

Why do I need a ORBIT PVVO Enhance?

Did you know that the voltage we are supplied to our homes is typically as high as 246V, although it is sometimes considerably higher than this, whilst the electrical appliances around our home are designed to run at 230V?

This is over voltage we simply do not need and are being charged for.

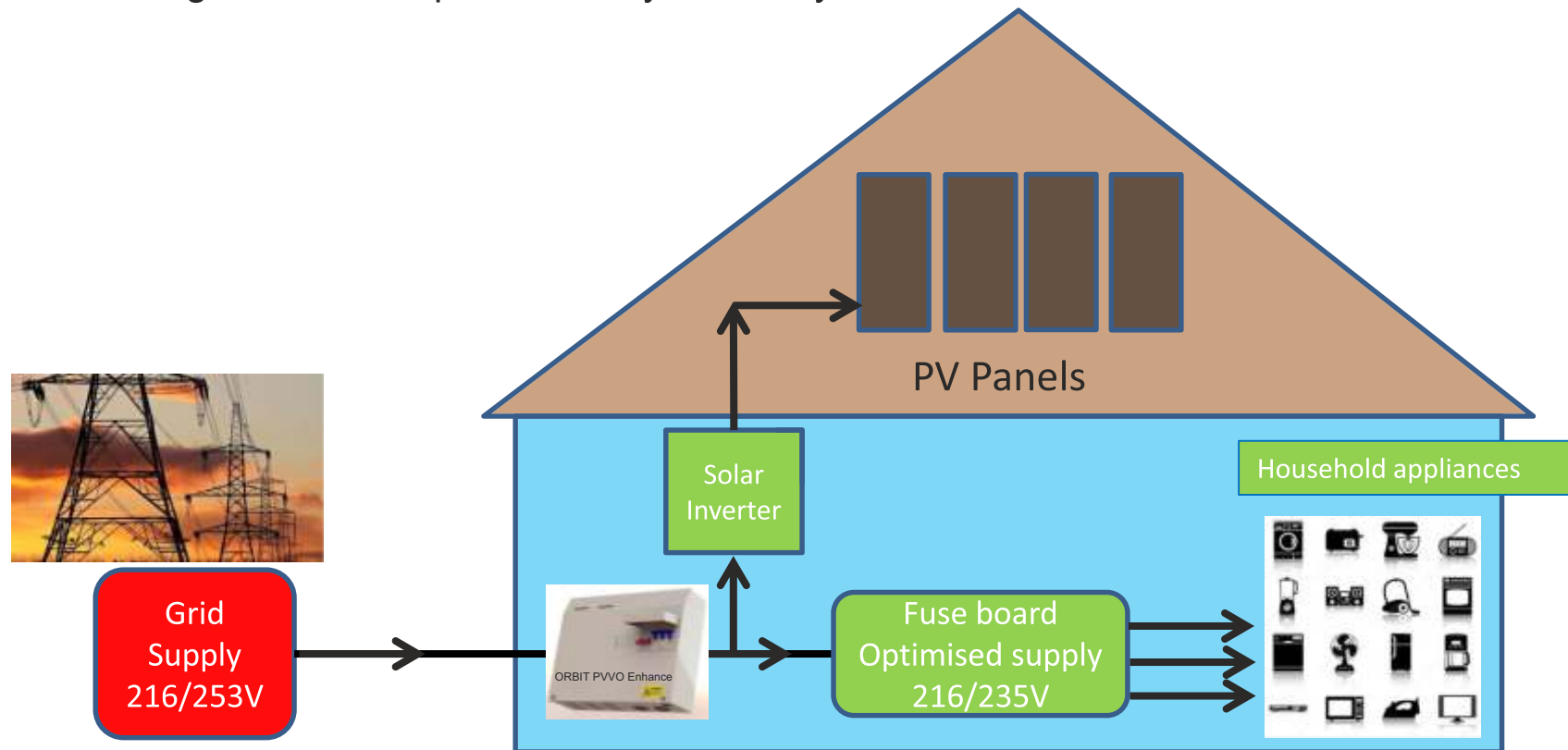
Reducing the voltage for the majority of appliances closer to their designed voltage leads to:

- Lower Energy Consumption
- Extended Lifespan
- Increased Appliance Efficiency
- Increased PV generation
- More usable energy from your Solar PV system



The ORBIT PVVO Enhance Unit controls the voltage supplied into your property, protecting your electrical appliances and Solar PV system from inefficiencies caused by high voltage levels.

