

ENERGY EFFICIENCY CONTROLLER EEC

Our passion is to deliver the most cost-effective solution and vessel tailored project management for each installation, ensuring full support to our clients before, during and after commissioning of any system – making DIMAR-TEC your ideal one-stop-solution provider.

At the Optimum. Anytime. Anywhere.

In contrast to most companies, we are neither a sensor manufacturer nor software developer. DIMAR-TEC's core competence has always been to develop best performing stand-alone systems by integrating existing resources – not by just selling its own equipment.

DIMAR-TEC's unique Energy Efficiency Controller EEC - Savings guaranteed !

UNIQUE SALES POINTS

**3-Year System Performance Warranty
-Unmatched within the Industry**

**Training Program for Customer's
Installation Team**

"Remote Sea Trial" process

Proof of Savings and Performance

**Crew's Sense of Responsibility supported
by Reports**

**Most cost-efficient solution at the Highest
Performance Level**

Payback 6 to 15 months

The EEC's unique concept will enable customer to instantly save upon installation. But DIMAR-TEC is taking this to another level – SAVINGS ARE GUARANTEED or your money back.



With DIMAR-TEC's unique "remote sea trial" optimization strategy, each EEC will be fine-tuned to individual vessel specifics - ensuring optimal performance and savings.

Due to their physical characteristics, circulating pumps in cooling water applications and engine room fans provide a considerable saving potential. Small reductions of the pump speed leads to a major reduction in electric power usage. Consequently, it generates energy and cost savings.

All pumps on board a vessel with engine load dependent operation are consuming a large amount of energy unnecessarily, as the layout been made for 100% MCR and a Sea Water Temperature of 32°C.

Neither this cooling nor the air quantity will be demanded during normal operation, as the traditional vessel layout is made for 85% MCR. However, the real operation profiles are usually considerably lower.

The cooling water pumps and engine room fans are sized according to the main engine size.

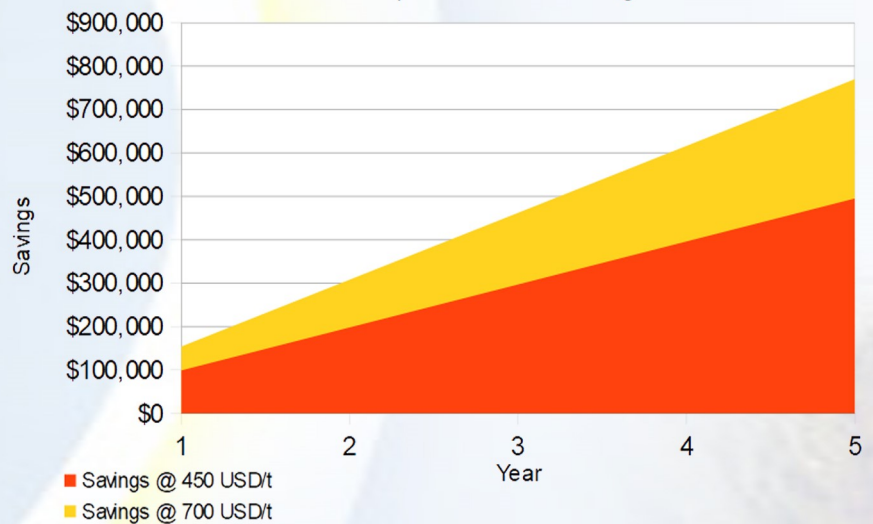
Typical savings for a sample vessel with 18 MW installed main engine are between 100.000 & 150.000 USD/ year, based on a fuel price range from 450-700 USD/ton (assumed costs for HFO and MDO).

This means a fleet of 10 vessels will create additional profit of 1-1.5 Mio USD per year.

Additional Profit Range for a Fleet of 10 vessels with assumed 18 MW main engines

| Year | additional Profit @ 450 USD/t | additional Profit @ 700 USD/t |
|------|-------------------------------|-------------------------------|
| 1 | US \$990,000 | US \$1,540,000 |
| 2 | US \$1,980,000 | US \$3,080,000 |
| 3 | US \$2,970,000 | US \$4,620,000 |
| 4 | US \$3,960,000 | US \$6,160,000 |
| 5 | US \$4,950,000 | US \$7,700,000 |

EEC savings range per vessel
sample for 18 MW main engine



To harvest this potential DIMAR-TEC's EEC system integrates state-of-the-art Frequency Inverter technology with IP54 protection. Our vessel-specific layout is designed to fit into smallest spaces and is perfectly suited for retrofits in any existing engine room.

Alarm & Monitoring System Integration

For easiest crew handling, DIMAR-TEC's EEC system integrates seamlessly into existing vessel control systems where the crew continue to operate as before. At the same time, cooling system temperatures and air supply to the engines are automatically controlled, key values and power consumption are recorded.

