



UNIVERTOR **AM**

Multifunctional vertical turning center





As flexible as your manufacturing tasks -
360° turning solutions from WEISSER

Just as chameleons can adapt to their environment, WEISSER's precision turning machines and multifunctional turning centers adapt to the customer's workpieces in the best possible way. In addition, WEISSER keeps an eye on the complete manufacturing process and offers the most economical solution for all requirements with its TURNKEY solutions.

UNIVERTOR AM-1 / AM-2

Version with one or two spindles

The modularly designed vertical precision turning machines of the UNIVERTOR AM are highly flexible and predestined for the complete machining of different batch sizes at lowest costs per piece. Technology integrations of rotational turning, hard turning, grinding, drilling, milling in one workspace enable high workpiece quality, contour accuracy and surface finish. In addition, setup, programming and idle times are significantly reduced. Highly productive simultaneous machining in one machine with up to two powerful disc turrets realize intelligent technology processes.



Conceptual advantages AM

- Left and right machine variants available
- Machine base with very good stiffness behavior and optimized damping properties due to remaining sand in the model
- Linear guides designed in high accuracy and preload classes in all machine axes
- All linear guides and feed drives arranged outside the working area for protection against chips
- Direct path measuring systems in all machining axes (glass scales)
- High dynamics of all machine axes
- Optimal chip fall downwards
- Self-built turning spindles with very good concentricity and axial run-out accuracy values
- Easy installation and removal of the turning spindle in the event of repairs
- Main spindle A8 or A11 according to DIN 55026
- Interface in tool turret VDI or Capto

Options

- Integrated measuring probe
- Driven tools (for drilling operations)
- 4-axis machining (through additional turret on cross-slide unit)
- Additional internal grinding unit
- Additional external grinding unit
- Combination of turning and grinding in smallest space
- Additional drilling head
- Additional Y-A axis unit with milling spindle for gear milling
- AM-2: Simultaneous or sequential machining (with possibility of turning the workpieces)
- AM-2: Various automation variants

UNIVERTOR AM-T

Version AM-T

In the working area of the UNIVERTOR AM-T with vertical spindle-slide arrangement and multifunction slide, the workpieces are cycled through the machine according to the transfer principle. The transfer takes place directly from the hanging pick-up spindle into the standing vertical spindle. The additional turrets, drilling heads or multifunctional slides mounted on the special column module enable a wide range of machining options. In this way, subsequent operations can be carried out in one work area with significantly reduced non-productive times and with maximum transfer precision between the clamping units. This guarantees highly accurate form and position tolerances on the workpieces.



