

DC Common Questions & Answers

Model PPS16-12MD and Model PPS16-24MD



WhisperGen™ is a combined heat and power system. A customer's needs may be best met by a stand-alone generator or heating system and factors such as duration and time of use, climate and hot water needs will all have an impact on the final solution.

Dependent on a customer's hot water or space heating needs, and the ratio of their hot water/heat to electricity requirements, a **WhisperGen™** onboard heat and power system may however be the optimum solution, particularly when the added benefits of quietness, low vibration, compact size, low emissions and self management are taken into account.

Assessing the suitability of the WhisperGen™ onboard heat and power system

1. What is the electrical power required over a 24 hour period?

The marine market predominantly uses AC generators so some customers tend to be sceptical about the ability of the **WhisperGen™** onboard heat and power system to meet their power requirements. While AC generators can be as small as 3kW the majority of installations are in the 6 - 10kW range. At 0.8kW the **WhisperGen™** onboard heat and power system looks underpowered, but it isn't necessarily so.

AC generators are sized to meet the maximum electrical demand on the boat at any one time. If the peak load will be 6kW then they will have at least a 6kW generator or higher. This peak demand may only be required for short periods of time such as when the microwave is on at the same time as the jug or the stove. For the balance of the time the load will be significantly lower at maybe 100 - 200W for refrigeration, lighting and navigation equipment.

By comparison, with a **WhisperGen™** onboard heat and power system the "power source" is effectively the battery bank and the maximum supply is governed by the size of the inverter. As a consequence, the **WhisperGen™** onboard heat and power system is capable of meeting the peak consumption loads of much larger units. The question is not what the peak load will be but what energy will be consumed in 24 hours. At 800W electrical energy per hour, the unit can effectively provide up to 19kWh/day. Generally, this is enough for most boats up to 18m (60ft).

2. What is the peak demand?

With a 19kWh/day capacity the customer has flexibility in how they utilise this and the inverter (or a series of inverters) needs to be sized to match the expected short term load. Most boats in Australia, NZ and the USA tend to install a 3-4kW inverter. However, the tendency in Europe is to go to higher capacity and avoid the need to carry gas (LPG/propane) on board.

Using multiple inverters is also more efficient because during periods of low load only the first inverter is live and the rest will be in standby mode.

There is clearly a limit to how long 6 - 9kW loads can be supplied but, unless there is air conditioning involved, that sort of continuous load is unusual.

The **WhisperGen™** onboard heat and power system has the added advantage in that, should an owner install a system with the expectation that their maximum consumption will be 3kW and later finds that they need 6kW then they do not need to replace the whole system as they would with an AC generator. Instead they can purchase an additional 3kW inverter to install in parallel with the original unit, thereby increasing peak load capacity to 6kW.

3. *What is the annual usage?*

This is relevant for reasons mainly related to product life expectancy and operating efficiencies. In terms of life expectancy, the **WhisperGen™** onboard heat and power system comes with a warranty of 2 years and/or 2,000 hours, whichever comes first. Our experience in global distribution is that the annual runtime typically is around 400 - 500 hours per year.

At 5 hours running per day the **WhisperGen™** onboard heat and power system is producing about 27.5kWh (94,000 Btu/h) of heat which is more than enough for most boats in terms of potable hot water or auxiliary space heating. The combined operating efficiency of the **WhisperGen™** onboard heat and power system is over 90% (75% heating and 15% electrical).

Key Benefits

If the **WhisperGen™** onboard heat and power system meets the requirements so far, the next stage is to look at the benefits in more detail.

1. *Weight*

At 90kg (198lb) the unit is extremely light. An 8kW AC generator is typically around 140 - 200kg (308 - 440lb) and, if a sound shield is added, then it can increase to more than 250kg (550lb).

2. *Size*

The unit is very compact at (w x d x h) 450mm x 500mm x 650mm (17³/₄" x 19³/₄" x 25¹/₂") and you can expect a generator in the 8kW range, to be anything from 10 to 30% larger. While 10% might not seem much of a saving, when you consider some of the spaces where these units are installed, every mm is precious. It is worth noting that, as a rule of thumb, the closer the competitor product is to our size and weight, the smaller the difference between price without the other key benefits that the **WhisperGen™** onboard heat and power system offers.

3. *Heat*

We know of no other cogeneration units on the market and so any cost comparison between our model and others needs to be adjusted to include a heater of similar output.

