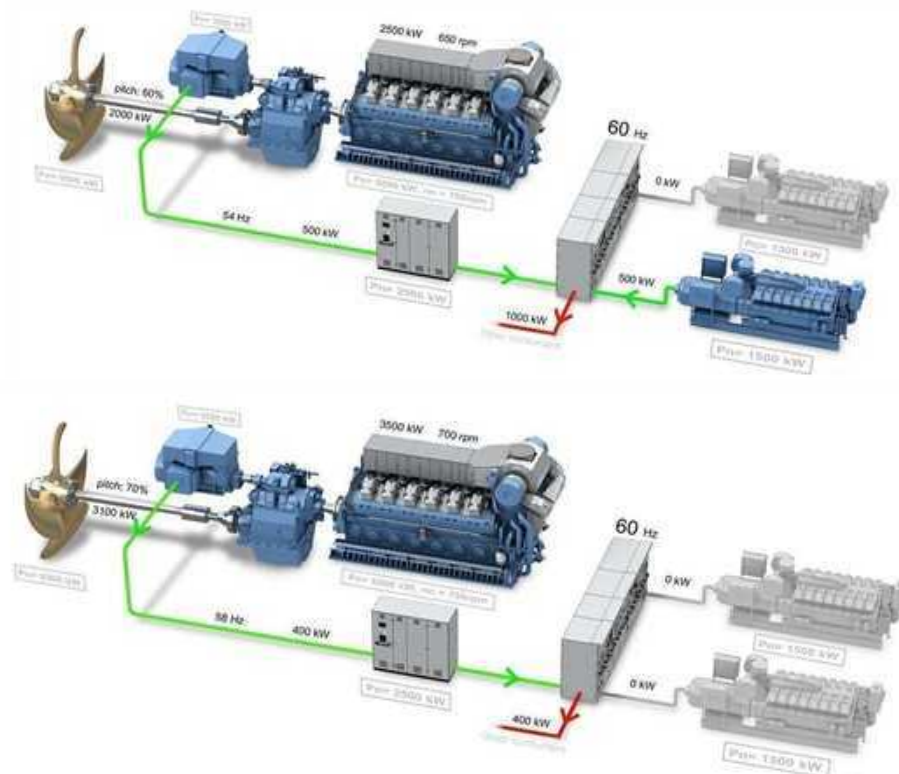


SHIP SHAFT-INTEGRATED GENERATOR SYSTEM

shaft Generator concept



The marine shaft generator system is a power generation system driven by the main propulsion shaft, utilizing the power from the main engine to supply electricity to the onboard electrical system during navigation. The core principle of this system involves mounting a generator on the propulsion shaft of the main engine, which is activated to generate electricity as the main engine operates. This system eliminates the need for a separate auxiliary generator, thereby achieving energy saving and reducing emissions.



