Siemens presents new active magnetic bearing system: Simotics AMB technology

- Simotics Active Magnetic Bearing technology (AMB) for wear-free operation in large-machine applications
- Regulated magnetic fields hold the rotor in suspension precisely without oil or contact
- Matched Siemens standard products offer high reliability and efficiency
- Truly simple integration into the digital world

With its Simotics AMB technology, Siemens presents an active magnetic bearing system for large machines, such as high-speed high-voltage motors or industrial turbines and compressors. The rotors for such applications are held suspended in the center of the bearing without any friction or wear. To do this, sensors record the position of the shaft 16,000 times a second and a regulator adjusts the magnetic field to keep the rotor hovering precisely in the bearing center. Even rotors weighing several tons spinning at maximum speed can be held in a position window that has the diameter of a human hair. The decisive unique selling proposition of Simotics AMB technology is that it allows the use of standard components from the Siemens portfolio, such as Sinamics and Simotion control and converter units. In the context of Totally Integrated Automation (TIA) and Integrated Drive Systems (IDS), Simotics AMB technology is a highly efficient and matched solution for large machine applications.

Simotics AMB technology is particularly well suited to the oil and gas industry, as well as power generation. But it is also a good fit for any industry using fast-running, high-powered machines with large-diameter shafts, such as high-speed electric motors. In the oil and gas business, Simotics AMB technology is mainly used in compressors for gas transport and storage or liquefaction. In conventional power
generation, a key field of application is in high-speed steam turbines. Simotics AMB technology seamlessly integrates into the Siemens Totally Integrated Automation (TIA) concept - as all of the components in it are mutually compatible and system-tested. The Sinamics standard control components are used both in the Integrated Drive System (IDS) in the drive train to control the magnetic bearings as well as in the main converter. The space-saving, PC-based Simotion P320-4 controller forms the customer-specific, configurable human-machine interface for system monitoring, communication with the higher-level plant controller, and for auxiliary commissioning functionalities. For the development of the magnetic bearing hardware, Siemens drew on more than a hundred years of experience building electric motors – for instance, proven manufacturing processes for torque motors for machine tools were the inspiration for the electromagnets in the bearings.

The result is a highly precise, rugged and safe magnetic bearing system. Thanks to the high power ratings of the Sinamics S120 converters, large magnetic-bearing air gaps can be achieved, even with very heavy rotors, vastly simplifying the arrangement of machine components. The control solution that is Simotics AMB technology also automatically provides operational data, such as shaft position, bearing force (currents), dynamic load on the bearing (voltages) and operating temperatures, which can be used to detect even minimal changes to the drive train, driven machine, and the downstream process. This information can be seamlessly transferred to a higher-level control system for system control and operational monitoring or used by data-based service concepts. It serves as the basis for simple, efficient online remote monitoring and operation, while ensuring maximum system availability.

Simotics Active Magnetic Bearing technology is already successfully in use: At NAM/Shell in two 23 MW high-speed compressor drive trains running at 6300 RPM in the Groningen gas field in the Netherlands, as well as at Vattenfall in a 10 MW steam turbine running at 5700 RPM at the Jänschwalde power plant in Germany.
New active magnetic bearing system from Siemens: Simotics Active Magnetic Bearing technology (AMB) for wear-free operation without oil in high-speed large-machine applications. The system is built around standard controller and converter units from the Sinamics family of products from Siemens. The illustration shows a special split bearing as used in a feed-pump drive turbine at the Jänschwalde power plant.

This press release and a press picture are available at www.siemens.com/press/PR2016030178PDEN

For further information on motors, please see www.siemens.com/simotics

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