GF Machining Solutions

Mikron

HPM 1150U
HPM 1350U

Swiss design and quality

Contents

GF Machining Solutions

The Mikron HPM machines are designed for universal production of high quality parts.

The very latest motor driven spindles, directly-driven circular and swivel axes and the stable machine body offer the very best conditions to manufacture modern tools economically and precisely.

Applications

A broad spectrum of parts can be machined using HPM

Turbines and compressor discs

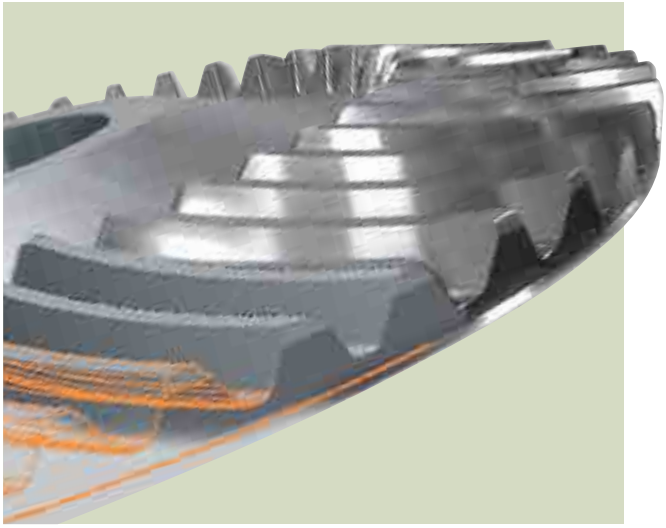
Extreme high temperature resistant tough steels
Aerospace

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

Suspension

Aluminium alloy
Car racing

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



Bevel gear wheel

Hard machining
Transmission

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

Escape doors for a small aircraft

A plastic injection mold

Highlights

Mikron HPM
Use for machining operations ranging from heavy rough machining to precise finish machining

Pallet magazine for workpieces up to 1 ton in weight

The work table and the loading stations allow optimal access

Mikron HPM 1150U
Loading: up to 1.1 t

Mikron HPM 1350U
Standard rotary table up to 1.6 t
Pallet table up to 1.5 t

The A and C axes can be clamped together for rough machining. This increases tool life.

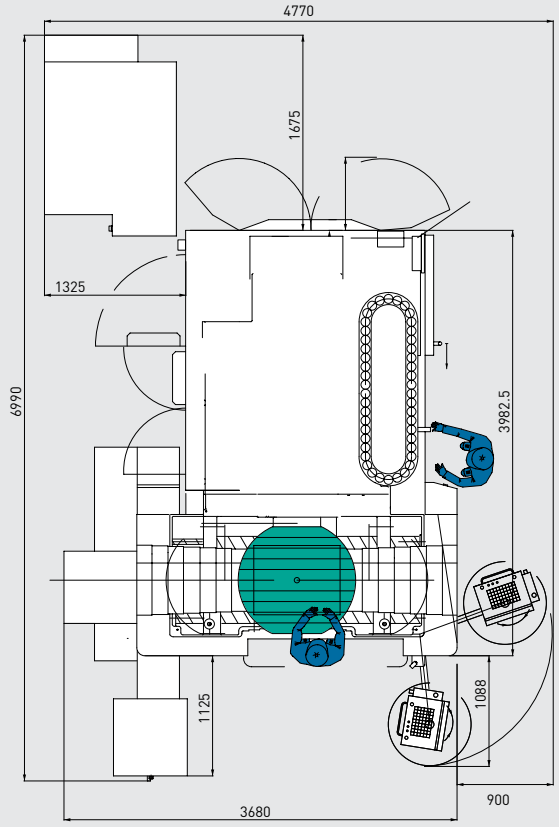
A swiveling control unit simplifies controlling and monitoring of the process.

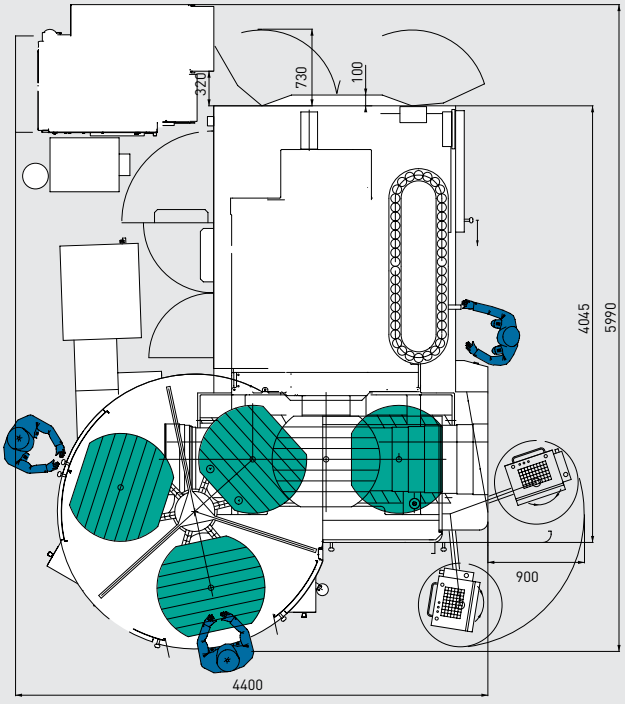
Two loading stations

The pallets can be manually locked and turned 360° and locks into 4 positions.

