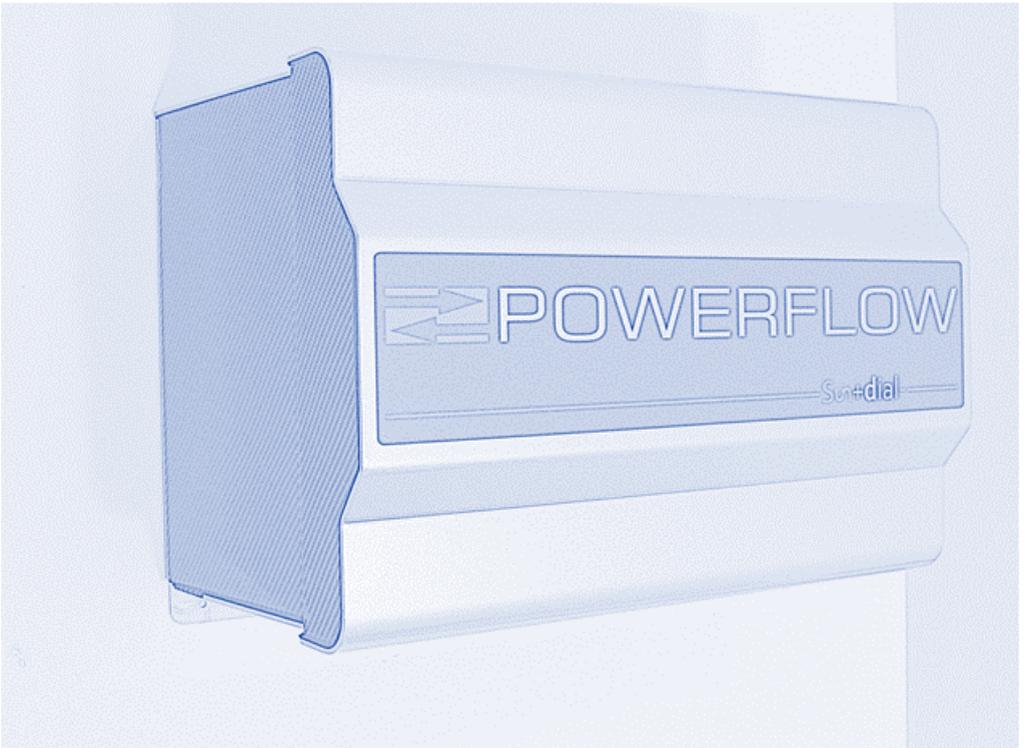


Important Information for your PowerFlow:

Sundial M
Sundial MT
Sundial S

- **User Manual:** FOR THE CONSUMER
- Product Identification Information
- Warranty Information

IMPORTANT INFORMATION: DO NOT DISCARD



Thank you for choosing PowerFlow

PowerFlow's Mission is to continually develop efficient energy storage technologies in order to increase the availability of low carbon generated power. This will contribute to CO2 reduction and help to protect our planet for future generations, something all of us at PowerFlow are very passionate about.

Over five decades of combined experience has been deeply integrated into your Sundial product. From its class leading efficiency, to the highest of safety standards, every component has been carefully considered to ensure long lasting reliable operation. All of our products are fully designed and 100% manufactured in the UK at our factory in Herefordshire, helping to support Great British manufacturing. By purchasing Sundial, you are supporting the development of this important technology so future generations can benefit and prosper from cleaner, greener more sustainable energy.

Ian Murray: Managing Director
PowerFlow Energy Ltd

Register Your Product.

Don't forget to register your product on the PowerFlow website. This will extend your 2 year standard warranty for an additional 3 years absolutely free.

Visit: www.powerflowenergy.com/warrantyregistration

Contact Us

If you have any questions about our products, our website is designed to provide support. Should you not find what you are looking for, you can contact us using the details below.

website: www.powerflowenergy.com

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Tel: 01452 421271
Email: info@powerflowenergy.co.uk



Made in England

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1. Introductory Information

1.1 Validity

PowerFlow Sundial fully complies with all EC safety regulations for use within the European union. This manual describes to the user how the Sundial operates and covers warranty and product identification information. For further installation, commissioning and maintenance procedures refer to the Sundial Installation Manual. This manual covers the following devices:

- Sundial M (SDM-1.5-500-10)
- Sundial MT (SDMT-1.5-500-10)
- Sundial S (SDS-1.5-500-10)

1.2 Visual Inspection

Following installation, visually check the device and cables for any signs of external damage. Contact your supplier if you find any damage. DO NOT perform any repair work yourself.