Shaft Generator Value

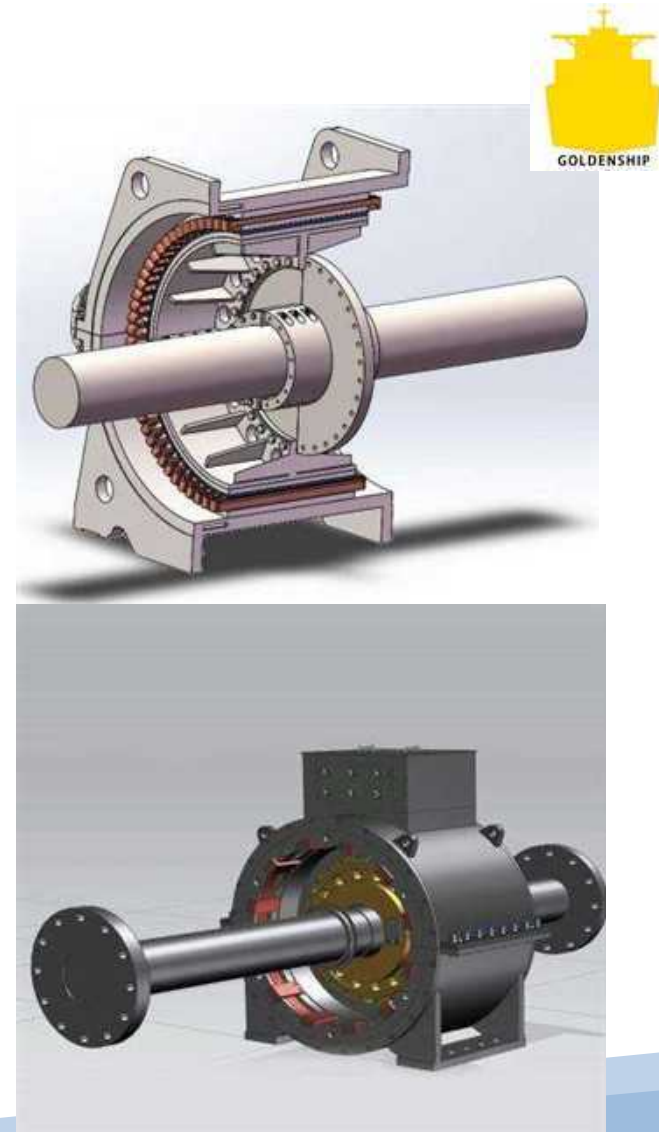
- Reduce fuel consumption and operating costs.
- Reduce carbon emissions, improve EEDI and EEXI energy efficiency indicators and CII rating.
- Reduce maintenance costs and extend main engine maintenance intervals.
- Reduce the workload of watch keeping crew.
- Reduce engine room temperature and noise.
- With PTI hybrid mode, adjust the main engine fuel consumption curve to a minimum.
- With PTH electric propulsion mode, the main engine failure can take me home.
- Depending on the system configuration, the return on investment time is only 2-3 years.



Product Introduction

•Product Solution - Permanent Magnet Shaft Generator

1. Suitable for retrofitting almost all operational vessels without modification restrictions.
2. Effectively improves the ship's EEXI index (by 4%-7%) and CII rating, ensuring compliance with energy consumption regulations and enhancing vessel competitiveness.
3. In the event of a shaft generator failure, the rotor can be quickly disengaged within 3 hours, ensuring it does not impact main engine operation.
4. Decreases auxiliary engine usage frequency, extending maintenance intervals and saving on maintenance costs.
5. Features a simple structure with no excitation unit or bearings, ensuring reliability and maintenance-free operation.



