



Automotive and Marine Power Systems

Market leaders in battery charging technology, on board power and power distribution.











Introducing LiFePO₄ Batteries ampsystems.co.uk





Solar Panels and Solar Regulators due in 2019

Global Distribution List

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Brief warranty statement and Sterling Power's UK location



2 years return to factory warranty. Sterling shall endeavour to replace the product or repair it within 5 working days of it being returned. Sterling is not liable for return carriage or additional labour. Lifetime repair policy after 2 years - If it is uneconomical to repair the product then a special discount may be offered on a similar product at Sterling's discretion. This only occurs if dealt with Sterling directly.



	UL 1236 SB
	CEC listed
	CSA C22.2-107.2
	Tested to CE standards
E	EN61000-3-2
	EN61000-3-3
	EN55014-1
	EN 55014-2
	EN60335-2-29
	EN ISO 13297
	EN 6100-3-2 Class A

ABYC RoHS

12V / 60A model,	all other u	inits pro rata
Input voltage range	e 80-2	70V 40-70 Hi
Power Factor at 23	30V	0.976
Efficiency		90.4%
Full load current (1	10/230V)	9.8/4.6A
Total Harmonic Dis	stortion	2.4% voltage
Total Harmonic Dis	stortion	2.4% curren
Ripple noise (R.M.	S.) 1	4mV
Ground leakage		0.5 mA
Generator/ mains	oower (wat	ts)
12V 20A approx	400W	-
12V 30A approx	500W	
12V 40A approx	700W	
12V 50A approx	850W	
12V 60A approx	1000W	
24V 20A approx	700W	
24V 30A approx	1000W	
voltmeter accuracy	· +/- 1	%
Ammeter accuracy	· +/- 1	%



Up to 3 isolated outputs. Each output can carry the full current rating of the charger. However, not all simultaneously - the total current is the charger's rating.

Cables not included with charger. Refer to page 46 for cables.

Additional Specification

-USA California Energy Commision (CEC) listed: CEC regulation stipulates that the charger is only on when necessary. This reduces AC power consumption and lowers operational costs while maintaining healthy batteries. (default setting is on, CEC can be turned off)

-Synchronized Rectification: Mosfet technology, increases overall efficiency over diode based chargers by approximately 8 percentage points.

-Automatic Desulphation / Equalization mode: 7-10 days cycle with anti-stratification program to keep batteries rejuvenated.

- Voltage + Current LED display: 2 LED matrix displays. Left side is the voltmeter and the right side is the ammeter.

- Performance monitoring LED bar: An LED display to show what rate the charger is operating at.

- Redundant safety system: In event of failure, the processor provides another system to shut off device, doubling security. The primary emergency backup is digital, the secondary system is analogue both are totally independent of one other.

- High temperature ambient operation rating: Most chargers are only continuously rated at 20 deg C (if even) this unit is rated at continuous operation at 40 deg C ambient.

- Multiple speed fan control: This reduces unnecessary fan noise experienced by the customer, even though the new extreme efficiency reduces the need for fans. At high ambient temperatures (40-50 deg C), however, fans would still be required to ensure operation.

- Thermostatically controlled force draft cooling: To ensure that when the cooling is actually required the noise level is a low as possible for the environmental and power conditions.

- The printed circuit boards are conformal coated: For high humidity and salt air operations.

– % power reduction: To allow unit to work with restricted power available (available on local control or remote control panel).

- Multiple chargers: Multiple chargers can be put in parallel to increase current rating. This is also great for redundancy.

∦



Basic wired setup cables not included



12V	40A		2	26	50 x 215 x 90	PCU1240	
12V	50A		3	3	15 x 215 x 90	PCU1250	
12V	60A		3	3	15 x 215 x 90	PCU1260	
24V	20A		2	26	60 x 215 x 90	PCU2420	
24V	30A		3	3	15 x 215 x 90	PCU2430	
36V *	20A		3	3	15 x 215 x 90	PCU3620*	
48V *	15A		3	3	15 x 215 x 90	PCU4815*	
Remote w / 5	m cable	0	.05	1	10 x 68 x 20	PCUR	
			* Built to Multi lan	UL12 guage	36 and CEC but main label over	not listed rlay sticker	
German main label overlay sticker						PCUG	
French main label overlay sticker						PCUF	
Spanish main label overlay sticker PCUS							

Bluetooth App shall display the same features has the PCUR (remote panel).

- Voltmeter
- Ammeter
- Charger output display bar Charging statuses
- Battery chemistry select
- Temperatures
- Voltage warnings.

A device, designed to be retrofitted to the remote port on the PCU, shall need to be bought and installed. This device has been designed to live inside the housing of the PCU (under the gray or red end cap). It can be stuck or bolted onto the bulk head that separates the AC and DC sides of the charger. Double tape or a screw through.

PCUB

Introducing the Bluetooth App

This app shall be available for both Android and Apple devices.

The latest Bluetooth 5 is being used.

This has a very impressive, unobstructed range of 1000m.



App appearances may change PCU bluetooth device part number: PCUB

Pro Charge Ultra Lite

ige utra Lite Multi stage | Fully Active PFC | Custom Charge Selection | 12V 20A / 30A | 2 outputs

Global Voltage 80-270VAC 40-70 Hz

(minor power reduction when AC voltage drops below 100V)

This new Pro charge Ultra Lite is aimed at the budget sensitive market. A common question shall be, what are the key differences between the Ultra and the Ultra Lite?:

- 1) The Ultra is larger due to it meeting the ABYC 40 Deg C+ high ambient temperature performance standards.
- 2) The Lite has an operational range in the 20 Deg C+ (a more common standard for non ABYC), thus, in a smaller body.
- 3) The Lite displays less information on the front panel but still a lot more than its competitors.
- Although built to UL standards, including fire resistant plastics etc, the Lite is NOT UL certified.
- 5) The Lite is not CEC certified, the Ultra is.

6) The Lite has temperature compensation, however, unlike the Ultra, the sensor is optional.

7) Cost, the Lite is lower cost

8) Outputs: The Lite has a max of 2 outputs suitable for most operations the Ultra has 3. PCU Lite has 2 years warranty the Ultra has 5 years.

230VAC performance is 30A DC | 20A DC 110VAC performance is 27A DC | 20A DC unit temperature dependent.

Truly Global Application and perfect for generators. The Pro Charge Ultra Lite shall work at AC voltages (80-270VAC and 40-70Hz) and DC voltages (130-320V).

Comprehensive 18 LED front panel. The dual function nature of the LED panel shall also provide voltage information, charging profile statuses and warning statuses.

Battery temperature sensing compensation and remote control (optional). Unlike our competitors this unit has battery temperature sensing and remote control port. The sensor and remote are optional extras. Temp sensor below (TSAY).

Battery daisy chain multiple battery high temperature system shutdown (optional). Where large numbers of batteries are being used our digital temperature sensor can be linked in a chain to shutdown the battery charger in event of any battery's exceeding 50 deg C.

> 8 pre-programmed charging profiles for AGM, Gel, sealed / flooded, calcium and lithium (LiFePO4) batteries. We also include a fully customizable option to allow the user to programme their own profile via the front panel.

Night time setting allows the unit to run at 1/2 power for a fixed time frame so the fan noise is reduced to a minimum.

Input voltage range

Ripple noise (rms)

voltmeter accuracy

Ground leakage

Efficiency

Power Factor at 230V

Total Harmonic Distortion

Total Harmonic Distortion

12V 30A approx 500W 12V 20A approx 350W

Generator / mains power (watts)

0.976 94.4%

14mV

+/- 1%

0.5 mA



Larger voltage / current requirements? The Pro Charge Ultra Lite series can be put in series or parallel with other Pro Charge Ultras. This is possible due to the chargers digital dynamic charging ability.

Float Modes and Energy Saving Modes.

You can force this charger into float mode (mid ~13V) intermittently or indefinitely. You can also put the charger into an Energy Saving mode. This mode saves energy by dropping the output voltage down to the voltage of a full battery (~12.8V). This ensures the battery is full and that the charger acts as a power supply when a load is applied to the battery.

Remote Control (Optional) LPCUR

Displays: Voltage / Warnings / Temperatures Can be used as an independent voltmeter measuring input battery voltage and output battery voltage.

- Force the unit to 1/2 current limit.



60 Deg C = 140 Deg F Digital Temp Sensor DAISY CHAIN

One of the world's most efficient chargers. This is courtesy of active power factor correction (PFC 0.99-1). and synchronised rectification The Pro Charge Ultra Lite is rated at over 90% efficient. PFC is an extremely important feature, please refer to Page 59. Non-active PFC chargers are approximately 65% efficient.

Power Pack / Power Supply. This charger works effortlessly as a power supply to DC loads to prevent depletion of your battery capacity.

Automatic Desulphation mode: 7-10 days cycle with anti-stratification program to keep batteries rejuvenated.

1/2 current mode. Reduce the charger's current by 50%.

> Perfect for generator use. Due to its active PFC tolerance of AC input it shall run from crude sine wave forms - typical from generators.

> Power Reduction you can set the charger to run at lower power outputs to complement a wider range of generators and low shore power connections.

Standards

Tested to CE standards EN61000-3-2 EN61000-3-3 EN55014-1 EN 55014-2 EN60335-2-29 EN ISO 13297

TSD60

Ultra Portable 7A Multi stage | Multi Chemistry | Adjustable current | 12V and 6V operation

Multi information LCD screen for

maximum information including:

Nominal charging voltage (6V / 12V).

Sterling has now integrated its high end algorithms for each battery type into a small and portable charger. With the Ultra Portable you get the same great performance from a portable charger as you would with a fixed charger. You can select between 6 different batterv chemistries, between 6V and 12V and between 3A | 5A | 7A charging rate. The portable charger can be wall mounted thanks to the wall bracket on the back of the charger.

Multi battery chemistry selection. Similar chargers only have one battery charging profile which fits all. This new portable charger has 6 preset charging profile (see table below) for each battery type, ensuring a fast and safe charging rate.

Automatic or manual start

up. Charger shall start

charging automatically after

30 seconds. This is incase you have cut the power or have had a power cut and

the charger shall resume charging and maintaining

the batteries.

Real charging voltage. Charging current. Battery chemistry select. Fault information. 28 STERL ING ower

The charger shall also remember which charging profile and current rating you have set and shall automatically resort to this setting when you turn the power on.

> Power reduction capability: The unit can be set to 3A | 5A | 7A



Can bring 12V batteries that have gone down as low as 4V back up to 12V.

Attractive packaging box,

Wall mounting storage bracket (included) on reverse side of the charger. Quick release for portable operation. Measurements denote centre of hole to hole.

ideal for retail.

Chemistry Charging Profiles

	Number	1	2 (default)	3	4	5	6*
101/	Profile	Gell/AGM I	Sealed LA / Lithium	AGM II	Open LA	Calcium	Desulph
IZV	Absorption (V)	14.1	14.4	14.6	14.8	15.1	15.5
	Float (V)	13.4	13.8	13.7	13.3	13.6	N/A
	Number	1	2 (default)	3	4	5	6*
6\/	Profile	Gell/AGM I	Sealed LA / Lithium	AGM II	Open LA	Calcium	Desulph
00	Absorption (V)	7.1	7.2	7.3	7.4	7.6	7.8
	Float (V)	6.7	6.9	6.9	6.7	6.8	N/A



Ultra Portable 6V / 12V 7A charger						
Region	V DC	L x W x D (mm)	Weight Kg	Code		
British	6V 12V	190 x 115 x 70	0.5	B127		
Europe	6V 12V	190 x 115 x 70	0.5	E127		
USA	6V 12V	190 x 115 x 70	0.5	A127		

Input voltage range

AC current at 230V

Efficiency

Power Factor at 230V

Total Harmonic Distortion

Total Harmonic Distortion

Ripple noise (R.M.S.)

Ground leakage

voltmeter accuracy

190-250V 50 Hz

0.90 ~0.6A

~80%

14mV

0.5 mA

+/- 1%

2.4% voltage

2.4% current

6 Stage Charging Curve -Charger set to Number 2 (14.4V bulk and 13.8V float). The charger shall pick up if a load is applied to the battery and re-establish boost mode

TA UIITA POTA

4 Faults on display.

6 stage battery charging.

UK + Europe + USA

plug models available

12V and 6V operation. The charger senses which voltage the

batteries are at and

adjust the charging

profiles accordingly.

View graph below.

- Fault 1 = High output voltage
- Fault 2 = High unit temp alarm
- Fault 3 = Reverse Polarity
- Fault 4 = Open circuit / Batt disconnected



Portable Battery Chargers (1A-6A)



Portable micro processor controlled chargers 230V AC 50Hz only							
Voltage(V)	Current (A)	Plug	L x W x D mm	Weight Kg	Code		
6V & 12V	3A	British	170 x 110 x 55	0.45	B123		
6V & 12V	3A	Euro	170 x 110 x 55	0.45	E123		

Portable micro processor controlled chargers 230V AC 50Hz only							
Voltage(V)	Current (A)	Plug	L x W x D mm	Weight Kg	Code		
6V & 12V	4A	British	160 x 60 x 45	0.6	B124		
6V & 12V	4A	Euro	160 x 60 x 45	0.6	E124		



Portable Battery Chargers	1A	3A	4A	5A	6A
LED display, indicates charging status and faults.					
Fault diagnostic system.					
Over heat / short-circuit / reverse polarity protection.					
Low input voltage and over voltage protection.					
Suitable for use with long term float / storage of battery.					
Constant 13.9V charge.					
Automatic 4 stage charging profiles.					
Adjustable charging current rates.					
Battery rejuvenation, pulse function (de-sulphation cycl	e).				
Insulated charging clips.	Ó				
Suitable for outdoor use in dry conditions only.	-				
Battery Ah capacity rating, up to 120Ah:					
Choice of either British or European plugs	Ŏ	Ó			
Auto start up	•			Ŏ	
6V (and 12V charging) battery charging options	-	•			
ov (and 12v charging) battery charging options		•		•	

Portable slow charge battery maintainer 230V AC 50 Hz only							
Voltage(V)	Current (A)	Plug	L x W x D mm	Weight Kg	Code		
12V	1A	British	135 x 50 x 40	0.35	B121		
12V	1 A	Euro	135 x 50 x 40	0.35	E121		

Portable Global Smart Charger 12V-5A / 24V-2.5A



Plug type	Input (VAC)	Output (VDC)	Current (A)	Weight Kg	Code
British	110-230V	12V	5A	0.4	GS125E
Euro	110-230V	12V	5A	0.4	GS1258
USA	110-230V	12V	5A	0.4	GS125A
British	110-230V	24V	2.5A	0.4	GS243E
Euro	110-230V	24V	2.5A	0.4	GS2438
USA	110-230V	24V	2.5A	0.4	GS243A

Battery Chemistry Module Multi Chemistry Multi Output charging device

12V/60A 24V/30A

The Battery Chemistry Module (BCM) is a retro fit device designed to be installed on the output of a current limiting multi output battery charger to allow the battery charger to have independent chemistry selection on each output. More and more so, individuals are having different battery styles/chemistry and different voltage scales (12V and/or 24V) all within their DC system. Due to this quagmire, the BCM is the solution to allow one battery charger to charge different battery chemistries at different voltage scales and at their correct charging profile. So, the BCM can essentially turn a very simple battery charger into a multi output, multi chemistry advanced battery charger with other inherent advantages.

Most cost effective method for multi chemistry multi output battery charging on the market.

Simple to install. Simply connect the input of the BCM to an output of a current limiting battery charger and connect the output of the BCM to the battery bank.

Ideal set up would be a 12V AGM house bank and a 24V deep cycle bow thruster bank. From one charger you can charge both banks at their correct voltage scale and correct charging profile.

Remote voltage compensation. To do away with voltage drop across long cables there is a feature which allows the charger to compensate for a voltage drop up to about 1 volt.

> Do not install on a charger where the current exceeds the BCM's rating.

Converts a single output charger into a multi output charger using multiple units.

Converts a multi output charger into a multi chemistry multi output charger.

— 4 Models: 12V-12V 12V-24V 24V-24V 12V-24V 12V-24V

8 selectable charging profiles. AGM, Gel, sealed lead acid, flooded lead acid and lithium. There is also a desulphation mode.

Battery temperature compensation and high battery temperature trip.

Battery Chemistry Module or a Battery to Battery Charger?

We are frequently asked this question.

For an in depth reason to choose the BCM over the **Battery to Battery Charger**. We recommend that you refer to our FAQ page. Here we shall discuss the main differences, essentially the benefits of current limiting in the versatility of the battery to battery charger. The BCM is a more cost effective method when connected to a battery charger.

Temperature Sensor 1 x battery analogue temperature sensor

Optional Remote Control cut hole: 54 mm total diameter: 68 mm thread depth: 44 mm

Additional Specifications:

1) 6 LEDs projecting over 20 individual charge and warning information events.

2) Fail safe, reverts to basic charge function - about 1V less in event of a failure. Product can be replaced/repaired at convenience.

3) High battery temperature "daisy chain" trip (optional). Every battery can be monitored and the unit switched off. This can be done in the event of a battery overheating causing high battery temperature problem.

4) Ignition fed generator to link in with sterling Pro Split R alternator splitter, this allows the output to be further split.

A common problem that the BCM solves.

Typically people have a mix of battery types in their system. A 12V AGM house bank and a flooded 24V bank for the bow thrusters. These batteries ideally want to be charged at different profiles. With a conventional charger this is not possible as you are fixed to 12V at an AGM setting. The BCM allows the user to charge at a flooded lead acid profile at 24V, while maintaining the charging profile for the starting battery at 12V. There are numerous combinations.

Pro Charge Ultra **AQUANAUTIC**

Waterproof battery charger

- 12V | 24V | 36V | 48V models.
- 10A-40A.
- 1 4 fully isolated outputs.
- Independent charging profile for each output unique feature.
- Active PFC Global input 80-270VAC.
- Synchronised rectification for higher temperature operation.
- Pre-wired and pre-fused of 2m cable.

