MFP 50

HIGHLY FLEXIBLE
FOR DEMANDING APPLICATIONS

C.O.R.E.®

MÄGERLE

MFP 50

HARDWARE

- 5 or 6-axis system
- Tool changer with 24 positions
- Grinding, milling and drilling in a single clamping
- Wear-free hydrostatic guideways
- Water-cooled drive
- Grinding spindle drive power: 25/50 kW
- C.O.R.E. Panel

SOFTWARE

- Pre-programmed grinding and dressing cycles
- Intuitive operation
- Focus on work and production safety
- C.O.R.E. OS operating system

DIMENSIONS

- X-axis – longitudinal stroke: 500 mm
- Y-axis – vertical stroke: 650 mm
- Z-axis – transverse stroke: 650 mm

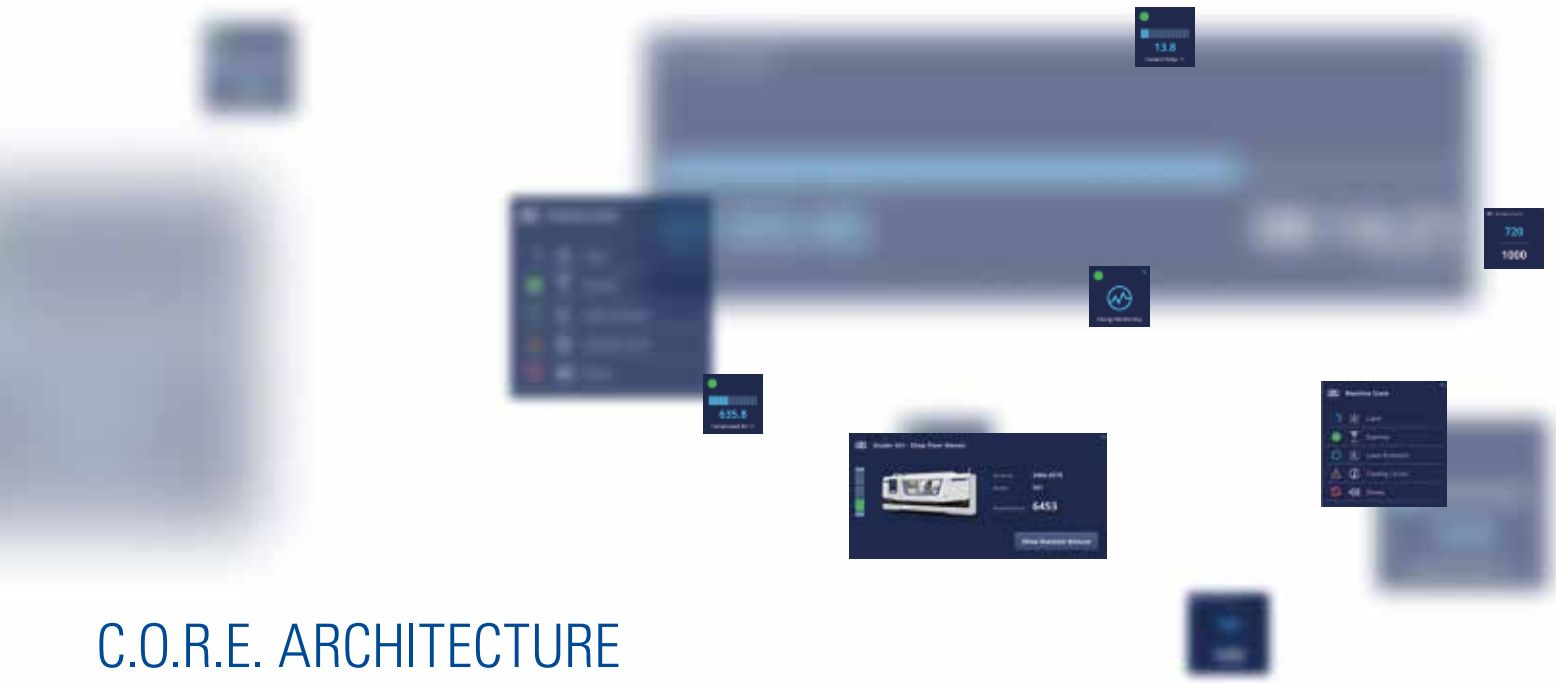
The MÄGERLE MFP 50 combines flexibility and performance in a compact design. As a 5 or 6-axis system, this CD grinding and machining center shows its top form when dealing with challenging workpieces. An intelligent design principle takes manufacturing quality, safety and cost efficiency to a new level. The coolant nozzle, controllable via two axes, allows unrestricted freedom of movement and precise positioning of the coolant jet. Spindle speeds of up to 10,000 revolutions per minute guarantee the highest machining precision. The grinding wheels are always mounted right at the front of the spindle, and the profile is changed through automatic positioning of the diamond rolls in the direction of the Z-axis. This allows a generous machining clearance, as collisions between wheel flange and workpiece are practically excluded. In the MFP 50 the grinding wheel diameter is used to the maximum, resulting in significant cost savings.