Product Introduction

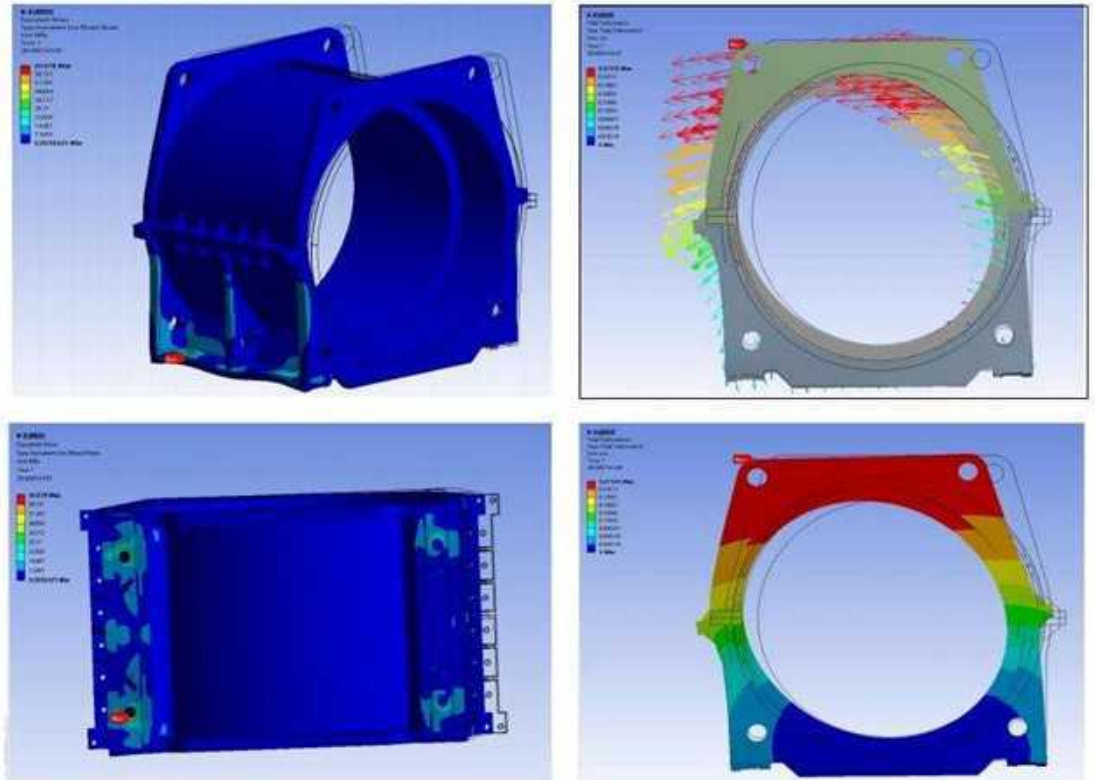


•Product Solution - Permanent Magnet Shaft Generator

Base material properties

Material name	Q235
density(kg/m3)	7850
Young's modulus(MPa)	2E5
Poisson's ratio	0.3
yield strength(MPa)	220

