility

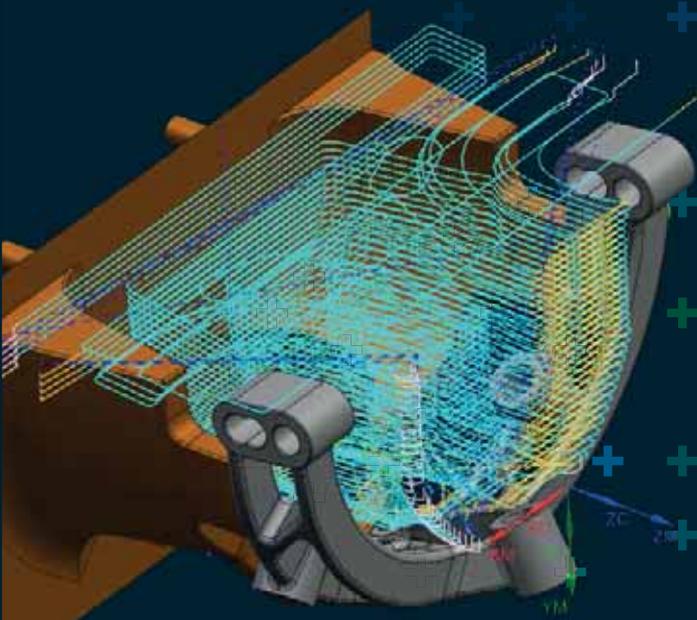
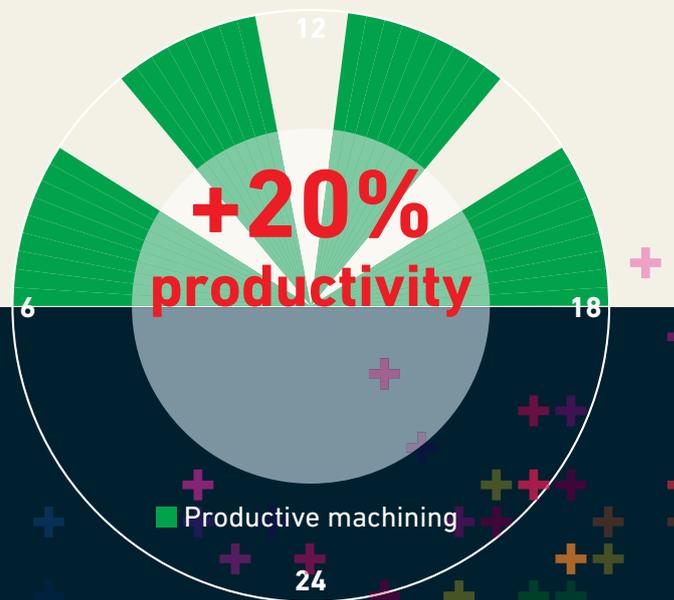
# Start your automated process

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

**Move from 3-Axis, multi-clamping Milling to 5-Axis, one-clamping Milling**



**Upgrade the machine: clamping with System 3R**



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



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

**Fast setup time**

**Lowest machine  
downtime**

**High profitability**

**Broad flexibility**

**Efficient  
productivity**

- + Mikron MILL E 500 U**
- + 20,000 min<sup>-1</sup> spindle**
- + Symmetrical table**
- + Delphin chuck**
- + Seven-pallet magazine**



