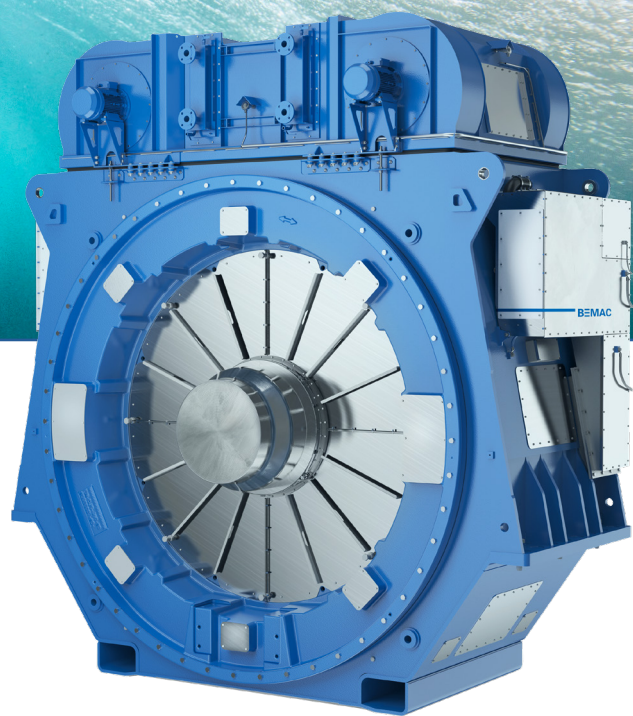




# THE SWITCH PERMANENT MAGNET MACHINES FOR SHAFT GENERATORS AND DIRECT-DRIVE PROPULSION



**BEMAC**



# WIDEST RANGE OF MARINE PM MACHINES AVAILABLE



OVER 300  
machines  
ordered

MORE  
THAN 150  
in operation

## KEY TO HIGHER EFFICIENCY

Permanent magnet (PM) technology is key to higher efficiency in shaft generator and direct-drive propulsion applications.

A strong magnetic field is needed to link the stator and rotor for electromechanical power conversion. Traditionally, this field was supplied by electric current through a separate winding.

Modern Neodymium magnets make it simple to create a magnetic field, without external energy. This also leads to higher machine efficiency. That's why PM multimegawatt-class machines have been the top choice for wind power – and now also for marine.

## ADVANTAGES OF THE SWITCH PERMANENT MAGNET MACHINES FOR MARINE

### Optimal performance

- Always tailored to the customer's specific application
- Optimized and field-proven design based on large installed base

### Higher efficiency

- No need for magnetization power
- Rotor losses close to zero
- Results in lower emissions and reduced fuel costs and carbon tax

### Better reliability and less maintenance

- No rotor windings, slip rings, exciters or automatic voltage regulators (AVRs)

### Reduced space requirements

- Higher air gap tangential stress results in more compact machine
- Shorter and narrower, especially in low-speed applications

### Enhanced shaft line dynamics

- Much smaller rotating mass and inertia
- Reduced torsional vibrations, lateral vibrations and rotor deflections

# THE SWITCH DC-HUB AND SINGLE DRIVE

The Switch DC-Hub is the world's smartest technology for a multimegawatt DC power system. It ensures stable and secure operation for chosen consumers and enables a vessel to be future-flexible for new fuel sources.



## The Switch DC-Hub includes two revolutionary building blocks:

- The Switch Electronic DC Breaker (EDCB) – protection on the inside against short-circuit faults
- The Switch Electronic Bus Link (EBL) – protection on the outside by splitting onboard grids in microseconds



The Switch is now part of the BEMAC Group whose products are unified under the BEMAC brand.

# DIRECT-DRIVE PROPULSION: BEARINGLESS CONCEPT



The Switch PMM can be used as a direct-drive propulsion motor, either conventionally with its own bearings and shaft or as a novel concept, utilizing the common bearings between the propulsion shaft and motor. A tandem configuration is also possible on request.

# FULL-POWER TESTING UP TO 18 MW



Complete full-power testing with machines and drives up to 18 MW is available at our Large Drive Test Center in Lappeenranta, Finland.

All tests fulfill international standards and class requirements.



[www.theswitch.com](http://www.theswitch.com)