Stress distribution of stator operating conditions - base torque

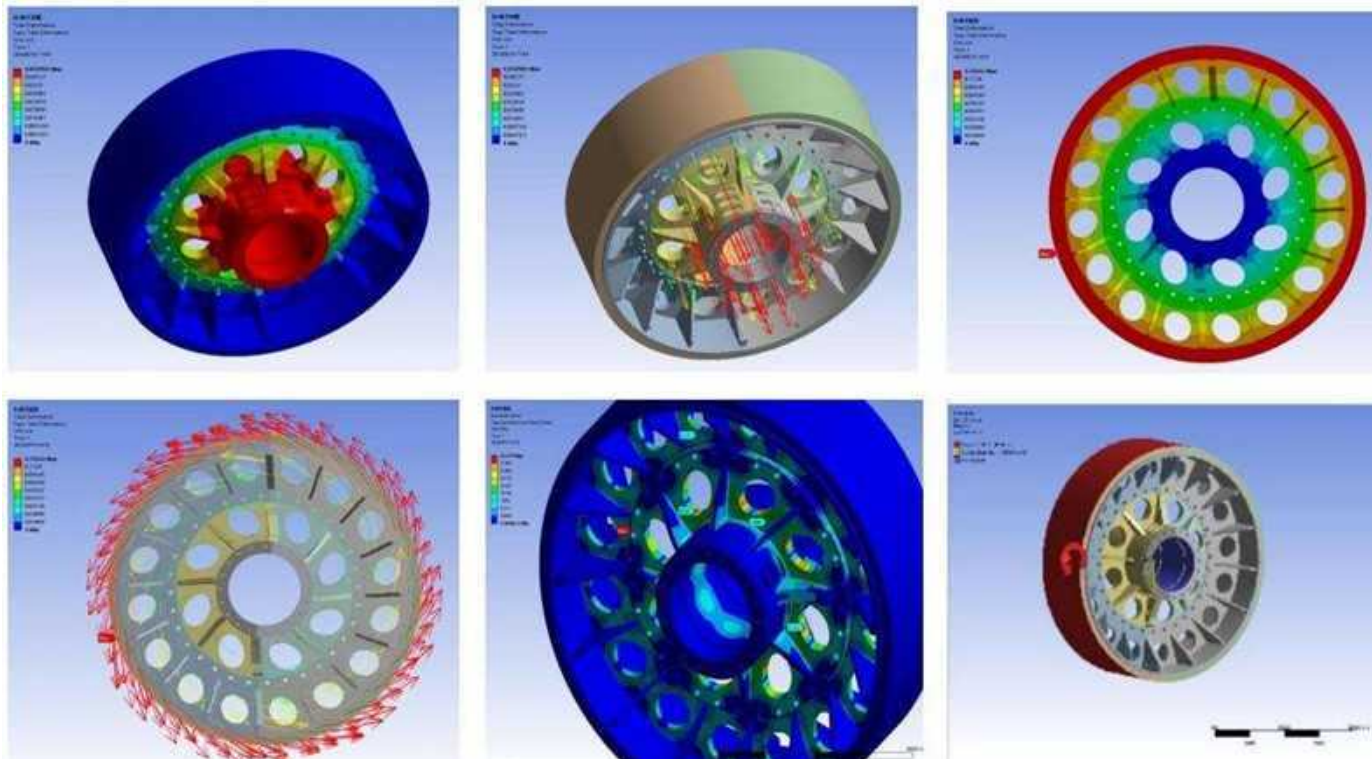


Product Introduction



- Product Solution - Permanent Magnet Shaft Generator

Stress distribution of rotor operating conditions: rotor load and rotor torque



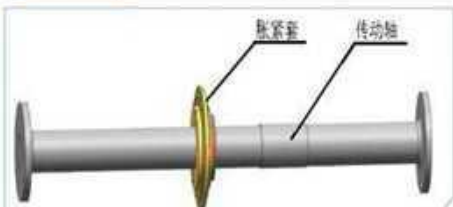
Product Introduction



•Product Solution - Permanent Magnet Shaft Generator

Installation of Permanent Magnet Shaft Generator

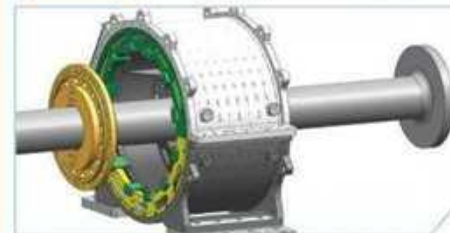
步骤一
Step 1 胀紧套预安装
Pre-install the expansion sleeve



步骤二
Step 2 电机下半部分吊装
Mount the lower half of the motor



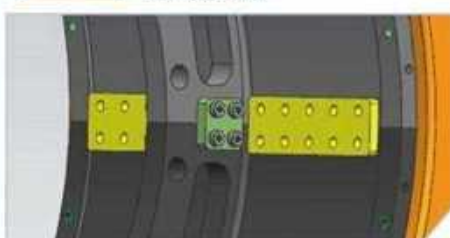
步骤三
Step 3 电机上半部分吊装
Mount the upper half of the motor



步骤四
Step 4 定子上下部分组装
Assemble the upper and lower parts of the stator



步骤五
Step 5 安装上下转子连接螺栓
Install the connecting bolts for the upper and lower rotor



步骤六
Step 6 胀套紧固并与转子连接
Fix the expansion sleeve and connect with the rotor



Product Introduction

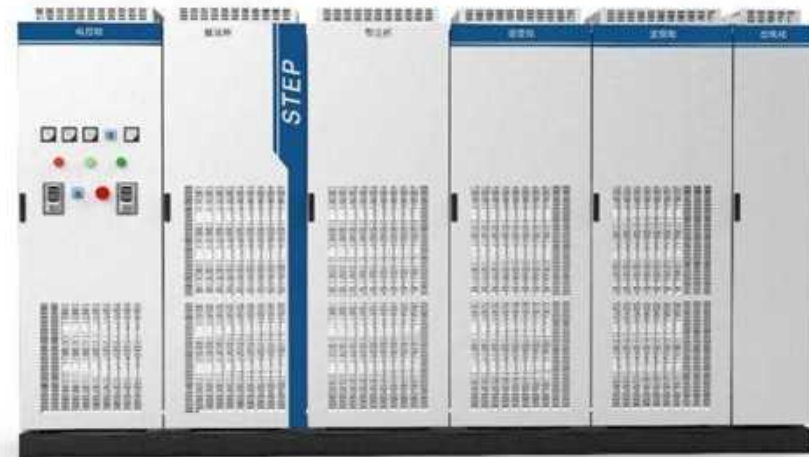
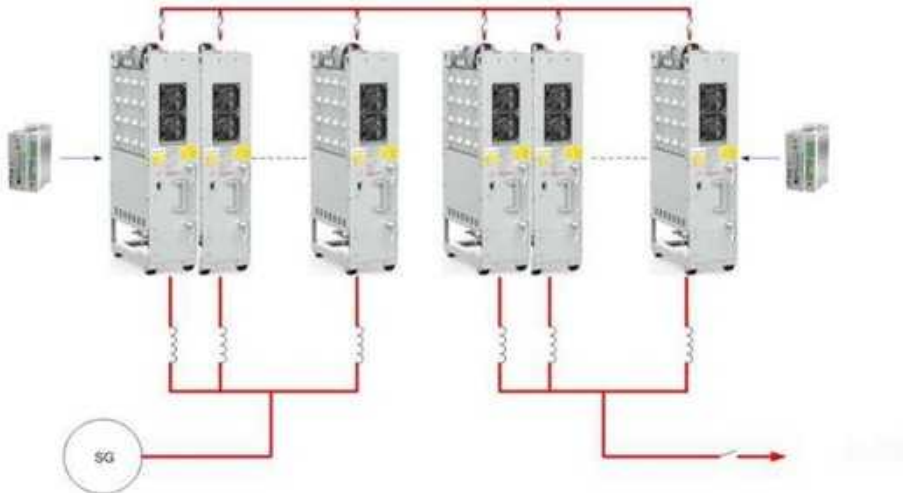


