

THE NEW STANDARD IN HYBRID POWER





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Firefly Solar Generators is the market leading expert in the design and manufacture of off-grid, portable solar powered generators. The Company's products go beyond solar power to provide temporary modular power management systems.

Whether as an alternative to existing power generation or as part of a hybrid solution, Firefly Solar delivers flexible power systems that offer a range of benefits to customers.

Firefly Solar has built its reputation based on excellent customer service and product reliability. Founded in 2007 the Company continues to develop innovative products to cater to the needs of its ever growing customer base.

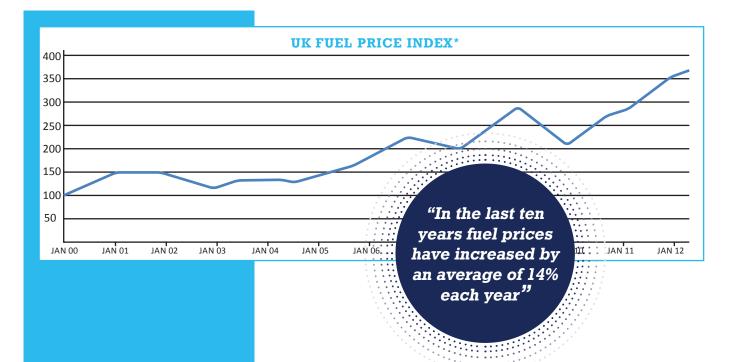
Firefly's latest product range includes multiple power input and output options. This flexible connectivity is combined with significant fuel savings, reduced carbon emissions, intelligent load management and represents a powerful alternative to conventional diesel generation for temporary power.

Flexible, intelligent, powerful.

COCA-COLA ENTERPRISES

Recognised as the world's most valuable brand, Coca Cola Enterprises approached Firefly to provide a sustainable power solution for an Event Recycling programme developed for shows in the UK and France. Firefly manufactured and then supplied Coca Cola Enterprises with six Cygnus Generators and eight Fold-Array solar panel systems.





"In this highest of pressure environments, a power failure was inconceivable and my trust in the Firefly guys turned out to be well founded; the lights kept burning without a hitch."

Charles Simmonds - BBC

"Firefly Solar's innovation in the festival market is one of the highlights of the summer and proves a real talking point for the audience whilst cutting the emissions of our events significantly."

Tim Harvey - Lovebox Festival

The Temporary & Remote Power Challenge

Diesel generators are the natural choice for temporary and remote power applications, but users face a number of challenges:

- Rising and increasingly volatile fuel prices
- Sourcing, transporting and storing fuel
- Inefficient use of large diesel generators for small loads
- Carbon emission targets
- Noise and air pollution
- Increasingly stringent regulations

Firefly Solar offer complementary power solutions that mitigate these issues. Firefly's intelligent and robust design combines experience and understanding of customer needs.

The Hybrid Power Solution

Firefly can help to reduce the impact of the challenges facing temporary power. Combining existing diesel generators with battery storage systems has a number of benefits including:

REDUCED OPERATING COSTS

Hybrid power can reduce fuel consumption by up to 30% and reduce maintenance of the diesel generator by 50%.

LOWER ENVIRONMENTAL IMPACT

A hybrid system can reduce carbon emissions by up to 30% compared to using a diesel generator. Local residents and staff can also benefit from silent operation and no exhaust fumes.

^{*} Source: DECC data May 2012



INCREASED RESILIENCE

Lower fuel consumption means less reliance on supply chains for re-supply.

IMPROVED PRODUCTIVITY

Fast deployment, simple controls, excellent reliability and autonomous running mean that the power system needs less management by staff.

Why Firefly Solar?

TRUST

Firefly has been chosen to design, build and install solar and hybrid power systems by major companies in the UK, including Coca-Cola Enterprises, British Gas, Network Rail and the Department for International Development. Firefly offers a two year warranty as standard, as well as comprehensive after sales service.