Conceptual advantages AM-T

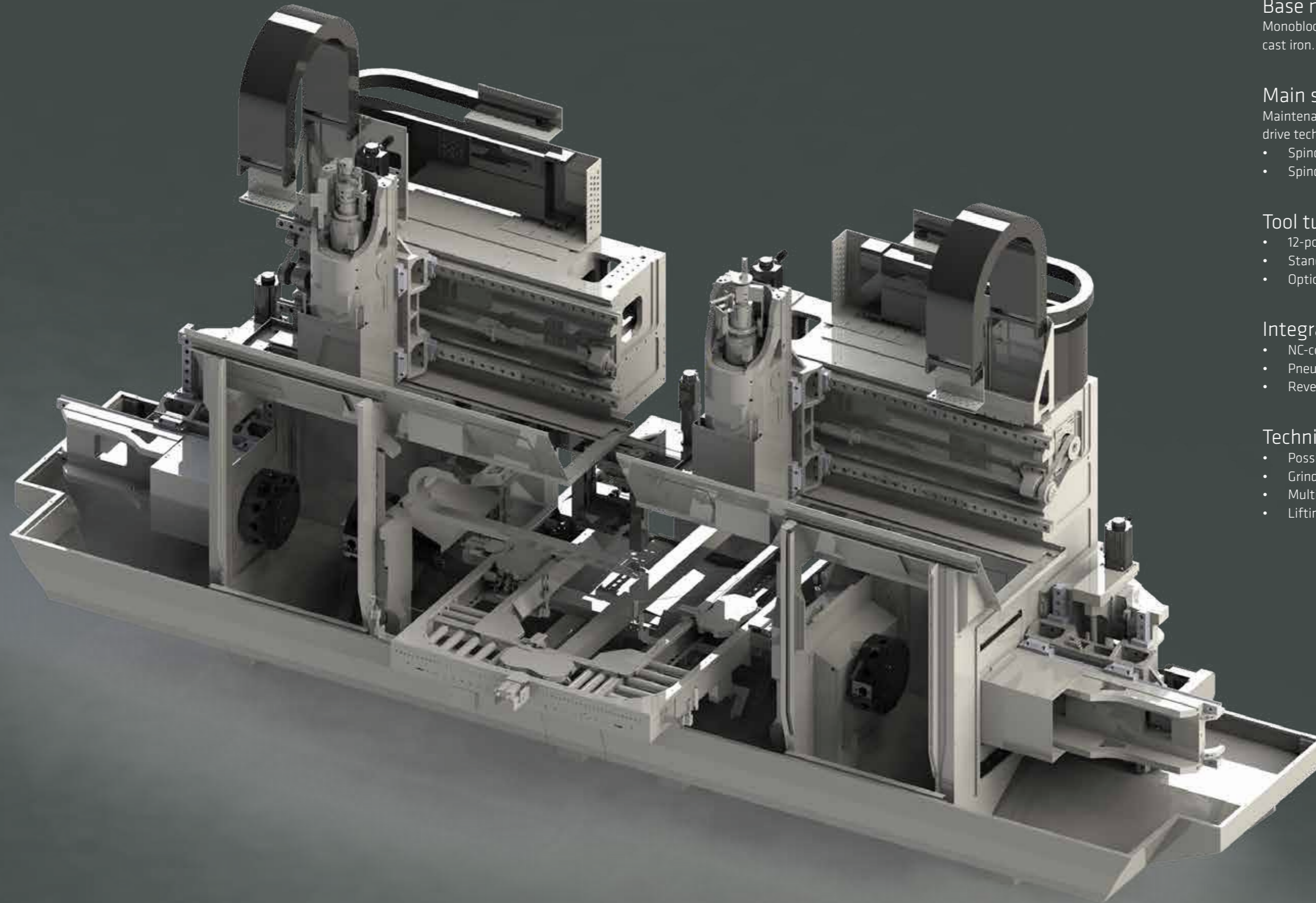
- Two-spindle design with pick-up spindle and vertically positioned counter spindle
- Direct transfer from first workpiece clamping (hanging spindle) to second workpiece clamping (standing spindle)
- Workpiece passage from left to right or vice versa possible
- Machine column with very good stiffness behavior and optimized damping properties due to remaining sand in the model
- Linear guides designed in high accuracy and preload classes in all machine axes
- All linear guides and feed drives arranged outside the working area for protection against chips
- Direct path measuring systems in all machining axes (glass scales)
- High dynamics of all machine axes
- Optimal chip fall downwards
- Self-built turning spindles with very good concentricity and axial runout accuracy values
- Easy installation and removal of the turning spindle in the event of repairs
- Main spindles A8 according to DIN 55026
- Interface in tool turret VDI or Capto

Options

- Integrated measuring probe
- Driven tools (for drilling operations)
- Additional drilling head
- NC lift-off tool holder possible



Design AM*



Base machine

Monobloc machine structure made of high quality cast iron. Heavily ribbed machine base.

Main spindle

Maintenance-free spindle motor in digital drive technology.

- Spindle bearing \varnothing : 120 mm
- Spindle flange: A8 according to DIN 55026

Tool turret

- 12-position with electric drive
- Standard interface VDI
- Optional tool drive

Integrated parts handling

- NC-controlled X- and Z-axis
- Pneumatically operated parallel gripper
- Reversible gripper 0° - 180

Technical extensions

- Possibility of 4-axis machining
- Grinding spindle (internal and external)
- Multi-spindle drilling heads
- Lifting steel holder

*using the example of a machine of type AM-2

Application examples

Bringing the application advance to the road...

Differential housings, brake discs, pistons: components manufactured on WEISSER machines can be found in countless vehicles. Intelligent production processes require innovative technologies and reliable, highly accurate machining centers designed for high-performance use. Therefore, WEISSER's precision turning machines and multifunctional turning centers are built with the highest level of technical maturity and high accuracy. This gives customers the assurance that nothing stands in the way of their production of safety-relevant components.



Automation

Transport systems

The automation options with different transport systems (e.g. pallet conveyor, drag frame, friction roller conveyor, etc.) offer highly variable application possibilities. Depending on the design, they can be adapted to the shape and weight of the workpieces to be transported. A variety of linking tasks, maximum flexibility and easy maintenance are part of the countless advantages offered by these customized automation solutions.

Robot automation

Robot automation offers a highly flexible loading and unloading method for your machine. Machining solutions with robot automation are configured according to the customer's requirements, so that related processes (e.g. measuring, signing, aligning) can also be operated in a space-saving manner and offer maximum availability.



