Multifunctional vertical turning center

WEISSER

UNIVERTOR AC series

Multifunctional precision turning centers of the UNIVERTOR AC series are among the best machine tools worldwide of their class regarding their compact design, speed and precision.

The UNIVERTOR AC series allows the highly productive complete machining of a wide range of workpieces. WEISSER focuses on the individual solution of demanding production tasks. All activities focus on the entire process and the development of a complete system. The core of the company philosophy is the greatest possible customer orientation.

The UNIVERTOR AC series is perfectly designed for hard-turning machining. Shortest cycle time allow high volumes and ensure a maximum of economic efficiency.

Consistent customer orientation:
Whether medium or large series, whether light or heavy, whether aluminium, cast iron, steel or titanium, whether dry or wet machining -regardless of the production task set, WEISSER covers a wide machining spectrum with the UNIVERTOR AC series.

Conceptional advantages

- Heavily ribbed monobloc machine base
- Extremely high stiffness and thermal stability
- Long travels despite compact overall machine dimensions
- Direct drives / guide ways outside the working area
- Precision linear guide ways preloaded in horizontal and vertical direction
- Maintenance-free three-phase servo drives
- High rapid traverse speeds

Machine models

UNIVERTOR AC-1

Single-spindle Pick-Up precision turning center with vertical spindle slot arrangement, excellent accessibility to clamping devices, tools and Pick-Up positions, good visibility into the work area and process monitoring.

UNIVERTOR AC-2

With its two independent work areas, the two-spindles Pick-Up precision lathe enables machining in the first and second clamping or simultaneous production in one clamping.