EEC performance short description:

- fully automated control of cooling water pumps and engine room ventilation
- system developed for cost efficient retrofit
- seamless integration in existing Alarm- & Monitoring Systems
- automated data recording ensures continuous proof of performance & savings
- "Remote Sea Trial" procedure ensures optimum setup
- uses proven industrial technology since decades

Savings Potential

- Guaranteed ongoing savings
- Payback in 6-15 months (depending on fuel & vessel operational profile)
- 2~8 % savings of total fuel consumption
- performance guarantee on SAVINGS RESULTS

Operations

- fully automated pump & fan control
- automated operational data export
- automated performance reports available

Value-for-money point of view:
==> You decide.

Future technical development point of view:

- modular design allows later system extensions
 E.g. for LT pumps or DIMAR-TEC's Fuel Efficiency Controller FEC

Installation / Commissioning / Certification

- designed according to ISO 9001 requirements
- simplest integration in vessel IT
- 3-day training available for installation & commissioning by customer manpower – external service costs can be reduced to Zero
- quality ensured with detailed vessel-specific process description by checklists and report templates

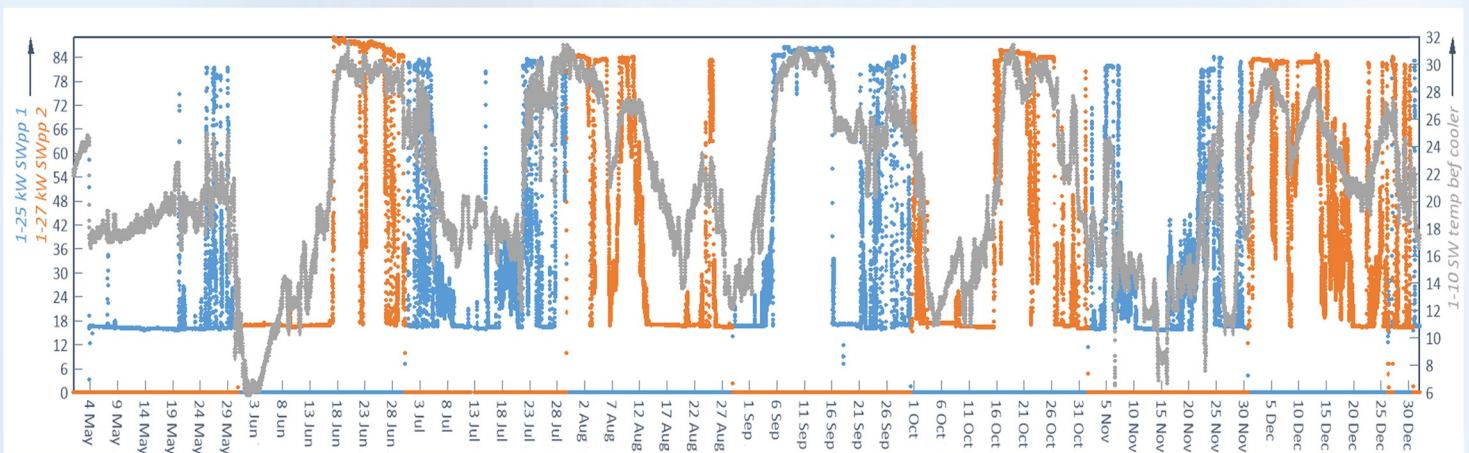
From Big Data to KPI

EEC Data does not only show the EEC performance, but provide detailed view of the Cooling system performance. These information is also used for the fine-tuning by DIMAR-TEC during the 6 months "Remote Sea Trial" procedure.

In the office, a simple one-page KPI report reflecting the performance and savings may be monitored, while the professional on-board reporting software may be considered to promote crew's sense of responsibility and increase productivity. Providing regular report will motivate the crew to optimize processes and savings on board.

