



Electric motors for milling and crushing machines

Your expert in
electric motors and drives





The open pit of the Mikhailovskoe Field, located in the vicinity of Kursk Magnetic Anomaly. Electric motors manufactured by the "Ruselprom" Group are successfully exploited as a part of grinding and crushing equipment of the Mikhailovskoe Mining and Processing Works.

Our portfolio comprises more than 90 000 successfully completed orders of motors for grinding mills and crushers

According to experts, more than 10% of world energy consumption falls on processes of grinding and crushing, which is explained by general increase in demand for metals and simultaneous decrease in the content of useful components in the roach. As a result, the equipment for raw materials crushing and grinding is becoming more energy-efficient, reliable and functional. This is the reason why manufacturers and users of the grinding mills and crushing machines are choosing with increasing frequency motors with lower power consumption and higher performance.

For more than 80 years electric motors produced by plants of the "Ruselprom" Group have been successfully fulfilling the task of providing the driving force for grinding mills and crushing machinery for various industries. Such experience and cooperation with customers and manufacturers conducted on a large scale allow us to offer only the best solutions for equipment and production processes employed by our client.

Driving Force of Your Machine

According to demands of our customers:



Machine-building Industry

We cooperate with the largest Russian manufacturers of crushing and milling equipment. Our electric motors are mounted on grinding mills, rod mills and cone mills and crushers manufactured by “Uralmash”, “Tyazhmash”, “NKMZ”, “Volgotsemash”, “Ormeto-YUMZ” and other machine builders.



Extraction Industry

Grinding mills and crushers for processing of raw materials are an indispensable part of mining and processing works and metallurgical complexes. Synchronous and asynchronous motors and thyristor exciters manufactured by the “Ruselprom” Group are working at various factories and integrated mills. These motors are chosen as means of modernizing grinding mills and crushers at Stoylensky, Lebedinsky, Mikhailovsky and Kovdorsky Mining and Processing Works and at MMC “Norilsk Nickel”. They are also used at the production facilities of the “Kazakhmys” Corporation, at factories of “Uralkali” and at the facilities of many other companies dealing in mining and processing of raw materials.



Cement Production

Our customers are the largest construction holdings that use both milling and crushing equipment for cement production. The “Ruselprom” Group is a long-standing partner for cement plants and regularly supplies them with a wide range of electric motors. Major part of the milling and crushing machinery at cement plants is equipped with our motors of different series.



Power Industry

One of the working processes running in boilers of thermal power plants is grinding and delivering pulverized coal into the boiler. For these purposes, coal-pulverizing mills are essential. Electric motors of the “Ruselprom” Group successfully operate as parts of coal-pulverizing mills used in various thermal power plants running on solid fuel.



A Wide Choice of Products and Individual Approach

The “Ruselprom” Group offers the widest range of electric motors for driving grinding mills and crushers with power range from 200 kW to 5200 kW in various executions. We have also developed modern digital excitation system for synchronous electric machines.

We also offer 16-channel monitoring system of thermal and vibration parameters of its own design, which will allow you to monitor not only the motors’ condition, but also condition of mating mechanisms.

Electric motors for milling and crushing machinery, thyristor exciters for synchronous motors, as well as monitoring systems are manufactured in St. Petersburg at the Leningrad Electrical Engineering Plant (LEZ) that has the ample experience in designing and manufacturing the mentioned kinds of equipment.

No matter what operating conditions, the composition and density of the processed materials are, we are ready to offer you a complete set of solutions for driving mills and crushers of different capacities that would suit your individual requirements.

In order to manufacture and develop electric motors adjusted to the individual needs of the customer, we employ highly qualified technical designers and all necessary tools to optimize motors precisely for your hardware. Our designers have experience of successful development of drives for both Russian and foreign machine builders and end-users, namely, plants, factories and mills.



Integrated Solution for Driving Motors of Grinding Mills and Crushers

A Wide Range of Efficient and Reliable Electric Motors

Performance and Reliability

The engineering design itself, materials used for the manufacture of rotor and stator, method of insulation of coils and bars, as well as the available set of test benches allow us to say with confidence that our motors demonstrate the best reliability, durability, and performance under different operating conditions and overload. These characteristics are achieved at cost of:

- enhanced mechanical strength and rigidity of the engine support and components of the rotor;
- increased values of starting torque, the input torque and the maximum torque in operating modes;
- increased heat-absorption capacity of stator and rotor windings;
- increased durability of the stator coils.

