

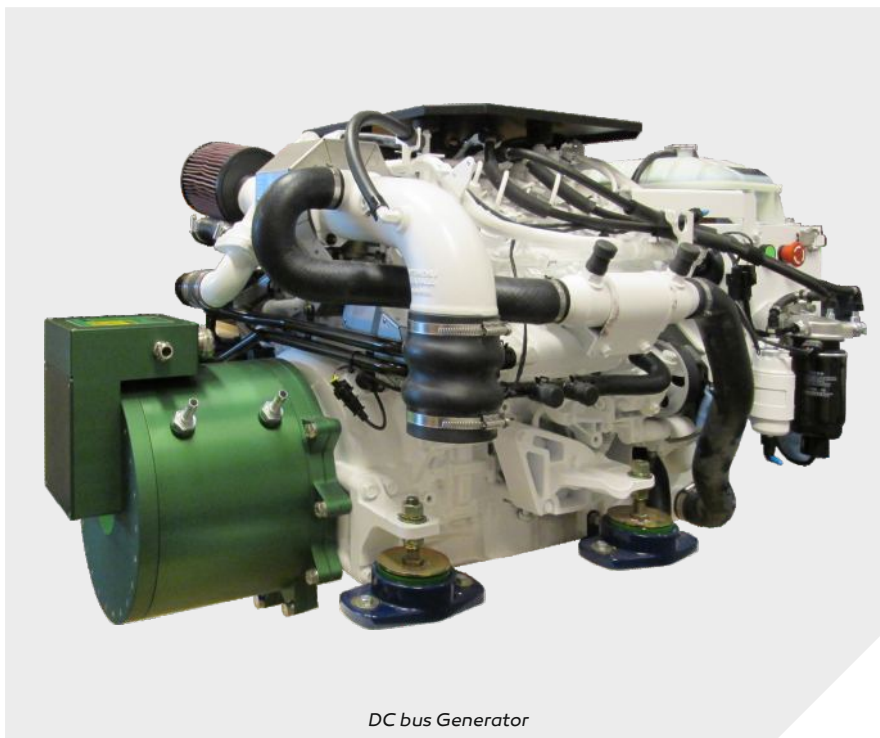
# DC bus Generator



# DC bus Generator

## Features

The Mega-Guard DC bus Generator (DCG) is a highly efficient diesel engine coupled to a permanent magnet generator for power generation. The electric power is converted to DC bus by a Mega-Guard High Power Inverter (HPI). The Mega-Guard HPI controls and monitors the diesel engine as well. This means e.g. that starting, stopping, RPM setpoint and monitoring of the diesel engine are controlled by the HPI. In this way a highly efficient and light weight electric power generator plant with DC bus connection is realized. The highly efficient permanent magnet generator consist of a Mega-Guard Electric Propulsion Motor which is used as a generator in this case.



DC bus Generator

High Power Inverter specification	
DC bus pre-charge and discharge	✓
DC bus termination	2x up to 240mm <sup>2</sup> with EMC cable glands
Power supply	24VDC (-25% ~ +30%)
Power consumption	10W
Mounting	Bulkhead
Weight	18kg
Dimensions	215x495x105mm (WxHxD)
Protection	IP67
Coolant medium and temperature	Water/glycol up to 35°C inlet temp. Derating above 35°C: 2% per °C
Coolant pressure drop	0.1 bar at flow of 10l/min 0.25 bar at flow of 25l/min
Ambient temperature	-25 ~ +70°C
Environmental conditions	IEC60945
Class approval	LRS, DNV-GL, ABS and risk based assessment

High Power Inverter safety	
AC short circuit protection	✓ Safe Torque Off
DC short circuit protection	✓ Safe Torque Off
DC bus contactor	✓
Overvoltage protection	✓
Overspeed protection	✓
Overtemperature protection	✓
Earth fault	✓

The generator is directly coupled to the flywheel of the diesel engine. The Mega-Guard DCG is available in power ranges from 140kW to 400kW. Multiple Mega-Guard DCG's can be connected to the DC bus in order to increase power and to add redundancy.

Mega-Guard DC bus Generators are available in various DC bus voltages ranging from 384-960VDC nominal. Light weight DCG's are available for light duty commercial applications with running hours of up to 1500 hour per year. Heavy duty Mega-Guard DCG's can be selected for heavy duty commercial applications with unlimited hours of use.

Mega-Guard DCG's are built-up with modern diesel engines with low fuel consumption. The light duty commercial and light weight DCG's have a 4 or 6 cylinder engine with common rail injection system and a 12VDC starting and alternator system. The speed is variable depending on load and it has a maximum of 3800RPM.

The heavy duty commercial diesel engines are built up with a 6 cylinder 10l or 12l engine and a 24VDC starting and alternator system. The maximum RPM is 1800 with variable speed and the DC bus Generator is designed for continuous running.

