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ABB motor sets world record in energy efficiency – saves half a million dollars

Pioneering technology leader ABB achieves almost 100% energy efficiency with synchronous motor.

Tests carried out on a 44 megawatt 6-pole synchronous ABB motor shortly before delivery showed an efficiency 0.25 percent greater than the 98.8 percent stipulated in the contract, resulting in the world record for electric motor efficiency. This efficiency improvement could save approximately \$500,000 in electrical energy costs over the course of a 20-year lifetime for each motor.

“With electricity costs being, by far, the largest component in the total cost of ownership of such a motor, savings like these have a significant impact on profits,” said Sami Atiya, president of ABB’s Robotic and Motion division. “In addition to extremely high efficiency, synchronous motors are renowned for their proven quality and reliability. Their robust design ensures reliability through cool operation temperatures and low vibration. As a pioneering technology leader driving the Energy revolution, and as part of our Next Level strategy, we are strongly committed to developing technology that improves efficiency and productivity.”

The world record efficiency was reached by optimizing the motor’s electrical and mechanical features, based on ABB’s application knowledge and more than 100 years of experience in manufacturing electric motors. The average efficiency for this type of synchronous motor is between 98.2 and 98.8 percent. If the motor is in continuous operation, the 0.25 percent efficiency improvement saves 1000 MWh energy per year which is equivalent to annual electricity consumption of 240 European households.

The world’s demand for energy today is nearly twice what it was 30 years ago. By 2030, it may have risen by over 50 percent again, according to estimates by the International Energy Agency. To cope with this not only are new energy resources necessary but the more efficient use of energy already available is critical. The energy saving potential in industry is enormous just in motor-driven applications alone. Variable speed drives and high efficient motors can help lower energy use typically by 20 to 50 percent, by reducing power consumption and losses.

Motor efficiency is the ratio of mechanical power output divided by electric power input. The world record results were obtained during tests carried out with a customer that will be installing ABB synchronous motors to drive compressors at an air separation plant that produces industrial gases. The synchronous motor is a special type of alternating current (AC) motor, being some 5 x 4 x 4 metres in size for an output power of 44 MW. Typical uses of synchronous motors are for driving fans, pumps, rolling mills, mine hoists, and compressors in such industries as air separation, oil and gas, chemical, marine, metals, mining, water, and pulp and paper.

ABB (ABBN: SIX Swiss Ex) is a pioneering technology leader in electrification products, robotics and motion, industrial automation and power grids, serving customers in utilities, industry and transport & infrastructure globally. Continuing more than a 125-year history of innovation, ABB today is writing the future of industrial digitalization and driving the Energy and Fourth Industrial Revolutions. ABB operates in more than 100 countries with about 132,000 employees. www.abb.com

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