

# KARGO

CYLINDRICAL GRINDING



# HEAVY SHAFTS EASILY GROUND



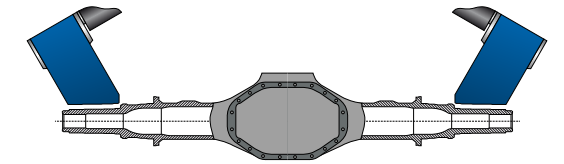
Up to 4.5 meters long and a weight of several tons – the KARGO series tirelessly masters grinding shafts of this size.

Corundum as well as CBN or diamond grinding wheels allow for maximum flexibility. They can be designed for any cutting performance and always provide the highest precision.

The various sizes and wheelhead versions make this robuste machine ideal for the cost-effective grinding of heavy workpieces with unbeatable availability.

## EXTERNAL CYLINDRICAL GRINDING

Parts are located and driven between centers or with a clamping chuck for most external cylindrical grinding applications. The KARGO uses straight and angular plunge-cut grinding technologies. With the straight plunge grinding process, the cutting and infeed movement is radial to the workpiece. The diameters are either ground in one plunge or several plunges with axial displacement. With angular plunge-cut grinding, the grinding wheel is inclined. The wheelhead (B axis) is tilted or mounted in a fixed position. The X and Z axes interpolate. This makes grinding diameters and flat surfaces in one plunge possible.



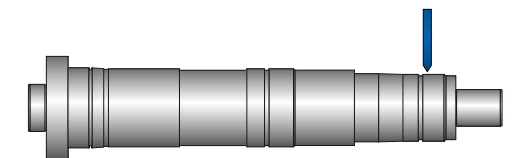
## INTERNAL CYLINDRICAL GRINDING

Internal cylindrical grinding enables the precise grinding of internal functional surfaces such as bores, cones or flat surfaces. In order to achieve the cutting speeds with small grinding pins, significantly smaller compared to a regular OD wheel, high frequency spindler come to use.

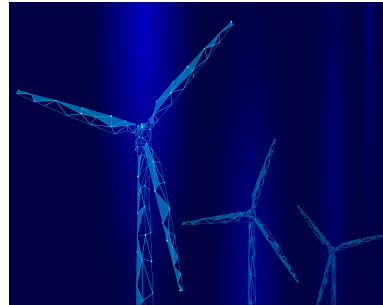


## GROOVES AND THREADS

Grooves and threads are ground with custom profiled grinding wheels. The workpiece geometry can be ground directly from the rough diameter.



# THE COST EFFECTIVE ALL-ROUNDER FOR HEAVY APPLICATION



## HIGHLIGHTS

- High flexibility due to several wheelhead versions
- Best grinding quality due to automatic compensation of disturbance variables
- Process reliability due to complete grinding in one clamping
- High stability due to solid structure
- Productivity thanks to JUNKER grinding experience paired with high availability, worldwide service and spare parts support

## WORKPIECES

The cylindrical grinding machines of the KARGO series grind outside and inside diameters as well as shoulders, tapers, grooves, chamfers and threads in single operations or combined.

The versatility of the KARGO proves itself in a wide variety of industries. Typical applications include:

- Gear shafts for the wind power industry
- Shafts for the aviation industry
- Axles for rail and commercial vehicles
- Pistons of hydraulic cylinders
- Chisels of demolition tools
- Screw compressors
- Machine spindles
- Rollers for printing and paper industr
- Rollers for heavy industry

# EQUIPMENT AND OPTIONS

## WHEELHEAD VERSIONS

The wide range of grinding wheelhead variants ensures great flexibility. Up to two grinding wheelheads can be mounted simultaneously and each one of them can be equipped with up to three grinding spindles. This means that even complex workpieces requiring several grinding tasks can be ground in one machine and in one clamping. Extremely quiet operation is ensured by the direct-drive grinding spindles - made by JUNKER. They are equipped with structure-borne sound sensor and dynamic balancing system.



## DRIVE AND GUIDANCE OF THE AXES

On the KARGO, the wheelhead moves with a cross-slide along the main axes in the X and Z directions. Thanks to the cross-slide design, the footprint of the machine is economical - despite the overall part size. Direct drives with linear motors ensure high dynamics of the main axes as well as very high positioning accuracy. Both the X and Z axes are equipped with high-precision linear recirculating roller bearing and guideway assemblies. The large distance between the guides of the X and Z axes ensure a stable design with high precision for the large grinding tools of the KARGO.