EXPERIENCE

Firefly has been working with hybrid power technology since 2007. The Company has used its own products in the field and understands the challenges of providing temporary power for a wide range of applications.

- Reduce fuel consumption by 30%
- Reduce maintenance costs by 50%
- Eliminate noise, pollutant gases and particulates
- Established in 2007
- In house expertise
- Free technical advice
- Excellent after sales support
- 2 year warranty as standard
- Tried, test and proven technology

"A really innovative company with a great product and a professional, competent and friendly team..." Paula Pollard - Ecotecture

"Firefly's portable solar generators are an important capital investment to ensure the footprint of our Event Recycling activities are minimised."

Patrick McGuirky - Recycling Director Coca-Cola Enterprises

"...ethically sound, inventive, technically brilliant, internationalist, passionate. " Thurstan Crocket - Sussex Eco Awards Head of Sustainability Brighton & Hove City Council

RENTAL SPECIFICATION

Firefly's own fleet of hybrid power generators have been deployed in a wide range of locations, weather conditions and and withstood the constant heavy use of the hire market. The product design has been constantly refined and upgraded to ensure robust, reliable products suitable for any challenge including in tropical and desert environments.

TECHNICAL EXPERTISE

Since the Company was founded the team has developed considerable expertise in a wide range of technologies, through a combination of research, testing and field trial. This experience means that you can be reassured that Firefly products offer reliability, superior functionality and value for money.



BESTIVAL

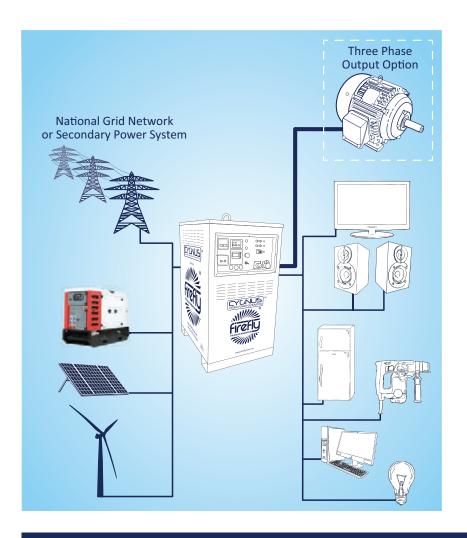
Firefly Solar returned to Bestival for the fourth year in a row, to put the solar power into the Solar-Powered Bandstand. Firefly's Cygnus hybrid generators powered the stage for the duration of the four day festival, supplying reliable, silent and emission-free power. This was a significant contribution to the aim of making Bestival 'an even greener and more environmentally friendly event'.



Stand Alone: Pure Solar Power

The essence of Firefly Solar Generators is to harness the energy of the sun and to store the power for when it is needed. For temporary or semi-permanent applications such as outdoor events or construction site offices, Firefly provides a clean, silent and autonomous supply of power.

Firefly Solar Generators can provide power for lighting, HVAC (heating, ventilation and air conditioning), household appliances, security systems, consumer electronics, telecoms, office equipment and power tools. The product range uses Swiss made pure sine wave inverters making the Firefly Solar Generators suitable for sensitive electronics such as PA systems and broadcast equipment.

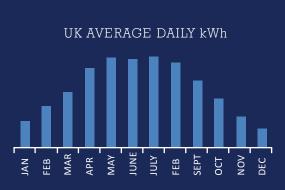


Firefly Solar Generators
provide integration of
multiple power sources
— not just solar PV. Power
storage and intelligent power
management is at the heart of
the system.

Other features include:

- Pure sine wave
- Single or three phase
- Extended run times
- Multiple safety functions
- Programmable controls
- Hook and forklift mountings
- Compact design
- Weatherproof

The amount of power from solar PV varies over the year and with weather conditions, but Firefly expertise will ensure the PV and battery capacity is aligned to the power demand. A correctly specified stand-alone PV system could deliver 365 days a year eliminating the need to re-fuel or service a generator. PV is very reliable and extremely efficient.