Robust and precise

# Mikron MILL E core components

## + Up to 60 tools

Easy tool loading during machine operation

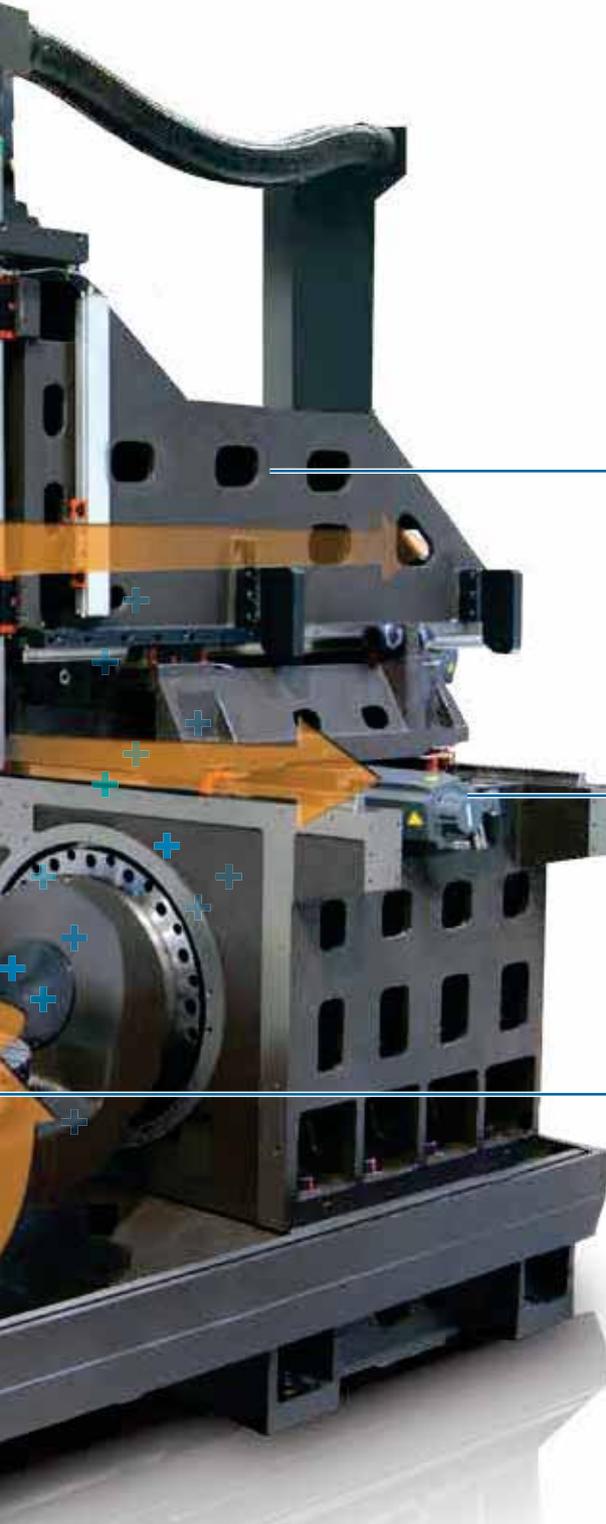
## + High stiffness

Increased stability thanks to the counter bearing

## + Compact footprint

Highest efficiency in smallest space





Fifty-year legacy  
of machine design  
expertise

## + Thermal symmetrical construction

Designed according to newest finite element calculation

## + High stability

Large-dimension ball screw and linear guides

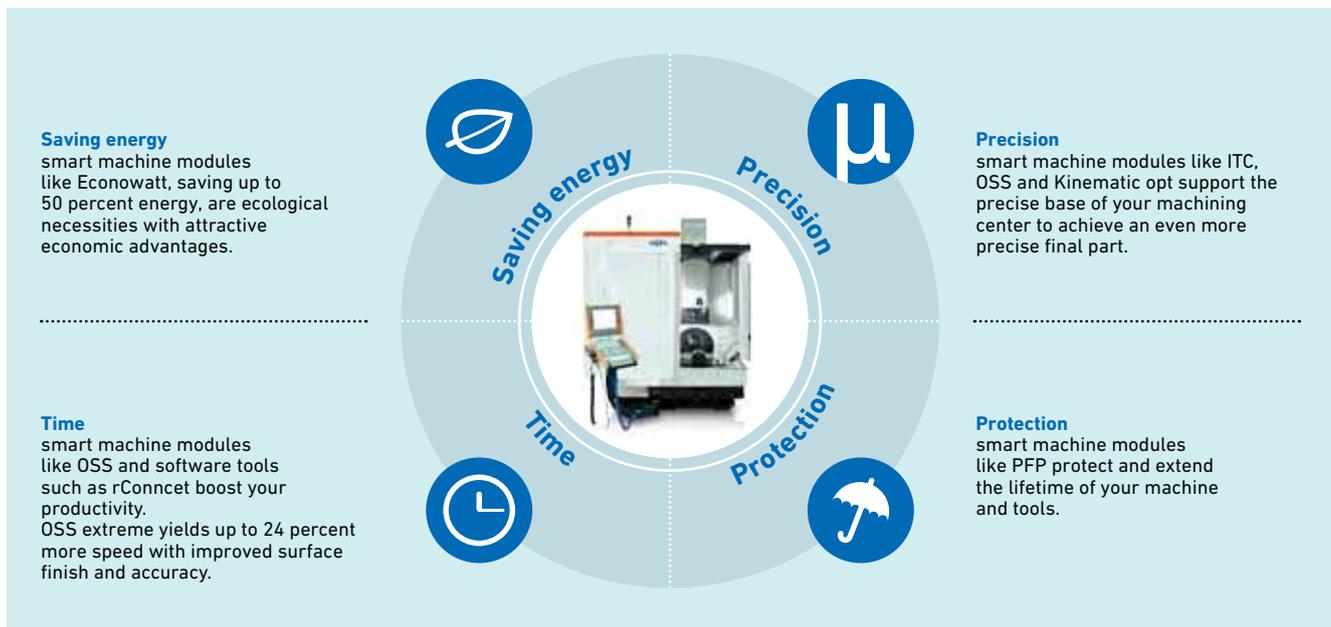
## + Ergonomic access

Well integrated rotary table

smart machine

# The new dimension in modern production

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<sup>st</sup>** is establishing comprehensive communication between man and machine, which makes available precise information that the operator requires to assess the Milling process.

**2<sup>nd</sup>** is supporting the operator in the optimization of the process, which considerably improves the performance.

**3<sup>rd</sup>** is the machine optimizing the Milling process, which improves process safety and workpiece quality—especially important in unmanned operation.

## smart machine construction kit system

Each of the modules fulfills a specific task. Just like in a construction kit, the user can select the modules that seem to him to be the best option for improving his process.

## The facts

- + Greater accuracy in shorter machining times
- + Increase in the workpiece surface quality as well as the surface and shape accuracy
- + Recognition of critical machining strategies
- + Improved process safety
- + Higher availability
- + Better operating comfort
- + Considerable increase in reliability 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

## High-performance Spindles

# High-efficiency Milling and effective processing

The high-performance Spindles on the MILL E 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<sup>-1</sup> Spindle is 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.

### Spindle 20,000 min<sup>-1</sup>

Power (S6)	36 kW
Torque (S6)	120Nm
Speed max.	20,000 min <sup>-1</sup>
Acceleration	2.5 s
Lubrication	Oil - air
Tool interface	HSK-A63 DIN69063-1

- Direct Lubricating System (DLS) oil-air bearing lubrication through outer race
- Fully digital Spindle equipped with every conceivable sensor to support smart machine integration
- Through-Spindle cooling featuring rotary unions fed by all known liquid and gaseous media
- Machine and Spindle Protection (MSP) crash-proof system to protect your machine and Spindle



The 12,000 min<sup>-1</sup> Spindle delivers sufficient performance and power for all kinds of applications. The ball bearings, which are lubricated for life, are effectively protected against incoming dirt with an air purge system. The tool is held by a spring and is released through hydraulic cylinder.

### Spindle 12'000 min<sup>-1</sup>

Power (S6)	20 kW
Torque (S6)	88 Nm
Speed max.	12,000 min <sup>-1</sup>
Acceleration	2.5 s
Lubrication	Oil - air
Tool interface	ISO 40 / BT 40 / CAT 40

- Good thermal stability through OCS
- Excellent weight / performance ratio
- Integrated intelliSTEP functionality
- Spindle cone BT/ISO/CAT 40
- Infinitely variable rotation speed range — no loss of performance
- Prepared with internal cooling agent feed for production use (optional)



The background of the image shows a close-up of a water spray or shower head. The water is being sprayed from the left side, creating a misty, white spray that fills the frame. Overlaid on this spray are numerous small, colorful plus signs (+) in various colors including blue, green, yellow, orange, red, pink, and purple. The plus signs are scattered across the spray, with some appearing more densely in certain areas. The overall effect is a dynamic and energetic visual.