## B-AXIS

The B-axis of the grinding wheelhead is driven by a backlash-free gear. Each angular position is freely programmable. The generously dimensioned motor ensures short swiveling times and thus also reduces the machine's downtimes. An integrated length measuring system enables a pitch accuracy of  $\pm 1$  angular second and a repeat accuracy of  $\pm 0.1$  angular seconds.



## IN-PROCESS MEASURING SYSTEM

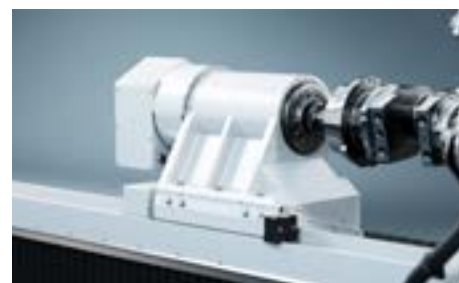
Thanks to a measuring system that swivels in when needed, various diameters can be measured in process, as well as post-process. A programmable linear axis allows the measuring system to be positioned freely along the length of the workpiece. The control system trades the measured values, calculates the correction and thus compensates for process influences due to temperature fluctuations or grinding wheel wear.



## WORKPIECE SPINDLE

The workhead is mounted directly on the machine table. The workpiece is driven by a direct-drive spindle, designed for high moment rigidity and extraordinary dynamics. The use of high-precision roller bearings ensures smooth running with very high radial and axial runout characteristics.

- A standardized geometry of the spindle nose allows the flexible use of various clamping and driving systems.
- An integrated measuring system - in combination with the high-precision main axes - allows precise grinding of non-circular workpiece shapes.



## TAILSTOCK

The tailstock is mounted on the machine table and is positioned on the same guide as the workhead. A large quill diameter ensures optimum stability for grinding between centers of particularly heavy workpieces. At the same time, the clamping pressure can be adjusted as required. The spacious design of the quill stroke and a pneumatic support for adjusting the tailstock allow flexible machining of different workpiece lengths.

## DRESSING

The dressing of the grinding wheel is CNC-controlled. Single point and rotary dressing can be used. The dressing discs can be mounted either on the workhead spindle or on the tailstock. Special developed dressing spindles made by JUNKER, are applied when rotary diamond dressing technology is used. Dressing is performed manually or via an automatic dressing program with grinding wheel compensation.



## MACHINE BED

The machine bed made of mineral casting offers impressive absorption performances and torsional stiffness. Thanks to its temperature stability, fluctuations in the ambient temperature can be easily compensated. This ensures high dimensional stability throughout the production shift.



## LENGTH POSITIONING

A swivel measuring head measures the axial position of the workpiece on a flat surface in order to compensate for blank fluctuations. The measured values are automatically considered in the grinding process and the control system.



## CONTROL SYSTEM

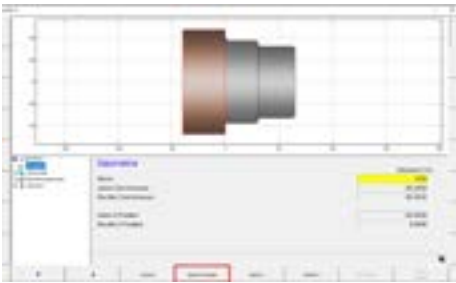
The Erwin Junker Operator Panel EJOP was specially developed for controlling grinding machines. All machine components are controlled via the operator panel - regardless of the series and the control system used. The identical structure, intuitive menu navigation and visualization of the workpiece geometry make operation extremely user-friendly and flexible. Programming is performed directly via the operating panel or via an external programming tool.





SOFTWARE

The new JUWOP II software is used to program workpieces using associated cylindrical grinding operations. The using universal cycles, geometries and technologies are created in conjunction with workpiece and technology assistants, and allow a very efficient programming of the grinding task. The program is created directly on the machine control or, optionally offline, on a work station.



ABRASIVES AND MATERIALS

Large workpieces are usually ground on the KARGO using conventional abrasives such as corundum. Depending on the application, CBN or diamond can also be used as abrasives. Both emulsion and mineral or synthetic oils can be used as coolants.

INDUSTRIAL AIR PURIFICATION FROM LTA

A competent partner for filtration solutions is LTA Lufttechnik GmbH, which also belongs to the JUNKER Group. LTA researches, develops and produces filter systems for industrial air purification. Five extinguishers and exhaust air purification systems can be installed additionally if required.



