

CrankGrind

The new generation of crankshaft grinding



Keydata

Experience the next generation of crankshaft grinding with the new CrankGrind from SCHAUDT. The machine for high-speed grinding of crankshafts combines our long lasting experience in non-cylindrical grinding with modern design and highest precision.

Schautd Mikrosa GmbH

Schautd Mikrosa GmbH is synonymous worldwide for cutting-edge technology in cylindrical, noncircular and universal grinding between centers, as well as in centerless external cylindrical grinding. Since 2009, the company combines the two long-established brands SCHAUDT and MIKROSA in a modern factory in Leipzig.

SCHAUDT is the brand for the automotive industry and its suppliers. It offers sophisticated technological solutions for cylindrical, noncircular and eccentric grinding. Our highly experienced experts also have unparalleled expertise in the high-precision grinding of long and heavy workpieces like those required for roll grinding, for example. Within this broad application range you obtain everything from a single source from SCHAUDT – application development, technology, assembly and sales.

MIKROSA is the technology and market leader in centerless external cylindrical grinding of rotationally symmetrical parts. The modular design of the machines means that you obtain a solution with handling and automation individually tailored to your grinding task. The technology spectrum extends from precision infeed grinding in many different variations through to superproductive throughfeed grinding. This allows you to machine a very large variety of workpieces, from small jet needles through to large shafts.

Long tradition and cutting-edge precision and quality place SCHAUDT and MIKROSA among the world's market and technological leaders today.

CrankGrind

Highly productive cross slide machine for grinding of crankshaft main and pin bearings · Granitan[®] machine bed · Grinding speeds up to 200 m/s (39,000 ft/min) · Highly dynamic X-axis · StuderGuide[®] on the Z-axis · Maintenance-friendly and easily accessible · User-friendly WOP-G programming system specially adapted for crankshaft grinding