Operational Data Samples

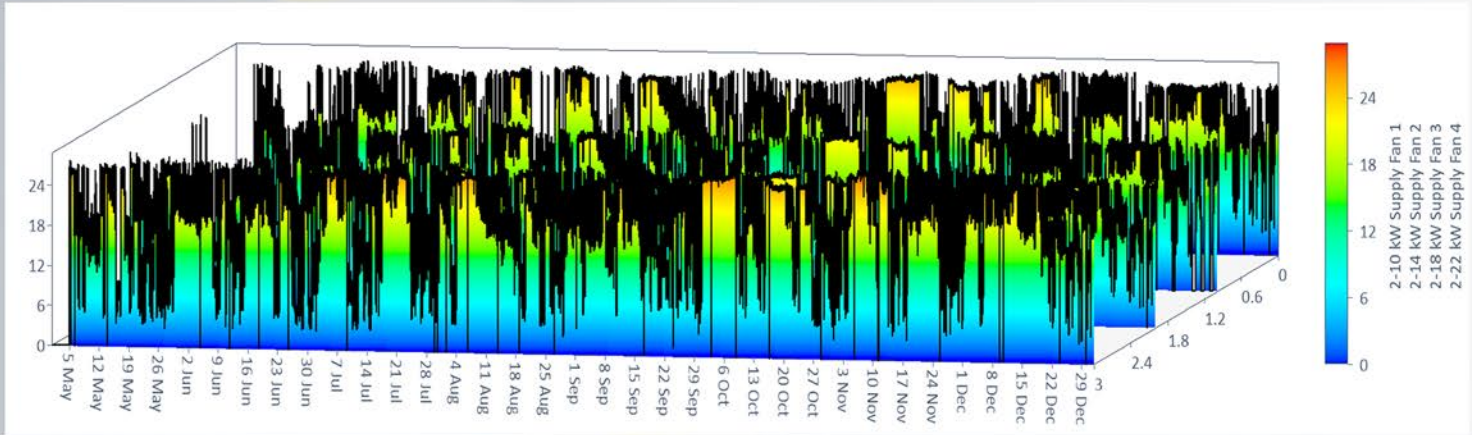
8 months saving sample of 89 kW Sea Water Pumps with Sea Water temperature curve:



Above graph demonstrates the change of average Sea Water Cooling Pump load due to Sea Water Temperature and the huge saving potential; the vessel been employed on "round the world voyages" over the 10 months period it is seen, that the high electric load been requested only when Sea Water temperatures reaching 30-32°C.

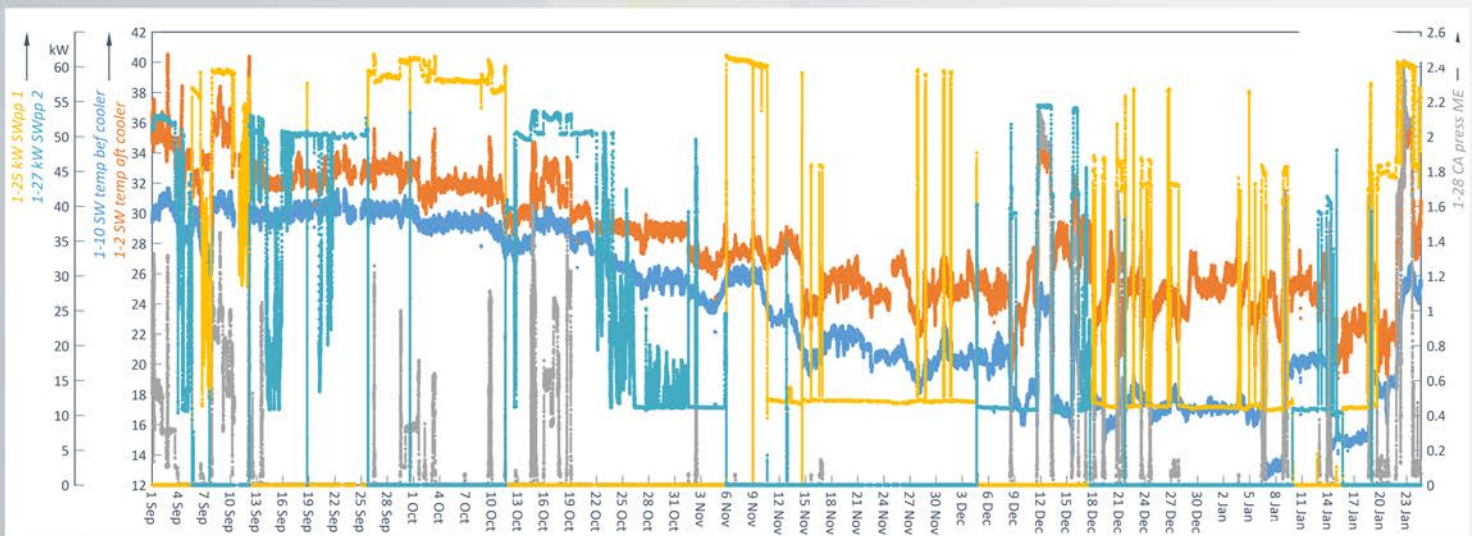


8 months operation of 26 kW Engine Room fans



The graph shows the variation in speed depending on air demand by the main engine.

4 months operation of 65 kW Sea Water Pumps



This data sample demonstrate how savings increase with decreasing Sea Water Temperature. The blue curve "1-10 SW temp bef cooler" shows in early September up to 32°C, falling to 12-20°C in January. The load level of the Sea Water pump in operation falls accordingly.

The grey curve "1-28 CA press ME" shows the main engine operation based on charge air pressure and the interaction of the cooling system.

Please contact your local agent or info@DIMAR-TEC.com to improve your fleet performance by immediate savings.