FIELDS OF COMPETENCE

TECHNOLOGY CENTERS

The JUNKER Technology Centers in Nordrach, Germany and in Holic in the 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 all over the world. 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 is.

ENERGY EFFICIENCY

A key indicator for the efficiency of a machine tool is the amount of energy required for a good part. This value is continuously reduced in grinding machines from JUNKER, since more grinding tasks are performed in a single machine. This leads to reduced downtimes and increased precision. Within the framework of energy management, examples include frequency-regulated components, recovered braking energy or the optimized sealing air requirement of self-developed grinding spindles.

PRODUCTION LINES

JUNKER can offer comprehensive references in designing and implementing of production lines perfectly tailored to customer requirements. As general contractor, JUNKER attaches enormous importance to standardized interfaces, for instance to workpiece transport, coolant systems or measurement devices. This enhances efficiency and ensures the longterm interaction of all plant components.

NON-STANDARD SOLUTIONS

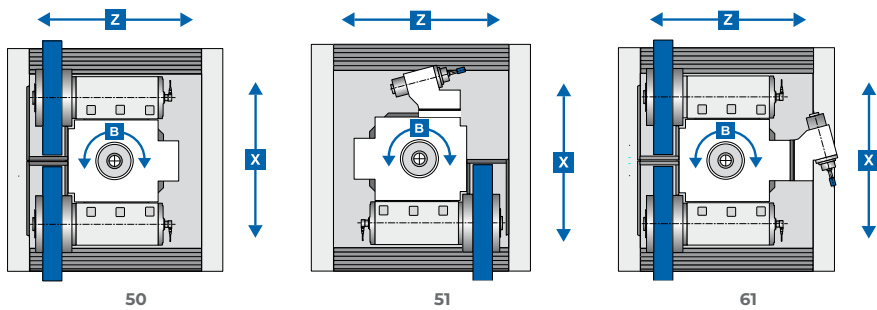
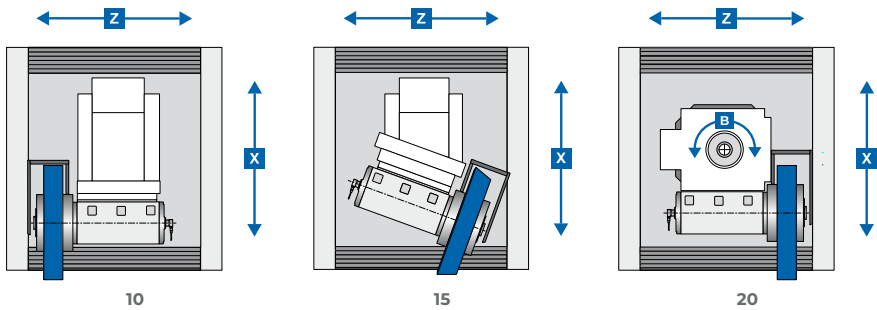
„Tell us what your grinding assignment is and we will provide you with the perfect machine; that's how a new grinding challenge looks for JUNKER.“ The engineers and technicians of the JUNKER team have access to a large variety of technologies that are used to provide custom made solutions for a wide range of applications. Top priority: increasing the quality and reducing the cycle times.

# TECHNICAL DATA



PLATFORM	20L		20XL		50L		50XL	
NUMBER OF WHEELHEADS	1	2	1	2	1	2	1	2
GRINDING LENGTH	3.000 mm		5.000 mm		3.000 mm		5.000 mm	
CLAMPING LENGTH	3.000 mm		5.000 mm		3.000 mm		5.000 mm	
CENTER HEIGHT	350 / 425 mm				350 / 425 mm			
PERIPHERAL DIAMETER	700 / 850 mm				700 / 850 mm			
WORKPIECE WEIGHT	2.000 kg		2.000 kg		5.000 kg		5.000 kg	
GRINDING WHEEL DIAMETER	760 mm				760 mm			
OUTPUT OF GRINDING WHEEL MOTOR	40 kW				40 kW			
GRINDING WHEEL WIDTH	250 mm				250 mm			
CNC CONTROL SYSTEM	Fanuc / Siemens				Fanuc / Siemens			
W X D X H (WITHOUT PERIPHERALS)	7.000 x 3.300 x 2.600 mm		9.000 x 3.300 x 2.600 mm		7.000 x 3.300 x 2.600 mm		9.000 x 3.300 x 2.600 mm	
TOTAL WEIGHT OF MACHINE	30.000 kg		43.000 kg		32.000 kg		45.000 kg	

## WHEELHEAD VERSIONS



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