YOUR BENEFIT

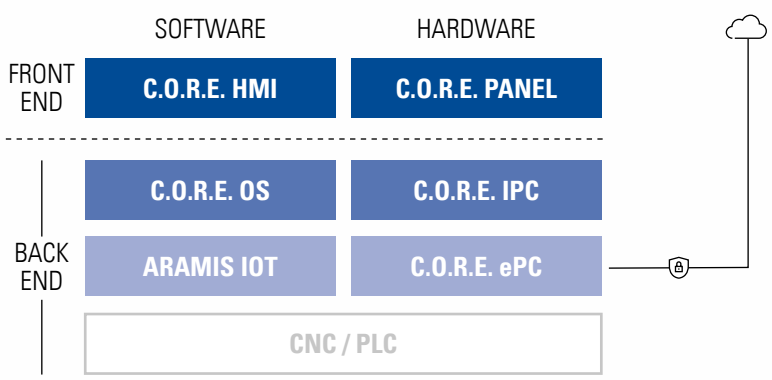
- Fast tool change
- Overhead dresser moveable in Z-direction
- Hydrostatic guideways
- Maximum grinding and cooling performance
- Maintenance-friendly design
- Process and system integration expertise
- Intuitive, user-friendly, and efficient operation
- Access to important information directly at the control panel (e.g. production progress, task details, etc.)
- Use of UNITED GRINDING Digital Solutions™ products directly on the machine
- Fast support thanks to direct interaction with our Customer Care team on the machine

C.O.R.E. – CUSTOMER ORIENTED REVOLUTION

With C.O.R.E., we make your production fit for the digital future.
The C.O.R.E. system from UNITED GRINDING is a future-oriented hardware and software platform that takes the operation, networking and digitalization of machine tools to a new level.
C.O.R.E. was developed to make our machines and your production environment fit for the digital industry of tomorrow. Operation is simple and intuitive via the multi-touch display, with a modern and customizable user interface. Thanks to the standardized hardware and software architecture, all UNITED GRINDING machines equipped with C.O.R.E. technology are network-compatible and can be easily integrated into digital factories. All common interface formats are supported. C.O.R.E.'s modern IoT technology core also enables data-based value-added services and integration and communication with cloud-based customer platforms.



C.O.R.E. ARCHITECTURE



C.O.R.E. PANEL & HMI – NEXT-GENERATION MACHINE OPERATION

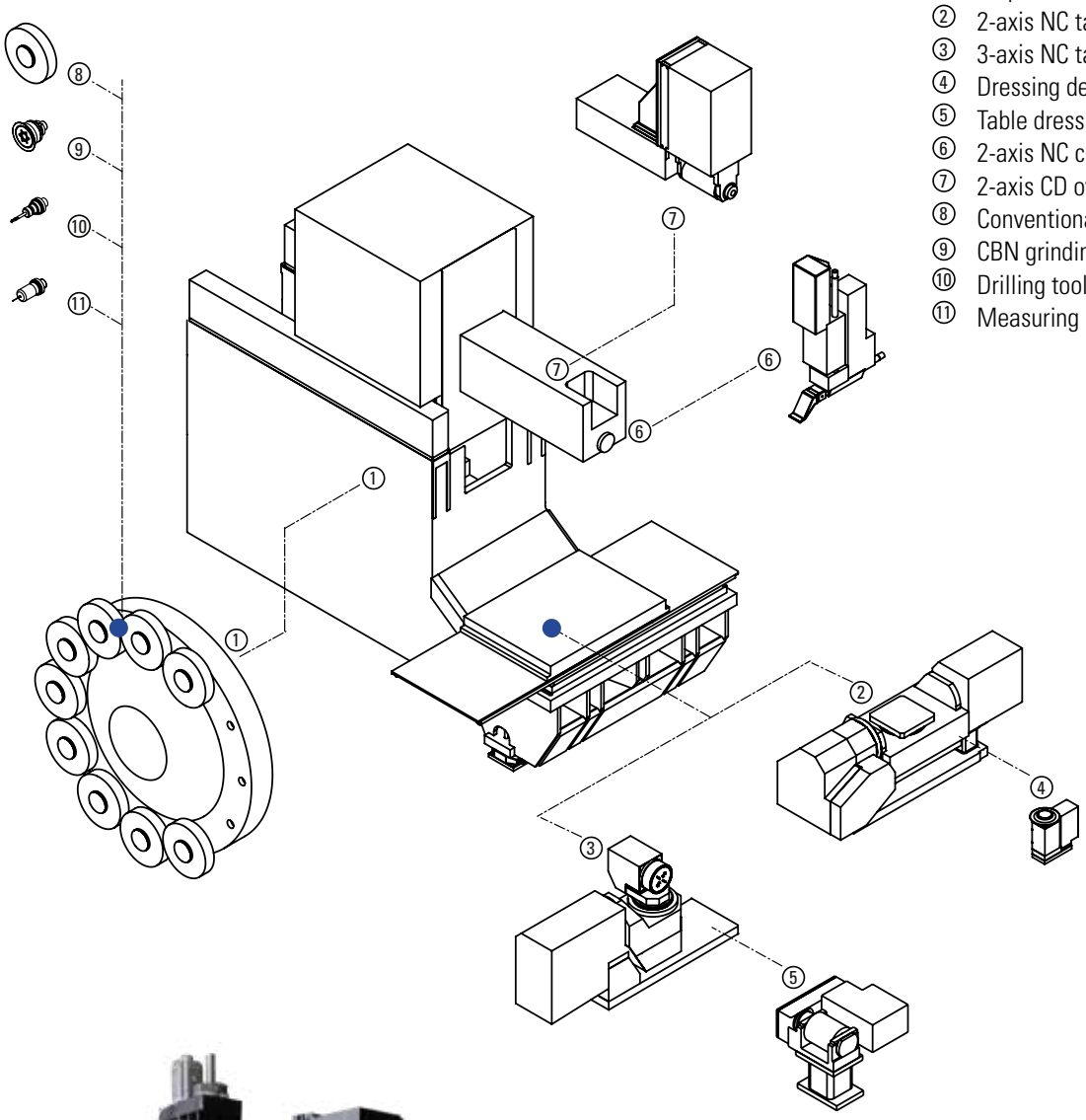
Like a large smartphone
With C.O.R.E., UNITED GRINDING has redefined the interaction between man and machine tool. Modern design combined with the most advanced technology to meet the operator requirements of tomorrow. The 24» multi-touch display enables navigation by touch and swipe gestures, similar to a smartphone. The uniform HMI for all UNITED GRINDING machines facilitates set-up, operation and general maintenance. Customizable user roles enable the display and restriction to role-relevant information and thus increase user-friendliness and safety. With the integrated front camera on the panel, assistance can be provided directly at the machine via Remote Service.