•Product Solution -Variable Frequency Control cabinet

Modular design

The AS710M series frequency converter is a water-cooled engineering drive frequency converter product with a common DC bus architecture.

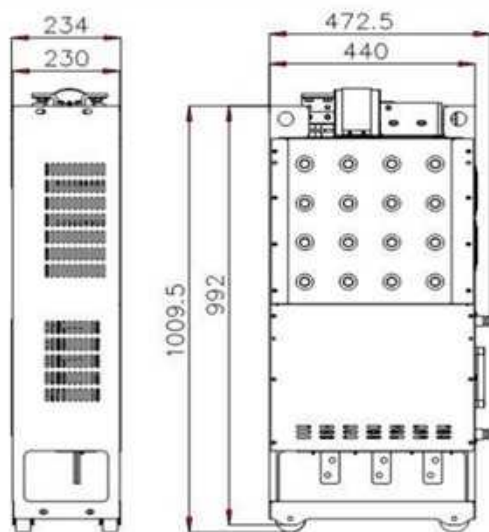
It can be configured as a two quadrant frequency converter or a four quadrant frequency converter through flexible unit combinations. Its control unit is equipped with rich control programs, which can adapt to various applications from the power generation side to the power consumption side



Product Introduction

•Product Solution -Variable Frequency Control cabinet

Product Map



重量 (kg)	Weight		
M1	≤79		
尺寸 (mm)	H	W	D
M1	1009.5	234	472.5

产品名称	产品型号	产品单元	外形规格	单元规格	电压 (V)	轻载		重载	
						PL (kW)	IL (A)	PH (kW)	IH (A)
变频器	AS710M	IGBT 单元 (ISU)	直流侧电压: 450~720Vdc; 交流侧电压: 380~480VAC; 额定功率在400V时有效						
			M1	AS710M 03 0303 T04	400	160	303	110	208
			M1	AS710M 03 0351 T04	400	185	351	132	252
			M1	AS710M 03 0390 T04	400	200	390	160	303
			M1	AS710M 03 0434 T04	400	220	434	185	351
			M1	AS710M 03 0495 T04	400	250	495	200	390
			M1	AS710M 03 0531 T04	400	280	531	220	434
			M1	AS710M 03 0600 T04	400	315	600	250	468
			M1	AS710M 03 0650 T04	400	355	650	280	520
			M1	AS710M 03 0760 T04	400	400	760	315	600
			M1	AS710M 03 0864 T04	400	450	864	355	650
			M1	AS710M 03 0931 T04	400	510	931	400	720

产品名称	产品型号	产品单元	外形规格	单元规格	电压 (V)	轻载		重载	
						PL (kW)	IL (A)	PH (kW)	IH (A)
变频器	AS710M	IGBT 单元 (ISU)	直流侧工作电压: 700~1200Vdc; 交流侧电压: 520~690VAC; 额定功率在690V时有效						
			M1	AS710M 03 0418 T07	690	355	418	280	326
			M1	AS710M 03 0471 T07	690	400	471	315	367
			M1	AS710M 03 0509 T07	690	450	509	355	397
			M1	AS710M 03 0576 T07	690	560	576	400	449
			M1	AS710M 03 0643 T07	690	630	643	450	501
			M1	AS710M 03 0720 T07	690	710	720	510	561
			M1	AS710M 03 0816 T07	690	800	816	560	636