Product Competence

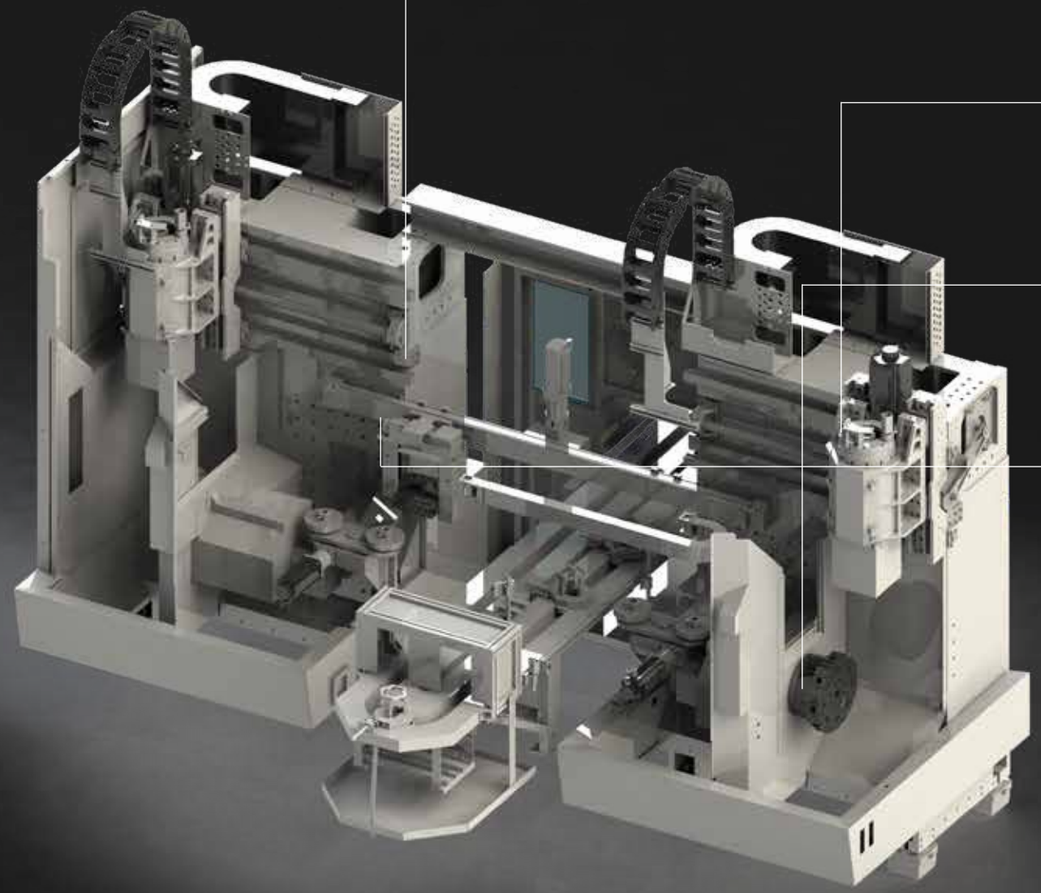
UNIVERTOR AC-1

The machines of the AC1 series are highly flexible and designed for the complete machining of various batch sizes, with very high quality requirements. The design as a right-hand or left-hand machine concept realizes the ideal adjustment to the production process.
Highly productive simultaneous machining in one machine with up to two powerful disk turrets (4-axes) or several grinding spindles enables intelligent technological processes with high savings potential and creates high-precision machining results.

UNIVERTOR AC-2

With the two-spindles UNIVERTOR AC-2 the simultaneous machining of two workpieces or the machining of one workpiece in two clamping systems is possible. It has the same modularity and flexibility as the UNIVERTOR AC-1.
The possibility of technology integration of innovative processes like rotation turning, hard turning, grinding, drilling or milling leads to a significant reduction of internal logistic processes and creates high-precision machining results.

Conceptual design



BASIC MACHINE

One-piece machine construction made of high-quality grey cast iron heavily ribbed machine base.

MAIN SPINDLE

Maintenance-free spindle motor with digital drive technology.

- Spindle bearing Ø: 3,54 inch / 90 mm
- Spindle flange: A6 according to DIN 55026

TOOL TURRET

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

INTEGRATED PART HANDLING

- NC-controlled X- and Z-axes
- pneumatically operated parallel gripper
- Turning gripper 0°- 180

TECHNICAL EXTENSIONS

- Possibility of 4-axes machining
- Grinding spindle (inside and outside)
- Multi-spindle drill heads

