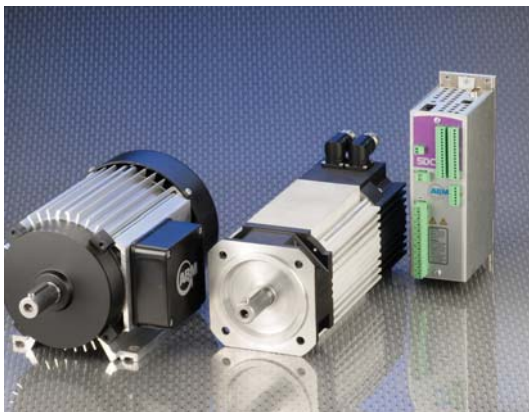


Alternative to Induction Motors and Servo Drives:

SINOCHRON[®] - Highly Efficient Drives for Sensorless Operation

Up to now engineers of sophisticated machines and systems had to choose between induction motors and servo drives. ABM now offers a new alternative: the **SINOCHRON[®] Motor**. This drive system combines benefits of the two known drive systems and is exceedingly well suited for a wide range of applications from textile- and packaging machinery over conveying and material handling systems to construction and agriculture equipment. Besides high power density and outstanding controllability the new concept shines with excellent energy efficiency.

ABM Greiffenberger presents with the new **SINOCHRON[®]** line an electrical motor design with key criteria implied in its name: It is a Sin**CHRON**ous motor with high performance permanent magnets with Sinusoidal flux distribution.



*ABM Induction Motor, **SINOCHRON[®] Motor** and Drive Controller SDC (from left to right.)*

Feature such as compact motor construction and outstanding rotational behaviour are imbedded in this motor design. Compared to induction motors approximately twice the short term overload capacity is possible allowing in many cases to select a smaller motor size.

Compared to servo motors sensorless operation is possible thanks to its sinusoidal counter voltage. Additionally, motor hook-up is easier because no speed encoders are needed.

System Solution with Drive Controller



ABM **SINOCHRON**[®] Motor with Drive Controller SDC

ABM Greiffenberger engineers did not only find an economically and technically convincing solution for the motors but also for the controllers and thereby developing the foundation for sensorless motor operation.

Actual values for rotor position and motor speed are not mechanically captured but calculated from electrical data. Specifically designed for the **SINOCHRON**[®] Motors electronic controllers type SDC (ServoDriveControllers) are optimally tuned to their features. By calculating to be determined values based on the motor parameters in the control software, the necessity for external encoder signals of actual values is eliminated.

Moving Functions from Hardware to Software

Previous hardware functions are now integrated in the software eliminating one drive component, reducing cost and required installation space. Nevertheless, drives still achieve an outstanding positional accuracy: The system recognizes the rotor position electrically to an accuracy of $\pm 5^\circ$. This is sufficient for drives with an adjustable range of speed of 1:1000 and/or where a medium positional accuracy is required.

High Reliability

Besides space saving installations, cost savings and simple motor hook-ups sensorless drives with **SINOCHRON**[®] Motors offer even more

benefits. By eliminating the speed/rotor position encoder the reliability of the complete system is dramatically improved. Because rotor positions are known at all times rotor orientation at start-up is unnecessary and uncontrolled rotor movements are eliminated.

Exemplary in Efficiency

In regard of energy efficiency of drive systems **SINOCHRON**[®] Motors are exemplary: They even exceed the guidelines of the highest efficiency class “Premium Class”, whose introduction is eminent and specifications go beyond the current class EFF1. Even in part-load operational range the motors run with high efficiency. Exemplary efficiency guarantees the end user energy cost savings and contributing to conserving resources.

Optimum Adaptation to Individual Application Requirements

Drive systems with **SINOCHRON**[®] Motors and SDC controllers allow an optimum adaptation to individual application requirements. Beside a motor-controller for speed and torque adjustment an “Advanced Controller”, programmed by ABM Greiffenberger to unique customer application requirements, is integrated. Programmed torque and speed behaviour as well as application based deceleration curves allow optimum acceleration and precise slow down and positioning.

Many Industry Specific Solutions are Possible



Application Example High-Speed Door

Maximum controller flexibility allows for solutions for highest demands unique to an individual industry.

Even special functions such as an electronic wave and synchronous control without

integral error can be realized
with minimum effort.

Being functional even in the field-weakening area makes these motors well suited for constant output applications such as winding- or traction drives.

Cut Cost – at Time of Purchase and during Operation

Cost reductions was a key development goal for the **SINOCHRON**[®] Motors with SDC controllers. ABM Greiffenberger reached this goal. Buyers can save an average of 20 % in initial investment alone compared to a servo motor with encoder. In comparison to induction motors savings come from dramatically reduced operational cost. **SINOCHRON**[®] Motors have up to 40 % less power loss resulting in lower overall energy cost.

Benefits of System Thinking

Machine builders benefit from a comprehensive drive system from a single source for outputs from 0.37 to 7.5 kW. All motors, gearboxes, brakes and controllers are properly coordinated and ABM Greiffenberger can customize on their basis individual drive concepts engineered for maximum efficiency and durability. Here, the vast know-how acquired by ABM engineers over decades of close cooperation on drive solutions with leading machine builders comes to full bear.

“Tertium datur”: There is a New Option Available

The outstanding **SINOCHRON**[®] Motor features make them perfectly suited for a wide range of applications in machinery and systems manufacturing and a real alternative to current drive options “Induction motors or servo motors?”. Further applications for the new drive include high speed drives for textile machines as well as drives where soft stop and start are crucial, e.g. stair lifts. With a compact design and resistance to tough ambient conditions they are also well suited for industrial doors and construction or agriculture machinery. In conveying

and material handling applications **SINOCHRON**[®] Motors shine thanks to available full motor torque at zero speed. ABM engineers believe that additional applications can be found on vacuum pumps and packaging machinery where synchronized operation of several drives is required.

Marktredwitz, 27.11.2007 Author: Dipl.-Ing. (TU) Wolfgang Benzing
Application Sales Manager at
ABM Greiffenberger Antriebstechnik GmbH