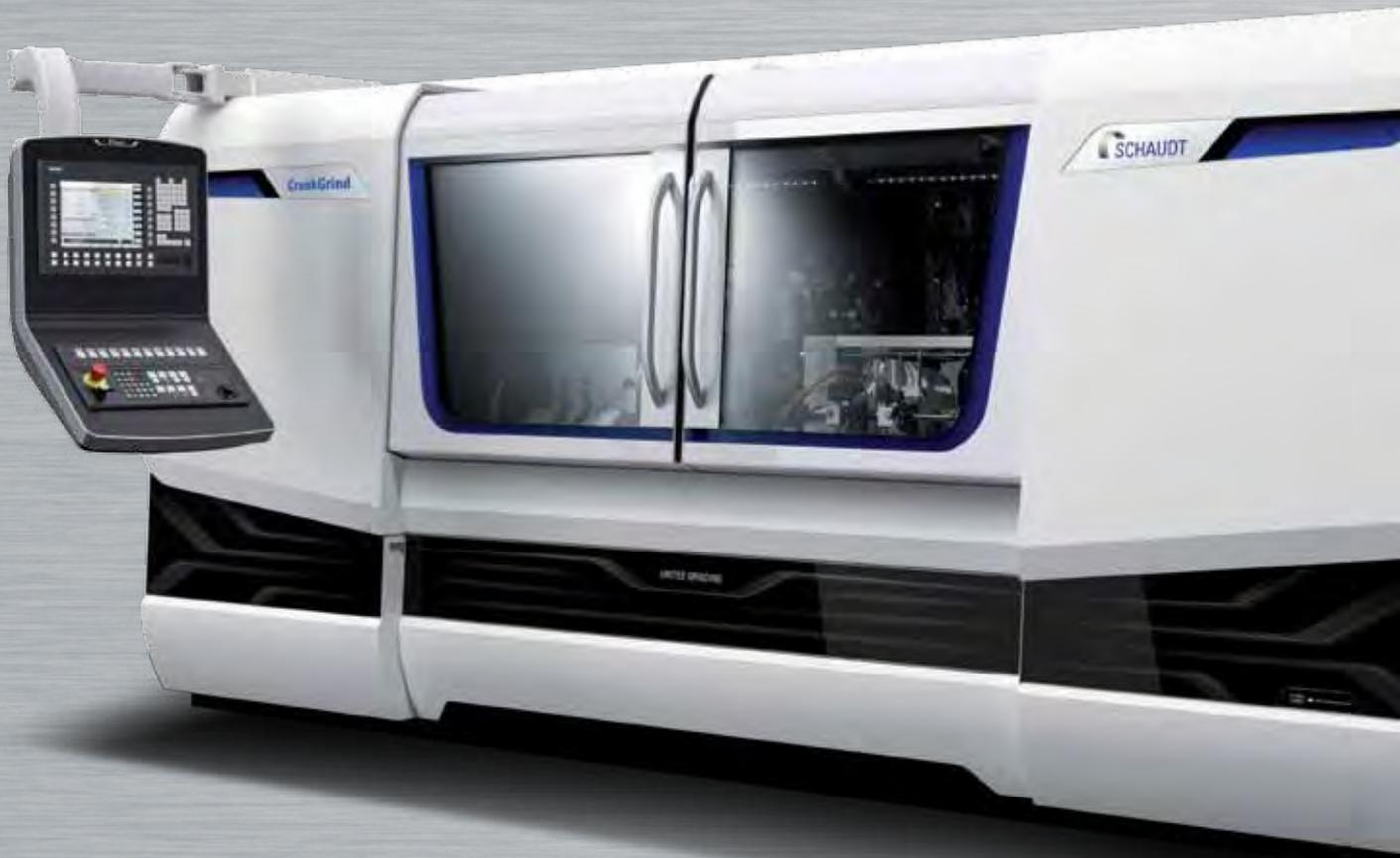
Features

Dimensions

- Grinding length 650 mm (25.6")
- Height of centers 225 mm (8.9")
- Max. grinding wheel dimension $\text{Ø}600 \times 50 \text{ mm}$ ($\text{Ø}23.6 \times 2.0$ ")
- Max. workpiece weight 150 kg (330 lbs)

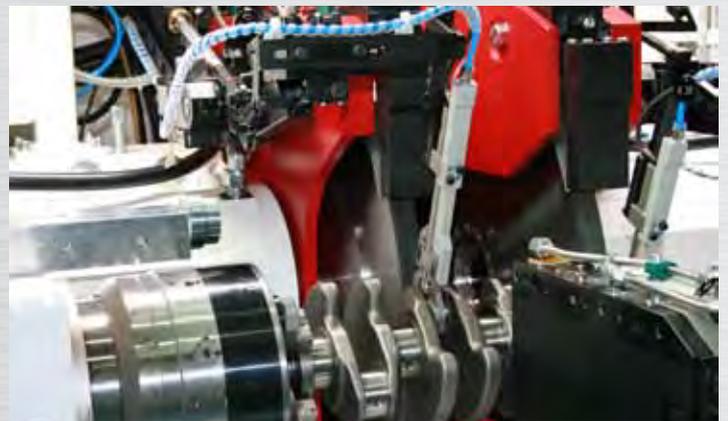
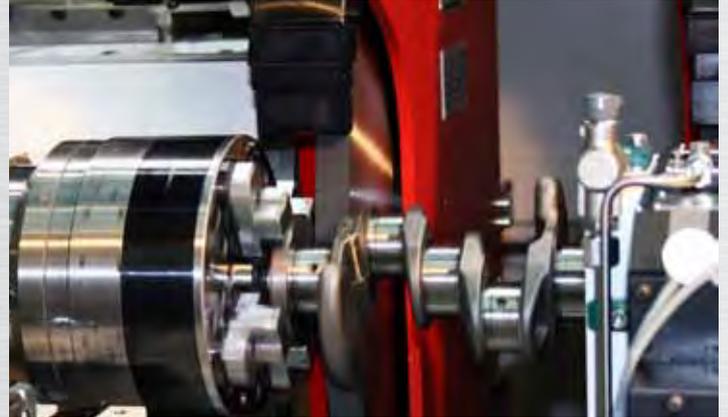
Hardware

- Compact machine design
- Twin cross slides for highest productivity
- Grinding wheel speeds up to 200 m/s (39,000 ft/min)
- Granitan[®] machine bed for high thermal stability and dynamic damping
- Vibration damping hydrostatic guideways with linear motor on the X-axes
- Proven guideway StuderGuide[®] on the Z-axes
- In-process gauging with Marposs Fenar L
- Ergonomic grinding wheel change
- Optimized machine ergonomics



Software

- Service-friendly SIEMENS SINUMERIK 840D sl control system
- Proven programming software WOP-G with specially adapted version for crankshaft grinding with user-oriented set-up interface
- Roundness measuring and correction with Fenar L directly in the machine, evaluation via WOP-G
- Standardized interfaces for loader and peripheral devices



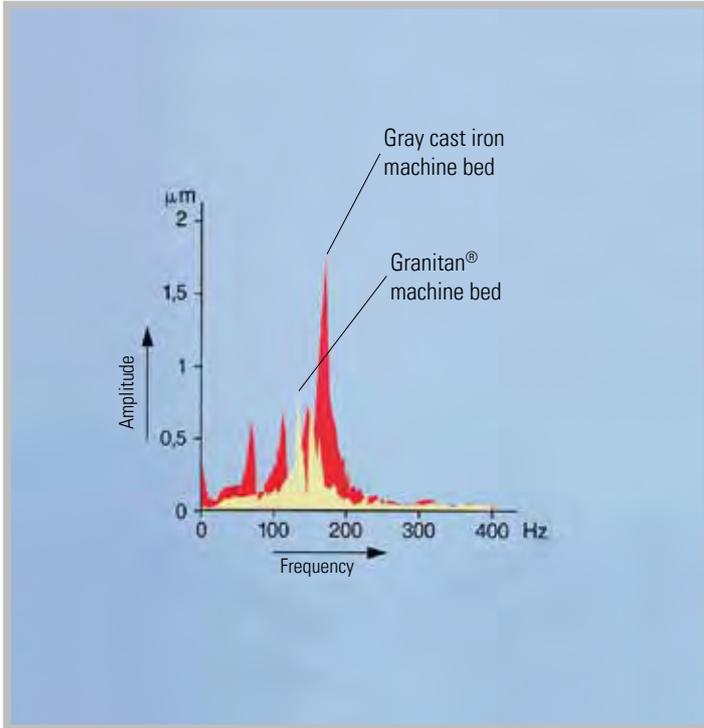
With the new crankshaft grinding machine CrankGrind from SCHAUDT we have developed a machine that combines our long lasting experience in non-cylindrical grinding with the most modern machine design and highest precision. The machine is equipped with twin cross slides for high-speed grinding of crankshaft main and pin bearings. This allows for the simultaneous machining of adjacent bearings with two grinding wheels due to a greatly reduced minimum wheel spacing. Depending on the process, this allows for a significant reduction in the machining time.