The impact of heat will vary greatly between installations. Some boats in warmer climates will use water heating off the main propulsion engines and others will have gas or electric heating. Yachts are less likely to be able to support heat requirements off the main engines (and less willing because of noise) so an alternative heat source is usually required.

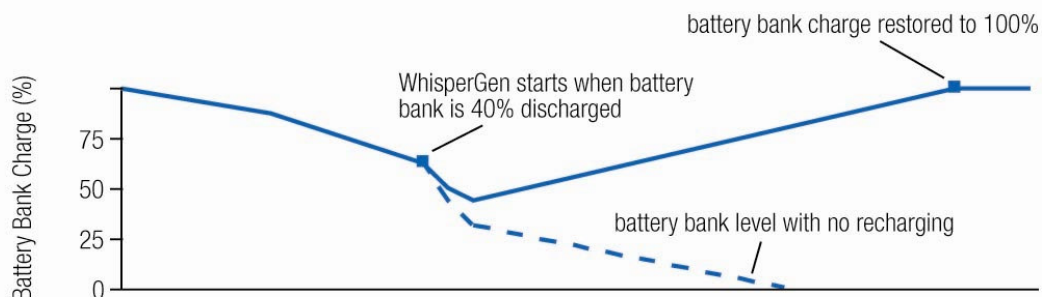
The **WhisperGen™** onboard heat and power system produces its heat in the form of hot water. The outlet temperature is adjustable up to a maximum of 75°C (167°F).

4. Self Management

The **WhisperGen™** onboard heat and power system has the advantage of being entirely self managing. When it is installed and set up, the battery bank size is loaded along with the maximum discharge level the owner selects. While set in auto charge mode the unit will turn itself on and off in response to the battery charge level. The unit has a built in battery management system that uses a three level charge system. It goes through 'bulk', 'absorption' then 'float' charge. Float charge is a trickle charge that ensures the batteries are charged to capacity.

The **WhisperGen™** onboard heat and power system is unobtrusive while running and can reduce its output to less than 50% of its normal operating level when required. Attempting this off main engines or an AC generator is unlikely due to the noise and low efficiency.

Alternatively the unit can be set to manage heat levels and/or a combination of both.



5. Servicing

The unit, once installed correctly, has very few serviceable parts that are likely to require attention. It should be noted, that correct installation is the strongest predictor of future reliability.

Unlike a diesel cycle engine, the **WhisperGen™** onboard heat and power system has no oil filters, air filters or the like. If something goes wrong with the core engine then it will need to be swapped out as it can only be serviced in the factory.

6. Noise

All the other benefits are great selling points but the one area that ultimately swings the final decision, is the quietness of the unit - *we at WhisperGen are not aware of anything that rivals the low operating noise and vibration level that the **WhisperGen™** onboard heat and power system offers.*



7. General

The benefits of the **WhisperGen™** onboard heat and power system are in general available in alternative products on an individual basis and are subject to the installation limitations. As a generalisation, users fall into three categories:

- a. Those that are comfort focused - they have spent US\$400k plus on a boat and the last thing they want to hear is the generator.
- b. The second group is more logistics orientated - limitations in the way the boat is configured and/or their sailing plans limit the options available - blue water yachts typically fall into this category, especially if used for 2 to 3 days at a time.
- c. The third group is those with larger vessels (21m (70ft) + yachts, 15m (50ft) + catamarans and motor boats) where the WhisperGen is used as a secondary source of heat and electricity – the owner may choose to run their **WhisperGen™** onboard heat and power system only during the evenings.

The **WhisperGen™** onboard heat and power system differs from other options in that it is unlikely that any other system can deliver the same results in such a compact and efficient manner. Furthermore we have yet to come across an installation of an AC generator that comes even close to the quietness of a **WhisperGen™** onboard heat and power system.

8. Other potential installations

Where a customer with an AC generator has increased power needs, they generally need to replace their whole generator. Installing a **WhisperGen™** onboard heat and power system in addition may allow the customer to supply their peak load as well as offering the additional **WhisperGen™** onboard heat and power system benefits. It may even be that the overall load requirement will come down if they currently use an electric water heater.

The load on larger boats is such that they tend to operate one or more AC generators while also wanting to minimise the run time and avoid where possible, any night time running. In this situation the **WhisperGen™** onboard heat and power system can often manage the night time load requirements through its output and battery bank.

Even though the 8 hour period may require a base load of 2kW per hour, the **WhisperGen™** onboard heat and power system will be able to sufficiently charge the battery bank to ensure that the charge levels do not drop below the maximum discharge level (assuming the battery bank is sized correctly).

For further information, visit www.whispergen.com