A one-piece machine bed made out of a casting

APS, APS extended, ITC and Adaptive Control.
These and further smart machine modules guarantee still more flexibility and process security for the production of high quality components.





Unusual levels of access

Mikron machining centers are characterised by extraordinary ergonomics.

The HPM series of machines engenders confidence based on the unparalleled levels of access offered, independent of the respective configuration of the machine.

Accessibility

Ergonomics and the working space

The Mikron HPM model series is universal

+ Predestined for machining operations involving the highest material cutting forces
+ Both swivel and rotary axes can be clamped
+ The tool life of the tools is extended by the high stability
+ The water cooling for the table drive guarantees reliable high precision over long machining times.

Mikron HPM 1350U
A pallet table in the pallet magazine
Pallets 1000 mm in diameter

Highlights

+ Direct measuring system
+ Water cooling
+ C-axis with clamping
+ A high loading weight

Ergonomics

The pallets can be unlocked and turned manually using the lever.

A view from above into the working space of Mikron HPM 1350U. Access to the workpiece is optimal.

Mikron HPM 1150U
Rotary table 1000 mm in diameter

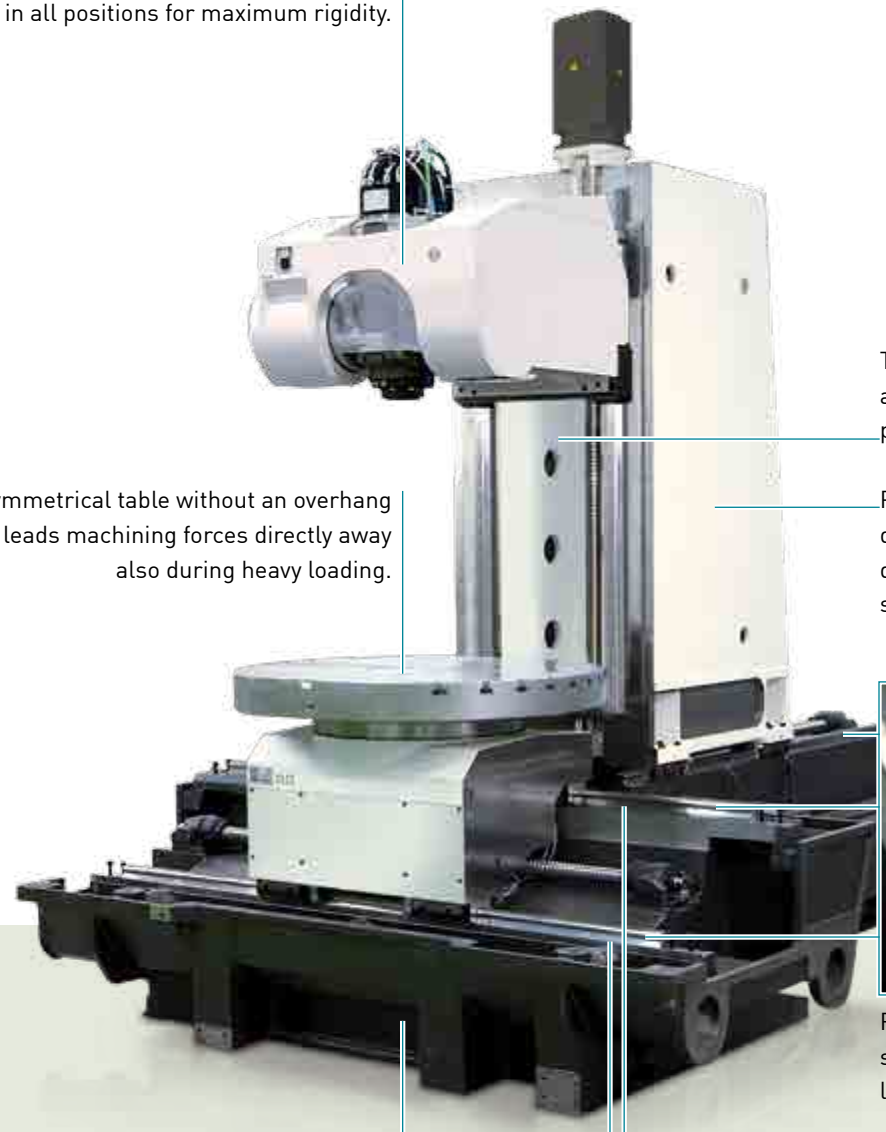
Mikron HPM 1350U
Rotary table 1100 mm in diameter

The long Y-axis also allows workpieces with a large diameter to be machined.

The basic machine

A well 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.



The Mikron HPM 1150U and 1350U are built on the moving column principle.

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.

High tech spindle

Constant machining in the HPC area

Tools spindles for demanding machining operations
Whichever machine configuration you choose you will always obtain the latest tools spindles with your Mikron HPM machine.
Tool spindle technology.