产品 名称	产品 型号	产品 单元	外形 规格	单元规格	电压 (V)	轻载		重载	
						PL (kW)	IL (A)	PH (kW)	IH (A)
变频器	AS710M	整流 单元 (TSU)	直流侧电压: 450~720Vdc; 交流侧电压: 380~480VAC; 额定功率在400V时有效						
			M1	AS710M 05 0509 T04	400	302	509	241	407
			M1	AS710M 05 1024 T04	400	551	1024	441	819

产品名称	产品型号	产品单元	外形规格	单元规格	电压 (V)	轻载		重载	
						PL (kW)	IL (A)	PH (kW)	IH (A)
变频器	AS710M	直流侧工作电压: 700~1200Vdc; 交流侧电压: 520~690VAC; 额定功率在690V时有效							
		整流单元 (TSU)	M1	AS710M 05 0852 T07	690	823	852	642	664

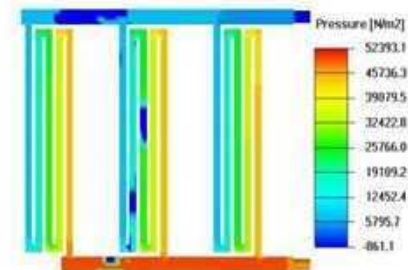
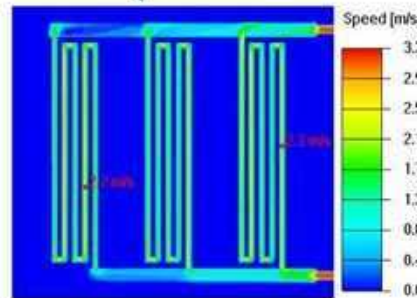
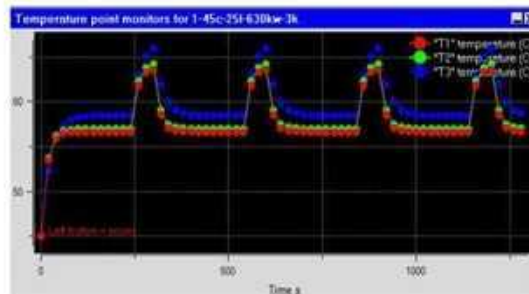
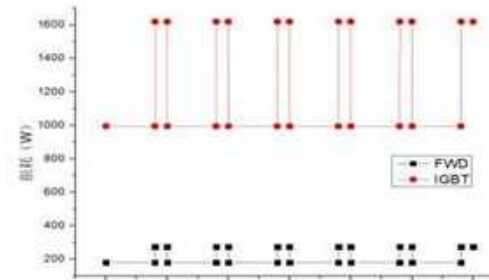
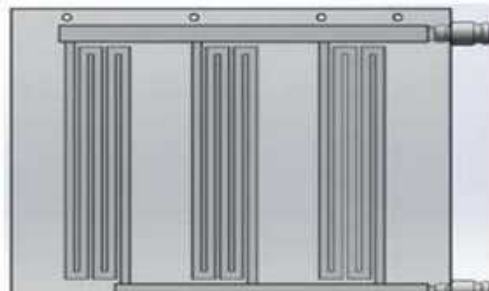
Product Introduction



- Product Solution -Variable Frequency Control cabinet

Thermal simulation technology

Adequate thermal simulation methods for comprehensive design of temperature field, fluid field, and pressure field