Technical highlights

Original WEISSER synchronous motor spindle with direct drive technology

More than 160 years of experience in development, design and own production of motor spindles carried out an unmatched competence potential, which is beneficial for WEISSER customers,

especially when it comes to:

- Process safety
- High technical availability
- Maximum productivity
- Excellent manufacturing quality

Highest precision and accuracy

Measuring of all components and units relevant for the accuracy - despite high basic accuracies the individual components are „finely assembled“. As a result, mechanical deviations during assembly are minimized and wear is reduced. This ensures a high long-term stability of the complete machine system.



Technologies

4-axes machining

Highly productive simultaneous machining in one machine with two powerful disk turrets (4-axes). Intelligent technology processes and the combination of different machining steps offer high savings potential. Working with two tools simultaneously shortens the machining times of the workpiece and reduces the cost per part.

Rotational turning

With the rotation turning process developed and patented by WEISSER, precisely machined surfaces can be generated with twist-free finishing precision and thus replace the expensive grinding operations. The simultaneous rotation of workpiece and tool cutting edge reduces the machining time by up to 77 % compared with hard turning.



Technologies

Hard turning

Hard turning describes the turning of steel with a hardness of more than 45 HRC. It is an efficient alternative for grinding hardened workpieces. The advantages of this process are shorter cycle, set-up and tooling times as well as the relatively lower investment costs and the options of wet and dry machining.

Out-of-round turning

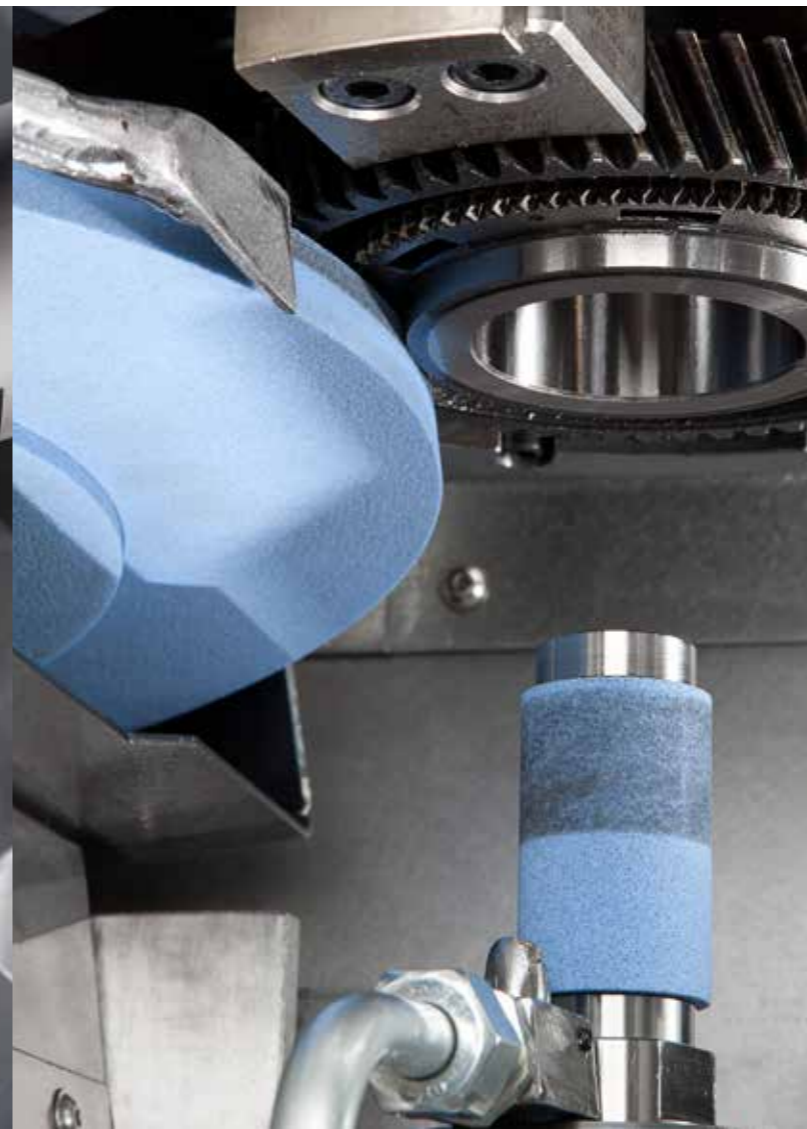
3 times capacity with WEISSER HOT system for shorter piece times and lower piece costs. The technology enables the highly productive machining of a wide range of workpieces, such as pistons for combustion engines, camshafts, polygonal profiles or the production of polygon shapes (shaft-hub connections) with process-oriented perfection.