RUSSIA.SOCHI.PARK – LONDON 2012

In Kensington, London a preview event was held to highlight the host city for the 2014 winter Olympics: Sochi. Firefly Solar provided a stand-alone solar power system that ran for two months. The power was used for security offices. In addition to providing silent, exhaust free power, the system saved over 2,600 litres of fuel and six tonnes of CO2.



Back Up Power:

Protection against mains grid failure is essential for a range of domestic, commercial, telecommunications, broadcast and medical equipment such as fridges, computers and emergency lighting. Building on Firefly Solar's expertise and hybrid power management capability, seamless power delivery from battery storage can be provided for critical systems in the event of primary power source failure.

In addition to battery storage, Firefly Solar can also include alternative power sources such as solar power or diesel gen set to maintain critical equipment during sustained failure of the primary power source.

Low Cost of Ownership - Significant Savings

Hire	Lease	Cash Purchase
Ideal for short, one off	Spread the cost in	Optimise use
or infrequent power needs	line with fuel savings	of tax allowances
No maintenance, servicing or repair	Off-set cost as operational expenditure	Realise full fuel saving in operational budgets
Full onsite support or	Service and	Extended warranty
equipment only packages	maintenance packages	and maintenance

Firefly products are available for lease, sale or hire. Following an initial enquiry, the team will confirm detailed system requirements including preferred purchase route. Firefly products will work with almost all existing diesel or petrol generators, so there is no need for additional expenditure to see the benefits of hybrid power. Using a Firefly unit could deliver fuel savings of 40,000 litres a year.*

Lease

A Firefly Cygnus Hybrid Power Generator costs from as little as £63.23 a week**, whilst saving as much as 770 litres in fuel.

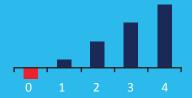
Cash Purchase

Prices start from £3,950 and could payback in less than 6 months.

Hire

For short term requirements, Firefly can provide a range of equipment and services. Prices start from £150 per week.

Cummulative saving of £85,000 in 4 years***





- Based on 100 kVA generator reduced to 12 hours run time a day in conjunction with a Firefly Cygnus unit.
- ** Finance based on Cygnus 3.5/12 over 3 years.
- *** Based on 89p per litre of diesel and annual savings of 40,000 litres.

Cygnus™ Hybrid Power Generator 3.5-5kVA

Simple "plug and play" connectivity means Cygnus is operational in less than 5 minutes. Truly portable with lifting ring and forklift pockets, the unit provides flexible power for a range of standby, back-up and base load applications. Parallel and series modular connectivity offers as much as 15 kVA peak power or 3 phase output. Stand-alone delivers silent and emission free performance, saving fuel and maintenance



Product features

- Up to 5kVA 240V 50Hz continuous output
- 12kVA peak output
 (5 seconds)
- 18kWh stored energy
- IP44 rated
- Pure sine wave Swiss made inverter
- Hybrid or stand-alone operation
- Single or three phase configuration

Options include:

- Power Storage Extender Pack
- Solar Prep
- Remote Monitoring Kit
- Road Tow
- Harsh Environment Kit Hot
- Harsh Environment Kit Cold





Cygnus Technical Data

MODEL	CYG/3.5/12	CYG/5.0/12
Continuous Output @ 25°c	3.0kVA	4.5kVA
Peak Power Output @ 25°c (30 minutes)	3.5kVA	5.0kVA
Peak Power Output @ 25°c (5 seconds)	9.0kVA	12.0kVA
AC Output Voltage (50hz)	240V	
AC Input Current Max	32A	
AC Output Current Max	20A (32A with external AC source connected)	
Inverter Protection	Overload, Overheat, Short Circuit, Low Battery, Excess Battery Voltage Ripple	
Power Storage Capacity	12kWh**	
Earth Fault Protection	40A 30mA RCD	
Power Output Connection	1x32A 240V SP CEEform	
Power Input Connection	1x32A 240V SP CEEform	
Charging Time From Mains Supply	7.5Hrs	
Auxiliary Connection (Remote generator Start) Bulgin Buccaneer Mini400 4pin 9 (2 programmable Aux relays)		
Battery Monitoring	LCD Battery Monitor (Voltage/PowerIn/Out/% Capacity Available/Time Available/State of Charge History)	
Parallel Capabilities (Single Phase)	Up to 3 units in parallel - only using	equal specification models
3 Phase Capabilities	3 equal specification models can be configured L1, L2 & L3 (Contact Manufacturer)	
Set up time	5 minutes	
Water/Ingress Protection Rating	IP44	
Operating Temperature Range	-5°c to +45°c	
Weight	676kg***	
Power Storage Extender Pack	6kWh additional storage**	
Solar Prep	MPPT controller with up to 2.5kWp array connection	

