

DC to AC Inverters - Automatic Battery Chargers - Combined Inverter / Charger
Advanced Regulators - Alternator to Battery Chargers
Battery to Battery Chargers - Accessories and Components

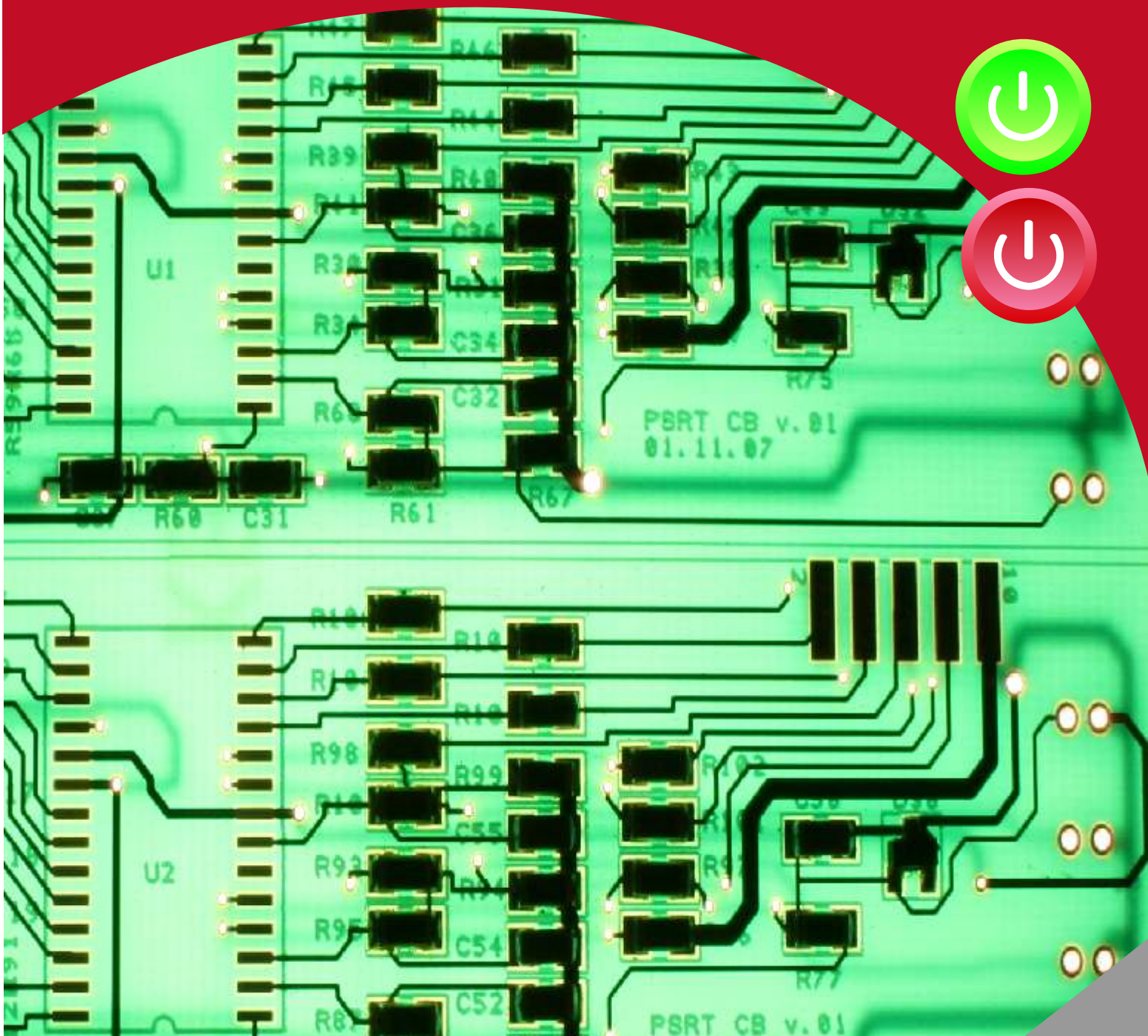


English version

Over 90 new products
and 10-15 % price reduction

**Advanced Marine and
Automotive Power Products**

STERLING POWER



www.sterling-power.com



from November 2009
2010 Edition

Introduction

Last year was a rather challenging year for everyone to say the least; compounded by the collapse of the £ against the \$ around October 2008, this resulted in large price rises from us last year. Its very important to our supply chain that we try to hold our price for a year due to catalogue printing etc. Last year the £ was about \$ 1.38, but this has now increased to about the \$ 1.60 where one would hope it will stay steady in that area for a period of time. As such we have been able to re calculate our prices and have found a reasonable price drop in most if not all products for 2010, that is assuming our Banking friends do not have any other major night mares up their sleeves. Combining the price drop with a lot of new exciting products we feel more than confident of the further increase in market share in our business sector next year.

Who, Where, Why and What are we about ?

Sterling Power Products is a small company owned by myself, Charles Sterling. I started out as a Marine Engineer Officer trained by British Petroleum, and worked on Super Tankers. This was a great experience; it was a little boring as these ships were new and never really broke down (they exploded the odd time but apart from that they were very reliable). So I left, and joined Canadian Pacific where I spent my time on container ships, ore carriers and other more interesting ships (more interesting from the engineering challenge point of view as they tended to be older, and therefore broke down more often). I did the running round the world thing and got into all the trouble you can imagine (ah, the good old days). I was one of the youngest people ever to hold a full seconds diesel (D.T.I.) ticket (steam and diesel) with part A and part of part B of a chief engineers ticket. But I was reluctant to spend my life running round the world from what appeared to be, one war zone to another, and where ones belief in god is directly proportional to how close that last bullet was to your head.

I have always claimed to be a reasonable engineer, and as such, try to convey not just what a product does but why you need it. I endeavour to make this as simple as possible. Please bear in mind that I answer about 90 calls a day, and have targeted the literature at people who want to understand the products, but have been unable to get access to the information. Most companies' technical information is hidden in the sales jargon, not with Sterling. We are proud of what our equipment does and see no need to cover up any flaws with glossy vague sales literature. Flaws should be designed out of products, not covered up. All companies products suffer from technical problems, the trick is to find them and design them out as quickly as possible. Being a small company with its own in house design team, our response time is at a level that larger competitors can only dream about. The end result is our products just keep getting better and better, outstripping our competitors more and more every year.

Sterling Power Products business plan is very simple. We design every conceivable performance and safety feature we can think of into our products; then we check our competitors just in case we missed something (however, we

have never come across anything close). Having designed all the features we try to manufacture the products at a cost that will allow us to offer our customers a product with a high technical specification, but at the same time keeping the cost down. This is especially important when dealing with O.E.M's (Original Equipment Manufactures, in our case boat builders). Builders want performance /safety/reliability but uppermost is price.

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Sterling Power Products Ltd



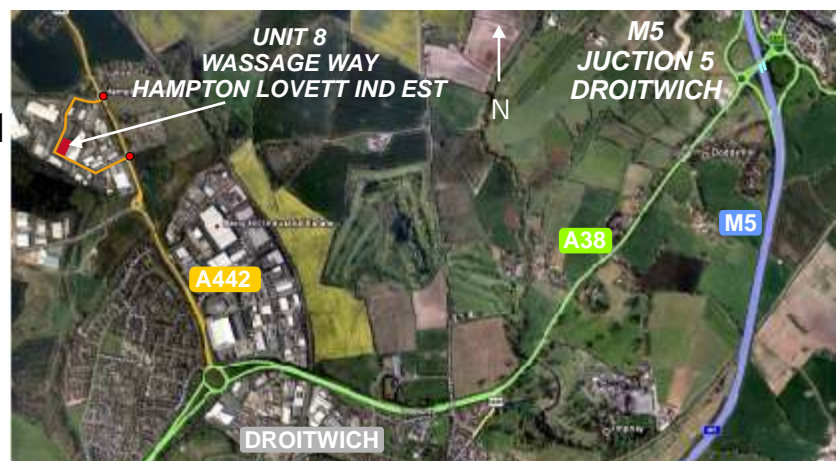
20,000 sq ft factory in Droitwich
Over £ 5,000,000.00 retail stock held
at any one time ensuring product
available and speed of delivery.

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Pro-Sport. Waterproof battery charger s

Totally waterproof (IP 68) , fully isolated outputs 2 x 12 v or 1 x 24 v.

Pro-Sport. 5 and 5/5 (10)

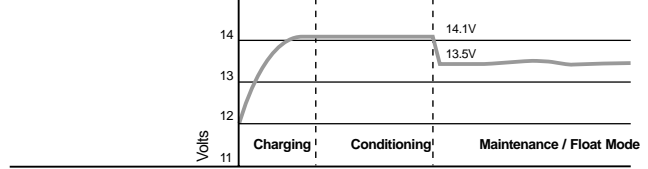
Totally waterproof (IP 68) , 3 stage Battery Charger



5/5 model
1 x 12 v 10 amps
2 x 12 v 5 amps
1 x 24 v 5 amps

5 model
1 x 12 v 5 amps

Typical Average Voltage



Pro sport 5 is 1 x 12 v 5 amp output
Pro Sport 5/5 is 2 x 12 v 5 amp totally isolated outputs, can be used as 1 x 12 v 10 amp, 2 x 12 v 5 amp, or 1 x 24 v 5 amp
Epoxy filled for waterproof and vibration proof aspects
Pre wired with 1.5 meters d/c and a/c cables
d/c cables pre fused and come with gold plated ring terminals ring

Pro Sport 5 and 5/5 water proof battery charger 230 v a/c 50 hz only						
Voltage d/c	Amps	Outputs	Size L x W x D mm	Weight kg	Part nos	
12	5	1	75 x 150 x 65	2.5	PS125	
12/24	12v 2 x 5 (1 x 24v x 5) or 12 V 1 X 10 amp	2	230 x 130 x 90	3.5	PS1255	

Pro Sport 8-20 amp
Pro Sport PFC
1 amp

- Molded Plastic case
- Extruded aluminium housing.
- Fully waterproof to (IP 68) standard .
- Both pos and neg fully isolated that enables the unit to charge 12 or 24v batteries.
- Adaptive charging, ensures max charge in the batteries.
- Lead acid / sealed (AGM/Gel) battery selectable for maximum performance
- Preset fixed non selectable battery type for gel, sealed, AGM, and open lead acid
- Dynamic thermal output control.
- LED power and charge indicators.
- Built-in protection distributed-on-demand.
- 4 step charging curve.
- Pre wired waterproof loom for easy installation.
- Pre fused and gold plated terminals
- 12 and 24 v application (except pro sport 5)
- 2 -3 x isolated outputs (except pro sport 5)
- 110 & 230 volt a/c auto

Ignition protected,
ideal for petrol boats

Ideal for sports boats or equipment
where the charger will be exposed
to water wash down such as a
power hose
or petrol fumes such as petrol boats



Advice: We recommend to use waterproof battery chargers where the waterproof aspect is a priority. For all other applications we recommend our digital control units (please refer to page 4) which are lighter and have a superior performance.



Pro Sport 20P
Power Factor Corrected
110-230 v a/c auto 40-70 hz

Pro-Sport. 8-20 amp

12 V 8 - 20 AMP 24 V 4 - 10 AMPS

Pro Sport Waterproof battery charger 230 v a/c hz only						
Voltage d/c	outputs	Amps	Size L x W x D mm	Weight kg	Part nos	
12	1	1	60 x 60 x 60	0.5	121CE	
12 & 24	2	8 at 12 v 4 at 24v	170 x 180 x 65	3.6	PS1208	
12 & 24	2	12 at 12 v 6 at 24v	210 x 180 x 65	3.6	PS1212	
12 & 24	2	20 at 12 v 10 at 24v	270 x 180 x 65	4.5	PS1220	
12 & 24 & 36	3	20@12v 10@24v 6@36v	270 x 180 x 65	5.0	PS1220plus	
Pro Sport P 110-230 v auto						
12	1	20	290 x 170 x 65	3.8	PSP12201	
12 & 24	2	20 at 12 v 10 at 24v	290 x 170 x 65	3.0	PSP12202	
12 & 24 & 36	3	20@12v 10@24v 6@36v	290 x 170 x 65	3.2	PSP12203	



1 AMP waterproof
float charger ideal for
jet ski, small boats,
bikes, lawn mowers etc.
single output

Portable Global Smart Charger with auto repair program

The new micro processor controlled small portable charger can now be used anywhere in the world. It not only gives you all the latest pulse charging and built in de-sulphation but is also truly global, with 100-230 volt 50/60 hz ac input, putting the product in a class of its own.

Features and benefits of this portable charger:

Universal AC Input (100V to 240V): can be used anywhere in the world, truly global charging

Suitable for all types of lead acid batteries: Wet, GEL, AGM, Calcium

Simple 3 touch screen selections with intuitive iconic LED indications: Simple to use
3 charge modes, small battery, large battery and Cold Charge, ideal for low temperature battery charging, of de-sulphation, and also for the new Calcium where a higher voltages is required to charge the batteries.

Microprocessor Control multi-stage charger with Pulse Absorption and Float Charge: fast charge but safe floating for long term operation.

Checks if a battery is faulty, the processor can automatically identify if a battery is beyond repair and flash a warning light to inform you it need replacing.

Repairs faulty batteries (if recoverable) if the battery is found to be faulty but repairable the unit will automatically identify the fault and inject high voltage short DC pulses until the battery is repaired, a l.e.d. shows the charger is on repair mode.

Defective battery identification. if after 8 hrs on the repair mode the battery is deemed not to be repairable then a l.e.d. will flash to inform you that the battery is beyond help and needs replacing

Three charge modes, when the battery is found to be suitable for a charge then the charger will bulk charge, then pulse width absorption charge and finally float charge, the unit can be left on permanently.

Soft start charging: if the battery is found to be heavily depleted then the smart charger will start at a low pulse current until the battery has reached a level where it can then absorb the full charge power

50% power reduction mode: for small batteries under 30 amp hrs

Cold weather 14.8v (x 2 for 24 v) charge mode option

Two interchangeable connection leads with clamps and eyelet terminals

Thermal control, regulates charge current in hot conditions

No connection spark, there is no output voltage until the battery is connected

Electronic reverse polarity protection with LED warning

40 hrs time out to avoid any possible problems

Short circuit protected

Thermal protection, reduces power and switches off if too hot

Specification

a/c input range 100-240 v

a/c frequency 47-64 hz

Full load 1.3 amps@230 v a/c

Max power 70 watts

Optional Efficiency >81%

Max d/c current 5 amps

Charge voltage for sealed battery 14.4v x 2 for 24v

Low temp/calcium mode 14.7 x 2 for 24 v

Float mode high level 13.5v x 2 for 24 v

Float mode low level 12.8v x 2 for 24 v

Ripple 200mv

Protection: overload, short circuit, over temperature,

reverse polarity, no spark, short circuit, 40 amp time out.

Construction Pol-carbonate casting, water resistant

Approvals EN 60335, EN55014, IP45 body only

Weight 0.4 kg

Dimensions 150x60x30 mm

Global Smart portable battery charger					
Plug type	Voltage a/c	Voltage d/c	Amps	Weight	Part nos
British	110-230	12	5	0.4	GS125B
Euro	110-230	12	5	0.4	GS125E
USA	110-230	12	5	0.4	GS125A
British	110-230	24	2.5	0.4	GS243B
Euro	110-230	24	2.5	0.4	GS243E
USA	110-230	24	2.5	0.4	GS243A



6 l.e.d information panel

Pro Budget. New PFC Portable Digital battery charger

This new portable charger range is now active PFC and has a power factor of 0.99 making it incredibly efficient, in the region of 89%, the adaptive, switch mode, 3 step, constant current, single output battery charger range is designed for use where only a single battery bank is to be charged. After the battery is charged the unit drops to a safe float voltage and will act as a power pack, safely delivering power to feed any on board power requirements up to the maximum current rating of the charger. Due to the reverse polarity protection feature of this unit, a battery with minimal charge level must be connected to the charger before it will activate, or become a power pack.

This charger is extremely compact, and is preset for use with open lead acid, sealed lead acid, gel, AGM or any battery where the charger voltage should not exceed 14.4 volts. (see charger voltage specification and performance below) This product is ideal for the vehicle/camper van market where only one output is required. This range offers all the features one would expect from the higher spec battery charger range but with lower cost.

Pro Budget Portable Charger						
Plug type	Voltage a/c	Voltage d/c	Amps	Size L x W x D	Weight	Part nos
British & Euro	90-250	12	6	190 x 70 x 50	0.65	PB126
British & Euro	90-250	12	12	165 x 100 x 50	0.8	PB1212
British & Euro	90-250	12	20	130 x 190 x 66	1.0	PB1220
British & Euro	90-250	24	6	165 x 100 x 50	0.8	PB246
British & Euro	90-250	24	10	130 x 190 x 66	1.0	PB2410

12 V 6 - 20 AMP **24 V 6 - 10 AMPS**
110 & 230 v unit



Includes 1 metre d/c cables and battery clamps
 Small 12 v 6 amp no charge L.E.D. only on or off
 all others include charge performance L.E.D.S
 comes complete with Euro and British plug set



The ultimate battery charger

Pro Charge U

release date
March 2010

3 output PFC global charger 110 and 230 v 50-60 hz
(only 2 outputs on the 10 amp)



12 v 60 amp model, all other units pro rata
 Input voltage range 90-270 v 40-70 hz
 Power Factor at 230 v 0.976
 Efficiency 89.4%
 Full load current (110/230v) 9.8/4.6
 Ripple noise (R.M.S.) 14mv
 Ground leakage 0.5 ma
 Generator/ mains power required to run unit (watts)
 12 v 20 amp approx 300 watts
 12 v 30 amp approx 450 watts
 12 v 40 amp approx 600 watts
 12 v 50 amp approx 750 watts
 12 v 60 amp approx 900 watts
 24 v 20 amp approx 600 watts
 24 v 30 amp approx 900 watts
 volt metre accuracy +/- 1%
 amp metre accuracy +/- 1%

EN61000-3-2
EN61000-3-3
EN50081-1
EN60335-2-29

Every so often it becomes necessary in a competitive market to simply raise the bar so high its leaves everyone in your wake, we do this regularly on other products but this year we re-visited our standard battery charger range to make a product so far beyond our competitors for performance, style and value that you simply leave them behind, with this new charger we like to think we have done just that. With our years of experience in this market we thought of everything we could possibly think of and combine it all into into this product range, resulting in the **Ultimate** battery charger.

