# Low speed synchronous motors 8 poles and above

## A flexible technology to adapt to multiple applications' requirements

21 MW synchronous propulsion motor

### GE offers a full range of horizontal and vertical synchronous motors, including direct-drive high torque density motors at speeds as low as 20 rpm.

We can easily adapt our standard product platforms to cater for many fixed speed applications with any purposed starting methods including direct on line, auto-transformer or electronic soft starting.

For all variable speed application, GE proposes a complete offering from design to commissioning for the motors, the frequency drives, the high voltage switchboards, transformers and automation.

GE has extensive experience in oil & gas, marine, industry and other applications with large low speed motors offering lower weight and inertia advantages.

- Reciprocating compressors (including hyper compressors)
- Extruders
- Propulsion
- Rolling mills
- Crushers

## FEATURES & BENEFITS

### Compact design

- High power and torque density
- Footprint and weight reduced

### Customizable configuration

- Modular cooling system: CACA, CACW, TEPV, WPII, ODP
- Ability to adapt to extreme environmental conditions: -40°C to +55°C ambient temperature, altitude > 1,000 m
- Safe and hazardous area
- Fixed speed 50/60 Hz
- Variable speed application – System approach for VSDS
- High load inertia starting
- Direct on line starting with limited voltage drop on the network (low inrush current)
- Limitation of current fluctuation/pulsating torque for reciprocating compressors
- Compliance to high level specifications
- Compliance to international standards (IEC, API, NEMA, CSA, DNV, ABS, ...)

### Robust reliability

- Improved stator cooling with pin vent technology and efficient rotor cooling to avoid hot temperature spots for a longer operating lifetime
- Improved insulation system to reduce partial discharge
- VPI with low Volatile Organic Compounds resin is applied to the complete stator and attached cables
- Full length slot wedges
- Removal stator core for simple stator replacement

### Exciter and control:

- AC excitation control system for VFD supply or VFD starting
- DC excitation control system for direct on line starting and fixed speed application
- Brushless excitation for minimum maintenance and maximum reliability in hazardous areas
- Excitation control cubicle according to customer requirements (redundancy, protection relays...)

### Bearings

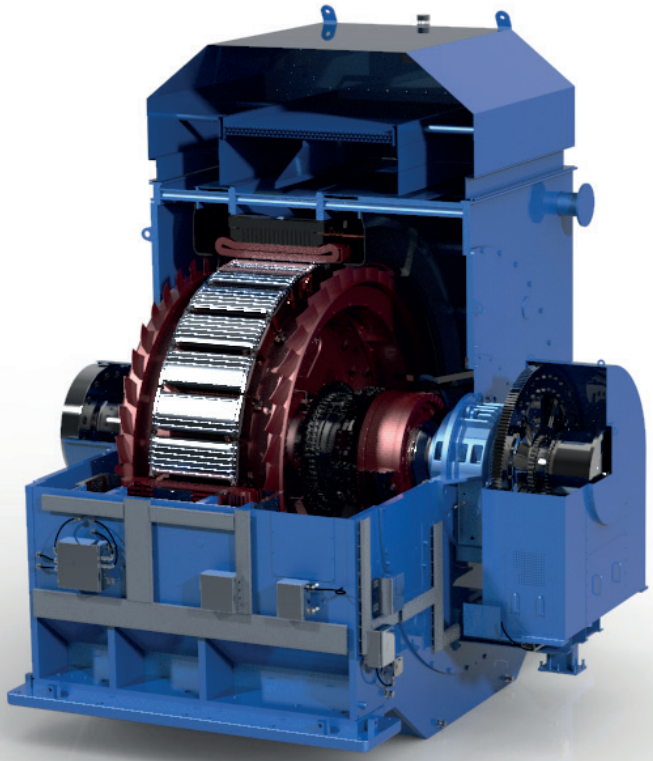
- Single bearing or dual bearings
- End-shield sleeve bearings or pedestal sleeve bearings
- Jacking oil units integrated or separated

## The advantage of synchronous motor technology

- ***Power factor leading or lagging***
- ***Higher efficiency than induction***
- ***High power density***
- ***Designed for RAM***
  *Reliability Availability Maintainability*
- ***Fully customizable***