 $^{^{\}ast}$ $\,\,$ All upgrades available pre or post purchase of main unit.

^{**} kWh ratings based on C20 battery ratings and 60% DOD (Depth of Discharge). Depth of discharge set at factory to ensure life cycle of battery bank. Adjustable if required.

^{***} Power Storage Extender Pack option increases weight by 244kg.

Cygnus™ Hybrid Power Generator 12-24 kVA



Product features Up to 24kVA 240V 50Hz continuous output

- 63kVA peak output (5 seconds)
- 46kWh usable stored energy
- IP44 rated
- Rental specification
- Backup or stand-alone operation
- Remote generator start

Cygnus HPG connects to diesel generators to reduce fuel consumption by up to 30%.

Similar to hybrid car technology, HPG's built-in intelligent load management switches between internal battery storage and an external diesel generator automatically. HPG reduces carbon emissions, eliminates noise and exhaust fumes in an IP44 rated rental specification canopy.

This is Firefly's most versatile power solution yet, for applications such as primary, standby and emergency power in a wide range of industries including live events, broadcast, construction, facilities management and disaster response.

Options include:

- Power Storage Extender Pack
- Solar Prep
- Remote Monitoring Kt
- Road Tow
- Harsh Environment Kit Hot
- Harsh Environment Kit Cold



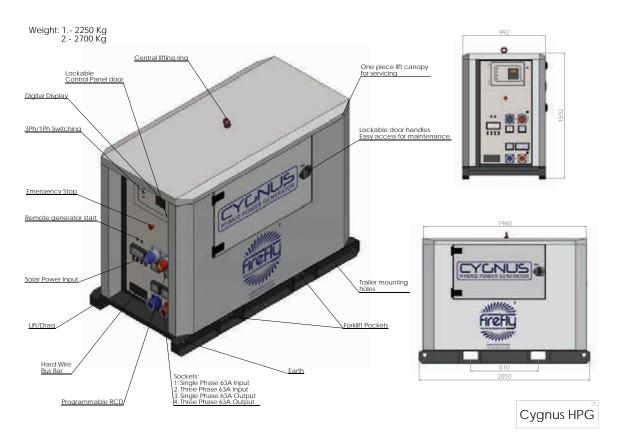
Up to 48 kWh autonomous run time

Cygnus HPG Technical Data

MODEL	CYG/12/36	CYG/18/36	CYG/24/36
Continuous Output @ 25°c	10.5kVA	15.0kVA	21.0kVA
Peak Power Output @ 25°c (30 minutes)	12.0kVA	18.0kVA	24.0kVA
Peak Power Output @ 25°c (5 seconds)	31.5kVA	45.0kVA	63.0kVA
AC Output Voltage (50hz)	240V / 415V		
AC Input Current Max	63A 3 phase		
AC Output Current Max	63A 3 phase with external AC	source connected	
Inverter Protection	Overload, Overheat, Short Circ	cuit, Low Battery, Excess Batter	y Voltage Ripple
Power Storage Capacity	36kWh**		
Earth Fault Protection	63A 1 pole 100mA RCD, 63A 3	pole 100mA RCD	
Power Input Connections	1x63A 240V SP CEEform, 1x63A 400V 3P+N+E CEEform		
Power Output Connections	1x63A 240V SP CEEform, 1x63.	A 400V 3P+N+E CEEform	
Charging Time from Mains Supply	7.5Hrs		
Auxiliary Connection (Remote generator start)	Bulgin Buccaneer Mini400 4pii	n 9 (2 programmable Aux relay	s)
Battery Monitoring	LCD Battery Monitor (Voltage , State of Charge History)	Power In / Out / % Capacity A	vailable / Time Available /
Set up time	5 minutes		
Water/Ingress Protection Rating	IP44		
Operating Temperature Range	-5°c to +45°c		
Weight	2250kg***		
Power Storage Extender Pack	12kWh additional storage*		
Solar Prep	MPPT controller with up to 5kWp array connection*		