Future-proof
The digital capabilities of your machine with C.O.R.E. technology continue to grow. The C.O.R.E. HMI is continuously being expanded with new functionalities, widgets and apps to make it even more user-friendly and personalizable. The arrangement, type and size of the tiles on the HMI can be customized so that every machine operator always has the information that is important to him or her at a glance.

In future, new software updates and functionalities will be easy to install via the customer portal, so you will always be up to date.

Technical data
- 24" Full HD multi-touch display
- Override rotary switch with cycle start
- Standardized function keys
- Integrated 2-hand start
- Electronic key system (RFID)
- Integrated front camera
- Tilt adjustment

MACHINE CONCEPT



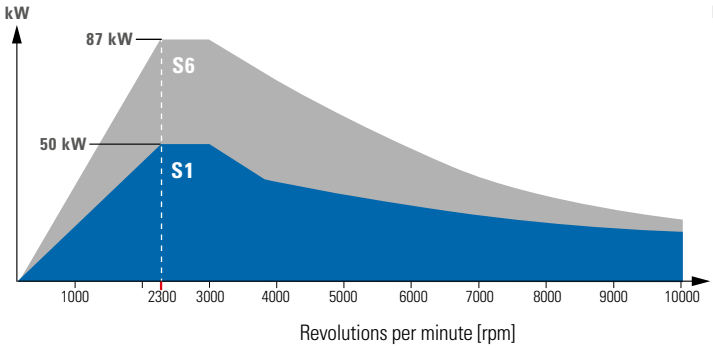
① 24-position tool changer
② 2-axis NC table
③ 3-axis NC table
④ Dressing device
⑤ Table dressing device
⑥ 2-axis NC coolant nozzle
⑦ 2-axis CD overhead dresser
⑧ Conventional grinding wheels
⑨ CBN grinding wheels
⑩ Drilling tools / Cutting tools
⑪ Measuring probe

POWERFUL DRIVES AND HYDROSTATIC SYSTEM

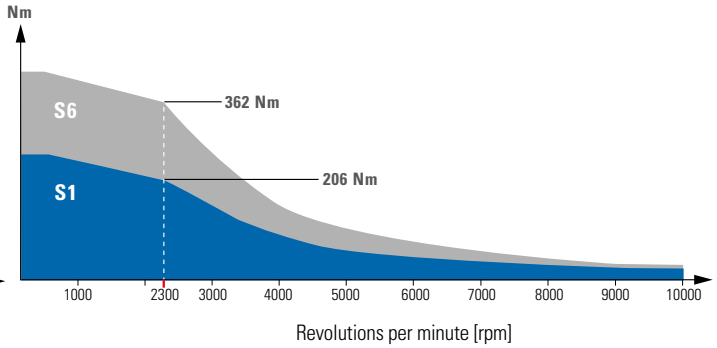
High performance and high torque

The water-cooled direct drive motor for the grinding spindle enables high performance and torque in continuous operation across the entire speed range. This leads to outstanding results in terms of removal rates. The HSK flange mountings guarantee high rigidity, attributed to the generous support on the tool holding fixture via the collar. They are also the key to enabling quick tooling changes with absolute repeatability precision. An optional balancing system dynamically balances unequal forces in the rotating grinding wheel.

Spindle capacity



Torque



S6 = 40% duty cycle

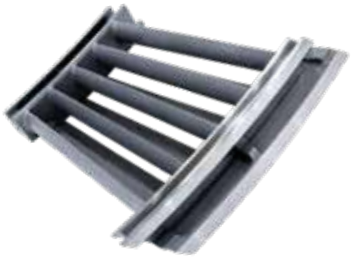
Wear-free guide concept

The unique design principle of MÄGERLE machining centers forms the basis for the overall machine quality. The vertical axis is supported by hydrostatic wrap-around guideways on a thin oil film and is completely separated from the column upper section. This principle enables the machines to withstand very high stresses free of wear, even in long-term use. The oil film also has a vibration-damping effect and guarantees high-precision machining of simple or complex workpieces.

APPLICATION EXAMPLES AND MACHINING CAPABILITIES

Turbine vanes

Turbine vanes are ground on the MFP 50 with minimal downtimes and a high degree of autonomy. The combination of automatic tool changer and CD overhead dresser enables several profiles to be ground in a single workpiece clamping, as well as ensuring dimensional stability.