+ **A high torque**
  15,000 rpm ISO-B40 / HSK-A63
  The ideal spindle for universal use
+ **For high spindle speeds of**
  24,000 rpm HSK-A63
  An oil-air lubrication system with suction removal of the used oil.
  Optimal for machining materials which should be machined at the highest cutting speeds or for tools with a small diameter

The facts

+ Vector regulation for the obtaining maximum torque in the lowest rotational speed range
+ Highly stable ceramic-hybrid spindle bearing system
+ Spindle jacket cooling by means of a regulated coolant circuit for constant temperatures during the whole operating period
+ Integrates “smart machine” sensors

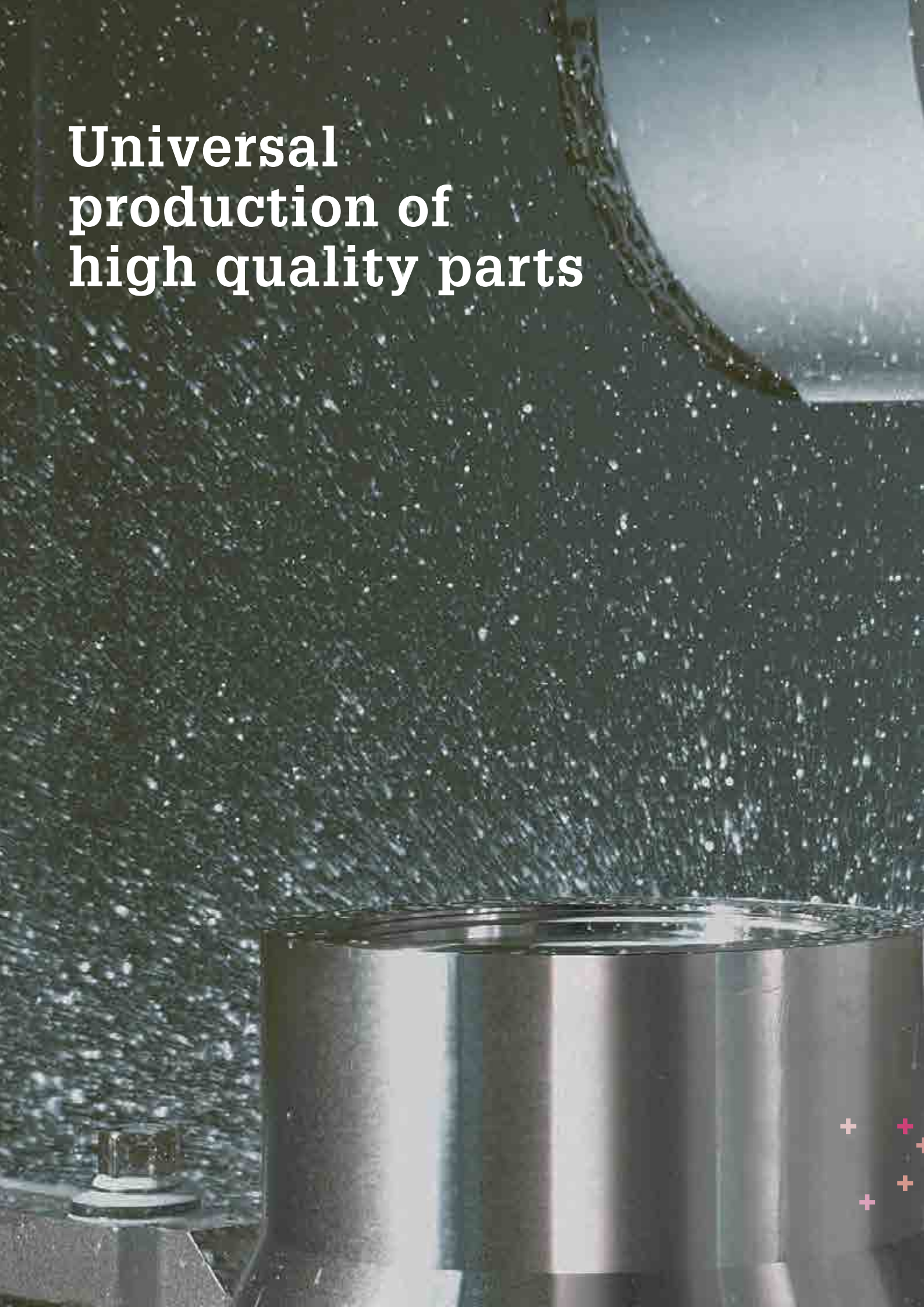
Your benefits

+ Precise high performance
+ Shorter acceleration phases
+ A high torque at lower rotational speeds
+ Thread cutting without a compensating chuck

Step-Tec
Since 1995 Step-Tec has developed, manufactured, sold and repaired motor-driven spindles for leading manufacturers of machining centers for milling and drilling 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 thanks to these spindles.