Extra new features on this product above and beyond of standard features include :

- 1) 11 pre programmed battery curves including Lifep04.
- 2) 1 custom set, can be set from charger, no need for computer.
- 3) 2 x digital meters for current and voltage measurement.
- 4) 1 x power meter to show what reserve power left on the unit.
- 5) PFC, active, up to 0.99 pf, ensuring efficient power conversion, up to almost 90% as opposed to about 50% for older non PFC technology. Combined with (below)
- 6) New synchronised rectification output as opposed to diode output, giving up to a extra10% efficiency
- 7) High voltage de-sulphation cycle.
- 8) New, low activity, standby mode to increase battery life.
- 9) Battery health program.
- 10) Multiple speed fan control to reduce 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) fans would still be required to ensure operation.
- 11) Primary (processor digitally controlled) and an emergency backup secondary (analogue controlled) high voltage trip.
- 12) 32 L.E.D. information panel.
- 13) Internal scan and systems check.
- 14) Remote control
- 15) Small footprint and light weight
- 16) Include battery temperature sensor
- 17) As with all our marine chargers all metals used are non ferrous

REMOTE CONTROL (OPTION)

110x 68 x20 mm including 10 metres cable
 Unique remote housing can be surface mounted, recess mounted or flush mounted



Pro Charge Ultra 80-230 V 40-70 hz a/c input					
D/C voltage	Amps	Number of outputs	Size L x W x D mm	Weight kg	Part nos
12	10	2	260 x 215 x 90	2.0	PCU1210
12	20	3	260 x 215 x 90	2.0	PCU1220
12	30	3	260 x 215 x 90	2.0	PCU1230
12	40	3	260 x 215 x 90	2.0	PCU1240
12	50	3	315 x 215 x 90	3.0	PCU1250
12	60	3	315 x 215 x 90	3.0	PCU1260
24	20	3	260 x 215 x 90	2.0	PCU2420
24	30	3	315 x 215 x 90	3.0	PCU2430
Remote control plus 10 metres cable			110 x 68 x 20	0.05	PCUR

No Batteries Wind up Multimeter



Do you ever find yourself needing a multi meter, which you know you have somewhere and when you find it the batteries are flat, well never again, this new product has no batteries so you can leave it as long as you like, simply wind the handle 2 times for about 2 mins use or wind for about 10 seconds for about 10 minutes of use. The high quality extremely well equipped with all the features and functions required for general use

Code

WUVM

GENERAL SPECIFICATIONS

Display 46 mm x 23 mm large LCD
 Measurement AC, ACA, DCV, DCA, ohms, continuity beeper, Hz, %, Capacitance, Diode, Data hold.
 Range selection Auto ranging with manual selecting.
 Data hold to freeze the display reading
 Dimensions 152 x 78 x 45 mm
 Weight 350 g
 Includes Red and Black test leads plus instruction manual
Electrical Specification
 D/C voltage Range Volts 400.0 mv - 1000 v D/C Accuracy +/- (1% + 3d)
 Input impedance 10 M ohm
 D/C & A/C current 10 A - 400 uA

Overload Protection Fuse
 Ohms 400-40 M ohm
 Capacitance 40nF-100 uF
 Frequency 4 Hz - 4 MHz
 Diode (forward voltage, VF)
 Range 4 V DC
 Resolution 0.001 V
 Test voltage 1.6 v DC
 test current 1 +/- 0.6 amps
 Continuity Beeper
 Beep if resistance less than 100 ohm
 response time < 100 ms

4 Step Constant Current 3 output progressive battery chargers/ Power packs

ProCharge C



12 v 10 , 20, 30 amp
24 v 20 amp

Pro Charge C 80-230 V		40-70 hz a/c input		Weight kg	Part nos
D/C voltage	Amps	Number of outputs	Size L x W x D mm		
12	10	2	240 x 165 x 60	1.5	PC1210
12	20	3	240 x 165 x 60	1.5	PC1220
12	30	3	320 x 165 x 60	2.0	PC1230
24	20	3	320 x 165 x 60	2.5	PC2420

This newly revamped and upgraded charger offers all the features of the international range but in a new look package and with extra features. The international range has proven to be one of the most successful on the market due to its price, extremely small footprint and performance. This 3 output unit accepts multi input voltage (80V-300V) and frequency (40Hz-400Hz) is ideal for a smaller boat.

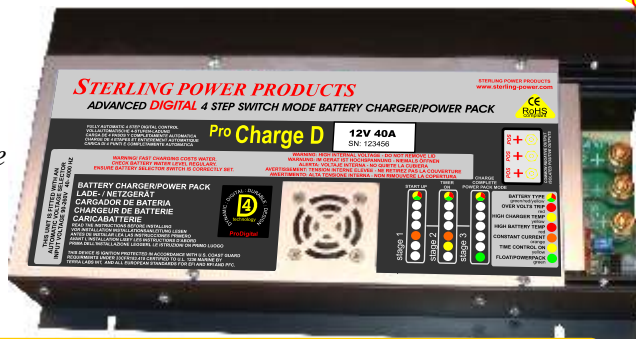
- 1) 4 step adaptative battery charging.
- 2) Programmable for gel, open lead acid, sealed, maintenance free and AGM batteries.
- 3) Automatic universal 110/230volt 50/60Hz input tolerance.
- 4) Power pack function.
- 5) 3 isolated outputs (except the 10 amp , only 2 on that model).
- 6) Low cost, high performance ratio.
- 7) New 3 stage R.F.I. filter for even lower radio interference.
- 8) 24kt gold plated output terminal.

ProCharge D 12 v 30, 40, 50 amp

24 v 25 amp

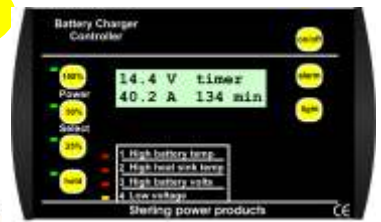


Includes
1 x battery
temperature
sensor



Best Buy Winner
from Segeln
German yacht magazine test

Incl.
gold output fuse



Remote control
(optional extra)

The new DIGITAL range of battery chargers is the latest High Tech upgrade of the 'ProC' charger range. All the power benefits of the standard system are retained with the control, safety and information aspects upgraded beyond recognition. The latest benefits offered by digital adaptative control are highlighted in the Quick Check on the opposite page (page 5) and should be studied. Digital management ensures more accurate control, more battery information type storage in the software, more real time calculations to be done to ensure the best charge, more information is also available in the control chip which can then be displayed on the new remote control and information panel that is supplied as an option in the small range but as standard in the large range.

Pro Charge D 80-230 V		40-70 hz a/c input		Weight kg	Part nos
D/C voltage	Amps	Number of outputs	Size L x W x D mm		
12	30	3	340 x 195 x 60	3	1230CED
12	40	3	340 x 195 x 60	3	1240CED
12	50	3	340 x 195 x 60	3	1250CED
24	25	3	340 x 195 x 60	3	2425CED
Remote control unit			170 x 90 x 40	0.25	CEDRC

ProCharge N



Includes
1 x battery
temperature
sensor



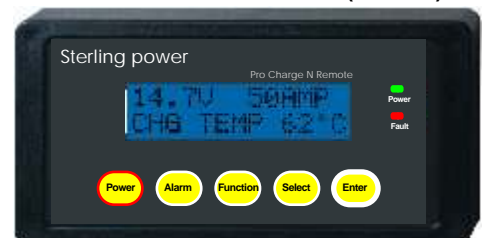
12 v 40, 50 , 60 amps
24 v 35 amps
Twin installation up to 6 outputs
12 v 120 amps
24 v 70 amps



aluminium A frame

The stylish powerful Digital Pro Charge N is the latest addition to Pro Charge range. This new product's impressive extra feature list can be seen on the next page. The units can, of course be used individually. For applications where extra power is required, however, or even when extra outputs are needed (for example a larger boat could have 2 engine starter battery banks, main domestic bank, bow thruster bank and a generator battery), you can simply connect one output from each charger directing both chargers power into the domestic bank and feed the other 4 battery banks with the 4 remaining outputs. This also reduces the cable diameter required as the 4 smaller battery banks are only capable of receiving 1/2 the power of the larger battery bank. A special aluminium A frame has been designed to support 2 units in a small foot print. To enhance this ability even more a special power balancing box was designed specifically for the major American boat builders who wanted more economic power, they found that they preferred the small size of the twin system and, of course, the redundancy factor in case of a problem. If the higher power option is required, then the frame is simply a neat way to combine units together, the chargers are bolted to the pre made frame and the frame is secured to the bulkhead for a neat finish.

REMOTE CONTROL (OPTION)



Pro Charge C 80-230 V		40-70 hz a/c input		Weight kg	Part nos
D/C voltage	Amps	Number of outputs	Size L x W x D mm		
12	40	3	440 x 200 x 100	5	PCN1240
12	50	3	440 x 200 x 100	5	PCN1250
12	60	3	460 x 200 x 100	5.5	PCN1260
24	30	3	460 x 200 x 100	5.5	PCN2430
Aluminium A frame to support 2 chargers			525 x 190 x 210	1	PCNA
Dual control box to balance twin installation				0.1	PCND
Remote control panel plus 10 metres cable			105 x 55 x 16	0.1	PCNR

STERLING QUICK CHECK LIST

Check these functions against our competitors
Green is a performance feature and Red a safety feature

	Pro Charge C	Pro Charge D	Pro Charge N
Adaptative charging	●	●	●
3 isolated outputs	●	●	●
Automatic 110/230 volt selector	●	●	●
Power pack mode	●	●	●
Multiple input frequency from 40-400 hz	●	●	●
Thermostatically controlled fan cooling	●	●	●
4 step constant current charging	●	●	●
High ambient temperature rated	●	●	●
4 different Battery type selector	●	●	●
Automatic battery bank size and state sensing	●	●	●
3 stage R.F.I. filter	●	●	●
3 led output display information panel	●	●	●
High heat sink temperature trip	●	●	●
24t gold plated output terminal post	●	●	●
Reverse polarity protected (with fuse)	●	●	●
Over load protected	●	●	●
Short circuit protected	●	●	●
Sturdy aluminium construction	●	●	●
Small foot print, low profile	●	●	●
U.L and A,B,Y,C, certificated	●	●	●
Can be used in parallel operation	●	●	●
Digital software control	●	●	●
Battery temperature sensing and compensation	●	●	●
High battery voltage trip	●	●	●
High battery temperature trip	●	●	●
Negative fused externally (A.B.Y.C. Requirement)	●	●	●
Auto power reduction in event of high temperature	●	●	●
7 led output display information panel	●	●	●
Automatic 10 day de - sulphation cycle	●	●	●
Remote control socket for optional remote panel	●	●	●
Safety time out circuit	●	●	●
7 battery type selection	●	●	●
Calcium battery cycle included	●	●	●
De Sulphation cycle selector	●	●	●
10 LED information display	●	●	●
10 LED current bar display on charger	●	●	●
Voltage balancing control circuit	●	●	●
Parallel balancing ability	●	●	●
Extra features offered with the remote optional	●	●	●
Remote switch on/off	●	●	●
Manual power reduction selector	●	●	●
Auto memory power lock on setting	●	●	●
Delay start up to enable power setting change	●	●	●
2 line 16 bit L.C.D. display screen	●	●	●
High charge rate timer countdown	●	●	●
Auto cycle all information with manual screen lock	●	●	●
Displays all alarm functions	●	●	●
Display, volts amps temperatures etc	●	●	●

More descriptive information on the above functions

Adaptative Charging.

This is where the charger control circuit can increase or decrease the charging profile depending on the state and size of the batteries, low cost fixed chargers do not have this ability

3 isolated outputs:

The charger has 3 outputs enabling 3 different battery banks to be charged at the same time.

Automatic 110/230 volt selector:

The in built system enables the charger to be automatically used on a wide voltage range from 80-300 volts A/C. This covers all the possibilities encountered on any marina in the world.

Power Pack Mode

This is an absolutely critical aspect of any charger, the term Battery charger is used when asking for this type of product, however the term Power Pack is much more important as this is the ability of the unit to supply the d.c needs of the boats system after the batteries are charged, ie this product can run the boats d/c requirements (to the max amps of the unit) with no batteries on board (if required say for a new build or when along side)

Multiple input frequencies from 40-400 Hz: (switch mode design)

Self-explanatory, the unit is able to work on all worldwide A/C input frequencies.

Thermostatically controlled fan cooling:

The unit monitors the unit temperature and controls the fans; this reduces any unnecessary fan noise from the charger and enables the unit to operate at high ambient temperatures

4 Step constant current charging.

All modern chargers should be constant current chargers as opposed to the old fashion constant voltage chargers, constant current chargers will charge over 10 times faster and should but about 30-40 % more charger into the batteries

High ambient temperature rated:

Many boat builders expect the chargers to work at full power continuously at 40 deg ambient, few chargers in Europe meet this A.B.Y.C, requirement - we do.

4 Different battery type selector :

There is more than one battery type; most chargers do not offer different programs for different battery types. Failure to offer an option will result in either overcharging some battery types and sulphating others. The Sterling offers charging curves for open lead acid batteries, traction batteries, sealed batteries, gel batteries and A.G.M batteries.

Automatic battery bank size and state:

No need to program in the battery bank size as the digital software can work that out itself.

3 stage R.F.I filter:

In order to meet C.E. requirements for Radio Frequency Interference a three-stage filter is used to ensure that not only is the standard reached but also that we fall well above the standard legally required.

High heat sink temp trip:

In the event of extreme temperature the battery charger will switch off at 70 deg C

24kt gold plated output terminal posts:

Over a period of time brass corrodes in salt air making poor connectors, we have all seen the green paste that forms around battery terminals etc. All Sterling connection posts are solid brass and are 24kt gold plated to eliminate this and ensure better connections.

Overload protected:

The unit cannot be overloaded and so engine or bow thrusters etc can be used while the charger is in operation without damage to the charger

Short circuit protected:

As stated the charger can be short-circuited with no adverse results.

Sturdy Aluminium construction.

All sterling chargers make good use of strong aluminium body , both to ensure heat is removed from the product and also to add strength to the product. Plastic just will not do the job.

Digital software control

There are 2 ways to control electronic processing, Analogue (hardware control) and Digital (soft ware control). Hardware control is where the voltage sensing and processing are all done via transistors and electronic hardware. This is fine as long as the information to be processed is kept simple.

Sterling leads the field in this type of controller but has found that when upgrading from our previous model, it required so many extra features to keep up with new battery types and alternator types etc, which makes a hardware version impossible to make. Digital control (software): This uses computer lines of code, digitally burned into a memory processor in the battery chargers. This means that very complex information and mathematical processes can be processed, which would be impossible for the hardware system to do. It is the next generation of control and more and more you will see the term digital control appearing on different products. Digital control offers so many extra features at no extra cost (see below) and accuracy beyond the ability of the analogue version.

Battery temperature sensing and compensation:

The Sterling Digital comes complete with a battery temperature sensor, which is automatically set to one of the temperature compensation set by your battery type selector switch.

High battery voltage trip:

Things do go wrong no matter how hard we try so in the event of the regulator control failing, then any voltage above what the software is expecting will shut the battery charger down and display the fault.

High battery temperature trip:

It always amazes me how many companies sense battery temperature and compensate the charger voltage against temperature, but in the extreme event of total battery failure when the battery is going to boil, the battery charger will not switch off. The Sterling processor not only senses the temperature but will shut down the charger in event of total failure and display the fault condition.

Auto Power reduction in event of high temperature.

Because it is best to get as much power as possible at high temperature, in extreme high temperature or cooling fan failure, if the heat sink reaches 65 deg C then the output current of the unit will be systematically reduced to prevent the high temperature trip being activated at 70 deg C, its better getting something than nothing.

7 led output display information panel: High charger rate, timer activated, battery type (3 colours), Float mode, high battery temp trip, over voltage trip.

Automatic 10 day de-sulphation cycle:

The good thing about a constant current charger is that it de-sulphates the battery plates ensuring maximum life from the batteries. However, this only works if the charger is switched on/off regularly (i.e. every time you disconnect and reconnect the charger the plates are subjected to a de-sulphation cycle). The problem is that some boats or standby equipment may be rarely used, for example:, a boat could be moored all year and never leave the pontoon, or a stand by generator with the charger on all the time. In these cases the de-sulphation cycle would only happen once and the batteries would eventually sulphate causing premature destruction. However the Sterling software has a 7 day timer which in the event of inactivity will automatically run a de-sulphation cycle keeping your plates clean.