Active Power Factor Correction (PFC 0.99-1). The Aquanautic is rated at over 86% efficient. Read page 51 on the importance of PFC.

Unique labyrinth gland sealing system ensuring a dual sealed system.

IP67 insulation for the vulnerable electronics system section. IP56 well protected waterproof fan cooling system.

The dual seal ensures a light weight and compact footprint. Under extreme water saturation, the fan can be replaced with ease.

Battery Temperature compensation available as an optional extra. This also includes **external interlock switch**.

> Multi Lingual. The Aquanautic comes with front labels and instructions in different languages: English, French, German and Spanish.

9 pre-programmed charging profiles for AGM, Gel, sealed/flooded and calcium batteries LIFePO4. We also include a **customizable** option to allow the user to programme their own profile via the front panel. This includes voltages and time based features

Optional Remote Control (PCUAR)

Charging voltage (V) and charge current (A)

• Voltage displays as individual battery banks or totalled if multi voltage banks used i.e. one bank 12V and one bank 24V (must be connected in correct sequence to achieve this).

• Voltage readings can be used with charger not connected to AC source to assist in battery monitoring.

- Battery charger sequence
- · Multi coloured screen to depict faults or normal running,
- Force select options available from remote control
- Charging stage and duration
- Configured battery type display
- Temperature of the charger
- Temperature of the battery
- Error Messages
- 110 x 68 x 20 mm
- 10 meters of cabling
- Remote housing surface / recess / flush mounted

Automatic Desulphation mode: 7-10 days cycle with anti-stratification program to keep batteries rejuvenated. Truly Global Charger. The Aquanautic shall work at AC voltages (80-270VAC and 40-70Hz) and DC voltages (130-320V) input. Perfect for generators.

Comprehensive 22 LED front panel. The user is provided with a **voltmeter**. The panel also includes charging profile statuses and warning statuses.

> **Power Pack / Power Supply.** This charger works effortlessly as a power supply to DC loads to prevent depletion of your battery capacity.

Perfect for generator use. Due to its active PFC tolerance of AC input it shall run from crude sine wave forms - typical from generators. *Also*, **% Power Reduction** you can set the charger to run at lower power outputs to complement a wider range of generators and low shore power connections.

Larger voltage / current requirements? The Pro Charge Ultra series can be put in series or parallel with other Pro Charge Ultras. This is enabled by the charger's dynamic charging ability.

Pre-wired and pre-fused cable with 8 mm ring terminals. Up to 4 DC outputs, model dependent. 2m cable.

12 chargers

Multi Chemistry, Multi output.

This bespoke feature of the Aquanautic allows each output to have their own unique charging profile. This is advantageous if you have different battery types in one system. Using the bass boat example below, you could have a sealed lead acid starting battery and AGM trolling motor batteries. With this Aquanautic you can charge BOTH the AGM and the sealed lead acid battery at their correct charging profile, simultaneously. If you so needed you even could charge 4 different battery chemistries across the 4 outputs.

Charging groups and battery balancing.

You can set the charger to charge in voltage groups. I.e. if you have to charge a 36V bank and a 12V bank you can programme the charger to attribute the correct charging profile to the correct voltage group bank. It can determine which cell within the bank requires more current and which requires less and charges them appropriately.

12V / 40A model, all other units pro rata Input voltage range 80-270V 40-70 Hz Power Factor at 230V 0.976 Active power factor correction 94.4% Efficiency Full load current (110/230V) 9.8/4.6A Total Harmonic Distortion 2.4% voltage 2.4% current Total Harmonic Distortion 14mV Ripple noise (rms) Ground leakage 0.5 mA Generator / mains power (watts) 12V 20A approx 350W 12V 30A approx 500W 12V 40A approx 600W

Model	Current (12V)	Outputs	Code
12V 1 output	10A	1	PCUA101
12V / 24V 2 output	10A	2	PCUA102
12V 1 output	25A	1	PCUA251
12V / 24V 2 output	25A	2	PCUA252
12V / 24V / 36V 3 output	25A	3	PCUA253
12V 1 output	40A	1	PCUA401
12V / 24V 2 output	40A	2	PCUA402
12V / 24V / 36V 3 output	40A	3	PCUA403
12V / 24V / 36V / 48V 4 output	40A	4	PCUA404
Remote Control			PCUAR

this setup:

PCUA101 PCUA251 PCUA401

36V trolling motor and 12V starter single output **Recommended chargers for**

This wiring example uses the 4 output (48V) charger PCUA404. Three 12V outputs in series across the 36V battery providing a total of 10A at 36V. Also, you have a 12V output providing 10A to the starter battery.

Alternator or Magneto

12V Battery Bank

This wiring example uses the 4 output (48V) charger PCUA404. All 4 outputs are used in series across the 48V bank, as depicted. Each output provides 10A at 12V, thus, providing a total of ·10A at 48V.

24V Bank

48V Bank

Application Examples

Waterproof Battery Chargers

AQUANAUTIC

Waterproof range

8-20A 1-3 fully isolated output Waterproof Digital Battery Chargers with fully Active PFC

The Waterproof Aquanautic battery charger is a fully sealed, fully waterproof and fully dust ingress/proof built to IP67 marine grade battery charger. The charger features active power factor correction, this allows for global AC input (90VAC-270VAC) and improved efficiency.

- Power Factor Corrected (active) 0.99-1 (PFC)
- 90VAC-270VAC input (47-70Hz).
- Extruded aluminum housing.
- Pre-fused and pre-wired with 1.5 m cable. - waterproof built to IP67 standard.
- Adaptive charging, ensuring maximum charge in the batteries.
- LED power and charge indicators.
- Pre-fused and gold plated terminals.
- Up to 3 isolated outputs.
- Preset charging profiles AGM, Gel, flooded lead acid.
- Available in **8A / 12A / 20A**

 Available in 12V / 24V / 36V
 Dynamic thermal output control, reduces power rather than over heats. Comes with pre-fused and pre-wired 1.5 m cables. 3 output PSP12203, example.

Waterproof Aquanautic PFC 110-230V Active Power Factor Correction					
Output (V)	Output(s)	Current (A)	L x W x D mm	Weight Kg	Code
12V	1	8A	180 x 170 x 65	2.5	PSP1282
12V & 24V	2	8A at 12V 4A at 24V	180 x 170 x 65	2.5	PSP1282
12V	1	12A	200 x 170 x 65	2.8	PSP12121
12V & 24V	2	12A at 12V 6A at 24V	200 x 170 x 65	2.8	PSP12122
12V	1	20A/12V	290 x 170 x 65	3.8	PSP12201
12V & 24V	2	20A/12V 10A/24V	290 x 170 x 65	3	PSP12202
12V & 24V& 36V	3	20A/12V 10A/24V 6A/36V	290 x 170 x 65	3.2	PSP12203

Pro Sport Range

- 12V 5A and 24V 5A (10A at 12V 2 output)
- Moulded plastic case.Ignition Protected
- Epoxy filled, IP68 proofing.

- Adaptive charging, ensuring maximum

- charge in the batteries.
- LED power and charge indicators.
- Pre-fused and pre-wired with 1.5 m cable.
- Up to 3 fully isolated outputs.

- Dynamic thermal output control, reduces power rather than over heats.

12V 5A only

The Pro Sport 5/5 12V/10A and 24V/5A

The Pro Sport 5 and 5/5 A range of battery chargers

designed to IP68 standard.

Available in 5A and 10A models. 12V and 24V.

Pro Sport 5 and 5/5 Waterproof Battery Charger 230V AC 50 Hz only					
Output (V)	Current (A)	Output(s)	L x W x D mm	Weight Kg	Code
12V	5A	1	75 X 150 X 65	2.5	PS125
12V & 24V 12	V(2 x 5A) / 12V(1 x 10A	.) 2	230 X 130 X 90	3.5	PS1255
	or 24V (1 x 5A)				

Regenerative Braking - Introduction to the problem and the solution.

Voltage variations associated with vehicle regenerative braking / smart alternator Systems (Energy Recovery System) and what a Sterling Battery to Battery Charge does to rectify this problem.

Time in mins

What is Smart Alternator / Regenerative Braking?

The initiative behind the introduction of smart alternators / regenerative braking is to lower CO2 emissions and to improve miles per gallon / KM per litre for EU regulations. These smart alternators are installed on modern European Vehicles (Euro 5, Euro 6 + and newer engine models).

The object of this new system is to utilise a vehicles wasted kinetic energy during braking / deceleration cycles experienced in every day motoring and rapidly convert as much of that energy (which is usually wasted as braking heat) into useful electricity and store this energy in the starter battery. Then, during acceleration and cruising release this energy back into the vehicles running system as "free electrical energy" thus reducing the time where a alternator loads the main engine. This increases MPG/KPL and lowers CO2 emissions.

However, in order for this system to be effective, the starter battery must have 'free space' to boost the energy into the battery, this requires the battery to be about 20% depleted (low enough to allow more power to be boosted into it but not too low as to prevent the engine from restarting when switched off). To replenish this 'free space', during deceleration or braking events, the voltage on the alternator shoots up to approximately 15V+. This higher voltage fast charges the starter battery to replenish its capacity. As you are using the inertia of the vehicle to charge the battery, rather than fuel, it is seen as 'free energy'. Then the voltage drops to about 12.4V to allow the free energy to be consumed by the vehicle allowing the battery to deplete itself by about 20% ready for the next speed reduction and so on and so forth. Albeit an improvement in terms of emissions, there are knock on effects regarding the auxiliary charging systems on board commercial vehicles, read on:

Problems with Smart Alternator / Regenerative Braking

The system requires a 20% empty starter battery for the system to work. It needs the space to "dump" the fast energy build up during braking. This is in direct conflict with the auxiliary charging system requirements, why?

1) No charge going into the batteries during the 12.2-12.4V phase (which is totally by primary system design). Therefore, if a simple relay charging system was used to charge the auxiliary system it would not be charged during this time frame, In fact it can back feed any charge it has into the vehicle system. This will certainly be a problem if you require a charged auxiliary battery during travel or at location to location.

2) Very high battery charge rate during vehicle deceleration / braking due to alternator high voltage. This is relatively problem free for the starter battery as its relatively full. However, a large empty auxiliary bank will experience very high currents at high voltages (much higher than their recommended level) which would be detrimental to the battery (especially sealed, AGM and Gel) leading to premature destruction.

Problem with using voltage sensitive/controlled relays?

1) Most VSR / VCRs have 2-3 minute time delays before activating.

2) Even if the relay engages the massive voltage swings would prevent the second battery from getting any serious charge when on low voltage and would certainly damage many batteries when at high voltage due to the voltage and massive current in rushes.

The Solution Sterling Batt. to Batt. chargers 20-180A

Sterling's Battery to Battery Charger: The battery to battery charger range is designed to be connected between the starter battery and the auxiliary system. This unit will increase the vehicle's voltage to the auxiliary battery when it is low and reduce the vehicles voltage to the auxiliary battery when it is high. It will also NOT permit high current inrush beyond the rating of the product (even under high demand loads) and so delivers the auxiliary battery system the correct voltage for different battery types (programmable) regardless off the main system voltage swings, thus, protecting the auxiliary batteries from unnecessary damage. It ensures a constant, safer and much faster charge from the system.

It should also be noted that even on older vehicles or vehicles without smart alternators / Regenerative braking system, the Battery to Battery charger will charge auxiliary batteries much faster than conventional non active products such as relays. This product also has the ability to compensate for cable voltage drops over distance which will still result in up to a 10 times + faster charge rate.

Vehicle used in test (use graph for illustration) Vehicle tested was a new (2013) Ford Transit van. Most, if not al vans and cars are now operating on this principle (no inditement to the Transit).

Regenerative

Route chosen:

The route involved some urban, then town, then motorway driving over about 40 minutes.

Graph / Voltage measured.

Blue line: Is the voltage measured at the battery from the Ford Transit using the regenerative system over the journey (acquired on actual journey).

Green line: Is the typical voltage one would see from a standard older vehicle not operation under regenerative braking control.

Red line: This is the voltage on the auxiliary battery sustained by the Sterling Battery to Battery charger regardless of the voltage on the input to the unit (or what ever voltage the unit is set for depending on the aux battery chemistry). The important thing to glean from this is that the Sterling unit is still boosting to 14.8V even when the input voltage drops to 12.6V. It also reduces the high 15V+ (not on the Ford sample) down to the correct 14.4V or 14.8V

Conclusion: One can clearly see the voltage swing associated with the regenerative braking. Swing from 12.6V - 15.0V. this presents 2 major problems: When at 12.6V the auxiliary charging would simply be useless and at 15.0V it would destroy Gel / AGM batteries. Voltage swings with other manufactures have been in the order of 12.2V-15.4V. There are also massive current fluctuations which adversely affects fuse and cable sizes.

Be aware: Some unscrupulous vehicle sales companies are setting the vehicle ECU to a workshop mode setting where all the advanced voltage fluctuations algorithms associated with the Euro 6 are disengaged to facilitate fault finding in a workshop. This temporary condition is meant for workshop use only and puts the vehicle outside its compliance certification for road use. This renders the vehicle non complaint and therefore not legal. Anyone running vehicles in this mode should contact VW. Just see how running vehicles on non complainant software is working out for them

Allows leisure battery charging <u>&</u> fridge operation whilst towing. Allows fridge to operate from leisure battery when un-hooked and away from a camp site (**WILDSIDE**). Plug + Play can be installed with existing cabling.

• The Existing Problem

Electrical requirements on board caravans are ever increasing. When at campsites this is no problem thanks to AC hook-up. However, if you tour and do not utilize these hook-ups and you find your fridge and mover not operating and your leisure battery not charging, this article is worth reading.

Still to this day, charging whilst towing is terrible. This is because the on board charging systems have not modernised by keeping up with on board electrical demands NOR by dealing with the contemporary peculiarities associated with Euro 6 engines on modern towing vehicles. Fridges do not run, leisure batteries do not charge, movers are ineffective etc. This is because the towing vehicle's alternator's voltage is dropping below the enabling threshold of the fridge and below that required to charge your batteries (read page 15). At current we have seen vast voltage drops down the cable.

Considering modern towing vehicles have large alternators it is shocking that their potential is not utilized.

Graph shows voltage drop across 2.5mm2 copper cable. The cable is 8m of positive cable and 8m of negative.

• Graph analysis

The above is the best case you can expect. We have used good cables, no relays, no chassis negatives, no fuses and the connections were good. The green is the voltage where you need to be to have any chance of charging your caravan battery. The higher up the green area the better your battery charge will be. The purple is your battery depletion, the lower down you are on this the more power you have used and so the more "empty" your battery shall become.

The **Euro 6** graph is the most telling - when the alternator is not doing anything (12.6V) the chart begins within the purple (discharge section). However, the voltage which ends up in the caravan under load is so far below this due to the voltage drops in the cables. This means your fridge is receiving a very low voltages and it simply cannot operate at this low voltage. The simple conclusion is that, under Euro 6 conditions, you shall not be able to run your fridge nor charge your batteries. Therefore, there is actually no point having this connection.

The classic towing graph (14V), displays a modicum of battery charging at very low current. However, at moderate or high load, absolutely no battery charging shall take place.

WILDSIDE addition

Adding Sterling's **WILDSIDE** takes this low input voltage and current but transforms the power from useless low voltage to a higher battery charging voltage (4 stage). Even at 05 Ohm load (22A) at ~9V the **WILDSIDE** unit boosts the output to the 14.4V charging regime for your typical leisure battery. By providing this boost not only do the leisure batteries get charged at an infinitely improved rate but the fridge is also brought online. Therefore, categorically, you can conclude that if you have a Euro 6 towing vehicle you shall neither charge your leisure battery nor run your fridge and shall require a **WILDSIDE** to achieve this. No Sterling, No charge, No Fridge.

An absorption fridge, when at 12V would consume in excess of 10A. Down at 8V, this is more like a 16A consumption. The **WILDSIDE** enables the fridge to operate, even at these extreme conditions, with a surplus of several amps to charge your leisure battery. Note, we recommend against the use of absorption fridge, as they are extremely thirsty. Possibly go with a compressor fridge (~2A).

The Solution - requirements:

1) Deal with the massive voltage drop down the cables / plugs between the car and the caravan by boosting the low voltage to the correct voltage expected to charge the batteries. Also, reducing the voltage during the voltage highs associated with the new Euro 6 engines to prevent damage to equipment.

2) Utilize as much of the standard plug and wiring system as possible to avoid changing the basic system - for the sake of ease of installation.

3) Enable the fridge to operate (12V aspect), in transit, or remain (optional setting) in operation if not connected to 230V.
4) Charge the on board batteries, fast, using a 4 stage charging profile + 9 battery type programmes available. This ensures the battery is fully charged. Plus, a custom set option allowing the unit to be set up to any customer's personal choice. This ensures your electric caravan mover works when you arrive at your destination.

pre-programmed charging 9 profiles for AGM, Gel, sealed / flooded, calcium and lithium (LiFePO₄) batteries.

BBC1225 - 25A input DC rating.

Charging modes:

1) Battery bias mode (default). This mode prioritises the leisure battery charging over running the fridge constantly. The BBC intelligently determines the state of your leisure battery. When the leisure batteries require charge, the fridge is offline and current is directed solely to the leisure battery. When it sees the leisure battery as sufficiently charged it shall bring the fridge online + simultaneously charge the leisure battery with any surplus. The BBC shall continually monitor the leisure battery. If the leisure battery begins depleting, due to a load, the BBC reverts to charging the leisure battery as priority.

2) Fridge bias mode. This mode brings the fridge online instantly and continuously, irrespective of leisure battery state of charge. Bringing the fridge online, particularly if the fridge is an absorption fridge, shall consume the majority of current. Any surplus current shall be directed to the leisure bank. Therefore, you shall likely still get battery charging, albeit less than battery bias mode.