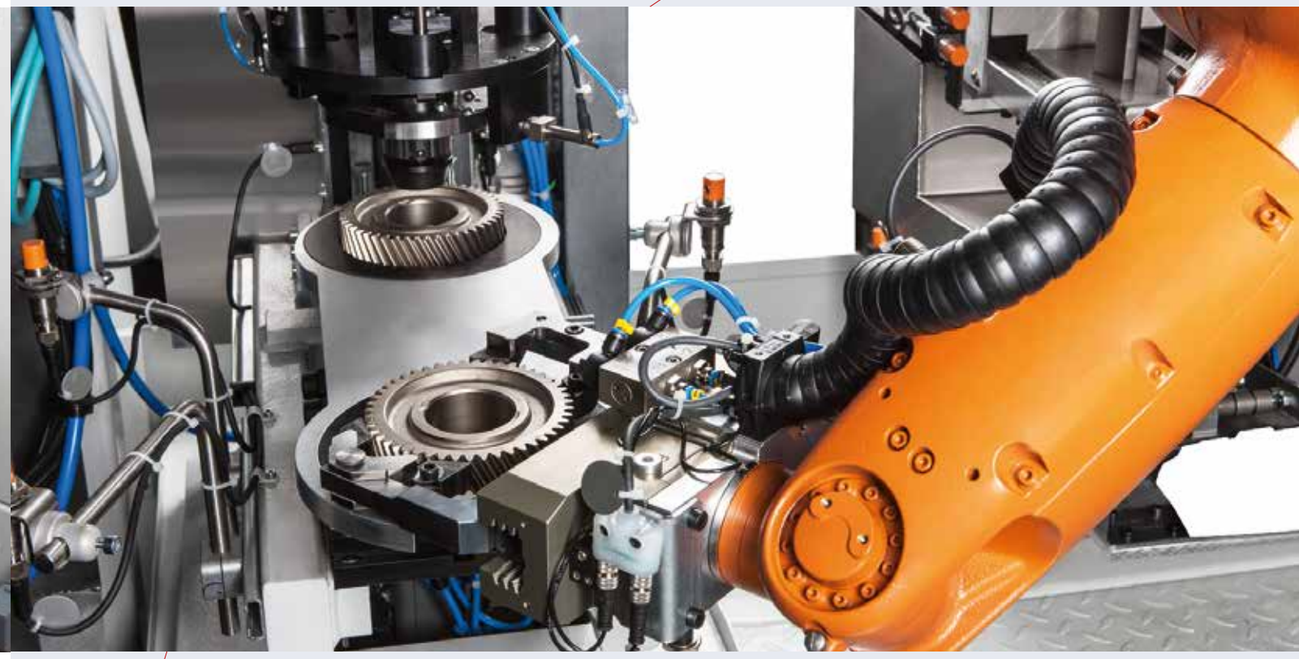
Automation

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.



Further automation solutions from WEISSER:

- Original WEISSER Pick-Up system
- Shuttle solutions
- Integrated part handling
- Loading cell

Technical Highlights

4-axes machining

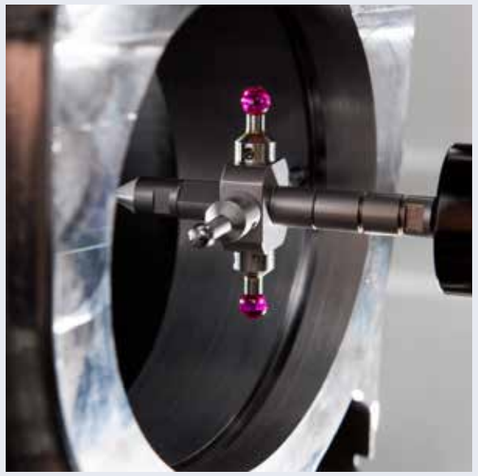
Highly productive simultaneous machining in one machine with two powerful disk turrets (4 axes). Intelligent technology processes and the combination of different machining steps offer high savings potential. Working with two tools simultaneously shortens the machining times of the workpiece and reduces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

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.

Mechanical zero

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.



WEISSER synchronous motor spindle

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

Technologies

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.

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.

Internal/external grinding

The complete machining from the combined processes of hard turning, internal and external cylindrical grinding in one machine is exemplary for perfect hard fine machining of rotationally symmetrical workpieces.

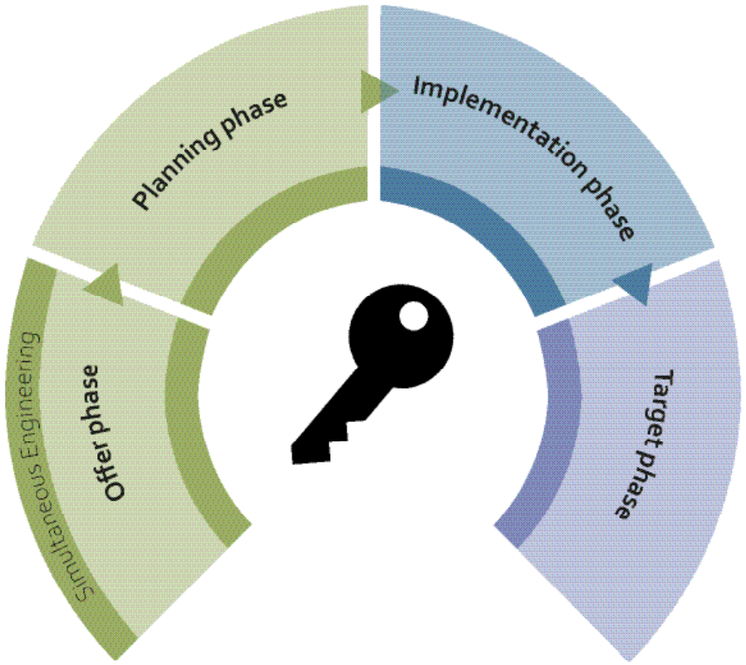
Gear cutting (hobbing)

Integration of a hobbing module, being the only method to manufacture internal and external gearings 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.

Turnkey

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 four steps to success. WEISSER Turnkey.