1.3 Maintenance and Cleaning

If the Sundial enclosure is dirty and the visibility of the LCD display is limited, clean with a damp cloth. Sundial has an automotive finish, therefore for stubborn stains and light scratches, an automotive granular cleaner and automotive polish can be used for improved results. Do not use corrosive substances or abrasive cloths for cleaning as they may damage the paint work.

1.4 Glossary of terms

The following terms are used within this manual.

AC: Abbreviation for 'Alternating Current' a term used for grid supply electricity.

DC: Abbreviation for 'Direct Current' a term used for electricity stored within a battery.

Energy, or kWh: Energy is measured in Wh (watt hours), kWh (kilowatt hours) or MWh (megawatt hours). The energy is the power calculated over time. If, for example your Sundial system operates at a constant power of 500W for 2 hours then the system has delivered 1kWh of energy into the building.

Power: Power is measured in W (watts), kW (kilowatts) or MW (megawatts). Power is an instantaneous value. Sundial displays the power currently charging (input power) or discharging (output power) from the battery.

PV or Solar: Abbreviation of photovoltaic. This may also be called the solar PV system or generator.

National Grid or grid: A term to refer to the national electricity supply network

Import: A term used to reference energy imported or used from the national grid by the house

Export: A term used to reference solar energy being fed onto the national grid from the house

RCD: Abbreviation for 'Residual Current Device' a term used for an electrical safety disconnection device.

MCB: Abbreviation for 'Miniature Circuit Breaker' a term used for an electrical safety disconnection device.

1.5 Country Regulatory Network Parameters

Note: Under local grid disconnection parameters, Sundial M and Sundial S are NOT able to provide backup power during a power cut and have been designed solely for grid connection energy storage applications only.

Using Sundial in the UK

Sundial is pre set by default with the G83/2 regulatory standard to enable parallel connection with the UK public electricity network. These parameters ensure that during a power cut, electricity from the battery cannot be distributed onto the public grid. The pre installed country set can be seen on the boot screen

Using Sundial outside the UK

The default shipping parameters during manufacture are G83/2 for use within the UK electricity network. The country set cannot be changed after shipping by either the installer or the user.

The country set can be changed during manufacture for use in other countries. In addition to the appropriate country set being ordered, it is recommended that any local connection permission required is also sought prior to ordering. A list of available country sets is listed below. Please contact PowerFlow Energy if a particular country set is required prior to ordering.

On the boot up screen, check to ensure that the correct country set has been supplied.

Supported country sets:

G83/2: UK.

VDE4105 (VDE0126): Germany, Austria, Switzerland, Poland.

CEI-021: Italy.

EN-50438: Slovenia, Ireland, Estonia.

2. Safety Precautions

2.1 Appropriate Usage

PowerFlow Sundial is a grid connected battery storage system designed solely to be used together with any grid connected solar PV or wind generation system. It is not designed as a battery back up system or to be operated in off grid situations.

Do not use Sundial for any other purpose other than described in the installation and user manuals. Alternative uses or modifications to Sundial are expressly NOT recommended. Any other use will void any warranty claims and operation permission.

2.2 Safety Instructions

The following terms will be used throughout this manual. Please observe the safety instructions.

DANGER: Danger to life due to AC and DC voltages.

- Electric shock risk due to voltages inside the Sundial device.
- DO NOT open the Sundial device.
- Even when the external supply has been disconnected, DC voltages are still present inside the device.
- Children may not play with or have access to Sundial.

WARNING: Risk of injury or damage to property.

- All installation work should be carefully considered.
- Children may not play with or have access to Sundial.

CAUTION: Adhere to all recommendations during installation, operation and use

2.3 Safety Notices

WARNING: Risk of injury due to heavy lifting

PowerFlow Sundial is designed to be as light weight as possible and is suitable for wall mounting. However, even lithium battery technology is inherently heavy in home storage applications due to the large capacity required.

CAUTION: Sundial weighs more than 25kg and should NOT be lifted by a single person. The carton has carry handles at either end and should be carried by two persons at all times.