**Efficient  
processing  
without high  
investment**

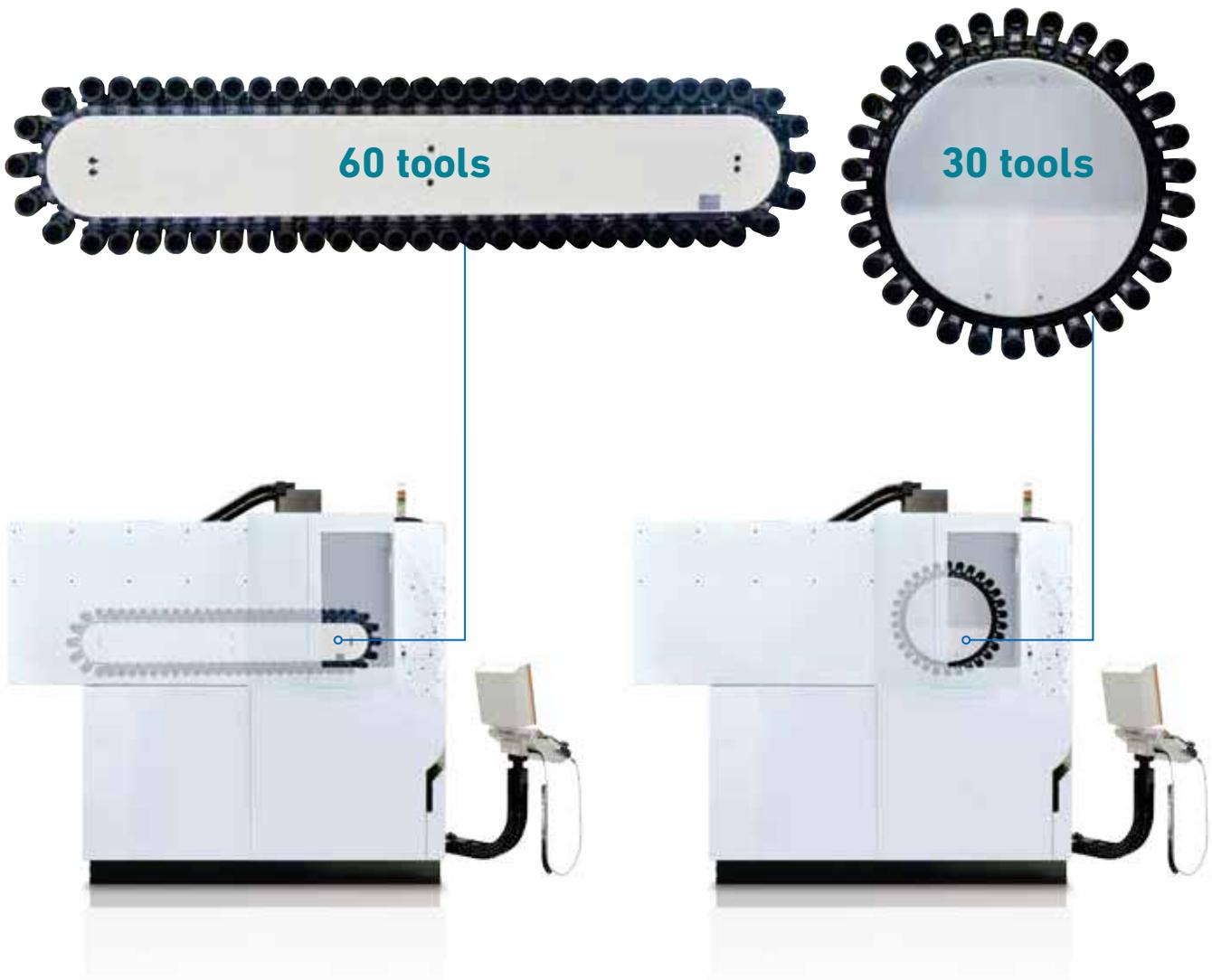
Tool magazines

# We have the solution for your needs

## Tool magazine for big capacities

- Disc-type or chain magazine
- Up to 60 tools can be stored in the chain-type tool magazine of the machine with no influence on the footprint.

- 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



Chip management

# Clean machining, wet or dry



## Customer benefits

- 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

## 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
- Coolant thermal control
- Oil skimmer

Automation with pallet magazine

# Lower your costs, increase productivity with Automation

Take your productivity to new levels while reducing your costs with our superior Automation solution. The WPC 10 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

Five-axis processing offers significant advantages for large and small components. Using five-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 "3+2" or "five-axis simultaneous" versions



