Slow Speed Synchronous Motors

Hyundai Ideal Electric Co., in business since 1903, specializes in the design and manufacture of large, to-order electric motors, generators, switchgear and controls.

Hyundai Ideal Electric Co. has built synchronous motors for over seventy years. Our expertise, combined with high quality materials and manufacturing processes, results in a reliable, cost-effective motor with high performance and low operating costs.

4500 HP, 720 RPM, 13,800 Volt Vertical Synchronous Pump Motors

Benefits

◖ Higher Efficiency
Synchronous motors are typically 1% to 2% more efficient than induction motors. This results in a substantial reduction in operating costs over the life of the motor.

◖ Lower Utility Charges
Synchronous motors consume no reactive power, eliminating utility demand charges that are common with induction motors. They can even be designed to put VAR's back into the electrical system.

◖ Operating Flexibility
Synchronous motors can take large torque and load spikes without pulling out of step, providing greater operating flexibility.

Special Applications

Hyundai Ideal Electric Co. offers both vertical and horizontal motor configurations suitable for a wide range of applications. Following are two examples of how our motors are customized to the applications.

◖ Reciprocating Compressors
When motors are used to drive reciprocating compressors, load pulsations can run as high as 200%. Hyundai Ideal Electric Co. can increase the hub (rotor) size to raise the motor WR^2 so that current pulsations are reduced without the need for a separate flywheel.

◖ Chipper and Ball Mill
Shock loads are an important consideration in chipper and ball mill applications. Using synchronous motors with leading power factor and over-exciting the field, the motor can ride through momentary torques as high as 300%.

Mechanical Features

◖ Rotor Shaft
Hyundai Ideal Electric Co. rotor shafts are forged AISI 1040 or 4140 series steel. Rotor hubs use fabricated A36 steel. This usually provides ample inertia for applications with high shock loads or torque pulsations.

◖ Rotor Poles
The rotor poles are stamped out of 16-gauge steel, stacked, and riveted together. Poles are individually wound under tension using wire with Double-Dacron glass insulation with epoxy applied between layers.

◖ Rotor Bars
Rotor bars use a floating cage construction to allow for thermal expansion, reducing mechanical stress during start-up. They are connected using heavy copper to allow ample cross section for current circulation.

◖ Bearings
Hyundai Ideal Electric Co. slow-speed synchronous motors typically use heavy-duty, self-lubricated, split-sleeve, bracket or pedestal-mounted bearings.

Stator Shift

Stator shift is an important consideration when specifying slow speed motors. Since many applications involve harsh environments, the internal cooling passages in the motor need to be cleaned regularly to remain clear. Obstructed air passages may raise the operating temperature and the chance of premature failure. By supplying an extra long shaft, the stator can be slid to expose both the stator and rotor windings, simplifying the routine maintenance that can extend the motor life.

Electrical Features

Sealed Insulation System

HIEC offers full Class F insulation, epoxy VPI system, from in-house VPI facility.

Brush type or Brushless

Hyundai Ideal Electric Co.'s brushless exciter uses a high-frequency design to ensure minimum ripple in the rectified DC current supplied to the motor field and to provide faster response times. The AC current is rectified by hermetically sealed diodes, which can be fused and supplied in parallel for critical applications.

If the application is better suited to static brush type motors, Hyundai Ideal Electric Co. can offer static excitation packages. This is common on applications that require motors with less than 300 RPM.

Industry Standards

Hyundai Ideal Electric Co. manufactures motors to meet all current industry standards, including NEMA, IEC and API. CSA Labeling and CENELEC/ATEX approved designs are also available.

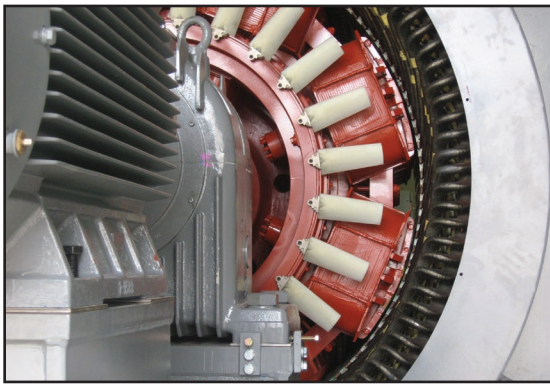
Most enclosures are available. Hyundai Ideal Electric Co. routinely designs motors for hazardous operation in Division 2/Zone 2 environments. Special designs for Division 1/Zone 1 environments, with TEFV enclosures, are available.

Testing

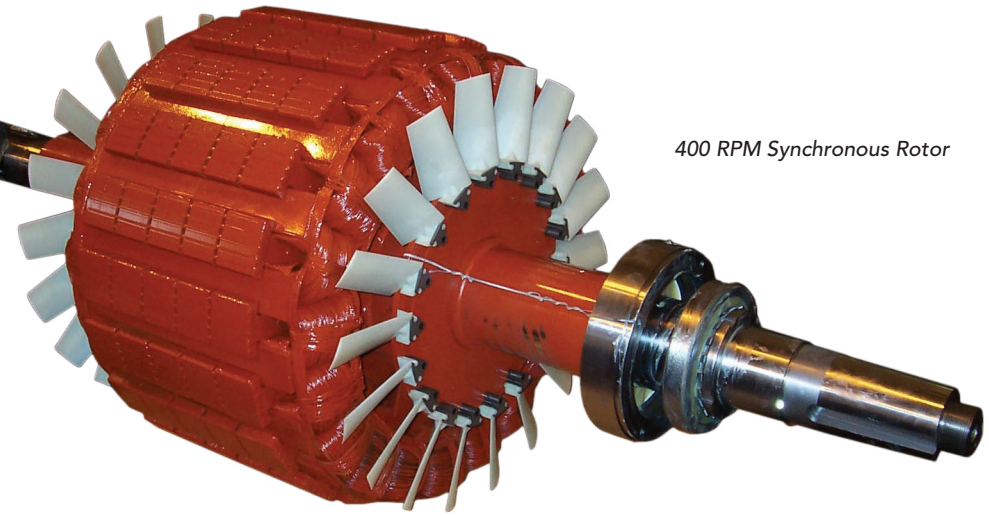
Hyundai Ideal Electric Co. motors have been rigorously tested in our factory – and, more importantly, in the field – to ensure each motor is mechanically and electrically sound. Hyundai Ideal Electric Co. has responded to the demand for increased testing by adding a state-of-the-art test floor to our manufacturing facility. Our test floor allows for the testing of vertical and horizontal synchronous motors at voltages from 480 volts to 13.8 kV and at 60 Hz and 50 Hz.

For More Information

For more information on synchronous motors, or any other HIEC product, contact Hyundai Ideal Electric Co. headquarters or your local HIEC representative.



End view of Slow Speed Synchronous Motor



400 RPM Synchronous Rotor

OUR MISSION

Our mission is to produce the highest quality product, satisfy customer requirements, and provide rewarding employment in a profitable growth environment, while supporting the community.

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