Turbine blades

The capacity of the tool changer allows the machine to be prepared for several types of turbine blades. As a result changeover times can be significantly reduced. The compact tool holding fixtures enable wide machining contours to be achieved, together with high removal rates.

Shrouds
Shrouds can be completely machined in just a few clampings on the MFP 50, including milling and drilling operations.

Compressor blades
Compressor blades for aircraft engines are manufactured from forgings, which comprise high-strength and in some cases also heat-resistant material alloys. The complete blade root profile is produced in a single clamping.

before

after

Gear grinding
Gear grinding on challenging workpieces is enabled by a tailored system configuration. To ensure dimensional stability, external and internal diameter can be ground in the same clamping. The process-optimized coolant supply enables high removal rates with consistent production quality.

AUTOMATIC TOOL CHANGER

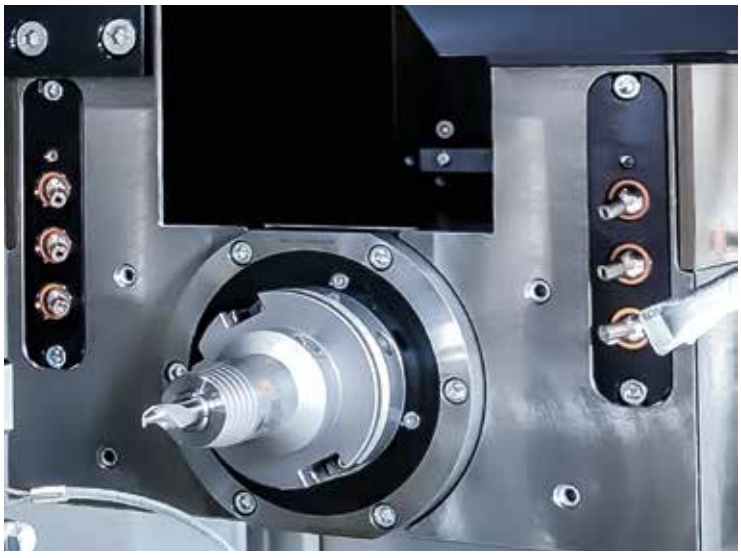
The tool changer includes 24 positions. It can be equipped with different grinding wheels according to the process requirements. The grinding process can be supplemented with the machine's drilling and milling capability, which supports a flexible machining platform for complex workpieces. In addition, the magazine can be loaded with a measuring probe which allows for dimensioning or workpiece position checks.

THE RIGHT DRESSING METHOD

Dressing Method

The dressing of the grinding wheels is a crucial factor for the efficiency of the grinding process. With overhead and table dressing devices, MÄGERLE provides professional solutions for the various requirements of this process step. The potential of the overhead principle is developed in continuous dressing (CD) and inprocess dressing (IPD). MÄGERLE uses servo motors for the drive; these can be freely programmed across the entire rpm range. The compact tool holding fixtures significantly reduce susceptibility to vibrations and the continuously dressed grinding wheel enables high removal rates with high profile accuracy over long cuts.

COOLING INTELLIGENCE



Cost-saving cooling intelligence
The NC controls of the MÄGERLE grinding centers enable precise positioning of the coolant supply, taking into account the respective grinding wheel geometry. Labyrinth seals with a sealing air arrangement protect all bearings in the machining area from impurities and contribute to the long working life of the overall system.

Nozzles are available on the grinding support for drilling and milling tools, and a coolant supply can be optionally provided through the spindle.

COOLANT FILTRATION SYSTEMS

The optimal solution for every application

MÄGERLE considers the grinding process as a system of different components and thus creates the necessary conditions for a high cost effectiveness. The system concept for coolant supply and cleaning is of central importance. Correct design is essential to utilize the full coolant potential. Taking account of these aspects, MÄGERLE in conjunction with the coolant system supplier matches integrated solutions to the customer-specific requirements.

