

## PDC-8220VP-30

### 14 kW Diesel DC Generator

**The Most Efficient Technology for Auxiliary Power for Sail or Motor Vessels**

**The Most Efficient DC Generator for Hybrid Electric Propulsion**

#### **The DC Electric Advantage**

Engineered for cruising yachts and commercial vessels with medium electrical loads. Properly configured the PDC-8220VP-30 can outperform a 30 kW AC generator.

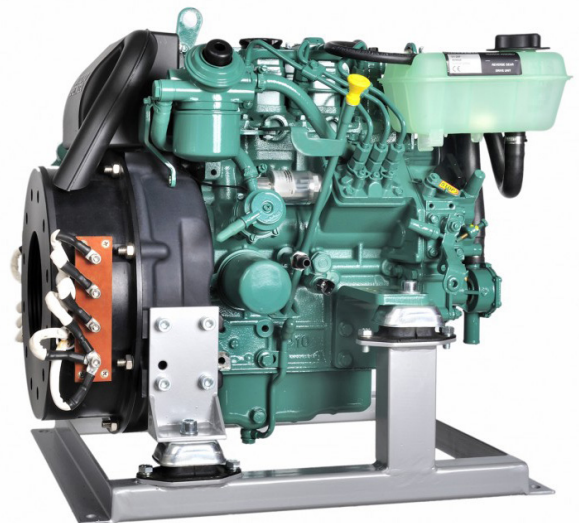
- Charges Batteries Faster
- Smaller in Size
- Lighter in Weight
- Greater Reliability
- Less Maintenance
- More Fuel Efficient

Any of our smaller DC marine generators (PDC-8080VP-13 and VP-20) can be used for Hybrid Propulsion, but we recommend this model as the smallest choice. In selecting a generator for a hybrid vessel you should make sure there is ample power for extended electric motoring in foul weather.

#### **Hybrid Electric Propulsion**

The concept is to place one or two DC generators in the most optimum location within the vessel to provide power for the electric propulsion motors and DC to AC inverters and to charge batteries, all at the same time. The system can run one or more generators and combine the electrical output. The electric motors can be used for the main propulsion in sailing and unmanned undersea vehicles (UUV) or for bow thrusters in motoring craft.

Having one central battery bank powering the electric propulsion saves the sailor the inconvenience of having to warm up a diesel to motor out of his slip, off his mooring, or out to the breakwater. Propulsion under motor is silent and odor free.



### Auxiliary Power

Using a DC generator, battery bank, and an inverter creates an on-board power system that can have both DC and AC power 24/7, yet the generator runs only a few hours a day or week. This is the most efficient and convenient source of marine power.

- Up to 110 amps of 12 Vdc charging for house-engine starting batteries.
- Up to 14 kW at 2800 RPM for battery charging, inverter power, and electric propulsion.
- Charges batteries and powers the inverter at the same time.
- Charges the batteries and operates the propulsion motor at the same time.

### Dual Voltage Systems

Having dual systems and separating the 12 Volt (or 24) house electronics (navigation, communication, lights, and stereo) from the battery bank used for the inverter and heavy DC loads (anchor, refrigeration, bow thrusters) offers many advantages. There is less electrical interference between the DC appliances that are producing the electrical noise and the appliances that are sensitive to it. Having the heavier DC loads operate at higher voltages improves reliability, safety, efficiency, and reduces the weight of copper onboard.

### 8000 Series Alternator

The Polar Power 8000 alternator series are the most reliable DC alternators on the market. There are no internal parts to wear out: no brushes, bearings, slip rings, exciters, rotating electrical windings, internal diodes, or any parts that make contact against spinning surfaces. These alternators are designed for lifetime service in marine environments. The primary applications for the

Polar Power alternators have been in heavy duty Military and Telecommunications use.

### Volvo Penta Engines

The PDC-8220VP-30 Generator incorporates the Volvo Penta D1 series engine that is designed for highest on-board comfort (low noise and vibration). This 3 cylinder engine is significantly smoother than conventional single or 2 cylinder marine generators. The base engine has been developed for heavy duty industrial applications and marinized for the highest marine demands. This guarantees a reliable engine with a long service life.

Volvo Penta D1 series engines are fitted with freshwater cooling as standard. This reduces internal corrosion and enables the engine to maintain a consistent and optimal working temperature under all conditions.

The Volvo Penta D1 engines incorporate a new 115 Amp marine alternator with an electronic sensor. This makes it possible to quickly charge larger banks of 12 Vdc batteries. 24 Vdc Starters and Alternators are available as an option.

### Accessories

#### Electric Fuel Pump

The standard mechanical fuel pump that is supplied with the Volvo Penta engine is very reliable, but an electric fuel pump is even more reliable and facilitates a rapid start.

#### Oil Refining Pack Filter

This bypass filter processes a partial flow of oil to remove particles at the sub-micron level. This filter is also effective in removing moisture that the oil absorbs from the combustion process and marine air. Using synthetic oil and our refining pack filter you can expect to double the time between oil changes.

### Fuel Refining Pack

The same filter that is used for refining the oil can be used for refining the fuel. This filter is used in conjunction with the present fuel filter supplied by the Volvo Penta Engine. This filter processes the fuel before it reaches the filter on the engine. This filter uses 185 grams of paper, which is typically more than most diesel filters. An electric fuel pump is required for this filter.

### Fluid Cooled Alternator

This option allows the alternator to run more efficiently when installed inside compartments with poor air circulation. We recommend air cooling over fluid cooling because it makes for a simpler system. The alternator is cooled with a 70/30 glycol fluid and a heat exchanger uses salt water for cooling.