During installation care should be taken when selecting a mounting location, fixing the wall bracket and lifting Sundial into place. Two persons should be present at all times during this operation.

DANGER: Risk of electric shock

DO NOT remove cover, exposed conductive parts inside

PowerFlow Sundial is designed to be full integrated and simple to install. It is recommended however, that all electrical work is carried out by a competent electrical professional and all local electrical standards, such as BS7671 and other local regulations are observed prior to installation.

3. Product Description

PowerFlow Sundial is a grid connected battery storage system which converts surplus AC electrical energy, or export, from any grid connected solar or wind generator into DC electrical energy for energy storage. When there is no longer surplus energy from the generator Sundial re-converts the stored DC energy back to AC energy to use distributed within the building.

By performing this function, surplus energy generation, which is unable to be used, can be stored and used at a later time when demand is greater than generation. This results in less energy consumption and in turn leads to cost savings.

Sundial is completely independent from the solar or wind generator other than it uses a current measurement device or CT to calculate in which direction energy is flowing and how much energy is available for storage.

Sundial performs energy capture and release purely based on this measurement. This enables Sundial to work during any time of the day or night and, together with the solar or wind generator, to ensure that maximum energy capture is possible.

During times when export occurs, the amount of energy available continually changes due to changes in generation and changes in building demand. Sundial automatically adjusts it's charging input every 200 milliseconds to match export levels ensuring that only surplus energy is used to charge the battery.

During times when demand is greater than generation, i.e. at night or on cloudy days, the amount of imported power continually changes due to changes in electrical load and changes in network supply voltage. Sundial automatically adjusts it's power output every 200 milliseconds to match import levels ensuring that storage energy being released is only used within the building and does not get exported.

This method of fast accurate power measurement, combined with fast reacting automated self adjusting charge and discharge power, makes Sundial unique. By utilising these control techniques, the maximum possible self consumption can be achieved through the system.

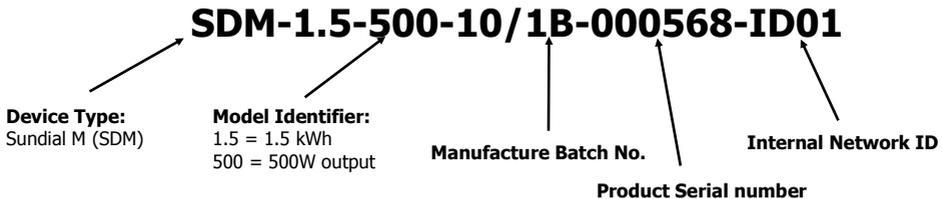
3.1 Product Identification

Sundial M and Sundial S communicate with each other via a CAT5e cable which transmits the RS485 communication protocol. Sundial M acts as the controller for the entire system, giving instructions to additional Sundial S units on when to charge and discharge power. In order for Sundial M to communicate, each Sundial device is factory set with an internal ID.

When multiple Sundial S devices are connected in the same system, each device ID **MUST** be different in order for Sundial M to communicate with all devices. If two of the same ID numbers are connected in the same network, Sundial M will not be able to identify two separate devices and the system will not function correctly.

IMPORTANT: Please ensure that different ID numbers for each sundial S device exist in the same network.

Each Sundial device is assigned a unique identifier, which incorporates a unique product reference, part code and network ID number. The network ID for Sundial M and MT is always ID01. The Network ID's for Sundial S range from ID02—ID16. In three phase installations, each phase is treated separately meaning there is no connection between phases. Therefore the network ID numbers can be repeated in each phase separately. The following example describes how the serial number is derived:



The type verification label below is a copy of that on the product, note the ID number. Each serial number is also registered at the time of shipping against the supplier it was supplied through. Please keep this information in a safe place for future reference.

Battery Capacity: 1.5kWh	Single Phase Operation Only	
Nominal Input Voltage: 230V/50Hz	Maximum Input Current: 2A	
Nominal Output Voltage: 230V/50Hz	Maximum Output Current: 3A	
Maximum Power: 500W	IP20	
SDM-1.5-500-10	SERIAL NUMBER	ID01

The serial number of this device has been recorded on page 18

3.2 Sundial Gateway

Sundial incorporates internal Wi-Fi communication for use with Sundial Gateway. Sundial Gateway is used to transfer information from Sundial via Wi-Fi to an online portal for monitoring purposes. Sundial Gateway is sold separately.