Rotary table with Dynafix pallet Automation

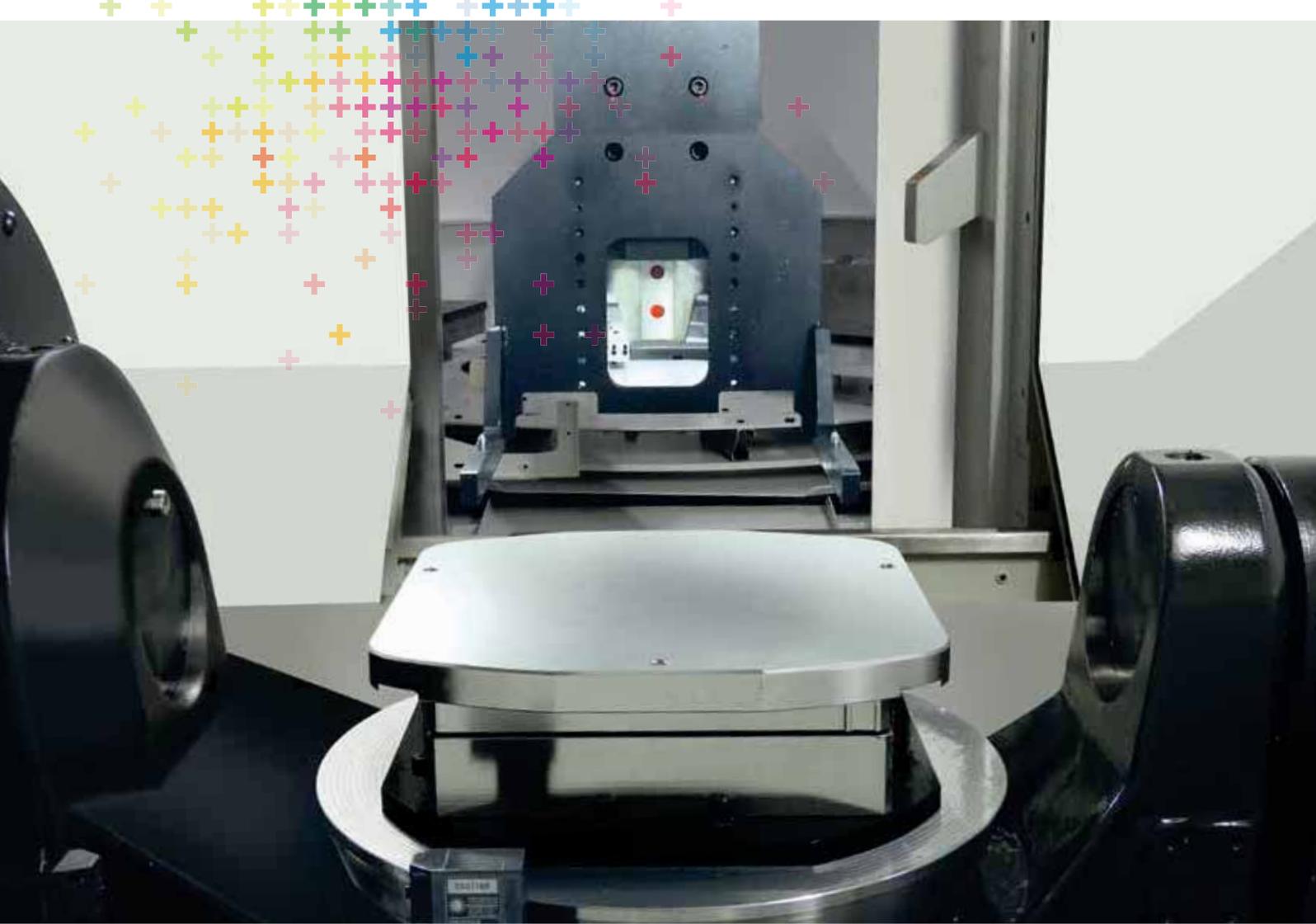


Delphin rotary swiveling table



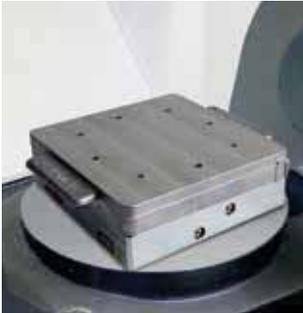
Rotary swiveling table with parallel grooves

**Enjoy  
unmanned  
production—  
nights and  
weekends**



Options

# 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



IKZ belt filter system (20 bar)



Rotating inspection window



Operation mode 3



Signal light

- Extended warranty
- Linear glass scales
- Minimal quantity lubrication
- Scratched proofed window
- Oil scimmer
- Roboter Interface

Additional options

- APS**
- APS extended**
- ITC**
- ITC 5X**
- RNS**
- PFP**
- DNC**
- Kinematic opt**

smart machine modules



**Fanuc control system**

Reliable and cost-performance CNC with high-end features like NANO interpolation and AI contour control

**Performance and reliability**

The Fanuc 0i-MD features an ultra-compact design using limited cabling to ensure highest reliability and provide easy maintenance.

Coupled with the latest Fanuc drive technology, the Fanuc 0i-MD ensures smooth machined surfaces by using a much finer resolution for position commands.

## Customer Services

# rConnect: Live Remote Assistance

rConnect comprises GF Machining Solution's modular digital services.

You stay connected with your machine park, at any time and wherever you are. Select the digital service that best fits your individual needs. Our Live Remote Assistance (LRA) supports you in keeping your commitments.



Certified by TÜViT Trusted Product

### Maximize your uptime

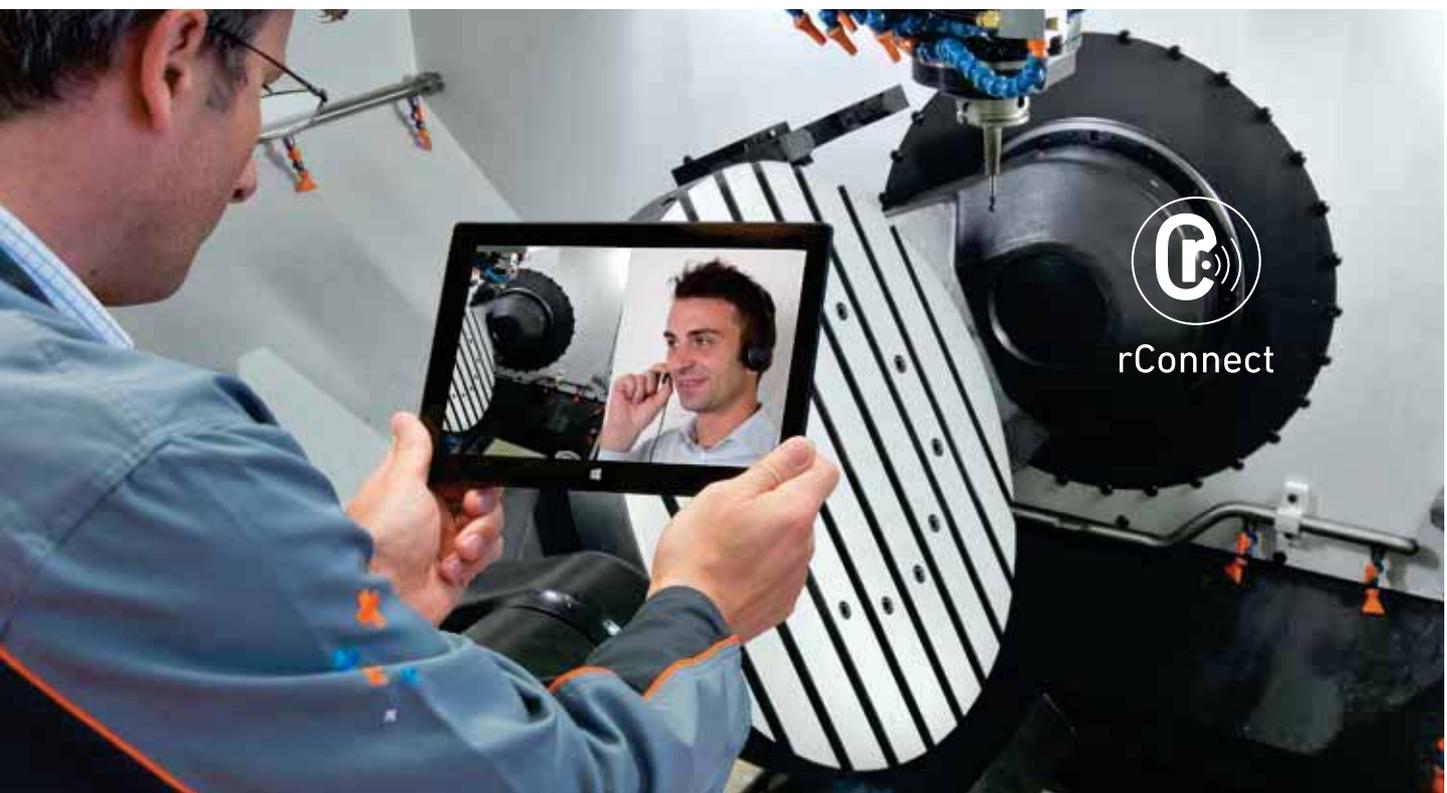
**Live Remote Assistance** provides you direct access to our expert service engineers with the latest technology. The LRA features audio, video, chat, whiteboard, file transfer, system access and screen sharing by using a Windows tablet or your standard PC.