Other Specification:

- 80A fridge engage relay.
- Automatic operation.
- OEM lock, to prevent tampering.
- 16 LED information and alarm panel.
- Optional battery temperature compensation.
- Thermostatically controlled fan cooling.
- High grade fire retardant plastic case.

The BBC shall dramatically A clean and simple install in the increase the charge rate main charging cable via the 20A (500%+) and shall compensate for poor connection and Euro 6 charging issues.

WILDSIDE

STERLING

conventional socket.

Shall easily double your useful battery storage capacity.

> This constant current charger also enables the battery plates to stay much cleaner and last longer.

WILDSIDE mode. This mode allows the fridge to run directly from the 12V leisure battery irrespective of whether you are hooked up to a towing vehicle or not. We have implemented a low voltage cut off at 11V to prevent complete leisure battery discharge.

If you are to use the **WILDSIDE** mode we would recommend increasing the Ah capacity of your leisure battery.

WILDSIDE mode is not default. The default mode is campsite mode. Campsite mode isolates the fridge from the leisure battery when not towing but enables fridge operation when towing.

BBC1225 performance table

Input Current	Alternator Voltage	BBC input Voltage	BBC total output voltage current
25A	12.4V	10.7V	14.4V @15.5A
25A	14.0V *	12.4V	14.4V @17.6A
25A	15.0V 📩	13.4V	14.4V @ 19.0A

★ Voltages under regen. braking system

Optional battery

temperature sensor

MPPT Solar Regulators

10A - 50A MPPT solar regulators with Bluetooth / WIFI and App

- Performance category MPPT
- Max in solar input power 600W 1200W
- System voltage 12 V / 24 / 36 / 48V
- Display and information LCD panel
- USB output 5 V / 2.4A
- Load output 50A max
- Operation Wi Fi / Bluetooth Apps / cloud function
- Dimension 240 x 178 x 73 mm
- Weight 980g

- Max in solar input power 360W 720W
- System voltage 12V / 24V auto detect
- Display and information LCD panel
- USB output 5V / 2.4A
- Load output 30A max
- Operation Wi Fi / Bluetooth Apps / cloud function
- Dimension 237 x 177 x 63 mm
- Weight 350g

10A PWM

- Performance category PWM
- Max in solar input power 150W 300W
- System voltage 12V / 24V
- Display 3 LEDS to display operation and faults
- USB output 5 V / 2.4 A
- Load output 10A max
- Dimension 125 x 81 x 30 mm
- Weight 160 g

Bluetooth and WiFi available on 30A/50A models What the app looks like. It displays:

- PV current (A)
- Battery voltage (V)
- Load (W)

Туре	Dimensions (mm)	Rating	weight(g)	WiFi / Bluetooth	Code
10A PWM	125 x 81 x 300	10A rated	160g	No	PWM10
30A MPPT	237 x 177 x 63	30A rated	350g	Yes	MPPT30
50A MPPT	240 x 178 x 73	50A rated	980g	Yes	MPPT50

Semi-Flexible Solar Panels ETFE 18W | 55W | 120W | 150W

These 12V flexible solar panel's first layer is made of Ethylene tetrafluoroethylene (ETFE). ETFE is a much more expensive and higher quality material than Polyethylene terephthalate (PET). Also, the monocrystalline cell has a higher conversion efficiency (20.4%). With up to 140mm bending height these solar panels can be used in many different fields - RV, Camper, Bus, Car, Boat + Yachts.

The Multi-grid panel is less affected by cracks, has more interconnection points, power generation features can resist cell cracks or fractures and reduce crack failures.

NEW

This means you can walk on it and has a high level of durability.

120W model

Solar

Electrical Characteristic	s:			
Maximum power(Pmax)	18W	55W	120W	150W
Voltage at Pmax(Vmp)	17.2V	17.2V	17.8V	17.8V
Current at Pmax(Imp)	0.96	2.94	6.42	8.02
Open circuit voltage(Voc)	18V	18V	20.4V	20.6V
Cells Efficiency(%)	20.30%	20.30%	20.40%	20.40%
The maximum system voltage	100VDC(IEC)	100VDC(IEC)	100VDC(IEC)	100VDC(IEC)
Power temperature coefficient / Deg C	-0.39%	-0.39%	-0.39%	-0.39%
Voltage temperature coefficient / Deg C	-0.30%	-0.30%	-0.30%	-0.30%
Current temperature coefficient / Deg C	0.04%	0.04%	0.04%	0.04%
Output power tolerance	±3%	±3%	±3%	±3%
NOCT	45±2DegC	45±2DegC	45±2DegC	45±2DegC
Data under standard testi	ng conditions(S	STC):1000W/M ²	; 1.5AM	
Specifications:				
	surface ETFE	surface ETFE	surface ETFE	surface ETFE
Contruction	EVA	EVA	EVA	EVA
Contraction	backboard TPT	backboard TPT	backboard TPT	backboard TPT
Module dimension	410 x 285 x 3	580 x 540 x	1200 x 540 x	1460 x 540 x
	mm	3mm	3mm	3mm
Weight	0.9Kg	1.4KG	2.3KG	3.0KG
No.of cells and connections	4*8	4*8	4*8	4*8
Maximum bending arch	15mm	30mm	80mm	140mm
height		501111		
CODE	SP18	SP55	SP120	SP150

Power Distribution Panel

Campervan power panel

Sterling Power's campervan power distribution panel (PDP) is a vastly superior, bespoke alternative to the existing power distribution panel currently in the campervan market. Below are 40 features that the Sterling PDP does that sets it way ahead and beyond any of its rivals. It has been designed intentionally to be swapped in place for existing panels of its type. Therefore, the PDP has been designed to have a certain familiarity for those who have always used them. For a conventional system to come close to competing with this product, and offer as many features as this system does, would cost many hundreds of pounds extra in product and installation costs - making this product very low cost and great value.

1. Charger is EU legal, complies with all the normal standards. EN 61000-3-2-Limits for harmonic current emissions.

2. The unit is E marked (type approved) so can be installed in new OEM vehicles.

3. Auxiliary and engine battery charger even with panel off but charger on.

5. Fan cooled, thermatic controlled multi speed fan to ensure max performance even in the hottest conditions with minimum noise.

7. A 1A trickle charge for engine starter battery for long term maintenance to compensate for long term starter battery drain.

9. Remote battery charging sense, allows the battery charger to read the voltage on the battery banks allowing the voltage drop on the charging cables to the compensate for allowing perfect battery charging.

> 11. Easy replacement / upgrade access to charger and other parts.

Battery Capacity Meter

14. Battery charger flashes on start up to show which battery type

185nnn

15. Battery capacity meter changes with battery type selected for charger.

16. Solid green lights (LEDs) change to slow flashing when under battery power to conserve energy.

17. More positive and stable fuse and contact covers.

panel view

front view

4. Approximately 50% less volume than competitors' alternatives, with a smaller footprint.

6. Digital / software controlled system for simple use yet offering complex operations.

8. Fully active PFC battery charger which means even with a very poor / low input voltage charger performance remains at peak performance. Charger works down to 170VAC ensuring your unit works perfectly whilst others on site shall fail.

10. Screw covers on front of unit to ensure smooth cosmetic finish.

13. Shore power to DC Battery charger (digital progressive) 4 stage constant current. With battery type selection including: AGM, GEL, sealed lead acid, open lead acid and lithium profiles.

• USB x 2 ports 5V / 2.0A

18. Option to allow power sockets and USB connectors to remain active with vehicle on the move.

Ideal for charging phones / tablets when moving or stationary.

19. Optional battery temperature sensor for temperature compensation.

DC fuse box containing 5 fuses

20. DC fuses LEDs to show if a fuse is blown and which one has failed.

12. All plastic parts are made with fire retardant plastic.

Membrane switches allowing for simple easy use of product.

Fault lights flash at multiple rates to indicate different system faults to aid fast and accurate

fault diagnoses.

Euro 6 Compatibility

21. Default is set for Euro 6 (regenerative braking vehicles). As such, there is no charge through the unit - all auxiliary battery charging is via a Battery to Battery Charger - you select the power you require (20A, 30A, 60A, 120A option).

Option 2, engage the split charge voltage sensitive relay charge system, this allows conventional charging via a relay to take place. There is an 80A charge circuit and will engage and disengage according to the vehicle's engine being on / off. This is suitable for all non-Euro 6 / non-smart alternator systems.

22. Aux battery protection, DC latching relay also acts as a low battery voltage disconnect to prevent total depletion and destruction of the domestic battery, trigger point is 10.5V (depending on battery type). Lights switch off then on for a few times to show there is a problem. Auto re-engages when charger or vehicle engine's started. Can be safely overridden by pushing button for 10 seconds. This removes all the control and allows the battery to totally deplete. Warning given in instruction about battery destruction.

25. Engine relay battery start protect. This setting for engine battery connection can cut off at say 12.3V which should also allow safe use of the engine battery and also allows the engine to start.

27. We have provisioned for larger cable connectors to allow for greater charging performance. We use 6mm bolts to allow for larger cables. This improves performance over the thin wiring looms that have conventionally been installed - that are appalling.

29. DC input cables can be easily shared with Sterling's Battery to Battery Charger or split charge relay.

30. Total isolation between DC and AC on back of unit up to AC/DC safety standards.

32. We do cater for users who wish to combine starter and auxiliary batteries through the distribution box via internal latching relays - discussed overleaf. Generally recommended for those with older (non-Euro 6 engine).

33. No battery charging directed through the distribution box on default . Separation of charge and discharge aspects. This is a massive advantage. It is absolutely impossible to make a 1 box fits all charging solutions. For example, you may have a large alternator but only a small auxiliary battery bank requiring low current charge. Or, you may have a large auxiliary bank with a large direct power requirement for inverters which may require high direct current capability from the alternator. This can be easily achieved by upping the power performance of the charging device independent of the panel.

35. Solar surplus power will also be diverted to the starter battery. This is automatically activated by voltage on domestic battery bank so it works in the event of solar charge on domestic battery bank. It has a 3 minute time delay to allow battery to battery charger to fail (not start up). It engages at 13.1V. It is best positioned on the DC board rather than the battery charger board. This is shown on the main panel as EBM, Engine Battery Maintainer.

26. BMS lithium remote charger shutdown option.

28. Feed can be supplied to show engine on; i.e. to engage the fridge. This can be done electronically (voltage sensing) without an extra ignition cable. LED on front to show fridge on DC mode i.e. engine running and relay engaged. Hard wired option allows fridge to run direct from DC.

34. You may have different battery types and require special charging regimes. You may have an older engine or a modern Euro 6+ with regenerative braking. All of these require different charging regimes. It is more effective to not allow any vehicle charge ability through the control which would invariably diminish the vehicle's ability for charging the auxiliary battery system. It is much better to treat the vehicle's charging aspect separate from the discharge system so this can be correctly installed.

top view

Po	wer Distribution Panel		
Device	L x W x D (mm)	Weight Kg	Code
12V PDP	203 x 143 x 185	2	PDP
emperature Sense	or	NA	TSAY

31. Clear concise wiring instructions on the product.

23. Use of more expensive latching relays over conventional relays. No relevant power consumption in control panel when on.

Campervan Dist

24. No un tethered AC cables in AC

system. This reduces any problems caused by cables vibrating and breaking.

Battery to Battery charger range

rear view

Euro 6 mode (Default): This setting prevents the engine battery from ever being connected to the auxiliary battery at the same time when the vehicle is in motion.

Voltage sensitive battery protection controls for each battery bank: the low voltages (algorithm controlled) are set to protect the auxiliary and starter battery from excessive discharge. The voltage settings are set differently for the two batteries as they are doing different jobs. These preset voltages are adjustable.

OEM lock This allows the panel to be locked to prevent any system critical functions from being played with by a operator.

Back feed from aux battery to starter battery (bi-directional) (optional). If you have solar installed or a battery charger on your auxiliary battery system and you wish for the surplus power to back feed to your starter battery to keep it topped up when the engine is off and the vehicle is in storage. You must NOT use this mode for mixed lithium / lead acid batteries.

USB specification. 18W, Quick Charge 3. For fast charging modern mobile phones such as the Samsung Galaxy S9+.

12V - 24V auto select, this unit will automatically select 12V or 24V control and change the battery settings.

Pre-printed	
nterchangeable label	s

Switch Panel Programmable intelligent

Vehicle charging from engine alternator for Non Euro 6 / non-regen. braking

vehicle mode (relay charging). For older non euro 6 Regen. braking vehicles the Lithium Battery in auxiliary battery system's internal relay charging system **position**. Regardless of your vehicle being will operate. WARNING - the rating of the Euro 6 or not the vehicle alternator system must never be directly connected to the relav is 90A.

Meter readings, this units digital display will show Volts - Amps - and Ah consumption from the auxiliary battery and voltages from the engine starter battery.

vehicle's alternator system. This is because the power demand of the lithium battery is so vicious you can easily destroy the vehicle's alternator.

Switches operational only under certain conditions. I.e. via an interlock. I.e. you may only want some switches active on side light operation only or some other signal interlock, this can be programmed to each switch.

> Extended time function default off : in the event of the auxiliary battery becoming too low this system can automatically crossover from the auxiliary battery system and get power from the vehicle's start battery. This will, also, automatically engage the engine starter battery protection (set higher than the auxiliary battery setting).

Last position memory (on / off) default on: If the panel loses power and power is then reinstated (power cycled) - when power is re-engaged the panel shall, for safety, reasons revert to all switches off as soon as start up. Alternatively, the panel can be set to remember the previous switch setting and revert to this setting on restart.

12.8

LCD multi coloured back light 150mm x 136mm x 65mm

Overload protection , this unit monitors the current to and from the auxiliary battery - whilst on auxiliary battery system only. If this exceeds 90A the unit will auto disconnect the

12V | 24V | 36V | 48V 20A-70A Input Models (larger units overleaf)

Battery to Battery Chargers Non Waterproof (Drip Proof IP21)

EURO 6

Sterling's range of Battery to Battery Chargers (B2Bs) has grown significantly over the past few years. Offering a product range in this market un surpassed by anyone in both power and flexibility. This is in an effort to supplement the ever growing demand from the commercial vehicle, recreational vehicle and marine industries. The B2Bs have become extremely popular as they fast charge batteries as you cruise along without the need for complex wiring, touching your alternator, voiding the alternator's warranty and tampering with the electronic control units (ECUs). You can provide the onboard batteries with a fast 4 stage charging profile with a very simple and speedy installation. All of the benefits of advanced charging without any of the draw backs. Simply connect the B2B between the battery being charged and the battery you wish to charge.

Small Waterproor

2 activation modes:

1) Automatic - Default, operates on input voltage (13.2V / 26.4V on). No ignition feed required. Probably not ideal for Euro 6 vehicles.

2) Ignition feed - apply ignition feed to the charger. This enables the charger to turn on when ignition feed is live. The unit then turns off when ignition turns off. Ideal for Euro 6 vehicles.

Output charging at **12V**, **24V**, **36V** and **48V**. Input voltages at **12V** and **24V**. **Up to 800W rating**. Much larger model up to 3000W coming soon.

Safety features:

- 100% fire proof plastic box
- no screws to corrode
- thermal power reduction
- multi stage fan cooling
- BMS high and low shutdown

Dynamic thermal charging, the charging voltage fluctuates based on the temperature of the sensor (included ->).

Unit is current limiting, prevents large current flow and requires less cable thickness.

Adjustable current limit. The current limit can be reduced to 50%.

1 x temperature sensor (TSAY) included in all units.

No risk of starter battery discharge. Current is **NOT** taken from the input battery and given to the output battery except during the low voltage timer for regenerative braking mode. This time frame can be increased in length or brought down to 0 seconds.

The default mode, which is Automatic Regenerative Braking Friendly, does not require an ignition feed to operate. It works on input voltage and timing algorithms (These values can be customised on the unit). This is ideal for most setups as ignition feeds are getting increasingly hard to find on modern vehicles, this new unit is therefore simple to install.

BB1260 | BB122470 | BB241235 BB242435 | BB123670 | BB124870

2019 - Introducing the BB + Solar MPPT + Duel charge 30A Battery to Battery Charger. Allows charging of the leisure battery while driving. (same specification

BB122430

BB1230 as above) ~350W + usable solar panel. Allows charging of leisure battery + starter battery when driving or stationary! Duel charger to charge engine battery from solar when

stationary - keeps starter battery topped up during lay up.

Very simple to install. No Electronic Control Unit (ECU) issues. No complex wiring. No Warranty issues. Fully prepared for smart alternators (Regenerative braking).

4 stage battery charging. The B2B charges batteries between 5-20 times faster than a stand alone alternator.

OEM lock: the unit can be locked by the installer to prevent tampering and misuse of the product by the operators. By locking the BB, you secure all previous settings in place and prevent subsequent tampering.

> 9 preset battery chemistry options including AGM, LiFePO4, Gel, flooded and sealed lead acid.

> **Customizable profile** - choose your your own charging profile on the front panel.

B2B turns on at 13.2V and turns off at 13.0V (x2 for 24V). Thus, does not drain input battery. With ignition connected, the charger works down to 10.0V (2x for 24V).

Boost / Reduce Charging. The B2Bs ensure batteries get the correct charging profile irrespective of high or low input voltages.

Night time setting allows the unit to run at $\frac{1}{2}$ power so the fan noise is kept down.

