



**Integrel**  
solutions

**INTELLIGENT GENERATION OF ELECTRICITY**

A guide to how the  
Integrel System works

# ABOUT US

Founded in 2003, Triskel Marine (trading as Integrel Solutions) provides an extensive range of technologies for electrical power sensing and data management. We deliver significant energy savings by precisely managing multiple energy sources and consumers.

With offices in Cornwall and Australia, Integrel Solutions is perfectly placed to understand and work within the harsh marine environment. We work closely with our clients to develop tailored solutions to their energy and data management needs. Underlying all of our technologies is a profound knowledge of the sea and advanced data management and communications. Using robust systems that can operate in difficult environments we collect data from multiple sources, bring it all to one place and then process it to provide control and information for our customers.

Over the past 10 years, we have used our knowledge to develop a range of hardware and software solutions for the toughest of environments. As an example, we provide the processing and power management for marine environmental monitoring buoys, where systems can be deployed at sea for months at a time with no possibility of external support. Our most recent advances have been in precision energy management for marine hybrid power and propulsion systems. Our whole vessel approach and accurate power sensing and load management have demonstrated fuel and energy savings of up to 25%.



## AWARDS

 **DAME** OVERALL WINNER

2018

### DAME AWARD

After receiving first prize in the Machinery, Propulsion, Mechanical and Electrical Systems and Fittings category Integrel went on to be named Overall Winner of the DAME Design Award 2018, beating 63 products nominated from 127 entries.



2019

### PITTMAN INNOVATION AWARD

SAIL Magazines Pittman Innovation Award named after their long-time Technical Editor Freeman K. Pittman, who passed away in 1996, these awards are presented annually to outstanding new products in the sailing industry.



2019

### IBEX INNOVATION AWARD

The IBEX Innovation Awards is one of the marine industry's most prestigious honors recognising manufacturers and suppliers who bring new, innovative products to the market.



**IT'S BASICALLY  
A GENERATOR  
ON STEROIDS**

## THE BASICS

In layman's terms, we call the Integrel Solutions system an "alternator on steroids" or an "engine mounted generator". It uses the spare power made by the engine to charge the house battery bank. What makes Integrel different is the fact that it operates very efficiently at 48 volts and is controlled by a sophisticated power management system and a network of redundant safety checks and balances. For those reasons, it can safely and more efficiently produce up to 10x more power, and therefore a faster charge, compared to a conventional alternator.

# HOW DOES IT WORK?

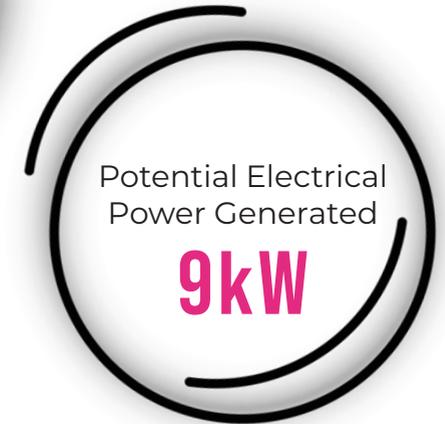
INTEGREL GENERATES POWER THROUGH NORMAL ENGINE USE AND STORES THIS POWER IN BATTERIES FOR LATER USE.

The Integrel generator is fitted to your yacht's diesel engine and then when you run your engine it generates electricity. Your existing inboard engine has a significant amount of spare capacity, Integrel harnesses this spare capacity to generate electrical energy to be stored for later use. All while keeping your engine running at optimum performance.

The Integrel Intelligent controller then converts this raw electrical energy into usable 48-volt energy. This energy production is closely monitored by sensors on each battery bank, to keep everything within a safe limit. The stored electrical energy is then used to power heavy-duty 48volt items like Bow Thrusters or Winches, as well as 12-volt Domestic items like your fridge, instruments and house lights.

It also powers your 110volt or 240 volt AC devices like Air Conditioning, washer, freezer, ice machine, espresso machine, induction cooker, hairdryer and more!