### Filter Capacitor

The DC generator produces clean DC power with RMS ripple under 200 millivolts as measured on the battery (based on voltage and current). Electric motors and inverters can place large voltage spikes on the electrical bus. To help absorb these spikes, a capacitor filter is recommended. More than one filter capacitor assembly may be required. This is dependent on the vessel's installation and the type of motors and inverters.

### Oil cooler

This option is also used for generators installed in poorly ventilated compartments and provides additional cooling to the engine through oil.

### 24 Vdc Generator electrical system

This option upgrades the starter and glow plug to 24 Vdc. The standard Volvo Penta engines are supplied with 12Vdc electrical systems.

### 24 Vdc Starting Battery Alternator.

Standard Volvo Penta alternator voltage is 12 Vdc. In special applications it may be desirable to upgrade the engine alternator to 24 Vdc for charging the starter battery. In most applications the starter battery charging is accomplished through a DC to DC power supply or in military 24 / 28 Vdc applications the starting battery and the load battery are combined in function.

### Ethernet Module

The standard communications connection is the RS232 or CAN bus. This option allows you to connect the generator to a hub or switch, facilitating remote communications for customer support. There is a built in email server for alarms.

## Technical Specifications

### Lubrication System

- Spin-on full-flow oil filter
- Separate oil scavenger pipe
- Closed circuit crankcase ventilation

### Fuel System

- Flange mounted, cam driven in-line injection pump
- Feed pump with hand primer
- Spin-on type fine fuel filter

### Exhaust System

- Freshwater cooled exhaust manifold and sea water cooled exhaust elbow

### Cooling System

- Freshwater cooling system governed by thermostat
- Tubular heat exchanger with integral expansion tank
- Coolant system prepared for hot water outlet fittings
- Easily accessible sea water pump and impeller



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### Electrical System

- Corrosion protected electrical system
- 14V/115A marine alternator
- Charging regulator with electronic sensor for voltage drop compensation
- Glow plugs for excellent cold starting
- Electric starter motor
- Electrical stop function
- Extension cable harness with plug-in connection available in various lengths

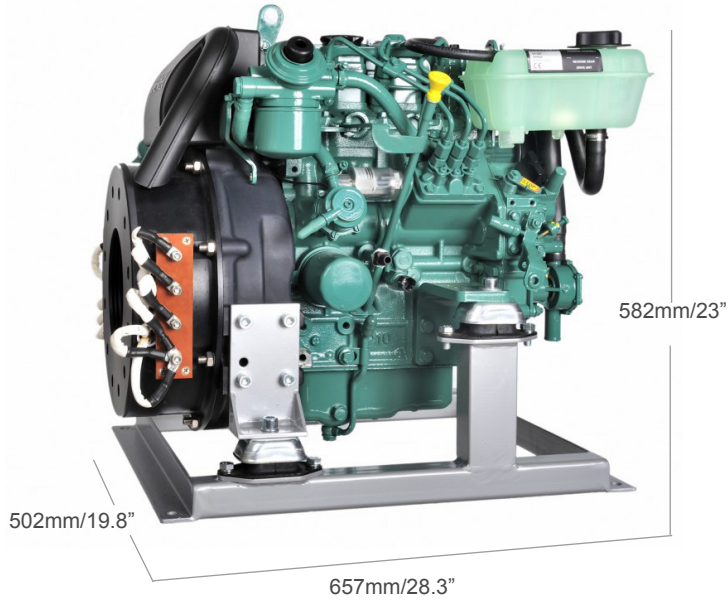
### Engine Block and Head

- Cylinder block and cylinder head manufactured from high grade cast iron.
- Crankcase features a rigid tunnel block design.
- Chrome molybdenum forged crankshaft dynamically balanced with integral counterweights.
- Pistons are cast from high silicon aluminum and are heat treated and fitted with two cast iron chromium faced compression rings and a single oil ring.

### Technical Specification

<b>PDC 8220VP-30</b>	
<b>Ratings kW (continuous)</b>	14kw
<b>Output DC Voltage</b>	48 - 144V
<b>Engine RPM</b>	2900
<b>Volvo Penta Engine</b>	D1-30
<b>Cylinders</b>	3
<b>Cylinder Volume</b>	1.13 Liters
<b>Weight</b>	153kg/337lbs
<b>Oil Capacity</b>	4.4 Liters
<b>Operating Temperature</b>	-20°C to 72°C
<b>Fuel Consumption</b>	290g/kWhr (calculated)
<b>Emmissions Certification</b>	Tier 4
<b>Generator Dimensions</b>	Length: 657mm/26" Width: 502mm/19.8" Height: 582mm/23"
<b>Soft Enclosure Dimensions</b>	Length: 908 mm / 35.75" Width: 559 mm / 22" Height: 572 mm / 22.5"

## Dimensions



**Soft Enclosure**



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### Support

At Polar Power Inc., we understand that there is always the possibility that at some point a part may fail. So we have provided an RS232 port on the generator's controller that can connect to your PC computer and an Ethernet option for your network. So no matter where you are, if you have access to the Internet, we have the ability to communicate remotely with the generator to help diagnose any problems.

### Worldwide Service

Engine spare parts and service are supported by Volvo Penta and Polar Power Inc. dealers.

### Limited Warranty

Polar Power Inc. (hereinafter "Polar"), hereby warrants goods manufactured and sold by it to be free from defects in material and workmanship for 12 months from the date of installation. The warranty is limited to repair or replacement at designated Dealers by Polar of such parts as they appear to Polar, upon inspection, to be defective in material or workmanship. This warranty is extended to the first owner only, and no warranty is made or authorized to be made assignable on resale by the first end owner.

#### North American Headquarters

Polar Power Inc  
249 E. Gardena Blvd  
Carson, CA 90248 USA  
Contact: [info@polarpowerinc.com](mailto:info@polarpowerinc.com)