Remote control socket:

The unit has the ability to be connected to a digital L.C.D. information and control panel.

Safety time out circuit, in the event of defective batteries , and the charger is unable to complete its charger cycle, the unit will drop to a low float voltage after 10 hrs to reduce the damaged to batteries

7 battery type selection: The new control takes into account many more battery types than the normal units

Calcium battery cycle included: the new calcium batteries require charge voltage way above any normal chargers ability, failure to reach these voltages will damage the batteries.

De sulphation cycle selector. This unit has the ability to manually select a de-sulphation cycle , only to be used where batteries are sulphated or extremely discharged and require "bringing back to life"

Voltage Balancing circuit. Multi output chargers can sometimes in extreme conditions under charge batteries due to voltage imbalance, this occurs mostly when new batteries are used and where there is very little discharge from these batteries. This unit has a separate control circuit to ensure all the batteries being charged remain within the voltage parameters set down in the cycle program selected.

Remote switch on/off: ability to switch the unit on and off from the remote panel

Manual power reduction selector: Some marinas offer only limited shore power; as a result high power battery chargers will not work. It therefore becomes necessary to reduce the out power of the charger to enable it to operate from the shore power. This remote offers the ability to select 100%, 50% or 25% power to deal with the lowest shore power supplies. It is best to have some power than none, this feature is also good if an onboard generator is used, i.e. you may want say a 100 amp charger for the onboard generator to charge the batteries fast but the local berth cannot support such a large charger. In this case the charger could be reduced to 25 amps when returned to the marina berth.

Auto memory power lock on setting:If reduced power is selected the software remembers the setting so in the event of removing the shore power the charger will start up on the reduced setting next time.

Delay start up to enable power setting change: In the event of a boat entering a marina and only a low power supply is available, if the last time the charger was used then the charger would start up on high power and trip the shore supply. To overcome this problem when the charger is started, the software counts down 30 seconds before automatically starting the charger on the last setting. This gives the operator ample time to reduce the power if required on the remote control.

2 line 16 bit L.C.D. display screen: As described above a large information screen is use which as an on/off switch for the background light.

Auto cycle all information with manual screen lock: Due to the large amount of information being displayed, it is not possible to fit it all on the screen. As a result the screen automatically scrolls through the screens. However you may wish to monitor one screen in particular, in this case simply push the lock button to lock that screen on.

Impressive information displayed: The L.C.D. display and control gives the following information, charger amps, charger volts, time remaining on equalizing charger, battery type selected, battery temperature, charger temperature, plus all alarm and other control functions.

Auxiliary Battery charger / maintainer

12-12 v 3 amp 24-24 v 2 amp
 12-24 v 1 amp 24-12 v 1 amp

IP 66 waterproof
 Ignition protected

Save money on batteries and stop them from being destroyed by discharging. A flat battery means you need an expensive replacement .

The auxiliary battery charger maintainer is simple to install, low cost product designed to enable extra battery banks on a boat or a camper van to be kept topped up from a separate battery bank which has, for example, a battery charger / wind gen/ solar cell connected to it .

Why use this product instead of a voltage sensitive relay?

A voltage sensitive relay is great where a large current flow is required , but it takes a relatively large amount of power to hold in a relay , this is power you cannot afford if you are only producing low current, also if the other battery you are charging is a engine battery then the starting current that will be present on engine start up will cause problems through the relay unless its current limiting. The battery maintainer uses FETs instead of relays and as such uses very little power itself (less than 1.5 ma) and so the power generated for example in a solar cell) can be passed through with little loss. Also the maintainer is current limiting so the high load on starting would not effect it. Relays also have a limited life cycle and on low power generation a relay could be clicking on and off all day, however with a FET control system does not have any physical contacts to wear out and no noise produced.

How does it work?

This unit is activated when the main battery has reached about 13.3 volts and allows excess power to be transferred from the primary charging system to charge/maintain an auxiliary battery bank.

Please note that this product has no fast charge / boost ability but simply mirrors the input voltage with a small voltage drop (depending on the current flow), the final charge voltage would be around 0.2 volts lower than the primary charge voltage, more than enough to keep a battery topped up and supply any small loads such as the battery internal discharge and the engine management system discharge (up to about 1 amp continuous) . This product should not be used on a battery with a sustained heavy discharge or drain as it does not have the ability to pass high currents, for higher currents see the Voltage Sensitive relays or Battery to Battery chargers etc in the catalogue.

This product has the ability to charge and maintain the charge, even if the battery is low (in a long time frame for example a 100 amp battery at 50% discharge could take about 1-2 days) it would never do this if the current discharges from that battery is in excess of 2 amps

Examples of where one would use this type product successfully.

1) **Boats** , if there is only 1 charger on board on the domestic system (such as a Combi inverter charger) then this could be used to connect from the domestic battery bank to the generator battery, or engine starter batteries to maintain there charge state when the combi charger is on. Or you may have a 24 v main battery but a 12 v generator, or a 12 v main battery with a 24 v gen (the list is endless)

2) **Camper vans**, where the camper van has a mains battery charger on the domestic battery but none on the engine start battery; if the vehicle is left for over a few weeks the engine start battery can be discharged through the engine management (E.C.U.) system or if a Tracker is fitted, this will also drain the system. The product will keep the starter battery charged and maintain a reasonable current to cover the losses due to the electronics on the engine starter battery and keep the vehicle in a ready condition (as long as the battery charger is on the domestic battery system, or there is surplus power provided by a solar cell/wind turbine)

Maybe you camper van has a small generator on it, or the vehicle is 24 v and the gen battery is 12 v.

3) **Solar / wind top up**, you may have a solar cell or a wind turbine on the main battery bank and again wish to share the surplus power from this device to other batteries , to maintain them at a ready condition

Specification

Power consumption in off line/standby 0.001 amps approx 1 amp hr every 40 days

Power consumption on line (normally not important but only important if a low power solar cell is being used) = 0.015 amps . so a solar cell in excess of 1 watt would work through this .

High voltage trip 15 v on aux battery bank (x 2 for 24 v), high temp lock down at 80 deg c

Aux battery low voltage warning LED on if aux bat below 12.6 off above 12.7 volts

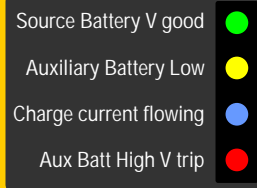
Voltage required to activate the device 13.3 v input

Voltage at which point the device switches off and on to standby 12.9 v input

Reverse polarity protected (fuse)

Auxiliary Battery Charge /Maintainer

www.sterling-power.com
 www.sterling-power.usa.com



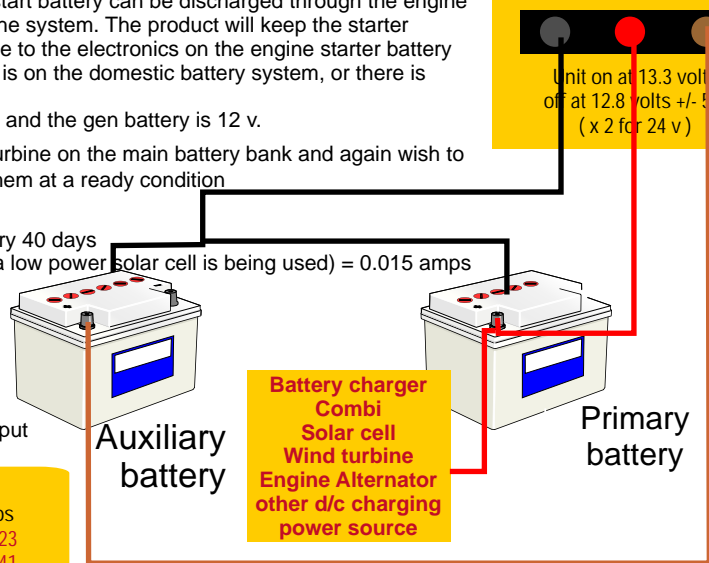
Sterling Power Products

Model type

12v to 12v	3 amp	<input type="checkbox"/>
12v to 24v	2 amp	<input type="checkbox"/>
24v to 24v	1 amp	<input type="checkbox"/>
24v to 12v	2 amp	<input type="checkbox"/>

Negative (BLACK) Common neg
 Positive (Red) Primary source battery
 Positive (BROWN) Aux battery to be charged

Unit on at 13.3 volts
 off at 12.8 volts +/- 1%
 (x 2 for 24 v)



Battery maintainer / charger inc 1 metre of cable					
Input V d/c	Output V d/c	Amps	Size L x W x D mm	Weight kg	Part nos
12	12	3	140 x 45 x 40	0.025	BM12123
12	24	1	140 x 45 x 40	0.025	BM12241
24	24	1	140 x 45 x 40	0.025	Bm24241
24	12	1	140 x 45 x 40	0.025	BM24121

Battery Balancer and Defective battery identification



model shown, 36 volt 3 x 12 v battery bank

This product is designed to balance battery banks in series , which may not be perfectly balanced and as such will prematurely be destroyed because they are not identical and there may be a slight internal resistance difference between each battery. If the batteries are balanced during the charge and discharge phase then they will last longer. Also, when a battery is detected as defective, it is clearly identified, enabling the operator to replace the correct battery before it is too late and both batteries end up getting destroyed. This unit can easily pay for itself many times over in its lifetime.

Suggested applications : 24 v starter battery bank on a boat or vehicle, 24 or 36 volt trawler motor bank on small electric outboard motors

Battery Balancer / defective battery identification				
Battery Bank V d/c	Bank Make up	Size L x W x D mm	Weight kg	Part nos
24	2 x 12 v	140 x 45 x 40	0.025	BD242
36	3 x 12 v	140 x 45 x 40	0.025	BD363
12	2 x 6 v	140 x 45 x 40	0.025	BD122
24	4 x 6 v	140 x 45 x 40	0.025	BD244

Battery to Battery 4 step DIGITAL Charger

On the surface this may look like another way of having an advanced regulator without wires (like the alt-bat charger on previous page) and in a way it is, however, this method has a specific market in mind and, like the advanced regulator and the voltage amplifier, it has a very precise slot which it has been designed for and fulfills perfectly.

Why do I need the d/c adaptative battery charger?

By now you will appreciate that the best way to charge a battery is using a 4 step battery charging curve (that cannot be achieved from a standard alternator). This system enables one to simply attach the unit to a standard engine battery and it will fool the alternator into working at it's maximum ability and ensure all it's surplus power is used to charge the auxiliary battery bank to it's maximum. This system is design to use only the surplus power and ensures that at all times the power required to run the primary system (the vehicle system or the boat engine) is not affected. The surplus power is converted into a higher voltage and used to charge a secondary battery bank using a digitally controlled programable 4 step charging curve as per all the other high charge products Sterling makes.

What performance improvements would I expect ?

In a nutshell it charges your extra battery system about 5 times faster than it would otherwise charge, doubles the useful power subsequently available, and increases battery life by de-sulphating them.

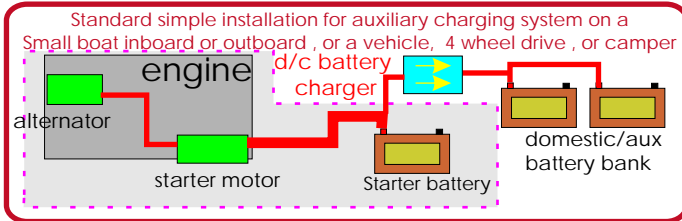
For best effect use open lead acid batteries, avoid gel, sealed and A.G.M.. batteries (see 'which is the best battery' article in the brochure).

Advantages of this unit.

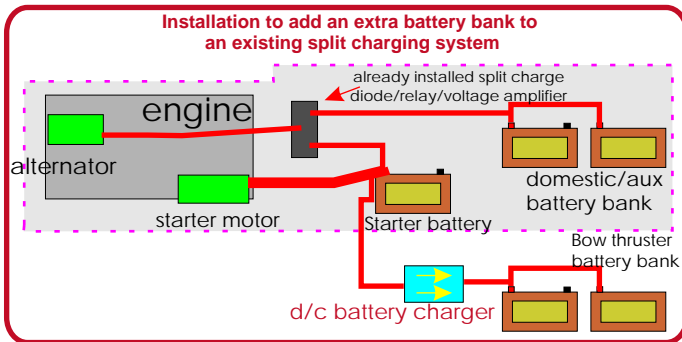
1) **Installation:** it does not get any easier, simply connect to your starter batteries, and to your domestic battery, job done, makes for

This unit can be used to charge extra battery banks from Boat Inboard engines, Boat Outboard engines Vehicle engines (cars/lorries/vans) and Generator engines.

The dotted line shows the original system and shows how simple it is to connect the bat-bat charger



This is the most common and simplest installation and is simply connected to the starter battery. In order to connect up the d/c battery charger all you do is connect one wire from the auxiliary battery banks to the starter battery, the starter battery stays between 13-14 volts (within its limits) and the domestic battery goes up to 14.4.-14.8. In order to put a good fast charge into the auxiliary batteries, this is especially good if the battery bank to be charged is not close to the starter battery and things like bow thrusters or batteries in the boot of cars or lorries.



This option shows a typical split charge system on any boat or camper vehicle, already installed and that has been using advanced alternator regulators or any other advanced charging system. Assume that then an extra battery bank is required, such as a bow thruster or radio battery bank or a generator. For ease of installation simply drop on a d/c battery charger.



Some models designed with outboards in mind are waterproof Ip68

optional remote control



inc 2 x temp sensors
1 x battery and
1 x alternator

easy and low cost installation.

2) **No direct connections to the standard engine alternator**, or to the outboard (if used on an outboard), thus on new installations there is no extra wiring for a split charge system.

3) **Ensures the engine battery system is not interfered with**

4) **Multiple units can be used**, for example if you have a 60 amp alternator, and 3 battery banks (engine, domestic, and bow thruster) then 2 of these can be used to run the bow thruster and the domestic system. The internal programs will adjust their charge patterns to accept the other unit and ensure only the excess power is used and the primary system is not placed in jeopardy.

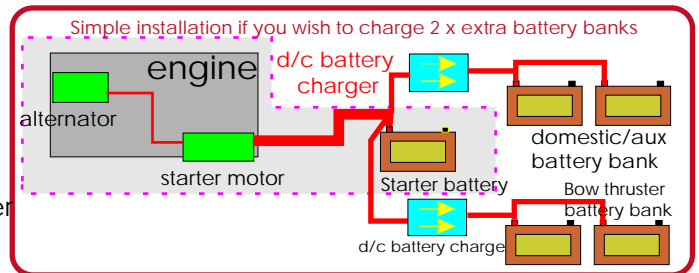
5) **Ensures there is no voltage rise on the engine management system**, to ensure no alarms or damage to the system be it an outboard, or a car, or a boat or a camper van

6) **No vehicle warranty issues as you are not connected to the main system**

How does it work?

The unit monitors the engine start battery, the unit will not start until the battery voltage exceeds 13 volts then it waits for 2.5 mins, to ensure that some charge is replaced after engine start, it then pulls the engine battery down to no less than 13.3 volts, this enables the engine battery to still receive a charge and ensures the alternator works at its full potential. To further ensure the engine battery is O.K.

Other features included in this system are remote control option, alternator temp sensing, battery temp sensing, ignition feed (if required), automatic start and shutdown. It's extra features and charging curves (software program) are very similar to the alternator to battery charger



This option shows a situation on many boats or camper vehicles where there may be 3 x battery banks, simply put 2 x d/c battery chargers on, and they will ensure both banks are catered for with no problem. The fact that one battery bank is further away than the other will make no difference

inc
2 meters
pre wired cables
with fuses
waterproof



New 12v 100 amp
24 v 60 amp available
jan 2010



inc 2 x temp sensors
1 x battery and
1 x alternator

REMOTE CONTROL (OPTION)
including 10 metres cable Unique remote housing can be surface mounted, recess mounted or flush mounted

Battery to Battery chargers							
D/C Input voltage	D/C output voltage	Amps in	Water proof	Size L x W x D	Weight	Part nos	
12	12	24	yes	230 x 135 x 65	3	BBW1220	
12	24	40	yes	230 x 135 x 65	3	BBW1224	
12	36	30	yes	230 x 135 x 65	3	BBW1236	
No remote control for the above							
12	12	50	no	200 x 270 x 70	3	BB1250	
12	12	100	no	190 x 190 x 70	1.5	BB12100	
24	24	30	no	200 x 270 x 70	3	BB2430	
24	24	60	no	190 x 190 x 70	2	BB2460	
Remote control for items in blue							
12	24	50	no	200 x 270 x 70	3	BB122450	
24	12	30	no	200 x 270 x 70	3	BB241230	
Remote control for items in red						0.05	BBRC

Universal Advanced DIGITAL Alternator Regulators

Please note

Advanced regs are not suitable for modern vehicles / boats with integrated Engine Management Systems as they increase the alternator's voltage and this can be interpreted by the management system as a fault on the alternator.

Please use an Alternator to Battery Charger or a Battery to Battery charger for these applications

The Problem with standard systems : Standard alternators are not designed to be good battery chargers; they are designed only to charge an engine start battery sufficiently to start the engine. Because of this inherent weakness, a more advanced regulator is required that in effect converts an alternator from a constant voltage battery charger to the latest 4-step progressive constant current battery charger (see battery charger graphs). Because of this improvement in the alternator control system, these regulators dramatically enhance the alternator's charge rates by between 200-2000% depending on how poor the original system is.