AUTOMATION

Automation and machining cells

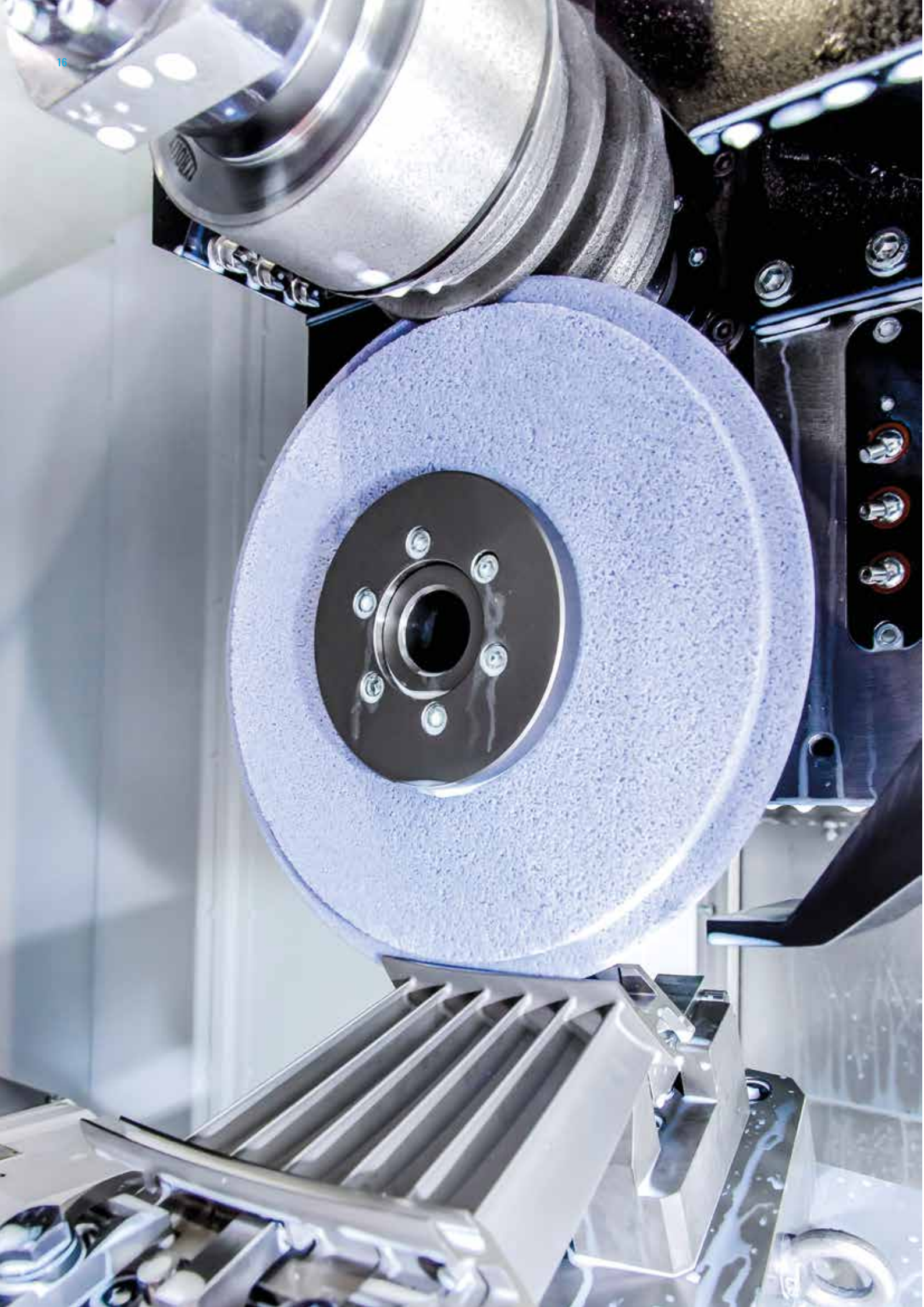
The MFP 50 is ideally suited for automatic loading and unloading. Flexible and efficient automation solutions are possible with a robot and linear system. The workpiece handling with robot technology is a quick and reliable step for increasing the capacity utilization and productivity of the MFP 50.

The integration of additional process steps such as cleaning and measuring is possible. MÄGERLE's expertise and experience with implemented automation solutions guarantee the highest productivity and quality and ensure your competitiveness.

Part loading is done via ergonomic loading stations that are separated from the work area.

Process steps

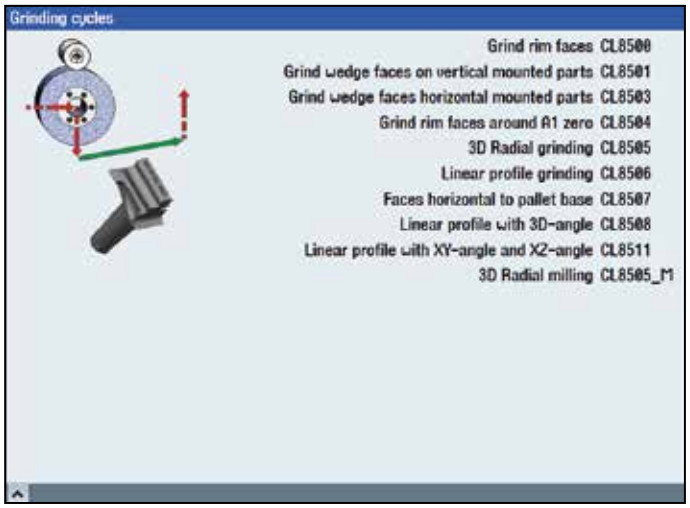
The workpiece is checked for its position in the fixture before machining. The machined parts are then cleaned prior to measurement. Correction values are derived from the measured values and fed back into the production process for the next components.

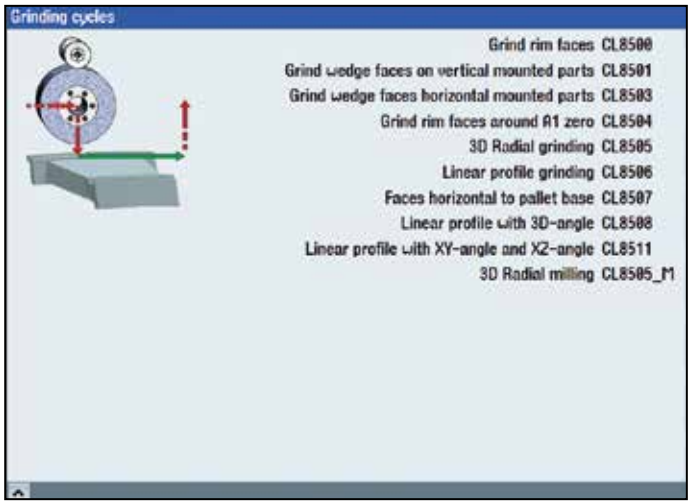


PROGRAMMING

The grinding center is equipped with the SIEMENS SINUMERIK ONE control. Specially visualized and parameterizable grinding and dressing cycles are available for efficient programming of the workpieces.