So say goodbye to your noisy, maintenance intensive, smelly generator and say hello to 5-star yachting wherever you are with Integrel.



# BENEFITS

ENJOY SOME OF THE FINER HALLMARKS OF SAILING.

Enjoy all of these luxuries wherever you are in the world without the worry of burning fuel to run a generator.



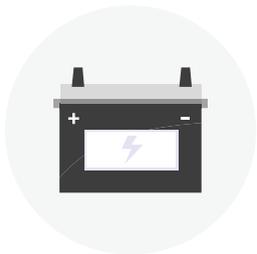
## AT ANCHOR

Moving from one anchorage to the next, Integrel works in the background as you island-hop to provide more than enough energy to fully enjoy a cool generator-free night.



## ON A OFFSHORE PASSAGE

With favourable sailing conditions, Integrel's efficiency allows you to only run your engines briefly at intervals on an offshore passage to charge your battery bank, allowing you to maintain the usual systems needed.



## AS A GENERATOR

Whilst at anchor you need to run your AC overnight to keep your guests happy, with Integrel fixed to your engine you can run it at idle to generate 3kW which will keep your battery bank topped up. You won't have to worry about a depleted battery bank or a noisy generator running in the night.



AIR CON

ELECTRICALS

COFFEE MACHINE

FRIDGE FREEZER

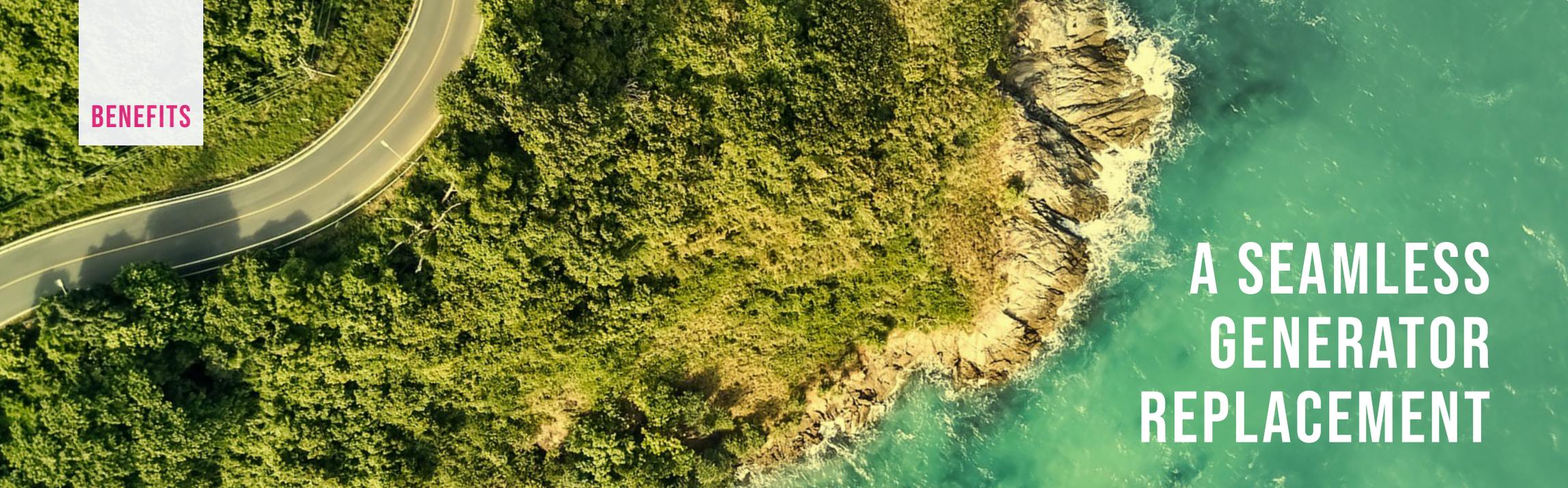
INDUCTION COOKER

MICROWAVE

WATER MAKER

WASHING MACHING

SHOWER



## BENEFITS

# A SEAMLESS GENERATOR REPLACEMENT

### WEIGHT

With Integrel you no longer need a generator to provide power, this instantly sheds a large amount of weight from your craft, especially if you are a performance-oriented sailboat. It also has the advantage of opening up the physical location of the generator compartment for other equipment or more storage space.

