POWERVAULT

P5 User Manual

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Welcome to your new Powervault P5

We hope you will love your P5 as much as we do.

The P5 reduces your carbon footprint, reduces your bills and helps you on your journey to net zero.

The P5 is a smart battery system that saves you money on your bills, by storing surplus renewable energy you generate, and allowing you to charge up with low-cost electricity from time-of-use tariffs such as Economy 7 and use this energy to power your home.

The P5 operates in an easy, hands-off way. When set it to 'normal' mode, the P5 will automatically discharge to your home if there are appliances demanding power, and there's stored energy available.

The P5 will automatically charge itself when there is excess electricity generated by your solar PV or wind turbine which would otherwise be exported.

This helps you to maximise the self-consumption of your generated energy, plus it minimises your need to pay for imported energy from the grid.

SAFETY INSTRUCTIONS

Read this entire document before using the P5 system. Failure to follow any of the instructions contained within this manual can result in electrical shock, serious injury, fatality, or damage to the Powervault unit rendering it inoperable and invalidating the warranty.

The P5 does not contain user serviceable parts.

All information contained within this document is believed to be correct at time of print.

All images provided in this document are for demonstration purposes only.

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AFTER INSTALL DO NOT :

⚠   attempt to open, repair, or dismantle the P5 – there are no user serviceable parts.

⚠   disconnect or remove any wiring from the P5.

⚠   insert foreign objects into the unit.

⚠   cover the unit with anything that will reduce air flow. Only ever use Powervault accessories.

⚠   expose the P5 to flames or pierce the P5.

⚠   expose the P5 to water. If your P5 has been situated outside, it is fitted in a sheltered location by our approved installer in accordance with the installation guide.

⚠   use solvents to clean the P5 or expose it to flammable or corrosive chemicals or vapours.

⚠   attempt to paint any part of the P5 inside or out.

⚠   attempt to use the P5 if it is defective or appears to be damaged or broken in any way. Contact Powervault if any defect appears after installation.

⚠   overload the emergency power socket, if fitted, by drawing more than 13 Amps.

⚠   push, pull, lean or place any object against or on the P5.

This 'DO NOT' list is for your safety and must be adhered to.

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Safety instructions

In case of an emergency, or if there is any threat to health and safety, immediately contact the fire brigade, or the relevant emergency services. Evacuate the area.

In case of an unusual smell or noise, and only if it is safe to approach the unit:

1 Turn the red AC rotary isolator 90° anti-clockwise to switch the unit off.

2 Lift the plastic flap on the left side and turn off the battery isolator.

3 If present, turn the black DC rotary isolator 90° anti-clockwise to switch the unit off.

POWERVAULT
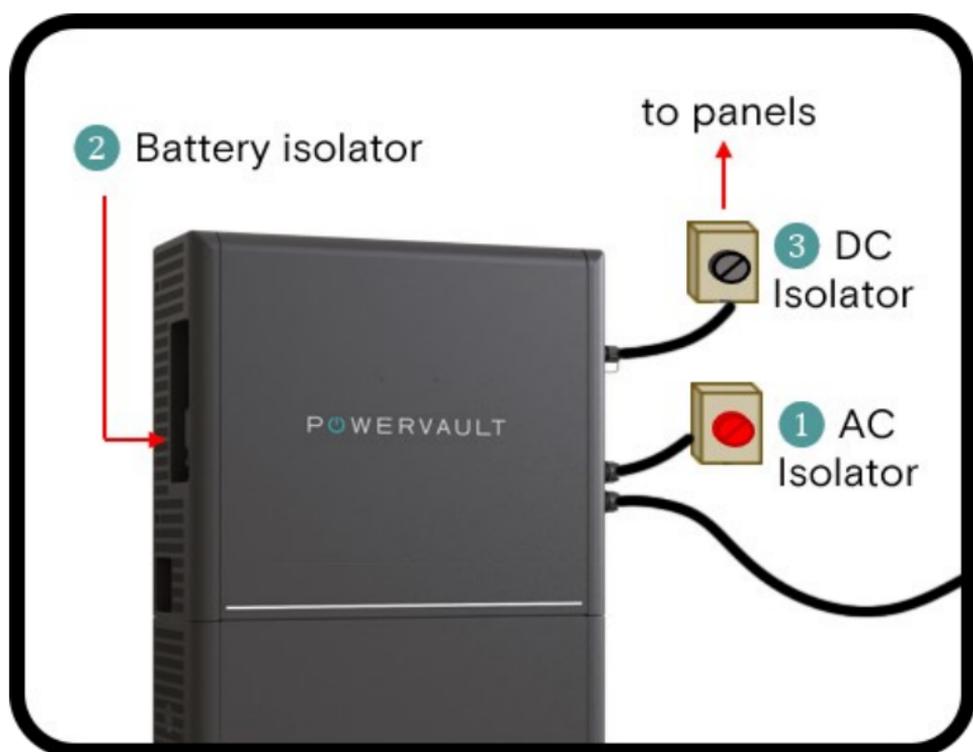
P5 Overview

The P5 will only charge when a programme has been set on the Portal.

An example of this is charging on cheaper off-peak electricity overnight.

The Portal enables you to manually set your schedule, or you can set your system to use our artificial intelligence algorithm SMARTSTOR.

This automatically optimises your P5's schedule for you, based on your personal electricity generation and demand profiles.

The P5 is connected to the Internet, enabling you to view and control its performance remotely through our Portal.

Please ensure that your P5 is continuously connected to the internet.

The P5 comes with a 10-year warranty, so long as it remains connected to the internet.
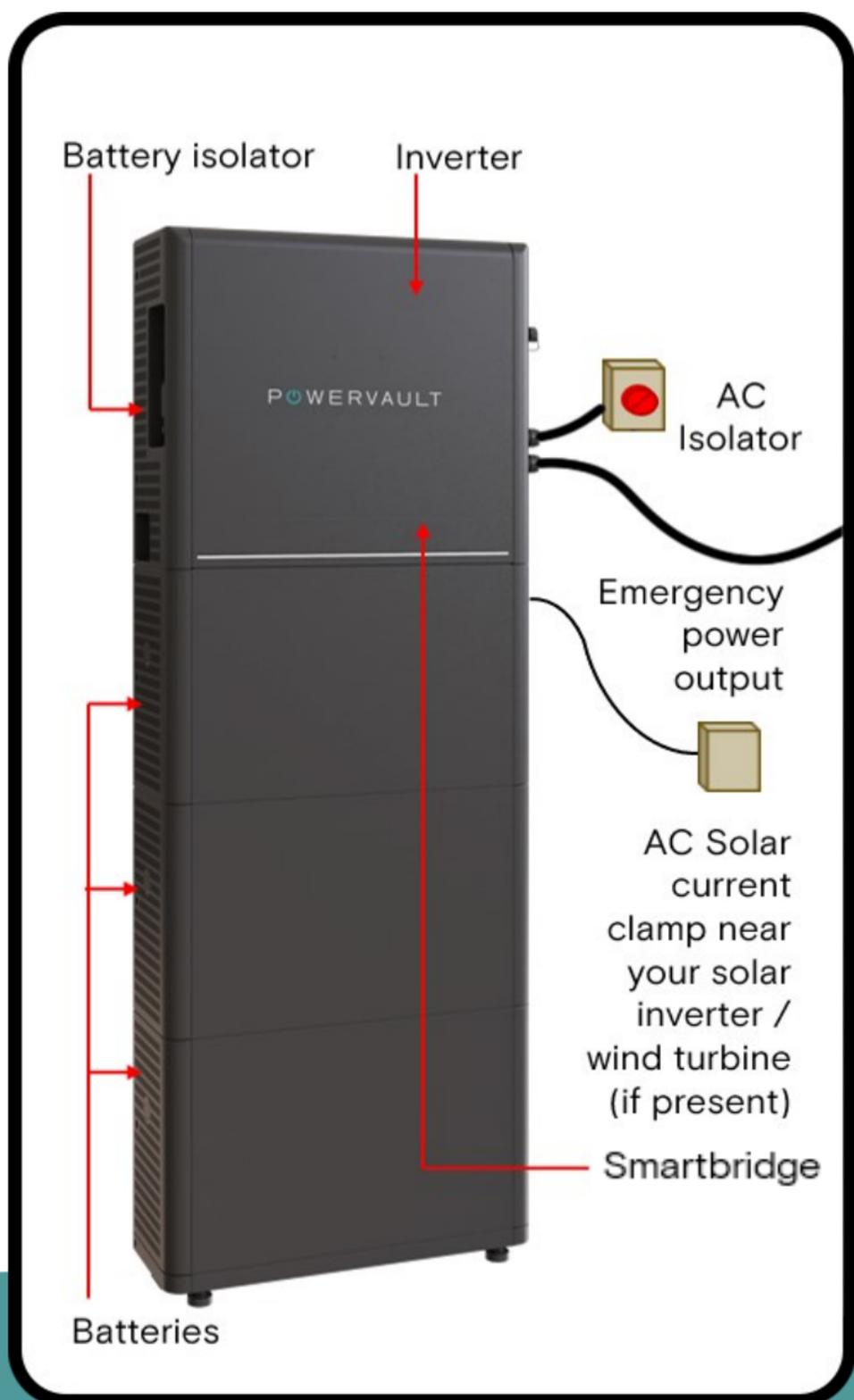
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Your Powervault : DC Connected

