

**Complete electrical solutions
for mining & mineral processing equipment**





**NIDEC INDUSTRIAL SOLUTIONS:
YOUR PARTNER FOR MINING
ELECTRICAL AND
AUTOMATION SYSTEMS**

The future of mining depends on smarter, more powerful equipment that can increase mine production and operate with greater energy efficiency.

Mining equipment requires larger motors and advanced digital control systems. System-specific software is needed to precisely match equipment performance to mine conditions. Remote monitoring and diagnostics are necessary to enable faster troubleshooting and increase production uptime.

Nidec Industrial Solutions is a worldwide leader in designing and manufacturing complete, customized electrical and automation solutions that deliver these results, and more. As your partner, we can help you maximize your mining equipment's performance, giving you a powerful competitive advantage in the marketplace.

Complete electrical and automation solutions



Nidec Industrial Solutions offers a wide range of rugged electric power and control solutions built to perform in harsh mining and minerals processing environments. Our motors, drives and control systems improve the performance of mines around the world.

Whether you are providing equipment for a new mining site or modernizing equipment in the field, our engineers will help you create an optimal electric solution.

- Proven application experience.
- Rugged and reliable equipment.
- Extensive and experienced engineering, service and support staff.
- Around the clock support.



One stop shop for electrical systems

We can serve as an engineering, procurement and construction (EPC) contractor, providing a one-stop shop for your entire electrical package, from design and construction, through installation and commissioning.

Our software and design engineers will work with you to create a solution that optimizes overall equipment costs. Often, that involves customizing off-the-shelf software and our rugged, reliable hardware for specific mining applications.

Our project engineering team has over 40 years of experience designing, building, installing and commissioning custom engineered mining solutions.



Service and Support

Our global service network enables us to deliver rapid response to your customer's onsite service needs. That includes providing original spare parts for the life of your equipment. Our service commitment also includes:

Long-term maintenance agreements

We offer personalized contracts covering all aspects of electric and automation system maintenance. A full range of engineering tools for preventive and predictive diagnostics can help increase equipment life, uptime and performance.

OTHER NIDEC SERVICES:

- Upgrades & retrofitting.
- Predictive maintenance.
- Electrical network analysis for better power quality and lower electric costs.
- Remote assistance.
- Training.



Solutions for every kind of mine



SURFACE MINING

Our experience in installing turn-key automation and control solutions, as well as stand-alone drives and motors is deep. That experience, coupled with our production technology know-how, enables us to tailor revamping and upgrade solutions to your specific needs. We can also support end users in implementing mechanical modifications to help reduce downtime. Over the past four decades, Nidec Industrial Solutions has partnered with major mine equipment manufacturers to provide drive and control systems for virtually every type of application in a surface mine. Our solutions help improve productivity and equipment availability at over 400 mines across the world.

Draglines

A surface mine's operational success depends on the efficiency and availability of its excavators. Our equipment provide draglines with state-of-the-art control and performance. Our dragline-specific control algorithms reduce gear wear and optimize swing control.

Pumps

Nidec is the world leader in heavy duty pump motors and drives.

Shovels

Our drives and controls help to maximize shovel output with optimized cycle times and higher production.

Conveyors

Our state-of-the-art control systems are designed to deliver "smart" conveyors that enable mines to move more material safely and reliably.

Mills and Crushers

We built some of the world's largest motors and drives and our extensive experience in large solutions in different topologies allows us to match the type of mill or crusher to maximize throughput.

Rectifiers

Nidec has over 40 years' experience providing very large and reliable rectifiers throughout the world.

UNDERGROUND MINING

The customized solutions we develop for underground mining equipment not only increase machine uptime and boost production, but also improve mine safety. Our systems are designed to deliver peak performance in dusty, dirty environments. Our heavy duty motors exceed the industry's most stringent standards for durability and energy saving performance.

What set us apart are our engineered-to-order capabilities, that enable us to design drop-in replacements for older motors to improve performance and efficiency.

Mine hoists

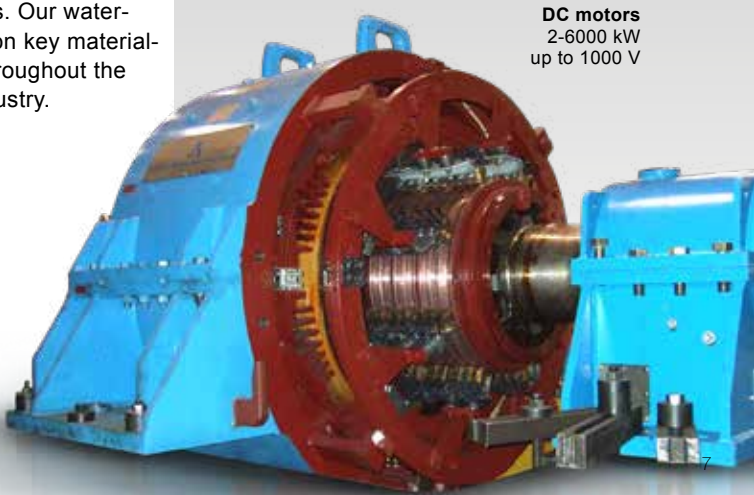
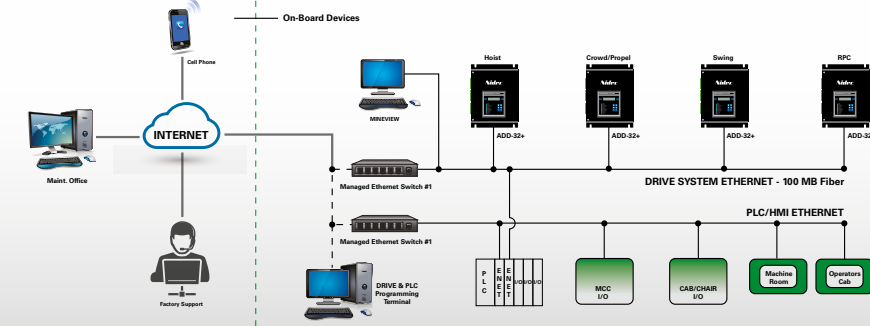
Underground miners that depend on electric hoists to raise and lower conveyances within the mine shaft know how critical hoist reliability and safety are to day-to-day operations. Our solutions can support both new and existing hoist projects. Our electric drive and control upgrades are not only safe and reliable, but also improve cycle times and increase mine production.