Internal / external grinding

Machining with the technology of internal and external cylindrical grinding in one machine is exemplary for perfect hard fine machining of rotationally symmetrical workpieces. In order to achieve optimum cycle times, this machining technology can be combined with hard turning or rotational turning processes.

Gear cutting (hobbing)

Integration of a hobbing module, being the only method to manufacture internal and external gears with different helix angles and directions in a single machining center. This manufacturing process combines hobbing and slotting by continuous hobbing with maximum feed rate.



Intelligent technology processes and complete Turnkey systems

WEISSER machining centers with integrated technology concepts are the solution to demands for shorter process times, productivity and process safety. Shorter cycle times and the associated lower unit costs are decisive competitive factors, especially when manufacturing high quantities. WEISSER turnkey solutions not only score at high quantities but also at small quantities with high set-up flexibility. We pass this competitive advantage on to our customers. With the

experience of more than 160 years of development, construction and realization of customized machines, our engineers develop today the most economical solution upon your requirements. The development of the complete production process provides you full cost transparency and helps you to solve complex tasks in an optimal way. With three steps to success. WEISSER Turnkey.

Typical, machine-specific workpieces with cycle and technical challenges.

OFFER PHASE AND PLANNING PHASE

- Process requirements
- Production boundary conditions
- Machine requirements & machine type
- Workpiece clamping / Tools
- MFU features
- Terms of acceptance
- Delivery instructions
- Processing strategy
- Inspection of critical MFU characteristics
- Number of fixings
- Number of spindles
- Design of the machine system
- Workpiece loading and automation
- Clamping device
- Tools

IMPLEMENTATION PHASE

- Construction and integration of the workpiece-specific
 - Clamping fixtures
 - Tools
 - Automation
- Approval process of the tooling plan, layout plan, etc.
- The verification procedure of the process capability through
 - the preliminary acceptance at WEISSER
 - the final acceptance at the customer

TARGET PHASE

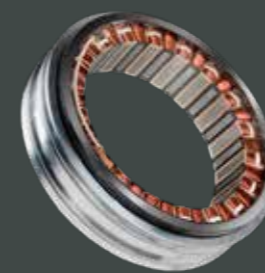
- Assistance with production startup and support
- Training in operation, programming and maintenance
- Service e.g. with preventive maintenance, spare part support, qualified service personnel, etc.



Differentialhousing

Machining in several clamping positions

- Outside and inside turning operations
- Various drilling processes
- Machining of the ball possible with special tools
- Cycle time: approx. 120 seconds



Stator housing

Machining of a stator carrier in two clamps

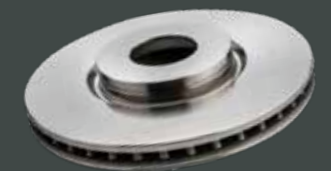
- Two independent working areas for OP10 and OP20
- Two motor spindles
- Measuring probe
- Individual clamping devices
- Cycle time: 80 to 90 seconds depending on the processing time



Axle drive wheel

Complete machining with soft turning, drilling and tapping

- Two independent working areas for OP10 and OP20
- Two motor spindles
- Wet machining with coolant
- Drill breakage control
- Special clamping devices
- Cycle time: approx. 120 seconds