In order for the Gateway to securely access and communicate with Sundial, two unique ID codes are provided. These have been recorded in the user manual and should be left with the consumer. They will be required to be inputted into the Gateway on setup. During manufacture PowerFlow also records the ID codes against the serial number of the device, so should it be misplaced, please contact PowerFlow for assistance.

External Gateway Network ID 1

External Gateway Network ID 2

The Gateway ID numbers of this device have been recorded on page 18

4. Display and Control Elements

4.1 External Control Overview

Sundial contains the following control and display elements.

- **Green power LED indicator on the front right hand side of the device**

The green power LED indicator on the front left hand side of both Sundial M, MT and Sundial S devices indicates there is a mains power supply to the device.

- **LCD display for the communication of basic information (Sundial M, MT only)**

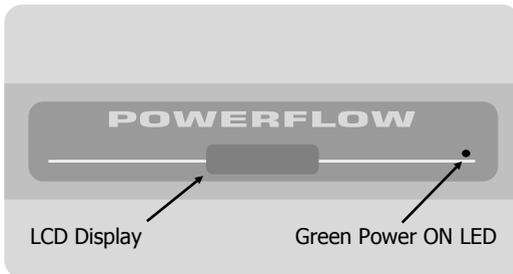
Sundial M and MT houses an LCD display with backlight. The backlight automatically dims when Sundial is in standby mode. This occurs when neither charging or discharging is possible, i.e when the battery is empty, or the battery is full, or the building is in a state of energy balance.

When operation continues the backlight becomes brighter to indicate operation.

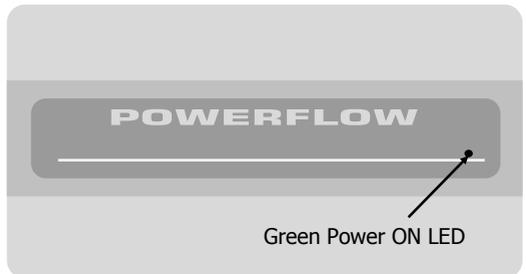
- **Night rate timer switch to turn the timer ON or OFF (Sundial MT only)**

Sundial MT incorporates a night rate timer function for charging the battery pack during economy 7 hours. This is a useful function during the winter months where multiple cycles per day can be used, capturing lower cost energy during night time and releasing it during high rate periods during the daytime. It is only applicable to buildings that have an economy 7 or economy 10 tariff already in place. The default position is OFF. When the night rate timer is switched to the ON position, the display will momentarily show 'NIGHT RATE TIMER ACTIVATED', The display will show 'TIMER ON' during the timer period. The timed period is factory set from 01.30am to 06.30am daily. When the switch is set to the OFF position, the display will momentarily show 'NIGHT RATE TIMER DEACTIVATED'.

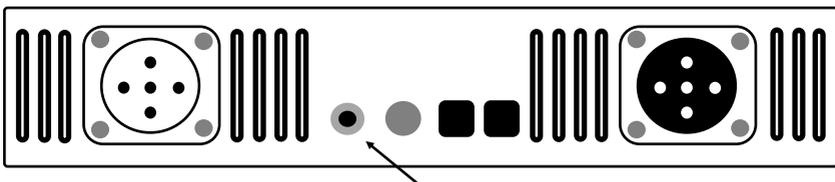
Sundial M



Sundial S



Sundial MT connection plate



Night rate timer ON/OFF switch

4.2 LCD Display Overview

Sundial M and Sundial MT house an LCD display designed to give live operational information to the user. The LCD display contains two lines which are both used on the home screen.

- The top line is dedicated to displaying the live power measurement of the building.
- The bottom line is dedicated to displaying operational and status information of the battery.

4.3 LCD Display Icons

The following icons are used on the home screen.



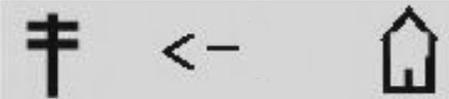
Grid Icon

Represents the electricity grid.



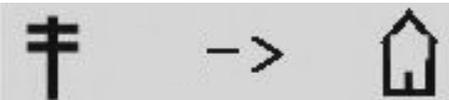
House Icon

Represents the house or building.



Energy Flow Arrow

If the arrow points from the house icon to the grid icon, this indicates power is being exported to the grid.