The proven Granitan® machine bed, with its high thermal stability and optimum vibration damping, forms the basis for stable high-precision grinding processes. The X-axes of the CrankGrind are equipped with fully hydrostatic guideways. It is driven by a linear motor to ensure maximum precision and dynamics. The Z-axis features the well proven guideway StuderGuide®, a combination of hydrodynamic and hydrostatic guide. It provides the highest accuracy, support and strong damping over the entire speed range.

In addition to workpiece accuracy and productivity, the main focuses in the development of the CrankGrind were primarily user-friendliness and machine ergonomics. All accesses have been designed to be maintenance-friendly. An enlarged machine window gives the operator a good overall view into the machine interior. The compact machine design also allows for easy manual loading or automatic loading via a gantry loader.

Machine bed

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The CrankGrind has a proven Granitan[®] machine bed. The material possesses excellent damping characteristics and high thermal stability. This is a big advantage when machining workpieces with high quality requirements. Temporary temperature fluctuations are extensively compensated and a high tolerance holding capacity can be guaranteed throughout the day.

The water- and oil-proof dripping tray of the CrankGrind was directly integrated into the machine bed to eliminate possible tripping hazards.

Your advantages

- Vibration-damping
- Thermally stable
- High dimensional stability
- Integrated base tub

Guideway and drive concept



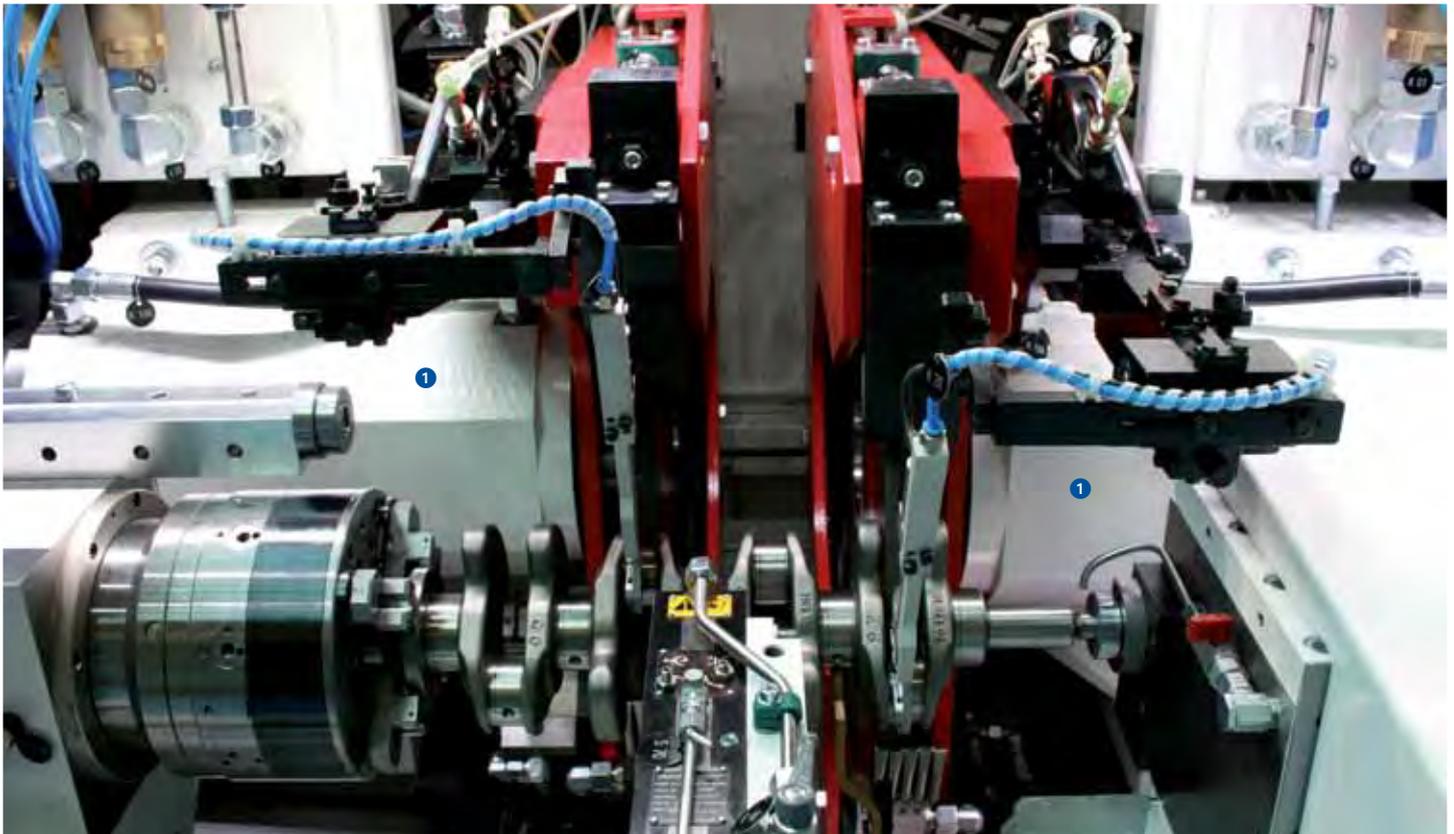
The X-axes of the CrankGrind are equipped with a classic hydrostatic guideway system that absorbs the magnetic forces without wear and, thus, allows for a very accurate guideway. The guideways are highly resilient, very rigid, and use a low volume of oil. The drive is a linear motor to ensure highest accuracy and dynamics.