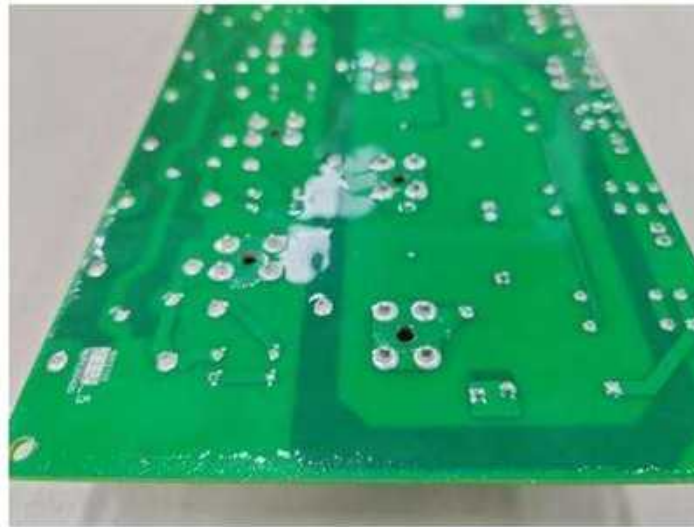
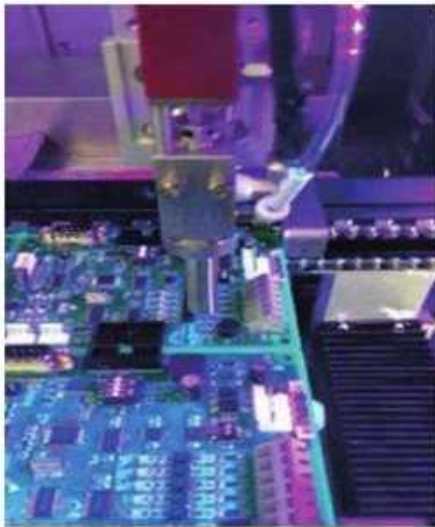


Quality Assurance



- Special spraying of electronic materials

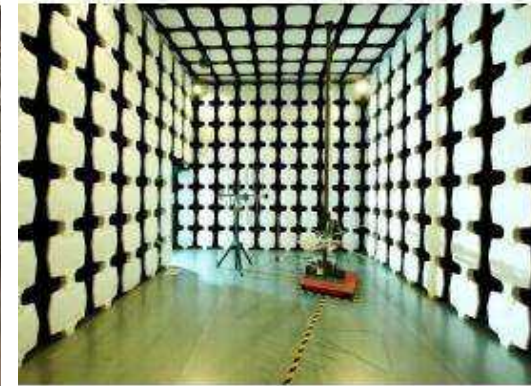
The unique three proof automatic spraying line equipment, imported from Germany with UV glue, meets the 3C3 standard. Ensure that the product is suitable for harsh marine environments.



Quality Assurance

- Complete testing equipment

SHigh power testing platform for Shaft
Generator Systems



Project Case



Dingxin 103 bulk carrier
Shaft capacity:550Kw



SEALIBRA bulk carrier
Shaft capacity:680Kw



AE JUPITER bulk carrier
Shaft capacity:600Kw



LUCKYLONG bulk carrier
Shaft capacity:550Kw



Shuolong 817 bulk carrier
Shaft capacity:550Kw



Dingxin 113 bulk carrier
Shaft capacity:600Kw

Project Case



SHAFT GENERATOR SYSTEM-Retrofit Order Service Process

01	Ship Inspection: 3D scan and model the installation location.	07	Submit Classification Society Documentation: Provide torsional vibration, alignment, harmonic short-circuit current, and other technical analyses.
02	Design: Determine installation locations for the motor, converter, transformer, and switchboard; calculate pier and navigation load; evaluate installation feasibility and plan for piping, cables, and lifting paths.	08	Design and Manufacture: Based on approval feedback, design the motor and converter cabinet procure and produce materials.
03	Technical Agreement and commercial quotation.	09	Prepare for Ship Installation: Clear interfering pipelines, prepare the bilge and related compartments weld suspension points, etc.
04	Post-contract Work.	10	System integration and Testing: Connect and test the motor, converter cabinet, and transformer system; obtain certification and prepare for shipment.
05	Provide Detailed Retrofit Plan and Project Management Sheet.	11	Onboard installation: Lift and install the motor, converter cabinet, and transformer on the vessel.
06	Collect Relevant Data and Provide Drawings.	12	System Testing, sea Trial, Acceptance, and Training.