If you have solar panels connected directly to your Powervault ("DC Connected") it will look like the diagram below.
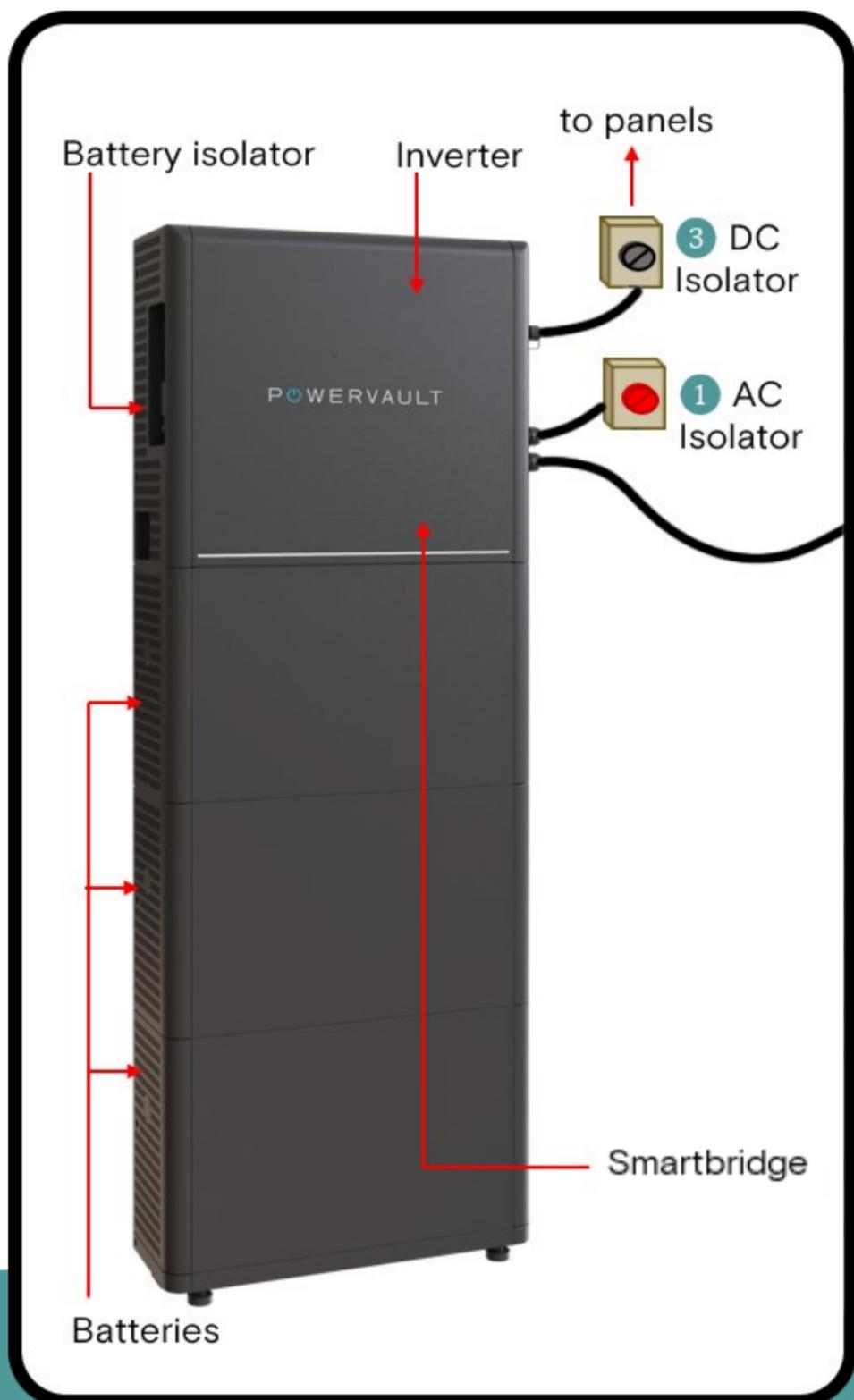
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Your Powervault : AC Connected

If your solar panels or other renewable generator are connected to a separate inverter ("AC Connected") or you do not have solar panels, it will look like the diagram below.

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Your Powervault : left-hand side

The key parts of your Powervault are labelled below.
You should not normally need to adjust or interact with the parts labelled in grey.
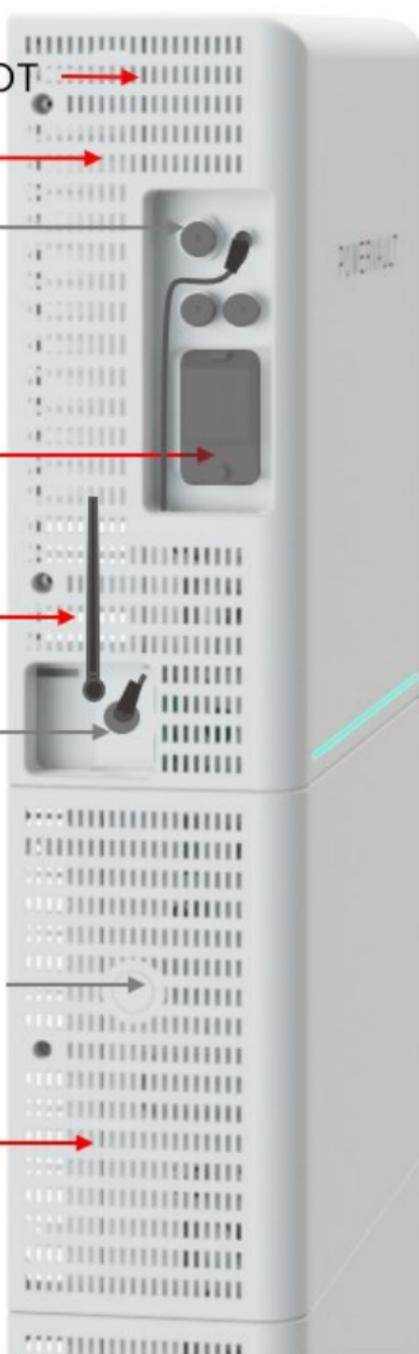
POWERVAULT

Your Powervault : right-hand side

The key parts of your Powervault are labelled below.
You should not normally need to adjust or interact with the parts labelled in grey.
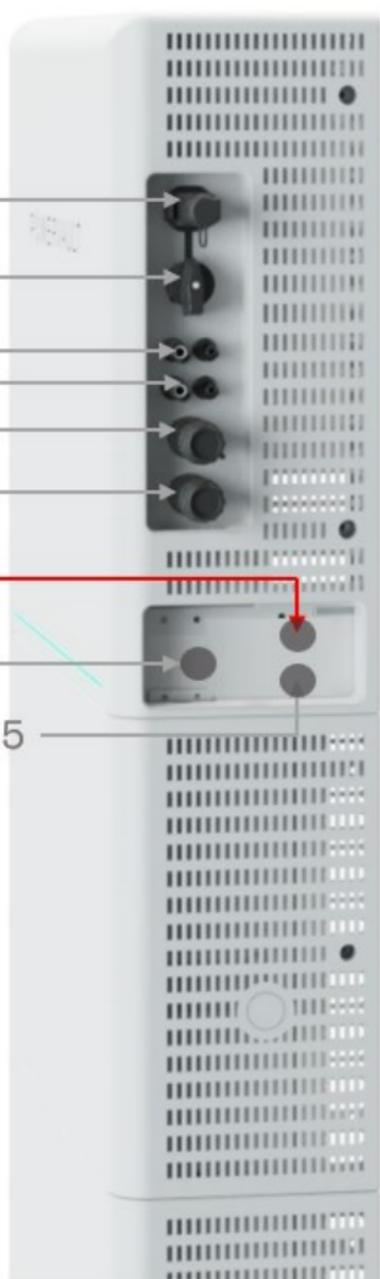
Grid current clamp