The Z-axes of the CrankGrind feature the proven guideway StuderGuide[®] which provides for highest accuracy, support and strong damping over the entire speed range. The drive is a high-precision ballscrew.

Your advantages

- Low friction even at low grinding speeds
- Proven guideway StuderGuide[®]
- High damping
- Maintenance-free and nonwearing

Wheelhead

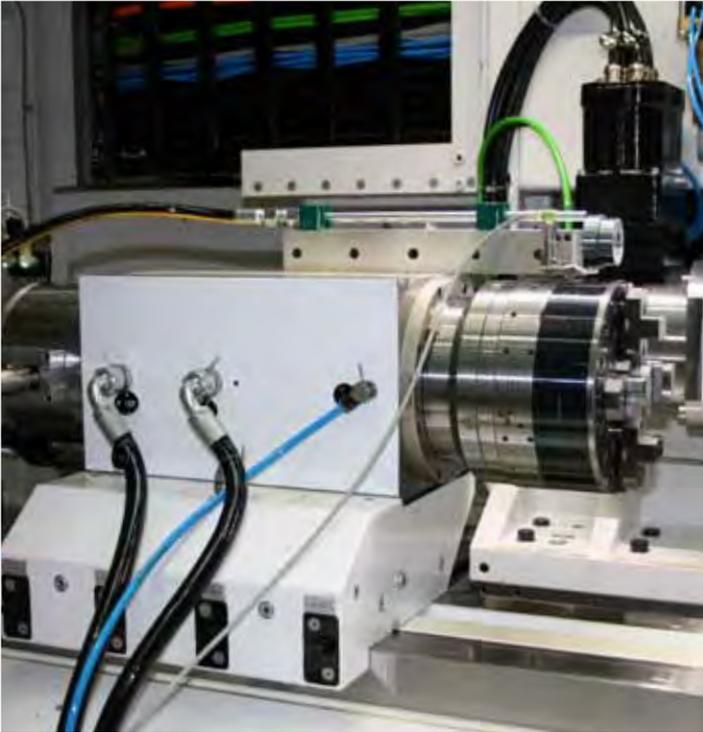


Your advantages

- High rigidity
- Low inertia
- Three wheel guard variants
- Minimal grinding wheel distance
- Grinding speed up to 200 m/s (39,000 ft/min)

The CrankGrind is equipped with a ball bearing spindle with a direct drive motor and automatic wheel balancing. When grinding crankshaft pin bearings an important requirement is the grinding wheel diameter of 600 mm (23.6"). The spindle motor has been carefully selected to provide sufficient power at 80 m/s (15,000 ft/min) wheel speed (for a typical finish grinding process) and at 150 m/s (30,000 ft/min) wheel speed (for rough grinding applications). The maximum wheel speed available is 200m/s (39,000 ft/min).