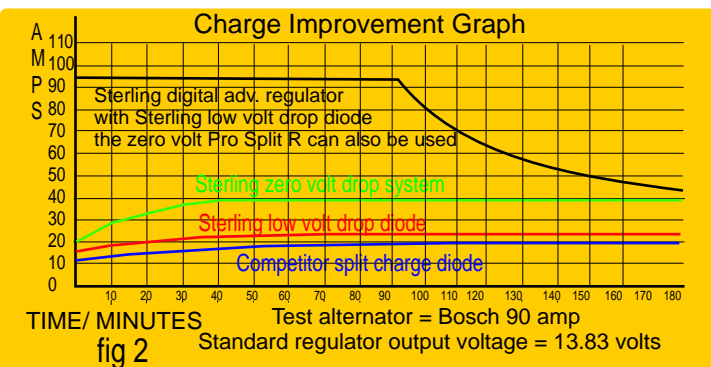
The Sterling Regulator is designed to charge batteries as fast as possible and to their maximum capacity without damage to the batteries or alternators.

What To Expect From An Advanced Regulator:

- 1) Maintains maximum performance of an alternator's power curve within a preset envelope as defined by battery manufacturers.
- 2) Batteries charging 4-20 times faster. (depending on original system)
- 3) Enables 25-35% extra useful power to be stored in batteries. A conventional alternator will only charge the battery to a max of about 75% and at about 40% remaining capacity the low voltage level renders it useless. This means that, of 100 amps of battery capacity, only about 35 amps are available to be used. An advanced regulator will fully charge the battery giving an extra 25% capacity that, in fact, increases the useable available power by about 70 -80 %.
- 4) Battery plates kept free from sulphate damage resulting in longer battery life.
- 5) Due to the built in safety features, in the event of incorrect installation the unit will switch itself off.
- 6) Reduces needless running hours on the main engine.
- 7) Compensates for voltage drops resulting from long cable runs, ammeters, diodes and other general wiring associated problems.
- 8) Automatically converts a machine-sensed alternator to a permanent battery sensed alternator.

SAFETY FIRST: The Sterling Advanced Regulator is full of safety features to prevent damage to your system. In the event of incorrect installation or a fault developing on the boat or vehicle, the high voltage trip picks up high voltages at the batteries and the alternator and switches off the advanced regulator (the field circuit is disconnected totally from the control via an internal relay).

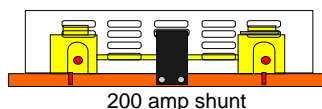
The Test: Using a standard 12V, 90 amp Bosch alternator fitted to our test bench, and rotated at a constant speed, the following test was undertaken. 4 x 100 amp "leisure" batteries were used, they were split into 2 battery banks, one for engine start and three for domestic. The engine start battery was fully charged (to copy that in real life) and the 3 x domestic batteries were discharged until such time as one of our 1800 watt inverters tripped out on low voltage. To make the test fair we linked 9 batteries together to make one larger battery bank then discharged them all to exactly the same level, then at random three batteries were selected and used for each test. The idea was to see how many amps could be replaced into a 300 amp battery bank. Bank discharged to a level one would expect in real life (ie. about 50-60% empty) over a 3 hour period, and to display the results in as simple a way as possible to highlight the difference between all the different options and why an Advanced Regulator is a necessity not a gimmick.



REMOTE CONTROL
(OPTION For Pro Reg S and U only)



Remote Control for Pro Reg S & B only
Voltage d/c 12 & 24 Size L x W x D mm 110 x 69 x 20 Weight kg 0.04 Part nos ARRSU



200 amp shunt

Shunt for Pro Reg U
Part nos
200 amp shunt S200A
400 amp shunt S400A

Pro Reg B Advanced alternator regulator
Voltage d/c 12 Size L x W x D mm 120 x 70 x 45 Weight kg 0.4 Part nos ART2VD

Pro Reg B
Inc battery temperature sensor and 1 metre of cables
Please check all the Features on this model on next

Battery Temp Sensor

12 v only
4 main battery types

Pro Reg D Advanced alternator regulator
Voltage d/c 12 & 24 Size L x W x D mm 180 x 90 x 55 Weight kg 0.5 Part nos PDAR
Remote control 170 x 90 x 40 0.25 PDARR

(Optional Extra)

Includes two temperature sensors 1 model 12 v and 24 v one model

IP 66, Waterproof Ignition protected

The new Pro Reg S and U are the next generation of advanced regulators, offering those extra features we deemed important based on our previous 15 years experience in this market.

The new style housing offers dust and water protection, along with the latest technology eliminates the need for fan cooling. All the extra features are explained on the next page

Pro Reg S
Includes two temperature sensors

Pro Reg S Advanced alternator regulator
Voltage d/c 12 Size L x W x D mm 140 x 113 x 45 Weight kg 0.4 Part nos ARS 12 v only

The Ultimate universal Advanced regulator with Automatic System Analysis Centre Pro Reg U

IP 66, Waterproof Ignition protected

Pro Reg U Advanced alternator regulator
Voltage d/c 12 & 24 Size L x W x D mm 160 x 140 x 45 Weight kg 0.45 Part nos ARU 12 & 24 v

Pro Reg

	B	D	S	U
Digital software control with slow start	●	●	●	●
Dynamic Progressive battery charging	●	●	●	●
Can be used in parallel (recommended) or as a stand alone regulator	●	●	●	●
Programable for different battery types	●	●	●	●
Single unit fits 99% of alternators and all battery types	●	●	●	●
Charges to 4 step progressive constant current charging curves	●	●	●	●
Self diagnosing fault system	●	●	●	●
Totally isolates the advanced regulator in fault condition	●	●	●	●
Information 6 LED display	●	●	●	●
Battery Temperature sensing	●	●	●	●
High battery temp trip	●	●	●	●
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	●	●	●	●
Protects batteries if temperature sensor open circuited	●	●	●	●
Protects batteries if split charge relay/diode fails open	●	●	●	●
Protects batteries if advanced reg fails closed	●	●	●	●
Protects batteries if battery sense wire falls off	●	●	●	●
10 I.e.d display		●		
12 or 24 v operation		●		●
Remote control option		●	●	
Alternator temperature sensor and disengage		●	●	●
IP 68 waterproof & ignition protected			●	●
7 battery types with 5 step charging curves			●	●
Battery type I.e.d. converts to volt metre after start up			●	●
Reg by pass for max rotor boost			●	●
If used in stand alone mode , transfers from adv reg to standard if fault			●	●
20 led information display			●	●
Battery balancing to help compensate for diode voltage distortion				●
44 I.e.d display panel				●
Extra I.e.d volt metre readings for all scanned safety parameters				●
Manual or auto scan operation				●
Amp metre up to 250 amps (reading) higher current ok but no reading				●

Advanced Regulator features explained in more depth:

Digital software control with slow start :

Digital control (software) uses lines of computer code, digitally burned into a memory processor in the Advanced Regulator. This means that very complex information and mathematical algorithms can be processed that would not be possible with an analogue hardware system. The unit ramps up the current over a short period of time to reduce the chance of alternator belt slip.

Dynamic progressive battery charging: this is a term used to explain that the internal software calculates a different charging regime every time its is used as the battery state etc is never the same. Older systems simply used fixed trimmers which were not able to distinguish different battery types or sizes

Can be used in Parallel or a stand alone reg. This unit can be used as a stand-alone regulator as well as in parallel with the original regulator. Sterling believes that where possible to leave the existing regulator in place this offers the Sterling Reg a fall back safety position in the event of it failing.

Programmable for different battery types:

Most other manufacturers fail to recognize the fact that the world has more than one type of battery. There are now four main groups, open lead acid/traction, sealed /gel, gel (Europe) and A.G.M. To optimise charging for each of these battery types there are four totally different charging curves, temperature curves and safety criteria with each battery type.

Single unit fits 99% of alternators:

The reason for this is very simple, if you check other makes, you can find 12-15 different models to cover what the Sterling will do with 1. The problem with this is the public must supply correct information about their alternator and batteries to ensure they receive the correct Advanced Regulator.

Charges to 4 step constant current progressive charging curves.

All good battery chargers are constant current with 3 - 4 step charging curve. This method is recognized as the best charging type so why expect anything less from your alternator- in most cases the primary battery charging source. The Sterling Advanced Regulator converts your basic constant voltage alternator into a modern 4 step constant current battery charger, it's that simple.

Self diagnosing fault findings:

The performance and benefits of an Advanced Regulator are beyond dispute, however, an Advanced Regulator which has been incorrectly installed or fails, can have devastating effects on a boat. It will destroy the batteries and could easily set fire to cables.

Sterling takes all this into account and recognizes that some boats on which these regulators are used have poor wiring and other faults. Because of this we scan the system every two seconds and if all the parameters are not within our pre-set values then the unit will switch off and signal fault. This in my opinion is the most important aspect of this type of device, a point not shared by our competitors.

Totally isolates the regulator in a fault condition:

This is very important and not fully understood by the public. All regulators can fail for different reasons. If an Advanced Regulator fails closed then the alternator will work at full power and destroy everything around itself. Simply turning the regulator off will have no effect, so in the event of a Sterling system failing or tripping, for whatever reason, we physically break the field wire guaranteeing that the Advanced Regulator will stop working.

Information L.E.D. display:

Most Advanced Regulators have no real information being transmitted to the operator and as a result one has no idea what is going on. Depending on the model we give the operator as much information as possible as to what is

happening with the product and the installation system in general.

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:

Most Advanced Regulators monitor the battery temperature to perform the task as explained above, but what is the point of monitoring the temperature if in the event of a battery going over temperature you do nothing about it? Sterling 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 14.4 (x 2 for 24 v) will remove the sulphate from a battery bank and so prolong its life expectancy.

In event of failure auto return to standard regulator:

There are many good reasons to leave the standard regulator in place, one of them being that, in the event of a Sterling failure or any trip condition of the advanced regulator, your standard regulator will automatically take over and allow the journey to continue but at a lower charge rate. If your Advanced Regulators does not offer this feature then you will lose the use of the boat during any failure.

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. Most other makes insist a temperature sensor be fitted.

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 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, again our software jumps in and saves the day).

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 (would it surprise you to know that the Sterling software will jump in and save the day again?).

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.

Reg by pass for max rotor performance:

There is a voltage drop across any regulator, thus reducing the max voltage drop possible across a rotor and so reducing the possible output power available from the alt, the new reg by pass removes all voltage drop restrictions and so maximising the power from the alt under maximum demand conditions **If used in stand alone mode, transfers from adv to stand ref in fault.**

This new innovative feature offers a new backup in event of problems, for example if the advanced reg is used as the only regulator and for example a split diode or relay fails, the advanced reg would pick up the dangerous high voltages associated with this event and shut the system down. This will save the equipment but could leave you stranded as the alternator would no longer work. However, this new system, when detecting such a fault recognises that the primary electrical route to the auxiliary battery bank may have been compromised or destroyed. The electrical route to the engine battery bank may well be intact, so rather than shut the system down the new unit transfers the regulator control from the Aux battery bank (under advanced control) to a default condition at the b+ at the alternator, there will be no advanced charging effect but it will get you home.

Battery balancing to help compensate for diode voltage distortion:

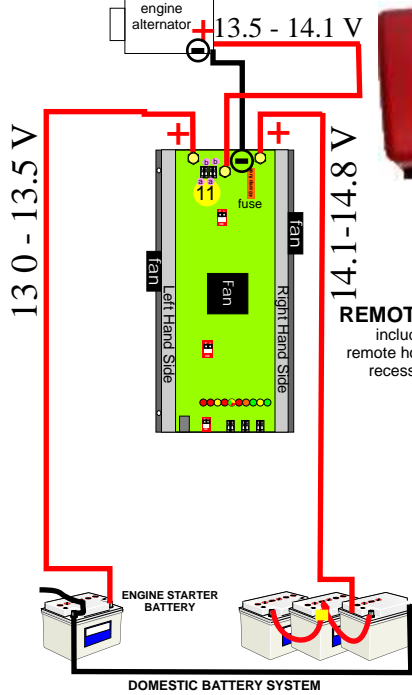
When split charge diodes are used with advanced regulators, a lot of current is forced into the large empty aux battery bank and the full small engine battery will have a lot less current flow and so lower voltage drop across the diode. This can push up the voltage on the engine start battery beyond the batteries limits and may cause the battery to excessively gas. The balancing system tries to pull down the surface voltage of the engine battery to reduce this effect .

Manual or auto scan operation:

There are so many factors required for an advanced regulator to safely operate that we monitor them all the time, however we have never had the ability to display this operation to the public before, and as such anytime there are problems with advanced regulators. We are always on the phone with customers running through voltage checks to help them find the problems with their systems. 99 times out of a 100 its their installation, poor wiring, long cable runs, dirty connectors, thin cables, defective relays, diodes, rotary switches etc. They all contribute to our product disengaging itself in order to protect your installation. This new feature is as much for our benefit as yours, it shows all the parameters which are monitored and how close your system is to the alarm/ trip preset parameter. This allows you to ensure your system is up to scratch and that it can safely deal with this new enhancement.

Alternator to Battery 4 step DIGITAL Split Charger

System wiring (minimum requirement,)



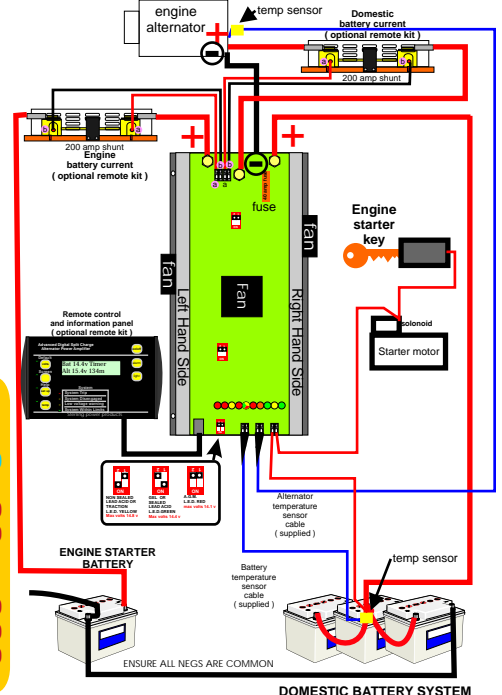
Not just a new product but a whole new concept
All the performance of an advanced alternator regulator without all the fitting



REMOTE CONTROL (OPTION)
including 10 metres cable Unique remote housing can be surface mounted, recess mounted or flush mounted

Alternator to Battery chargers					
D/C voltage	Max Alt amps	Size L x W x D	Weight	Part nos	
12	80	250 x 180 x 70	2.5	AB1280	
12	130	250 x 180 x 70	2.5	AB12130	
Remote for above products in blue (no shunts) ABRC					
12	160	250 x 280 x 70	3.5	AB12160	
12	210	250 x 280 x 70	3.5	AB12210	
24	60	250 x 280 x 70	3.5	AB2460	
24	100	250 x 280 x 70	3.5	AB24100	
24	150	350 x 280 x 70	5.0	AB24150	
24	200	350 x 280 x 70	5.0	AB24200	
Remote for above product inc 2 x 200 amp shunts ABRC					

Full System wiring (including optional remote kit if used)



Charge your batteries over 5 times faster, input 50% extra power plus de-sulphate the batteries and make them last longer.

Can be used with 2 alternators

Available in 80 / 130 / 160 / 210 amp models

This is a 100% unique product, not available anywhere else in the world, and totally designed and conceived by Sterling in order to overcome all problems experienced now and anticipated in the future with standard advanced alternator regulators. This following explanation is to help understand what it does and where it should be used and should not in any way be taken to demean any of the other charging products we manufacture. The Digital Advanced Alternator Regulator offers the best low cost technical solution to maximise the performance of your alternator ensuring adaptive charging. There are, however, applications and markets that require a different approach to increasing the alternator performance: without all the work and expertise required to install a regulator.

Issues with Advanced alternator regulators are:

The main problems with all standard advanced regulators are:

- 1) **Relatively difficult to install.** This prevents semi skilled personnel from fitting.
- 2) **Requires the removal of the existing alternator to work on it.** This is not always easy to achieve and can add many hours of awkward work to an otherwise simple installation.
- 3) **Requires extra cables to be run on the boat or vehicle.** Again this can appear a simple thing, until a few hours work is required to pass a cable through a bulkhead.
- 4) **Warranty on new engines:** some engine/vehicle dealers raise warranty issues if a new alternator is modified to fit an advanced regulator with this product the alt is not tampered with.
- 5) **E.C.U. problems** Many new engines have E.C.U.'s (electronic control systems) on their engine management systems, any attempt to fit an Advanced Regulator will result in alarms going off (mostly in vehicles, motor homes and the latest marine engines). This new system ensures the main vehicle/boat voltage remains within the E.C.U.'s programmed parameters and allows the extra battery bank to be charged at the higher voltages needed to achieve fast charging.
- 6) **Total Package** 95% of installations using an Advanced Alternator Regulator also have some sort of split charge system. This product already has this split charge system built in to it.

How do we do this.

Well, in theory, it is very simple. With an advanced regulator which connects to the alternator's regulator, we override the standard alternator regulator and we push the alternator's voltage up to increase the voltage at the batteries. This results in a massive charge improvement at the batteries.

With the Alternator to battery charger we do the reverse. We put a load on the alternator to pull the alternator voltage down. This fools the alternator into thinking that there is a major drain on the system and as such the standard regulator works at full current. However, the voltage is pulled down to a totally useless voltage for charging batteries. So the new system takes in this high current, but low voltage, and amplifies the voltage to charge the auxiliary battery bank at a much higher voltage than the base system voltage. In order to achieve the fast battery charging, the software control program and settings for this product are the same as for our Digital battery chargers and the Digital advanced alternator regulator.

