

JUPITER

CENTERLESS CYLINDRICAL GRINDING



PRODUCTIVE ALL THE WAY

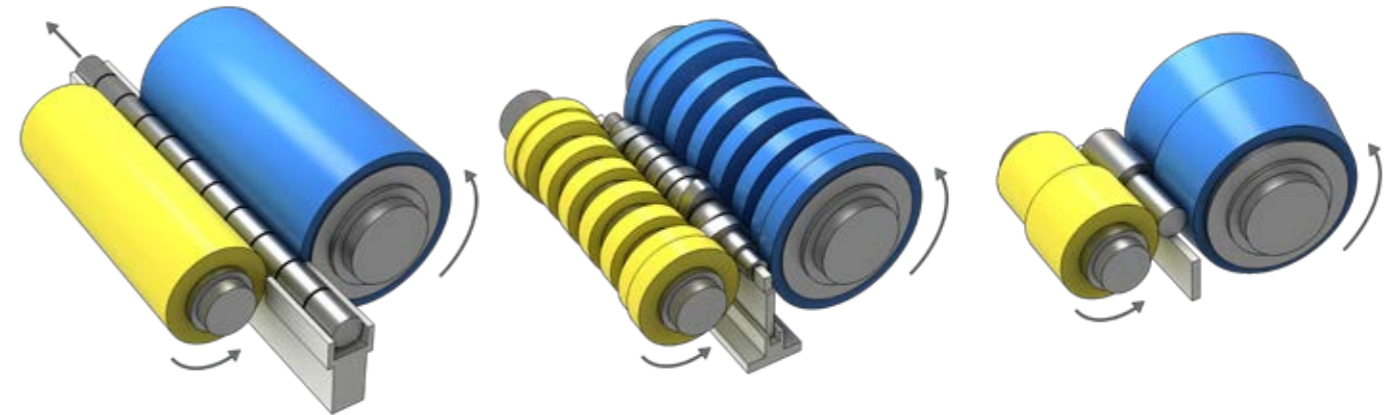


JUPITER series centerless grinding machines offer substantial production benefits: The patented CNC height adjustment of the support blade minimizes tooling times, automatic adjustment of the grinding gap geometry optimizes the grinding process and the inclined bed guarantees maximum dimensional precision. Depending on the application, corundum, CBN or diamond is used as an abrasive.

CENTERLESS GRINDING

During centerless cylindrical grinding, the workpiece is not clamped but lies in the grinding gap between the grinding wheel, regulating wheel and support blade. The grinding pressure presses the workpiece against the regulating wheel, which brakes the workpiece to its own peripheral speed.

For this to work, the friction at the regulating wheel must be greater than the friction at the grinding wheel. The friction is achieved by the rubber bond at the regulating wheel and by inclining the support blade and machine bed.



THROUGHFEED GRINDING

Throughfeed grinding is among the most productive methods used in the field of grinding technology. It entails workpieces traveling through the machine in a continuous stream without interruption. The grinding wheel has defined roughing, finishing and ultra-fine grinding zones, enabling it to grind all the workpieces to one diameter. The throughfeed rate is determined by the incline and speed of the regulating wheel.

PLUNGE-CUT GRINDING

The centerless plunge-cut grinding method entails grinding workpieces with offset or profiled diameters. Here, the grinding wheel is given the negative profile of the desired workpiece contour. In this way, all the diameters which have to be produced at the workpiece can be ground in a single plunge cut operation. The workpieces are positioned, then ground and finally unloaded by means of an axial stop on the support blade.

INCLINED PLUNGE-CUT GRINDING

The inclined plunge-cut grinding of the JUPITER 200S represents a special process variant. In contrast to conventional plunge-cut grinding, with inclined plunge-cut grinding the wheelhead is inclined by 10°. This enables centerless grinding of flat shoulders or face ends.

CONCEPTS TO SATISFY THE HIGHEST DEMANDS



WORKPIECE SPECTRUM

JUPITER's high output has produced outstanding success across every sector of industry and covering a wide array of different materials - from carbide and steel to ceramic and glass. Typical workpieces include:

- **Roller bearing components** such as rollers, pins, cages or rings
- **Various shafts**, such as gear, turbocharger or rotor shafts
- **Engine components** such as camshaft tubes, valves or piston pins

There are three main aspects which influence workpiece concentricity during centerless grinding: The grinding gap geometry, the machine parameters and the rigidity of the grinding gap components. The JUPITER series is the culmination of over 60 years of experience in centerless grinding, guaranteeing the perfect interaction of all influencing factors and top-quality grinding results.

