

Innovation at Power Electrics

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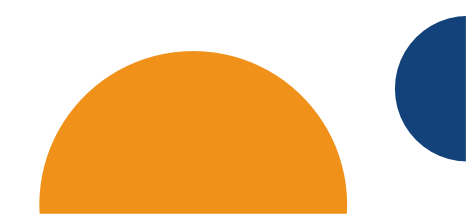


The challenge we all face

How do we cut costs, reduce emissions
while keeping power reliable?

Our answer brings it all into one box

The **SolarBox**



Why did we build it?

Four Key Reasons

1. Success of our containerised generators
2. Growing uptake of our BES solutions
3. Our Journey to **Green** and our customers drive towards net zero
4. Repeated Questions from our customers?

“Have you got an all-in-one unit with a generator and a BES?”

“Can you provide solar with that?”

What is the SolarBox?

Three energy technologies in one integrated package

30 kVA

GENERATOR

Power and battery charging

45 kVA/90 kWh

BES

**Energy storage and load
support**

2.5 kW

SOLAR

**Renewable energy
contribution**

All in a secure, lockable container with 420 litre fuel tank

Provides you with 53 hours at full load

External tanks can be added for extended runtimes

External Solar can be added to the system

How does it work?

GENERATOR

Supplies higher loads and recharges the BES = For power and BES charging

BES

Supplies low loads and supports peaks = Energy storage and Load support

SOLAR

Adds energy when available = Renewable energy contribution.

What Problems are we solving?

Site logistics and installation

- Compact footprint = Fewer separate items on site
- Fewer external connections = Simpler installation and disconnection
- One transport movement and one lift = Simpler and safer deployment
- Secure, lockable container = Helps protect against theft and damage
- Less external cabling = Reduced trip hazards on site

What Problems are we solving?

Power Efficiency and Performance

- Reduced generator light loading = Fewer generator issues
- Reduced fuel consumption = Lower running costs
- Noise = Fewer complaints from staff and the public
- Oversizing generators = Generator and BES can work together to cover peak demand
- Integrated controls = Automatically manages the generator, BES and solar to match site demand. It's a set and forget system
- Solar contribution = Free renewable energy. Reduced fuel and emissions. Supporting your net zero targets.