When would I use a Digital Split power amplifier as opposed to a Digital Advanced Alternator Regulator?

- 1) If you are a boat builder or vehicle builder and labour costs are a critical issue, then this unit wins hands down. It requires only one extra wire (a negative) to the unit, the other power cables will already be standard. The only wires required for this unit are the alternator in and domestic + engine battery out.
- 2) If you are worried about the time and effort that it takes to fit an advanced regulator, then this unit will win. If you already have a split charger diode installed then the fitting for this unit will be about 15 mins.
- 3) If you have a voltage sensitive base platform (ie a car or van with a E.C.U. with high voltage alarms) then this is a must.
- 4) If you have warranty issues with a new engine, then this unit simply does not touch the alternator, as a result there is no warranty conflict.
- 5) If you are worried about finding a competent electrician abroad, or concerned about the fitting costs of an advanced regulator, then this is the solution.

This new product incorporates a split charge system to charge 2 battery banks. However, on the domestic battery bank channel only, there is a unique voltage amplifier. This ensures the alternator works at its maximum output (it could also be used on a single output battery charger or other current limited power source) and increases the voltage of the domestic line (with software digital control) up to 14.1 volts (for A.G.M) 14.4. (for gel) and 14.8 for open lead acid/traction. The same advanced program is used in the very successful Digital Advanced Regulator. Also please note that in the event of this product failing it will fail safe, ensuring you alternator continues to charge the system (but at a reduced rate) to get to back home. The unit is also fail safe, in the event of a problem the unit will still charge but at a reduced rate

What other uses for this product?

This product could be used on any other product which has current limit on it. For example, if you have an old fashioned constant voltage transformer based battery charger (or a constant current with low preset voltage controls and poor timer performance) which does not work very well, then simply attach this to the output of the old battery charger, and you will have the latest digital controlled 4 step charger, with all the programs, remote control and split output of the latest chargers on the market. Plus, at least a performance increase of about 500% (charger must not exceed the current rating of the device purchased).

Extra Features built into the system for use if required:

- 1) Battery temperature sensing.
- 2) Alternator temperature sensing. This disengages the unit in the event of the alternator temperature getting too high, it then re engages the unit when the alternator cools down.
- 3) Battery sensor: the system battery sensor is built into the unit and is connected to the battery out terminal. An extension cable can, however, be fitted to sense the voltage at the battery thus improving the performance slightly in the event of long cable runs.
- 4) Ignition start. Some alternators require a voltage on the alternator to start up. A split diode will prevent such an alternator from working. However there is a built in device to overcome this problem in the event of such a alternator type being used.
- 5) The remote control. This offers full set-up information, plus voltages and temperatures of all the relevant places, as per the digital alternator regulator.
- 6) Current measurement. This unit, as standard, does not measure current. However, if the optional Remote control is purchased it can measure the current to the domestic system (on both remote models). The remote on the 160-210 amp models can also measure the alternator and starter battery currents it comes complete with 2x pre wired shunts that enable 2 currents to be monitored and the third current to be derived from the first two using the embedded software. The end package is a very simple and easy installation with all the performance and safety features of the most expensive Advanced Alternator Regulator, but with an extremely simple and convenient installation method.

What do I expect to see from this unit and why?

The illustration below shows results from bench tests representing a typical split charge system with an engine battery of 100 amp hr (standard lead acid) and a domestic battery of 3 x 100 amp hr (standard lead acid). The engine battery was discharged to 11 volts (about 10 engine starts) and the domestic bank to about 11 volts (will no longer run an inverter and is about 60% empty). The alternator used was a Bosch 90 amp with a standard 13.9 volt (variable) regulator. The unit battery type is programmed to open lead acid. There are 2 graphs, one is the current delivered into the batteries, and the other is various voltages measured on the system.

System voltage graph:

The key points to pick up on here are:

The yellow trace (alternator voltage into the unit) clearly shows the system doing its job. It is designed to pull this voltage down a little to enable the standard alternator regulator to produce its full current- you can clearly see that the standard alternator voltage is at position 4 on the voltage curve, however the input voltage has been pulled down to position 5, the effect on the alternator output current is full output at position 8 - 9, where you can clearly see the standard alternator current without the advanced charging system taper down fast from 80 - 30

amps over the same time (from position 2-3). The advanced charging equates to about 70 amps improvement over the standard non assisted alternator.

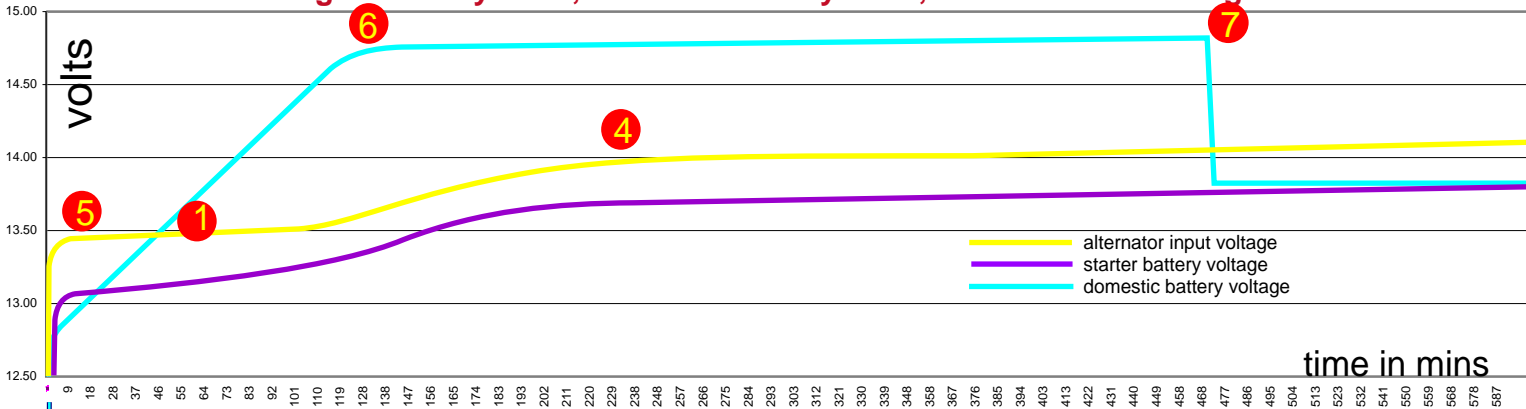
Position 1: This is the most interesting stage where the magic is at work, the point where the domestic battery voltage exceeds the alternator input voltage, this is what the advanced charging process is all about.

The current graph The domestic current graph clearly shows the constant current charge between points 8-9, at position 9 the current starts to taper off until it reaches position 10. The accuracy of the software can be seen when the voltage drops from the high voltage charge to the constant voltage charge (float), the current only dropped 5 amps, (at position 10) showing without doubt that the software program was spot on, the batteries could not accept any more positive charge and were clearly full. The high charge voltage is maintained between voltage positions 6-7 at 14.8 volts.

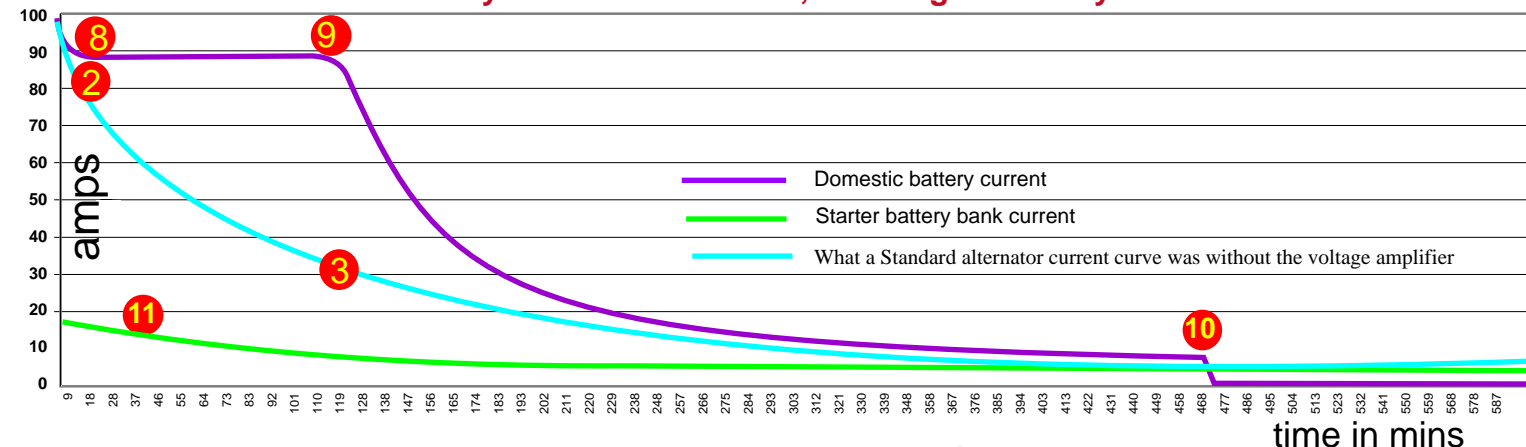
Engine priority

Position 11 shows that through the whole process the engine battery continues to charge and is not deprived of its charging voltage, the engine battery performance is the most important as at the end of the day it must be able to restart the engine.

Engine battery bank, domestic battery bank, and alternator voltage curves

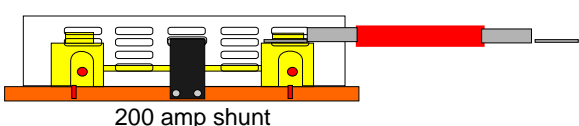
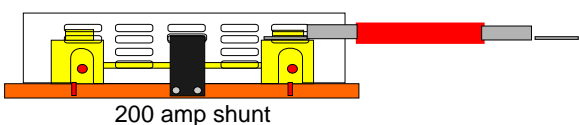
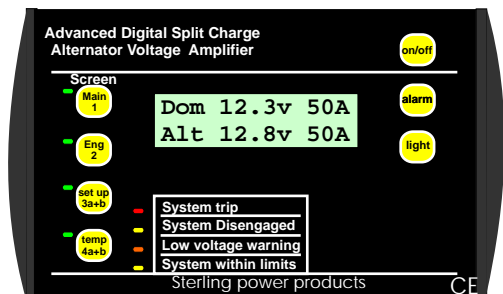


Domestic battery bank current curve, with engine battery bank current curve



Optional Extra Remote control kit (160-210 amp unit)

Included parts: the remote panel, 10 metres of pre wired link cable and 2 x 200 amp pre wired shunts
the 2 x shunts enable 2 x real currents to be measured and 1 x current calculated in the software
the 3 x currents to be measured, accuracy +/-5%



Screen 1:

Push the button marked Main 1, this is the main screen and the best one to leave the unit on. It shows the domestic battery voltage and current, also the alternator output current

Screen 2:

Push button marked Eng 2. It shows the engine battery voltage and current. This screen also shows the elapsed time.

Screen 3a:

Push button marked Setup 3a+b: There are 2 screens on this button. Push once for screen a, then again for screen b. Screen a shows the system setup, this refers to the domestic battery only

Screen 3b:

Push button marked Setup 3a+b: There are 2 screens on this button. Screen b shows the effective boost being delivered at this time and ranges from 0% (during the rest periods and on float) to 100 % when system on full power

Screen 4a:

Push button marked Temp 4a+b: There are 2 screens on this button. Push once for screen a, then again for screen b. Screen a shows the alternator temp and the domestic battery temp. If the temperature sensors are not fitted it will default

Screen 4b:

Push button marked Temp 4a+b: There are 2 screens on this button. Push once for screen a, then again for screen b. Screen b shows the box heat sink temperatures, LHS stands

Dom 12.3v 50A
Alt 12.8v 50A

Start 12.7 4A
Timer: 134 m

System set:12v
Bat Type : Wet

Alt Controller
Power 13% Boost

Alt Temp + 20C
Bat Temp + 20C

Case LHS + 17C
Case RHS + 23C

0.0 volt drop multiple output alternator splitting systems

ProSplit R

Single and twin alternator units

Zero Point Zero Volt Drop Intelligent Digital Alternator Power Distribution System.

This product uses a micro processor to monitor the multiple battery bank outputs which are to be charged by an alternator; it ensures the batteries are all charged in conjunction with each other and prevents any back feed through the device in the event of high loads on one battery bank. The system also has the ability to disconnect the alternator and individual battery bank outputs in the case of problems caused by the alternator or other power items in the system. It does all this and still offers only a max voltage drop of less than 0.01 volt, much less than any so called 0 volt drop mosfet / diode system. Many so called 0 volt drop systems simply do not come close, the Mastervolt battery mate is as high as 0.6 volts at full power (where it counts) while the Sterling is at 0.09 volts, a 500% performance improvement over the Mastervolt Battery mate unit and about 1100% over a standard diode.

Faster Battery charging: Apart from the obvious charging benefits of the 0 volt drop across the unit which dramatically helps battery charging from the standard alternator, the Pro Split has another unique feature to boost this ability even more. The main problem with split charge systems is that they are trying to charge 2 battery banks (or more). Usually one is already almost full (the engine battery) while one is empty (the domestic battery bank). The problem is that when you try to charge the 2 batteries with conventional splitting systems the higher voltage from the full engine battery fools the regulator on the alternator into thinking that the combined battery states are in fact better than they actually are. The trick is to isolate the engine battery (when its safe to do so) so the only voltage presented to the standard regulator is the empty domestic battery. This ensures a one on one charging experience between the empty battery and the alternator regulator which dramatically improves the regulator's charging performance into this battery bank. Then when its prudent to do so we re engage the engine starter battery at a level where it does not effect the maximum charge ability of the regulator.

How does the unit work

This unit on the surface looks like a simple device, however, this is a very complex software control device with in excess on 1000 lines of code. Under normal operation the unit has a simple operating mode. Being engineers we are not only concerned about normal operation conditions, we also like to build into our products as much safety and control as possible to both protect your electrical system and to ensure the available power is directed to where it is required most.

What is the problem? Voltage drop across splitting systems (such as diodes) will cause poor performance when trying to charge batteries. This can be easily compensated for by using things like advanced alternator regulators or battery sensed alternators, however, this in itself can cause problems (particularly with prolonged use and sealed batteries such as AGM and gel) with other batteries in the circuit, i.e. an over charge can take place, as explained in the diagrams below. All boats have at least two battery bank outputs, some have three. These tend to be the engine start battery, the domestic battery bank (please note that if you join three or four batteries together in your domestic battery bank it is still one battery), and the bow thruster battery. Having introduced 2-3 battery bank outputs onto your boat, the problem then is how do you charge them from one alternator source (or two alternators which I will discuss later).

Example 1 shows a typical split charge diode installation with a standard alternator with no advanced regulator or battery sensing reg. The test assumes an 60 amp alternator, the diode is 70 amp rated and there is an average cable between the alt and the battery bank. The alternator voltage is assumed to be about 14.2 volts, however, in real life this could vary from 13.9-14.8 volts depending on the manufacturer and the internal regulator fitted to the unit. Important to note on example 1 is the fact that the alternator produces 14.2V at the alt but, by the time it gets to the domestic battery, there is only 12.8V left, this is an appalling voltage and would result in you having extremely bad charge performance at your battery bank. However, note that the engine battery is at 13.6V (this higher voltage is not an issue in this case but

the phenomenon will cause a problem in later examples) this is because that at 60 amps the voltage drop across the diode to the domestic battery is 1 volt, however, because the starter battery is almost full it is only drawing a few amps from the alt and so its voltage drop is only going to be about 0.4 volts (remember the voltage drop across a diode is not linear it is proportional to the current flow, i.e. the more current flow through a diode the greater the voltage drop). Conclusion in example 1, there is no danger to anything but there is an appalling low charge voltage presented to the batteries making the charging system grossly ineffective.

Example 2 is replacing the standard reg with a battery sensed reg, this in effect says to the alternator, give me 14.2 volts at the domestic battery bank (or at the end of the battery sensed cable) regardless of what voltage the alternator has to produce to achieve this goal. This will improve charge at the domestic battery a great deal, i.e. you can see that the voltage will rise on the battery from 12.8 in example 1, to 14.2 in example 2. However, when the voltage is checked through the system (and taking into account the voltage drops across the diodes) the engine battery voltage is now 15.2V, this would rise even more if the cables were longer i.e. if you had 4 or 5 meters of cables then the voltage drop in the cables could be up to 1 volt, this would drive up the starter battery by another 1 volt etc. Conclusion- the starter battery should be open lead acid type as it is going to gas a little. In the short term the batteries would simply gas a little, and a regularly maintained battery would be ok. However, with a sealed, gel or AGM type any gassing could damage this type of battery.

Example 3 is pretty much the same as example 2 except a modern advanced regulator will push the batteries up to 14.8 and in some cases the new calcium batteries could go as high as 15.1 volts. This simply adds another 0.6 volts onto example 2 with the same conclusions only worse.

