WPU Gear Unit
Dependable planetary gear unit for consistent drive power
Gear unit for all kind of vertical roller mills

Our compact MAAG® WPU bevel and planetary gearbox is your ticket to reliable power transmission in your vertical roller mill. With two series to suit your requirement, our two-stage gear unit is suitable for a wide-range of mills and applications.

Key benefits

- Tailor-made for your vertical roller mill
- Reduced energy losses and lower cost
- Optimal longevity, reliability and performance
- Streamlined servicing
We achieve the wide power range of our large WPU gear unit series with a unique design. We use the fixed ring gear of the planetary stage directly as part of the casing (see figure below). This design ensures optimum ratio split between bevel and planetary stage and results in the highest possible drive power for conventional two stage gear units. The hydrodynamic sleeve bearings in the planet shafts provide infinite lifetime and round up the unique and maintenance friendly design.

The small WPU series, specially designed for coal grinding in cement and thermal power plants, use the common planetary arrangement. The ring gear is mounted into the gear casing so that reliable torque transmission is guaranteed. The entire gear unit is equipped with anti-friction bearings. Spherical roller bearings mounted on the planet shafts ensure best possible position of planet wheels during operation in each load condition.

The unique requirements of coal mills demand that the grinding system considers the heat sources used to dry raw coal, as well as the fire and explosion hazards of coal dust. Our MAAG® WPU Gear Unit combines proven technology with the necessary adjustments to deliver high functionality for coal mills and plant arrangements. We can also ensure that all electrical equipment installed on the WPU Gear Unit complies with your anti-explosive requirements.

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**Introduction**

The two series of our MAAG® WPU gear unit ensure that your vertical roller mill has the dependable drive system you need, whatever your required power range. The large series accommodates power ranges from approximately 1,300 kW to 5,500 kW, while the small is perfect for coal mills with a power range up to 1,500 kW.

Both gear series meet the general requirement of vertical roller mill drives. With one bevel and one planetary gear stage our WPU Gear Unit reduces the speed of the electrical motor to the desired grinding table speed and changes the horizontal input axis into the vertical output axis. Finally, the grinding table is supported by the thrust bearing in the gear casing.

**Torque transmission that fits your mill**

Both bevel and planetary stage gears are made from high-alloy steel, precisely cut on top class machines and heat treated in fully controlled equipment. The toothed flanks of the sun pinions have profile and longitudinal modifications to fully compensate for deformations of the sun pinion and planet wheels occurring under load. This method guarantees optimum tooth flank contact, load distribution and very long life-cycle.
Components deliver endurance and ease

Our MAAG® WPU Gear Unit is based on well-proven standardised design, whatever your required power range. With specification to ensure safe and reliable operation, our two-stage gearbox has you covered.

**Unique design for optimal performance**

Our special planetary gear arrangement of the large WPU series provide the highest possible torque transmission from conventional two-stage gearboxes. With this we lower not only your energy losses compared to three-stage gear units, but also your investment.

The output flange bearing arrangement of all our WPU Gear Units assists the reliable operation. As generally known, the thrust bearing – equipped with tilting pads – support the mill table and guide the grinding forces into the foundation. In addition, we use a large radial slide bearing with high damping to support the mill table in horizontal direction. It is located directly under the output flange and reduce the leverage effect. Our large WPU series contains in addition an emergency shoulder in the planet carrier – making excessive misalignment in the planetary stage impossible.

**High quality and simplified maintenance**

Our highly-trained engineers and machine operators manufacture best-quality parts in our state-of-the-art workshop. Generally, our gear units are characterised by tooth quality of ISO Q4 or better. It not only reduces friction losses but also improve the longevity of the geared parts.