Inverter PV isolator

Solar PV DC Inputs

AC Grid Input

AC emergency output

Ethernet connection

Smartbridge power in

AC Solar Clamp / RS485

Turning your Powervault ON

1 Turn the red rotary isolator 90° anti-clockwise to switch the unit on.

2 Lift the plastic flap on the left-hand side and turn on the battery isolator.

3 If present, turn the black rotary isolator 90° anti-clockwise to connect the solar panels.
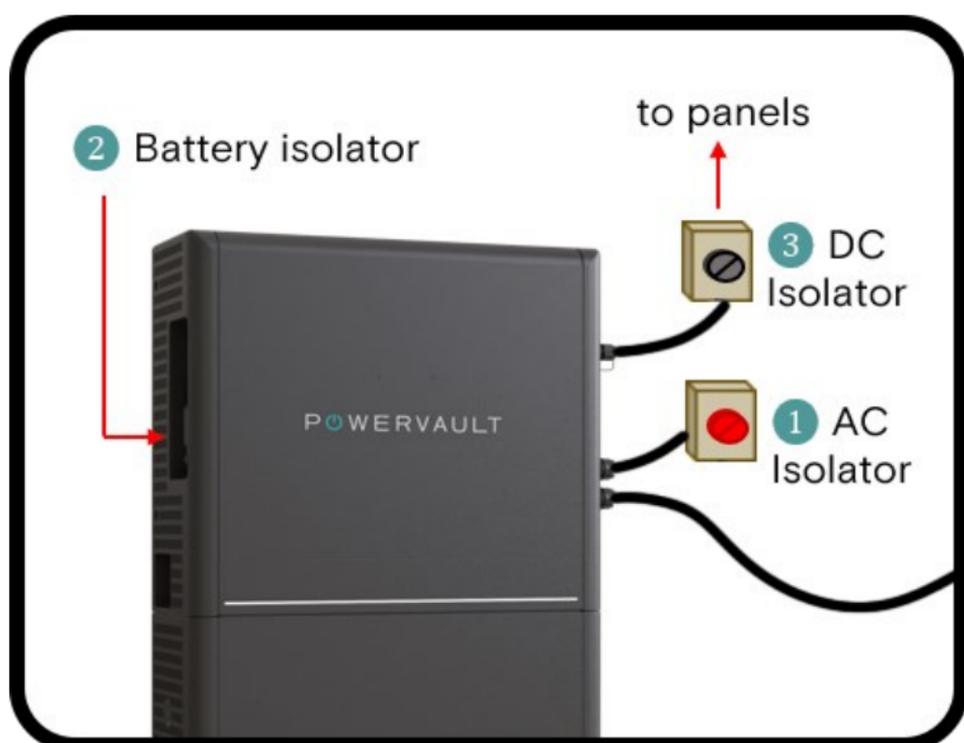
The lights on the right-hand side should initially show orange or red and change to green within the first three minutes.

The LED strip on the front of the Powervault will show white during start up.

When it is ready, it will show the colours documented in the LED section in this manual.

Turning your Powervault OFF

You should leave your Powervault switched on to prevent damage to the batteries, switching off for a long period of time can invalidate your warranty. If you are going on holiday, we recommend setting the unit to "normal mode".

Should you ever need to turn off your Powervault, for example to:

- To do a hard reset.

- Safely Isolate the unit for maintenance.

- Turn off the unit in an emergency.
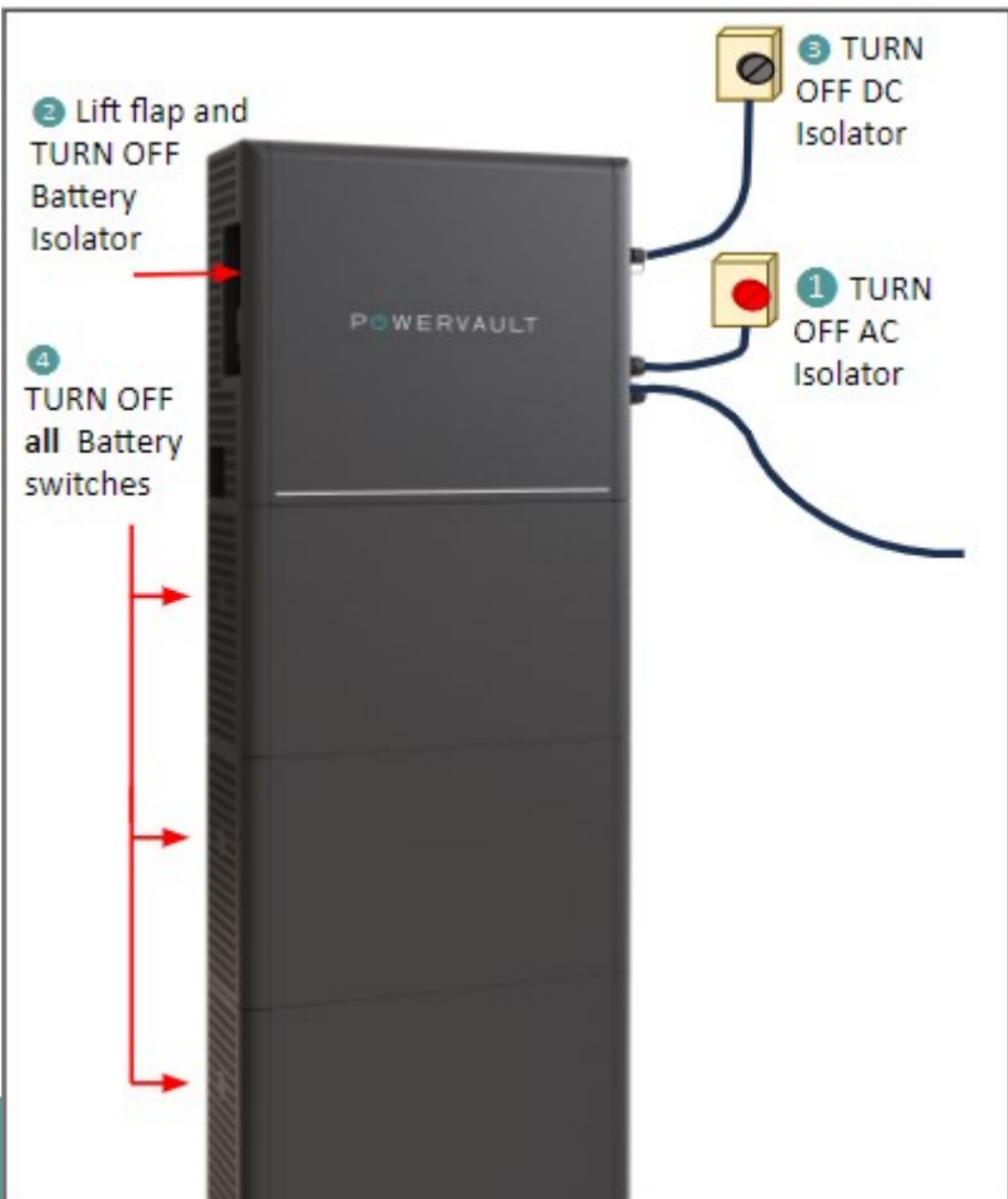
Connecting to your Wi-Fi

Part of the installation process is connecting your P5 to the internet. The instructions below apply to both an initial setup and if you change your router. The P5 has its own hotspot that you will use to securely connect to the internet.

Set up checklist:

- P5 Wi-Fi hotspot name (printed on the right-hand side of the battery)
- Your unique Wi-Fi hotspot password card (enclosed in the P5 packaging, also shown in the Portal account details section.)
- Your home Wi-Fi password.
- A tablet, laptop, or mobile device that you can take within 20cm of the P5 LED strip.

Wi-Fi signal strength

You can check your internet connection strength in the Portal. The icon is in 'account details,' top right-hand corner. Hover over the icon to see the % reading.

If it regularly drops below 30%, we recommend upgrading your connection to an Ethernet cable or adding powerline extenders.