### A proven technology

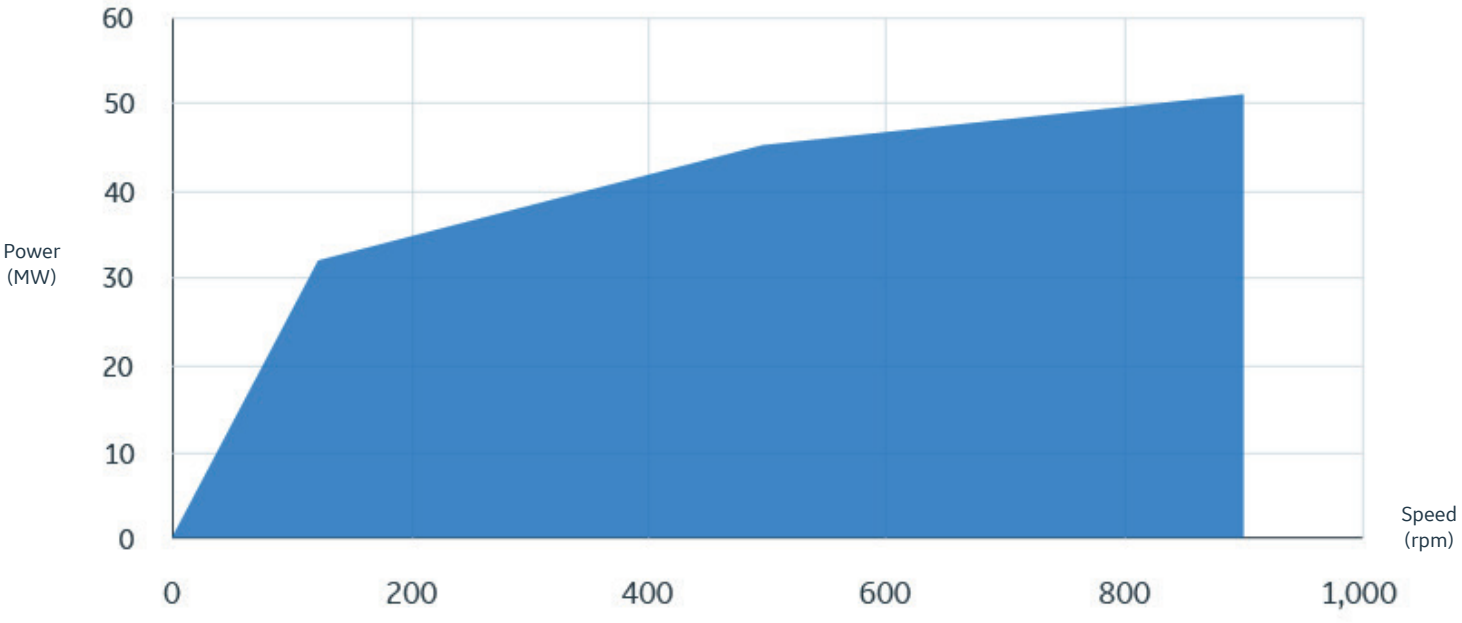
The worldwide installed base for GE synchronous motors accounts for over 600 units and 5,500 MW of power. Our technology is based on all our experience gained over the years in manufacturing electric motors and on 7 active patents related to low speed synchronous motors like the Pin Vent Technology which reduces hot spot compared to I-beam technology.



### DECARBONIZATION

- GE high efficiency electrical motors help to reduce global carbon intensity for power generation
- Electrical technology also supersedes mechanical drivers in terms of lower carbon footprint

## CAPACITY CURVE

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## Services from GE —a focus on availability

We understand the vital importance of process availability – and our focus on service keeps us actively engaged, both when things are going right, and when they are going wrong.

Our world-class Global Customer Service and Support Center is available 24/7, 365 days a year. Our strategic distribution centers and authorized distributors are there to ensure we will quickly fulfill your genuine replacement part needs, no matter where you are located.

With a comprehensive global network of service engineers and technicians, GE is uniquely positioned to provide the knowledge, experience, and skills for your full range of industrial service requirements. From system design to maintenance and outage support, we have the resources and capabilities to advance your equipment 's performance and reliability.

We also provide managed system upgrade paths for our legacy systems and has significant experience in replacing systems from other manufacturers with low disruption to the existing infrastructure.

### Remote support

Connectix, GE's remote diagnostic and support system, is based on highly secure satellite communications links. It enables our experts, regardless of their geographical location, to look over the shoulder of your onsite equipment operator or technician and advise and assist you on fault finding and resolution. We understand the vital importance of process availability – and our focus on service keeps us actively engaged, both when things are going right, and when they are going wrong. Through our Maintenance+ Service Agreements, we can continuously monitor health status of your assets and provide you on time solutions and advice for your imminent issues, before they happen.

## Overall system, project, and service capabilities

Our offerings cover each step of your project, namely conceptual design, engineering, manufacturing, equipment transportation and commissioning of the plant.

We will accompany you from the initial talks, system analysis, consulting, and sales pitches to the handover of the commissioned plant. From our perspective, overall system engineering (during planning phase) along with experienced project managers (during execution phase) are key to success – our system consultants work with you on finalizing the requirements and project managers coordinate the individual contractors, immediately perceive uprising challenges, and manage them in a structured and well-organized manner.

### Productive Process Analysis

- Site survey & measurement
- Technical regulations compliance
- Rotating train productivity and efficiency study
- Service maintainability, availability and reliability study

### Integration and Testing

- Integration into existing customer site
- Type tests
- Factory acceptance tests and site acceptance tests
- Commissioning support, expert consulting & support

### Project and Service Support

- Product lifecycle management
- Up-time increase
- Motors controls
- Remote monitoring & diagnostics
- Health checks
- Control modernization & upgrades
- On demand field services engineering support, evolving to system operation profiles & needs

### Some key benefits of GE's support are:

- Single point of contact
- Reduced call-out rates
- 24/7 availability
- Rapid mobilization of engineers
- Routine maintenance visits
- Training
- System health checks
- Spares management
- Obsolescence management

## To find out more, please email your request to **contact.nancy@ge.com**

Building a world that works