### Increase your flexibility

Know the status of your machines in real time at any location. The **rConnect Cockpit** is the user interface for your machine operator, maintenance technician or operations manager. It provides the operator with support for daily machine-related activities.

### Secure connection based on the latest technology

To ensure your security, an encrypted point-to-point connection is established between your machine and GF Machining Solutions only at your request. Our remote service product is certified with the TÜViT Trusted Product Certificate.



**rConnect**

## Technical data

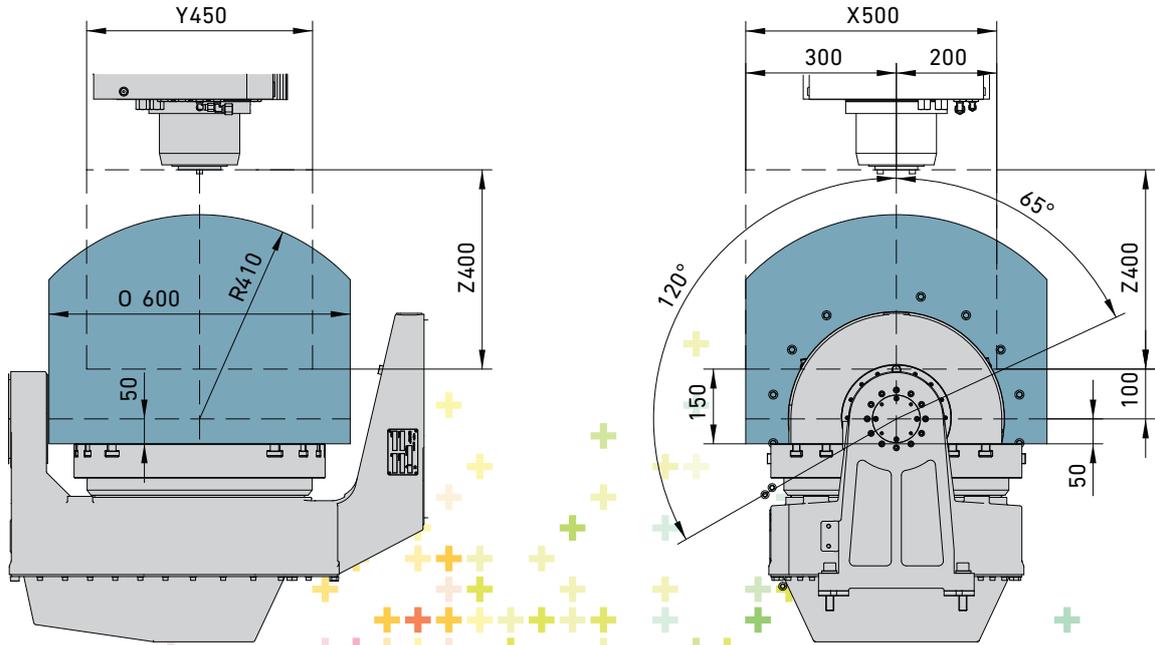


Mikron MILL E 500 U

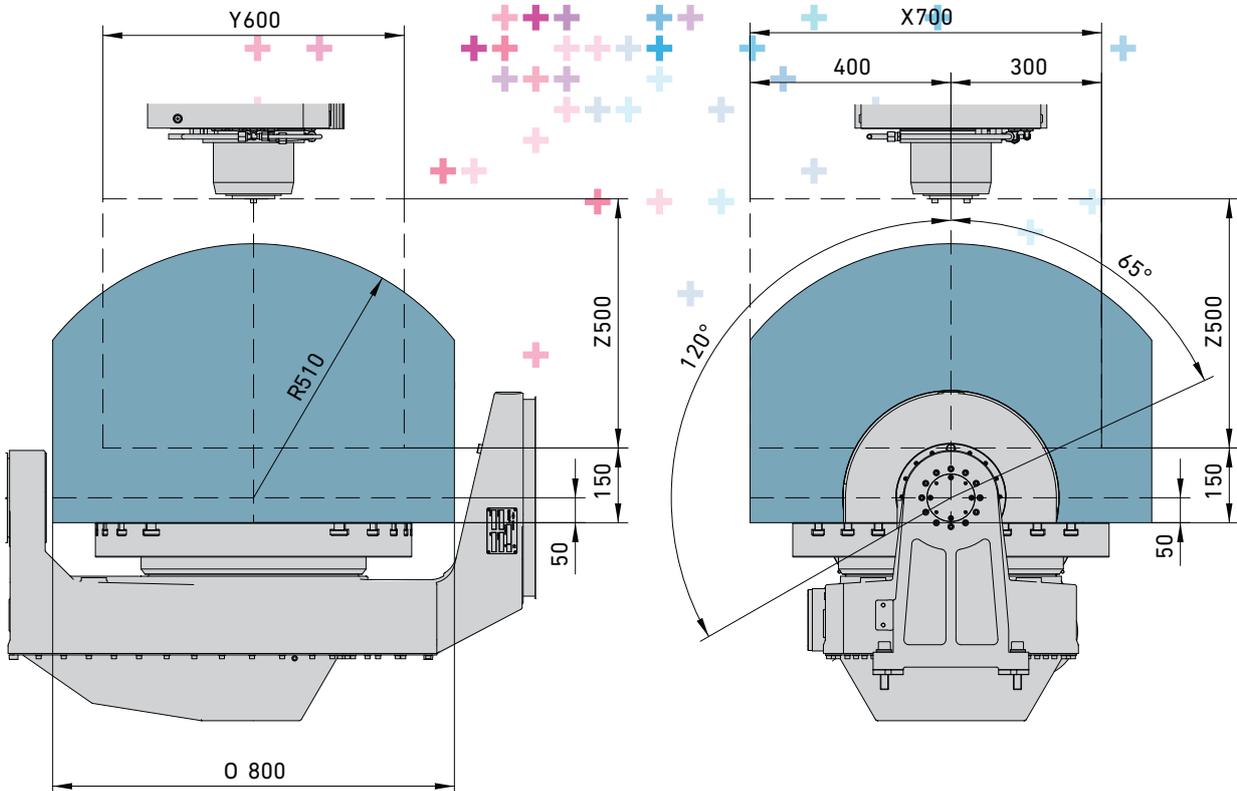
Mikron MILL E 700 U

Machine			Mikron MILL E 500 U	Mikron MILL E 500 U	Mikron MILL E 700 U	Mikron MILL E 700 U
			RTT 3+2	RTT Simultan	RTT 3+2	RTT Simultan
<b>Axis travel</b>						
Lengthwise	X	mm	500	500	700	700
Crosswise	Y	mm	450	450	600	600
Vertical	Z	mm	400	400	500	500
Swivel axis		°	-65 / +120	-65 / +120	-65 / +120	-65 / +120
Rotation axis		°	n x 360	n x 360	n x 360	n x 360
Axes			3+2	Five-axis simultaneous	3+2	Five-axis simultaneous
<b>Spindle</b>						
Spindle type			In-line	Motor	In-line	Motor
Max. rotations		min <sup>-1</sup>	12,000	20,000	12,000	20,000
Max. torque		kW/Nm	20/88	36/120	20/88	36/120
Tool interface			ISO 40 BT 40 CAT 40	HSK-A63	ISO 40 BT 40 CAT 40	HSK-A63
<b>Travel speed</b>						
Rapid traverse	X, Y, Z	m/min	30 / 30 / 30	30 / 30 / 30	30 / 30 / 30	30 / 30 / 30
Rapid traverse	B, C	min <sup>-1</sup>	17 / 28	32 / 112	17 / 28	32 / 112
<b>Automation</b>						
Tool magazine	unit		DT 30 / CT 60			
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	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	30	30
Robot interface			Available	Available	Available	Available
<b>Rotary swivel table</b>						
T-groove table	mm		500	500	630	630
Workpiece weight (3/5)	kg		300	300 / 200	450	450 / 450
<b>Weight</b>						
Machine weight	kg		6030	6030	8060	8060
<b>Control</b>						
Heidenhain	12 / 20 k		iTNC 530 HSCI FS			
Fanuc	12 k		0i-MD	-	0i-MD	-