DC V (in)	DC V (out)	Current (A)	Weight (Kg)	L x W x D mm	Code	
12V	12V	30A input	1.2	190 x 160 x 50	BB1230	
12V 🧧	🦻 24V	30A input	NEW 1.2	191 x 160 x 50	BB122430	
12V +) ⁽²⁽ + 12V	30A input	$\frac{+}{50}$ $\frac{1.3}{+}$ 1.3	191 x 160 x 50	BBS1230	
12V	12V	60A input	1.4	190 x 160 x 70	BB1260	
12V	24V	70A input	1.4	190 x 160 x 70	BB122470	
12V	36V	70A input	1.4	190 x 160 x 70	BB123670	
12V	48V	70A input	1.4	190 x 160 x 70	BB124870	
24V	24V	35A input	1.4	190 x 160 x 70	BB242435	
24V	12V	35A input	1.4	190 x 160 x 70	BB241235	
Remote w/	10m cable				BBURC	

Remote Control (Optional)

Can be used as an independent voltmeter measuring input battery voltage and output battery voltage. Can remotely modify the Batt. the Batt. Charger: - Force the unit to float - Force the unit to 1/2 current limit - Force the unit to standby - Force the unit off - Force the unit off - Force the unit to Night Mode			
- Reset both Remote and 54mm diameter	d Charger	(E13)	
BLUE EFFICIENCY	BLUEMO	DTION	
® Trademark of Mercedes Benz	® Trademark of Volkswagen		
SCOM	TECHNO	etic DLOGY	
® Trademark of Vauxhall / Opel	® Trademark of Ford		

Displays: Voltage / Warnings / Temperatures.

12V Alternator direct output power Linearisation Device (ALD)

Total alternator control. Certain applications require current and voltage control directly from the alternator's output - lithium battery charging, for example. This is not straight forward. The problem is that an alternator produces a half wave, non filtered wave form. This is a poor quality output and could not be used directly into any normal equipment without using a battery as a buffer. Failure to do this will destroying the equipment. In addition, lithium batteries require a shut off system so at any time the alternator could become unloaded fast which would destroy the alternator. This is prevented under normal use as an alternator is always connected to a battery. The battery absorbs all the spikes to make a relatively smooth linear power supply. The battery is crucial to achieving this smoothness and also allows the alternator to be unloaded without destroying the alternator.

The solution. The ALD fits directly onto the alternator's output. The ALD absorbs the large spikes from the alternator's generation system and also offers itself as a buffer to absorb the alternator's power during electrically unfriendly events that occur during lithium charging. This product is essential if alternators are used directly onto Alternator to Battery Charger or Battery to Battery Charger without being attached to a starter battery.

Do not use with Euro 5/6 engines

Pro Charge B - Waterproof Battery to Battery Charger (built to IP68)

12V 24V 36V 48V Up to 28A at 12V Input

The Pro Charge B is a fully epoxy encapsulated, plug and play, battery to battery charger. It is primarily designed to be put between the starter battery and an appliance battery (trolling / bow thruster / domestic). The charger puts a load on the alternator and converts that load into a 4 stage charging profile to provide fast and effective charging to the leisure/domestic batteries. The whole point of the charger is to charge your batteries up when you drive/cruise along by fully utilizing your on board alternator. The charger is best suited for alfresco use to fully utilize its weatherproof casing. Therefore, it tends to be at home on bass fishing boats charging the trolling motor bank - it can be used in a plethora of other places.

Boost / Reduce Charging. The Pro Charge B shall ensure your batteries get the correct charging profile for your batteries irrespective of high or low input voltage.

> Pre-Wired and Pre-Fused cables. 1.5 m / 70 inches cable length.

Multiple units can be used on the same installation.

up to 400W rating. Output charging at 12V, 24V, 36V and 48V. Input voltages at 12V and 24V.

> IP68, totally waterproof, fully encapsulated, can be submerged in water.

Thermal power reduction, allows for short high power runs to maximise power transfer.

Various activation modes.

Automatic mode works from sensing voltage. Manual mode works from switch over ride. Regenerative braking mode the chargers stays on down to 12.2V.

Battery Chemistry type selection. 6 battery chemistry types including

AGM, Gel, sealed / flooded lead acid and LiFePO₄.

Suitable for battery banks up to about 300Ah at 12V.

\frown	Battery to Battery chargers / IP68 FULLY WATERPROOF					
(\mathbf{F}_{24})	Input (VDC)	Output (VDC)	Input Current (A)	L x W x D mm	Weight Kg	Code
	12V	12V	25A*	230 x 135 x 65	3	BBW1212
Emarked	12V	24V	25A*	230 x 135 x 65	3	BBW1224
Suitable for OEM	12V	36V	25A*	230 x 135 x 65	3	BBW1236
fitting.	12V	48V	25A*	230 x 135 x 65	3	BBW1248
	24V	24V	13A	230 x 135 x 65	3	BBW2424
ROF	24V	12V	13A	230 x 135 x 65	3	BBW2412

compatible models from 2019 Please check with Sterling first!

EURO 6

* 28A for about 30 minutes then drops to about 18A on thermal restriction

• Charging in a Bass Fishing Boat

Charging performance of alternator or magneto without a Pro Charge B will produce about 1-2A. With a Pro Charge B you can expect the output from the charging source to run at a much higher rate - up to 28A at 12V. Larger alternators do not adversely affect the product as its current limiting.

Shore Power Charger (AC to DC).

Directing shore power to the engine starter battery shall activate the Pro Charge B to charge the trolling motor batteries at their correct profile at 12V/24V/36V/48V.

Prime Wiring example.

Not only does the Pro Charge B connect the 12V starter battery to the trolling motor bank it also chargers them at their correct voltage scale and profile. This encourages the alternator to work at a much higher capacity and results in faster charge between fishing stops and better maintenance of your trolling motor batteries.

Ultimate Wiring example.

Why not charge the bass boat batteries while driving along? Connect a Pro Charge B from the truck starter via an Anderson type socket at the back of the truck to the Prime Wiring setup. This example allow you to fast charge while driving to and from the lake and then while cruising on the lake.

Lithium Batteries 12V 60Ah / 100Ah / 120Ah LiFePO4 + BMS + Safety Shutdown

For many years people have wanted a simple easy solution to installing lithium batteries in the automotive industry: Including commercial vehicles, campervans, caravans, military, police and ambulances. However, due to the specific incompatibility with charging voltages and currents on board the vehicles and the requirements of the battery, the two things simply could not be safely brought together without a very elaborate intermediary system linked into a BMS for the lithium battery.

All this is not gone; today we have lithium batteries with built in BMS and automatic shutdown systems that take care of the extreme faults that may be presented to a lithium battery. With the simple addition of a Battery to Battery charger the correct voltage and current profile is provided to the battery from the vehicle's alternator with no integration fuss. This means, when your alternator voltage is low, the battery to battery charger increases the voltage and when your alternator's voltage is too high the battery to battery charger decreases it. Also, when you have too much current, the battery to battery charger reduces the current, thus, presenting the lithium battery with its ideal safe voltage and current requirements. This has never been so important than with the modern Euro 5/6 vehicle applications. The first, all in one - simple to install - package that removes all fears with this technology for application on vehicles.

Specification: All integrated BMS and safety shutdown	60Ah	100Ah	120Ah	
Nominal Voltage	12.8 VDC			
Nominal Amp Hrs	60-66	100-115	120-130	
Nominal Wh power	760	1280	1536	
Maximum continuous charge rate Amps	30 (0.5C)	50 (0.5C)	50	
Maximum continuous discharge rate Amps	60 (1 C)	100 (1 C)	100	
Intermittent discharge rate 30 seconds	120 (2 C)	200 (2 C)	200	
Battery must be safely charged within units parameters	Cell type Prisma	atic Fire retardan	t plastic case	
Max charge Voltage	V=14.8V,			
Recommended Charge and float V	14.6V Charge, Float V=13.8V			
Cut off voltage	10V			
cutoff temperature	50 deg C			
Charge Curve style		CC/CV		
Operational temperature		-30 to 60 deg C	;	
Internal consumption:	Operat	ional = 10mA, Dor	mant 0.1mA	
E13 marking.	10R00-10R05-14430-00			
Dimensions L x W x H cm	26 x 16 x 21	33 x 21.5 x 17	41 x 23.5 x 17	
Weight Kg	10	14.5	15	
Part Number	AL1260	AL12100	AL12120	

Lithium battery information

What is C rating?

C essentially means the battery's charge rate to Ah capacity. 0.5C for a 100Ah battery means you can charge the battery at 50A. The number before the C denotes the fraction of the Ah capacity to charge at. E.g. 0.5×100 Ah = 50A. Look out for terms such as continuous rating and maximum rating. You are only interested in the continuous rating figure. This is what you should rate your battery charge to.

Life expectancy

An average AGM battery claims 1000 cycles. In real world use, due to over charging and deep discharging this figure dramatically diminishes. Lithium batteries are not as affected by depth of charge and discharge. 20x longer life.

Lithium, a straight swap from Lead Acid?

NO! Lithium batteries MUST be charged with correct voltage profile and current rate. To regulate for correct voltage and current we would recommend looking at our Battery to Battery chargers.

What to look for, sales jargon.

Different lithium battery specification, what to look for:

- 1) Ensure C rating is at least 0.5C.
- 2) When C is before the number (C1) this really means 0.1C.

3) Maximum charge and discharge ratings need to be quantifies with a time scale. 3C for 30 seconds would be an honest value. Just stating 3C without a timescale is misinformation.

Lichium Infor

4) Ensure the battery has its own shut down ability. Over charge, over voltage over temperature etc. This is vital.

Chassis weight

Lithium batteries are generally half the weight of their lead acid equivalents. You also get twice the available (real world) Ah capacity. This makes lithium batteries 4x more effective at delivering the same power to weight ratio. This is extremely important if chassis weight is of importance.

Through power and exceeding lithium's rating?

A good example for this is say, a VW campervan, where you want to charge a 100Ah lithium battery (and only have the physical room for 1 battery) from the vehicle's alternator. Modern alternators are about 2000W, the 30A battery to battery charger will charge the lithium battery at about 25A and have no problems as far as charging the battery is concerned. However, you may want to fit an inverter (say a high powered one at 1500-2000W) to run a hair dryer / microwave / coffee machine. Although your 100Ah lithium battery would run 1000W for 1 hour you may not want to deplete your battery bank. You may simply wish to start your engine to through put power directly from the engine's alternator to the inverter to relieve some of the drain from the battery to run the equipment. As you have fitted 30A battery to battery charger the through power would only be 350W, however, if you had fitted a 60A battery to battery charger the through power would be 800W. If you needed more through power look forward to Sterling Through Power Device. This enables you to essentially charge the lithium battery at its correct current rating + allow for current from the alternator to bypass the battery, straight to the appliance, to prevent detriment to the lithium battery.

Manufacturers' marketing myths

This graph is what lead acid battery manufacturers want your to see, yet not understand. Charging at a 0.1C rate and discharging by only 20% to claim your 1000 cycles is simply not real world testing. This implies that someone who has a 100Ah battery uses a 10A charger and only discharges the battery by 20% and then recharges it. In reality, your charger is an alternator of 100A+ (1C) and you'll discharge the batteries to 50%+ before recharging. This shall reduce your number of cycles by 4 fold. This explains why your batteries last only 2.5 years rather than the expected 10 years.

Realities

Compare the cycles from a lithium battery at 1C charge rate against the more realistic lead acid cycles at 1C. Note the cycle scale on the lithium is 10000 cycle where the lead acid scale is only 1000 cycles, the lithium has approximately 20 times greater life expectancy.

Pro Reg BW (Waterproof)

Maximum Alternator Rating:

With existing fitted regulator 350A alternator. With no fitted regulator 150A alternator

Field Rating:

Positive Field Control = 8A maximum field current. Negative Field Control = 13A maximum field current.

Waterproof IP66 (built to) - as the unit is sealed the longevity of the regulator is significantly enhanced as the circuit board is not exposed to the elements.

8 LED information display

Pro Reg BW Waterproof Advanced alternator regulator					
Voltage DC	L x W x D	Weight Kg	Code		
12V	120 x 80 x 45	0.4	AR12W		

1 x Battery Temp Sensor (TSAY)

Pro Reg D

Maximum Alternator Rating: With existing fitted regulator 600A alternator. With no fitted regulator 400A alternator

Field Rating:

Positive Field Control = 25A maximum field current. Negative Field Control = 30A maximum field current.

12V and 24V operation

Fan cooled allows for rating to be the highest of all Sterling regulators.

Pro Reg D Advanced alternator regulator						
Voltage DC L x W x D Weight Kg Code						
12V & 24V	180 x 90 x 55	0.5	PDAR			
Remote control 170 x 90 x 40 0.25 PDARR						

Pro Reg DW (Waterproof)

Maximum Alternator Rating:

With existing fitted regulator 400A alternator. With no fitted regulator 200A alternator

Field Rating:

Positive Field Control = 12A maximum field current. Negative Field Control = 18A maximum field current.

12V and 24V operation

Waterproof IP66 (built to) - as the unit is sealed the longevity of the regulator is significantly enhanced as the circuit board is not exposed to the elements.

15 LED information panel

Pro Reg DW Advanced alternator regulator							
Voltage DC L x W x D Weight Kg Code							
12V & 24V	160 x 96 x 55	0.58	PDARW				
Remote control	170 x 90 x 40	0.25	PDARR				

2 x Battery Temp Sensor (TSAY)

Pro Reg BW D DV	v
Digital software control with slow start	-
Dynamic Progressive battery charging	,
Can be used in parallel (recommended) or stand alone regulator	,
Programmable for different battery types	
Single unit fits 99% of alternators and all battery types	1
Charges to 4 step progressive constant current charging curves	
Self diagnosing fault system	1
Totally isolates the advanced regulator in fault condition	
Information 6 LED display one tri coloured	
Information 8 LED display (B only)	
Battery Temperature sensing	1
High battery temp trip	1
High battery voltage trip	,
High alternator voltage trip	,
De-sulphation ability on open lead acid batteries	,
In event of failure auto return to standard alternator regulator	,
Can be used with or without the temperature sensor	,
Monitors for excessive neg voltage drop and trips	1
Protects batteries if temperature sensor open circuited	1
Protects batteries if split charge relay/diode fails open	1
Protects batteries if advanced reg fails closed	1
Protects batteries if battery sense wire falls off or broken	1
10 LED display	
13 LED display	1
12 or 24V operation, selectable	/
Remote control option	1
Alternator temperature sensor and boost disengage	
Unit thermostatically controlled fan cooling for max performance	
IP 66 waterproof & ignition protected for W options	' L

Advanced Regulator features explained in more depth:

Digital software control with slow start:

Digital control (software) means that very complex information and mathematical algorithms can be processed that would not be possible with an analogue hardware system. Unit ramps currents early - prevents alt slip.

Dynamic progressive battery charging: This is a term used to explain that the internal software calculates a different charging regime every time it is used as the battery state is never the same. Older systems simply used fixed trimmers.

Can be used in parallel or as a stand alone regulator: These regulators can be used as stand alone and in parallel with existing regulators. Good practice to leave original regulator in place for fail safe.

Programmable for different battery types: Multiple charging profiles for AGM, Gel and lead acid cells.

Single unit fits 99% of alternators: Manufactures have multiple, we have one.

Charges to 4 step constant current progressive charging curves:

Self diagnosing fault findings:

The regulators scan the system every two seconds and if all the parameters are not within our preset values then the unit will switch 'off' and signal a fault. This is to prevent adverse damage to your batteries.

Totally isolates the regulator in a fault condition:

Sterling's system physically breaks the field wire guaranteeing that the Advanced Regulator will stop working.

Information LED display:

Battery temperature sensing:

One battery temperature sensor is supplied with the unit. This will adjust the output charging curves with the ambient battery temperature.

High battery temperature trip:

Sterling's software will pick up the high temperature and in the worst case of a battery exceeding 50 deg C, will switch 'off' the regulator and display a warning.

High battery voltage trip:

In the event of the battery voltage going too high the unit will switch the regulator 'off' and display a warning.

High alternator voltage trip:

This is the most common trip used. In the event of poor wiring, incorrect installation, or any fault in the system, the alternator voltage will rise too high; the unit will trip out and display a warning.

De-sulphation ability on open lead acid batteries:

In order to prevent and even de-sulphate lead acid batteries a regular charge cycle exceeding 14.4V (x 2 for 24V) will remove the sulphate from a battery bank and so prolong its life expectancy.

Your standard regulator will automatically take over and allow the journey to continue but at a lower charge rate.

Can be used with or without temperature sensing:

Some people don't want to fit temperature sensors, the choice is yours, the software will pick up if you use it or not and control accordingly.

Protects batteries if temperature sensor open circuited:

A big problem with temperature sensors (why people don't like fitting them) is that they are on a battery. If someone changes the batteries and breaks or open circuits the temperature sensor wire, most Advanced Regulators will destroy your batteries by over charging them. Not so with a Sterling. In the event of a failure of a cable break the Sterling software will pick it up within 2 seconds and return to the default settings and carry on safely. It will also protect batteries if split charge relay/diode fails open circuit.

A common fault when fitting an Advanced Regulator is the old split charge diode or relay that is not up to handling the new performance, resulting in a regulator to fail. This will result in the destruction of the other battery bank, as the battery sense wire will be isolated from the alternator (but not with a Sterling).

Protects batteries if advanced regulator fails:

In the unlikely event of the Advanced Regulator failing then most regulators will fail closed and destroy all your batteries (Sterling software will prevent this from happening).

Alternator temp monitoring and disengagement:

This unit can monitor the alternator temperature and switch off the control unit in the event of high alternator temperature. The Advanced Regulator will automatically re-engage when the alternator cools down.

Thermostatically controlled fan cooling: Pro Reg D only

This is the only fan cooled regulator on the market (as per 2014) and offers the ability to connect this device to massive alternators if required. This unit can deliver field currents up to 20A+. This allows use on alternators way up to 600A plus or to work in extremely high ambient temperatures. We are unable to correctly advise on the maximum performance of this regulator against any large alternators as we have simply been unable to stretch it to its maximum with any alternators we have found to date to run with it.