Material handling

Nidec's variable speed low- and medium-voltage drives are custom-engineered to interface with the electrical equipment in potentially hazardous environments. Our water-cooled drives are used on key material-handling applications throughout the underground mining industry.

DREDGES

Machine uptime is critical in dredging. Nidec-driven dredges simply move more material. We have installed and upgraded these systems on every major type of dredging equipment, including dipper dredges, cutterhead dredges, trailing suction dredges, and clamshell dredges.



DC motors
2-6000 kW
up to 1000 V

Engineered solutions for critical mining applications



Electric drive systems

Mines around the world depend on Nidec's state-of-the-art drives and controls. Our drive systems are designed to handle many mining specific requirements including peak overcurrent and severe impact loads, optimized cycle times, special environments, and high altitude requirements.



AC Active Front End (AFE) power converters

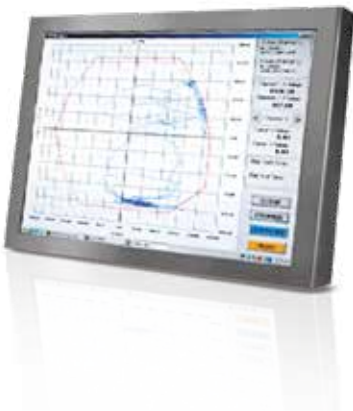
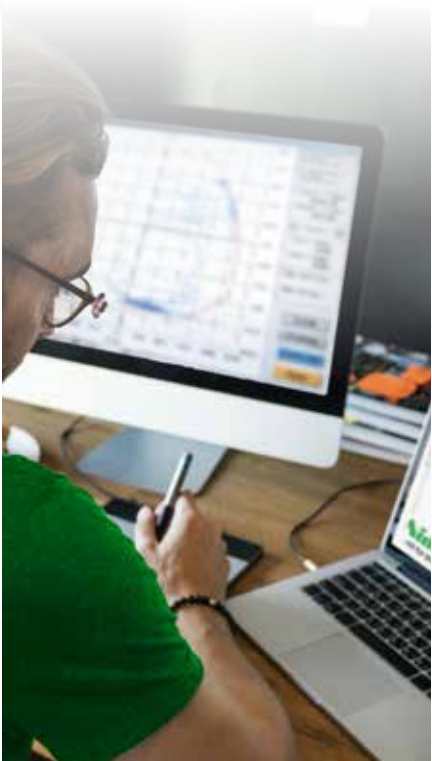


Mines are focused on energy efficiency. Our converters can help improve power factor and low-current harmonics. They are designed to meet the most stringent electric utility standards and have high tolerance for line voltage fluctuations common in mining, reducing shutdowns and component failure.



NIDEC MineView™ Diagnostic System

The life of your machinery can be increased with the MineView Diagnostic System. By continuously gathering data from drives, programmable logic controllers and machine sensors, MineView makes it possible to quickly identify machine underutilization. This data can be accessed remotely and used to troubleshoot problems rapidly, resulting in greater equipment availability and extended machine life.



Partner for mining electrical and automation systems



DIRECT-DRIVE SYSTEM FOR BELT CONVEYOR *China*

Whether designing a new site, optimizing existing operations or modernizing equipment, Nidec Industrial Solutions provides know-how and equipment to improve mine performance:

- LV AC Drives
- DC Drives
- MV AC Drives
- Large Electric Motors & Generators
- Industrial Power Rectifiers
- Encoders
- Battery Energy Storage & Microgrids



- The challenge:** realize direct-drive system with low speed permanent magnet motor for underground belt conveyor
- The solution:** Six GT5W650H were installed in a conveyor 5.6 km long. GT5W650H is a high-performance drive, engineered as a 1200 Voltage solution with mining application- specific requirements in mind. Its advanced control strategy and proven IGBT technology provide process improvement and energy savings in mining environments. Nidec's solution is an industry leader in compact size and low weight. The system includes the soft start function and torque balance required for this multi-drive application, allowing long-term continuous operation with frequent load changes.
- Scope of supply:** LV drive system (6 GT5W650H)



About Nidec Industrial Solutions

Nidec Industrial Solutions is one of the world's leading suppliers of complete electrical packages for mining and mineral processing. More than 250 of our drive control systems are installed on shovels, draglines, drills, hoists, slurry pumps, cranes, conveyors and other machines used in large surface and underground mines around the world. Our automation and control systems, including our ARTICS Smart Energy power management systems, can be found in more than 1,000 plants worldwide.

We are a business platform of Nidec Corporation, a global manufacturer of electric motors, generators and power electronics. With operations on four continents and a workforce of 100,000, Nidec develops, manufactures and installs motors, generators and controls used in commercial and industrial applications, ranging from 50 kW to 100 MW. Nidec's next-generation solutions focus on improving efficiency, reducing energy consumption and enabling your success.



INDUSTRIAL SOLUTIONS