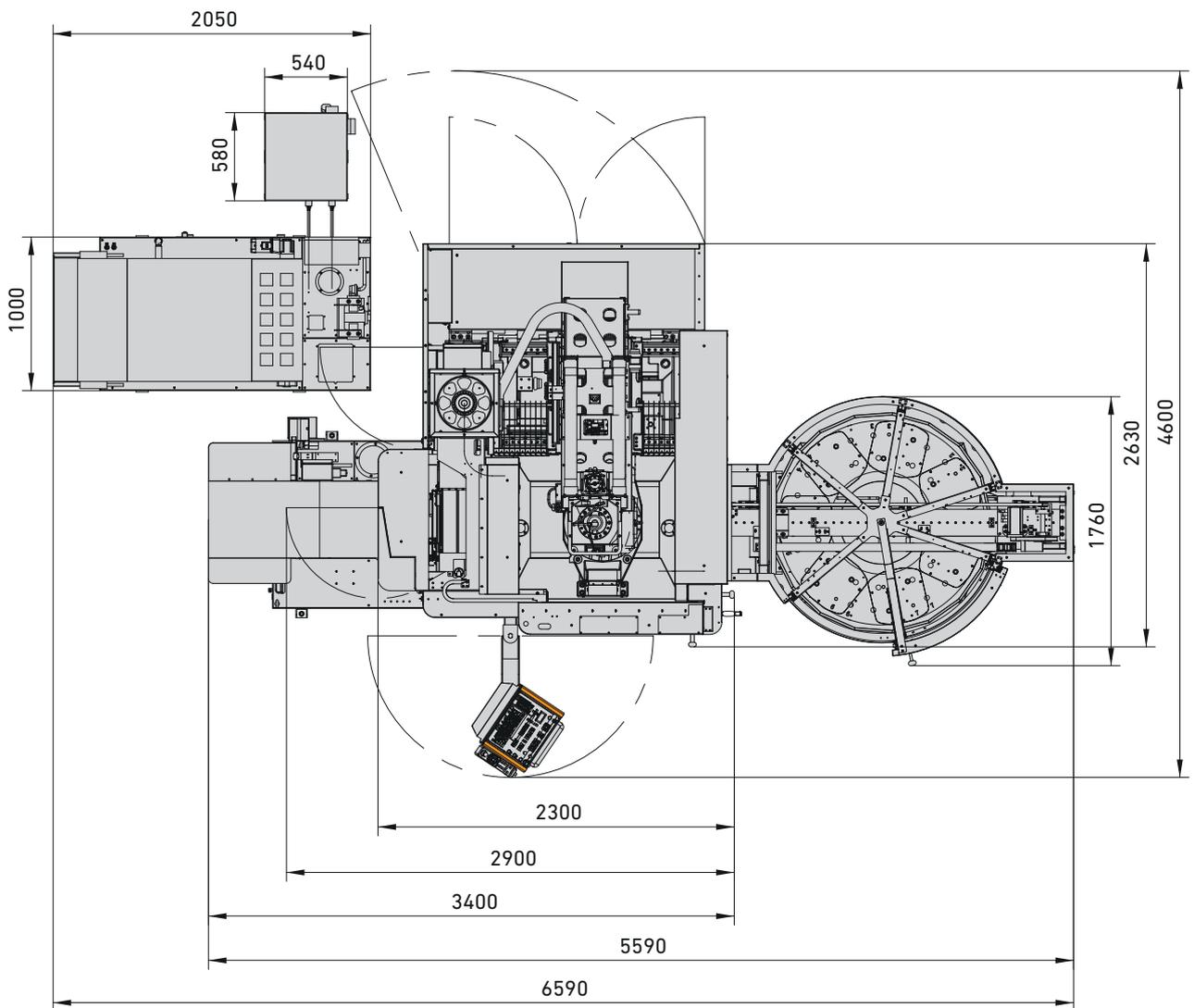
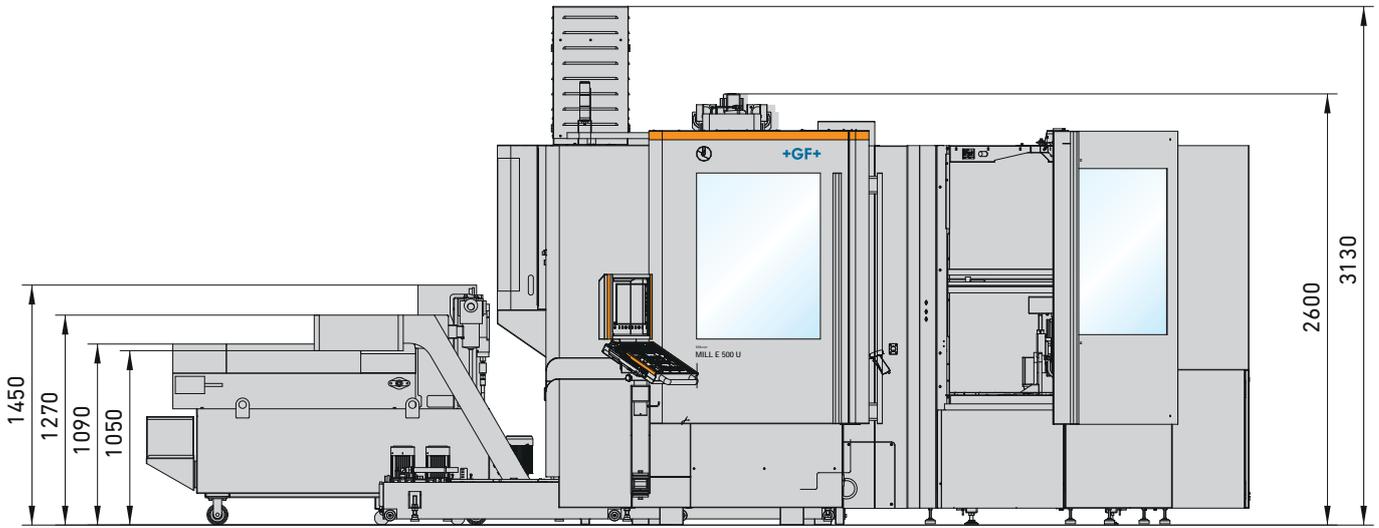
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