Extremely good advice to our customers regarding fitting Advanced alternator regulators. There is a trend (especially in the USA) to remove the standard alternator regulators and throw them away and fit a advanced regulator by its self (if you knowledgeable about alternators then this *can* be done), this is an extremely bad practice, always retain the standard regulator in place as this offers a lot simpler installation and the finished setup is much safer as you have an automatic back regulator

installed in the unlikely event off the advanced regulator failure, this allows you to continue you journey on the standard regulator and you simply lose the advanced aspect.

Also when the standard reg is removed this over complicates the installation process and as such makes it impossible to have a good installation guide due to the variation off connectors multiplied by the thousands off different alternators.

Where as the Sterling advanced reg will work as a stand alone reg on a alternator its simple not possible for us to assist anyone going down this route, you need a local alternator expert to fit the advanced reg who can sort out the mess created when the standard reg is removed and discarded , we at Sterling power products simply cannot help.

In the event off a defective standard reg if it has failed then replace it and get the standard alternator working before attempting to install the advanced reg, if you alternator has no standard reg we advise you get one or a remote standard reg to get the alternator working as standard first before endeavouring to fit the advanced reg , this way the standard instruction will apply and an emergency back up regulator is already installed in case off a fault.

Attempting to fit a advanced regulator onto a alternator which is not working is just not recommended for the average person other than by an alternator expert.

Not recommenced for vehicles (especially European vehicles) as tis product may interfere with the vehicles management system, use the **Sterling Battery to Battery chargers for vehicles**

Warning: for large alternators (120A plus) where the existing regulator is non existent (Bulmar) then we recommend the Pro Reg D as this has fan cooling

Pro Reg Alternator max sizes

Pro Reg Bup to 250A with standard reg / 130A stand alonePro Reg BWup to 350A with standard reg / 150A stand alonePro Reg DWup to 450A with standard reg / 150A stand alonePro Reg Dup to 600A with standard reg / 400A stand alone

Alternator to Battery Chargers 80A-400A (at 12V) 60A-200A (at 24V)

The Alternator to Battery charger (A2B) connects very simply to an existing alternator(s) and provides extremely fast and effective charge to the domestic/house bank (5+ times faster than a stand alone alternator). The A2B achieves this performance by pulling down the voltage on the alternator by putting a 'load' on it. This low voltage (at high current) is amplified to a 4 stage charging profile at the domestic bank. Due to the A2B's internal splitting system there is the option to charge the starter battery too. The starter does not get advanced charging, it simply gets a sufficient maintenance charge.

Quick and Easy Installation. This charger is effective, simple and fast to install. It transforms the output of the alternator into a sophisticated multistage charger resulting in faster and more complete charging of your house / domestic battery bank.

Starter bank and domestic bank charger. This charger has an intelligent integral splitting system. The output is split to the starter bank and to the domestic / house bank. Domestic receives advanced charging.

> Multiple alternator inputs. Numerous alternators can be fed to the input of the charger provided the total current rating does not exceed the charger's rating. E.g. 400A charger can handle 4 x 100A alternators.

Largest model up to 400A (at 12V), 200A (at 24V).

Over 5 times faster charging. This charger optimizes the available output of the alternator and converts it to mimic that of a mains driven 4 stage battery charger. Consequently your batteries will charge faster resulting in less engine hours and a reduction in fuel used. This charger can therefore, pay for itself within a matter of weeks.

No alternator modification required. The charger is fitted between the alternator and battery(s) and, unlike conventional regulators, requires no modification or interference with the alternator whatsoever. This saves on time and bypasses any engine management systems (ECU) or warranty issues.

Not suitable for any modern European vehicle or any vehicle equipped with an advanced ECU. For suitable products - look to the range of Regenerative Braking Friendly devices – the Battery to Battery Charger.

Smallest model 80A - 130A (at 12V).

Battery and alternator temperature sensing. The chargers disengage the unit in the event of the alternator temperature getting too high, it then reengages the unit when the alternator cools down. The same thing happens when the batteries get too hot.

Multiple charging profiles. Chargers have AGM, Gel, Flooded lead acid, sealed lead acid and calcium charging profiles.

Alternator Regulator or Alternator to Battery Charger? We are frequently asked this question.

For an in depth reason to choose the A2B over the alternator regulator. We recommend that you refer to our FAQ page. Here we shall discuss the main differences, the time it takes to wire up, engine management systems and warranty voiding.

Put simply the Alternator to Battery charger can be more easily and speedily installed, it tends to avoid any engine management issues and shall not void your manufacturers warranty.

Additional features:

1) Battery sensor. When DC cables are long a voltage drop can be induced across it. There is a connector which allows for the compensation of this drop.

2) Ignition start. Some alternators require a voltage on the alternator to start up. There is a built in device to overcome this problem in the event of such an alternator type being used.

3) The remote control. This offers full set-up information, plus voltages and temperatures of all the relevant places, as per the digital alternator regulator.

Optional Remote control for the AB12160/210/24100.

10m of pre-wired link cable and 2 x 200A shunts. Ideal for measuring current. Can be surface, recess or flush mounted.

200A

shunts included

Full system wiring single or twin alt (including optional remote kit if used)

DOMESTIC BATTERY SYSTEM

Optional Remote control for the AB1280/12130/300/400. 10m of pre-wired link cable. Does not measure current.

Alternator to Battery chargers DC (V) Max Alt size (A) LxWxD Weight Kg Code 80A 270 x 180 x 80 2.5 AB1280 12V 12V 130A 270 x 180 x 80 2.5 AB12130 12V 300A 370 x 288 x 70 5 AB12300 12V 400A 370 x 288 x 70 5.1 AB12400 24V 80A 270 x 180 x 80 2.5 AB2480 24V 200A 370 x 288 x 70 5.2 AB24200 Remote for above products in Black (no shunts) ABNRC AB12160 160A 250 x 280 x 70 12V 3.5 AB12210 12V 210A 250 x 280 x 70 3.5 24V 100A 250 x 280 x 70 3.5 AB24100 Remote for above products in Red inc 2 x 200A shunts ABRC

Application S

Pro Split R 0.0V drop alternator splitting system built to IP65

12V/24V 120A-250A. Up to 2 alternator inputs and 4 outputs.

The Pro Split R is a 0.0V drop alternator splitting system. It is the successor to the old diode based splitting systems which induced large voltage drops at high current. The newer, much more intelligent, Pro Split R selects a battery bank and isolates the other battery banks to prevent their voltage misleading the alternator's regulator (assuming regulator is connected). This allows the regulator to focus on the correct battery and can maximise the alternator's potential. Then, at a specific level, the other battery banks are charged and finally all charged together. The charging performance can be further enhanced with the use of an Advanced Alternator Regulator (see pages 26/27).

Isolates the battery bank(s): The unit isolates when there is any attempt to back feed the power from the full battery bank to a more demanding battery.

Comprehensive L.E.D. display: that shows which channels are in use and which are not.

6

Micro Processor Controlled: All batteries are charged in conjunction with each other and back feed under high load conditions is prevented. The system also has the ability to disconnect the alternator and individual battery bank outputs in the case of problems caused by the alternator to other devices.

> Alternator Regulators: The sense stud on the Pro Split R allows seamless integration of Sterling's alternator regulator with this 0.0V splitter resulting in the ultimate split charging device.

> > Overload Design: The model rated for 180A is actually continually rated for 240A with overload in excess of 2000A.

High Safety Elements Built In: As much safety and control is built in as possible to protect your electrical system and to ensure available power is directed to where it is required most.

Fail-Safe: In the event of unit failure, the engine start battery and alternator remain connected. This ensures the safe running of the boat/vehicle. It prioritizes the engine start battery charging over all other battery bank outputs.

Backfeed protected:

If there is a defective battery charger on one battery bank trying to back feed into another battery bank, the unit would disconnect that battery bank to save

Distributes the most power: to the battery bank which demands it.

Faster Battery Charging: 0.0V drop allows for a much faster charge. Additionally, once the Pro Split R is happy with the charge state of the starter battery the focus of the charge is directed to the larger domestic/house bank. This ensures a one on one charging experience between the alternator and house. N.B. The starter battery is always monitored and then prioritised if needs be.

Larger Models: The image to the right is of the largest Pro Split R in the range. It handles 2 alternators in and 4 outputs. The outputs include 2 x starter batteries (one on each side) and 2 auxiliary banks. The alternator maximum is 130A at 12V for this model.

regulators: Provides a 4 stage charging profile to each of the 4 outputs for super fast charging on all banks.

Not suitable for any modern European vehicle or any vehicle equipped with an advanced ECU. For suitable products look to the range of Regenerative Braking. Friendly, such as the Battery to Battery Charger.

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0.01 voltage drop through

This negligible voltage drop is

far superior in performance in

comparison to the old diode based splitting systems which suffered from a far greater

the current range :

voltage drop.

others.

Isolates the main alternator: If

the alternator was to fail, the Pro Split R would isolate all batteries to protect them from over charging (boiling).

Works with 2 x alternator

Pro Split R 0.0 volt drop intelligent splitter						
DC (V)	Max Alt (A)	Battery banks	L x W x D	Weight Kg	Code	
12V	120A	2	150 x 80 x 120	0.6	PSR122	
12V	180A	2	150 x 80 x 140	0.7	PSR182	
12V	250A	2	150 x 80 x 155	0.9	PSR252	
12V	120A	3	150 x 80 x 130	0.9	PSR123	
12V	180A	3	150 x 80 x 150	1	PSR183	
12V	250A	3	150 x 80 x 180	1.3	PSR253	
Twin 12V	2 x 130A	4	150 x 80 x 295	1.8	PSRT134	
24V	60A	2	150 x 80 x 120	1.8	PSR62	
24	100A	2	150 x 80 x 140	0.6	PSR102	
24V	150A	2	150 x 80 x 165	0.7	PSR152	
24V	240A	2	150 x 80 x 250	1.2	PSR242	
24V	60A	3	150 x 80 x 150	0.7	PSR63	
24V	100A	3	150 x 80 x 175	1	PSR103	
24V	150A	3	150 x 80 x 220	1.3	PSR153	
Twin 24V	2 x 80A	4	150 x 80 x 295	1.8	PSRT84	

12V/24V Auto Select 90A-270A.

Up to 2 alternator inputs and 4 outputs.

The Pro Split L (PSL), like its predecessor, is a 0.0V drop alternator splitting system. It is the successor to the Pro Split R. The newer, more intelligent, Pro Split L uses latching relays that consume 0.0A and 0.0V drop during operation unlike conventional relays that can use up to 1A to remain closed. The PSL is more versatile as it can be used with wind, solar, combis (inverter chargers), single, multiple output battery chargers and with alternator(s) and alternator regulators. Furthermore, the PSL can be used in conjunction with Sterling's Battery to Battery chargers to enable correct charge of lithium batteries. Charge can flow through the PSL from any terminal to charge any of the other battery banks that are connected. The SELECT / INPUT buttons enable the PSL to be customised regarding activation voltages etc..

Combined inverter chargers: one of the big advantages of the pro split L is to allow other power sources (other than just the alternator(s)) to contribute their power to the total DC system. Combis' inherently have large battery charging abilities but only charge the main leisure battery that they are connected to. However, the Pro Split L allows the Combi to effectively charge all the battery banks in the DC at full power.

Voltage sensitive mode and ignition feed mode or BOTH. Typically, you would require an ignition feed to activate splitting systems. However, this Pro Split L shall operated based on voltage thresholds. These thresholds can be adjusted to suit your battery requirements. You can also operate the Pro Split L with a simple ignition feed or have a combination of both.

Isolates the battery bank(s): The unit isolates when there is any attempt to back feed the power from the full battery bank to a more demanding battery.

0.01 voltage drop through the current range :

This negligible voltage drop is far superior in performance in comparison to the old diode based splitting systems which suffered from a far greater voltage drop.

Backfeed protected:

If there is a defective battery charger on one battery bank trying to back feed into another battery bank, the unit would disconnect that battery bank to save others.

Distributes the most power: to the battery bank which demands it.

Larger Models: The image to the right is of the largest Pro Split R in the range. It handles 2 alternators in and 4 outputs. The outputs include 2 x starter batteries (one on each side) and 2 auxiliary banks. The alternator maximum is 180A at 12V for this model.

Lithium batteries. We recommend charging a lithium battery bank via a Battery to Battery charger. Battery to Battery chargers regulate voltage and current to within the operational parameters of your lithium batteries - they also prevent current back feed through it to the other batteries in your system. These chargers can be used in conjunction with the Pro Split L. Please view the wiring example overleaf.

The Pro Split L comes with up to 3 BMS shutdown connector

Latching relays - latching relays require 0.0A to remain in position. There is also a 0.0V drop across them. This makes latching relays the most efficient relaying method. Perfect for solar and wind generators where power harvest is minimal anyway.

Programmable buttons on the device.

Faster Battery Charging: 0.0V drop allows for a much faster charge. Additionally, once the Pro Split R is happy with the charge state of the starter battery the focus of the charge is directed to the larger domestic/house bank. This ensures a one on one charging experience between the alternator and house. N.B. The starter battery is always monitored and then prioritised if needs be.

Micro Processor Controlled: All batteries are charged in conjunction with each other and back feed under high load conditions is prevented. The system also has the ability to disconnect the alternator and individual battery bank outputs in the case of problems caused by the alternator to other devices.

Works with 2 x alternator regulators: Provides a 4 stage charging profile to

each of the 4 outputs for super fast charging on all banks.

Single output battery chargers: A single output battery charger can be put onto the input of Pro Split L and shall split the current to all of the battery banks that are on your DC system. The Pro Split L essentially turns your single output battery charger into a multi output charger. This saves having to double up on cable and spend more money on a multiple output battery charger. Both alternator and charger can share the same input stud!

12V / 24V Auto Select. The Pro Split L shall select automatically whether the unit is connected to a 12V system or a 24V system.

Voltmeter on PSL - shows DC voltage on all outputs.

Overload Design: The model rated for 180A is actually continually rated for 240A with overload in excess of 2000A.

Alternator Regulators: The sense stud on the Pro Split L allows seamless integration of Sterling's alternator regulator with this 0.0V splitter resulting in the ultimate split charging device.

High Safety Elements Built In: As much safety and control is built in as possible to protect your electrical system and to ensure available power is directed to where it is required most.

Fail-Safe: In the event of unit failure, the engine start battery and alternator remain connected. This ensures the safe running of the boat/vehicle. It prioritizes the engine start battery charging over all other battery bank outputs.

Isolates the main alternator: If the alternator was to fail, the Pro Split R would isolate all batteries to protect them from over charging (boiling).

Not suitable for any modern European vehicle or any vehicle equipped with an advanced ECU. For suitable products look to the range of Regenerative Braking Friendly, such as the Battery to Battery Charger.

Pro Split L - Wiring Examples

Example 1:

Here, solar and wind are connected to the output battery terminals. Thanks to the voltage sensitive feature, all of the other battery connected shall benefit from surplus charge coming from the solar and wind. No ignition required.

AUX Batt 1

°Split L

III PE

or 2

28

engine

alternato

d+ or

ignition feed

Wind <u>R</u>eg

Wind Gen

Solar Ger

Example 2:

Here, solar and wind are connected to the alternator input terminal along with the alternator - as per a conventional splitting system. All connected battery banks shall be charged. This can be used with or without ignition feed connected, depending on how you set it up.

0.01 Drop Splitters

Example 3:

Here, solar, wind and an AC to DC battery charger are connected to the alternator input terminal along with the alternator. We have also put a Combi inverter / charger onto the domestic battery. The PSL can be set to enable all charging source (solar, wind, battery charger, alternator and Combi) to charge up all of the battery banks connected to the PSL.

Pro Split L 0.0V + 0.0A drop intelligent splitter							
DC (V)	Max Alt (A)	Battery banks	Size L x W x D mm	Weight	Kg Code		
12/24	90	2	150 x 80 x 120	0.6	PSL902		
12/24	180	2	150 x 80 x 140	0.7	PSL1802		
12/24	270	2	150 x 80 x 155	0.9	PSL2702		
12/24	90	3	150 x 80 x 120	0.9	PSL903		
12/24	180	3	150 x 80 x 140	1.1	PSL1803		
12/24	270	3	150 x 80 x 155	1.3	PSL2703		
12/24	2 x 180	4	150 x 80 x 295	2.0	PSLT1804		

Current Limiting Voltage Sensitive Relays

from 70A - 280A 12V/24V

The range of **C**urrent Limiting **V**oltage **S**ensitive **R**elays (CVSRs) offer bullet proof versatility. Not only do they act as bidirectional 0.0V drop charging relay but they also offer the ability to react in a controlled way to excessive loads that would normal destroy conventional relays. Under high loads, such as: Large Inverters /AC units / Bow Thrusters. The load drawn down the DC cabling would exceed the cable and relay rating and cause the arc to weld shut or would simply cause the relay to shatter. However, the CVSRs have PTC fuses which allow this high load to abate before opening the relay, thus protecting your relay/system.

Built in current limiting: Courtesy of the PTC fuses (red components jutting out of the unit), if overloaded, the product will simply shut off safely so as to protect the relay and the installation. Once the high load demand has been removed the relay is safe to re-engage.

Available in: 70A, 140A, 210A & 280A. 12/24V auto select.

0.0V drop charging relay: 0.01V drop is the voltage drop across the relay. This is a negligible drop allowing for the best charge possible across the relay.

Extremely low quiescent current, approx 1 mA.

Start up time delays: A 30 second start up time delay prevents the relay coming on while the engine is being started, protecting the relay circuit and preventing fuses blowing and damage to the relay.

6 LED information display. With remote LED option. With 5 built in alarms

Uni and Bidirectional charging relay:

IP66 waterproof (built to)

Manual Override: The unit, by default, is voltage sensitive. It requires 13.3V to close circuit and 13.0V to open circuit. A manual override allows the user to dictate when the relay activates. Typical override would be an ignition feed.