 $^{^{\}ast}$ $\,\,$ All upgrades available pre or post purchase of main unit.

^{***} Power Storage Extender Pack option increases weight by 450 kg.



^{**} kWh ratings based on C20 battery ratings and 60% DOD (Depth of Discharge). Depth of discharge set at factory to ensure life cycle of battery bank. Adjustable if required.

Pictor Hybrid Power Generator™

Pictor is a versatile addition to the Firefly range. Ideal where lower power is needed or where space is restricted. Other applications include UPS for diesel generators or where there is poor grid connection. It can be charged using Firefly's Solar PV Fold-Array, or with mains supply via the internal AC/DC charge unit. The multi-purpose Pictor has been designed to double as a lighting tower. Automatic twilight switching saves time for staff.

Product features

- Up to 1.4kVA 240V 50Hz
 continuous output
- 3.3kVA peak output (5 seconds)
- 4kWh usable stored energy
- IP44 rated
- Pure sine wave Swiss made inverter
- Backup or stand-alone operation
- Tower light mode with twilight switching





Options include:





- Towerlight Kit
- Auto stop/ start for gen sets
- 110V/60Hz inverter

Pictor Technical Data

MODEL PIC/1.4/6 Continuous Output @ 25°c 1.1kVA 1.4kVA Peak Power Output @ 25°c (30 minutes) 3.3kVA Peak Power Output @ 25°c (5 seconds) 240V AC Output Voltage (50hz) 16A **AC Input Current Max AC Output Current Max** 6A (16A with external AC source connected) <40ms **Transfer Relay Time Inverter Protection** Overload, Overheat, Short Circuit, Low Battery, Excess Battery Voltage Ripple 12V DC Output 10A 'Cigar' Socket **Battery Storage Type AGM** Sealed 4kWh **Battery Capacity** 16A / 30mA RCBO **Earth Fault / Overload Protection Power Output Connection** 1x16A 240V SP CEEform 1 x 240V Neutrik Powercon Socket **Auxiliary Power Output Connection Charging Time From Mains Supply** 7.5Hrs **Battery Monitoring** LED State of Charge Battery Monitor Set up time 5 minutes IP44 **Water/Ingress Protection Rating Operating Temperature Range** -5°c to +45°c Solar Power Provision Internal 30A Charge control with 30A MC3 Connection **Dimensions** W:600 x D:485 x H: 810 (mm)



Product features

- Up to 750 VA 240V 50Hz
 continuous output
- 1.4kVA peak output (5 seconds)
- Modular 1.3 kWh stored energy
- IP44 rated
- 'Hot swap' PowerStorage Extender
- Ultra compact and hand portable



Pyxis is the hand portable, modular Solar Generator that is ideal for small events, exhibitions and working in remote locations. Providing in excess of 15 hours run time for a laptop or television it is equally applicable for commercial or leisure use. Mains or solar PV charging is possible. The stackable extender units allow rapid and easy expansion of capacity whatever the requirement.



