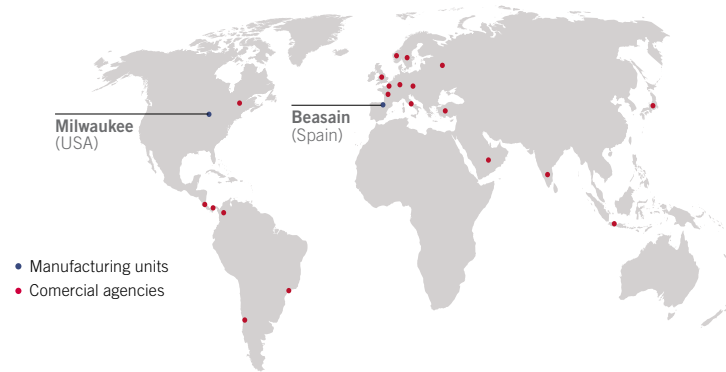


Indar Electric, an Ingeteam company, has worked for over seventy years in the design, manufacture and supply of electrical rotating machines.

- The experience acquired during this time allows us to provide a **wide range of products, developed from our own technology, placing us in a position of leadership** both in the Spanish and international markets.
- The more than 15,000 generators for wind application, **more than 14,5 GW of installed power, and more than 9,5% of the world market share in terms of power installed** throughout the world are a clear exponent of our competitiveness and productive capability.
- One of the most important factors of Indar Electric is the quality offered in products and services, guaranteed by the **ISO 9001 and 14001 certificates**, as well as the high level of involvement of all of the personnel that directly and indirectly take part in the design and manufacturing processes.
- In this context, Indar Electric has decidedly opted for the **LEAN Manufacturing Philosophy** and systems of self control and bar code traceability in the **recently inaugurated 14.000 m² production plant**, as a framework for competitiveness in the coming years, with the aim of offering excellence in our products and services.



SYNCHRONOUS AND ASYNCHRONOUS WIND GENERATORS

Cooperation with the client forms part of the philosophy of the company, with a personalized and unique treatment forming the basis of the relationship, and with a clear common purpose.



INDAR Electric testing bench

Features

- Generators of power levels from 850 kW up to 12 MW.
- Asynchronous doubly fed or synchronous with permanent magnets and technology xDFM, Clean Power Series.
- Direct Drive, medium or high speed.
- Air or water cooled.
- For all machines up to isolation H.
- Voltage from 690 V up to 15 kV for DFM Technology.
- Voltages from 690 V to 4.6 kV for PMG Technology.
- Frequency: 50 Hz and 60 Hz.
- For fixed and variable flow turbines.
- Onshore & Offshore applications.
- Various fabrication structures and forms.
- Noise level adjusted to client needs.
- Compliance with international standards: IEC, UL, CSA, USTC, etc.

Wind applications

Doubly Fed, xDFM & Squirrel cage (Asynchronous)

3,150 kW
650 - 1,350 rpm (50 Hz)
780 - 1,620 rpm (60 Hz)
12,000 V.



2,520 kW
690 - 1,300 rpm (50 Hz)
815 - 1,531 rpm (60 Hz)
690V.



Wind applications

PMG or Excitation (Synchronous)

2,670 kW
500 - 1,900 rpm (50 Hz / 60 Hz)
690 V.



100 kW
70 rpm (50 Hz / 60 Hz)
400 V.



3,200 kW
1,000 - 2,000 rpm (50 Hz)
810 - 1,740 rpm (60 Hz)
1,000 V.

2,070 kW
1,000 - 2,050 rpm (50 Hz)
1,200 - 2,460 rpm (60 Hz)
690 V.



World class testing facilities

To this respect INDAR has one of the best test benches in the world. The main capabilities are:

- On load tests up to 8 MW.
- Back to back configuration testing up to 65 MW.
- LVRT (low voltage ride through) testing 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.

This allows INDAR to fully test his designs for all kind of environmental conditions and to guarantee the best quality on his products.

To develop products and services adapted to the characteristics of each project and client. For this purpose the R+D+i support unit is made up of highly qualified personnel, and has the most advanced computer resources for the design and development of generators.

The main philosophy of INDAR is to guarantee the quality and the reliability with in-house fully proven solutions.

R+D+i

Customized design solutions for different environment applications:

- Cold Temperatures**
-30°C, 50°C
- High Corrosion Resistant**
C4H
- Desert Conditions**
Sandstorm
- Frequency**
60 HZ

860 kW
1,100 - 1,950 rpm (50 Hz)
1,320 - 2,340 rpm (60 Hz)
690 V.



1,545 kW
700 - 1,300 rpm (50 Hz)
840 - 1,560 rpm (60 Hz)
12,000 V.



Power ranges from:

- from 800 kW to 6 MW (direct drive or medium or high speed) with LV- PMG (< 1 kV).
- from 800 kW to 12 MW (direct drive or medium or high speed) with MV-PMG (< 15 kV).

- Permanent magnets: from 800 kW to 12 MW (direct drive or medium or high speed).
- DFM systems: from 660 kW to more than 6 MW.

- xDFM technology: from 1.5 to 6 MW.
- Mid-size wind turbines from 70 kW to 300 kW with PMG technology.