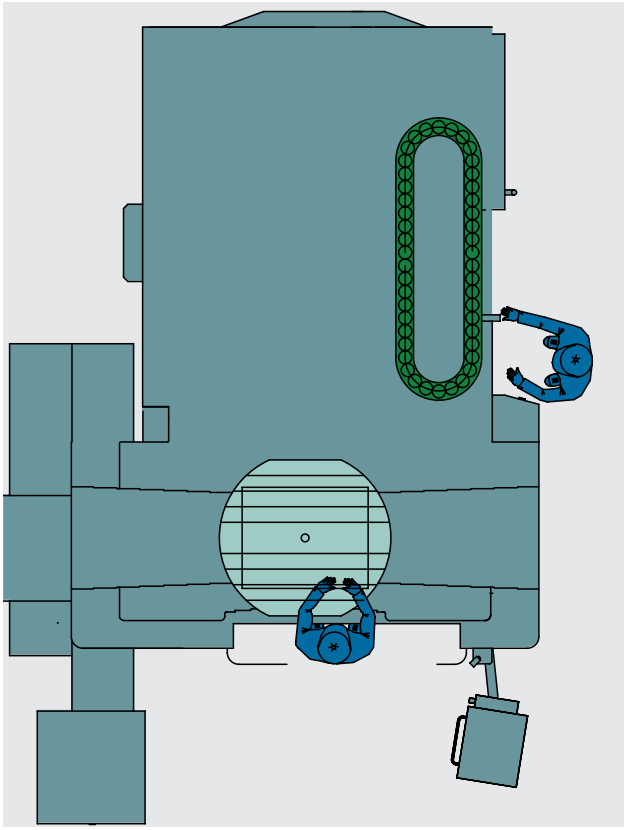
The scope of delivery includes the smart machine module APS (Advanced Processing System) for reliable recording and display of vibrations produced during the milling process.



Universal production of high quality parts

Tool magazine

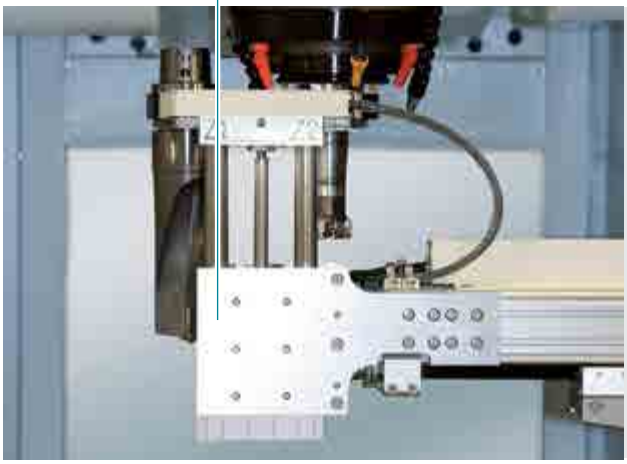
30, 46 or 92 tools



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.



Ergonomics

Simple monitoring of horizontal machining

The operating panel is swivelled from the machine front to the side window or in near the tool magazine in order to be able to monitor the machining process also for horizontal machining.

Options

Our machines are prepared for a large number of options.

The infrared measuring sensor

Laser tool measurement

Minimum quantity lubrication and cooling

Motor-driven spindle for 60,000 rpm

Internal tool cooling

A belt filter plant

Suction removal of mist

A rotating viewing window

Pallet magazine

KinematicsOpt

Operating modes 3+4

APS
CAMplete
Econowatt
SIGMA FMC
ITC
ITC 5X
ITM
OSS
OSS extended
OSS extreme
PFP
RNS
SPS

smart machine

HEIDENHAIN

A control unit from HEIDENHAIN

SIEMENS

A control unit from SIEMENS

smart machine

The new dimension in modern production

Saving energy

Protection

Precision

Productivity

The smart machine is constantly being further developed. The currently available modules can be found at www.gfms.com

Bringing intelligence into the milling process is the intended aim of "smart machine".

This includes a range of modules that are collectively referred to under the generic term "smart machine" and that fulfil various functions. In order to make the milling process "intelligent", various requirements have to be implemented.

First of all, establishing comprehensive communication between man and machine, which makes precise information that the operator requires to assess the milling process available to him. Secondly, supporting the operator in the optimisation of the process, which considerably improves the performance. Thirdly, the machine optimises the milling process, which improves the process safety and the quality of the workpiece - above all in unmanned operation.

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
+ Improvement in the process safety
+ Reduction of the machine set due to longer service life
+ Higher availability
+ Better operating comfort
+ Considerable increase in reliability in unmanned operation

smart machine construction kit system

Each of the modules fulfils 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.