< 30% shown in red (poor signal)

30-60% shown in orange (acceptable signal range)

> 60% shown in green (recommended signal strength)

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How to connect to your Wi-Fi

1.   Ensure your device is connected to your home Wi-Fi, not a mobile network and it is within 20cm of the LED strip.

2.   Go to the Wi-Fi settings on your device and select the P5 hotspot, the hotspot SSID is similar to: powervault-00ffffff.

3.   Enter the P5 hotspot password supplied by Powervault, this is unique to your battery.

4.   Once connected to the hotspot, open a new browser window and enter 192.168.4.1

5.   Log in with your email address and enter the same password used to connect to the hotspot.

6.   You will now see the 'Initial Device Setup' page, complete the form with your installer.

7.   Once you see ' Initial Device setup complete' message, click 'continue'.

8.   Your device will scan for available networks, connect to your Wi-Fi.

9.   You have successfully completed P5 Wi-Fi connection.

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Your Powervault's LEDs

Your Powervault is fitted with an LED strip. In normal operation the colour shows what it is doing, and the length of the line shows how full it is.

Battery charging from solar PV

Battery charging from grid

Battery discharging

Battery discharging : power cut

Unit idle

Unit starting up

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Your Powervault's LEDs

Battery charging from solar PV : 25%

Battery charging from solar PV : 50%

Battery charging from solar PV : 75%

Battery charging from solar PV : 100%

For charging, discharging and idle modes, the length of the line indicates how full or empty the Powervault is e.g.

Unit idle : 50%

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Your Powervault's LEDs

Additional LEDs indicate an error.

Blue light on right : internet not working
This error light will disappear if the internet recovers.

More serious errors are shown below.

Overheating : the unit will operate normally once it has cooled down.

Too cold: the unit will operate normally once it has warmed up.

Fault : three or more LEDs indicate a fault. Please contact Customer Services.

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The Portal

The Portal is your window into your Powervault. You can use it to understand what your Powervault is doing, what your solar panels are doing and how electricity is being used in your home. You can also change settings on your Powervault to make it do what you want.

You can register for the portal by scanning the QR code on the side of your Powervault system – just follow the instructions.

You need to make sure that your Powervault is connected to the internet. This will enable the Powervault to operate correctly and help to protect the batteries by preventing them from draining completely.
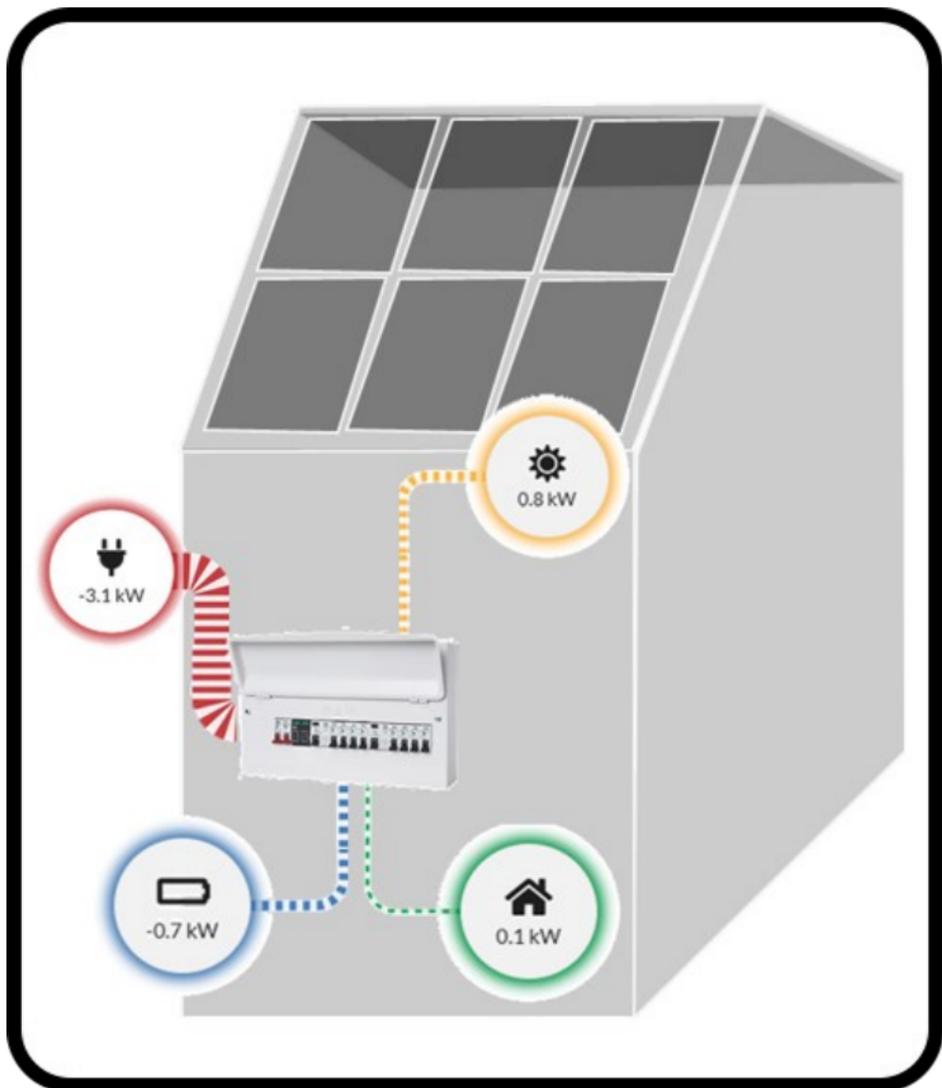
You must not disconnect the Powervault from the internet and you must not turn it off for prolonged periods of time.

Instructions for what to do if your power is switched off for an extended period, or you are on holiday are here.

To access the Portal click here:

http://powervault.co.uk/portal

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Portal : power flow indicators

The Portal shows you how power is flowing into your house. The left-hand panel shows power:

flowing to/from the grid

used by appliances in your home

generated by the solar panels

power going to / from your battery

Portal : energy graphs

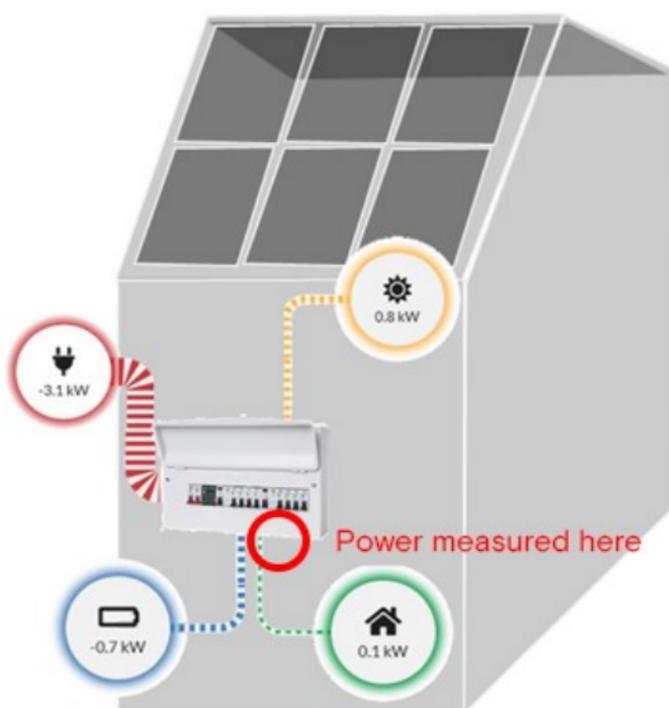The top graph shows how much power you are using in your home throughout the day and where it is coming from.
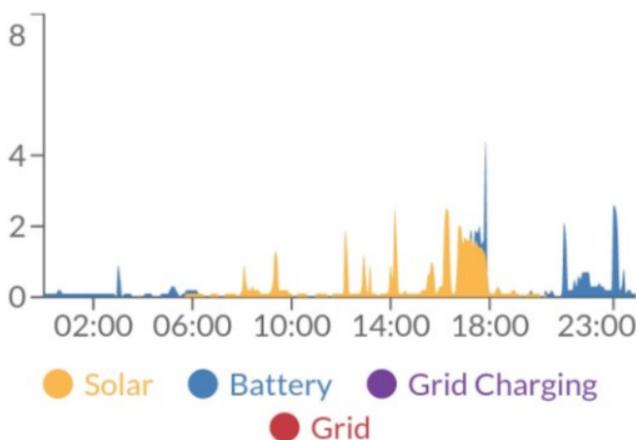
consumed from the grid
generated by the solar panels
power from your battery
grid energy used to charge battery