## System lay-out and operation

Mega-Guard DCG is built-up with the following components:

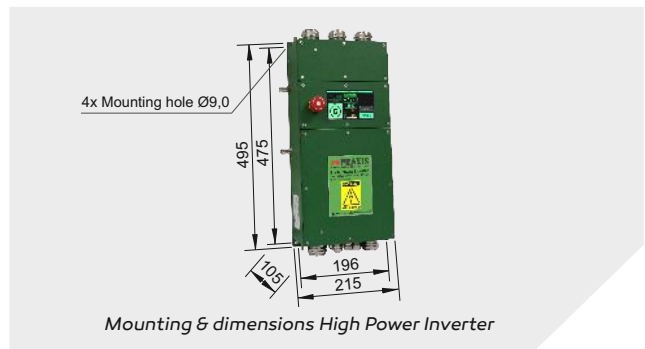
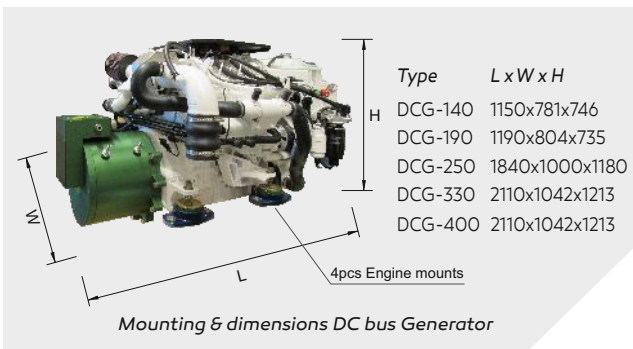
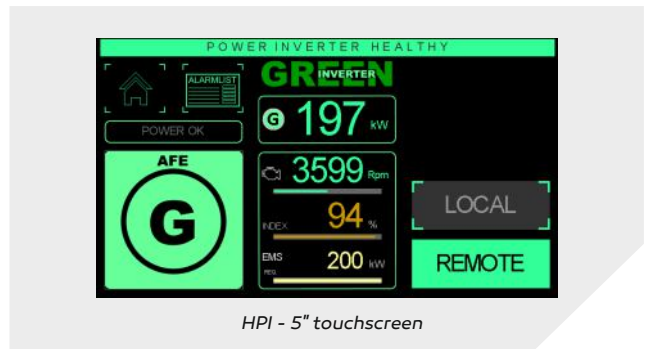
- ▶ diesel engine
- ▶ permanent magnet generator
- ▶ High Power Inverter (HPI) with DC bus connection

The diesel engine is controlled and monitored by Mega-Guard HPI as well. The HPI is equipped with a 5" touchscreen for local operation and monitoring of the Mega-Guard DCG. On the touchscreen the following parameters are displayed:

- ▶ local or remote control
- ▶ diesel engine running or stopped
- ▶ delivered power in kW
- ▶ RPM
- ▶ loading percentage
- ▶ number of running hours

In addition , the HPI contains an Emergency Stop pushbutton in order to force diesel engine stop and to disconnect the HPI from DC bus.

Mega-Guard DCG's have two independent cooling systems. The diesel engine is seawater cooled and includes a seawater pump. The HPI is connected to an independent cooling system based upon water/glycol.



## DC bus Generator specification

Type	Power Rated	Yearly hours maximum	Yearly hours max. @ rated power	Max. power recommended	RPM Rated	DC bus voltage	Weight	Noise @7m	Casing	Emission
DCG-140	140kW	1000h	100h	105kW	3800	384-768VDC	370kg	70dB	option	IMO NOx Tier 2 EU RCD
DCG-190	190kW	1500h	300h	150kW	3800	384-768VDC	425kg	70dB	option	IMO NOx Tier 2 EU RCD
DCG-250	250kW	unlimited	unlimited	250kW	1800	768-960VDC	1370kg	tbd	option	IMO NOx (EIAPP)
DCG-330	330kW	unlimited	unlimited	330kW	1800	768-960VDC	1685kg	tbd	option	IMO NOx (EIAPP)
DCG-400	400kW	3000h	900h	360kW	1800	768-960VDC	1705kg	tbd	option	IMO NOx (EIAPP)



Vessel Management System



Power Management System



Fire Alarm System



CCTV Video Distribution



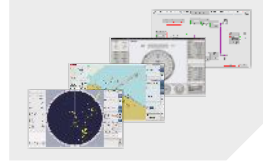
Ship Performance Monitor



Fleet Management System



Integrated Navigation System



Heading Control System



Propulsion Control System



Dynamic Positioning System



BNWAS Watch Alarm System



Navigation Light Control



Wiper Control System



Energy Management System



Electric Propulsion Motor



Electric Steerable POD



High Power Inverter



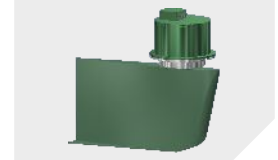
DC bus Generator



Electric Energy Storage



Electric Fin Stabilizer



*Ship automation,  
navigation and  
electric propulsion*