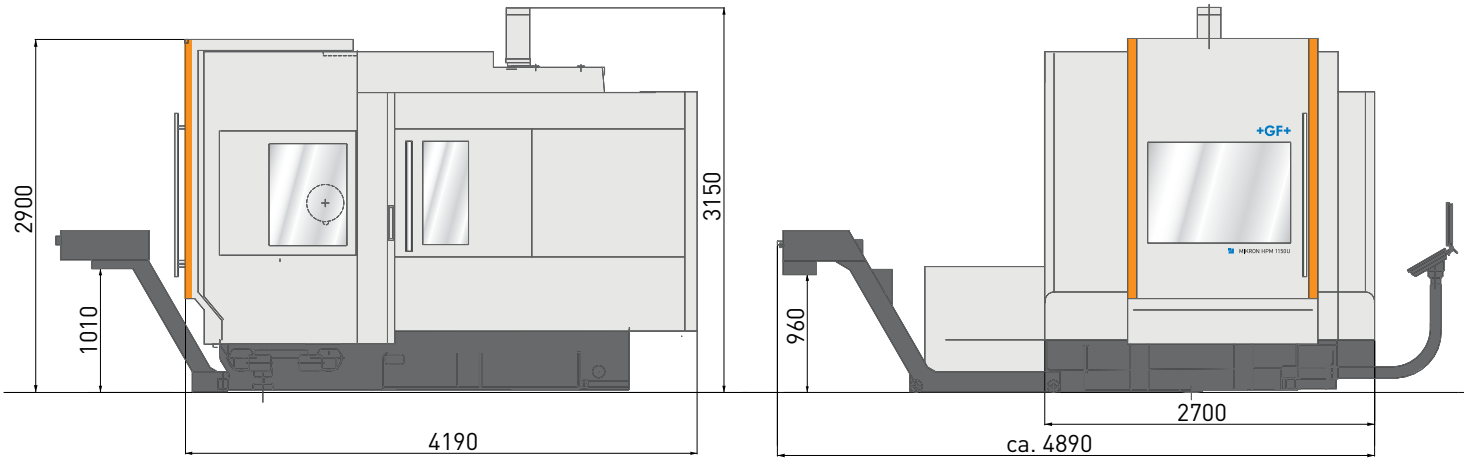
Your benefit

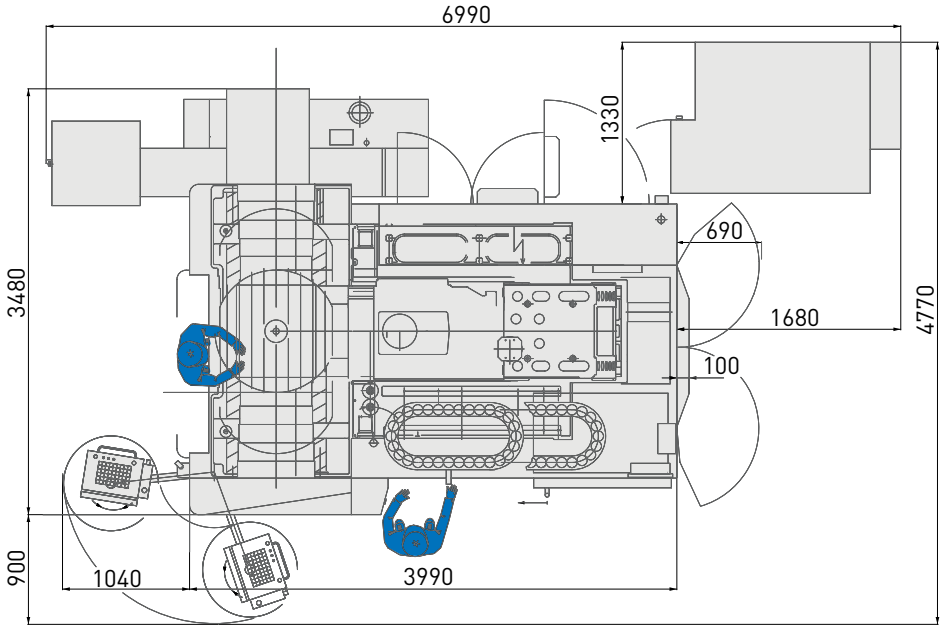
Producing the workpieces in a process-secure and precise manner, increasing the reliability in unmanned operation, increasing the service life of the machine and significantly reducing production costs.