In 5-axis machining, 3D grinding and auxiliary cycles can be programmed for milling and drilling operations.





CAD/CAM CONNECTION

A SIEMENS NX postprocessor is available for CAM process development. The generated NC programs take account of the MÄGERLE grinding cycles. As a result the programs can be easily edited on the machine control unit via operator guidance. MÄGERLE provides a Vericut package for simulating and checking the programs.

WE ARE HERE FOR YOU!

Our products are designed to meet customer demands for as long as possible, they are intended to operate efficiently, reliably, and be available at any time.

From «Start up» through to «Retrofit» – our Customer Care is there for you throughout the working life of your machine. For this reason, you can rely on competent HelpLines worldwide and Service Engineers near you:

- We will provide you with fast, straight-forward support.
- We will help to increase your productivity.
- We work professionally, reliably and transparently.
- We will provide a professional solution to your problems.

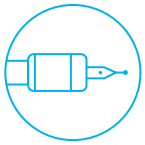
Start up
Commissioning
Warranty extension

Qualification
Training
Product support

Prevention
Maintenance
Inspection

Service
Customer service
Customer consultation
HelpLine

Digital solutions
Remote Service



Material
Spare parts
Replacement parts
Accessories

Rebuild
Machine overhaul
Assembly overhaul

Retrofit
Modifications
Retrofits

DIGITAL SOLUTIONS

Digital Solutions stand for products and services that open up the data space of your machine through IoT-based networking, enable seamless integration across the entire store floor in digital value-added networks and provide data-based value-added services and digital services – for greater efficiency, productivity and competitiveness.
You can find out more about the services of Digital Solutions on our website under the Customer Care section.

CUSTOMER CARE

EASE OF OPERATION AND MAINTENANCE

Operation

The machine is operated via the swiveling control panel with a view of the working area in the front of the machine. When the splash guard is opened, heavy workpieces including clamping fixtures can also be loaded from the top with a gantry or jib crane.

① Working area
② Splash guard opened at the top
③ Tool changer loading
④ Pneumatics