Remote Monitoring

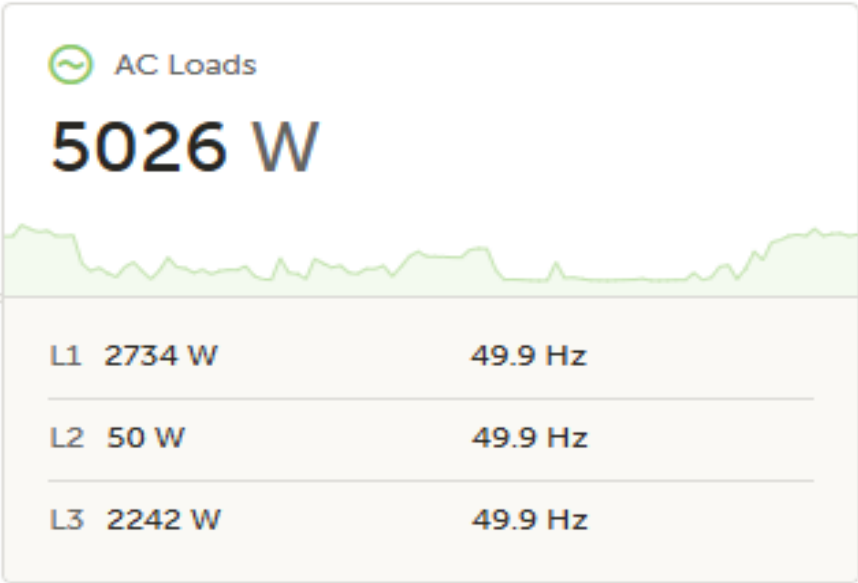
Understanding the Power Flow



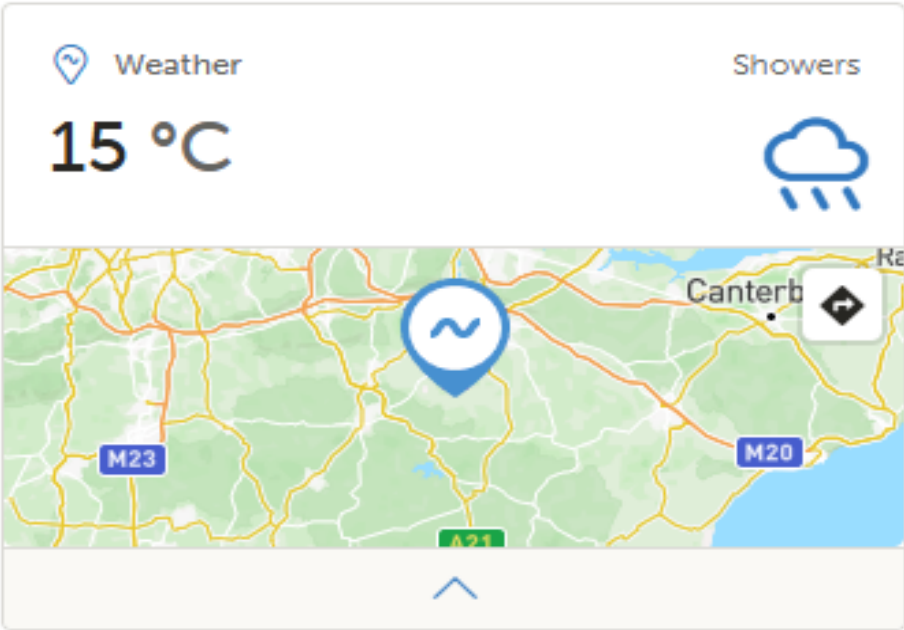
Generator Status



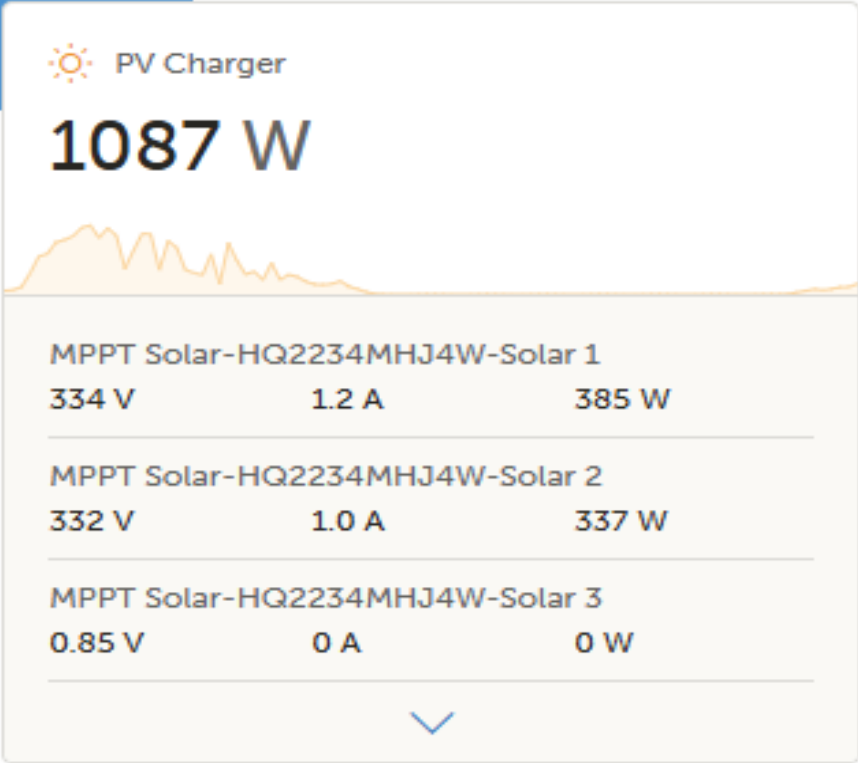
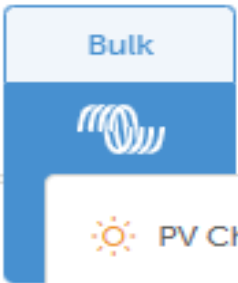
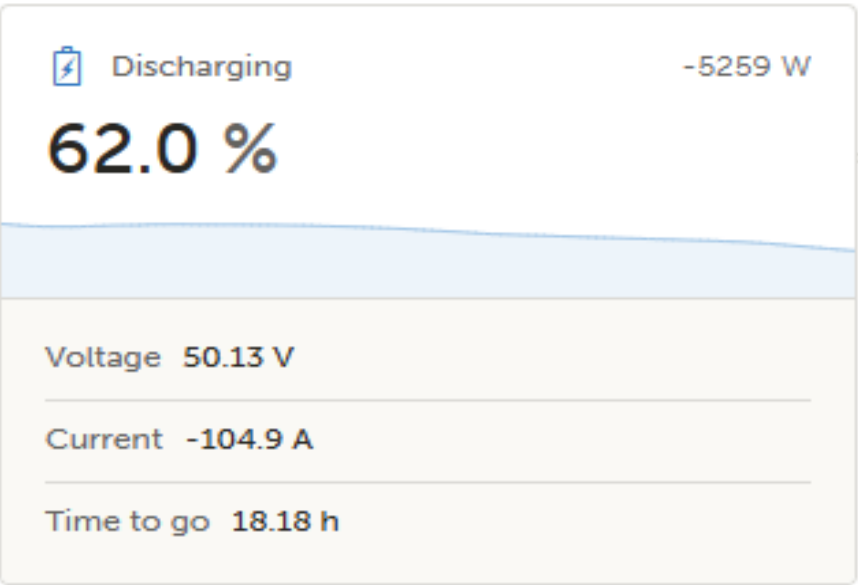
Current Load