Technical data

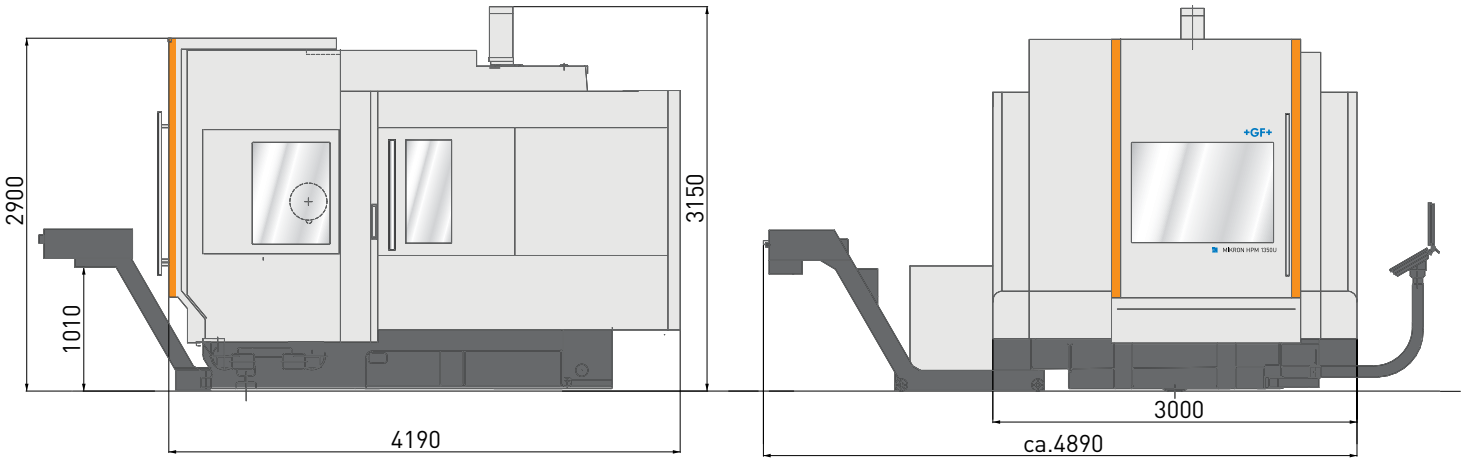
			Mikron HPM 1150U	Mikron HPM 1350U
Working range				
Longitudinal	X	mm	1000	1350
Cross	Y	mm	1150	1150
Vertical	Z	mm	700/895	700/895
A-axis		°	+16/-120	+16/-120
C-axis		°	n x 360	n x 360
Number of simultaneous axis		pce.	5 axis/5 simultaneous	5 axis/5 simultaneous
Feed Drives				
Feed rate / Rapid traverse	X, Y	m/min	15 / 30	15 / 32
Feed rate / Rapid traverse	Z	m/min	15 / 30	15 / 32
Feed rate / Rapid traverse	A	min^{-1}	11 / 20	11 / 20
Feed rate / Rapid traverse	C	min^{-1}	40	40
Working spindle				
Working spindle 10`000	Spindle power 40% ED	kW	34	34
HSK-A100	Spindle torque 40% ED	Nm	324	324
Working spindle 15`000	Spindle power 40% ED	kW	38	38
ISO-B40	Spindle torque 40% ED	Nm	193	193
Working spindle 15`000	Spindle power 40% ED	kW	38	38
HSK-A63	Spindle torque 40% ED	Nm	193	193
Working spindle 24`000	Spindle power 40% ED	kW	30	30
HSK-A63	Spindle torque 40% ED	Nm	75	75
Accuracy XYZ ISO 230-2(97)				
Accuracy	A	µm	X = 8 Y + Z = 6	X = 8 Y + Z = 6
Repeatability	R	µm	X = 5 Y + Z = 4	X = 5 Y + Z = 4
Work table				
Clamping surface		Ø mm	1000	1100
Max. workpiece weight		kg	1100	1600
Automation				
Pallet magazine		Positions	-	3
Pallet clamping surface		Ø mm	-	1000 / 840
Tool magazine	ISO-B40 / HSK-A63	Positions	30, 46, 92	30, 46, 92
	HSK-A100	Positions	170	170
Control unit				
Heidenhain			iTNC 530	iTNC 530
Siemens			840 D	840 D
Weight				
Machine		kg	12'300	12'600 - 17'100
smart machine				
			APS, APS extended,	APS, APS extended,
			Adaptive control, ITC	Adaptive control, ITC

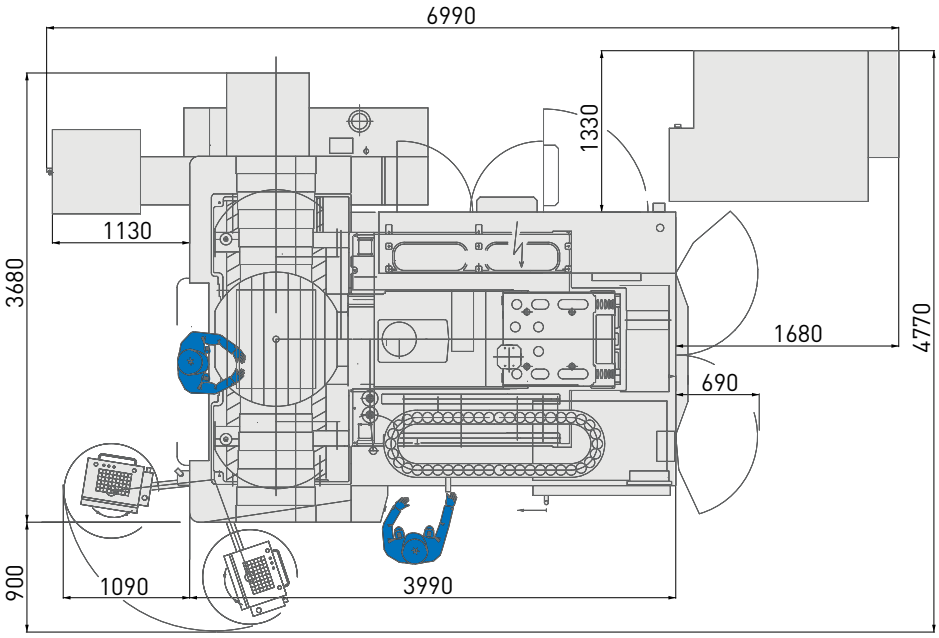
Mikron HPM 1150U
without Pallet magazine