Energy Flow Arrow

If the arrow points from the grid icon to the house icon, this indicates power is being imported from the grid.



Battery Icon 1

Indicates the battery is empty.



Battery Icon 2

Indicates the battery is part charged.



Battery Icon 3

Indicates the battery is fully charged.



Battery Charge Icon

Indicates the battery is being discharged.



Battery Charge Icon

Indicates the battery is being charged.

4.4 Home Screen

The home screen displays system data and is updated every 2 seconds.

AC Power Value

Displays the amount of power being measured by the current clamp. This value is either import power or export power depending on the direction of the Energy Flow Arrow.

The DC power value is subtracted from the AC power value to give a true reading of the building energy balance during battery charge or discharge.



DC Power Value

Displays the amount of power being charged or discharged from the battery. PWR OUT indicates the battery is being discharged, PWR IN indicates the battery is being charged.

4.5 LCD Display Messages

In addition to the display icons, the following messages can be seen during operation.

Messages seen on Sundial M and MT:

Display Message	Description
PWR IN	The battery is charging from export solar power
PWR OUT	The battery is discharging stored power into the house or building
BATTERY EMPTY WAITING EXPORT	The battery has been fully discharged and the house continues to import power. With no solar export available to charge the battery, Sundial will remain in standby mode (display dimmed) until PWR IN is possible.
BATTERY FULL WAITING IMPORT	The battery has been fully charged and the house continues to export solar power. Sundial will remain in standby mode (display dimmed) until PWR OUT is possible.
BALANCED	The house is in a state where solar generation is equal to the house consumption or below the activation threshold for Sundial. In this situation, Sundial can neither charge or discharge the battery and will wait in standby until the energy balance changes.
COOLING	The battery has been charging or discharging at a high rate for a sustained period of time in a warm environment. The charging or discharging circuits have been disconnected to protect the battery and Sundial enters standby mode. Once the temperature has reduced sufficiently, PWR IN or PWR OUT will continue automatically.
NIGHT RATE TIMER ACTIVATED	The night rate timer has been switched ON using switch F on the connection panel (Sundial MT only)
NIGHT RATE TIMER DEACTIVATED	The night rate timer has been switched OFF using switch F on the connection panel (Sundial MT only)
TIMER ON	The night rate timer has been activated and has turned Sundial to charge mode during the timed period.

5. Warranty Information

5.1 PowerFlow Factory Warranty

Applies solely to the following products: **Sundial M, Sundial MT, Sundial S**

The statutory warranty obligation of the seller of your device is not affected by this warranty and remains fully valid for 24 months from the date of purchase from PowerFlow. For the above mentioned products, you receive a POWERFLOW extended factory warranty above the statutory 24 months period valid only if the warranty conditions are met:

If the device is registered on the POWERFLOW website at: www.powerflowenergy.com/warrantyregistration it will benefit from a five year warranty period from the date of manufacture. This is inclusive of, but does not affect, the statutory warranty obligation of 24 months.

The POWERFLOW factory warranty covers any costs for repair or spare parts during the agreed period beginning on the date of manufacture of the device, subject to the following warranty conditions. This is not associated with a durability warranty.

5.2 Warranty Conditions

Sundial is a non serviceable device. All internal workings are maintenance free. The removal of the cover is prohibited unless during service under express permission from PowerFlow. Any unauthorised removal of the cover will void any warranty.

Due to the nature of the battery technology used in the Sundial device, each battery pack holds a shelf life of 12 months. If the device remains in storage for longer than this period without use, this may reduce the expected life of the battery. In such circumstances, PowerFlow Energy Ltd cannot warranty the battery performance specified in the technical specification and as a result cannot honour any extended warranty period detailed above.

If a device becomes defective during the first six months of operation from date of purchase, the device will be replaced with a new equivalent product. Defects arising after the first six months will be covered under the POWERFLOW manufacturer warranty period and, unless this should be impossible or disproportionate, one of the following options will be selected at the discretion of POWERFLOW:

- Device repair at POWERFLOW, or
- Device repair on-site, or
- Exchange for a replacement device of equivalent value with regard to model and age.

In the latter case, the remainder of the warranty entitlement will be transferred to the replacement device and your entitlement will be documented at POWERFLOW. The term "disproportionate" as referred to above applies in particular if, as a result of the envisaged measures, POWERFLOW were to incur costs deemed unreasonable according to the following criteria:

- In view of the value that the device would have without the defect,
- Taking into account the significance of the defect, and
- After consideration of alternative workaround possibilities that POWERFLOW customers could revert to without significant inconvenience.