- Reducing energy costs by 8-14%* saving you money on your electricity bills
- Increasing your solar generation by up to 11.95%*!
- Increasing your FIT payments and helping to increase your return on investment
- Increasing the useable power from your PV system



* Generation increase and energy savings based on in house testing and may be higher or lower than stated

How does the ORBIT PVVO Enhance save money on electricity bills?

The saving derived from the ORBIT PVVO Enhance Unit is relative and depends upon

- Type of appliance
- Running time
- Frequency of use
- Appliance design parameters
- Temperature
- Supply Voltage

Rationalisation of these many variables has led ORBIT to the conclusion that a conservative and realistic savings projection for return on investment can be applied at 8%, over the typical diversity and consumption seen in the typical home. At any one specific time both higher and lower savings could be achieved, but the mean value has been evidenced as being in the order of 8% (average value).

The table below shows typical energy savings from common household appliances

Appliance	Percentage Energy Saving
A rated freezer	17% energy saving
A rated refrigerator	16% energy saving
3 speed central heating pump	15% to 18% energy saving
LED	8% energy saving with no noticeable drop in lumens output
CFL lighting	11% energy saving
Incandescent bulb	15% energy saving
Low voltage halogen spot lights	15% energy saving
DAB radio	5% energy saving
DECT cordless phone base station	30% energy saving
ADSL modem and wireless router	5% energy saving
Personal Computer	4% energy saving
Hi-Fi	13% energy saving

Academic texts supporting this saving projection are broadly available from independent studies undertaken which evidence the significant savings and benefits to be had from closer management of the distributed voltages around the home.

What the experts say

The National Grid / GCRP studies referenced,

“indicate that such a 2.5% voltage reduction would produce both a 2.5% average reduction in demand and energy on the networks to which it was applied”.

Such reductions could be attractive to both Government and end users as:

- Provide the cost benefits of energy reduction to millions of end users who cannot afford investment in such “voltage optimisation” equipment currently marketed

A quote from the electrical guide to the 17th Edition of the IEE Wiring Regulations (BS 7671): 2008 and Part P of the Building Regulations by John Whitfield

“Since the present supply voltages on the UK lie within the acceptable spread of values, supply companies in the UK have not reduced their voltages from 240V. This is hardly surprising, because such action would immediately reduce the energy use by customers (and the income of the Companies) by more than 8%”

Get more usable power from your PV installation

Solar PV systems have to increase the supplied voltage to enable them to export their generated electricity back onto the National Grid, inevitably the voltage into your property will also increase.

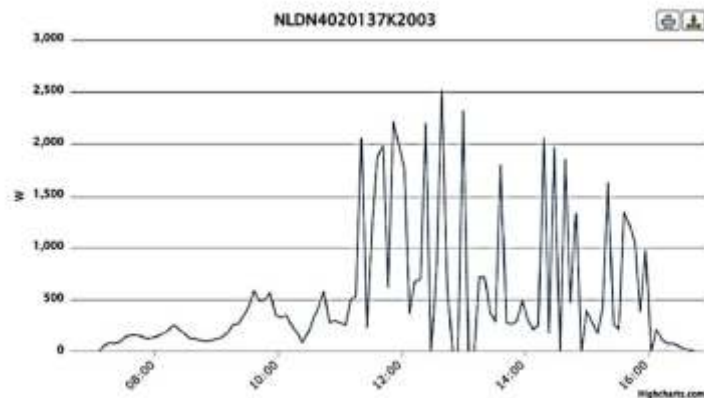
Installing a ORBIT PVVO Enhance Unit alongside your PV system prevents this precious generated energy from being wasted due to inefficiencies caused by over voltage at appliances. Potentially leaving more of the “Free energy” available for use around the property helping to speed up the return on investment.

An example, if you are generating 3kW of power from your Solar PV System, a 3kW kettle rated at 230V but operating at 250V will consume additional 500W. This is additional power that you will have to buy from the grid, by reducing the voltage, yes your kettle may take a little longer to boil, but it could be boiled from the power generated entirely by your Solar System.

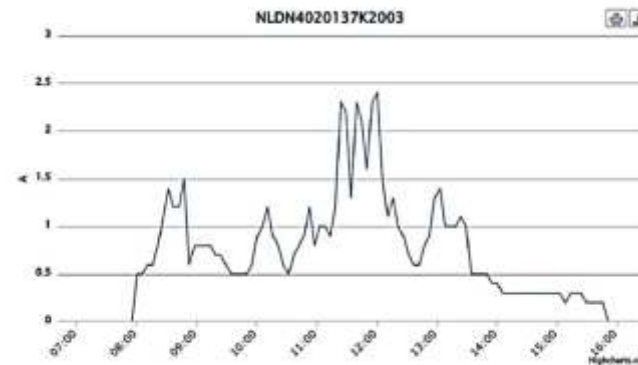
How does the ORBIT PVVO Enhance help my PV system generate more energy?

