



CONSULTANCY

Given the importance of processes where the motor-converter package is installed, especially with systems integration projects, consultancy is important in terms of sizing and selecting all of the components correctly and safely. Consultancy includes calculating plant efficiency, grid harmonic distortion analysis (THD), electromagnetic compatibility, overload calculations, short-circuit calculations, protection logic, etc. Collaboration forms part of the philosophy of our company, with a unique, personalised approach which forms the basis of the relationship with our clients.

ENGINEERING

Electrical engineering includes the basic and detailed design as well as choosing key components such as cabling, connection switchgear, etc.

TESTS

Our advanced laboratory, equipped with rotary electrical machines and power electronics, offers the possibility of performing combined full load tests on the motor-converter package. This makes it possible to validate the correct design and integration of the systems before installing them, in order to minimise commissioning times and increase the success of the project. The laboratory has its own grid and is able to perform tests at full load up to 8 MW and back-to-back up to 43 MW.

SIMULATION

We offer powerful calculation and simulation tools on the behaviour of the motor-converter package. This enables us to model the electrical plant, analyse the optimum working points beforehand, and size the equipment depending on the client's requirements.

COMMISSIONING AND TRAINING

Our commissioning service includes starting up the systems supplied and checking all of its functional features to ensure that they comply with the requirements defined in the project. During the training stage, besides familiarising the user with the way the equipment works, the maintenance staff are provided with information on the power electronics systems. This therefore enables them to carry out preventative and corrective maintenance unaided during the plant's useful life.

SERVICE AND MAINTENANCE

In over 70 years, Ingeteam-Indar has built a solid, multisector knowledge base founded on the capacity for innovation and providing outstanding service. Our dedicated 24/365 technical support service and remote diagnosis monitoring technology reduces stoppage times caused by preventative and corrective maintenance, minimising operational costs and increasing productivity with the aim of increasing profits.

Ingeteam

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**Frequency Converters
Substation Automation**
Ingeteam Power Technology, S.A.
Parque Tecnológico de Bizkaia, edif. 110
48170 Zamudio, Bizkaia (Spain)
Tel: +34 94 403 96 00
technology@ingeteam.com

Motors & Generators
Indar Electric, S.L.
Barrio Altamira, Pol. Industrial Txara S/N
20200 Beasain, Gipuzkoa (Spain)
Tel. +34 943 028 200
mining@indar.ingeteam.com

Pumps
Indar MH, S.L.
Barrio Altamira, Pol. Industrial Txara S/N
20200 Beasain, Gipuzkoa (Spain)
Tel. +34 943 028 200
indarmh@indar.ingeteam.com

Solutions for mining



Ingeteam

Over 70 years' experience of designing and manufacturing in-house products with outstanding reliability and performance, as well as accumulated technological know-how for a wide range of sectors, make Ingeteam - Indar the best option for mining equipment. Our product portfolio in the mining sector covers everything from pumps, motors, generators, control and protection systems, and frequency converters to complete drive systems for different mining processes. This knowledge, together with our wide range of product and our manufacturing plants in Europe and the USA allow us to speed up aftersales service and provide our clients with extensive cover.

Besides offering in-house technology and products, Ingeteam-Indar offers a series of associated services of significant added value, which allow us to design the best configuration beforehand in order to optimise the plant and make it profitable in the shortest time possible. Once the equipment has been installed, preventive maintenance, training and our wide network of services maximise the operational time.

Ingeteam

Electrical Motors

Our range of motors responds to multisector requirements such as mining, the marine industry, steelmaking, the paper and cellulose industry, water treatment, material handling, the cement industry, power plants, etc. The Indar range of motors is designed according to the specific requirements of each drive. Given the flexibility in its design, our range of motors offers a wide range of powers, speeds, voltages and cooling systems.

Frequency Converters

We offer a complete range of low- and medium-voltage air- and water-cooled frequency converters called INGEDRIVE®, designed for single- and multi-motor applications and working with synchronous or asynchronous motors as well as permanent magnet motors. The range of INGEDRIVE® frequency converters is ideal for both four-quadrant operation with energy feedback (AFE configuration) and for applications without energy feedback (DFE rectifier). INGEDRIVE® is available with powers from 300 kW to 36 MVA, and voltages from 380 V to 6.9 kV, offering robust, reliable and long-lasting equipment.