The factory warranty includes the costs of POWERFLOW for work and material for the restoration of faultless functioning in POWERFLOW's factory or for on-site repair work by POWERFLOW service personnel. All other costs, particularly shipping costs, travel and accommodation costs of POWERFLOW's personnel for on-site repairs as well as costs of the customer's own employees are NOT included in the factory warranty.

To determine the warranty entitlement, it will be necessary to either complete and submit the device replacement form at www.powerflowenergy.com/devicereplacement or email POWERFLOW at info@powerflowenergy.co.uk.

If the defective device was installed by a PowerFlow accredited installer, it will be necessary to contact them in the first instance. The type label on the device must be completely legible. Otherwise, POWERFLOW is entitled to refuse warranty services.

Defective devices, with a detailed error description and proof of purchase, will need to be sent to the POWERFLOW factory for fault diagnosis. If no error is found with the device, you will NOT be charged and the device will be returned to the sender. Shipping costs may be charged at the discretion of POWERFLOW.

If we agree to a replacement, we generally send an equivalent replacement device, packaged appropriately for transport, within ten working days. this time frame is not guaranteed.

5.3 Scope of Factory Warranty

The factory warranty does not cover damage that has occurred due to any of the following reasons:

- Transport damage
- Incorrect installation or commissioning.
- Failure to observe the user manual and/or the installation and technical manuals
- Removal of cover without prior service permission from PowerFlow
- Modifications, changes or attempted repairs
- Incorrect use or inappropriate operation
- Insufficient ventilation of the device
- Failure to observe the applicable safety regulations and appropriate standards. (e.g: BS7671, etc.)
- Public or private network supply problems outside of tolerance limits of the statutory guidelines
- Force Majeure (e.g: lightning strikes, storms, fire, flooding or water damage, etc.)

Neither does it cover cosmetic defects which do not influence the energy recovery.

Claims that go beyond the rights cited in the warranty conditions, in particular claims for compensation for direct or indirect damages arising from the defective device, for compensation for costs arising from disassembly and installation, or loss of profits are not covered by the manufacturer warranty, insofar PowerFlow Energy Ltd is not subject to statutory liability. In such cases, please contact the company that sold you the device. Possible claims in accordance with the law on product liability remain unaffected. POWERFLOW reserve the right to change the warranty conditions without notice. All claims arising from or in connection with this warranty are subject to UK law.

For further information, visit www.powerflowenergy.com under the section "Service".

5.4 EN Declaration of Conformity



EN Declaration of Conformity

The devices listed below have been developed, manufactured and/or tested according to the below mentioned EN directives.

- Electromagnetic Compatibility
- Generation Connection Requirements
- Low Voltage Directive and General Electrical Safety Requirements

PRODUCT(s)	Sundial M,MT	Sundial S
Electromagnetic Compatibility –3 (EMC) *	SDM-1.5/500-10	SDMS1.5/500-10
BS EN 61000-2-3-6: 2006: Limitation for harmonic current emissions in public low-voltage supply systems. Limitation of voltage fluctuations and flicker in public low-voltage supply	X	X
BS EN 61000-6-1: 2007: Generic standards. Immunity for residential commercial and light-industrial environments.	X	X
Electromagnetic Compatibility –4 (EMC)		
BS EN 61000-4-5:2011: Surge immunity tests.	X	X
BS EN 61000-4-11: 2004: Voltage dips, short interruptions and voltage variations immunity tests.	X	X
Generation Connection Requirements		
BS EN 50438: Requirements for micro-generating plants to be connected in parallel with public low-voltage distribution networks	X	X
VDE 4105: Technical requirements for the connection to and parallel operation with low-voltage distribution networks	X	X
G83/2: Connection of small scale embedded generators up to 16A per phase	X	X
Low Voltage Directive and General Electrical Safety Requirements		
BS EN 60335-1:2012+A11:2014: Household similar electrical appliances. Safety, General Requirements.	X	X
BS EN 62109-1-2: 2010: Safety of power converters for use in photovoltaic power systems. General requirements.	X	X
BS EN 50438: Requirements for micro-generating plants to be connected in parallel with public low-voltage distribution networks	X	X
EU Directives: 2006/95/EC, 2004/108/EC, CE, RoHs compliant	X	X
Device Operation		
F-POINT <i>technology</i> ®: Measurement and reaction time of control system	400ms	400ms

Information

Without written confirmation by Power Flow Energy, this declaration of conformity is no longer valid if:

- The product is modified, supplemented or changed in any other way.
- Components, which are not part of the Power Flow accessories list are integrated into the product.
- The product has not been used for its intended use laid out by the product specifications.