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.

WEISSER IoT Solutions

Digitization / Industry 4.0

Intelligence, efficiency, individuality, speed, connectivity - these are the central statements associated with Industry 4.0. Thanks to WEISSER's broad portfolio of Industry 4.0 solutions your machine can be connected to the digital world. By reducing downtimes, you can increase the efficiency of your machine, keep it up to date by constant software updates and maintain the quality of your workpieces by keeping the machine always updated and the parameters in standard.

WEISSER Cloud CorE

Through our cloud platform you can access your machine from anywhere. By interlinking the entire assembly line, you can optimally plan your production and derive organizational measures. And should a problem occurs, your WEISSER service partner can be contacted directly. Our aim is to carry out a preventive maintenance (Predictive Maintenance PdM), so that you can recognize in advance when refilling is required and detect a leak at an early stage due to a non-continuous decrease of operating materials.

Workpieces

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

Bearing inner ring

Machining of all functional surfaces in one clamping

- Console chip removal equipment
- Highest accuracy
- Turning and grinding
- Cycle time: 50 seconds, depending on size and processing effort

Ratchet wheel

Machining of drillings and flat surfaces

- Hard turning and grinding
- Clamping in the gearing or on the tip circle diameter
- Highest accuracy
- Grinding, drilling and taper in one machine
- Cycle time: 60 seconds depending on size and processing time

Ratchet wheel (soft)

Soft machining completely in two clamping positions

- OP10 Three-jaw power chuck
- OP20 Collet chuck or mandrel
- If required: spindle head with driven tools
- 4-axes machining
- Cycle time: 30-40 seconds depending on plate size