Workhead



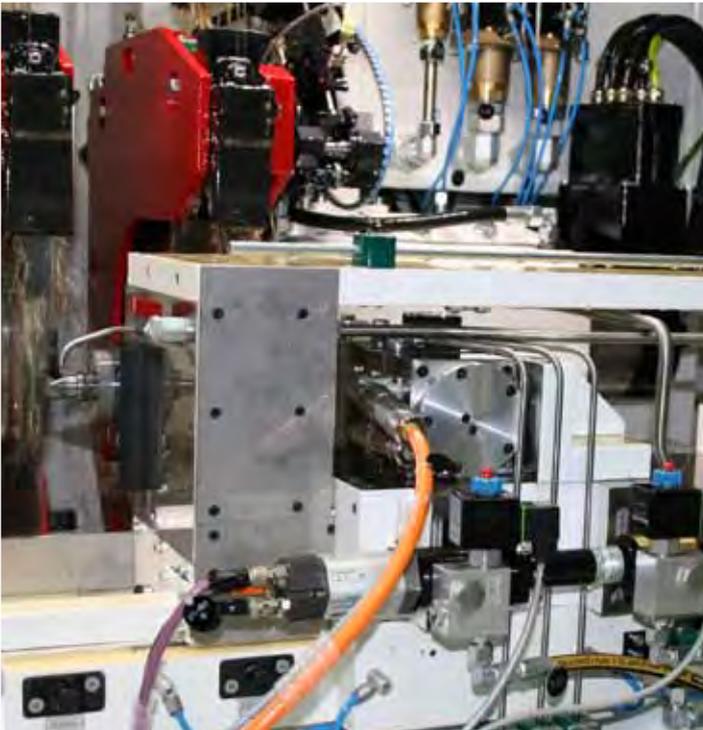
Two workhead alternatives are available for the CrankGrind. As a standard the machine has a table-mounted spindle with a direct drive servo-motor. After releasing the clamping, the workhead can easily be moved on an air cushion.

Optionally, the workhead can be equipped with a larger motor with higher torque capability. Both variants are also available on a sliding axis to facilitate fast automatic loading and unloading of crankshafts.

Your advantages

- Air cushion for easy movement of the workhead
- Optional with sliding axis

Tailstock



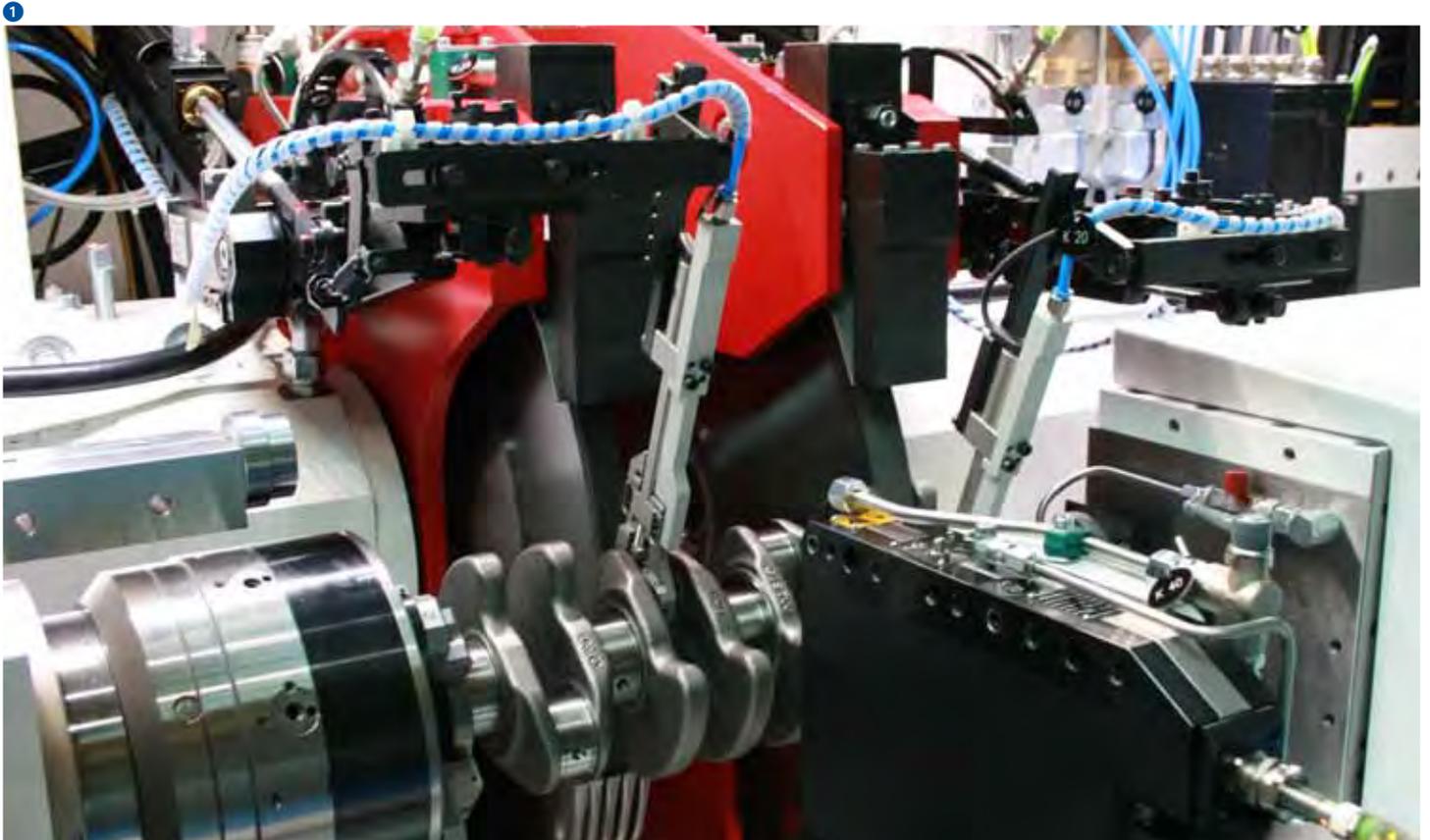
The clamping force of the standard sliding tailstock of the CrankGrind is continuously adjustable. The design has been optimized to provide the highest stiffness for supporting the crankshaft alongside an accurate and fast tailstock positioning.

