



**ELECTRIC DRIVES**  
FOR EVERY DEMAND

Highest Quality

# Motors and Generators for Electric Yacht Systems

120 kW – 20 MW



# Marine Decarbonisation

## Goal: Net zero

Decarbonisation goals set by the IMO cause a new course for maritime propulsion systems. The reduction of greenhouse gas emissions by 40% until 2030 compared to the level of 2008 is one of the major targets.

The improvement of technical levels, such as EEXI (Energy Efficiency Existing Ship Index), and operational levels, such as CII (Carbon Intensity Index), will assist customers to align with these rules.

## Enjoy the VEM Advantages

### Frequency Converter Technology

All VEM PM machines are suitable for VFD operation (variable frequency drive). Form wound windings withstand all levels in accordance with IVIC D (ultra harsh conditions). Random winding aligns with all levels of converter operation based on IVIC B. To reduce harmonics and minimize the impact on rotor temperatures, a dU/dTfilter is mandatory for all low voltage machines.

### Flexibility in Design

Thanks to the ultra-compact design, our PM machines, can be installed in spaces where conventional machines would never fit within the existing footprint. This opens beneficial ways for designers and OEM to find new vessel concepts.

#### Your Benefits

Highest efficiency

Beneficial installation space

Ultra compact motors

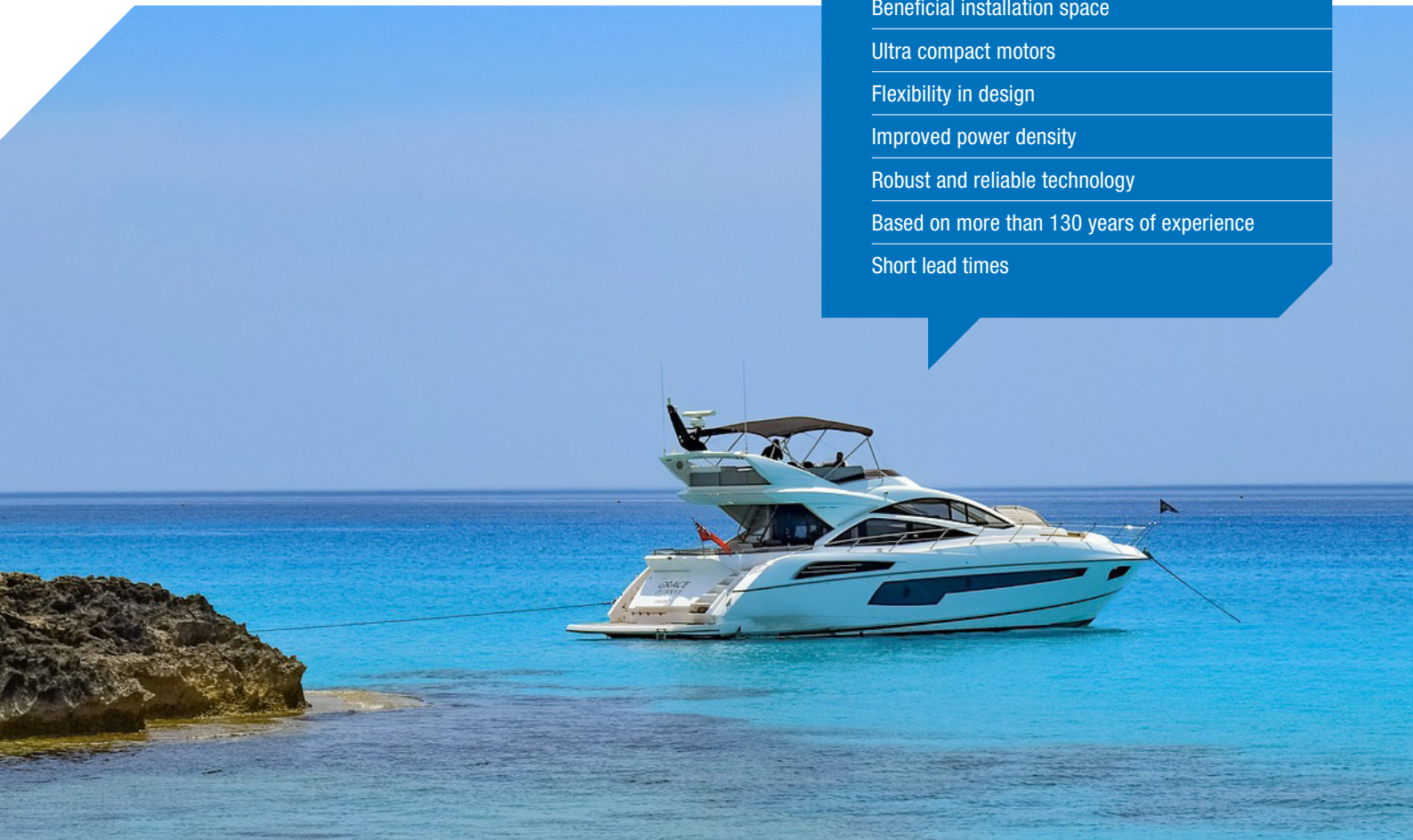
Flexibility in design

Improved power density

Robust and reliable technology

Based on more than 130 years of experience

Short lead times