Customisable on and off voltages: The voltage at which the relay closes and opens are default at 13.3V (on) and 13.0V (off) - twice for 24V. However, these thresholds can be adjusted.

Current Limiting Voltage Sensitive Relays (adjustable)						
DC (V)	Rated (A)	L x W x D mm	Weight Kg	Code		
12V & 24V auto	70A	140 x 120 x 40	0.1	CVSR70		
12V & 24V auto	140A	140 x 180 x 40	0.2	CVSR140		
12V & 24V auto	210A	140 x 210 x 40	0.25	CVSR210		
12V & 24V auto	280A	140 x 240 x 40	0.25	CVSR280		

IMPORTANT Safety Features

(shared by CVSRs / VSRs and Ignition Fed Relays).

- High overload surge rating.
- Back EMF spark arrester.
- Emergency auxiliary forced activation.
- High battery voltage trip protection.
- Suppression diodes across relay to prolong life.
- SAEJ1171 ignition protected.
- 5 alarm functions and safety trips.
- Protects primary battery from discharge.
- Anti Relay contact arching protection.
- Reverse polarity protected.

Voltage Sensitive and Ignition Fed Relays

Voltage Sensitive Relays Pro Con VSR range (80A-240A) (refer to CVSR page for safety features)

0.0V drop and low quiescent current. The voltage drop is 0.01V allowing for negligible power loss across the relay. The quiescent current is 1mA.

6 LED information display

Automatic voltage activation. True to word the relays are sensitive to voltage. On voltage is 13.3V. Off is 13.0V (x2 for 24V). This can be manually changed.

Ignition/signal override is possible to allow for manual override.

High quality brass connections.

Uni and Bidirectional charging relay: Multiple relays can be used to link / isolate as many battery banks as suitable.

Built to IP66 waterproof

Available in: 80A, 160A, 240A **12/24V auto select.**

Start up time delays: A 30 second start up time delay prevents the relay coming on while the engine is being started, protecting the relay circuit and preventing fuses blowing and damage to the relay.

Voltage Sensitive Relays (adjustable)						
DC (V)	Rated (A)	Size L x W x D mm	Weight Kg	Code		
12 & 24 auto	80	140 x180 x 40	0.1	VSR80		
12 & 24 auto	160	140 x190 x 40	0.2	VSR160		
12 & 24 auto	240	140 x200 x 40	0.25	VSR240		

Additional VSRs

Magnetic Digital VSR: The Digital VSR shares the **same features as the above VSR80-240 range**. It has fewer LEDs but is totally waterproof and ingress proof. This relay requires the use of the magnet to change the relays settings. The largest current rating is 160A.

Analogue VSR: The Analogue VSR is the most affordable VSR that Sterling does. It has no adjustable features. The user can not adjust the voltage thresholds and there is no switching delay. The unit is also not 12V/24V auto select. They are simply 12V or 24V models. The unit has a fixed on voltage of 13.3V and the fixed off voltage of 13.0V. Ignition override is also possible.

Voltage Sensitive Relays (adjustable)							
DC (V) Rated (A) Weight Kg Code							
12 & 24 auto	80	0.1	VSRB80				
12 & 24 auto	160	0.1	VSRB160				

Ignition Fed Relays (refer to CVSR page for safety features)

Requires Ignition / D+ / Signal feed to operate: This range of low cost signal activated relays are the simplest in the range. It offers the ability to link together as many battery banks as you wish and therefore charge different battery banks on a boat / vehicle when the engine is running. Available in: 12V 80A,160A & 240A 24V 50A 100A & 150A

IP66 waterproof (built to)

Voltage Sensitive Relays (adjustable)							
DC (V)	Rated (A)	Weight Kg	Code				
12	80	0.1	VSRA8012				
12	160	0.1	VSRA16012				
24	80	0.1	VSRA8024				
24	160	0.1	VSRA16024				

Starter battery interlock: This unit has the ability to interlock with up to 2 engines starter motors to ensure the relay is inactive when starter motors are engaged, thus protecting the relay and avoiding fuses blowing.

DC (V)	Rated (A)	Size L x W x D mm	Weight Kg	Code
12	80	140 x 60 x 40	0.025	IFR1280
12	160	140 x 70 x 40	0.030	IFR12160
12	240	140 x 80 x 40	0.030	IFR12240
24	50	140 x 60 x 40	0.025	IFR2450
24	100	140 x 70 x 40	0.030	IFR24100
24	150	140 x 80 x 40	0.030	IFR24150

120A - 200A Ignition Fed relays 12V / 24V

Part No.	R12120	R24120	R12200	R24200
Coil Nominal (V)	12V	24V	12V	24V
Contact Current Rating (A)	120A	120A	200A	200A

Pro Latch R - Latching Relays

80A - 240A Models

The Pro Latch R is a versatile latching relay with 4 major operational modes. The benefit of using a latching style relay over a conventional relay is down to the efficiency of the relays. Conventional relays use up to as much as 0.5A to stay closed circuited. However, the latching relay does not use any current to stay closed. This is ideal for low harvest systems that include wind and solar. The 4 major operational modes are discussed below:

More Efficient. Latching relay technology is more efficient than conventional relays as they consume no power to stay closed. The only minor current drawn is via the software (0.5mA).

Models: 80A / 160A / 240A 12V and 24V.

IP66 Waterproof. The Pro Latch R is built to IP66. which is the highest level of waterproof and ingress proof rating.

> Ideal for Solar and Wind technology. Along with other low harvest energy sources.

Operational Mode 1.

Bidirectional Charging Mode. This mode allows activation of the Pro Latch R at both sides of the relay - ideal for normal between battery charging. Activation voltages are on at 13.3V and off at 12.9V.

Operational Mode 2.

Battery Protection Mode. This mode allow the user to protect the battery from excessive charging and discharging. The on voltage is 12.9V and the off is 10.9V.

Operational Mode 3.

Engine Start Protect. This mode allow the user to protect the start battery from discharging beyond a point whereby they can no longer start the engine when cranking. The on voltage is 12.9V and the off is 12.3V.

This mode allows for relay activation on one side of the relay only. Very similar to mode 1 without the bidirectionality. On at 13.3V and off at 12.9V.

Intelligent switching algorithms. All operational modes switch the relay between on and off positions. There is a time and history element to when the relay changes position, it not a simple voltage threshold switch. This is designed to prevent unnecessary relay chatter and inefficiencies.

12V or 24V Auto select. The Pro Latch R's can detect whether you have a 12V or 24V system and shall conduct its operation accordingly.

Remote Control

- 5) Sleep: power saver function.
- 6) Audible alarm stop.
- 7) Audible alarm disconnect.
- 8) Back light option on/off.
- 9) Background light colour change depending on function.
 - 10) Relay circuit opened or closed indicator.

Pro Latch R Remote Control Functions

11) High Voltage trip alarm and low voltage warning.

Remote control allows access to all the relevant information, the panel comes complete with a 5 metre telephone type extension lead. The remote is in a standard 54mm threaded housing. This is an optional product and is not required for the operation of the main product.

Operational Mode 4 Unidirectional Charging Mode.

54mm hole cut

> Examples of common applications for the Pro Latch R

Code	Continuous	Max Intermittent	Quiescent	Input Voltage	Output stud	Preset Voltage	(can be adjusted	if required)
	Current	Current	Current mA			Battery protect	Starter Protect	Charging mode
LR80	80A	500A	0.5	12V/24V auto	6 m m	Off 10.9V on 12.8V	Off 12.4V on 13V	on 13.3 off 12.9
LR160	160A	1000A	0.5	12V/24V auto	8 m m	Off 10.9V on 12.8V	Off 12.4V on 13V	on 13.3 off 12.9
LR240	240A	1500A	0.5	12V/24V auto	8 m m	Off 10.9V on 12.8V	Off 12.4V on 13V	on 13.3 off 12.9
LRB80	80A	500A	0.5	B = Budget: Re	lay only availa	ble with a fixed/non	adjustable factory	/ setting, non-programmable
LRR	LRR Latching relay remote with 5 metres of cable, for longer use standard telephone cable extension.							

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Electrical Latching Isolation Switches

160 - 640A Models

Electrical Latching Battery isolation switches (ELBs) are used to completely isolate a battery bank to prevent any unwanted current drain from taking place. Typically users want to cut leaking from their starting system and from their appliance system. The key features to look for when selection ELBs are: Continuous rating (A), overload rating (A) and then the current draw when the ELB is on and off. Sterling's ELBs excel in all these key features. Built to **IP66.**

160A - 640A Latching circuit rating: The products rating are their continuous rating. Work out what the continuous load shall be in order to rate the ELB to the correct specification.

D+ alternator ignition feed safety interlock circuit: If the latch position changes when the alternator is running damage can befall the engine/alternator. To prevent this, a signal override system has been installed. This signal (D+/61/ ign feed) will prevent the switch position changing. Only when the signal has abated (engine turned off) will the latching relay switch.

> **Cold cranking / engine start:** The ELBs can handle 1500A-6000A over 5 seconds and 600A to 2400A over a 30 second cranking period (model dependent).

The battery powering the ELB does not have to be the battery that you wish to isolate.

Up to 50V for the latching circuit: The latching circuit is fine for voltage ratings up to 50V.

The latching circuit and the control circuit are isolated. This is extremely important and means that the unit can latch on the **negative** or the **positive** of the battery that you wish.

Latching relay technology uses no current to stay closed or opened circuited. This means latching relays will not consume current from your system when turned on or off. The switching consumption does use current about 2A for 0.5 seconds.

☐ Key lock optional: the unit comes with a momentary rocker switch to operate the unit, however, you can purchase a key lock option if required.

Supplied 3 way rocker switch with Blue LED

Optional

key lock switch

The control circuit is powered by either 12V (low as 8V) or 24V (low as 16V). Due to the low instantaneous power consumption of the controlling circuit you can tap the voltage off a larger bank 36V/48V bank.

8mm studs ensure good contact for electrical cables.

160A and 240A models

	Intermitt	tent	Elect	rical Battery	/ Isolator		
Continuous rating:	30 sec	Starter rating	LWDmm	Weight Kg	Cont (A)	Control V	Code
160A	300A	Not suitable starter	90x90x80	0.2	0	12V	ELB12160
160A	300A	Not suitable starter	90x90x80	0.2	0	24V	ELB24160
240A	450A	Car/small van	90x90x80	0.2	0	12V	ELB12240
240A	450A	Car/small van	90x90x80	0.2	0	24V	ELB24240
480A **	1000A	lorry, up to 600hp	150x100x120	0.4	0	12V	ELB12480
480A **	1000A	lorry, up to 600hp	150x100x120	0.4	0	24V	ELB24480
640A **	1300A	lorry, up to 1000hp	150x100x120	0.4	0	12V	ELB12640
640A **	1300A	lorry, up to 1000hp	150x100x120	0.4	0	24V	ELB24640
Extra momentary switc	h (one suppli	ed standard in each kit)					ELS1
Key operated switch w	ith 2 keys (o	ptional extra) N.B only mo	mentary switche	s can be used			ELKS1

480A and 640A models

Split Charge Diodes 70A - 200A Models

Recommended to be used in conjunction with an advanced alternator regulator

Sterling power has developed a range of low cost split charge diodes, they benefit from enhanced performance over conventional diodes and at a lower cost.

All other split charge diode manufacturers use conventional alternator diodes which, at a low current flow have about a 0.93V drop.

70-200A rating. 2-3 outputs. Relative low voltage drop for diode splitting category.

Over coming voltage drop (0.8V -1.2V). You can attempt to over come voltage drop across the Pro Split D by using a Sterling Alternator Regulator. This shall ensure that the battery bank of designate charge get its correct charging profile.

	W cu ap dr 0. e> lo
Tradition of Spin Choren Disco. 70A 70A 70A 70A 70A 70A 70A 70A 70A 70A	

/hen the full rated urrent of these diodes is pproached the voltage rop increases to around 95V. This results in xcessive heat and power ss across the diode.

For improved charging and intelligent charging look at Sterling's Pro Split R and Alternator to Battery Chargers.

Low	voltage drop spl	it charge diodes	5
Alternator inputs	Battery banks	Max Alt (A)	Code
1	2	70	D70A2
1	3	70	D70A3
1	2	90	D90A2
1	3	90	D90A3
1	2	130	D130A2
1	3	130	D130A3
1	2	160	D160A2
1	3	160	D160A3
1	2	200	D200A2
1	3	200	D200A3

110															_	<u> </u>		
100																		
90				_		-				<u> </u>								
A an	S	erli	ng c	ligit	al a	dv. I	regu	lato	r									
M 70	w	ith S	Sterl	ing	low	vol	t dro	op c	liod	е								
	01	pro	o sp	lit								/	1					
- 50				S	terliı	na P	ro S	olit F	R 0.1	0 vo	t dr	go		/	_			
5 50						-					_	_						_
40		/		S	terli	na P	ro S	blit [v vo	t dr	go	diod	è				-
30																		_
20					-					-							_	-
10					6	omp	etito	r spl	it cr	large	e dia	de						-
0	1	0 2	0 3	0 4	0 5	0 60	0 70) 80) 90	10	0 110	120	130	14() 150	160	170	180
Т	Test	alte	erna	ator	= F	Bosi	ch 9	0A	TIN		MI		TES					
Star	nda	rd r	eau	lato	or oi	utpi	ut ve	olta	ae	= 1	3.8	3 \	/olts	5				

Charge rate with different splitting systems

	Conve	entional	Splitte	ers	Sterli	ng's P	ro Sp	lit D
AMPS PASSED (A)	30	50	60	70	30	50	60	70
VOLTAGE DROP (V)	0.93	0.95	0.97	1.1	0.78	0.75	0.74	0.74
POWER LOSS (W)	27.9	47.5	58.2	77	23.4	37.5	44.4	51.8

DC Isolation Switches

Pro Combi S+ Combi Inverter Charger

Neutral - Earth bonding link when on inverter

mode to comply with latest regulations. This

The Pro Combi S+ is Sterling's new inverter charger. It is a bespoke unit that has an attractive new design. The unit is lighter, smaller, yet more powerful than its predecessor. New splash proof design offering some protection against the odd water spill. The Combi S+ also comes with an auxiliary charging output to allow the user to charge their starter battery whilst bulk charging their main battery bank. The auxiliary charging is simply a module that can be installed and allows the user to charge 12V from a 12V or 24V from a 24V or even a combination of them as it is simply a module (e.g. 12V from a 24V unit), unit built to IP22.

8 Battery type selectors. All with their own 4 stage charging profiles.

Remote control panel included. The remote is removable and can be replaced with a blank panel. The switch panel can then be remotely mounted using the supplied extension lead (10 meters).

Battery Charger only select option. Allows unit to be set, so in event of shore power failure the inverter does not engage.

Features a power saver function and battery charger power reduction. Great for smaller power supplies and gensets.

30A automatic crossover switch: If shore power is connected to the combi the unit. allows you to run your appliances directly from the shore power. However, when shore power is disconnected, the unit transfers the load from shore power to inverter power in less than 20ms, ensuring a smooth uninterruptible power supply.

> Sterling Power's Combi S+ range of Inverter / Chargers are new to 2016. They arrive in a bespoke and attractive waterproof enclosure (IP55).

> > The Battery chargers across the range are larger in current rating. 70A at 12V - 35A for 24V.

12V and 24V models

Picture of 1600W model

Extremely low quiescent current From 0.1A with power saver on. 0.5A with power saver off.

New, lighter and smaller unit. Refer to the weights and dimensions in the table below. No extra length attributed to end cover caps etc as all AC and DC connectors are now neatly integrated into the unit.

The additional 5A auxiliary charging output port is a new feature of the S+ model. It allows the user to charge the starter battery (example). Also, you can pick and mix. For example, have a 12V main unit with a 24V output port, or vice versa.

Power Factor Corrected (PFC) This unit delivers a unity (0.99) power factor.

		Continuous		Dimensions		
DC Voltage (V)	Nominal VA	Power @ 20degC (W)	Charger (A)	(L x W x D) mm	Weight (Kg)	Code
12	1600	1300	70	225 x 205 x 230	8.5	PCSP121600
24	1600	1300	35	225 x 205 x 230	8.5	PCSP241600
	Auxiliary Charge Module 1	2V or 24V Combi to 12V Battery	5A			ACM12
	Auxiliary Charge Module	12V Combi to 24V Battery	ЗA			ACM1224
	Auxiliary Charge Module	12V Combi to 24V Battery	ЗA			ACM2424

To make the choice even simpler we have 6 months exchange/upgrade policy. If you purchase the incorrect Combi and find there is some equipment that you cannot use, Sterling are happy to upgrade your unit for another with the only cost being the difference between the 2 products (the unit must be sent direct to Sterling and in good condition and postage paid for by customer). Offer applies dealing direct to the Sterling factory only.

Charger power reduction. Large chargers on Combis often require too much AC power from gensets. The Combi S2 allows the user to reduce the charger's power consumption to within the rating of the genset /AC supply.

Remote control panel included. The remote is removable and can be replaced with a blank panel. The switch panel can then be remotely mounted using the supplied extension lead (10 meters).

Low Quiescent current consumption.

using transformer switching algorithms. Combis use current to produce power, even with no loads attached. A typical 12V 2500W Combi would use between 1.5-5A just to stay on and more for a 12V 3500W model. This is due to the flux requirements of the transformer. To run something like a 20W phone charger could consumer up to 80W from the battery. This is unacceptable. On our new units, on power saver mode, we have managed to get the quiescent current down to about 0.7A=8W. The phone charger, now, shall only consume 28W from the battery.

Designed to IP22

AC power timer. This feature enables the user to turn the inverter on for a set time - user sets 30 minute intervals (up to 5 hours). This is ideal as it allows the user to charge phones / tablets / laptops for a particular time and the inverter then turns off and consumes no current. E.g. Peoples' mobile phones may require 1 hour of charge whilst in bed, so you

Multiple power saver functions. To preserve battery current we have devised 3 types of power saving functions - this allows the user to pick which one best suits their needs.