Signature:

Ian Murray .BSc Managing Director
PowerFlow Energy Ltd

6. Trouble shooting

Why does Sundial not switch ON?

Check that all MCB's, RCD's or fuses are in the ON position.
Check all isolators are in the ON position.

If the above have been verified, please contact your supplier for further support in the first instance.

I don't understand the display?

Refer to section 4 on page 9 of this manual for further details on the display.

How do I connect an additional Sundial device to my system?

If you already own a Sundial M battery storage module and would like to expand the system to a greater capacity, Sundial S can be integrated at a later date. A Sundial S module can easily be integrated into a new or existing system by connecting the main power cable and communications cable from Sundial M to Sundial S.

Please refer to page 7 of this guide for further information on product identification and to the installation manual for further system integration. The serial numbers and product codes identify internal network ID's. If you are adding a Sundial S device, the internal network ID must be different from one you already have. More information can also be found on the Product Identification Document supplied with your Sundial device.

What do the WI-FI network ID numbers mean?

Sundial is already embedded with WI-FI communication. PowerFlow are currently working on an internet gateway product that will allow information from the Sundial system to be viewed on your own portal via your PC or tablet. The ID numbers will be required for the connection of the gateway to your Sundial device. Please keep this information in a safe place for future reference. The gateway device will be available Summer 2016. For further information please visit www.powerflowenergy.com
Refer to section 3.2 on page 8 of this manual for further details.

I can't find what I'm looking for here?

If you can't find the answers to your questions in this manual, then for further information please visit www.powerflowenergy.com

You can also send us an email via our website at www.powerflowenergy.com/contact-us