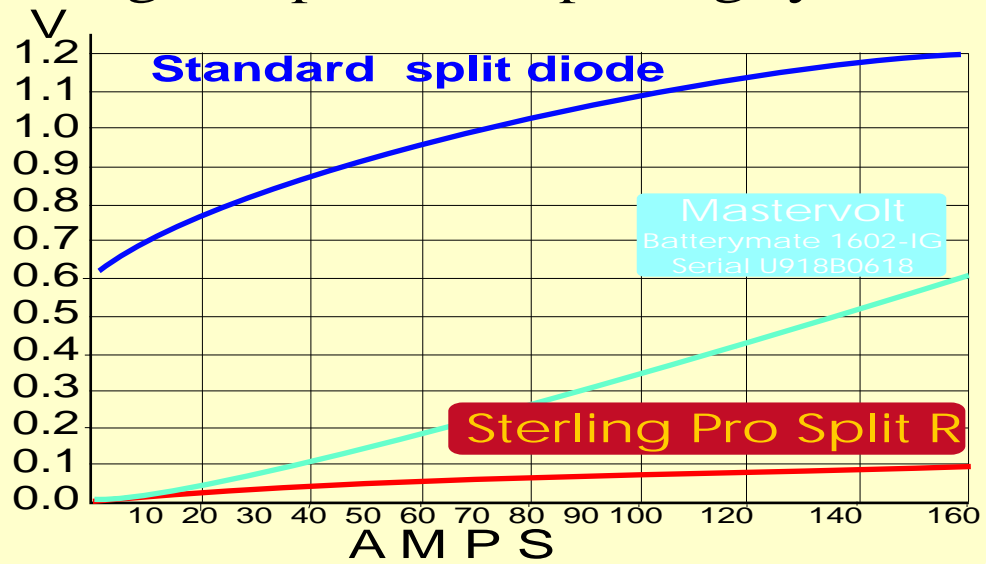
The solution: **Example 4** If the voltage drop across the splitting device could be eliminated then there would be no excessive rise in voltage on the starter battery. This way the gassing/high charge rate of the secondary would be the same as the domestic battery bank and under control. This would prevent excessive gassing taking place and causing excessive water loss in the starter battery. It also has many added features associated with this new technique

Other advantages of the Zero Volt Drop Intelligent Alt Distribution System

- 1) distributes the most power to the battery bank which demands it
- 2) isolates a battery bank when there is any attempt to back feed the power from the full battery bank to a more demanding battery system
- 3) Isolates full batteries to ensure empty batteries can charge faster from a standard regulator maintaining the engine start battery requirements as paramount
- 4) isolates the main alternator from all the batteries in the event of a failure of the alternator's own regulator. This prevents the batteries from boiling
- 5) isolates any battery bank which tries to back feed a high voltage from a different source. i.e. if there was a defective battery charger on one battery bank trying to back feed into another battery bank then the unit would disconnect that battery bank to save the others.
- 6) L.E.D. display shows which channels are in use and which are not
- 7) overload design, for example, our model rated for a 180 amps is actually continually rated for 240 amps with overload in excess of 2000 amps
- 8) fail-safe, in event of unit failure the engine start battery and alt remain connected, ensuring the safe running of the boat/vehicle. Prioritizes the engine start battery charging over all other battery bank outputs

Competitors products: various other companies claim they have 0 volt split charge systems, however the so called transistors / mosfet's splitters when under load are only about 50% better than the standard low cost diodes, where as the Sterling is 90% better. We have a 0.09 volt drop under full load conditions as opposed to 0.6 v which the Mastervolt product has, making our product over 500% more effective. Plus we offer all the extra functions as described above, which the transistor/ mosfet products simply cannot achieve

Voltage drop across splitting systems



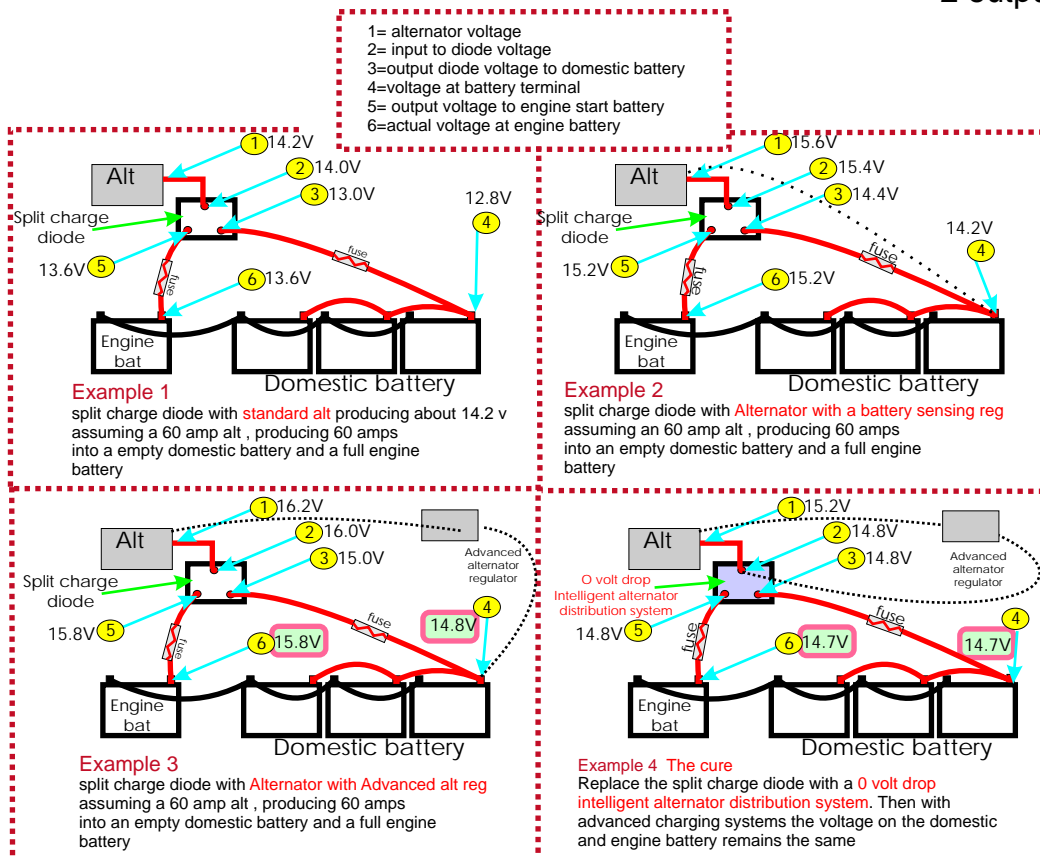
For 2 or more alts either use the twin unit or Multiple alternators can be used on the single inputs as long as the total amps off the combined alternators does not exceed the rating of the product

Pro Charge Ultra 80-230 V 40-70 hz a/c input						
D/C voltage	Max Alt Amps	Battery banks	Size L x W x D mm	Weight kg	Part nos	
12	120	2	150 x 80 x 120	0.6	PSR122	
12	180	2	150 x 80 x 140	0.7	PSR182	
12	250	2	150 x 80 x 155	0.9	PSR252	
12	120	3	150 x 80 x 130	0.9	PSR123	
12	180	3	150 x 80 x 150	1.0	PSR183	
12	250	3	150 x 80 x 180	1.3	PSR253	
Twin 12	2 x 130	4	150 x 80 x 295	1.8	PSRT134	
24	60	2	150 x 80 x 120	1.8	PSR62	
24	100	2	150 x 80 x 140	0.6	PSR102	
24	150	2	150 x 80 x 165	0.7	PSR152	
24	240	2	150 x 80 x 250	1.2	PSR242	
24	60	3	150 x 80 x 150	0.7	PSR63	
24	100	3	150 x 80 x 175	1.0	PSR103	
24	150	3	150 x 80 x 220	1.3	PSR153	
Twin 24	2 x 80	4	150 x 80 x 295	1.8	PSRT84	

twin alternator unit 4 output



Point zero volt drop / IP66 waterproof



ProConnect series of voltage sensitive and current limiting relays

ProCon IF

Available in 12 v : 80,160 & 240 amps

24 v : 50,100 & 150 amps

Ignition feed/D+/signal feed relay:

This range of low cost low signal activated relays is 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.

Ideal applications: Boats with outboard motors and simple cabin batteries with no heavy loads on the cabin batteries, small vehicles/boats with auxiliary battery systems with low loads on the auxiliary battery bank which are not in excess of the rating of the relay so as not to overload the relay circuit.

Its limitations: There is no current limit with this type of device, so avoid using it on a system which has a high secondary battery load, such as a big inverter, anchor winch or bow thruster, as the surge currents associated with this type of equipment can destroy the unit (see current limiting relays for this application).

Advantage over a standard relay. A standard relay has an activation feed via a cable. This feed takes about 0.5 amp to run, which adds the 0.5 amp to where you are taking the feed from, either the d+ on the alternator or key switch or oil pressure switch. This can place enough extra load on these circuits to cause a problem. There is also the secondary problem of voltage drop in the ignition feed cable affecting the relay. The Sterling IF product overcomes this by only using the ignition feed as a signal and takes no power from the ignition feed wire. The signal then activates an internal control system, which in turn activates the relay from main power circuit internally. This also has the advantage of not suffering from voltage drops in the feed line and allows the relay to run cooler. A 30 sec time delay prevents the high load on the starter battery on start up from destroying the relay when the starter is engaged and demanding high loads. This unit is also water resistant and in a much safer package form. The package also contains anti-spark protection to help reduce the effect of back EMF from open circuiting the relay under heavy loads, without this relays will weld close if the unit is switched off under high current pass applications. The connection terminals are also high quality brass nuts and bolts gold plated and not poor quality crimp connectors which are not suitable for high sustained current flow.

ProCon VSR

with limited adjustment (select input activation side)

Available in 12 v : 80,160 & 240 amps

24 v : 50,100 & 150 amps

Voltage Sensitive activated Relays:

This product would be regarded as the next level up from the signal feed relay (as above), the main difference being that it is totally automatic- this relay does not require a feed to operate, it works on monitoring the input voltage to the device (usually the starter battery or battery bank with other charging source such as a battery charger or wind gen), when this voltage exceeds 13.3 volts the processor makes the assumption that the alternator/battery charger or other power device is active and as such it will automatically engage the relay to connect the main battery bank to the auxiliary battery bank and so charge the aux battery. Conversely, when the voltage drops below 12.9 volts the processor in the relay assumes that either the engine has been stopped or the load on the aux battery is pulling the starter battery down too much and for safety reasons it should be isolated. In a nut shell this is easier to install than the above and is smarter, however, it has some of the same limitations as the standard signal relay.

Ideal applications: See the above signal relay applications. Also ideal for charging a secondary battery bank from a battery charger which has only one output such as combined inverter charger. The starter motor interlock connection prevents the starter motor current being pulled through the relay and damaging the relay.

Its limitations : See the above limitations for the signal relay. Another major problem with standard relays is their ability to switch off under high load. The main job of a voltage sensitive relay is to sense any major current being taken out of the starter battery (primary) and to stop it. For example, if we take a typical 12V boat system with an 80 amp alternator and install a standard 80 amp VSR on the engine starter battery bank to charge the secondary battery (domestic battery bank, anchor winch or bow thruster battery bank). On engine start up the alternator will raise the voltage on the starter battery and this will engage the relay to charge the secondary battery bank (so far so good). However, for the sake of argument say the secondary battery bank is discharged (ie first thing in the morning) and then someone switches on a 2000 watt inverter, or a bow thruster or the anchor winch, these items will attempt to draw 200 amps + from the secondary battery bank. However, because the secondary battery is nearly empty, the load (the 200 amps) will automatically attempt to draw this current from the highest voltage source which, in this case, would be the starter battery bank. Obviously we do not want this to happen as we do not want to drain the starter battery or burn out the 80 amp relay or even worse set fire to the cables because you are now trying to pull 200 amps plus down these cables. In theory the large current flow through the VSR will drop the starter battery voltage and so trigger the relay to open circuit and so switch off this circuit stopping the drain and saving the day. However, a relay has 3 main ratings, for example an 80 amp relay can take 80 amps all day no problem, (hence its continuous rating) and has a short term over load of about 400 amps for about 1/10th sec. It has a third rating, however, that is much more important; that is the maximum current it can open circuit at. The assumption by the public is that an 80 amp relay can open circuit at 80 amps, but that is not so, it has an open circuit current rating of about 30-40 amps. And so the problem becomes apparent, the high load on the secondary battery system (in the above example) causes an instant load of 200 amps + on the relay (that's ok, it can deal with this for a split second) then the control circuit attempts to open the relay to stop this discharge, then BANG you open the relay with 200 amps going through it (with an open circuit rating of about 40 amps) and so you cause a large back E.M.F. If you're lucky, it will vaporise the contacts blowing them in to small pieces and open circuit the relay destroying the product. To reduce this effect, Sterling puts anti back E.M.F. spark reducers on all relay products.

ProCon CVSR

with limited adjustment (select input activation side)

Available in 12 v : 70,140 & 210 amps

24 v : 60,120 & 170 amps

Current limiting Voltage Sensitive Relays

These relays have built in current limiting, in a nutshell you can do what ever you want with them, if you overload them they simply switch off safely. The trick with a relay is not to open circuit when it is overloaded, but to remove the load, then open circuit the relay within its rating. With a current limiting VSR in an overload situation such as the example in the section above (Voltage Sensitive Relays) the 200 amps will surge through the relay for a split second (within the relay's capability), then the built in current limiting device will see this overload and reduce the current from the dangerous 200+ amps to a very safe 6 amps, the relay will then safely open circuit with a 6 amp load and not a 200 amp load, and so protect the relay and your installation. Once the high load demand has been removed then the relay is safe to re-engage and continue doing its job.

The CVSR has the same features as the standard Voltage Sensitive relay (as above but has the current limiting added for extra safety).

ProCon CVSRA

with full adjustment

12/24 v auto select : 70,140 & 210 amps

Current limiting Voltage Sensitive Relays (Adjustable) Have all the same current limiting abilities as the CVSR range (as above) however this product has a select user interface, it automatically selects between 12 and 24 v applications and allows the owner to adjust the main voltages (activation and deactivation voltages can be adjusted from the standard settings) for more precise voltage management control if required

The Sterling unit has 3 programmable settings , you select which function you require by passing a magnet over the unit and selecting the program you require

Function 1. Charging activated by starter battery voltage increase (engine on) This is the most common setting and the factory default setting. This setting also does not have an ignition feed requirement. This connects the primary and secondary banks based on a voltage in excess of 13.3V being sensed on the primary battery only (the engine starter battery). The 2nd battery bank, once connected would only disconnect when both battery banks drop below 13.0 volts on both sides. The 13V safety threshold is still activated to protect and separate the batteries if, or when, the drain that invoked this function (voltage drops below 13 volts) once the unit has tripped, will not re-engage until the voltage on the primary battery bank (the engine start) has exceeded 13.3 volts again. **No ignition feed required on this setting**

Function 2. Charging either way, based on a voltage rise on either side of the unit. This function will close the relay at 13.3 volts sensed on either side of the relay, a good example of this would be the use of a combi inverter charger on the domestic battery bank, because most combi's only have a single output charging line (to the domestic battery bank) then with this function the unit will charge from the combi to the starter battery bank (in effect giving you 2 outputs from the battery charger) when the combi is on, but also charge from the alternator to the domestic battery bank when the combi is off. In either mode the unit still has the 13.3V on and 13V off mode and the current limit function. **No ignition feed required on this setting**

Function 3. Charging batteries one way only This function allows a charge to flow from the alternator, or battery to battery charger, or any other charging source to a secondary battery bank, but only when the engine is running. In effect this mode only allows current flow from the primary source to the secondary, and will continue to flow until either there is an overload threat or a low voltage threat to the primary battery or the engine is shut down. This function requires an extra wire to the unit, an ignition feed, that informs the unit if the engine is running or not. **None of the other functions require an ignition feed**

Other advantages of a current limiting VSR

- 1) 0.0 volt drop across the device ensuring more even charge.
- 2) Cables can be thinner as the overload is contained and reduced automatically not only protecting the relay but also the cables.
- 3) No fuse required to protect the product, the product can even deal with a dead short and switch itself off with no damage
- 4) Ignition protected SAE J1171
- 5) IP66 water proof
- 6) Can be used in different charging modes
- 7) In the unlikely event that the pre programmed voltage settings are not suitable, then the voltages are adjustable using the select button
- 8) Auto 12-24 volt selection

ALL Inc rubber boots



Stud sizes

- 80 amp = 5 mm
- 160 amp = 8 mm
- 240 amp = 10 mm

Pro Connect IF

Ignition feed/signal feed relay:



Ignition / Signal feed Relays				
D/C voltage	Amps	Size L x W x D mm	Weight kg	Part nos
12	80	140 x 60 x 40	0.025	RS1280
12	160	140 x 60 x 40	0.030	RS12160
12	240	140 x 70 x 40	0.030	RS12240
24	50	140 x 60 x 40	0.025	RS2450
24	160	140 x 60 x 40	0.030	RS24100
24	240	140 x 70 x 40	0.030	RS24150

Pro Connect VSR

Voltage Sensitive Relays:



Voltage Sensitive Relays				
D/C voltage	Amps	Size L x W x D mm	Weight kg	Part nos
12	80	140 x 60 x 40	0.025	RVS1280
12	160	140 x 60 x 40	0.030	RVS12160
12	240	140 x 70 x 40	0.030	RVS12240
24	50	140 x 60 x 40	0.025	RVS2450
24	160	140 x 60 x 40	0.030	RSV24100
24	240	140 x 70 x 40	0.030	RSV24150

Pro Connect CVSR

Current limiting Voltage Sensitive Relays :



Current Limiting Voltage Sensitive Relays				
D/C voltage	Amps	Size L x W x D mm	Weight kg	Part nos
12	70	140 x 60 x 40	0.025	RVSR1270
12	140	140 x 90 x 40	0.050	RVSR12140
12	210	140 x 120 x 40	0.075	RVSR12210
24	50	140 x 60 x 40	0.025	RVSR2450
24	100	140 x 90 x 40	0.050	RVSR24100
24	150	140 x 120 x 40	0.075	RVSR24150

Pro Connect CVSRA

Current limiting VSR- 12/24 select, fully adjustable relays :



Current Limiting Voltage Sensitive Relays				
D/C voltage	Amps	Size L x W x D mm	Weight kg	Part nos
12 & 24 auto	70	140 x 120 x 40	0.1	CVSRA70
12 & 24 auto	140	140 x 180 x 40	0.2	CVSRA140
12 & 24 auto	210	140 x 200 x 40	0.25	CVSRA210

V.S.R ratings, for the 70 amp model, for 140a x 2. for 210 a x 3
 continuous operating current of the VSR at 30 deg c = 70 amps
 continuous relay operating current at 90 deg c = 60 amps
 instant overload current = 650 amps
 current limit after shut down current = 6 amps
 at rest power consumption less than 1ma

Which model suits my needs best ?