Location + Weather



What is it doing



BES Charge level + Time to go

Solar contribution

Let the BES do the Work

Situation 1

- BES supplies the load = **Zero emissions**
- Generator off, Power still on = **Zero fuel consumption, reduced running costs**
- Solar contribution = **Free renewable energy from the Sun**
- Integrated controls, Generator is ready to run = **A reliable and robust system**

We need more power

Situation 2

- Demand increases = Generator Starts = **No interaction from you**
- Generator supplies the load and charges the BES = **BES and generator working together**
- Running the generator at a healthier load = **Getting the most out of your fuel**
- BES charge level rises = **Energy stored for the next low load period**

The Generator needs some help

Situation 3

- 30 kVA generator maximum capacity of 24 kW. For the demo we have set that at around 20kw
- Now let's Increase load above the maximum input to 20 kW, above what the generator can supply
- The BES provides the extra power. Peak shaving / Power Assisting the generator

Why is this important for you?

- We can use a smaller generator and BES to cover short peaks

And then when demand falls.....

- BES Recharges = Recovery and readiness for the next peak or low load period

We have a problem

Situation 4

- Simulate loss of the generator
- The BES continues supplying the load. **No loss of power.**
- The BES support provides time for us to respond **before power is lost**
- Solar continues to contribute to the system. **Increasing time for us to react**
- In this situation we can also service the generator **without you losing Power**
- All three technologies working together provide a **more reliable and robust system**

Demonstration Overview

One integrated system responding to changing demand

Situation 1: Let the BES do the work

The BES supplies low loads, keeping the generator off.

Situation 2: We need more Power

The generator starts automatically to meet higher demand.

Situation 3: The Generator needs some help - Peak shaving / Power Assist

The BES supplies extra power during peaks.

Situation 4: We have a problem

The BES keeps the power on and provides time for us to respond before power is lost.

The Bonus - Here comes the Sun – Solar at every stage

Solar continues to contribute while the Sun is shining.

Where could you use it?

Best suited to low, variable or intermittent loads

SITE COMPOUNDS AND WELFARE

Higher daytime demand, with quiet, emission free BES operation during lower load periods

PUMPS ON FLOAT CONTROL

Control systems, Ultrasonics, Vac Pumps, all running without an engine idling while the pump waits to start

INTERMITTENT AND LOW LOAD EQUIPMENT

Hoists, lighting, CCTV, Wi-Fi and Security, any equipment with brief peaks and long periods of low load

What's Next? More Power. Smarter Control

The Solar Box V2 & V3

V2 - A 60kva Stage V in the same secure 10ft container.

V3 - A 20ft container with increased battery storage and more solar

Smart Distribution boards

Control the load when you want to, reducing energy demands on site

Enhanced Telemetry

Greater visibility of your sites Power usage and system performance

Your Challenges. Our Next innovation

Tell us what would make a difference to you? Your ideas help shape our next developments. You bring the ideas. We bring the energy



A Final Recap on the SolarBox

Reduced generator runtime

Fuel and emissions savings

Quiet battery operation

Better generator loading

Renewable solar contribution

Peak shaving and flexibility

Compact footprint

All in a Secure, lockable container

Three Technologies, One integrated power system, helping you cut costs, reduce emissions, while keeping power reliable!

That's the SolarBox

Any questions?