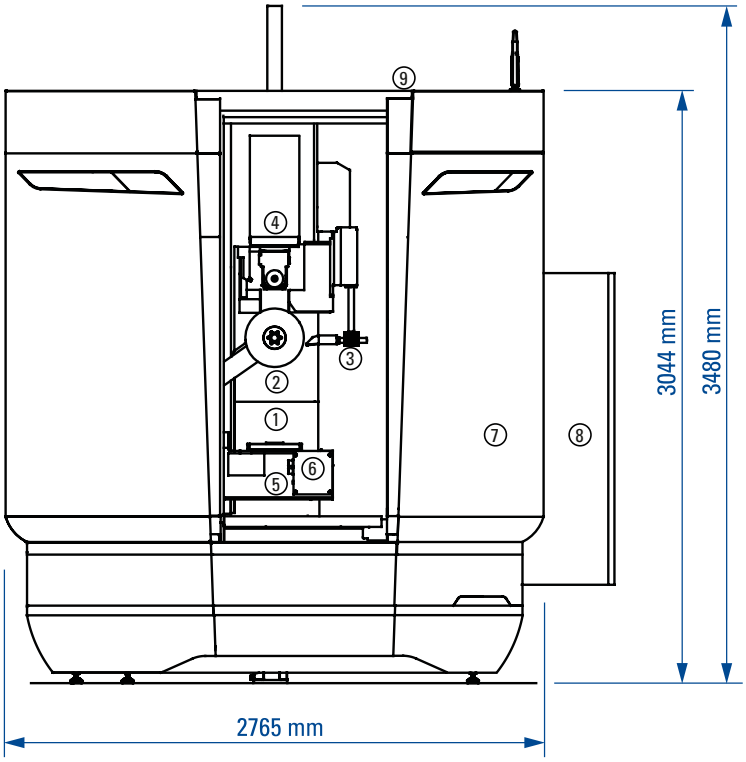
Maintenance

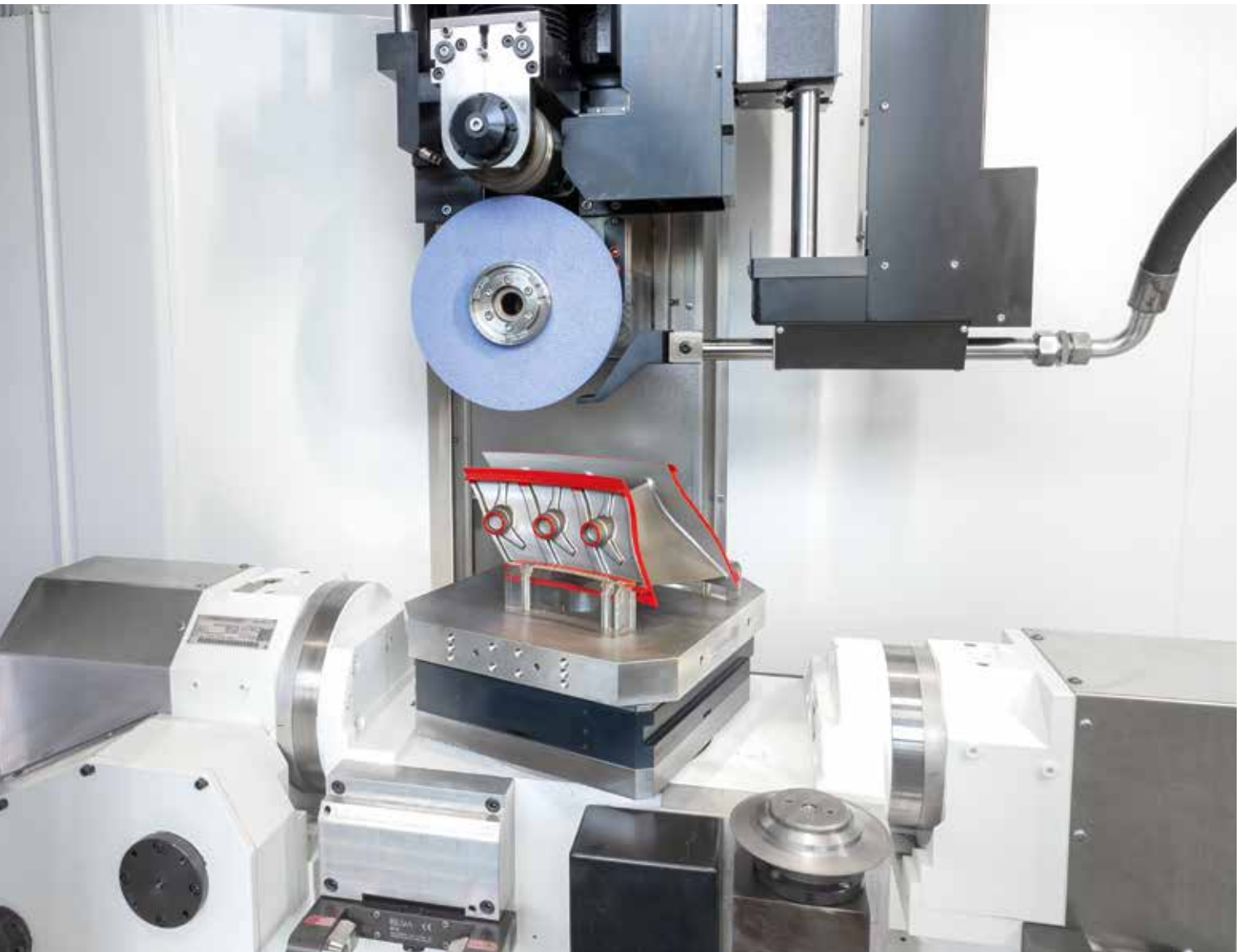
Access for maintenance of the respective units and components of the entire machine is centrally positioned and designed to make maintenance easy. Periodic maintenance activities can thus be efficiently performed.

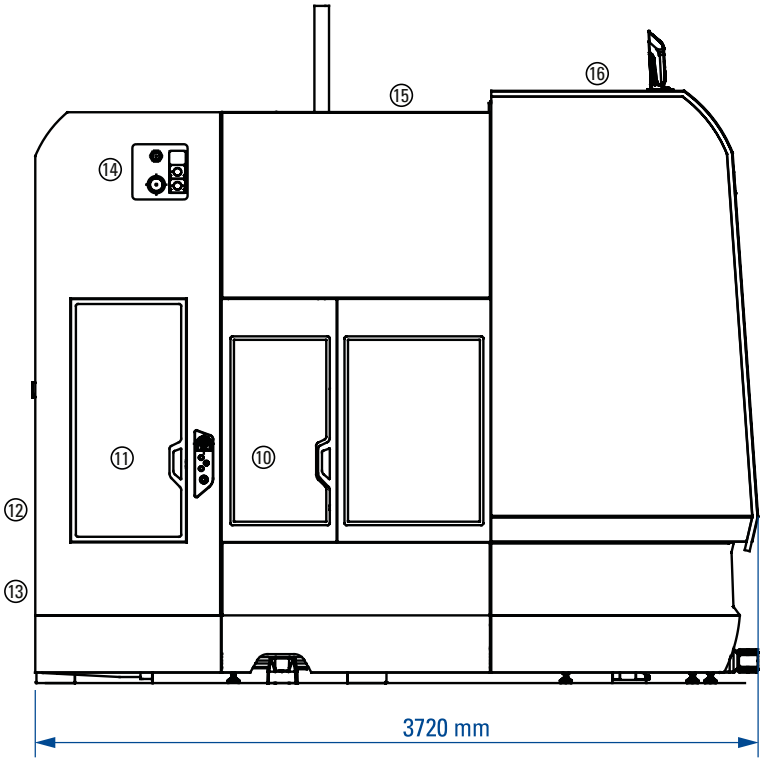
① Electric cabinet
② Fluidics
③ Central lubrication

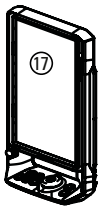
LAYOUT

① Working area
② Quick-change spindle for machining tools
③ Automatic coolant nozzle
④ Overhead dresser
⑤ NC indexing head 2/3 axes
⑥ Dressing device (optional)
⑦ Safety splash guard
⑧ Electrical cabinet
⑨ Automatic door drive









⑩ Tool change magazine
⑪ Pneumatics
⑫ Centralized lubricating system
⑬ Hydrostatic/Hydraulic unit
⑭ Interface to coolant processing system
⑮ Mist extractor (interface)
⑯ Machine status lamp
⑰ Operating panel