By monitoring the incoming supply voltage, rather than the inflated inverter voltage, the ORBIT PVVO Enhance unit allows the Solar PV inverter to compliantly stay in circuit for longer. Preventing nuisance over voltage shut down and keeping you system generating energy for longer. Meaning a faster return of investment for existing and new systems alike.

Additionally, as excessive voltage is given up as heat in electrical appliances, running the PV inverter closer to it's designed voltage will reduce stresses caused by overheating and prevent the unit constantly switching on and off which will increase it's operating life.



Graph shows loss of generation caused by over voltage shutdown



Graph shows same system with no over voltage shut down or loss of generation.

Typical savings

A typical property with Solar PV installed consumes 5,400kWh⁺ per year
Using electricity price of £0.15 that equates to £810.00 per year.

With conservative savings of 8%* achieved by installing a ORBIT PVVO Enhance Unit **£64.80 per year** could be saved off your electricity bills.

A typical 4kWp Solar PV system generates 3,300kWh per year. Installing a ORBIT PVVO Enhance unit and reducing potential losses in generation of 11.95%* give an additional 394.35kWh of useable energy per year. Using the 8% saving at appliances from this additional generation equates to an energy saving of **£59.15** (394.35kWh X £0.15)

Solar PV FIT rate for systems installed before March 2012 is £0.5067 per kW of energy generated and £0.0502 per kW of exported energy. A typical 4kW system generating 3,300kWh per year should return £1,672.11.

With a ORBIT PVVO Enhance unit and an additional 11.95% this could increase by **£199.81 per year**. Exported energy payments could also increase giving an additional **£19.79 per year**

Combined electrical savings and increased Solar generation give a total year one benefit of **£343.55!!**
Without inflation or energy price rises this equates to **£6,871.00 !!** over the 20 years of your FIT payments

⁺ Figure taken from 'The National Energy Efficiency Data-Framework (NEED) produced document Energy Usage in households with Solar PV installations and published by DECC'

* Generation increase and energy savings based on in house testing and may be higher or lower than stated

Electricity Price Rises

Unfortunately for us as consumers electricity prices tend to increase year on year.

The table shows the potential savings based on a 1.5%, 5% and 10% price increase per annum.

Based on a conservative 5% increase, the total saving on electricity bills would equate to £4,098.53 over the life expectancy of the equipment

	energy price rises %		
1.50%		5%	10%
£123.95		£123.95	£123.95
£125.81		£130.15	£136.35
£127.70		£136.65	£149.98
£129.61		£143.49	£164.98
£131.56		£150.66	£181.48
£133.53		£158.20	£199.62
£135.53		£166.10	£219.58
£137.57		£174.41	£241.54
£139.63		£183.13	£265.70
£141.72		£192.29	£292.27
£143.85		£201.90	£321.49
£146.01		£212.00	£353.64
£148.20		£222.60	£389.01
£150.42		£233.73	£427.91
£152.68		£245.41	£470.70
£154.97		£257.68	£517.77
£157.29		£270.57	£569.55
£159.65		£284.10	£626.50
£162.04		£298.30	£689.15
£164.48		£313.22	£758.07
£2,866.18		£4,098.53	£7,099.24

FIT increase with RPI

Solar Feed in Tariff payments are increased every year linked with the RPI. The RPI in April 2017 was 2.6

Assuming that the RPI stays at this level during the FIT period the total benefit of fitting ORBIT PVVO Enhance would be **£5,666.42**

Giving a total benefit to the consumer of £9,764.42

Electricity Savings £4,098.53

FIT payments £5,666.42

2.60%
£219.60
£225.31
£231.17
£237.18
£243.34
£249.67
£256.16
£262.82
£269.66
£276.67
£283.86
£291.24
£298.81
£306.58
£314.55
£322.73
£331.12
£339.73
£348.57
£357.63
£5,666.42

Robust design. Built to last.

All ORBIT PVVO Enhance units are designed to cope with 100% of the load 100% of the time.

C & S PVVO Enhance units are built to last, with a life expectancy of 25 years. Giving total peace of mind and ensuring the maximum return on your investment



Install an ORBIT PVVO Enhance unit and;

- PROTECT Against Rising Electricity Prices
- PROTECT Your Electrical Appliances
- PROTECT Your Investment in Solar PV
- PROTECT Your Solar Generation

