Synchronous reluctance motor-drive package for industrial use
Optimized cost of ownership
Lowest energy bill with maximum availability for a wide range of industrial applications

Our synchronous reluctance motor-drive packages are designed to meet the precise needs of industries such as mining, chemicals, power plants, material handling and pulp and paper. They are suitable for a wide range of applications such as pumps, fans, compressors, extruders, conveyors and mixers.

IE4 efficiency, 11 to 315 kW
The heart of the package is a magnet-free motor meeting IE4 efficiency levels. The lowest energy bill is achieved with speed control provided by an ACS880 drive and the excellent partial load efficiency performance of SynRM technology.

Verified package efficiency
For the first time, you don’t have to guess the combined energy consumption of the motor and drive for a given output. The SynRM motor and drive package efficiency is measured to verify the efficiency. When comparing efficiencies between different alternatives, make sure you’re looking at efficiency values for the whole package and all the speeds that will be run.

Upgrade system efficiency without mechanical modifications
Unlike many other IE4 motors, most IE4 SynRM motors follow Cenelec harmonized size and output combinations. This means that upgrading to the highest efficiency level is easy and straightforward without the need for mechanical modifications, which will keep the payback time of the total investment very short.

Traditional IE2 induction motor
Unprecedented reliability
The rotor that runs exceptionally cool keeps motor bearing temperatures low and therefore increases bearing system reliability. Moreover, the temperature rise of the IE4 SynRM motor windings is well below class B. These factors take motor reliability to an unprecedented level, keeping the processes running without interruptions.

Induction motor on the outside, innovation inside
Synchronous reluctance motors combine innovative rotor and conventional stator technology. You get the performance of a permanent magnet motor together with the cost-efficiency, simplicity and service-friendliness of an induction motor.

The all-compatible ACS880 drives
The all-compatible drives are designed to provide customers across industries and applications with unprecedented levels of compatibility and flexibility. ACS880 supports various motor types including synchronous reluctance motors.

IE4 SynRM motor and drive package
Ultimate efficiency and reliability to optimize your cost of ownership

The idea is simple. Take a conventional, proven stator technology and a totally new, innovative rotor design. Then combine them with a best-in-class industrial drive loaded with purpose-design motor control.

**Ultra-high efficiency motor to cut the cost of running**

The new rotor has neither magnets nor windings, and thus suffers virtually no power losses. ABB has converted this advantage into ultra-high efficiency. As a result, you get the IE4 super premium efficiency level, which means very low energy consumption especially with in partial load variable speed operation.

**Superior reliability to minimize the cost of downtime**

IE4 synchronous reluctance motors have very low winding temperatures, which increases the reliability and lifetime of the winding. More importantly, the cool synchronous reluctance rotor means significantly lower bearing temperatures – an important factor because bearing failures cause about 70 percent of unplanned motor outages. Even if the bearings eventually need replacing, there are no magnetic forces involved – unlike in a permanent magnet motor – so the bearing change is as fast and easy as with an induction motor.

**Winner of the 2011 Automation Award – The Automation Oscars**

The new motor and drive package won Germany’s most important automation award at the SPS/IPC/DRIVES trade show in Nuremberg.

SynRM technology is also available in high output motor and drive packages with up to two frame sizes smaller motor. To learn more, visit www.abb.com/motors&generators
Packaging the latest motor and drive technology

Motor highlights
- Motors meet IE4 efficiency levels according to IEC 60034-30-1 Ed 1.0
- Unprecedented reliability through very low winding and bearing temperatures
- Can replace standard induction motors – same power, size combinations
- Variant codes and mechanical construction based on the proven M3BP cast iron process performance motors – conventional yet innovative. Same parts, easy to source and change.
- No magnets, no cage – you cannot break what isn’t there
- Service procedures comparable to induction motors – easy to maintain

ACS880 drive highlights
- Compact design for easy installation commissioning and maintenance
- Enclosure classes IP21, IP22, IP42, IP54, IP55 for various ambient conditions
- The offering ranges from wall-mounted to cabinet-built drives and drive modules
- Integrated safety including safe torque off (STO) as standard and plug-in safety functions module as option
- Full motor control over the whole speed range down to zero with Direct torque control (DTC) technology, without feedback devices like encoders or position sensors
- The drive with flying start capability sense the rotation speed and direction of a machine and increase the motor speed to the corresponding level without stopping the machine
- Removable memory unit for easy maintenance
- Wide range of fieldbus adapters enable connectivity with all major automation networks
Why settle for IE4?

Using a motor with the highest efficiency class together with speed control is a good start when it comes to minimizing your energy bill.

However the IE class only indicates motor efficiency with a sinusoidal supply at nominal speed and power. This information is not relevant when calculating energy consumption in variable speed applications. Accurate calculations demand efficiency data for the whole motor-drive package and for the entire speed range.

Now – for the first time in the industry – ABB offers you the means to calculate actual energy consumption with a measured efficiency curve for the motor and drive package. Log the operating profile and energy consumption of your present system and calculate the energy consumption with the new IE4 SynRM package.

This time your calculations will be based on facts, not assumptions.

Motor-drive package efficiency curves

![Motor-drive package efficiency curves](image)

IE4 SynRM motor-drive package efficiency (37 kW, 1500 rpm)

Motor-drive package efficiency data for pumps and fans by ABB
IE4 SynRM motor-drive package

Technical data
This table presents technical performance data for IE4 SynRM motors. Variant codes and construction details are based on the M3BP motor. Protection IP55, self cooling IC 411, insulation class F, temperature rise class B. Motor values are given with an ACS880 VSD supply.

<table>
<thead>
<tr>
<th>Output kW</th>
<th>Motor type</th>
<th>Product code</th>
<th>Current $I_n$ [A]</th>
<th>Torque $T_n$ [Nm]</th>
<th>Torque $T_{n/100}$ [Nm]</th>
<th>Max speed $n_{max}$ [r/min]</th>
<th>Weight [m kg]</th>
<th>Suggested wall-mounted ACS880-01 single drives for no overload*</th>
<th>Suggested cabinet-built ACS880-07 single drives for no overload*</th>
<th>Package efficiency IE4 SynRM &amp; ACS880 $\tau_{n/100}$%, $n_{max}=100%$</th>
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<td>MLA 4</td>
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<td>133</td>
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* Consult ABB for motor and drive dimensioning for applications with other load characteristics.

For further information, see "Low voltage motor catalog: IE4 synchronous reluctance motor and drive package", code: 9AKK105828 EN.
Contact us

For more information contact your local ABB representative or visit:

www.abb.com/motors&generators
www.abb.com/drives

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