TECHNICAL DATA FOR MFP 50

X-axis	longitudinal stroke	mm	500
	travel speed	mm/min	0...30.000
Y-axis	vertical stroke	mm	650
	travel speed	mm/min	0...20.000
Z-axis	transverse stroke	mm	650
	travel speed	mm/min	0...20.000
Quick-clamping spindle		type	HSK-B80
Maximum continuous power grinding spindle		kW	25/50
Rpm range max.		min^{-1}	0...10.000
Grinding wheel dimensions (D x T x H)		mm	300 x 60 x 76,2
V-axis profile dressing device, roll width, max.		mm	215
Tool changer positions		n/pos	24
Tool length max.		mm	200
Tool holder			HSK-B80
NC combination - rotary/swivel axes		n/axes	2/3

We reserve the right to make technical changes

MÄGERLE AG MASCHINENFABRIK

Precision, quality and flexibility are key attributes of the products manufactured by Mägerle AG Maschinenfabrik. A technology leader for high-performance surface and profile grinding systems, the company founded in 1929 primarily specializes in customized solutions.

At the heart of the international success of our high-quality Swiss machinery is the unique design principle of the MÄGERLE modular system. Thanks to state-of-the-art technology, MÄGERLE can offer customers from many branches of industry reliable grinding centers. The high machining precision of the grinding centers ensures that our customers remain competitive.

Alongside decades of accumulated expertise, our highly motivated and dedicated employees play a key role in the success of the company.

As part of the UNITED MACHINING SOLUTIONS, MÄGERLE is a strong member of the group of globally leading machinery engineering companies for grinding machines. All over the world, this gives MÄGERLE customers access to an extensive network of experienced service and engineering technicians.

ABOUT US

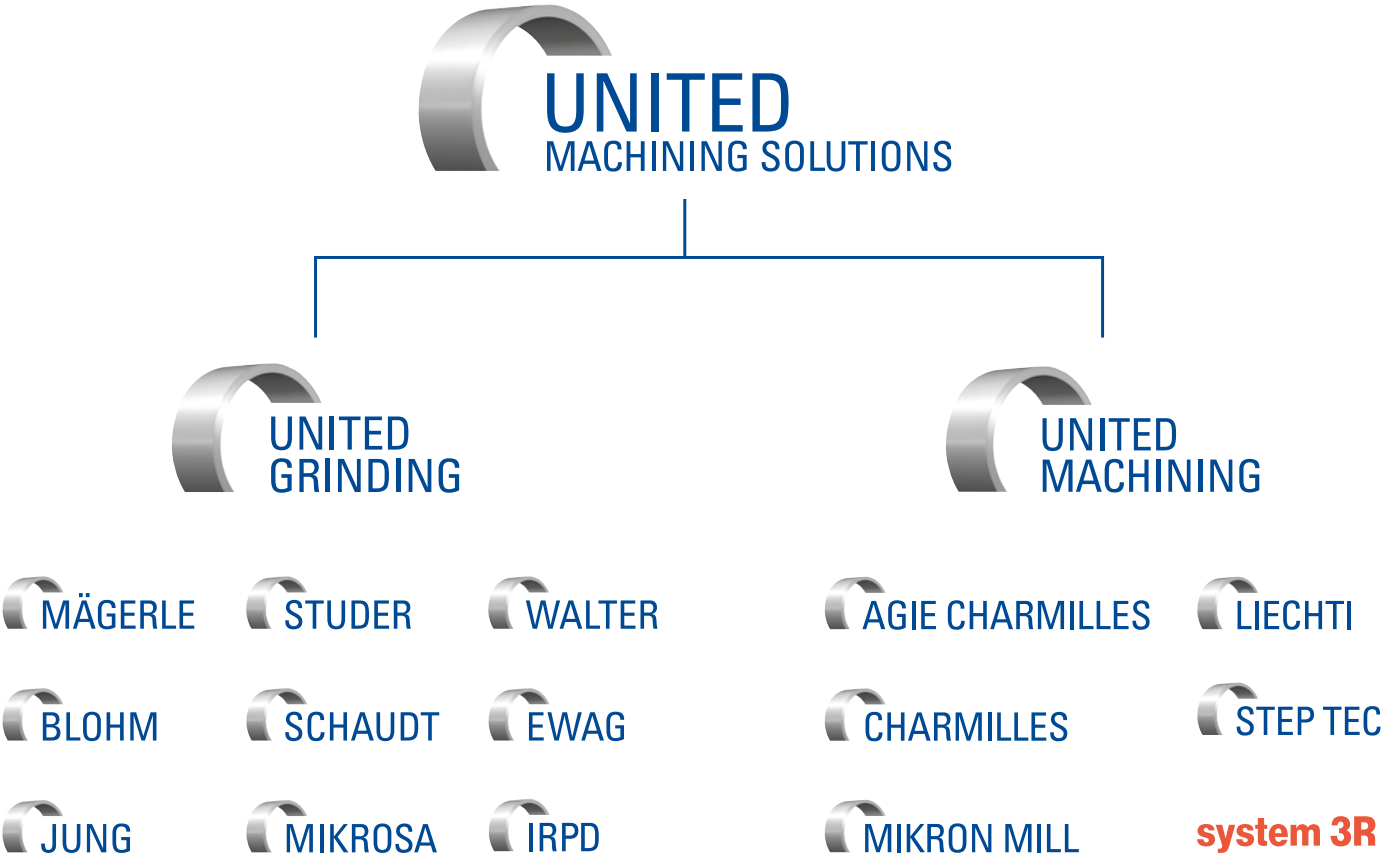
UNITED MACHINING SOLUTIONS

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»



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