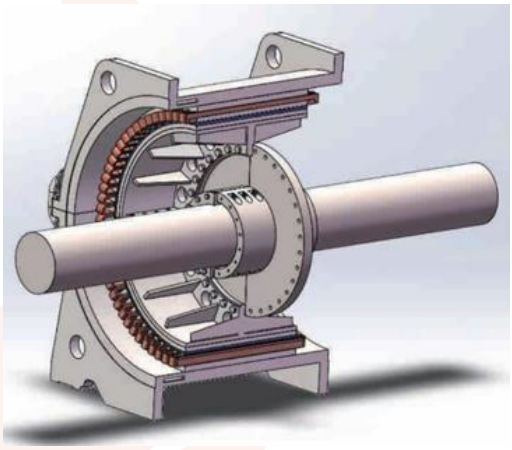
Power Generation – Shaft Generator Systems

Fuel Efficiency • Emission Reduction • Main Engine–Driven Power Generation

ALQAQNOOS Engineering provides professional Shaft Generator Power Generation Services for marine vessels and offshore applications. Shaft generator systems utilize the surplus mechanical power of the main engine to generate electrical energy, supplying stable onboard power while reducing auxiliary engine operation, fuel consumption, and emissions.

All shaft generator equipment, permanent magnet motors, and converter technologies are supplied and technically supported by approved technology partners, while ALQAQNOOS delivers engineering, system integration, installation, commissioning, testing, and lifecycle support.



Shaft Generator System Overview

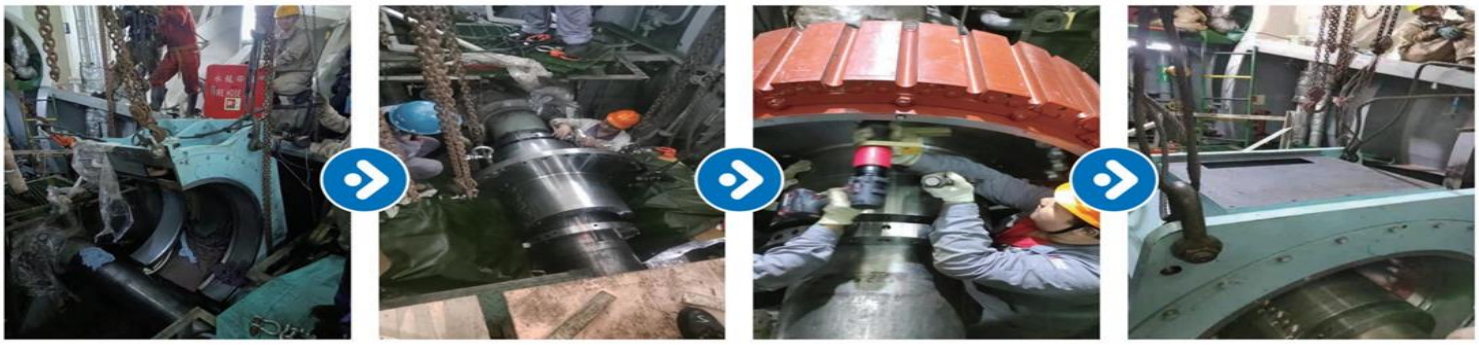
A shaft generator system converts mechanical energy from the propeller shaft or gearbox free end into constant-frequency, constant-voltage electrical power using advanced frequency converter technology.
This allows reliable power generation across a wide main-engine speed range, supporting both newbuild vessels and retrofit projects.

System Configurations Supported

Main Engine Direct-Drive Systems

Permanent magnet shaft-mounted generators installed on the intermediate or tail shaft, combined with dual PWM frequency converters, offering:

- High efficiency
- Compact design
- Low maintenance
- Wide operating speed range