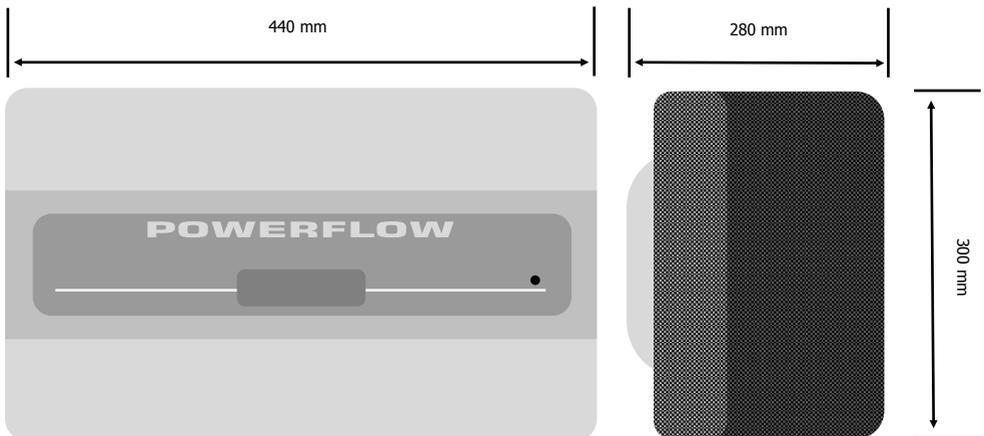
7. Technical Data

TECHNICAL DATA Product Code	Sundial M, MT (PF-SDM-1.5-500-10)	Sundial S (PF-SDS-1.5-500-10)
Battery		
Battery Type	1.8kWh Lithium Iron Phosphate (LiFePO4)	1.8kWh Lithium Iron Phosphate (LiFePO4)
Nominal Usable Storage Capacity	1.5 kWh	1.5 kWh
Number of Cycles (80% DOD)	> 6000	> 6000
Life Expectancy	10 Years	10 Years
Under/Over Voltage Protection	Yes	Yes
Under/Over Charge Current Protection	Yes	Yes
Under/Over Discharge Current Protection	Yes	Yes
Cell Balancing / Anti-Aging Protection	Yes / Yes	Yes / Yes
AC Input / Output		
Input / Output Voltage: Nominal / Range	230V / 180-270V	230V / 180-270V
Input / Output Voltage: Nominal / Range	50Hz / 47.5-55Hz	50Hz / 47.5-55Hz
Nominal Input Power	300W (6 x 50W adaptive steps)	300W (6 x 50W adaptive steps)
Nominal Real Output Power	500W (4 x 125W adaptive steps)	500W (4 x 125W adaptive steps)
Max Apparent Output Power	580VA	580VA
Reactive Power Factor Control	1 (Unity) 0.8cap, 0.8ind, Dynamic	1 (Unity) 0.8cap, 0.8ind, Dynamic
Inverter Topology	HF Transformer	HF Transformer
Start up power: Export / Import	50w / 125w	50w / 125w
Total Harmonic Distortion (odd)	<3%	<3%
Final stage conversion efficiency	96.1%	96.1%
Operational Data		
Max Number of Devices (per phase)	1	15
Max Number of Devices (per string)	1	7
Max Nominal Storage Capacity (per phase)	1.5kWh	22.5kWh +
Max Nominal Output Power (per phase)	500W	7500W
Input / Output Power Connection	Plug and Play (PowerFlow Speed-Fit)	Plug and Play (PowerFlow Speed-Fit)
Measurement and Power Control Method	F-POINT <i>technology</i> ®	F-POINT <i>technology</i> ®
Communication Bus / Connection	RS485-PFLIN / RJ45	RS485-PFLIN / RJ45
WiFi, Ethernet Access with web server	(available 2016)	(available 2016)
Ambient Temperature Range	-20°C to +60°C	-20°C to +60°C
Optimum Battery Temperature Range	+5°C to +40°C	+5°C to +40°C
Battery Charge Temperature Range	0°C to +45°C	0°C to +45°C
Full Battery Discharge Temperature Range	-20°C to +60°C	-20°C to +60°C
Cooling Concept	Convective (fan less)	Convective (fan less)

TECHNICAL DATA	Sundial M,MT (PF-SDM-1.5-500-10)	Sundial S (PF-SDS-1.5-500-10)
General Data		
Dimensions (L /H /D)	440 / 300 / 280 mm	440 / 300 / 280 mm
Enclosure Weight (Kg)	35	32
Mounting Type	Wall Hung	Wall Hung
Compatible with PowerFlow ERS immersion heating	Yes	Yes
Battery Enclosure Ingress Protection	IP56	IP56
Cooling Architecture Ingress Protection	IP20	IP20
Crystal Clear LCD Display / LED status indicators	Yes / Yes	No / Yes
Compliant Certification Standards	EN 50438, VDE 4105, CEI 0-21, G83/2, EN 62109-1, EN 62109-2, EN 61000-2-3-6, EN 61000-6-1, RoHS, CE	EN 50438, VDE 4105, CEI 0-21, G83/2, EN 62109-1, EN 62109-2, EN 61000-2-3-6, EN 61000-6-1, RoHS, CE
Anti-Islanding Protection	Yes	Yes
Backup Power Availability	N/A	(available 2016)
Export Limitation Control (compliance with DNO)	(available 2016)	(available 2016)
Night Rate (economy 7) charge timer	Sundial MT only	N/A
Country of Manufacture	England	England
Enclosure	Custom Aluminium Designed (sealed)	Custom Aluminium Designed (sealed)
Colour	Metallic Silver / Carbon Fibre	Metallic Silver / Carbon Fibre
External Touch Screen Display	(available 2016)	(available 2016)
Warranty*	5 Years / 6000 cycles	5 Years / 6000 cycles

*See the warranty document for further details on Sundial extended limited warranty conditions. (65% battery retention after 6000 cycles). Product specification is subject to change without notice.

7.1 Product Dimensions



8. Device Serial and Gateway ID Numbers

8.1 Unique Product Identification Number

		
Battery Capacity: 1.5kWh	Single Phase Operation Only	
Nominal Input Voltage: 230V/50Hz	Maximum Input Current: 2A	
Nominal Output Voltage: 230V/50Hz	Maximum Output Current: 3A	
Maximum Power: 500W	IP20	
SDM-1.5-500-10	SDS-1.5-500-10	ID01
		
		
		

8.2 External Gateway Network ID

External Gateway Network ID 1

External Gateway Network ID 2



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