Options include:

- Power Storage Extender
- Solar Prep
- 110V/60Hz inverter



Pyxis Technical Data

Dimensions

Weight

Model PYX/750/40/12 Continuous Output @ 25°c 700W Peak Power Output @ 25°c 1400W 230V AC Output Voltage (50hz) **AC Output Current Max** 6A **Inverter Protection** Overload, Overheat, Short Circuit, Low Battery, Over Voltage 12V DC Output 50A Anderson **Power Storage Capacity** 1.8kWh (inc Battery Extender) **Power Output Connection** 1x16A 240V SP CEEform Set up time 5 minutes Water/Ingress Protection Rating IP44 -5°c to +45°c **Operating Temperature Range** Internal 30A Charge control with 30A MC3 Connection **Solar Power Provision**

W:560 x D:350 x H: 340 (mm)

28Kg



Case Study: Team Columbia-HTC

Columbia-HTC wanted to create a Europe-wide brand experience as part of their team sponsorship during the Tour de France. Using PedGen consumers were able to charge their mobile phone whilst riding an official team bike. Using the Firefly YouPower meter race fans were able to compare their power output to a range of household appliances, as well as that of the professional cyclists in the team.







PedGen is Firefly's flagship "people power" product. PedGen is a small generator attached to a standard bicycle which is capable of charging or running small low power devices, such as mobile phones, tablets, laptops and printers. Alternatively the power can be used to charge Firefly Hybrid Power Generators, so power can be used to run larger mains voltage appliances.

PedGen has proved particularly popular as part of interactive displays for brands such as HTC, Epson, Nissan and Timberland. Furthermore, PedGen has been included as the centre piece in educational displays and permanent playground installations.

Firefly has developed a range of Kinetrics products including the LumberGen, HamGen, TeedleGen and WhirlyGen – all based on well-known playground rides.

PedGen Technical Data Sheet

Model	KIN/PED/250/12
Output Voltage	12.5V DC
Generating Capacity (battery charging)	250 Watts
Generating Capacity (running 12V DC consumers)	12A
Connections (battery charging)	1 x 50A 12-24V DC Red SB50 Anderson
Connections (12V DC consumers)	Multi-Contract MC3
Bicycle Compatibility (wheel)	24" - 700c (28")
Dimensions (mm)	W: 525 x D: 470 x H: 180
Weight (kg)	9

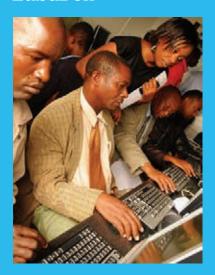
Containerised Power

Firefly designs, builds and installs containerised hybrid power systems from 3.5kVA to 100kVA. Whether for use as offices or for communities, corporate demonstration or as larger standalone hybrid power solutions; Firefly has the expertise and technical capability to meet your requirements.

Firefly offers a range of standardised office spaces with integrated solar power and storage, for applications such as internet cafés or medical centres. Bespoke systems can be designed to meet the power needs of larger installations and sites, either on a permanent or temporary basis.



Case Study: ZubaBox



The UK charity Computer Aid approached Firefly to develop a self-contained, portable internet café. ZubaBox uses solar power to run the internal computer network and satellite uplink, in areas without mains power or fixed line internet connections. The concept has proved extremely successful with ten Zubabox café's deployed in 4 countries across sub-Saharan Africa.





About Us

Open / Terminate

Power On / Off

Firefly Solar Generators Ltd supplies dependable, emission free and silent power generation. Since its formation in 2007 the Company has developed considerable expertise and technology in the fields of solar PV and power storage; particularly for portable and temporary applications. The team at Firefly continues to build on its experience and reputation gained in the outdoor events industry by offering a practical alternative to diesel generators. Recognising the importance of dependable power supply, the Company offers integrated and modular hybrid power systems — demonstrating its commitment to providing a range of flexible power management solutions for customers.

RCD Override

PRODUCT QUALITY

Firefly Solar Generators are assembled at the Company's UK factory, under an ISO 9001:2008 approved quality control system. Component suppliers are carefully selected to ensure high levels of reliability and performance of the final product. Installation and testing is carried out to ensure compliance with EU legislation. Firefly products are covered under a two year warranty for mechanical and electrical faults from date of purchase.