# Engineering at VEM

## Efficiency Ahead

PM machines provide typically a 2 to 4 percent higher efficiency at full load and even up to 10 percent at partial load, compared to induction machines.

## Short Circuit Proof

Short circuits in the main switch board (MSB) or in the VFD may cause an electromagnetic counter field that could damage or demagnetize the rotor of PM machines. VEM machines withstand these short circuit events under every condition.

## Reliability

In VEM you can trust. With over 130 years of experience in constructing electrical machines, our commitment to high engineering standards and quality ensures long-term operation. We offer our customers a unique guarantee for PM machines.

## Propulsion Motors

- Permanent magnet
- Induction type

## Thruster Types

- Azimuth thruster
- Retractable thruster
- Bow and stern thruster
- Swing up thruster

## Power Generation

- Fixed speed generator (salient pole)
- Variable speed (induction or PM)
- PTI/ PTO (induction or PM)



### VEM Technology

Embedded magnets

Short circuit proof

Guarenteed stability of magnets

Random winding (except of HV)

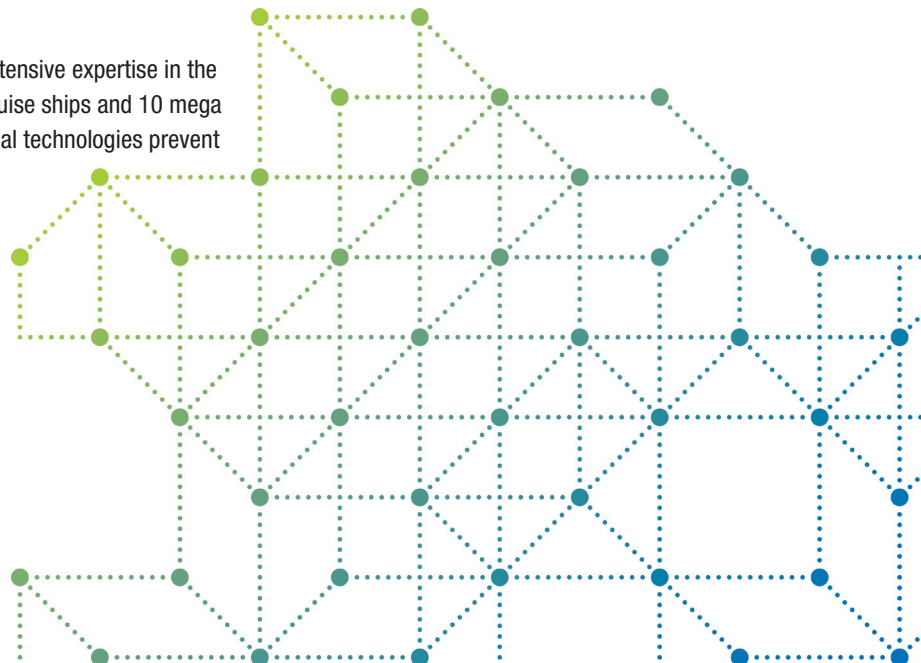
Insulation/temperature rise F/F  
(more on demand)

Approved marine technology based  
on standard components

Water-jacket-cooled

## Our Experience

Over the last few years, VEM has developed extensive expertise in the field of structure-borne noise. More than 20 cruise ships and 10 mega yachts rely on VEM's rotating machinery. Special technologies prevent the noise at its source.



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