As an option the tailstock can be designed as a second workhead axis (C2), which can assist in driving larger or more flexible crankshaft components.

Your advantages

- Highest rigidity
- User-friendly programming and monitoring via machine control
- Fast and precise positioning of tailstock

Integrated measuring system



Your advantages

- Higher accuracies
- Lower scrap rate
- Roundness measuring and correction in the machine

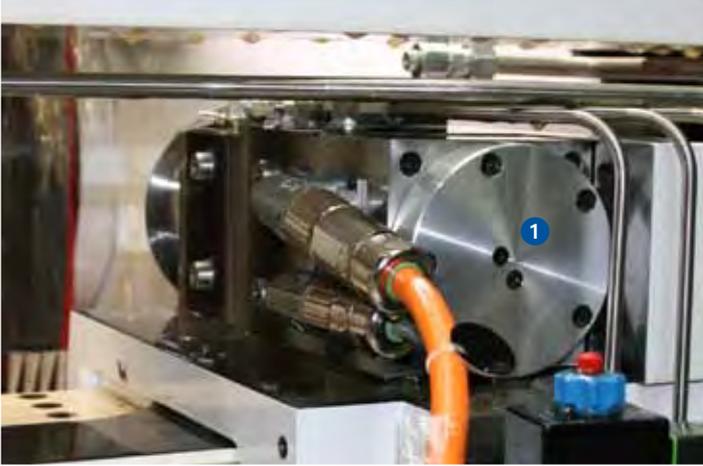
Depending on the grinding process requirements, the CrankGrind can be equipped with different measuring systems.

The diameter measuring system Fenar L by Marposs is almost a standard feature when it comes to any modern crankshaft pin grinding machine. It is an in-process system to gauge crankshaft main and pin bearing diameters using a specially design pivoting arm and prism. Fenar L allows for the continuous monitoring of bearing diameters to optimize the grinding process. This ensures good grinding results and increases process dependability. The

roundness of each bearing can be measured in a post-process operation and is then automatically corrected via the SCHAUDT programming system WOP-G.

Additional measuring systems available are the Marposs Unimar for main bearing diameters as well as touch probes for axial and radial position measuring. A touch probe, to easily calibrate the grinding wheel, may also be integrated in the machine.

Dressing

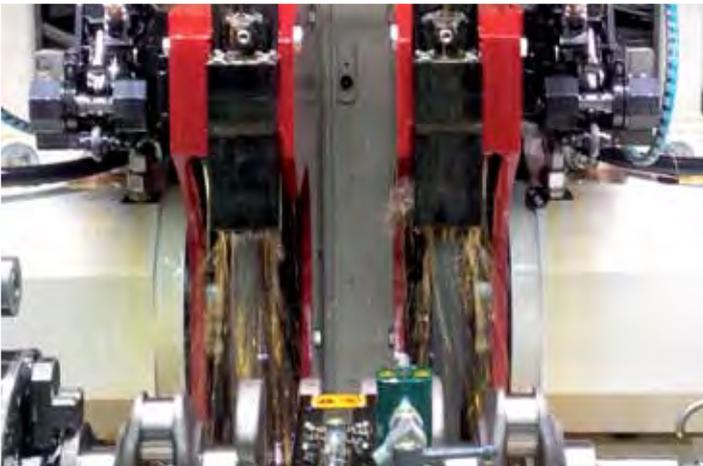


There are three dressing unit variants available for the CrankGrind:
Variant 1: integrated in the tailstock with straight dresser
Variant 2: integrated in the tailstock with cup dresser
Variant 3: table mounted with cup dresser, using the entire grinding length of 650 mm (25.6")

Your advantages

- Different dressing units depending on the grinding task and workpiece length

Coolant

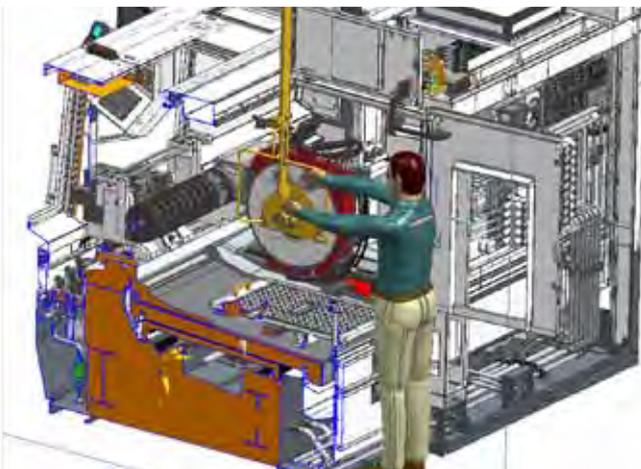


The coolant application of the CrankGrind comes with main coolant nozzles, lower coolant nozzles, and cleaning nozzles. The coolant pressure is precisely adjustable depending on the grinding task. There are also frequently-controlled coolant pumps available for the machine.