The Battery chargers across the range are larger in current rating. 130A->200Aat 12V. 60-100A for 24V.

24 LED information display

Neutral - Earth bonding link when on inverter mode to comply with latest regulations. This allows RCD breakers to work.

Power Factor Corrected (PFC). This unit delivers a unity (0.99) power factor.

Battery Charger only select option. Allows unit to be set, so in event of shore power failure the inverter does not engage.

Remote Control w/ 10m cable PS = Power Saver select PE = Power Eco select 1/2hr = Power timer select **/**↓ = Charger power reduction C/O = Charger OnlyI/O = Inverter Only Fault | Low battery | High temp LEDs

		Continuous		Dimensions		
DC Voltage (V)	Nominal VA	Power @ 20degC (W)	Charger (A)	(L x W x D) mm	Weight (Kg)	Code
12	3200	2600	130	400 x 205 x 230	15.0	PC2S123200
24	3200	2600	60	400 x 205 x 230	15.0	PC2S243200
12	5000	3900	200	590 x 205 x 230	21.0	PC2S125000
24	5000	3900	100	590 x 205 x 230	21.0	PC2S245000
12V C	ombi to 12V batt	ery 5A Auxilia	ary Charge Modul	e (ACM)		ACM12
12V Co	ombi to 24V batte	ery 3A Auxilia	ary Charge Modul	e (ACM)		ACM1224
24V C	ombi to 24V batt	ery 3A Auxilia	ary Charge Modul	e (ACM)		ACM2424

3200 model

8 Battery type selectors. All with their own 4 stage charging profiles. Custom set also available

from panel, no computer required

Sterling Power's Combi S2 range of Inverter / Chargers are new to 2017. They arrive in a bespoke and attractive waterproof enclosure (IP55).

The additional 5A auxiliary charging output port is a new feature of the S+ model. It allows the user to charge the starter battery (example). Also, you can pick and mix. For example, have a 12V main unit with a 24V output port, or vice versa.

New, lighter and smaller unit. Refer to the weights and dimensions in the table below. no extra length attributed to end cover caps etc as all AC and DC connectors are now neatly integrated into the unit.

> 32A automatic crossover switch: using latching. relays which do not consume power. If shore power is connected to the Combi the unit allows you to run your appliances directly from the shore power. However, when shore power is disconnected, the unit transfers the load from shore power to inverter power in less than 20ms. This ensures a smooth uninterruptible power supply.

400L x 205W x 230D mm 5000 model 590L x 205W x 230D mm

3000W - 5000W

inc built in RCD

8.8.8.8

230V / 50Hz 200W - 1600W **RCD** optional

Option 1 Twin socket - Euro (Schuko) + UK. USB 2A/5V

Optional remote control with 5 metres of cable.

4 Digit display: 1) Power - Wattage 2) Voltage

110V 50Hz Model 2200W model shape

Ο	ption	2

Pre-wired RCD w/ 1m AC cable. USB 2A/5V

110V / 50Hz Yellow Socket for site use 12V/24V 1600W models.

2201/	Duro Sino I		wartare 12V/			22001
Zouv	Pure Sine V	Woight		DC ar Dmm	Cables	Codo
	200W/		312e L X W X		1m Cig Plug	SIR12200
12V 12V	2001	1.4Kg	210x190x05		1m DC 9mm ring	SIB12200
121	500W	1.4Kg	210x190x05		1m DC 8mm ring	SIB12300
121	100014/	2.0Kg	200x190x00		9mm connection	SID 12000
121	100000	2.2Kg	300x190x65		omm connection	SIB121000
120	100000	J.OKY	300x 190x65		omm connection	SIB 12 1000
12V	22007	4.5Kg	300x220x85		8mm connection	SIB122200
24V	2007	1.4Kg	210x190x85			SIB24200
24V	30000	1.4Kg	210x190x85		1m DC 8mm ring	SIB24300
24V	600W	2.0Kg	250x190x85		1m DC 8mm ring	SIB24600
24V	1000W	2.2Kg	300x190x85		8mm connection	SIB241000
24V	1600W	3.6Kg	300x190x85		8mm connection	SIB241600
24V	2200W	4.5Kg	300x220x85		8mm connection	SIB242200
	Option 2 F	Pre-Fitted with R	CD and with 1	mete	r AC cable	
12V	300W	1.5Kg	250x190x85		6mm connection	SIBR12300
12V	600W	1.8Kg	360x190x85		6mm connection	SIBR12600
12V	1000W	2.0Kg	300x190x85		8mm connection	SIBR121000
12V	1600W	3.6Kg	300x190x85		8mm connection	SIBR121600
12V	2200W	4.5Kg	300x220x85		8mm connection	SIBR122200
24V	300W	1.5Kg	250x190x85		6mm connection	SIBR24300
24V	600W	1.8Kg	360x190x85		6mm connection	SIBR24600
24V	1000W	2.0Kg	300x190x85		8mm connection	SIBR241000
24V	1600W	3.6Kg	300x190x85		8mm connection	SIBR241600
24V	2200W	4.5Kg	300x220x85		8mm connection	SIBR242200
230V Pur	e Sine Wav	e 50 Hz AC inve	rters w/ RCD	12V C	OC and 24V DC 300	00W - 5000W
12V	3000W	6.2Kg	450x256x185		No Cables	SIB123000
12V	4000W	7.0Kg	550x256x185		No Cables	SIB124000
12V	5000W	7.6Kg	550x256x185		No Cables	SIB125000
24V	3000W	6.2Kg	450x256x185		No Cables	SIB243000
24V	4000W	7.0Kg	550x256x185		No Cables	SIB244000
24V	5000W	7.6Kg	550x256x185		No Cables	SIB245000
	110V / 50H	z model 1600W	with Yellow So	ocket		
12V	1600W	3.6Kg	300x190x85		8mm connection	ASIB121600
24V	1600W	3.6Kg	300x190x85		8mm connection	ASIB241600
Remote of	control (fits a	Il models)	90x60x20		5 metre	SWR

Front panel waterproof

	Manu	al 230V Crossov	er Switches		
Input sources	Output	Continuous (A)	Max Voltage (V)	Number of poles	Code
3	1	16	300	3	SC16A
3	1	32	300	3	SC32A
3	1	50	300	3	SC50A

High Voltage Protection Device 6KW direct, unlimited power indirect

Sterling's High Voltage Protection Device (HVPD) is designed to protect any 230V AC supply such as: Generators / inverters / mains from incorrect voltage destruction. At some marinas / parks the mains supply voltage is wrong and this can result in the governor speed control / regulator / voltage controller failing (sticking). This can result in a dangerous situation for the operator and can destroy AC equipment. The HVPD is designed to prevent such destructions.

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Portable Meters

DC Clamp Meter (ammeter)	
Dimensions	160mm x 35mm x 25mm
Weight	100g
Electrical Specification:	Meets IEC 1010 CAT111
DC voltage	0-200V overload protection 600V
AC voltage	0-500V overload protection 600V
DC current	0-600A overload protection
AC current	0-600A overload protection
Resistance	0-200 ohms overload protection 400
AC frequency response	40-400 Hz
AC speck tested on sine wave	50/60 Hz
Compact yet heavy duty	
Continuity beeper	
Data hold function	
24 40	
Cart to	Code
and the second sec	CLAMP1

DC Voltage Probe & Diagnostic Tool		
Available voltages	12V / 24V	
Battery Condition Reading	Low 11.5V / 50% 12.0V / I	Full 25.2V (24V x 2)
Charger / Alternator output	13.2V (min) / 14.5V (max)	/ 15.5V (over volt) (24V x 2)
Weight	250g	
Unique to Sterling Power	14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Code
	1. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	TM12V 12V
		TM24V 24V

Winding	Wind twice for 2mins use, wind for 10s for 10 mins
Display	46 mm x 23 mm large LCD
Measurement	AC, ACA, DCV, DCA, Ohms, continuity beeper, Hz, %, Cap
Dimensions	152 x 78 x 45 mm
Weight	350g
DC voltage	Range Volts 400.0 mV - 1000V DC Accuracy +/- (1% + 3d
nput impedance	10 M Ohm
DC current measure	400mA - 10A
Ohms	400-40 M ohm
Capacitance	40nF-100 mF
Frequency	4 Hz - 4 MHz
Diode	(forward voltage, VF)
Range	4 V DC
Resolution	0.001 V
Test voltage	1.6V DC
Test current	1 +/- 0.6 amps
ncludes red and black tes	st leads plus instruction manual
Continuity Beeper	
Overload Protection Fuse	The same way to be
Beep if resistance less th	an 100 ohm
response time < 100 m	Code
Range selection Auto ran	ging with manual selecting. WUVM
Data hold to freeze the dir	splay reading

ortable Meres

Digital Battery Tester

Includes alternator and starter motor tests

The load test. Depending on the size of the battery, this product adds a very high load to the battery (125 A). The battery should be able to deliver this load and hold the voltage up at the same time. If the battery is unable to deliver the load (and sustain it for this time frame) then the battery is either defective or simply not fully charged when the test was performed. This is why it is crucial to ensure the batteries are fully charged before the test is performed to eliminate that possibility.

What does the tester do?

To properly test a battery you need to test the voltage of it under a heavy load. This is what the Digital Battery Tester (DBT) does. The DBT puts a 125A load on the 12V battery for 10 seconds. It measure the rate of recovery of the battery's voltage after the load has abated. The faster the recovery the healthier the battery. Superb device for measure battery condition.

10s Load test	125A
Voltage	12V (for 24/36V center tap)
Battery CCA rating	200-1000A
Battery Ah rating	30-140Ah
Indications	good / w eak / bad / sulphation extent
Battery Voltmeter	yes
High Voltage trip	13V
Time between loads	120 seconds
Uses	Batteries, Alternators, Starter Motors
DC Cable length	530mm
Size (LWD)	280mm x 100mm x 120mm
Weight	1.1 Kg

The unit can also be used to measure the performance of the charging device (alternator / battery charger) - to inform the user whether the charging device is **good, weak or bad**.

Voltage & Temperature Monitoring System With Alarm

The voltage & temperature monitoring system measures 4 voltages and 3 temperatures. Not only can the unit monitor, it can also have each channel alarm at specific levels. The high and low voltage alarms and the high temperature alarms can be set by the user. When the unit alarms, a relay circuit can be activated to induce a response.

Manual lock or auto scan. The unit will, on default, simply scan through all 4 voltage and 3 temperatures remaining on each parameter for about 3 seconds. You have the option to allow continuous scan or simply lock the display on the one screen. Please note that even if you have locked the display on one parameter all the other parameters are still being scanned. If there is an alarm on one of the other channels while you have it locked onto a different channel the alarm will breakthrough. After you acknowledge the alarm the previously locked screen will return automatically.

Lock unit. For security, there is the ability to lock the settings by a code. In the case you have locked the unit it will only be possible to cycle through the displays on the screen and to mute an alarm.

Low voltage saving. The lowest voltage for each channel will be saved. The voltage has to remain at this level for minimum 10 minutes to be saved. This prevents the use of anchors / bowthrusters influencing the low voltage point, as these devices are only transient. This value can be deleted to run a new low voltage monitoring.

Removing unwanted alarms. There is an upper (voltage + temperature) and lower voltage alarm (voltage) for each setting. You may not wish to engage some of these alarms, you can simply remove any alarms you wish not to Supply voltage: use.

Setting degree C or degree F scale.

Buzzer alarms: for any alarms the buzzer can be on or off. If on, the alarm can be muted

8-35VDC Current consumption: < 3mA Temperature range: 10 - 150 Deg C

Remote Control:

Backlight colour user selectable (blue, red or green) or Auto select, changes colour based on alarms or conditions. Screen alarms: for any alarms the screen will display a red screen.

Relay Circuit. There is a relay offering normally closed (N/C) or normally opened (N/O) switching. This can then be used to activate whatever you wish to upon the alarm levels being reached.

We predict this relay circuit shall be used to start up generators when the batteries get down to a certain voltage. Other examples, using temperature, would include an engine switching off under high system temperatures. There are an array of examples.

Background LED lights will only stay on in auto mode when the system has surplus power i.e. it's charging.

> Special Generator start ability. Switching a relay to activate a generator is quite simple. However, knowing when to stop it is more difficult. There are numerous options to stop the generator based on voltage, temperature or time. For instance you may wish to stop the generator when the batteries hit a certain voltage / temperature / after a set time. There is also a safety timeout setting to prevent the generator staying on indefinitely because the battery charger has failed.

Automatic backlight colour change. The backlight can change its colour automatically if the colour change value has been tripped.

In a 12V system: <12.2V = red, <13.2V = green, <15V = blue, >15V = red.

These values can be changed for each channel individually.

- Kit includes: 1 x control box
- 1 x remote control
- 1 x temperature sensor

Voltage Temperature Monitoring Input DC (V) Size L x W x D mm Weight kg Code 70 x 70 x 60 TVM1 12-24V 0.2 Extra temp sensors (1 included) purchase more **TS1**

Pneumatic Tank Gauge System

Most boats suffer badly from unreliable tank level gauges, this is a particular problem with dirty water tanks. The main problem is the corrosive nature of the salt water and that float meters are damaged in the tanks. The measuring device must not be effected by the movement or the corrosive nature of the fluid it is measuring. The best way to achieve this is the way ships and other quality tank meters work by using pneumatics. This has always proved too expensive to miniaturise for leisure craft, use until now.

Pro Save Range - Galvanic Isolators / Zinc Savers 16A - 120A Range

In order for modern boat builders to comply with modern CE standards such as EN ISO 13297 they must fit the shore earth wire to your boats bonding system which is also connected to the hull / anodes etc. This ensures that any 230V mains faults will operate the R.C.D on the boat in order to save your life. However, now your boat is connected to the rest of the boats in the marina. This results in 2 main problems. Firstly, any increase in voltage on any earth in the marina may result in the dissolving of your anodes. Secondly, if you have a zinc / magnesium / aluminium anode on your boat and the boat next to you (or marina) does not then your boat shall be protecting everyone resulting in dramatic losses of anode.

The solution, Sterling's **Pro Save**. The zinc savers maintain the continuity with the earth to ensure safety (EN ISO 13297 standard) but prevent any stray currents coming up the earth. The Pro Save has to be built to stringent testing and has to be able to carry its current rating for 24 hours without exceeding 90 degrees centigrade.

Galvanic Isolators / zinc savers Standard euro version			
AC (A)	Size mm	Weight Kg	Code
16	120 x 100 x 90	1.0	ZS16A
30	220 x 120 x 100	1.5	ZS30A
50	220 x 165 x 100	1.8	ZS50A

Galvanic Isolators / Zinc Savers Standard Euro Version with Cap			
AC (A) Size mm Weight Kg Code			
30	220 x 120 x 100	1.5	ZS30C
50	220 x 165 x 100	1.8	ZS50C

The new range also offers two LED warning lights. The two warning lights indicate the following: 1) To indicate if there is a break through fault. For instance, if the earth voltage has exceed the ability of the device to protect the boat's system (very rare this would ever be the case). 2) Total failure due to massive short circuit way beyond the products ability to protect. The product has failed and the boat and personnel are in danger. If this fault is triggered, there are underlying issues beyond that of the normal safety features of the shore power system. The over engineered aspect of this product cannot be overstated.

built to IP66 WATERPROOF Electrics IP55 Replaceable fan

Safety first:

This product complies fully to European standard EN ISO 13297. Not to be used where UL / ABYC fail safe standard are required. See below.

110A model

In fault condition the product does not exceed 90 deg C, during tests the product 24 hr fault temperature

was sustained well below:

The new Pro Save W offers all the same great protection as the Pro Save A+C models but in a new waterproof plastic package:

Stainless steel hardware and very low footprint, made possible by a new induction fan cooling system which only operates when the unit is in a major fault condition.

> EN ISO 13297 Small Craft Directive

Waterproof Zinc Saver off fault plus 20%				
Model	Fault Current (24 hours)	End Temp (Deg C)		
32A	41A	65		
64A	85A	78		
110A	152A	75		

Waterproof Galvanic Isolator / Zinc Savers					
AC (A)	Size L x W x D mm Weight Kg Connector Code				
32	150 x 120 x 118	1.0	6 mm	ZSW32	
64	150 x 120 x 118	1.0	6 mm	ZSW64	
110	155 x 170 x 118	1.8	8 mm	ZSW110	

32A / 64A model

Battery Maintainer Echo / mirror charger

The battery maintainer is a charging device that enables an **extra battery bank** to be kept 'topped up' from the **main battery bank** which has the charging device(s) connected to it (e.g. alternator, battery charger, solar cell / wind turbine etc). The unit transfers approximately 3A(12V) and requires the charging devices to be turned on to work. It is best suited at keeping a starter battery topped up and maintained by the charge that your house bank receives.

than lost across inefficient relays.

Other Specifications	
Offline power consumption	0.001A
Online power consumption	1mA
Activation voltage input battery (x 2 for 24V)	13.3V
High voltage trip on input battery (x 2 for 24V).	15V
high temperature lock down (Deg C)	80
Off Voltage and Standby input battery (x2 for 24V)	12.9V
Reverse polarity protected (fuse).	
Aux battery 'low voltage' warning LED on if aux bat below 12.6V and 'off	'above 12.7V.

Battery maintainer / charger inc 1 metre of cable					
Input (V) DC Output (V) DC Current (A) L x W x D mm Weight Kg Code				g Code	
12V	12V	3A	140 x 45 x 40	0.25	BM 12123
12V	24V	1A	140 x 45 x 40	0.25	BM 12241
24V	24V	3A	140 x 45 x 40	0.25	BM 24241
24V	12V	1A	140 x 45 x 40	0.25	BM 24121

fuse

fuse

High Power Distribution and Fuse Box Up to 500A

Compact and clear DC distribution system for boats and specialist vehicles.