Energy Efficiency and Low Operating Costs

The total price of the milling and crushing equipment consists of several components: the cost of equipment itself and the cost of its operation. Furthermore, the latter makes the major part of the cost and it consists of the cost of electricity, maintenance and repair. Electric machines with higher performance factor and longer intervals between overhauls can significantly reduce the cost of operating the equipment.

Electric motors for grinding mills and crushers manufactured by the “Ruselprom” Group demonstrate increased performance factor and productivity, significantly reducing the cost of electricity consumed by your equipment. Both the design of stator winding and employed repairable insulation of heat-resistance class “F” increase the overall time span between overhauls of the motor, and thereby reduce operating costs.

Warranty and Technical Support

Our company as a responsible manufacturer provides comprehensive service support and maintenance of electric motors through their operating life from the very moment of the initial sale.

The warranty period for electric motors for grinding mills and crushers is 2 years from the date of commencement of operation, yet this period may not last longer than 3 years from the date of manufacture and shipment of equipment from the works of a manufacturer.

Electric Motors for Grinding Mills and

An electric motor can be designed and manufactured to suit the customer's individual specifications

We offer synchronous electric motors for milling and crushing machines of series SDM (СДМ), SDMZ (СДМЗ), SDS (СДС), SDSZ (СДСЗ), SDV (СДВ) и asynchronous electric motors of series AKS (АКС), AKSZ (АКСЗ), AKZ (АКЗ), AK4 (АК4), AZD (АЗД), AOK (АОК) and AOM (АОМ)*. These series of synchronous and asynchronous electric

motors for milling and crushing machines are manufactured both in open and enclosed design. Electric motors of enclosed design can be used in harsh environments with high levels of dust content. Electric motors of these series are designed to operate on AC 50 Hz with voltage of 6000 V (3 000 V) and 10 000 V.



Synchronous electric motors of SDM and SDMZ series

Power	400–5 200 kW
Voltage	6 000, 10 000 V
Speed of rotation	75–1 000 r.p.m.
Performance factor	92,2–96,2%
Protection level	IP21/IP44
Weight	from 9 700 kg

Area of use:

- grinding mills for metallurgical and mining industries
- coal-pulverizing mills for thermal power plants working on solid fuel
- cement-grinding mills for construction industry



Synchronous electric motors of SDS and SDSZ series

Power	1050–2500 kW
Voltage	6000 V
Speed of rotation	100–187,5 r.p.m.
Performance factor	94,0–95,1%
Protection level	IP21/IP44
Weight	from 19 300 kg

Area of use:

- grinding mills for metallurgical and mining industries
- coal-pulverizing mills for thermal power plants working on solid fuel
- cement-grinding mills for construction industry



Synchronous electric motors of SDV series

Power	800–1600 kW
Voltage	6 000 (3 000), 10 000 V
Speed of rotation	375–600 r.p.m.
Performance factor	94–95,5%
Protection level	IP00
Weight	from 3 480 kg

Area of use:

- grinding mills for mining industry

Asynchronous squirrel-cage electric motors of AOM series

Power	800–1 250 kW
Voltage	6 000 V
Speed of rotation	750–1 000 r.p.m.
Performance factor	95,3%
Protection level	IP21
Weight	from 6 850 kg

Area of use:

- coal-pulverizing mills for thermal power plants working on solid fuel



Asynchronous electric motors with wound rotors of AOK series

Power	250–2 700 kWt
Voltage	3 000, 6 000, 10 000 V
Speed of rotation	500–1800 r.p.m.
Performance factor	91,0–95,3%
Protection level	IP44/IP54
Weight	from 3 150 kg

Area of use:

- grinding mills and crushers for mining industry
- grinding mills and crushers for construction

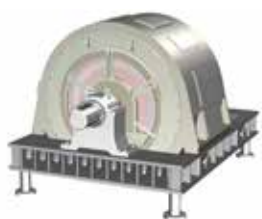


Asynchronous electric motors with wound rotors of AK4 series

Power	200 - 1000 kWt
Voltage	6000 (3000), 10 000 V
Speed of rotation	500 - 1500 r.p.m.
Performance factor	91,1 - 95,2%
Protection level	IP23
Weight	from 2100 kg