Your advantages

- Reduction of grinding burns
- Reduction of coolant consumption
- Reduction of energy consumption

Wheel change



The grinding wheels of the CrankGrind can be conveniently changed without the need to climb inside the machine. This is a unique feature on a crankshaft grinding machine of this size. The design also allows for manual loading without the use of a pedestal in front of the machine. Obviously, the machine can also be fully automated using the loader hatch incorporated in the roof of the machine.

Your advantages

- Easy and ergonomic wheel change without climbing inside the machine

Machine design



The optimized ergonomics of the new CrankGrind is very impressive. The height adjustable control panel, the enlarged viewing window into the machine interior, as well as the adapted foot area for better access to the tooling area are only a few examples for the thought-out design features. It clearly shows that usability was the main focus during the entire development process.

Generally, the machine was designed to be very service-friendly and maintenance-friendly. Therefore, all coolant components, hydraulic components, pneumatic components, and even the main power connections were centrally placed for easy localization and access. Also, the electrical cables have one main channel conveniently placed at the top at the rear of the machine.

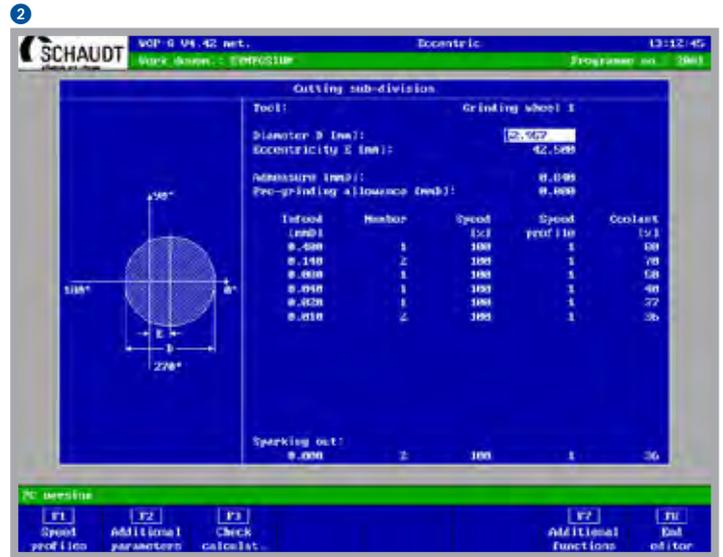
For most customers space requirements are important criteria when buying a machine tool. The CrankGrind has been designed with a minimized overall footprint of 5.8 x 7 m (19 x 23 ft). This already includes additional peripheral devices like electrical cabinets, coolant pumps, aggregates, and the coolant mist extraction unit. The machine dimensions were designed to allow for standard transport.



Your advantages

- Focus on user-friendliness
- Service-friendly and maintenance-friendly access
- Logically centralized connections
- Compact machine housing
- Standard transport

WOP-G programming interface



Your advantages

- User-friendly
- Easy generation of grinding programs
- Wide functional scope

The SCHAUDT WOP-G software is well known for being one of the most user-friendly and flexible grinding software systems in the area of high production CBN grinding machines. For the CrankGrind we have specially adapted the software to suit a modern crankshaft grinding process.

Special features include:

- improved control of the coolant pressures and flow at the different stages in the crankshaft grinding process,
- increased flexibility of the grinding feeds and speeds via a larger number of grinding steps during one plunge,
- new special grinding cycles for grinding shoulders, faces and radii.

Customer Care

SCHAUDT grinding machines should fulfill the customer's requirements for as long as possible, work cost-effectively, function reliably and be available at all times. From "start up" through to "retrofit" – our Customer Care is there for you throughout the working life of your machine. 12 professional helplines and more than 60 service technicians are available in your area, wherever you are in the world.

- We will provide you with fast, uncomplicated 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



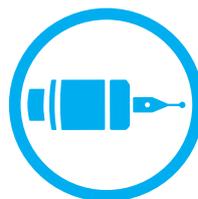
Qualification
Training
Production support



Prevention
Maintenance
Inspection



Service
Customer service
Customer consultation
HelpLine
Remote service



Material
Spare parts
Replacement parts
Accessories



Rebuild
Machine overhaul
Assembly overhaul



Retrofit
Modifications
Retrofits

Technical data

CrankGrind

Working ranges

Grinding length between centers, max.	mm	650	25.6"
Height of centers	mm	225	8.9"
Workpiece weight, max.	kg	150	330 lbs