### FUNCTIONALITY

A conventional generator requires a hands-on approach running the generator to recharge your battery bank is inevitable and will usually occur at 30% charge. When running it strictly to charge the battery bank it will not be under full load and running inefficiently. This means that battery recharge times can take 2 or 3 hours. Compare this to Integrel which has a much more powerful charge cycle; that can be charged while motoring and because it's a lot more efficient it charges your battery a lot quicker. If the battery charge level gets too low, Integrel will sound an audible warning prompting you to run an engine for recharge purposes, leaving you to spend less time worrying about house battery charge.



### MAINTENANCE

A conventional generator requires regular oil changes, impeller replacement, belt-tightening, etc. All the requirements of any marine diesel engine. This means that you must carry parts and spares for a third marine diesel. Integrel is very low maintenance and will only require the infrequent replacement of the serpentine belt.

### NOISE & SMELL

Another downside to sailing with a generator is the noise and smell it creates when running. Integrel solves this problem as it runs with your engine to create power, eliminating the need for a generator and allowing you to enjoy a gen-hum-free night.

# REDUCED CARBON FOOTPRINT

AS A REPLACEMENT FOR A GENERATOR, INTEGREL DECREASES YOUR CARBON FOOTPRINT.

It's a fact; using a generator on your boat increases your vessel's carbon footprint. An average 9kW Genset at 1/2 load can put out up to 4kg CO<sub>2</sub> per hour, in comparison a New York to London Boeing 747 flight uses 92kg CO<sub>2</sub> per hour. This may not seem like an issue in the grand scheme of things but when you consider all of the craft on the water that still uses a generator, it amounts to enough that warrants a change.

Our Integrel system is a great combatant against generator emissions. By working with your propulsion engine and eliminating the need for a generator to create power, Integrel effectively decreases your carbon emissions.

**“OUR SYSTEM DOESN'T CLAIM TO MAKE YOUR BOAT  
A GREEN ENERGY MACHINE BUT IT CAN REDUCE  
YOUR CARBON FOOTPRINT BY REPLACING YOUR  
ON-BOARD GENERATOR.”**



## UNLIMITED IN APPLICATION

Since its birth, Integrel has been installed on over 20 vessels, including Yachts, Catamarans and, Trimarans from boat brands like Jeanneau, Garcia & Lagoon.



"Every time we run the engine we produce electrical power that gets stored in the battery bank and when combined with our solar panels we don't worry too much about power. Our old generator also weighed 270kg. For a boat like ours, a sailing trimaran, the Integrel system just makes sense. Weight reduction means a faster boat."

*Bob P, Skipper of a NEEL 51*

### NEWLY COMMISSIONED

The couple who sail this vessel needed a power solution to stay on the water as long as possible, after selling their home and commissioning an exploration yacht they sought an alternative to a generator. They now have our 9kW Integrel alternator generating power for their 19.2kWh bank of Li-Ion batteries, allowing them to stay out of marinas for longer.

### OLDER YACHT NEEDING BETTER POWER

This vessel was constructed in 2003 and had its fair share of generator issues. This prompted its skipper to seek alternate means of power which lead him to our Integrel system. He now has more than enough power with 14kWh of Li-Ion batteries and our 9kW Integrel alternator.

### SAILING TRIMARAN

The family living aboard this high-performance Trimaran needed a power solution that could provide for the 5 of them and still allow them to use all of the modern conveniences. With Integrel installed the skipper only has to run his engine once every 5/6 days to power up to a 30kWh battery bank.

# CONTACT US FOR MORE INFORMATION

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