Power Used

Solar   Battery   Grid Charging
Grid

0.8 kW

-3.1 kW

Power measured here

-0.7 kW   0.1 kW
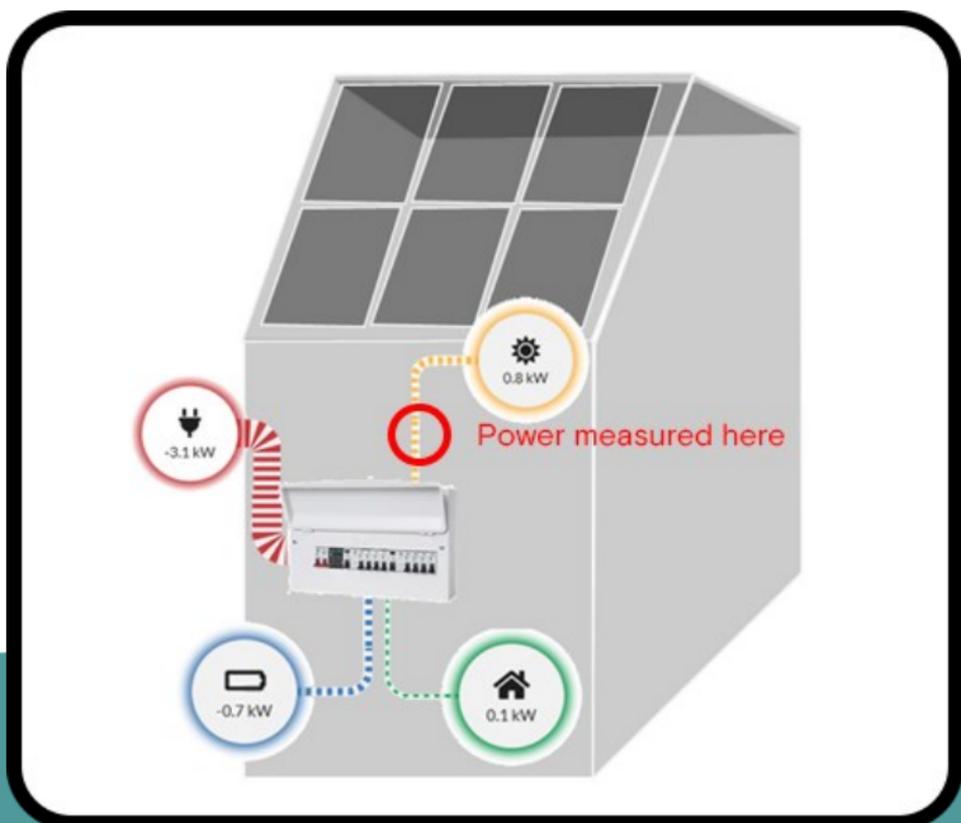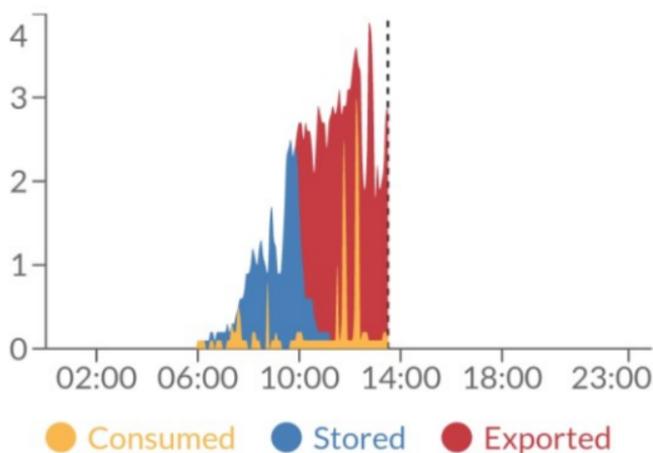
Portal : energy graphs

The bottom graph shows how much power you are using in your home throughout the day and where it is coming from.

sent to the grid
consumed in the home
charged into your battery

Power Generated

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Portal : setting a schedule

You might want to charge your battery at a particular time of day, to take advantage of lower electricity costs.

To do this, you can set the Powervault into the "Force Charge" Mode overnight and into the "Normal" Mode during the day.

"Force charge" forces the battery to charge from the grid even if there is no sun.

"Normal" model is the basic battery mode. It means that the Powervault will charge up with any available solar that would otherwise be exported. It will discharge the battery to meet your home usage.

To set up a schedule overnight:
1) Click "Edit Manual Schedule"

Portal : setting a schedule

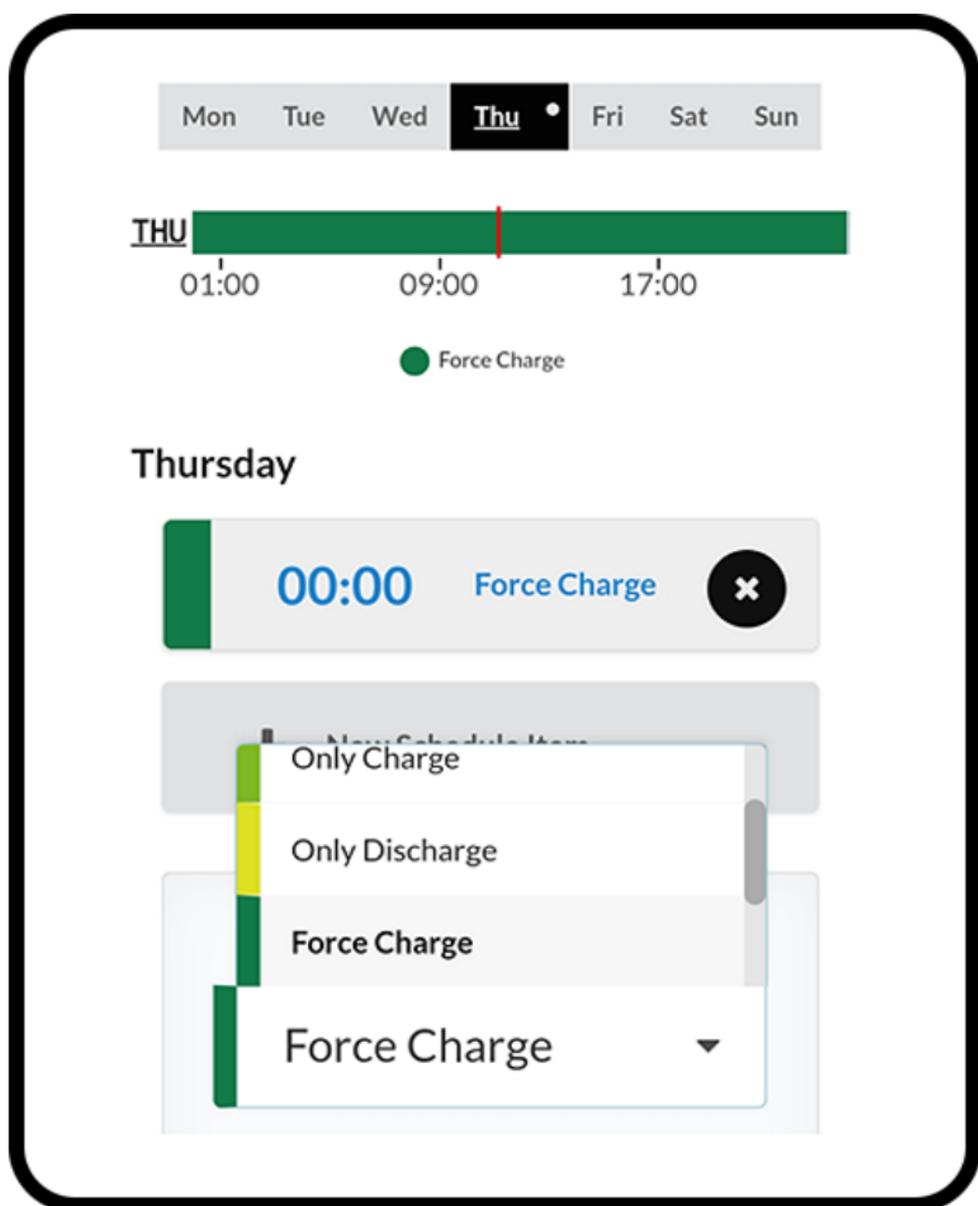2) Set the battery into force charge from midnight:

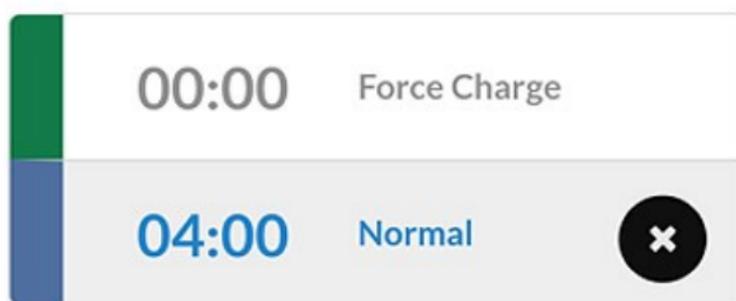Select "Force Charge".
Do not select "Only Charge"

Portal : setting a schedule

3) Add a New Schedule Item to run the battery on "normal" mode from say 04:00

Portal : setting a schedule

4) Click 'copy to all days'. Click 'save changes'.

