



Indar Electric motors & Generators

SOLUTIONS FOR
RAILWAY & MOBILITY

Ingeteam



RAILWAY & MOBILITY

Ingeteam has strengthened the offer for Railway & Mobility with Indar electric traction motors and generators, bringing optimal efficiency, availability, robustness, and performance to rail electrical vehicles and meeting customer requirements.



80 YEARS

The experience acquired during over 80 years at Indar, allows us to provide a wide range of electrical machines, developed with in-house technology, placing us in a position of leadership in the international market.



Ingeteam offers its experience and compromise to Rolling Stock market, applying its knowledge to market requirements to deliver tailor-made and personalized solution for the whole life of your project.

Our team is composed by highly qualified personnel, benefiting from the most advanced resources for the design and development of its traction motors and generators. Our technological capacity is shown in the range of solutions offered, assuring their homologation in the state-of-the-art electric machine and power electronics combined laboratory. This allows to test our developments under all kind of environmental conditions and to guarantee the best performance of products.

Our electric traction motors and generators which are manufactured to provide optimal efficiency, reliability, toughness and performance level to the Electric Vehicles requiring such equipment, adjusting its personalized design to the space availability conditions in each project.



ADVANTAGES



Flexibility
All machines are customized to meet your needs.



Efficiency
High performance and torque density result in low weight and minimum space requirements.



Construction
Structural designs to withstand mechanical shocks of up to 100 g.



Material
Copper-made squirrel-cage rotors contribute to higher efficiency and lower rotor temperatures.



Reliability
Use of insulation system offers a high degree of electric, mechanical and thermal reliability to avoid converter-bearing currents.



Noise
Low electro-magnetic audible noise.



Lifecycle
Our products have a life expectancy in excess of 30 years.



Cooling Concepts
Our various cooling concepts are aligned to the respective application requirements.

TRACTION

- ▶ Peak power: up to 1.500 kW
- ▶ Tension range from 400V up to 3.000V
- ▶ Isolation: C220

MOTORS

Squirrel cage asynchronous motors.
Permanent magnet synchronous motors.



GENERATORS

Wound synchronous generators.
Permanent magnet synchronous generators.
Squirrel cage asynchronous generators



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|--------------|---------------|-----------------------|------------|
| ▶ TRAMS | ▶ LRVS | ▶ METRO | ▶ EMU |
| ▶ HIGH SPEED | ▶ LOCOMOTIVES | ▶ SPECIAL APPLICATION | ▶ RETROFIT |

- ▶ We develop solutions for rail vehicles that are **tailored to your specific requirements**.
- ▶ **Full cooperation** with customers: From the initial design drawings through to final delivery. We **focus on** a comprehensive approach based on electrical and mechanical criteria, even before contract initiation and open after sales arrangements.
- ▶ Reliability with strong and long term collaboration with our customers as **technology partners**.
- ▶ The close proximity between our design department and our production and testing facilities is one of our advantages, as is our **in-house engineering department**.
- ▶ Benefiting from Ingeteam engineering experience in traction systems for rolling stock.
- ▶ Put your trust in our expertise as a full-range supplier and **take advantage of our in-house offers**.
- ▶ Open to establish different **models of collaboration**.

R+D+i

R+D WORLD CLASS TESTING FACILITIES

One of the best rotative electric machine and power electronics laboratory in the world.

The main capabilities are:

- ▶ On load tests up to 8MW.
- ▶ Back to back configuration testing up to 65 MW.
- ▶ LVRT (low voltage ride through) resting capability.
- ▶ Self-generated grid of 50/60 Hz 20 MVAs.
- ▶ Combined tests of electrical and thermal insulation ageing.
- ▶ Climatic chamber (-30°C to 80°C) extreme ambient conditions.
- ▶ System test (Converter/motor/transformer) at the electro-mobility laboratory, according to **IEC 61377**.



This allows Indar Electric Machines to be fully tested under all kind of environmental conditions and will guarantee the best quality on products delivered.

The development of our products and services is specifically adapted to the characteristics of each project and client.

For this purpose the R&D&I department is made up of highly qualified personnel, and it has the most advanced computer resources for the design and development of traction motors and generators.

Our philosophy is to guarantee quality and the reliability of our products with in-house fully proven solutions.





Ingeteam

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