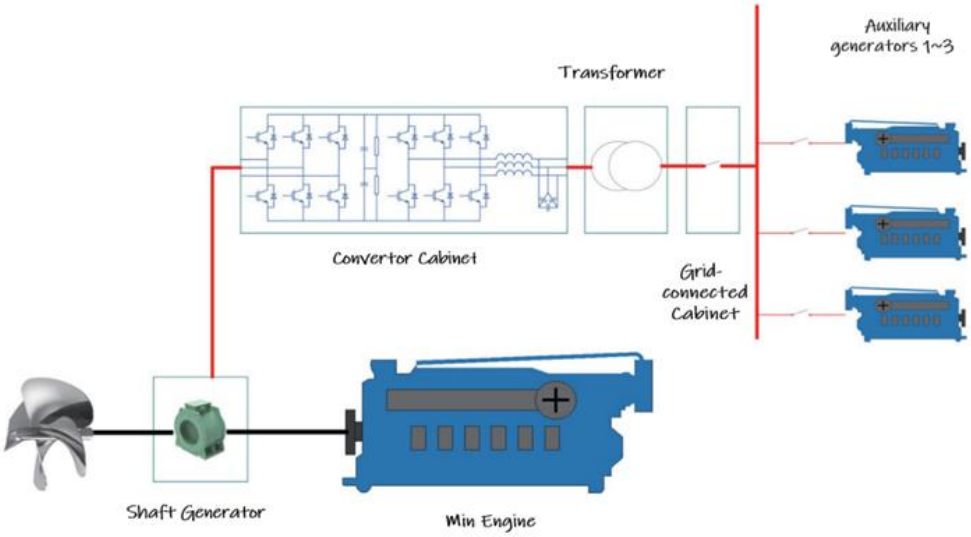


Lower half of stator lifting | Installation of expansion sleeve | Installation of rotor | Installation of upper part of stator

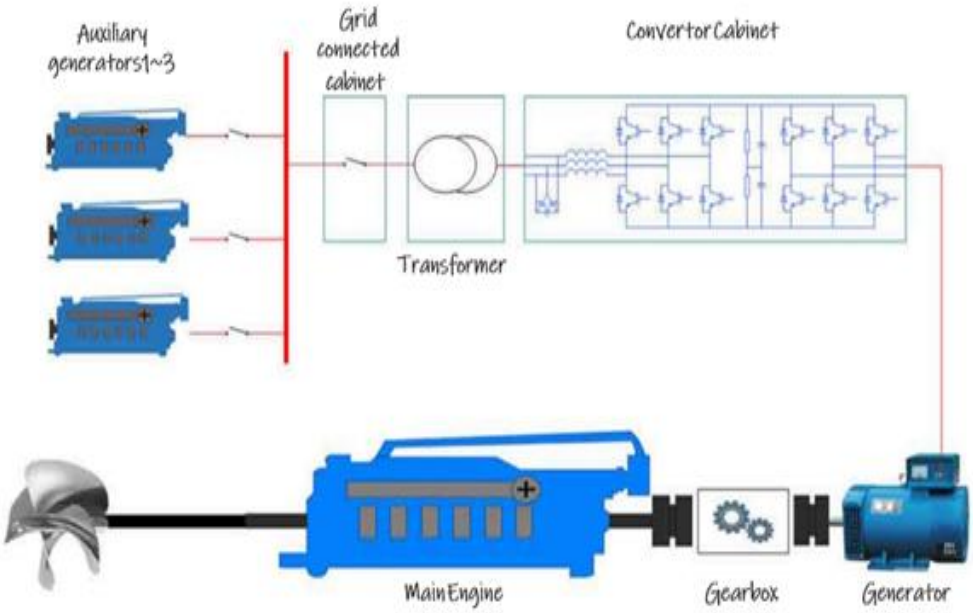
Gearbox Free-End Shaft Generator Systems

High-speed synchronous or permanent magnet generators driven via gearbox free end, suitable for vessels requiring flexible installation and higher power output.