Confirm Weekly Schedule

You have made the following changes:

- **Monday**   Not changed
- **Tuesday**   Not changed
- **Wednesday**   Not changed
- **Thursday**   Changed
- **Friday**   Not changed
- **Saturday**   Not changed
- **Sunday**   Not changed

COPY THURSDAY TO ALL DAYS

SAVE CHANGES   Cancel

5) Your Portal should now show a bar chart underneath the graph displaying the different programmed states:

Operating State

Manual Schedule:

01:00 04:00 07:00 10:00 13:00 16:00 19:00 22:00

● Force Charge   ● Normal

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Portal : modes explainer

● **Normal**
Will charge if there is unused solar generation available and discharge to offset any energy demanded from the grid.

● **Only charge**
Charge from solar if the house is not exporting to the grid. It will not discharge to meet your demand therefore retaining energy in the battery.

● **Only discharge**
Discharge energy to offset your demand from the grid, but do not charge.

● **Force charge**
Charge at maximum power until full, whether or not surplus solar generation is available, and will not discharge. This is useful for overnight charging from the grid.

● **Force discharge**
Discharge at maximum power until empty, with any energy surplus to your consumption being exported to the grid. Do not charge.

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Portal : LED options

There are two display options, simply select your preference and save:

LED Settings

Select an animation style for the Powervault's LEDs:

| Discrete LED mode ✓	Normal LED mode

CLOSE   SAVE SETTINGS

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Portal on a mobile phone

The Portal works brilliantly on your mobile phone. It shows identical information as the desktop version but is optimised for mobile for both Android and iOS.

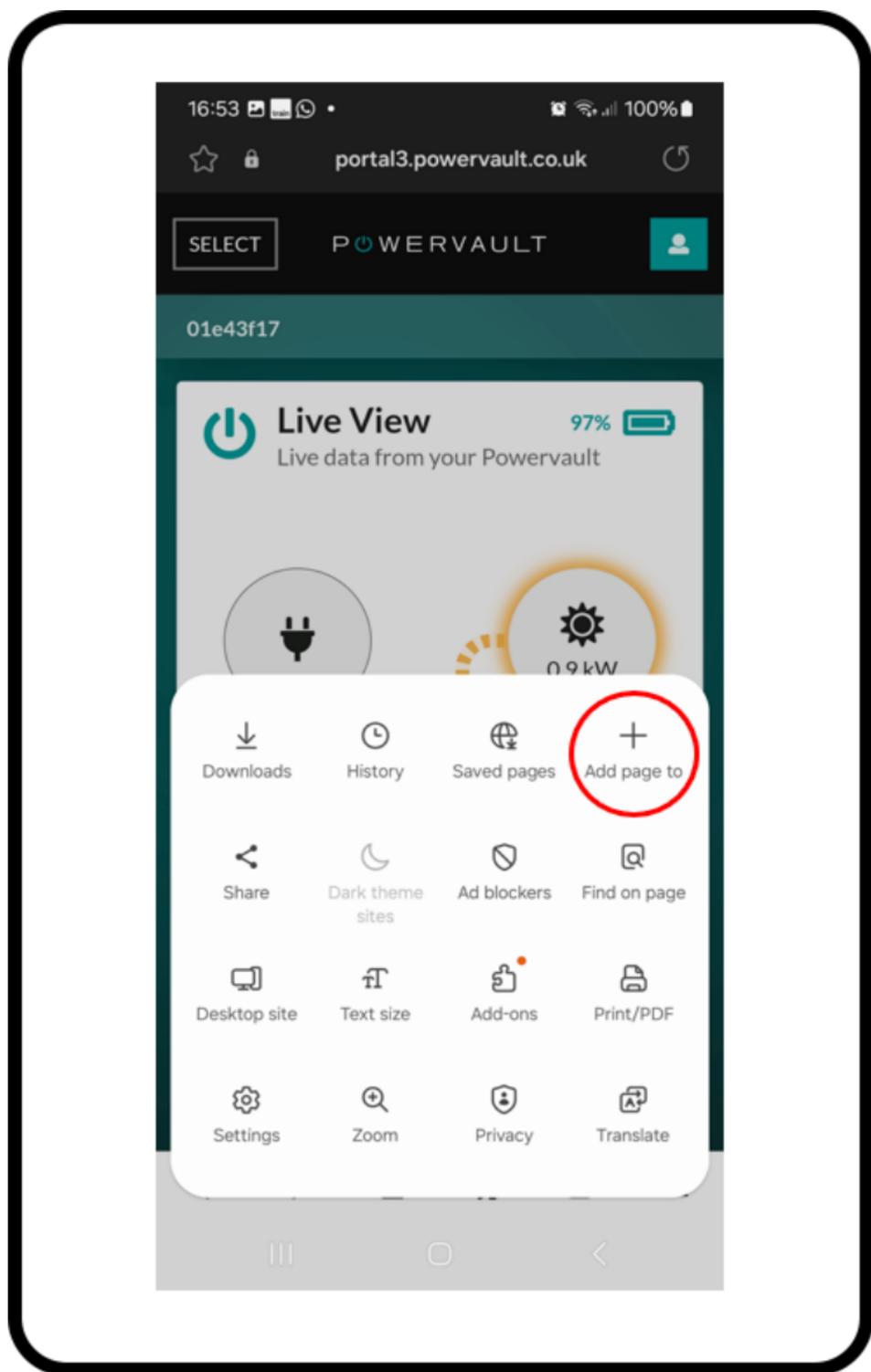You can access the Portal at
powervault.co.uk/portal

For quick access, create a shortcut and install it on your phone's home screen. It will be displayed like an App. These are the steps:

