PTO PowerMax
Max efficiency

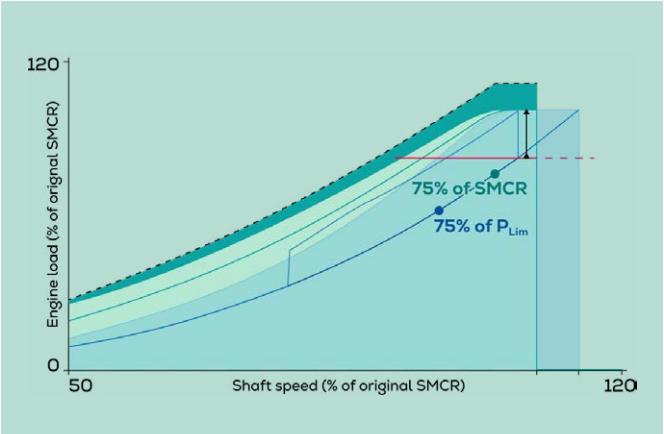
The PTO PowerMax is engineered to optimize the efficiency of large shaft generator systems, enabling vessels to meet and exceed the latest emissions regulations. By dynamically managing the combined propulsion power and PTO (Power Take-Off) power, PTO PowerMax ensures that total engine output remains within safe operational limits – while maximizing available PTO capacity. This innovative approach allows for a more favorable EEDI (Energy Efficiency Design Index) calculation, supporting compliance with tightening IMO standards and reducing environmental impact.

Key benefits

- **Lower EEDI values:** Enables the use of EEDI Calculation PTO Option 2, often resulting in a reduced EEDI for ships equipped with large PTO systems.
- **Regulatory compliance:** Directly affects the EEDI and can support other regulation requirements such as: CII, Fuel EU Maritime, EU ETS and also evolving IMO regulation requirements because of the possibility of larger shaft generator capacity.
- **Operational efficiency:** Ensuring that the PTO option 2 from EEDI regulations can be applied to improve the EEDI. This is especially beneficial for vessels with a high electric power consumption. At the same time, it ensures the installation of a main engine with sufficient power and, hereby, torque capacity for driving the PTO even in conditions less ideal than at sea trial. This will give a high margin for utilisation of the PTO in service.

Enhanced compliance & efficiency for new builds

PTO PowerMax empowers new vessels to achieve EEDI compliance more easily by benefiting from higher PTO output utilization within regulatory constraints. This positions vessels for success in environmentally conscious markets and also improves energy efficiency. By calculating reference power at 75 % of the propulsion power limitation (P_{Lim}) instead of 75 % of SMCR power, ships benefit from a significantly lower EEDI.



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PTO PowerMax

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To illustrate this numerically, here is an example of how to calculate the power used in the EEDI formula for a Kamsarmax bulk carrier with the following configuration:

- 6S60ME-C10.5
- SMCR power: 9000kW
- SMCR speed: 84 rpm
- Propeller Light running margin: 7%
- PTO maximum capacity: 1000 kWm

Calculation applying PTO PowerMax:

$$P_{LIM,\ propulsion} = P_{SMCR} - P_{PTO} = 9{,}000 - 1{,}000 = 8{,}000\ kW$$

Whereby P_{ME} used in the EEDI calculation is

$$P_{ME,\ PowerMax} = 0.75 \times P_{LIM,\ propulsion} = 6{,}000\ kW$$

5% reduction compared to applying PTO option 1:

$$P_{ME,\ opt.\ 1} = 0.75 \times (P_{SMCR} - P_{AE}/0.75) = 6{,}300\ kW$$

Compared to no PTO:

$$P_{ME,\ w/o\ PTO} = 0.75 \times P_{SMCR} = 0.75 \times 9{,}000 = 6{,}750\ kW$$

P_{ME} is inserted into the EEDI formula, and even though V_{ref} also decreases slightly due to the lower P_{ME}, the P_{ME} would decrease more significantly and the EEDI value will be lowered.

$$EEDI \approx \frac{\Sigma\ P_{ME} \times C_f \times SFOC}{Capacity \times V_{ref}}$$

Applicable to

All Everllence B&W ME-C engines with shaft generators.

More information

Contact your local Everllence office for more information about the product and how it can improve your specific engine.

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