HIGHLIGHTS

- **Rapid set-up** due to patented CNC height adjustment of the support blade
- **Minimized undulations** with grinding wheel balancing on two planes
- **Extremely low running noise** due to grinding spindle with direct drive
- **Optimum grinding quality** as a result of market-leading rigidity
- **Optimized grinding process** due to automatic grinding gap geometry setting
- **Individual CNC dressing** of grinding wheel and regulating wheel

ONE PASS, MULTIPLE OPERATIONS

Rough, intermediate and finish grinding in a single pass: Using the throughfeed grinding method, the JUPITER 500 replaces the rough and intermediate grinding processes by using a special CBN grinding wheel set. This saves the user the need to perform several work processes, increasing output many times over.



SUPPORT RAIL

The patented CNC height adjustment of the support rail has two decisive benefits. Firstly, it ensures faster set-up, as all three grinding gap components (grinding wheel, regulating wheel and support rail) can be controlled from the operator panel. Secondly, the workpiece axis remains on a level during the entire grinding process, which exerts a positive influence on workpiece quality during centerless grinding.

EQUIPMENT AND OPTIONS

ABRASIVE

Depending on the application, corundum, CBN or diamond is used as an abrasive. When using CBN or diamond, the base wheels are made of steel or carbon. Carbon is light in weight, has vibration-damping properties and remains dimensionally stable even at high speeds.



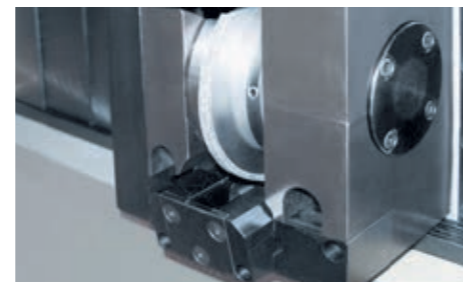
8° INCLINED BED

The 8° inclined bed increases friction at the regulating wheel, as gravity causes a larger proportion of the workpiece weight to shift from the support blade to the regulating wheel. This makes for easier rotation of the workpiece prior to grinding and ensures greater friction at the regulating wheel during the grinding process, creating a better braking effect. The inclined bed also causes the coolant and grinding sludge to drain away naturally.



DRESSING UNIT

Dressing of the regulating wheel and grinding wheel is CNC controlled. A powered diamond dressing wheel, a workpiece-dependent diamond profile roller or a stationary dressing tool such as a single grain diamond or diamond fliese blade can be used for dressing the grinding wheel. The regulating wheel is generally dressed using a single grain diamond.



PARTIAL AND FULL ENCLOSURE

For throughfeed grinding with emulsion, JUPITER series grinding machines are also available with a partial enclosure. This simplifies access to the machine components for maintenance and servicing work, as well as mechanical adjustment of the B axis.



STATIONARY GRINDING GAP

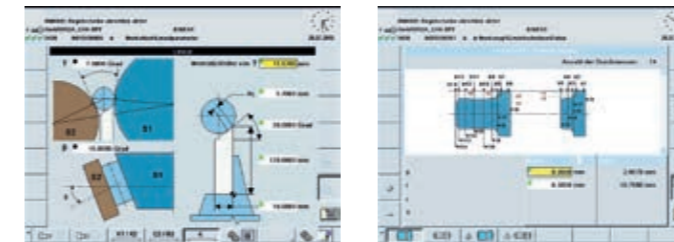
The wheel heads of the grinding and regulating wheel are each equipped with an X axis. The stationary grinding gap enables low-cost loading systems to be used which do not require a tracking axis.



CONTROL SYSTEM

The Erwin Junker Operator Panel was specifically developed to control grinding machines. All machine components are controlled using the operator panel – irrespective of the series and the used control system. The identical structure, intuitive menu guidance and visualization of the workpiece geometry make for extreme user convenience and flexibility in operation.

Programming takes place directly through the operator panel or by use of an external program tool. All the data is saved, including third-party assemblies. If required, the JUNKER Servicing Department can also access the data online. This keeps servicing costs low and enhances plant availability.



AXIS DRIVE AND GUIDANCE

The X axes, with linear roller ways with high pre-load, takes care of ultra-precise positioning of the grinding and regulating wheel head. Drive is executed by a precise, intrinsically rigid ball screw with infinitely variable servo drive and glass scale.



The B axis of the wheelheads is driven by a backlash-free gear. Every angular position is programmable; the position sensor system has a sensational resolution of 0.00001 of a degree. Extreme low noise (vibration) levels are guaranteed with the JUNKER grinding spindles with direct drive – an in-house development – complete with a structure-borne sound sensor and dynamic balancing system in one or two planes



MACHINE BED

The polymer machine bed provides impressive damping behavior and torsional rigidity. The temperature stability allows fluctuations in the ambient temperature to be compensated with a minimum of effort, ensuring a high level of dimensional stability throughout the whole day.