1) First navigate to the Portal via your web browser:
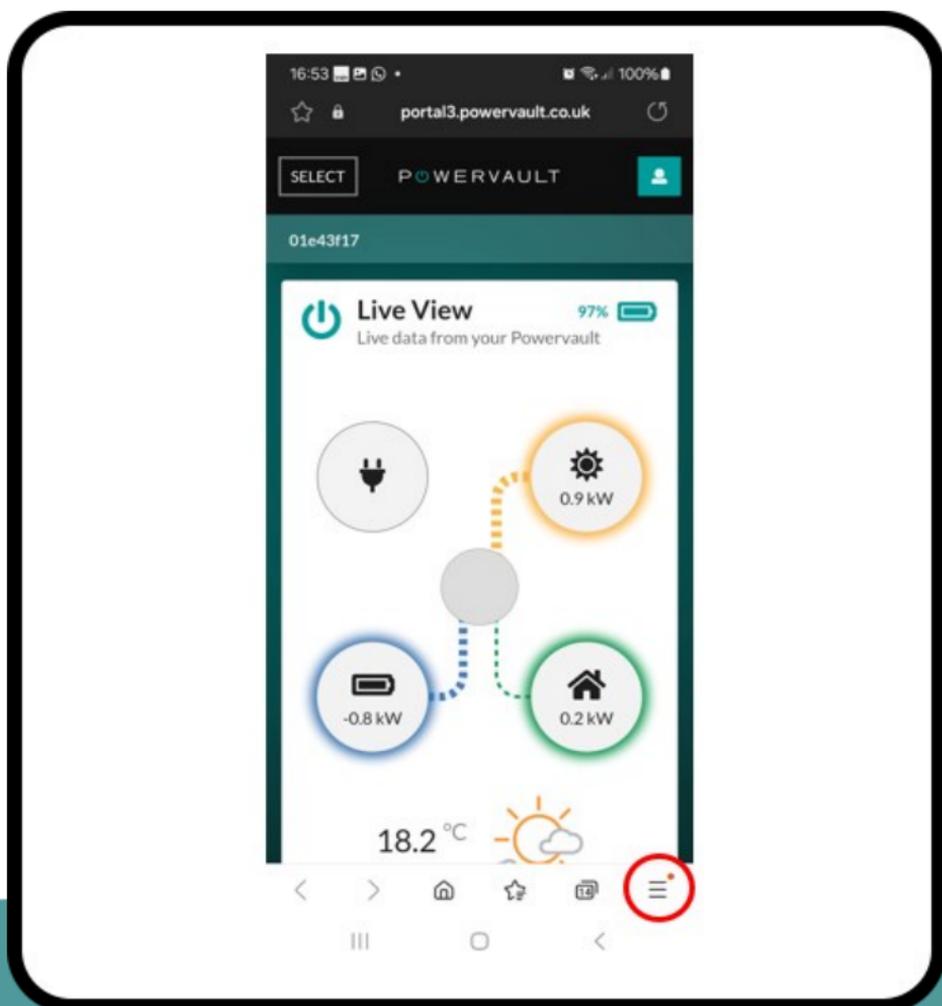
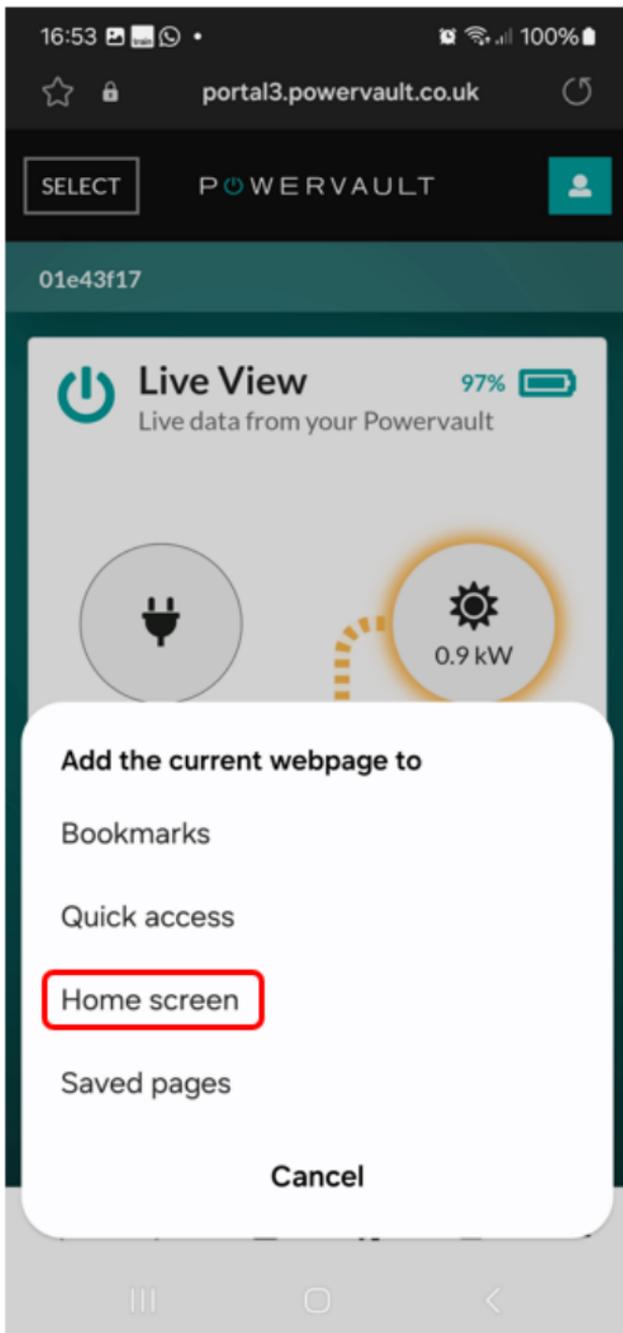# POWERVAULT

Portal on a mobile phone

2) Click the "+ Add page to" or "Create App" button

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Portal on a mobile phone

3) Click the "Home screen" option and it will save the Powervault icon. Tap the icon to login and use like an App.

SMARTSTOR™

Powervault SMARTSTOR™ is the brain behind our battery management software. It creates the charging schedule for the next day by learning your individual energy use and then plugs in prices and times from your time-of-use tariff.
Next it takes local weather forecasts and generates a daily schedule to maximise your free solar and your savings.

You can choose to manually set your charge and discharge schedule or let SMARTSTOR™ AI do the hard work for you.

Turning on SMARTSTOR

Turning on SMARTSTOR is simple. Scroll down to the Settings section.

Click 'Set Up SMARTSTOR'.

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Setting up SMARTSTOR

Select your tariff from the list. If your tariff is not listed, then please contact us.

SMARTSTOR will optimise the amount and timing of charging to maximise the performance of your Powervault.

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SMARTSTOR example

When SMARTSTOR is enabled you will see an additional schedule below the graphs on your portal.

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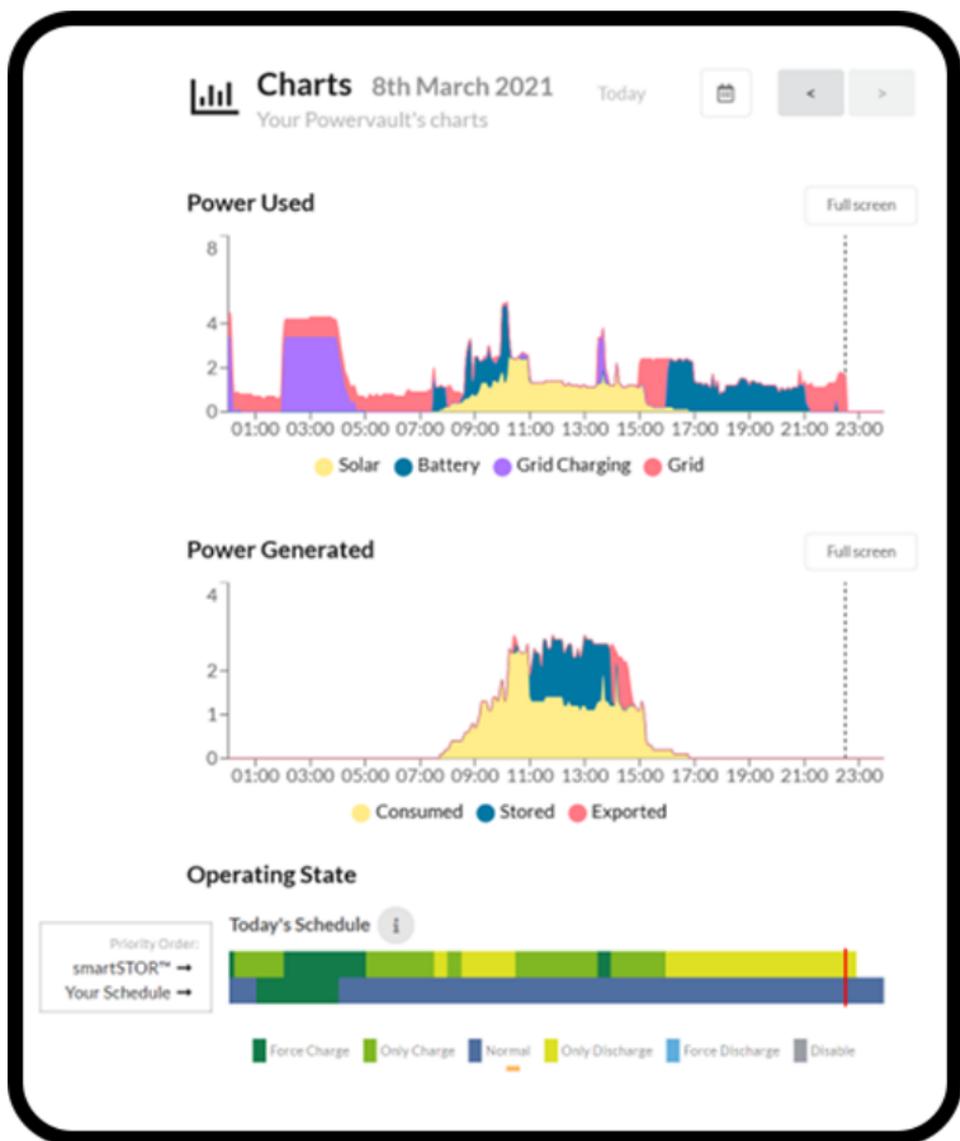
Emergency Power Sockets

The P5 can be purchased with an optional Emergency Power Socket (EPS) feature which includes two Emergency Power Sockets that are usually powered directly from the grid. Should a power cut occur, these sockets are instead powered from your P5. This allows you to power appliances during a blackout, as long as there is available charge in your battery. The Emergency Power Sockets can draw up to 13A in total: do not draw more than 13A from the sockets. The sockets will automatically trip off when overloaded.