5 x 15A continuous outputs with 30A fuses with one 300A fuse supplying that section (all supplied). **3 x ANL fused** outputs from 80-500A ability. —

extra aux DC feed position to bypass main feed in event of ancillary equipment requiring a permanent feed even if the main battery bank is isolated, such as alarms or bilge pumps.

Red LEDs to show when fuse has blown (only on when fuse has blown).

Cable guides for the low power cables, plus cable ties to be tightened when wiring complete to keep wires tidy and secure.

1 x 15A 'maintained' output with 30A fuse.

Green LEDs to show the circuit is live (LEDs on all the time when battery not isolated, can be switched 'off', if preferred, by removing a link).

1) Retail market: can modernise your old system and make it safer and easier to find fuses/cables in case of faulty circuitry. Install near domestic to meet modern safety requirements.

2) OEM market: it shall reduce wiring time and improve cable tidiness. Replaces the need for many individual parts to be fitted and connected. Saving both time and money. Most negatives returned to box to enable easy circuit checks.

Emergency alternator link in the event of the alternator fuse blowing (this prevents the alternator being damaged).

80 amp	GANL80
100 amp	GANL100
150 amp	GANL150
200 amp	GANL200
250 amp	GANL250
300 amp	GANL300
350 amp	GANL350
400 amp	GANL400
500 amp	GANL500

ANL Fuse Holders M8 (up to 500A) & M12(up to 1000A) ANL

Module Kit (not inc. charger) 3 x100A ANL fuse + 3 fuse holders + 12 x 8mm eye terminals JSC1MK

Module 2 - JSC2 Automatic 12V / 24V Auto Select Jump Starting Device

Module 2. This module adds an extra safety layer and automates the jumping procedure. It auto selects the correct voltage (12V or 24V) for jumping the recipient batteries. It also disengages the circuit when the jumping clips have been disconnected from the recipient battery terminals ensuring any jump leads not connected to a battery are "dead". Module 2 also relays on the regulated charge profile generated from module 1 to the recipient batteries. You can also force the unit to operate outside of its preset parameters, in the few circumstances where this is required.

Once the relays engage,

If voltage sensed is 4V-16V then 12V is a signal is sent back to selected. If 16V-32V then 24V is selected. module 1 to force module 1 into boost mode. This 12V and 24V modes can be forced if enhances the charging required, however, at 16V+ and 32V+ voltage relayed on to the warning alarms shall sound. Also, trying to recipient batteries. force select into a battery where the auto system disagrees will alarm and require the force select button to be pushed again. Below 4V the unit can also be forced, 700A continuous rating 1000A however, chances are the sub 4V battery cranking (dependent on your shall need replacing. battery and cabling ability) From Module 1 Fuses for illustrative purposes only. Fuses should be connected nearer to input battery. Battery and Jump cable (per meter) Double PVC insulated welding cable Croc clips CSA(mm2) Colour Code not included C50R 50 Red 50 Black C50B 70 C70R Red 70 C70B Black

Totally automatic safety function.

95

95

120

120

Red

Black

Black

Red

C95R

C95B

C120R

C120B

Once the jump leads are removed from the batteries or the current drops below 5A the unit will automatically disengage.

This safeguards against live 12V or 24V at the end of the jump cables which are not in use.

If battery requiring jumping is not absorbing current, due to fault, this <5A disengage can be force overridden for 20 seconds to try to start the battery charge process.

SUND STAT MOULE

Module 2

DC cable length is optional. Please refer to the chart to the left. The image is for display purposes only. Cables do not come with the module kit.

Jump cables - connected to recipient batteries (batteries that require charging or jumping). These are not included.

Jump cables - not only provide automatic 12V or 24V jump starting they also charge the batteries if needed. Either in normal fast charge or an even faster boost charge. Both charge functions are fully regulated and will not damage any ancillary equipment in charging mode.

High Power Performance Alternators

12V / 200A Good Low R.P.M Performance

Description	Code
12V 200A alternator with standard reg	AL12200
12V 200A alternator with standard & PDAR	AL12200PDAR

12V / 140A

Good Low R.P.M Performance alternator supplied with multi V and twin V pulley photo shows multi V.

Alternator Open Circuit Protection Device

Protects your alternator from **massive spikes** caused when you inadvertently isolate an alternator by switching the battery off or a cable is loose or a fuse blows.

Protects against any action which results in the alternator being disconnected from a battery when in operation.

Simple safe emergency route for that spike to be discharged giving full protection to the alternators regulator

The protection device does not carry the main current of so only light wiring is required.

Unit works with any alternator or splitting device (12V or 24V).

Alternator protection device				
Voltage	L x W x D mm	Weight Kg	Code	
12V	90 x 90 x 60	0.25	APD12	
24V	90 x 90 x 60	0.25	APD24	

Pro Pulse Battery De-sulphation & Maintenance device

Prolongs battery's life by up to 100% and improves battery performance: Sulphate build up on plates reduces the batterys life span and performance.

By connecting a Pro Pulse this sulphate is removed and allows the battery to live longer and have greater performance.

Connect across 12V: The Pro Pulse reverse feeds a small electrical pulse back into the battery which prevents and also reverses sulphation on the battery plates.

This is not a battery charger and it cannot actually charge your batteries, it is a desulphation device.

By keeping the plates clean and free from sulphation the battery stays fresh and responsive to charging and discharging.

New Models good for up to 500Ah battery bank at 12V.

Waterproof IP66 (built to).

Offline current draw 1.8mA

Not required if you already have an advanced battery charging system from Sterling as they have desulphation cycles built into their charging profiles.

Rejuvenates older battery(s) and sharpens their response. This allows them to accept faster charge and preserves their cold cranking ability.

Model good for up to 150Ah battery bank at 12V.

Requires a charging source to operate. It shall not deplete your battery bank. Operation voltages are 13.3V+ (at 12V) and 26.6V+ (at 24V).

Description	Size mm	Weight kg	Code
De-sulphation unit 12V - up to 150Ah bank (IP66)	90 x 90 x 60	0.2	PPW12150
De-sulphation unit 12V - up to 500Ah bank (IP66)	90 x 90 x 60	0.2	PPW12500
De-sulphation unit 24V - up to 250Ah bank (IP66)	90 x 90 x 60	0.25	PPW24250

2M Pre-fused (80A / 100A) Cables

Daisy Chain - Temperature alarm

Most problems caused on engine systems can be pre-empted and stopped before any catastrophic failure takes place. Many of these failures are caused by run away temperature rises on batteries / hydraulic systems / bearings etc. The Daisy Chain can be installed in these key areas and an alarm is sounded and/or a relay triggered to prompt a response.

Temp

What is Power Factor Correction (PFC)?

This can be split into 2 groups:

Active PFC - by far the best, this gives a full input voltage range from 80-300V, and (in more technical terms) massively reduces the VA off the product so it will work with about 40% less current and power from generators. This accounts for about an extra 20% cost over the other type.

Passive PFC - this is a simple way of matching the units capacitance with an inductor to balance the load. This allows the unit to pass EU laws regarding harmonic distortion but does not actually fix the harmonics. This results in a much lower cost product with much lower input voltage variations. I.e. 210-230V abilities at much higher VA rating so a generator would need to be about 40% larger to run the product. I.e. a 12V 60A active PFC charger would run on less than a 1000W gen set but a passive charger of the same size would need about 1500W.

This feature is a big deal and should not be ignored especially on boats or vehicles where there are large voltage variations on the input. Even in 110V or 230V only areas, the voltages can easily drop 10%. With Active PFC this is of no concern with Passive PFC the charger will simply stop working.

Power factor Correction (PFC) is the concept that cleans up the electrical waves. By doing so, it increases the efficiency of the charger significantly. Efficiency is measured by the power going out (DC) and the power going in (AC) times 100. Prior to PFC a chargers efficiency ran at about 65% (35% energy wasted through the charger). With PFC the efficiency figure is more like 90% (only 10% lost through the charger). PFC, therefore, makes electric bills cheaper and enables one to run the charger from a smaller generator.

Active PFC shall more than likely be advertised as a selling point to the product. If not advertised assume passive PFC.

IP RATINGS SCALE

The Ingress Protection (IP) rating system is an internationally recognized scale that relates to proven protection against environmental factors such as liquids and solids.

Ingress protection ratings can be identified by the letters IP, followed by two numbers. These numbers define the amount of protection a digital scale has against specified elements and its ability to resist foreign matter that could otherwise get inside the product and cause it to fail.

The first number refers to the amount of protection a scale or indicator enclosure has against solid matter (such as dust particles), while the second number defines the level of protection against liquids. The larger each digit is, the greater the protection.

First ı	number - Protection against solids
0	No protection.
1	Protected against solid objects greater than 50 mm.
2	Protected against solid objects greater than 12 mm diameter.
3	Protected against solid objects greater than 2.5mm diameter.
4	Protected against solid objects greater than 1.0mm diameter.
5	Dust protected.
6	Dust tight. No Ingress of dust.
Secor	nd number - Protection against liquids
00001	No protection
1	Protocted against vortically dripping water
1	
2	Protected against dripping water when tilted up to 15°.
3	Protected against spraying water at an angle of up to 60° from vertical.
4	Protected against splashing water when the enclosure is tilted at any angle up to 15°.
5	Protected against water jets from any direction
6	Protected against heavy seas or powerful jets of water.
7	Protected against the effects of short term immersion (under defined conditions of pressure and time).
8	Protected against submersion (under conditions specified by the manufacturer).
9k	Protected against close-range high pressure, high temperature spray downs.

What is Regenerative Braking?

Please see page 17 for a comprehensive explanation.

Why choose the Alternator to Battery Charger over an Advanced Alternator Regulator?

Ease of installation, is the simple answer. They both end up doing the same thing but by very different technologies. The advanced regulator is a lot cheaper but can be hard to fit. The alternator to battery charger is a lot more expensive, easier to fit and has a few extra features like an internal splitting system.

Why Choose a Battery to Battery Charger over an Alternator to Battery Charger and an Advanced Alternator Regulator?

The Battery to Battery Charger is a trouble free installation. Both the Advanced Regulator and the Alternator to Battery charger would cause problems with vehicles with complex ECUs. This is all European vehicles. Most American vehicles may still be okay (this will change over the years). The Battery to Battery Charger connects to the engine starter battery and has 100% nothing to do with the primary system (other than taking its power). All complex aspects off the primary system are left in tact. This ensures no problems will be reflected in the standard engine management system.

Which Battery to Battery Charger to use?

Features Waterproof	1 New Batt to Batt	2 Waterproof 60A-120A	3 IP68 waterproof	4 Original	5 Original with RBF
Including cables and fuses			•		
Current limiting	•	•	•	•	•
High V reduction and low V Boost	•	•	•	•	•
Battery type adjustable 6 types			•		
Battery type adjustable 8 types		•	-		
Battery type adjustable 9 types	•				
Battery type adjustable 4 types	-			•	•
Custom set	•	•	•	•	•
Lithium battery type	•	•	•		
Fan cooled	•	•		•	•
RBF friendly	•	•	•		•
Adjustable current limit	new 120-240 model				

Why Choose an Alternator to Battery Charger over an Alternator Regulator?

Alternator to regulators have the following disadvantages to the Alternator to battery chargers:

Relatively difficult to install: This limits semi skilled personnel for fitting.

Requires the removal of the existing alternator to work on it: This can be awkward and time consuming.

Requires extra cables to be run on the boat or vehicle: This can be again be time consuming and awkward.

Warranty on new engines: Some engine / vehicle dealers raise warranty issues if a new alternator is modified to fit an advanced regulator.

ECU Problems: Many new engines have ECU's (electronic control units) on their engine management systems, any attempt to fit an advanced regulator will result in alarms going off (mainly in vehicles, motor homes and the latest marine engines). The Alternator to Battery Charger ensure the main vehicle / boat voltage remains within the ECU's programmed parameters and allows the extra battery bank to be charged at the higher voltages needed to achieve fast charging.

Total Package: 95% of installations using an advanced alternator regulator also have some sort of split charger system whereas the alternator to battery charger already has that built in.

FAQ's

A 65

What is Current Limiting?

Current limiting is the ability of the product to internally limit the current which it will allow to pass through itself. This prevents damage to the unit in the event off heavy current draw (larger than the rating of the product) such as engine starting and large bow thrusters/inverters. This also allows multiple units to be used on the same battery banks with no overloading of one unit. Any size charger / alternator can be used with a current limited device and this device shall limit the current to the rating of the device.

Can I use my solar panels in conjunction with Sterling's charging products?

Yes, they will work, they have nothing to do with each other but the solar systems will not affect nor interfere with any Sterling Power system.

How to rate the size of a charger:

This very much depends on circumstance:

- From standard shore power, the rule of thumb is to charge at about 10% of the Ah capacity of your battery bank(s). This is ideal if leaving to charge overnight or time is not a big factor. An empty battery (about 80% empty) would fully charge in about 8-10 hours.
- 2) If charging from a generator, to save on generator hours / fuel, it is recommended to rate the charger to 25%+. The larger the charger the faster the charge rate and the less hours on the generator's set. This is a purely finincially driven decision based your requirements.
- 3) A user may wish to really thump current in to their batteries in order to get them charged quickly between short stops. They may be using AGMs and are willing to replace them regularly (as they shall not live long). In this case rate the charger at around 50%+ of Ah capacity. For batteries like lithium it could be as high as 1C which is charging at the total rate of the battery's Ah in one hour. You could actually use 400A of battery charging on a 400Ah lithium battery bank and charge in 1 hour.
- **Note.** Rate to continuous onboard use. E.g. Using 50A, only charging at 20A, equals a 30A deficit. In this case, use at least a 50A charger.

Need a larger charger than Sterling can provide?

The Sterling Pro Charge Ultra range is digitally controlled and current limiting. This allows numerous units to be put together in parallel (to increase current rating) or to be put in series (to increase voltage rating). A typical example would be someone wanting 120A charger at 12V. Simply add 2 PCU1260 in parallel. Likewise, you could add 2 PCU2430 together in series to get 30A at 48V.

How to Calculate Fuse Ratings.

In order to work out the size of fuse needed, follow this formula for working out the fuse rating, voltage or wattage for each appliance:

P (power Watts) = V (Voltage) x I (Amps)

The current the product will pull can be calculated by dividing the power used by the appliance by the voltage going into the appliance:

I(Amps) = P(Watts) + V(voltage) for a fuse you like to work from 50-200% above this amp rating depending on the product. For example, if you using a 2500W inverter which is about 200A load, the inverter may have a large short term overload of say 4000W, so the fuse would be able to deal with that surge. The same would be true for a bow thrusters, anchor winches, air conditioners where there is a sizable overload ability - rate to double the continuous load. However, for fixed loads with no overload (e.g. lights) then 30-50% above is fine. Remember, the fuse is to protect the cables not the product, also, note that any wire directly connected to a battery should be fused.

DC voltage measured	DC 12V (fuse size)	DC 24V (fuse size)
Fridge (40W)	6A	3A
Hairdryer (1400W)	200A	100A
Kettle (1600W)	200A	100A
Laptop PC (350W)	50A	25A
Microwave (1400W back plate)	200A	100A
Television (300W)	50A	25A
Washing Machine (2200W)	300A	150A

Some videos you may find useful

Lithium batteries vers lead acid www.youtube.com/watch?v=jR34QF3xcCc&t= Bay Marine USA on the Pro Charge Ultra www.youtube.com/watch?v=5veL6OsKzjl&t=6s Caravan battery charging (wild side product) www.youtube.com/watch?v=r67b1SaBGJk Charging Problems with campervans / caravans www.youtube.com/watch?v=7WADiMSJ7Yc Wildside caravan charging www.youtube.com/watch?v=uDZJ2sJoegk Sterling on range of batteries for the leisure market www.youtube.com/watch?v=sJZlounw4oE Van Life battery to battery chargers www.youtube.com/watch?v=NH b5cwS-pc Fast caravan battery changing www.youtube.com/watch?v=zx52od8w3iw Fridge AC vers DC efficiencies www.youtube.com/watch?v=IQ48BgvJIJw&t=3s Fridge AC vers DC for inland waterways www.youtube.com/watch?v=SUzbp18L9oc&t=11s Smart alternators / re-gen braking alternators Vehicles www.youtube.com/watch?v=cJlk2nMGrys Battery to battery charger pro charge ultra www.youtube.com/watch?v=R4OAIIJ4M7I&t=4s Pro Charge Ultra www.youtube.com/watch?v=WJFrsbYkvf8 Pro charge ultra trouble shooting www.youtube.com/watch?v=O_J_fPRiP4 Short information series on Alternators performance www.youtube.com/watch?v=10yvm4glUsc Short information on charging batteries www.youtube.com/watch?v=hKURbJOoICk Battery to battery charger trouble shooting www.youtube.com/watch?v=woHS0P8GSgg Battery to battery charger factory reset www.youtube.com/watch?v=5GXEPzr0EfE Why you do not use relays for charging on euro 6 www.youtube.com/watch?v=2OiPiGSsA9w Alternator protection device www.youtube.com/watch?v=03SQMDnY600 Inverters and different types www.youtube.com/watch?v=wuWaBtbhPWc Battery Chemistry module www.youtube.com/watch?v=IRKfKxK 0rI 500 amp power distribution box www.youtube.com/watch?v=8ArEo-wHrl8 Testing if you vehicle is Euro 6 with re gen breaking www.youtube.com/watch?v=X3LDVZAZMII Practical camper van problems and solutions www.youtube.com/watch?v=EEhmWVd6Evs

New office with R + D extension. Approved for construction next year

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New 24,000 sq ft warehouse extension completed - making 50,000 sq ft warehouse. Office and R+D department extension due next year.

For HD photographs of Sterling's products, refer to: <u>https://www.flickr.com/photos/128075788@N06/sets/</u> The relevant links can also be found on our website.

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