Energy Generation and Distribution

Ingeteam offers a wide range of products and solutions with the latest technology for comprehensively controlling, protecting and automating electrical substations for mining installations. The solutions proposed by Ingeteam offer a custom-made system complying with all of the requirements of the plant's operational staff, as well as powerful analysis tools for contributing to continuously improving the electrical grid.

Electrical Generators

Indar's electrical generator families are designed in accordance with the most stringent reliability and robustness requirements and are adapted to the primary energy source as hydraulic turbines, gas turbines, steam turbines, diesel motors, etc. This allows us to respond to the technical demands of plants with different topologies.

Hydropower generators, power up to 70 MVA, Voltage up to 15 kV. Horizontal/Vertical construction.

Generators coupled to steam/gas turbine up to 60 MVA, Voltage up to 15 kV. Horizontal construction.

Generators coupled to diesel motor, heavy fuel, gas motor, etc. Power up to 27 MVA. Voltage up to 15 kV. Horizontal construction.

Pumps

The family of submersible pumps and motors manufactured by Indar is especially designed for pumping water in different applications. Its modular, versatile design enables it to cover a wide range of flows and heights and respond to the most demanding operational and installation conditions by adapting the construction materials and electrical characteristics of the equipment.

Applications



Mineral Processing - Grinding

We manufacture drive systems and motors for large horizontal SAG mills and Ball mills with single/dual pinions, integrating control functional features. We also manufacture drive systems and motors for large vertical High Pressure Grinding Rolls (HPGR).



Mine Hoists

We design and manufacture drive systems and motors for large mine hoists, including redundant solutions to guarantee their maximum availability and security.



Material Handling

We design and manufacture drive and motor systems for conveyor belts, including regenerative solutions that ensure maximum energy efficiency during the transportation of material.



Generation

Mining plants require the most reliable energy generation close to the point of consumption. Hence, we offer electromechanical hydropower solutions, Indar being a leading company in the market.



Ventilation

We offer a wide range of products for mine fan applications. Indar has the capacity to design motors with high inertia characteristics to meet operational demands. Together with Ingeteam's frequency converters, we are able to offer our clients the best solution with single and multiple drive configuration with a common rectifier.



Substation and Protection Automation

We offer equipment for the protection, control and automation of distribution and electrical substations. Alongside our motor and generator protection equipment, we are able to extensively cover a plant's electrical supply value chain.



Pumping

We offer submersible equipment for pumping underground water, mine well depletion, etc. They can be installed at a great depth and are reliable and robust with few maintenance requirements and can be adapted to the harsh, demanding operating and installation conditions found in mines.



Reactive Power and Energy Storage

We have solutions for voltage regulation and power factor control (STATCOM) as well as energy storage solutions that ensure uninterrupted power supply for a plant's critical services. Alongside the advantages previously mentioned, our Grid-Diesel-Renewables-Storage hybrid solutions reduce diesel consumption and CO2 emissions.



Excavation

We offer solutions based on AC multi-drive configuration for shovels and draglines.

Mine Hoist

Motor

MV100 Water Frequency Converter

Material Handling

Motor

LV400 Air Frequency Converter

SAG/Ball Mill

Motor

MV500 Water Frequency Converter

Frequency Converters

INGEDRIVE LV400
Power range: 300 kVA-6.5 MVA
Voltage range: 380 V-690 V
Cooling: Aire o agua

INGEDRIVE MV100
Power range: 800 kVA-15 MVA
Voltage range: 3.3/4.16 kV
Cooling: Aire o agua

INGEDRIVE MV500
Power range: 6 MVA-36 MVA
Voltage range: 3.3 kV
Cooling: Agua

INGEDRIVE MV700
Power range: 1 MVA-4 MVA
Voltage range: 6.9 kV
Cooling: Aire

Motors and Generators

Squirrel-Cage Induction Motors
Power up to 15 MW
Voltage up to 15 kV
Speed up to 1800 rpm
Horizontal construction

Synchronous Motors
Power up to 10 MW
Voltage up to 15 kV
Horizontal construction

Synchronous Generators
Power up to 70 MVA
Voltage up to 15 kV
Horizontal or Vertical construction

Submersible Motors and Pumps

Flow up to 8000m³/h
Elevation height up to 1000m
Voltage up to 11kV
Protection up to (IP68)
Poles: from 2 to 8 poles

Ventilation

Motor

MV100 Air Frequency Converter

Pumping

Pumps

Substation Automation

INGESAS Protection and Control

Storage, STATCOM INGRID

Hydropower Plant

Generator