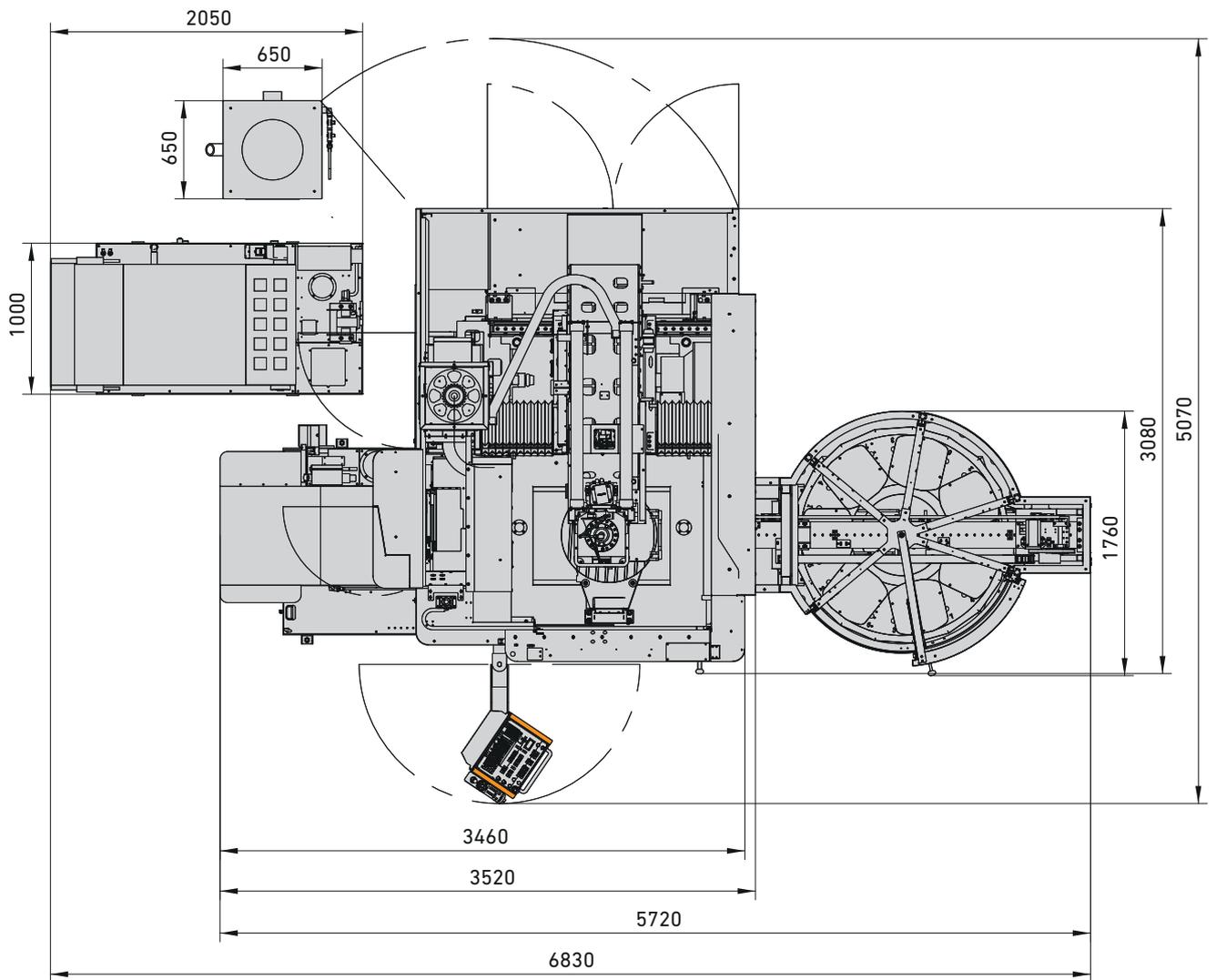
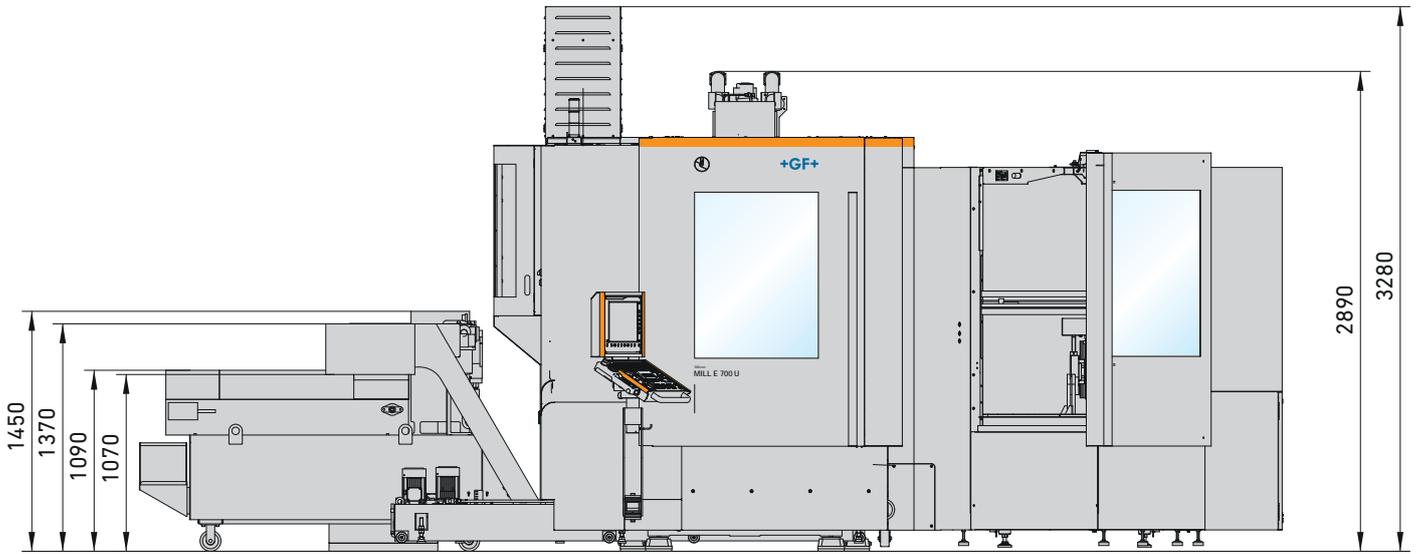
Mikron MILL E 700 U