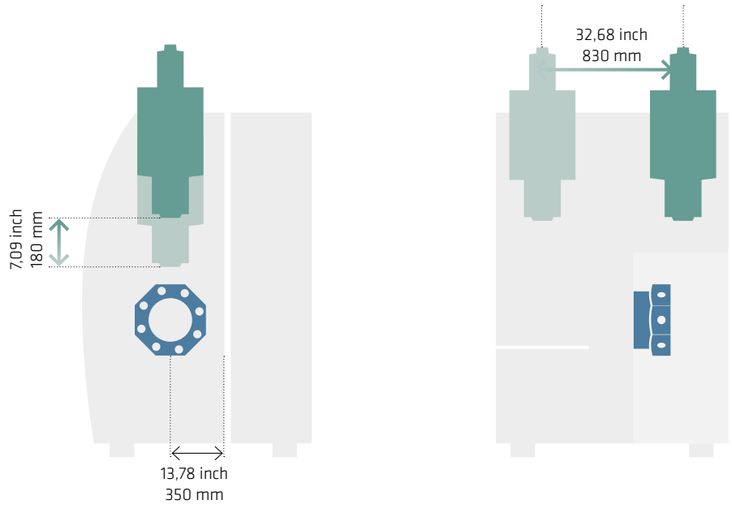
Steel pistons

Machining in several processing steps

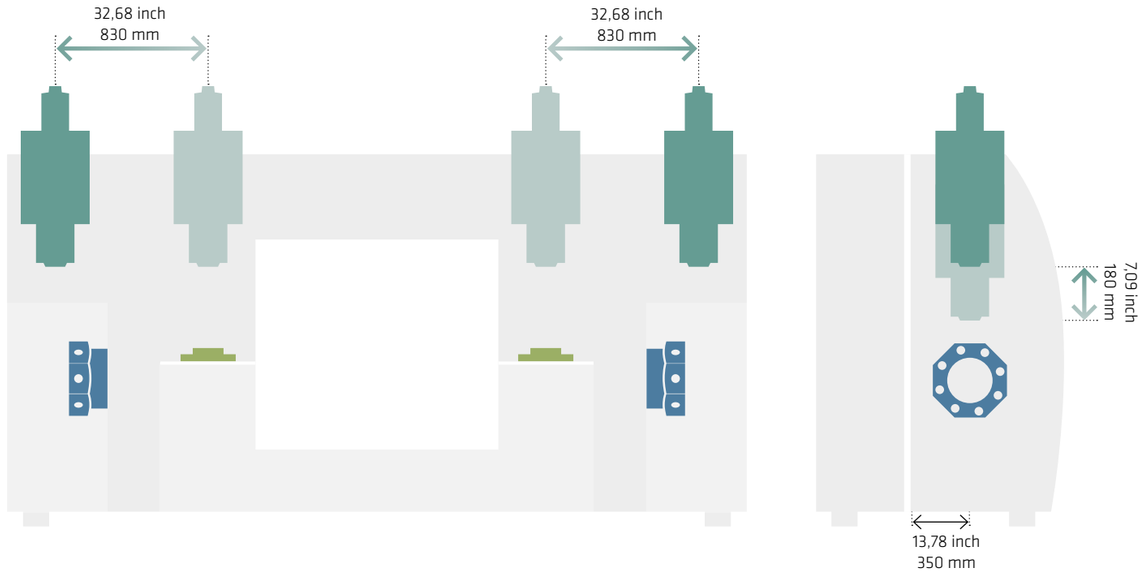
- Pre-turning and finish turning
- Turning the cooling channel
- Milling valve pockets
- Precision turning
- Turn grooves
- Bolt hole pre- and finish machining
- Line cycle 30 seconds

Technical data

UNIVERTOR AC-1



UNIVERTOR AC-2



Technical data

		AC-1	AC-2
Max. turning diameter	**inch** / mm	**5,90** / 150	**5,90** / 150
Max. chuck diameter	**inch** / mm	**8,46** / 215	**8,46** / 215
Max. Feed force X/Z (40 % CDF)	kN	7 / 7	7 / 7
Working stroke X/Z-axis	**inch** /mm	**32,68 / 7,09** 830 / 180	**32,68 / 7,09** 830 / 180
Max. Process speed X/Z	**ipm** m/min	**2.362,21 / 1.181, 10** 60 / 30	**2.362,21 / 1.181, 10** 60 / 30
Ball screw diameter X1/Z1	**inch** mm	**1,57 / 1,57** 40 / 40	**1,57 / 1,57** 40 / 40
Number of tools		12	12
Tool holder		VDI40/Capto	VDI40/Capto
Tool flight circle	**inch** / mm	**26,38** / 670	**26,38** / 670

Main spindle

Spindle bearing diameter	**inch** / mm	**3,54** / 90	**3,54** 90
Spindle flange	DIN55026	A6	A6
Drive power 100 % CDF	kW	16,8 (20,9)	16,8 (20,9)
Drive power 40 % CDF	kW	21,5 (28)	21,5 (28)
Rated speed	rpm	1.600	1.600
Max. Speed	rpm	4.500	4.500
Torque 100 % CDF	Nm	100 (200)	100 (200)
Torque 40 % CDF	Nm	128 (255)	128 (255)

Inner grinding spindle

Drive power 100 % / 60% CDF	kW	15 / 18	15 / 18
Torque 100 % / 60% CDF	Nm	4,7 / 5,7	4,7 / 5,7
Spindle bearing diameter	**inch** /mm	**1,77** / 45	**1,77** / 45
Max. Speed	rpm	45.000	45.000
Nominal speed	rpm	30.000	30.000
Tool holder		D28 / 43	D28 / 43

External grinding

Drive power 100 % / 60% CDF	kW	11,5 / 14	11,5 / 14
Torque 100 % / 60% CDF	Nm	39,7 / 49	39,7 / 49
Spindle bearing diameter	**inch** / mm	**3,15** / 80	**3,15 /** 80
Max. Speed	rpm	6.000	6.000
Nominal speed	rpm	2.700	2.700
Tool holder		Mounting cole Ø 73	Mounting cole Ø 73

Dimensions

Dimensions basic machine (LxWxH)	**inch** mm	**103,35 x 91,34 x 110,24** 2.625 x 2.320 x 2.800	**169,29 x 98,43 x 110,24** 4.300 x 2.500 x 2.800
Weight	**lbs** / kg	**15.432,36** / 7.000	**33.069,34** / 15.000

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