Area of use:

- crushers for construction industry



Asynchronous electric motors with wound rotors of AKS and AKCSZ series

Power	1000 - 3 800 kW
Voltage	6000, 10 000 V
Speed of rotation	500 - 1000 об/мин
Performance factor	94,1 - 96%
Protection level	IP20/IP44
Weight	from 5770

Area of use:

- grinding mills and crushers for mining industry
- grinding mills and crushers for construction industry



Asynchronous electric motors with wound rotors of AKZ series

Power	200–1 000 kW
Voltage	6 000 V
Speed of rotation	500–1500 r.p.m.
Performance factor	91,0–94,0%
Protection level	IP44
Weight	from 2 600 kg

Area of use:

- grinding mills and crushers for mining industry
- grinding mills and crushers for construction industry



Asynchronous squirrel-cage electric motors of AZD series

Power	250 kW
Voltage	3 000, 6 000 B
Speed of rotation	500 r.p.m.
Performance factor	92,3%
Protection level	IP44
Weight	from 3 700 kg

Area of use:

- crushers for mining and construction industry

* Our portfolio of manufactured motors includes a series of asynchronous electric motors of DAZO (ΔΑΒΟ) series for driving hammer crushers.



Photo by courtesy of the company NLMK

High-capacity Electric Motors for Grinding Mills in the Stoilenskoe Field

The Stoilenskoe field is located in the central part of Kursk Magnetic Anomaly. The field is rich in raw materials: it contains more than 25 million tons of rich iron ore and about 1.4 billion tons of ferruginous quartzite. The development and enrichment of the deposit ores is conducted by the Stoilensky Mining and Processing Works. In terms of production of marketable ore this Mining and Processing Works is one of the leading producers of iron ore: it accounts for over 15% of marketable ore production in Russia. Currently, the production in this field is conducted by open-pit method.

After the process of extraction ore is delivered to the coarse crushing unit, and then to the medium and fine crushing units, where it is crushed and pulverized. During the stages of crushing and grinding high-capacity mills and crushers are the main mechanisms employed. In the process of ore grinding the Mining and Processing Works employs 16 ball mills of 5500x6500 size, which are driven by large 80-poled electrical machines with power capacity of 4 MW manufactured by the “Ruselprom” Group.

Optional Equipment

Thyristor Exciters and Monitoring Systems Manufactured by JSC "NPP Ruselprom-Electromash"

To control vibration and thermal parameters (or other parameters on a customer's request) of electric motors and driven mechanisms the monitoring systems SM-REM (CM-PЭM) are employed.

The System of Vibration and Thermal Parameters Monitoring



It provides for:

- Continuous monitoring of thermal and vibration parameters of the equipment unit
- Generation and delivery of information and warning signals of technological protections
- Registration and storage of monitoring data
- Delivery of information to the ACS

Details:

- Redundant power supply
- Galvanic isolation of measuring circuits
- The maximum noise immunity (Class A according to GOST P 51317.6.4 and GOST R 51318.11)
- Wide range of connectable sensors (detection of input signals at levels 4-20 mA)

Execution:

- Measuring unit in Ex class execution
- up to 16 channels of measurement for one measuring unit
- Up to 64 measuring units networked together
- Remote controller for settings adjustment and measuring units operation control

For automated excitement by controlled DC of the windings of synchronous motors' rotors the excitation systems of type VT-REM (BT-PЭM) and VT-REM-R (BT-PЭM-P) are applied. The main task of these systems is prevention of accidents in case monitored parameters are being exceeded. The system generates warning and alarm signals and sends them into the relay protection and control setup through "dry contacts" at the level of 220 V.