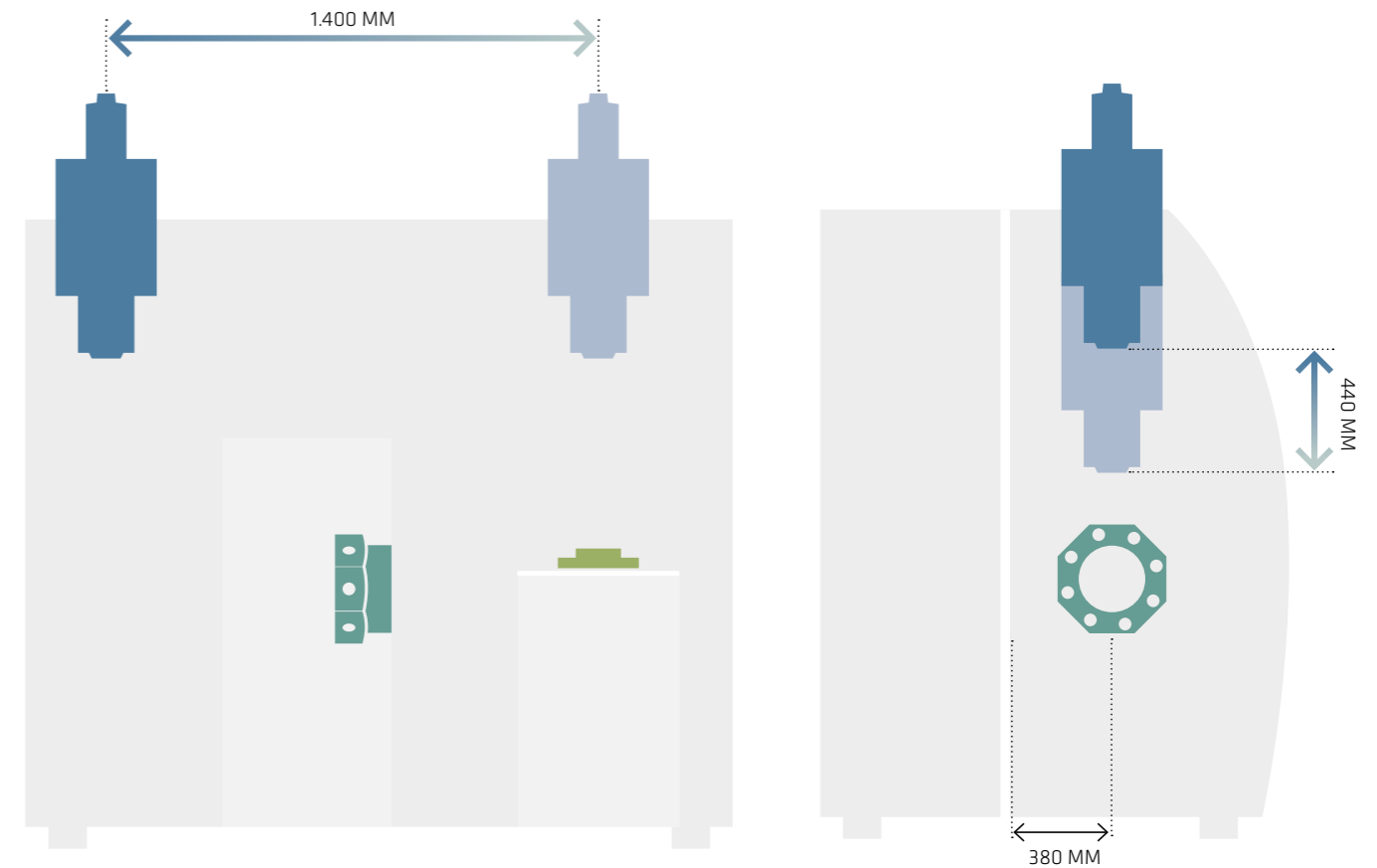


Brake disc

Machining of brake discs in four clamping positions on two machines

- Counter spindle or two pending spindles
- Units driven for bore machining
- Dry machining
- Ventilated, unventilated and lightweight brake discs
- Cycle time: 45 to 50 seconds

Technical data AM



		AM	AM-T	Internal grinding spindle				
Max. Turning diameter	mm	360	450	Drive power 100 % / 60% CDF	kW	15 / 18		
Max. Chuck diameter	mm	410	500	Torque 100 % / 60% CDF	Nm	4,7 / 5,7		
Max. Feed force X/Z (40 % CDF)	kN	8 / 10	8 / 10	Spindle bearing diameter	mm	45		
Working stroke X/Z-axis	mm	1.400 / 440	1.400 / 350	Max. Speed	rpm	45.000		
Max. Process speed X/Z	m/min	60 / 30	60 / 30	Rated speed	rpm	30.000		
Ball screw diameter X1/Z1	mm	40 / 40	40 / 40	Tool holder		Ø 28 / 43		
Number of tools		12	8 / 12	External grinding				
Tool holder		VDI40 / 50 / Capto	VDI40 / 50 / Capto	Drive power 100 % / 60% CDF	kW	11,5 / 14		
Tool flight circle	mm	740		Torque 100 % / 60% CDF	Nm	39,7 / 49		
Main spindle				Spindle bearing diameter	mm	80		
Spindle bearing diameter	mm	120	120	Max. Speed	rpm	6.000		
Spindle flange	DIN55026	A8	A8	Rated speed	rpm	2.700		
Drive power 100 % CDF	kW	35,1	35	Tool holder		Pick-up cone Ø 73		
Drive power 40 % CDF	kW	40	40	Dimensions				
Rated speed	rpm	780	780	Dimensions basic machine (LxWxH)	mm	AM-1: 3.400 x 2.587 x 3.190	AM-2: 5.400 x 2.587 x 3.190	AM-T: 3.500 x 3.200 x 3.800
Max. Speed	rpm	3.500	3.500	Weight	kg	AM-1: 11.000	AM-2: 21.000	AM-T: 18.000
Torque 100 % CDF	Nm	430	430					
Torque 40 % CDF	Nm	610	610					



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