Wheelhead

X-axis guide		hydrostatic	
Z-axis guide		StuderGuide®	
Grinding wheel diameter	mm	600	23.6"
Grinding wheel width, max.	mm	50	2.0"
Grinding wheel drive capacity, max.	kW	72	96.6 hp
Grinding wheel peripheral speed, max.	m/s	200	39,000 ft/min

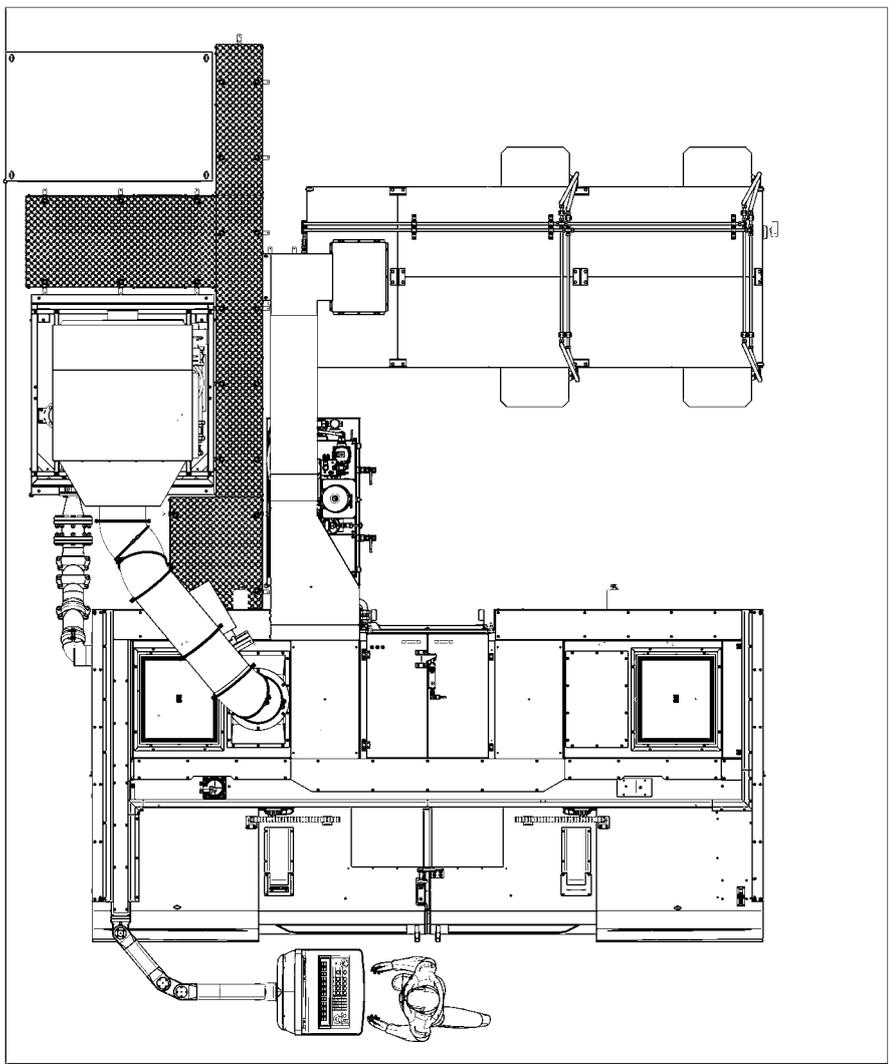
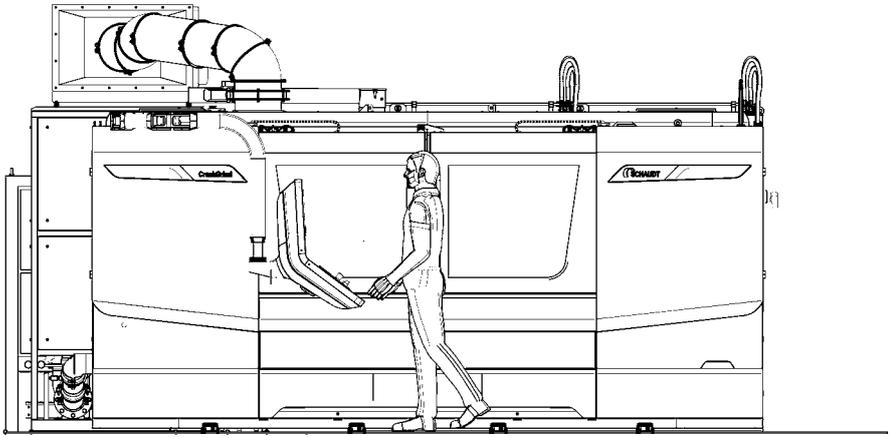
Workhead

Number of revolutions	rpm	1,000 / 300	
Torque	Nm	50 / 130	36.9 / 221.3 lbf ft

SIEMENS SINUMERIK 840D sl control system

Dimensions

Machine weight	t	16	35,200 lbs
Machine height, max.	mm	2,200	86.6"
Installation space machine	mm	4,410 x 2,200	173.6 x 86.6"
Installation space with periphery	mm	5,800 x 7,000	228.3 x 275.6"





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