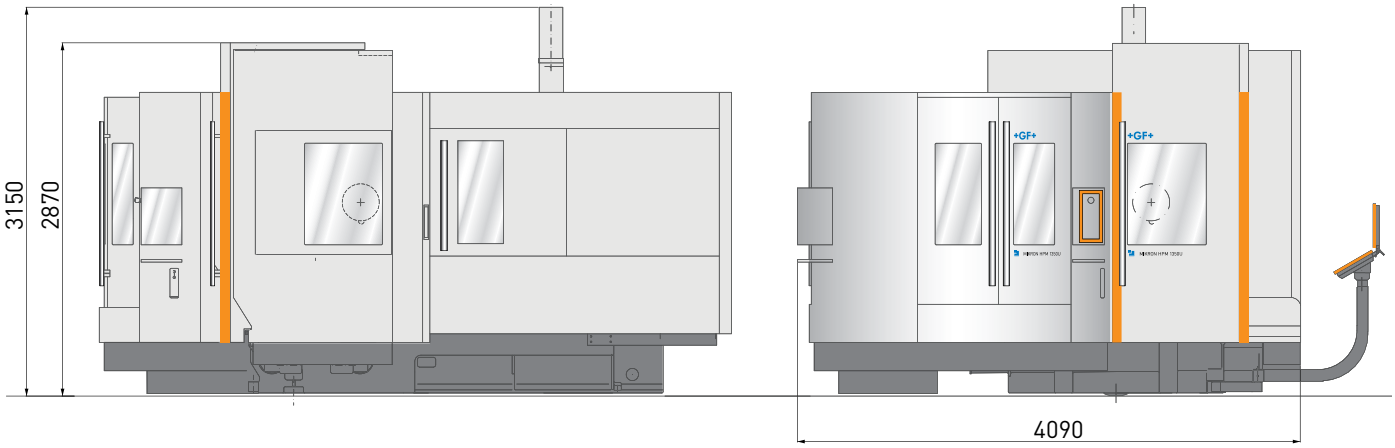


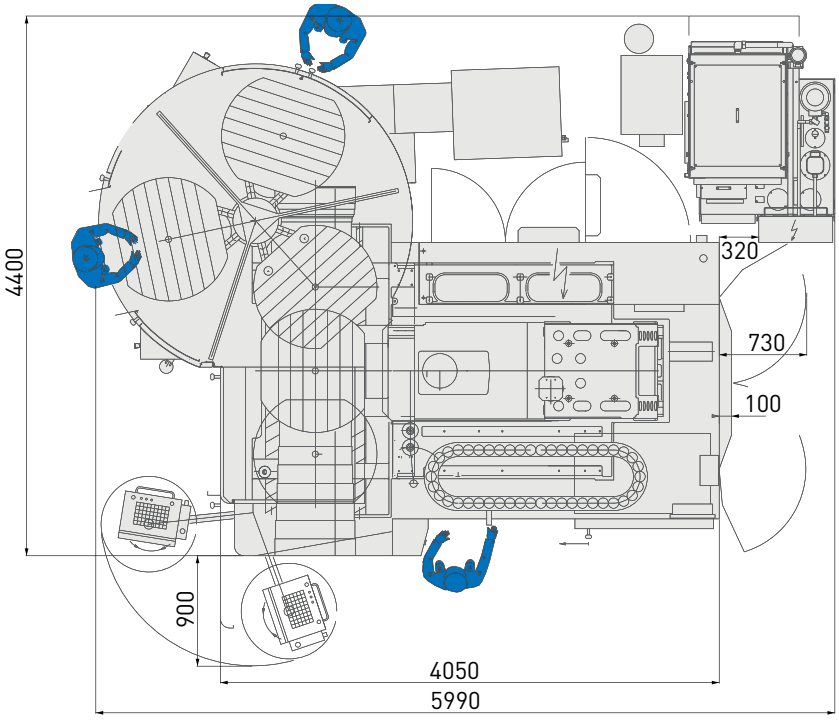
Mikron HPM 1350U
without Pallet magazine



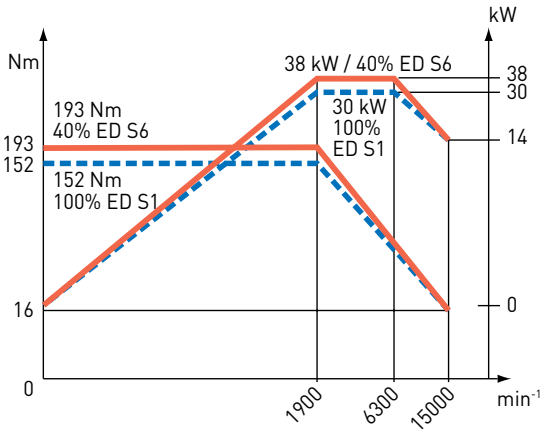


Mikron HPM 1350U
with Pallet magazine

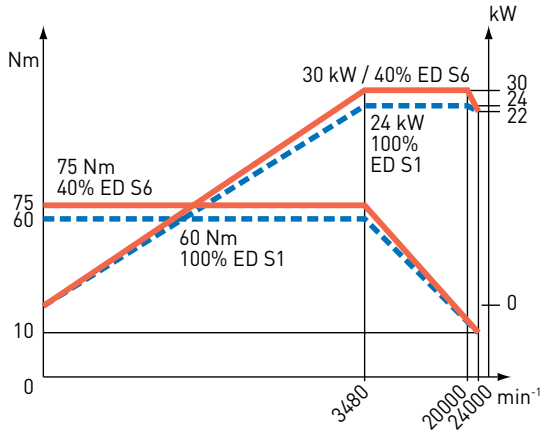




HPM 1150U / 1350U
HSK A63 / ISO B40 / 15000 min^{-1}



HPM 1150U / 1350U
HSK A63 / 24000 min^{-1}



GF Machining Solutions

Milling

High-Speed and High-Performance Milling Centers. In terms of cutting speed, HSM centers are 10 times faster than conventional milling machines. Greater accuracy and a better surface finish are also achieved. This means that even tempered materials can be machined to a condition where they are largely ready to use. One essential advantage of HSM is that with systematic integration, the process chain can be significantly shortened. HSM has developed alongside EDM into one of the key technologies in mold and tool making.