- 1) The first part is easy, what is the max size of your alternator or charging device, i.e. do you have an 90 amp alternator or a 100 amp battery charger charging the primary battery bank. This means that the secondary battery could be subjected to at least that load so the relay must be able to comfortably handle that sort of current continuously. It would be wise to give the relay a good 10-20% comfort zone, i.e. always up size the relay if the charging source and relay are the same, for example, if you have an 80 amp alt and a 80 amp relay then go to the 160 amp relay option to be safe.
- 2) Next its cost of installation and ease of installation. If you are fitting the unit and access to ignition feeds is simple then the **Ignition Feed** system should be entertained, however if not then the **Voltage Sensitive Relay** version is much simpler to fit and totally automatic.
- 3) The last but most important aspect is safety. The most important thing here is to establish what the maximum possible load that could be placed on the secondary battery bank when the relay is engaged, i.e. a large inverter/anchor winch, bow thruster. Remember what every load you put on the secondary battery will have a % of this load transferred to the primary battery depending on how full the secondary battery is. This could range from a few percent to 100 percent, so its important that the relay system can deal with this high load without damage. If there are large potential loads such as hundreds of amps then the only way to do this is using a **Current limiting voltage sensitive relay** because when exposed to excessive currents, the current limiting models simply and safely shut down until the excessive current is removed, i.e. switched off, then it can automatically re instate its self and carry on after that large surge load has stopped.
 For stockists the best unit is the **CVSRA** as this is 12 and 24 v with auto selection and fully adjustable which means one unit fits all .

Pro Connect CVSRA

Pro Connect CVSR

Pro Connect VSR

Pro Connect IF

Sterling product features check list

0.01 volt drop	●	●	●	●
Ignition feed (not always required)	●	●	●	●
Water proof to IP66	●	●	●	●
High overload surge rating	●	●	●	●
Back Emf spark arrester	●	●	●	●
1 i.e.d. information display	●	●	●	●
Remote L.E.D connection	●	●	●	●
No ignition feed voltage drop	●	●	●	●
Suppression diodes across relay to prolong life	●	●	●	●
Time delay to prevent engine starter damage	●	●	●	●
Automatic voltage activation	●	●	●	●
Automatic voltage de activation	●	●	●	●
Protects primary battery from discharge	●	●	●	●
Emergency auxiliary forced activation	●	●	●	●
High battery voltage trip protection	●	●	●	●
2 led information display	●	●	●	●
Single & Twin Starter motor disengage connections	●	●	●	●
Adjustable relay trigger side operation	●	●	●	●
Current limiting protection	●	●	●	●
Can deal with a dead short without external fuse	●	●	●	●
Voltage adjustment parameters settings	●	●	●	●
5 i.e.d. information display	●	●	●	●
12 and 24 v automatic selection	●	●	●	●
SAEJ1171 ignition protected	●	●	●	●

Split Charge Systems Facts And Figures

All boats have at least two battery banks, some have three. These tend to be the engine start battery, the domestic battery bank (please note that if you join three or four batteries together in your domestic battery bank it is still one battery), and the bow thruster battery. Having introduced 2-3 battery banks onto your boat, the problem then is how do you charge them from one alternator source (or two alternators which I will discuss later). There are four various options employed by boat builders, below are the options with a short explanation giving both the positive and negative aspects.

1) Rotary switch. This method is very dated and not very common on boats. It is recognisable as a large circular switch with four marked positions on the switch. It is marked, off, 1, 2 and both. The good side of this system is that it is easy to install. The bad side is that it needs constant human intervention to ensure it works. Failure to operate it correctly will result in all batteries being discharged or not being charged correctly and possible damage to the alternator. They also tend to suffer failure if large prolonged current is passed through them. The spring in the switch can over-heat and loses its tension; this leads to an exponential break down of the switch that manifests in heat. When these switches fail they tend to melt the plastic case (if you are lucky). Simply check the temperature of the switch every so often by touching the back - it should be cold.

2) Split charge relay. This system is both dated and extremely dangerous, and more than likely will make your boat fall short on CE requirements, especially if an inverter is used or a bow thruster. The good side is, that it is easy to fit and requires no alterations to the standard engine system, but merely connects the domestic battery bank to the engine battery via a relay, which is energised when the engine starts.

The bad side (and the very dangerous side) is that a relay is prone to over loading. Say, for example, you have a 70 amp relay on your system and a 55 amp alternator, all seems great, but if you fit a 1500 watt inverter which can draw 150 amps and one morning the domestic battery is flat. So, you start the engine to charge the domestic batteries, the 70 amp split charge relay will come on line to enable the alternator to charge the domestic battery bank. Then you load your inverter to 150 amps, the 150 amps will not be drawn from the domestic battery because it is flat but be drawn from the engine battery (which is full). That means you will draw 150 amps up the split charge cable and through the 70 amp relay. If you are lucky you will destroy the relay, if you are not so lucky then you will set fire to the cross over cables, hence the dangerous aspect. The system must be suitable for the purpose for which it is installed and this is clearly not. Be warned about split charge systems using relays. If using relays it is important to have a massive overload ability

3) Split charge diodes: By using a set of diodes on a heat sink, one can ensure no

back feed through the diode, thus ensuring that high currents from other battery banks do not flow up the charge lines and cause a fire. This is the most common method by far employed round the world and is the standard in the USA, for 3 reasons, safety, safety and safety, by the way did I say safety? However, all is far from perfect. The big down side with a split diode system is the voltage drop across the diode (in the order of 0.8-1.2 volts), which dramatically reduces the charge rate of the alternator on average by about 70%, however, this can easily be over come using products such as the Advanced Alternator regulator in conjunction with the split diode.

4) 0 volt-splitting systems: These are electronic devices using a control circuit and driving mosfets. The end result is a very low voltage drop across the splitting system (in the order of 0.04 -0.6 volts) but no reverse current flow is permitted due to the operation of the mosfets. However, on standard marine engines it is much more effective to employ the lower cost diode where an advanced regulator is fitted, (see performance).

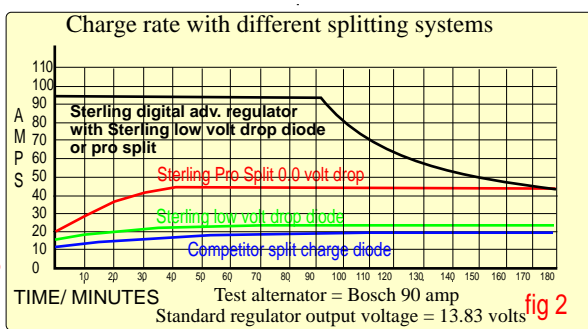
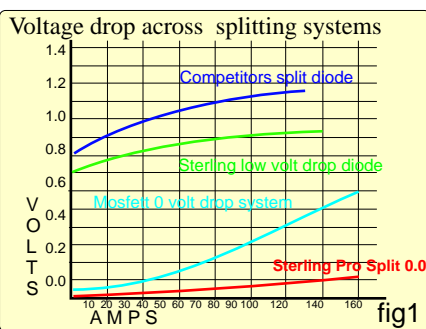
5) 0.0 volt splitting system. The new Pro Split R from Sterling has a voltage drop about 1/10 that of a split charge diode and 1/5 that of a 0 volt drop mosfet system. See Pro Split graph below.

Conclusion: Test 1: From fig1 we can see the voltage drop across different splitting systems. This directly relates to the ability to charge the batteries, the larger the voltage drop across the device, the less effective the batteries charge.

Test 2 shows the clear advantage of using advanced regulators in conjunction with a conventional split charge diode. The advanced regulator automatically compensates for the voltage drop across the diode, plus the high charge 4-step program further increases the charge rate. The illustrated tests were on a 300 amp hour battery bank, but can easily be extrapolated to 400 amp plus.

The best low cost system clearly is a standard low cost split charge diode (for safety and cost) or the new Pro Split R and an advanced regulator on the alternator to compensate for the diode faults and charge at the constant current charging curves. This, not only charges 2-3 times faster (on a good installation, but much higher on a bad one) but puts about 100% more useful power into the batteries.

The best system but a bit more expensive is the new Pro Split (see next page) For a twin alternator system, the ideal system is: on the largest alternator, fit direct to the domestic battery bank and attach an Advanced Regulator to that alternator. On the smallest alternator split this with a split charge diode between the engine battery and the domestic (and any other battery bank) and add another advanced regulator to it. This gives maximum charge rate to the domestic batteries.



ProSplit D



Split Charge Blocking Diodes 70-200 amps, 2-3 outputs

Sterling Power has developed a range of low cost split charge diodes. These diodes have enhanced performance over conventional diodes and at a lower cost. The difference is in the devices. All other split charge diode manufacturers use conventional alternator diodes, which at low current flow have about a 0.93 voltage drop. When the full rated current of these diodes is approached, the voltage drop increases to about 0.95 volts. This results in excessive heat and power loss across the diode. For example: A conventional one alternator in and two battery bank out, tested against a Sterling unit had the following results:

AMPS PASSED	CONVENTIONAL SPLITTERS				STERLING SPLITTER			
	30a	50a	60a	70a	30a	50a	60a	70a
VOLTAGE DROP	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

Low voltage drop split charge diodes			
Alternator inputs	Battery banks	Max alt current	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

The Pro Pulse is designed to connect to a 12 v battery bank. This unit reverse feeds a small electrical pulse back into the battery which prevents and also reverses sulphation on the battery plates. By keeping the plates clean and free from sulphation then the battery stays fresh and responsive to charging and discharging. If you have been replacing batteries because they are not holding their charge then in most cases the battery is, in fact, in good condition except the plates are sulphated. Sulphation acts like a waterproof coating over the plates preventing the plate area effected being active and contributing to reduction in the battery cell performance. The solution is to remove this sulphation and expose the plate to the battery process again. The Pro Pulse should be fitted to any battery bank to ensure that sulphation is not only prevented but also reversed and so prolong the life and performance of the battery bank.

This device is not required if you have a Pro Digital battery charger or any other advanced Sterling charging product connected to your batteries as they have a de-sulphation cycle built into their software program.

This is not a battery charger and it cannot actually charge your batteries it is a de-sulphation device.

Battery De-sulphation & maintenance device

Connects direct to battery

No external power source

Reverse feeds high frequency pulse

Battery to blow sulphation off the plates

Prolongs battery life by up to 100%

Rejuvenates older batteries

Sharpens battery response to accept faster charge

Preserves cold start performance

Suitable for use on all vehicles and boats

Pro Pulse De-Sulphation unit	
Size	Code
100 x 90 x 30 mm	PP12V

Pro Pulse



e13 12V unit
for 24 v use 2 x 12 v

Pro Power Distribution D/C High Powered Fused Distribution Box

This new product is designed to ensure your D/C electrical distribution system on boats and specialist vehicles is both very safe and compact. The clear plastic cover makes it easy to see the green L.E.D.s indicating live circuits and the red L.E.D.s indicating failed circuits. In the event of concerns about excess power being used by the L.E.D.s a simple link can be removed to kill all the green L.E.D.s (that would otherwise be on all the time) but leave the red (fuse blown warning) L.E.D.s active (but only on in a fault condition). Other interesting features include an alternator fail safe blow fuse. The alternator fuse can safely blow but offer the alternator an emergency link to prevent the alternator's regulator from being damaged due to the loss of a battery link. This output can also be used for other purposes if not being used for an alternator.

The unit has been designed with 2 main markets in mind:

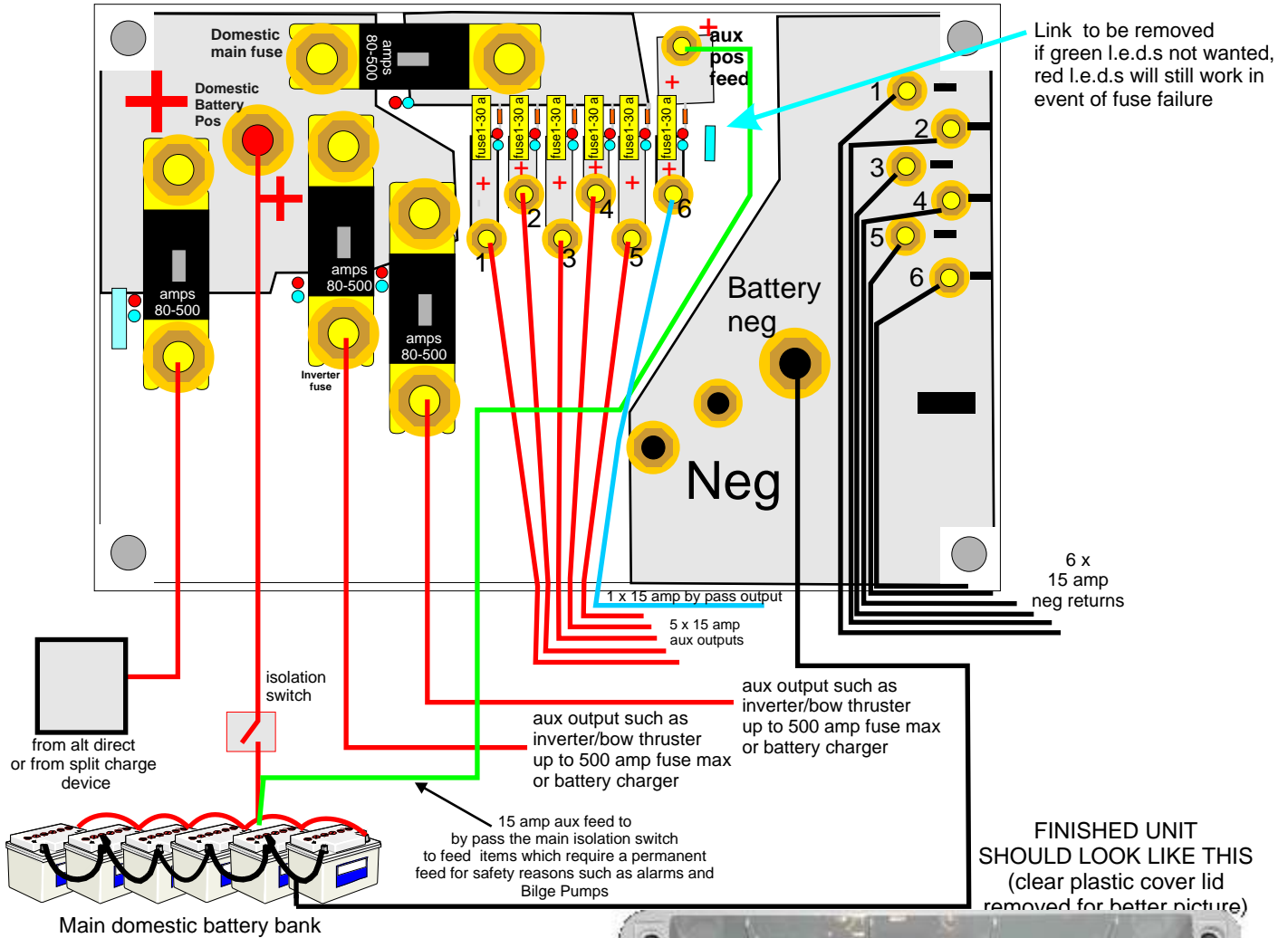
1) Retail market: for existing boats/specialist vehicles, this box can bring your old system up to a much more modern and safer specification. Fit close to the domestic battery bank and all your fuses are now inside the recommended distance for modern safety standards. It also puts all your fuses in the same area and allows easy testing of faulty circuits.

2) O.E.M. market: if used on a system from scratch, this will reduce the wiring time of any system, replacing the need for many individual parts

needing to be fitted and connected whilst also standardising the wiring arrangements saving a lot of time and money.