With the unique planetary gear stage and the optimal grinding table support our MAAG® WPU provides you dependable output and limited downtime. The internal emergency shoulders within the gear unit limit the tilting of the mill table and guarantee a longer service life for gearing and bearings. With the internal toothed coupling we make sure that reaction forces from the grinding process don’t affect the bevel gear alignment. And finally – large manholes in the lower casing part provide direct access to the bevel gear.
Get the most from this effective gear unit with auxiliary systems

A broad collection of auxiliary systems completes our MAAG® WPU Gear Units. Lubrication unit and coupling are must-have. But we also provide auxiliary or maintenance drives according your plant arrangement, while our monitoring system and service packages round out the scope of delivery.

Oil supply unit keeps your gear running
The oil supply units for our vertical roller mill gear units and drive systems includes low-pressure pumps to feed bearings and gearing with filtered and cooled lubrication oil. If needed high-pressure pumps supply the oil for the thrust bearing from a separated compartment of the tank filled with filtered oil from the low-pressure part. Using only clean oil on the high-pressure side allows us to improve the lifespan of the pumps.

Beyond a basic condition monitoring system with MAAG® Predicta
Our condition monitoring system Predicta does much more than triggering inadmissible operating conditions. It lets you set up condition-based preventive maintenance that uses continuous monitoring and data analysis to detect wear and tear at an early stage. With this enhanced information, we help you plan maintenance and servicing in advance – reducing downtime and keeping your plant running smoothly.

Auxiliary drive for maintenance purpose
A maintenance or auxiliary drive that is tailored to your requirements rounds out the scope of supply for your MAAG WPU gear unit. The maintenance drive is placed between the motor and gear unit and allows you to rotate the mill table very slowly. This simplifies maintenance work at your vertical roller mill, including replacing lining plates or rebuilding surfaces through welding.

The auxiliary drive is mostly used to start the mill when the break-away torque is too substantial to start the motor directly. The fluid coupling of the auxiliary unit guarantees smooth acceleration and the overrunning clutch automatically disengages the auxiliary drive after the main motor starts.
Precision is a question of quality

Our products are known for their high reliability. Manufactured in state-of-the-art production plants, enriched with many years of experience, supported by a wide range of services.

Quality policy
Our certification according to the latest ISO 9001:2008 standards and our commitment to create strong relationships with our customers, suppliers and employees has the clear target to establish us as a trustworthy, reliable and professional partner. This commitment includes providing the markets with high quality and high value solutions, products and services to support productivity and sustainability of our customer.

With our process management system, we endeavor to meet and exceed quality standards and provide adequate resources to support the quality system.

Our quality policy centers on the importance of meeting our customers’ requirements. To reach that our management continuously reviews and establishes the quality objectives and our employees are committed to the company’s Management System, as well to the continual improvement of the system and the entire organization. Each employee is aware of the vision and strategy we pursue and works in a culture of opportunity.

With our suppliers and external partners, we cultivate an open communication and collaborate on performance-oriented results.
As part of the global FLSmidth Group, the business continues to be the preferred full-service provider for the heavy-duty industry. As leading technical developer of drive solutions for the cement and minerals industries we remain focused on our customers productivity.

**Engineering and production**
Since introducing with great success in 1966 the technology of mill gear units to the cement industry we have sold over 6000 MAAG™ gear units and 1000 girth gears. In today’s setup, Engineering and Production take place in 4 modern plants located in Italy, Switzerland, Poland and India.

**Our strength**
We support our customer’s expectations with highly efficient products. The key of success lies in the combination of modularized solutions and compact design. Careful material selection and unique production accuracy enables our gear units to increase customers sustainability. The continuous incorporation of experience, new technical solutions and latest manufacturing techniques into the production process combined with intensive development and training of our engineers assure best understanding of how to design and operate a gear unit to lengthen its life cycle. A constant willingness to innovate and close collaborations with our customers have led to ensure that MAAG gear units operate reliably throughout the world under toughest conditions.

**Product range**
Today’s product range includes various drive solutions and maintenance systems for all types of applications needed in various industries. We also manufacture single components such as bevel sets, girth gears and various replacement parts.

All MAAG gear units are available as standard solutions or customized to its specific application.

A pioneer of modern gear technology

For more than 100 years, the MAAG® Gear brand has successfully lived up to its founding vision and values.