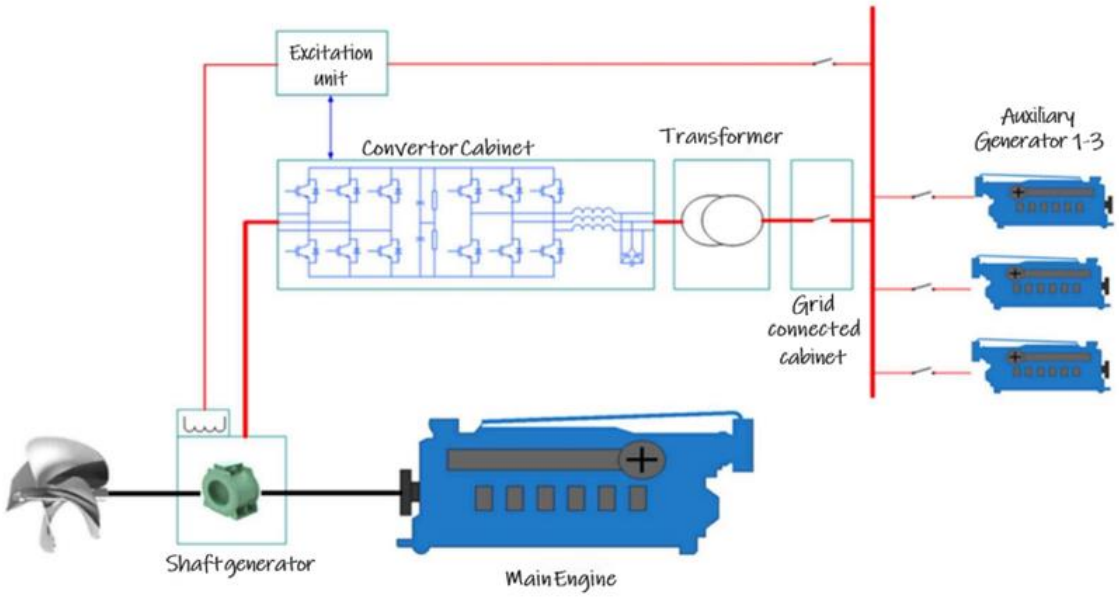
Topology of Shaft Generator system scheme



Topology of Free End Shaft Generator System Scheme



Topology of the Brush Motor System for the through stern shaft



Key Technical Advantages

- ✓ High-efficiency permanent magnet generator technology
- ✓ Stable power output over wide speed range
- ✓ Reduced auxiliary generator running hours
- ✓ Lower fuel consumption and CO_2 emissions
- ✓ Water-cooled compact motor design
- ✓ Advanced dual PWM frequency conversion
- ✓ Fast load response and stable voltage control
- ✓ Reduced maintenance compared to traditional excitation systems

Engineering & Service Scope

ALQAQNOOS provides turnkey shaft generator services, including:

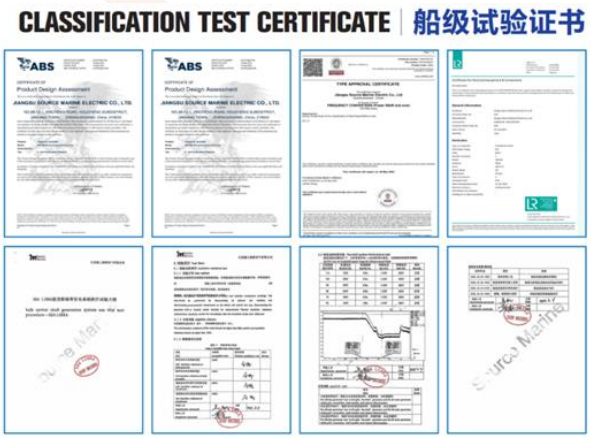
- ✓ System feasibility studies & load analysis
- ✓ Newbuild and retrofit engineering design
- ✓ Integration with main switchboard, PMS & AMS
- ✓ Converter configuration and control logic tuning
- ✓ Installation supervision (afloat or drydock)
- ✓ Testing, commissioning & sea trial support
- ✓ Class coordination and documentation

Retrofit & Modernization Solutions

Shaft generator retrofit solutions for operating vessels, including:

- ✓ Permanent magnet shaft-hugging systems
- ✓ Split shaft generator retrofit solutions
- ✓ Upgrade of existing excitation generators with modern converters
- ✓ Minimal mechanical modification and optimized installation time

These solutions enable energy savings without increasing main engine fuel consumption, extending vessel operational life.



Applications & Vessel Types

- ❖ Bulk carriers
- ❖ Tankers
- ❖ Container vessels
- ❖ Offshore support vessels
- ❖ Large power-demand ships
- ❖ Newbuild and existing fleets

Service Positioning

ALQAQNOOS acts as a Shaft Generator Engineering, Integration, and Service Partner, responsible for:

- ➢ Project engineering & coordination
- ➢ Installation & commissioning execution
- ➢ System testing & verification
- ➢ After-sales technical support

While shaft generators, permanent magnet motors, converters, and proprietary control technologies are supplied and supported by certified manufacturers, ensuring international standards and long-term reliability.

Your Partner for Efficient & Sustainable Marine Power Generation

With **ALQAQNOOS** Shaft Generator Services, shipowners achieve fuel savings, emission reduction, improved energy efficiency, and reliable onboard power generation, aligned with modern environmental and operational requirements.