RELIABILITY AND SIMPLICITY

Five years of development and design refinement has delivered an extremely robust product. The Company continues to offer hire services, as this "hands on" experience of using the product is essential to understanding in-the-field performance. It also means that easy deployment, operation and low maintenance remain in the forefront of design objectives.

INNOVATION

Firefly Solar continues to identify new technologies and components as part of its drive to develop products that meet customer needs now and in the future. Customer feedback and market research form an important part of the product development process.

"Their solar product is beyond compare and several of our biggest clients are delighted that such a fantastic ecofriendly solution exists." Ian Irving Sledge Marketing

BESPOKE DESIGN AND BUILD

The Company has completed a wide range of complex bespoke system designs and build. Expertise and experience means that simple, cost effective solutions can be identified whatever the project. Please contact our Sales office to discuss your requirements.

DOMESTIC AND COMMERCIAL GRID

Firefly Solar undertakes design and installation of grid tie PV systems in the UK. The Company offers a free site survey and quotation service. As you would expect Firefly Solar is an approved installer under the Micro Generation Certification Scheme (MCS), certificate number ELC54741. The team has experience in design and delivery of systems ranging from 4 to 250 kWp. Solar PV installations continue to offer a very attractive return on investment, particularly when grid electricity prices inevitably rise year on year.

BESPOKE SOLAR PUMP PROJECT

Firefly Solar installed a solar powered pump to collect a legacy oil spillage that had contaminated the ground near a rail yard. The solar pump will gradually remove the oil as it slowly drains into a purpose built underground trap. Firefly Solar undertook the system design and installation alongside the main site contractor.





"Andy and his team at Firefly have demonstrated their commitment to excellence through their R&D into hybrid power generation systems (HPG). Their approach is one of business-sense, matching their innovation with market need, without compromising their focus on sustainability"

James Caan. Dragon's Den and Berti Accelerator

WARRANTY

Firefly offers a comprehensive two year parts and labour warranty from date of purchase which means that in the unlikely event of a fault; this will be repaired at no cost to the customer.

AFTER SALES SERVICES

Firefly's after sales support covers a wide range of services. Firefly products already benefit from minimal maintenance, as there are no mechanical parts. However, regular inspection is advisable. Firefly will tailor service and inspection to each customer's needs to include electrical safety testing of all critical components. Firefly is a distributor and service engineer for key component manufacturers, which means that the Company's in house expertise is underpinned by a close relationship with these suppliers.

Firefly product design means that customers can request equipment upgrades at any time. Additional options such as Solar Prep, Remote Monitoring, Power Storage Extender Pack or Harsh Environment Kits can be installed at the customer's convenience.

Training for customer staff is offered for all new product purchases, but additional training support is included as part of the After Sales Support package. This can be provided on site or at Firefly HQ. Firefly also provides telephone support for customer engineers for trouble shooting and minor repair.

CERTIFICATION AND APPROVALS

In addition to ISO9001 and MCS certification, Firefly is Part P approved and all products are CE marked for compliance with relevant EU legislation.

ENVIRONMENTAL POLICY

Firefly operates a 0% of waste to landfill policy. All waste items that can be recycled are split-up and collected by an accredited recycling company based locally. Waste that cannot be recycled is sent to a local energy-from-waste plant where energy, locked in the waste, is released to generate electricity.

At the end of product life, Firefly will accept return of equipment for recycling and breakdown in order to ensure safe disposal of specific items such as lead acid batteries. These are passed onto a company that is a member of the BRMA and registered with the Environment Agency as a hazardous waste producer. All electrical waste disposal is WEEE compliant.

AWARDS AND RECOGNITION

Over the years Firefly has received accolades from a range of organisations including:

- Shell Springboard Awards
- Green Business Awards
- National Outdoor Events Association
- Event Industry Awards
- Sussex Eco Awards

Firefly Solar Generators Ltd

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www.fireflysolar.net

the inventiveness of small
companies in the face of big
challenges from climate change
and the rising demand for
energy... Firefly Solar embody
this idea to the core."
Angus Gillespie
Vice President for CO2
Shell



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