Thyristor Exciters VT-REM (R)



Type of motor	SDM, SDMZ, SDS	Ambient class	Boreal climate, placement category 4
Voltage of motor, kV	6,0 (10,0)	Protection level	IP(21-54)
Nominal voltage of the excitation system, V	36, 48, 75, 115, 150, 230	Starting resistance	inbuilt
Nominal current of the excitation system, A	200, 315, 400	Power supply of thyristor converter	Rectifier transformer
Duration of	60	Switch gear of stator circuit	no
Rate of superexcitation, p.u.		Number of regulation channels	1(2)
- By voltage	2,0	Local control units	yes
- By current	1,8	Display	yes
Rectification circuit	3-phase neutral circuit 3-phase bridge circuit	Dimensions of cabinet (Width x Depth x Height), mm	800 x 600 x 1 750
Regulation type	ARV-REM-700		
Cooling	Ambient cooling		

Application of equipment of the



Reconstruction of crushing and milling units of the copper concentrator

In the process of expansion and modernization of production facilities at the Almalyk Mining and Metallurgical Integrated Plant energy-efficient high-capacity electric motors of SDM (СДМ) series manufactured by the “Ruselprom” Group were selected as means of modernization. Each grinding mill with mounted low-speed synchronous electric motor of SDM (СДМ) series with power capacity of 5200 kW can process up to 390 tons of ore material per hour, which will allow the company to significantly increase its capacity of ore processing.



Electric motors for mines in the Zhezkazgan region

The Zhezkazgan region is one of the largest regions in the CIS in terms of extraction and beneficiation of ore with content of copper above 0.7%, and other non-ferrous metals. This region hosts seven mines (the open Severnyi mine, Yuzhnyi, Stepnoy, Vostochnyi, Zapadnyi, Annenskiy and Zhomart mines) and three processing plants. Ore undergoes several stages of grinding, and at each stage electric motors of SDM (СДМ) and SDS (СДС) series manufactured by the “Ruselprom” Group successfully function as a part of the milling equipment. Crushed ore pulp is processed at the concentrators, and the produced concentrate is transferred to the metallurgical industry for being further processed into finished metal.



Cooperation with machine builders: electric motors for ball mills

Central discharge ball mill of 2700x3600 series manufactured by “Uralmash” are widely used in the mining, metallurgical and other industries. Electric motors of series SDM400 (СДМ400) manufactured by the “Ruselprom” Group are purposefully installed in these types of mills as they successfully fulfill the tasks of wet and dry grinding and crushing of ferrous, non-ferrous and rare metals, as well as of limestone, dolomite and other materials, including abrasive and very durable materials.



Electric boiler for power plant

The Kashira Regional Power Plant is located in town of Kashira of the Moscow region, on the bank of the Oka River. The main fuel used in power plant is gas and coal. Electric motors of SDMZ (СДМЗ) series with power capacity of 1600 kW manufactured by the “Ruselprom” Group are successfully operating as part coal mills, hence providing the boiler plant with pulverized coal.

“Ruselprom” Group at working sites



Technical re-equipment of the cement factory

High quality raw materials for cement production are extracted in the Oktyabrskoe village of Mikhailovsky District in the Ryazan region. Raw materials are then processed at the Mikhailovsky cement plant, which is a key supplier of cement to the construction market of Moscow and the Moscow region. In order to increase production volumes the enterprise is currently refurbishing its basic technological units, which implies modernization and replacement of equipment, including replacement of electric motors in mills and crushing units. New motors of SDS (СДС) series manufactured by the “Ruselprom” Group can improve production efficiency and increase the capacity of raw materials grinding and crushing.



Electrical machinery to increase the volume of processed ore

In the context of technological modernization of the plant for the extraction and processing of iron ore “ОАО “Karelsky Okatysh” the electric motors of SDMZ (СДМЗ) series have been redesigned so that to increase their power capacity from 1000 to 1250 kW in order to match the existing foundation. Such electric machines can significantly improve the performance of the grinding mill while reducing capital expenditures.



Electric Motors for Crushing Machines

Three-phase asynchronous electric motors of AZD (АЗД) series with squirrel-cage rotor manufactured by the «Ruselprom» Group, with power capacity of 250 kW and rotation speed of 500 r.p.m. successfully operate as drives for cone crushers for medium and coarse breaking of types KSD 2200 (КСД 2200) and KMD2200 (КМД 2200) at the production facilities of such companies as «ArcelorMittal Temirtau» and «Kazakhmys» as well as many others, both domestic and foreign enterprises.



Electric motors for Crushing Units at the Indian mining site

Electric motors of AOK (АОК) series manufactured by the “Ruselprom” Group with power capacity of 400 kW and rotation speed of 500 r.p.m. operate on crushers for fine crushing of the type KMD2200 (КМД 2200) manufactured by “Uralmash” on the iron ore extraction and processing site Danimalai in India.



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