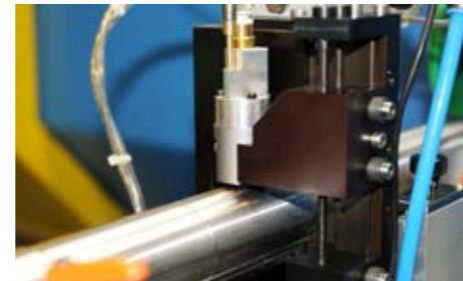


LOADING SYSTEMS

JUNKER offers both internal and external loading systems for all its machine series, depending on customer and workpiece requirements. The loading systems can be combined with different infeed and discharge systems such as conveyor belts or custom tailored systems.

MEASUREMENT SYSTEMS

The measurement systems are individually adjusted to specific workpieces and customer specifications. The measurement processes performed entail evaluation of the measured values, using these results for dimensional correction in line with the prepared measurement strategy.



FIRE PROTECTION AND LTA AIR FILTERS

In case of a fire, the machine interior is automatically hermetically sealed, suffocating a fire before it has a chance to spread. If required, extinguishers (CO₂ or water mist systems) and exhaust air purification systems can be additionally installed. Your competent partner for all fire protection and filtration solutions is LTA Lufttechnik GmbH, a member of the JUNKER Group which researches, develops and produces filtration systems for industrial air purification.

FIELDS OF COMPETENCE

TECHNOLOGY CENTERS

The JUNKER Technology Centers in Nordrach, Germany and in Holice, Czech Republic offer a wide selection of grinding machines for demonstrations and customer-specific grinding tests. These facilities give potential buyers and customers the chance to be impressed by the technical and economic performance of JUNKER and ZEMA grinding machines and test them on their own workpieces.

SERVICE

The company group's growing sales and servicing network ensures satisfied customers worldwide. JUNKER Premium Service acts swiftly and with outstanding expertise wherever its customers are around the globe. Available around the clock, this service provides the assurance of planning security for customers: The highly qualified team will find the right solution no matter what the problem.

ENERGY EFFICIENCY

The key indicator for the efficiency of a machine tool is the energy requirement for each good part produced. Through the use of JUNKER grinding machines, this value is continuously dropping. As the number of grinding steps possible in a single machine increases, machine downtimes diminish and precision improves. The company's energy management program continues to uncover and leverage added potential for savings. Examples include frequency-regulated components, recovered braking energy or optimized sealing air consumption in our own internally developed grinding spindles.

PRODUCTION LINES

JUNKER is able to provide comprehensive references for the design and implementation of production lines ideally tailored to the specific requirements of its customers. As a general contractor, JUNKER places added importance on standardized interfaces such as workpiece transport, coolant systems or measuring devices. This enhances efficiency and ensures the long-term interaction of all the different components of a production line.

NON-STANDARD SOLUTIONS

A new grinding technology challenge for JUNKER? „Tell us what your grinding challenge is and we'll supply you with the perfect machine.“ The engineers and technicians of the JUNKER team are able to draw on an enormous fund of technological expertise to provide customized solutions for every field of application. Top priority: Increasing workpiece quality, reducing cycle times.

TECHNICAL DATA



PLATFORM	200	200S	250	500
Workpiece diameter	1.5 – 100 mm	1.5 – 100 mm	3 – 220 mm	3 - 220 mm
Workpiece length	200 mm	200 mm	250 mm	500 mm
Corundum grinding wheel (63 m/sec)	500 x 200 x 305 mm	500 x 200 x 305 mm	610 x 250 x 305 mm	610 x 500 x 305 mm
CBN grinding wheel (120 m/sec)	-	500 x 200 x 127 mm	500 x 250 x 305 mm	500 x 500 x 305 mm
Spindle drive	12 kW	22 kW	28 kW	37 (55-100) kW
Abrasive	Corundum	CBN / corundum	CBN / corundum	CBN / corundum
Regulating wheel dimensions	300 x 200 x 203 mm	300 x 200 x 203 mm	350 x 250 x 203 mm	350 x 500 x 203 mm
Spindle drive regulating wheel	5.0 kW	5.0 kW	5.7 kW	11.5 kW
Throughfeed grinding	yes	yes	yes	yes
Plunge-cut grinding	yes	yes	yes	yes
Inclined plunge-cut grinding	no	yes	no	no
Grinding between centers	no	no	no	yes
Rough, intermediate and finish grinding	no	no	no	yes
W x D x H mm (without peripherals)	1,600 x 3,700 x 2,200	1,600 x 3,700 x 2,200	1,250 x 3,730 x 2,100	4,410 x 2,600 x 2,200
Weight	approx. 11,000 kg	approx. 12,000 kg	approx. 15,000 kg	approx. 18,000 kg

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