Emergency Power Sockets

On the Portal, you can select the Reserve Capacity that your P5 will always hold, in case of a power outage. For example, if you select 20% your P5 will never discharge below 20% capacity, and so will reserve this energy in case there is a power cut.
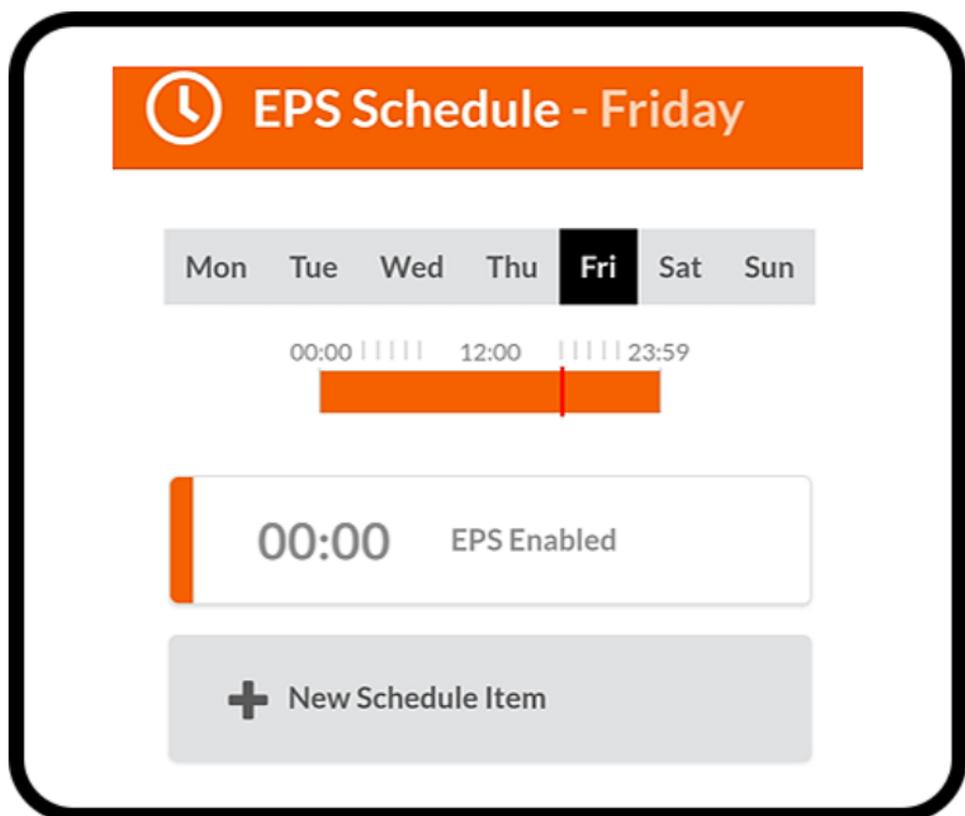
If your solar PV is connected directly to your Powervault (DC) then you will be able to use your solar PV energy through the emergency plug sockets during a power cut.

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Troubleshooting

If your Powervault appears to be offline please check the following:

• Is the LED display showing any colour?

Check to see if the front-facing LED display is running.

• If not, please check your consumer unit (fuse box) for any tripped fuse switches.

These would be in the down position if tripped, they can be reset by flipping the switch upwards. If you need our support, you can send us a photo during office hours.

• If there are no tripped fuses, please check that the red rotary switch or external breaker on the left side of the unit is in the upward ON position.

If not, move the switch to the upward ON position.

• If the red rotary switch or external breaker is already in the upward ON position, please try resetting the unit.

Reset the unit by turning the unit off, waiting five minutes and then turning the unit on.

P O W E R V A U L T

Troubleshooting

If these steps do not resolve the issue, please check the internet connection to the unit:

Check that your router is on and working.

It can sometimes help to reset the router by switching it off, then on again. Check that other devices in your home have internet access.

Check the Wi-Fi signal strength

When your Powervault was first installed a Wi-Fi signal strength and broadband speed test would have been carried out from the location where your Powervault is installed. Go to the location where your Powervault is installed. Ensure that you are connected to the same Wi-Fi network. Carry out a download speed test.

If the Wi-Fi signal is low then verify that any Wi-Fi repeaters you have are in correct operation. Wi-Fi repeaters have a habit of going offline. It can be helpful to turn off your broadband router and all the repeaters and then turn them on again to reset them.

If this doesn't work, please reboot your Powervault.

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Troubleshooting

Check the Ethernet cable is connected securely at both ends.

If your unit is connected via physical ethernet, the Ethernet cable should be securely clipped into the Powervault and your router (or Wi-Fi / powerline extender).

If your set-up uses Wi-Fi or powerline extenders (such as TP Link), try resetting or re-pairing these devices.

To reset and re-pair TP Link extenders:

- Hold down each button for 15 seconds to reset the devices.

- Turn them off and press the buttons on both devices within two minutes of each other.

- The three lights on the front of the TP Link will all be green when there's a good connection.

If you have recently installed any hardware or software on your home network that restricts or limits internet traffic (such as a parental control service or a firewall) please ensure that these do not block your Powervault from reaching the internet.

If all of the steps above do not resolve the issue, please contact Customer Services.

Frequently Asked Questions

How will I be able to see if P5 is working properly?

You can monitor your P5 performance remotely wherever you are, using our online portal which shows both live and historical data.

Can I increase my P5 storage capacity after it has been installed?

Yes, you can upgrade 5 kWh, 10 kWh and 15 kWh systems at a later date if you have physical space. Please contact us about upgrading your P5.

Does the P5 always output the same amount of energy?

The energy that you can draw from the battery depends on the power usage in your home. Lower power usage means less efficiency and less energy available. The energy capacity of your Powervault is calculated under test conditions.

I don't seem to be able to make my unit charge overnight

Verify that you have selected "Force Charge" rather than "Only Charge". Use "Force Charge" to ensure the unit charges overnight. Use "Only Charge" only in situations where you wish to store solar energy during the day for an evening peak price.

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Frequently Asked Questions

Does the P5 always input/output the same power?

As with most batteries, the maximum power input and output of the Powervault depend on how full the battery is. It is normal for the power output to reduce as the battery approaches being either fully or empty. In hot weather, power output may be reduced to prevent the system from overheating.

How noisy is the P5?

At full discharge or charge power, P5 measures 35dB of noise or less. This is equivalent to the background noise in a quiet library.

Can I move the P5 to a different location post-installation?

Your P5 must only be moved by an Approved Powervault Installer, otherwise the warranty will become invalid.

Once the P5 has been installed, we recommend keeping it in its original location. If you do need to move your unit to another location, we can arrange for the system to be moved for an additional charge.

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Frequently Asked Questions

Why does the Portal show a different number to my smart meter?

The P5 measures the power flowing in and out of your house to enable it to decide when to charge and discharge the energy in your battery and to provide an indication of your energy usage on the Portal.

Unlike a smart meter which contains a highly accurate metering device, the Powervault uses a grid clamp which is designed to be easily retrofitted to your property. Unfortunately we are unable to guarantee the accuracy of this kind of clamp as it can be limited at low power levels.

With your assistance we can improve the accuracy of your Portal readings if you are willing to contact Customer Services with a sample of your smart meter data.

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Frequently Asked Questions

Why is SMARTSTOR not working?

Take the following steps if SMARTSTOR does not seem to be working:

1. Check that the correct tariff is selected – suppliers can have several tariffs with similar names.

2. Check that your post code shown under the weather icon on the left-hand side in Live View is correct.

3. Ensure that SMARTSTOR is switched on. Also be aware that SMARTSTOR takes several weeks to gather information and learn your profile.

4. SMARTSTOR is designed to work out the best time to charge and discharge based on the weather, the electricity price and how you generally use electricity however it cannot foresee unpredictable or random events. E.g. if you charge your EV on a different day each week, this is an unpredictable event.

5. If you cannot resolve your query from the manual, please see the FAQ section on the portal or contact Customer Services.