EDM

Electric Discharge Machines. EDM can be used to machine conductive materials of any hardness (for example steel or titanium) to an accuracy of up to one-thousandth of a millimeter with no mechanical action. By virtue of these properties, EDM is one of the key technologies in mold and tool making. There are two distinct processes — wire-cutting EDM and die-sinking EDM.

Laser

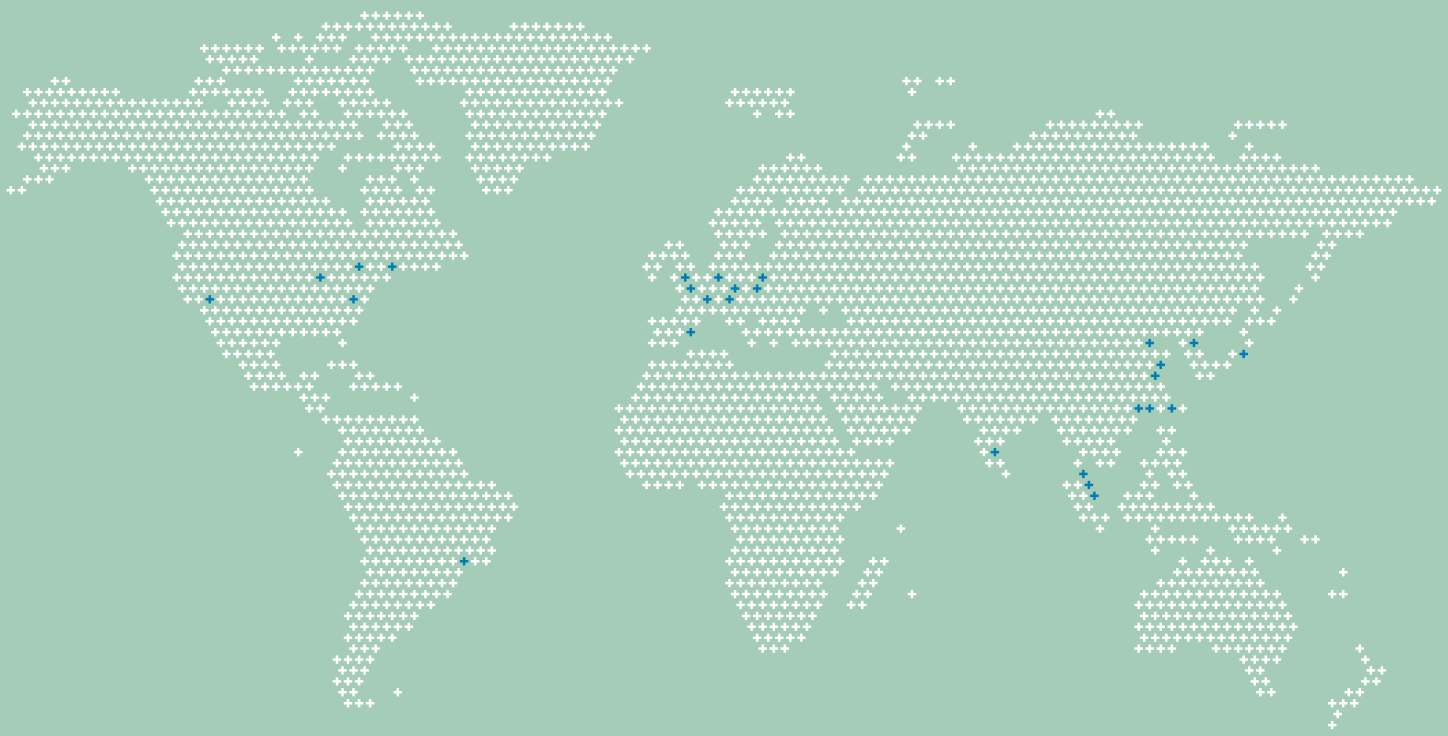
Laser texturing. Laser texturing supplements and extends the technologies offered by GF Machining Solutions. With our laser technology we enable you to produce texturizing, engraving, microstructuring, marking and labeling of 2D geometries right through to complex 3D geometries. Laser texturing, compared to conventional surface treatment using manual etching processes, offers economic, ecological and design advantages.

Automation

Tooling, Automation, Software. Tooling for fixing workpieces and tools; automation systems and system software for configuring machine tools and recording and exchanging data with the various system components and design advantages.

Customer Services

Operations, Machine and Business Support. Customer Services provides with three levels of support all kind of services for GF Machining Solutions machines. Operations Support offers the complete range of original wear parts and certified consumables including wires, filters, electrodes, resin and many other materials. Machine Support contains all services connected with spare parts, technical support and preventive services. Business Support offers business solutions tailored to the customer's specific needs.



GF Machining Solutions

259.805.842

At a glance

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

www.gfms.com