

Completely Integrated Solutions
for the Navy

SINAVY^{CIS} DC-PROP

Highly available and extremely
reliable: DC propulsion-propulsion
motors for submarines

Your Success is Our Goal

SIEMENS

Industrial Solutions and Services

SINAVY^{CIS} DC-PROP from Siemens offers optimal solutions for submarine propulsion. Highly robust and successfully utilized in more than 130 submarines, these DC motors with their double-armature motor design stand out through their high level of efficiency and reliability.

SINAVY^{CIS} DC-PROP – robust, reliable and maintenance friendly

Not least for reasons of crew safety, great demands are placed on submarines propulsion systems. A high level of reliability, particularly during long periods of operation and under extreme conditions, is absolutely imperative. In the event of a key element failure, redundant components must ensure that system availability is upheld at all times.

Other important requirements include a high degree of efficiency and low noise levels during operation. In order to conduct maintenance measures quickly and smoothly, all propulsion components must also be easily accessible.

SINAVY^{CIS} DC-PROP – our solution in detail

The low-noise SINAVY^{CIS} DC-PROP propulsion motors for submarines are equipped with double-armature technology. Their efficiency is optimized for the entire rpm range between patrol (silent mode) and cruising speed. This is achieved through the low-loss design of the engine in the partialload operational range, as well as through converters for the armature current/-voltage in the low-rpm range. By providing for large thermal energy reserves in the motor design, the ventilators/ cooling units are only necessary at high-rpm speeds, whereby their rotational speed and performance is controlled in accordance with motor cooling requirements. This also helps to improve efficiency and reduce noise.

Six good reasons for SINAVY^{CIS} DC-PROP

- Low noise levels
- Highly efficient
- High level of availability through double-armature technology
- Shockproof with minimized weight
- Continual rpm adjustment through drive speed steps and exciter field control
- Convenient accessibility of all components ensures trouble-free maintenance



Through tiered switching of the partial armatures and partial batteries in up to 5 rates of speed/rpm, the appropriate voltage level is allocated to each of the partial armatures. Consequently, the control range of the exciter can be confined and high exciter loss avoided. Within a particular speed rate, rpm adjustment is regulated by the influence on the exciter field with the help of an exciting current actuator.

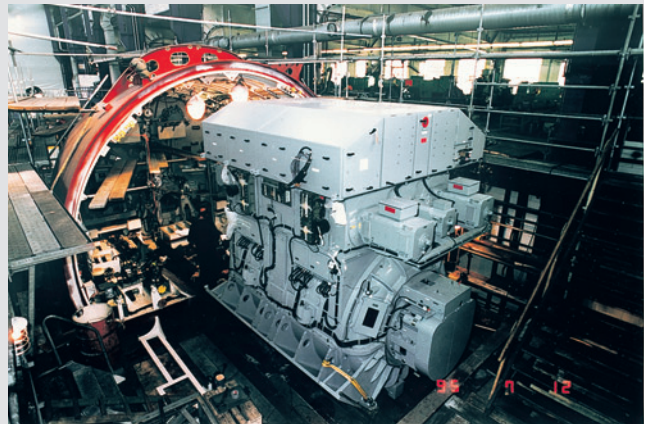
Always playing it safe, even in an emergency

SINAVY^{CIS} DC-PROP propulsion motors are highly reliable. Important functions are designed redundantly. Through the separation of the two completely independent partial-motors and feed of the exciter current from at least two sources, SINAVY^{CIS} DC-PROP ensures a very high degree of operational reliability.

The coil insulation is flood-proof and can be regenerated after seawater contamination by simple rinsing.

Low signatures

Shockproof and weight-minimized, the SINAVY^{CIS} DC-PROP propulsion motors are specially adapted for submarine operations. All connections as well as the internal wiring are designed to keep stray fields low. If required, the SINAVY^{CIS} DC-PROP housings are also available in a non-magnetic version.



Many years of experience at Siemens in noise reduction have gone into the construction and design of SINAVY^{CIS} DC-PROP propulsion motors. The noise levels of submarine propulsion systems of this type are far below noise signature limits established by shipyards and navies.

In designing the DC motors, particular emphasis was placed on easy accessibility of all system elements for maintenance purposes. The housing and bearing shields are divided severalfold to allow for disassembly under tight installation conditions on board. The stator yoke is rotatable, so that all segments can be easily accessed and, if necessary, removed.

Proven and highly sought after

To date, Siemens has equipped more than 130 submarines with SINAVY^{CIS} DC-PROP propulsion motors. As of the beginning of 2004, new orders were on hand for a total of seven Class 209 submarines from South Africa and Turkey.

SINAVY^{CIS} – Completely Integrated Solutions for the Navy

As a comprehensive industry-specific solution for naval vessels, our SINAVY^{CIS} product family integrates all the products and services you need for sustained maximization of your ship's performance.

For each particular task, a solution has been defined that

- **horizontally** improves all of your ship's operations
- **vertically** integrates the ship's information and security management end-to-end, helping to make better-founded decisions
- and, at the same time, is designed for optimal vessel specific maintenance and comes with assured further development **over the whole life cycle**

Due to this unique combination of horizontal, vertical and life cycle dimensions, our solutions all carry the genes of an exhaustive and sustained plant productivity in their very core.

For More Stability. More Availability. More Power.

Completely Integrated Solutions from Siemens.

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CIS = Completely Integrated Solutions

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