# Mikron MILL E 500 U



Mikron MILL E 700 U



# GF Machining Solutions



## EDM (electrical discharge machining)

### AgieCharmilles wire-cutting, die-sinking and hole-drilling machines

For over 60 years we have been at the forefront of every EDM development: designing and refining the EDM process and building machine tools that deliver peerless part accuracies, surface finishes, cutting speeds and process reliability. Today, our AgieCharmilles wire-cutting, die-sinking and hole-drilling machines are recognized throughout the world as the best in the business. Our continuous research and development in digital generator technology, control systems and integrated Automation systems are evidence of our commitment to keeping your EDM operations on the leading edge of technology.



## Laser

### AgieCharmilles Laser texturing machines

Laser texturing is a fully-digitized surface engineering process that has huge potential. The technology enables precise 2D and 3D textures or engravings to be machined accurately and directly onto complex parts or molds to improve and alter their aesthetic appeal, functionality and performance. The process is infinitely repeatable and offers many distinct environmental and economic advantages over conventional texturing processes.

### Laser Additive Manufacturing (AM)

GF Machining Solutions has partnered with EOS, the global leader for high-end AM solutions, to integrate this innovative technology and further develop it into its current solutions to fully benefit the mold industry, by focusing on injection efficiency: optimized cooling design to reduce cycle time, lower energy consumption, higher quality of plastic parts.



## Tooling and Automation

### System 3R Tooling, Automation and software

Productivity is the key to manufacturing success, and automating a manufacturing process is a proven method of increasing its efficiency, effectiveness, quality and reliability. System 3R's integrated Tooling, Automation and software solutions ranging from simple workpiece pallet and electrode changers through to flexible manufacturing and robot handling systems are guaranteed to help you increase their competitive advantage.



## Milling

### Mikron high-speed (HSM), high-performance (HPM) and high-efficiency (HEM) Milling centers

Customers operating in the mold, tool and die and precision component manufacturing sectors stake their reputations on being able to quickly and cost-competitively meet their customers' demands. That's why they invest in GF Mikron machines. Incorporating the latest and most advanced technologies and premium-performance components, Mikron HSM, HPM and HEM machines help you increase your production capabilities and improve your productivity. Designed and built for speed, accuracy and reliability, the machines, like you, are proven performers.

### Liechti dedicated aerospace and energy machining centers

Aerospace and power generation turbine manufacturers increasingly turn to Liechti dedicated five- and six-axis machining centers to machine complex, high-precision airfoils on blades, disks, blings, blisks/IBRs and impellers. It's easy to see why because these machines, with their specific profile machining technology, specialized CAD/CAM software and engineering competence for ultra-dynamic machining in titanium, Inconel, nimonic, titanium-aluminide and high-alloy steels, yield productivity gains as much as 30 percent, thanks to reduced machining times. In the globally competitive aerospace and power generation manufacturing sector, that's definitely worth shouting about.

### Step-Tec Spindles

At the heart of every GF Mikron machining center is high-performance Step-Tec Spindle. Step-Tec Spindles are essential core components of our machining centers. Highly accurate and thermally stable Step-Tec Spindles ensure that our machines can handle everything from heavy-duty roughing to fine-finishing operations.



## Customer Services

### Operations Support, Machine Support and Business Support

To help you get the most and the best from your machine tools and equipment, we offer three levels of support. Operations Support covers our range of original wear parts and certified consumables (EDM wires, filters, resins, electrodes etc.) to ensure that your machines are performing at the highest levels. Machine Support maximizes, through our best-in-class technical support, preventive services and quality spare parts, your machine tool uptime. Business Support is designed to help you make a real step-change in your productivity and performance with solutions tailored to your specific needs.



## At a glance

We enable our customers to run their businesses efficiently and effectively by offering innovative Milling, EDM, Laser, Additive Manufacturing, Spindle, Tooling and Automation solutions. A comprehensive package of Customer Services completes our proposition.

[www.gfms.com](http://www.gfms.com)