Key features include

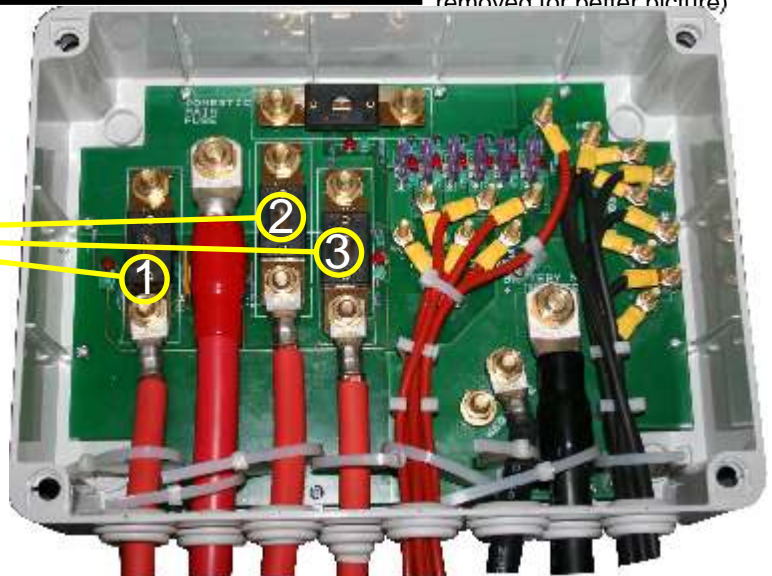
- 1) 3 x ANL fused outputs from 80-500 amp ability (fuses purchased extra, see our gold ANL range for the fuse required).
- 2) 5 x 15 amp continuous outputs with 30 amp fuses (supplied) with one 300 x fuse supplying that section
- 3) 1 x 15 amp 'maintained' output with 30 amp fuse, extra aux d/c feed 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.
- 4) Emergency alternator link in the event of the alternator fuse blowing (this prevents the alternator being damaged).
- 5) Green L.E.D.s to show the circuit is live (L.E.D.s on all the time when battery not isolated, can be switched off, if preferred, by removing a link).
- 6) Red L.E.D.s to show when fuse has blown (only on when fuse has blown).
- 7) Cable guides for the low power cables, plus cable ties to be tightened when wiring complete to keep wires tidy and secure.
- 8) Small footprint very compact design
- 9) Most negatives returned to box to enable easy circuit checks



D/C High Powered Fused Distribution			
Size	Weight	Code	Price inc vat
300 x 220 x 120 mm	1.5kg	PPD500	

3 optional GANL fuses required, please select the required sizes

Fuse	Code
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



1600, 2500 & 3500 Watt

Standard Features:

- 30 amp through current
- P.F.C. (power factor correction)
- Inc Remote control with 10 metre cable
- 4 step progressive charging
- 8 battery type selector

Earth - Natural link when on inverter mode to comply with latest regulations

The new Pro Combi range are designed to be very competitive, no frills, high performance, and value for money products, presented in a simple, easy to install and use style.

If you require power assist, parallel connection, three phase output functions or any other enhanced combi features then this range is not for you. If you're not familiar with these things this ProCombi is perfect for you.

Modern combis are getting more and more complex, with each company trying to out do the next with abilities beyond the understanding and requirements of most people. This detracts from the combi's main strength of being easy to install and easy to use. There is, no doubt, a market for all the sexy functions but the vast majority of combi users simply do not need them and never will. Most people simply require the unit to act as a high performance constant current battery charger when on mains power then cross over to act as an efficient inverter when on battery - and that's it!

The problem with enhanced functions is, even if they are not used, they eat up valuable power. The more functions on a product running (even though you do not use them) the higher the quiescent current on the inverter (the current the unit uses itself to operate). Complex combis at 12V can use as much as 9.5 amps whereas Pro Combi can use as little as 2 amps.

Also a lot of the expensive combis do not even have a Power saver function which can drop the combi power consumption to as little as 0.2 amps when off load, some combis continue to consume 2 amps + even when there is no load

Sterling have reversed this trend with this Pro Combi range by stripping away the unnecessary features from a complex combi saving money. The end result is a simple, straight forward product that does what you think it should. Using our years of experience in this market we have tailored the product range to suit 90% of people purchasing Combis.

**How to compare model ratings with other Combis:
 Watts vs VA: the truth**

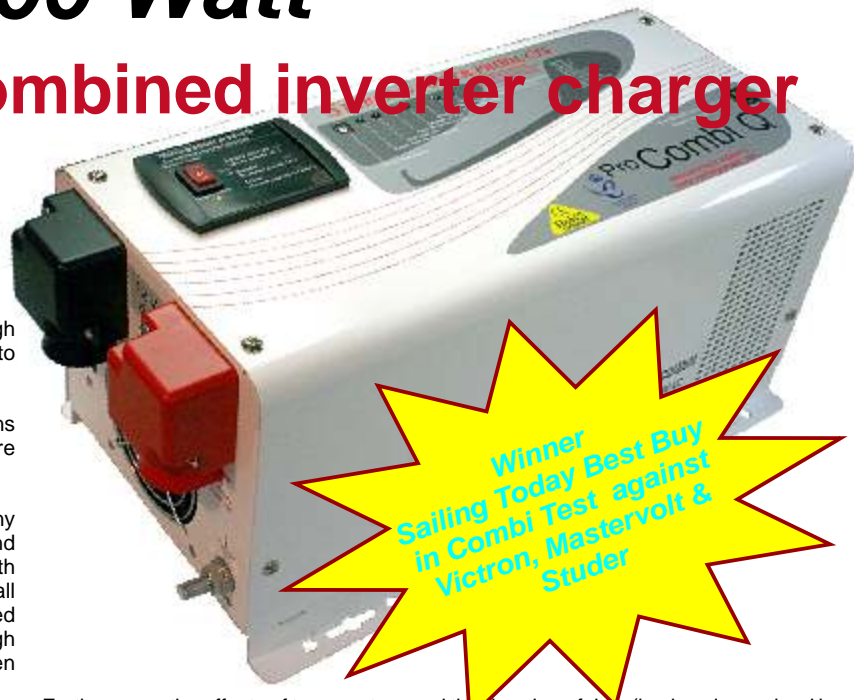
The most significant issue to be aware of is how output ratings are massaged to appear better than the competition. You might be excused for thinking that a unit with '3000' written on it, for example, means that it will deliver 3000 watts continuously. This is not necessarily the case if you look at the small print.

Have you ever found it strange that the product you want to run (ie the hair dryer, washing machine, TV, etc) has the power consumption shown in watts, yet the inverter/ generator companies give you the rating in VA, and when you put your 1000 watt product on a 1000 va inverter it does not work. In the small print you find out that the 1000 va inverter is only 700 watts for 10 mins then it over heats- this simply cannot be right.

In the eyes of the unknowing consumer, rating a power product in VA is a simple way of using meaningless figures to confuse and make performance appear better than it really is. Unfortunately this practice is still allowed in Europe (European standards committees are looking into this practice) unlike the USA where there are recognised standards (eg ABYC) and you can be sued for publishing misleading information and incorrect ratings. The only true rating, without confusion, is in watts, using a simple resistive load with unity power factor, such as an electric heater / standard light bulb, etc. This method gives a lower correct figure, however it is not what the marketing teams involved in promoting power products want to see.

Take, for example a 3000 Victron Multi that is perceived by the public to be 3000 watts continuously rated. If, however, you read the Victron specification for watts at 40degC the actual power is 2000Watts. The Sterling 2500W Combi delivers 2500Watts which in fact makes it a more powerful full unit. This distortion is not limited to Victron, unfortunately most, if not all, the European manufacturers push model figures to the realms of fantasy in spiralling competitiveness and in order to confuse and impress the public who believe that these figures are actual continuous power rating.

Combined inverter charger



**Winner
 Sailing Today Best Buy
 in Combi Test against
 Victron, Mastervolt &
 Studer**

Furthermore, the effects of temperature and the duration of duty (i.e. how long a load is maintained) can also be used to manipulate ratings. It is much harder for a unit working in 40degC ambient temperature than in 25degC, just as it is harder to run at a higher load for extended periods. Therefore, a unit rated for short periods at a cooler temperature will also appear more powerful.

To illustrate, taking data published by Victron Energy and Mastervolt, the following comparison can be made:

Model/product	Public perceived power	True Cont. Watts @ 40degC
Victron Phoenix MultiPlus 12/3000/120	3000W	2000Watts
Mastervolt Mass Combi 12/2500-100	2500W	Not stated
Sterling Pro Combi S or Q 12/2500	2500W	2300Watts
Victron Quatro 12/5000/120	5000W	12 v 3000Watts
Sterling 3500 combi	3500W	3300Watts

The simple truth of the matter is VA means nothing. If you want to know how much power your inverter is going to give you then ask for the rating in watts at 40 deg c , all the other ratings should be kept for the comic books where they belong. ProCombi has the lower value in the model name but, in fact, is the more powerful of the bunch when like for like ratings are compared making it even better value for money than you thought! With the Sterling unit you get what you think you should be getting, and it does what it says it does on the box.

The sooner ratings have a legal recognised standard like the U.S.A. the better for everyone.

- EN61000-3-2**
- EN61000-3-3**
- EN50081-1**
- EN60335-2-29**

Pro Combi Q quasi sine wave		
D/C voltage	Power at 20 deg c (watts)	Part nos
12	1600	PCQ121600
12	2500	PCQ122500
24	1600	PCQ241600
24	2500	PCQ242500
Pro Combi S pure sine wave		
D/C voltage	Power at 20 deg c (watts)	Part nos
12	1500	PCS121500
12	2500	PCS122500
12	3500	PCS123500
24	1500	PCS241500
24	2500	PCS242500
24	3500	PCS243500

What does the Pro Combi range offer?

On the battery charger side

- 1) 4 step constant current battery charging
- 2) 8 pre set battery type selector plus de-sulphation
- 3) powerful charge rate
- 4) will charge even with totally flat batteries
- 5) PFC, draws about 30% less power than conventional units

On the crossover side

- 1) 20 m/s crossover time, will not to lose any equipment due to power loss
- 2) 30 amp through current ability on all models
- 3) twin 30 amp / single 50 amp on the 3500 watt models

On the inverter side

- 1) high overload ability
- 2) high temperature rating
- 3) low quiescent current
- 5) power saver mode to automatically reduce power
- 6) allows through power even with no batteries connected
- 7) natural earth link to enable RCD breakers to work

On the remote control

- 1) ability to switch the unit on/off
- 2) ability to select or de select power saver mode

General

- 1) removable local panel to give remote control with warning and function i.e.d.
- 2) remote on/off plus remote power saver on/off
- 4) 10 metres remote cable
- 5) almost 20 alarms/ warnings/and information

There are 2 main models the **Pro Combi Q** (for quasi-sine wave) and the **Pro Combi S** (for Pure-sine wave)

So the simple question is, what best suits your needs?.

Pro Combi Q, (quasi-sine model) suitable for most installations, where you would use a microwave, fridge, hair dryer, vacuum cleaner, kettle, computer, etc The vast majority of products will run on quasi-sinewave. Hi Fi could have a buzz on the speakers and older non flat screen TVs may have a line on the screen. It is not possible for us to say what item may have a problem, if any.

Pro Combi S (pure sine wave model) where all the above plus washing machines, bread makers, thyristor controlled equipment are used - then sine wave is required

.To Make the choice even simpler we have 6 months exchange/upgrade policy . If you purchase a Pro Combi Q and find there is some equipment that you cannot run due to the Quasi Sine wave and require Pure Sine wave, Sterling are happy to up-grade your quasi-sine unit for Sine wave with the only cost being the difference between the 2 products (unit must be sent direct to Sterling and in good condition). Offer applies dealing direct with the factory only

General specification

Input Wave form:	Pro Combi Q	Sinusoidal
Nominal Voltage:	Input	230 v a/c
Low voltage trip:		184v+/- 4%
Minimum engage:		voltage 194v +/- 4%
High voltage trip:		253v +/- 4%
High voltage re engage:		243v +/- 4%
Max input a/c voltage:		270 v rms
Nominal input frequency:		50hz or 60hz auto detect
Low freq trip:		47 hz for 50 hz, 58 hz for 60 hz
High freq trip:		53 hz for 50 hz, 62 hz for 60 hz
Output wave form:		(on by pass mode) same as input
Overload protection :		Circuit breaker
Short circuit protection :		Circuit breaker
Transfer switch rating :		30 amp
Efficiency on line transfer mode:		96%+
Line transfer time :		20 ms
Bypass without battery connected :		yes
Max by pass current :		30 amps
By pass over load current :		35 amps: Alarm
Inverter Specification / output		
Output wave form:		Modified Sine Wave/ Quasi sine wave
Output continuous power watts		1600 2500
Output continuous power VA		2400 3600
Power factor:		0.9- 1.0
Nominal output voltage rms :		230vac
Max voltage rms :		260vac
Output voltage regulation:		+/- 10% rms
Output frequency:		50hz+/-0.3hz or 60hz+/-0.3hz
Transient response time:		<150ms;0% to 100% RCD load
Nominal efficiency :		>85%
Surge ratings :		1500model=4500va 2500model = 7200va
Online current consumption at 12 v/24		12v 1.8a 24v 0.9a
Power saver mode current consumption		12v 0.4a 24v 0.2a
Short circuit protection:		yes, less than 3 cycles
Inverter Specification / input		
Nominal input voltage :		12 or 24 v depending on model
Minimum start voltage :		10 v for 12 v model 20v for 24 v
Low battery alarm:		10.5v for 12 v model 21v for 24 v
Low battery trip:		10 v for 12 v model 20v for 24 v
High voltage alarm:		15.5 for 12v model 30v for 24 v
Power saver :		below 20 watts when enabled
Power saver :		can be switched on/off on remote control

Pro Combi S

Input Wave form:	Pure sine wave
Nominal Voltage:	Input 230 v a/c
Low voltage trip:	184v+/- 4%
Minimum engage:	voltage 194v +/- 4%
High voltage trip:	253v +/- 4%
High voltage re engage:	243v +/- 4%
Max input a/c voltage:	270 v rms
Nominal input frequency:	50hz or 60hz auto detect
Low freq trip:	47 hz for 50 hz, 58 hz for 60 hz
High freq trip:	53 hz for 50 hz, 62 hz for 60 hz
Output wave form:	(on by pass mode) same as input
Overload protection :	Circuit breaker
Short circuit protection :	Circuit breaker
Transfer switch rating :	1500-2500 w = 30 amp the 3500 w= 50 amp
Efficiency on line transfer mode:	95%+
Line transfer time :	20 ms
Bypass without battery connected :	yes
Max by pass current :	30 amp
By pass over load current :	35 amps: Alarm
Inverter Specification / output	
Output wave form:	Pure sine wave
Output continuous power watts	continuous 2100 (2500 30 min), 3200 (3500 30 mins)
Output continuous power VA	3100 5000
Power factor:	0.9-1.0
Nominal output voltage rms :	230vac
Max voltage rms :	260vac
Output voltage regulation:	+/- 10% rms
Output frequency:	50hz+/-0.3hz or 60hz+/-0.3hz
Transient response time:	<150ms;0% to 100% RCD load
Nominal efficiency :	>88%
Surge ratings :	PQS1500=4500va PQS2500=7200va
Online current consumption at 12 v/24	not available until march 2008
Power saver mode current consumption	not available until march 2008
Short circuit protection:	yes, less than 3 cycles
Inverter Specification / input	
Nominal input voltage :	12 or 24 v depending on model
Minimum start voltage :	10 v for 12 v model 20v for 24 v
Low battery alarm:	10.5v for 12 v model 21v for 24 v
Low battery trip:	10 v for 12 v model 20v for 24 v
High voltage alarm:	15.5 for 12v model 30v for 24 v
Power saver :	below 20 watts when enabled
Power saver :	Same switched on/off on remote

Charger Mode specification

Input voltage range:	196-245 v ac
Output voltage:	dependent on battery type selection
Output current 12 v model :	1600- 40A 2500 - 55A
Output current 24 v model :	1600- 20A 2500 - 25A
Battery initial voltage for start up:	0-15v for 12 v x 2 /24v
Over charge protection shutdown:	15.7 12 v x 2 for 24 v

Charger Mode specification

Input voltage range:	196-245 v ac
Output voltage:	dependent on battery type
Output current 12 v model :	1500 - 40A 2500 - 70A 3500 - 100A
Output current 24 v model :	1500 - 20A 2500 - 35A 3500 - 50A
Battery initial voltage for start up:	0-15v for 12 v x 2 /24v
Over charge protection shutdown:	15.7 12 v x 2 for 24 v

Charger curves (4 stage constant current)Battery types

Battery type	charge v	float v	x 2 for 24 v
Gel U.S.A	14.0	13.7	
A.G.M. 1	14.1	13.4	
A.G.M. 2	14.6	13.7	
Sealed Lead Acid	14.4	13.6	
Gel Euro	14.4	13.8	
Open Lead acid	14.8	13.3	
Calcium	15.1	13.6	
De-sulphation	15.5 for 4 hrs		
Battery bank size:	auto detected / auto program adjusted		
General Features.			
Remote control.	Front control panel removable as remote		
Size:	in mm 185W 180H 430L (1600, 2500)		
Weight:	1600w 18 kg 2500w 20 kg		

Charger curves

Battery type	charge v	float v	x 2 for 24 v
Gel U.S.A	14.0	13.7	
A.G.M. 1	14.1	13.4	
A.G.M. 2	14.6	13.7	
Sealed Lead Acid	14.4	13.6	
Gel Euro	14.4	13.8	
Open Lead acid	14.8	13.3	
Calcium	15.1	13.6	
De-sulphation	15.5 for 4 hrs		
Battery bank size:	auto detected / auto program adjusted		
General Features.			
Remote control.	Front control panel removable as remote		
Size:	in mm 185W 180H 430L (1600, 2500) 227W 180H 512L (3500)		
Weight:	1500w 20 kg 2500w 20 kg 3500 24kg		

ProPower Q

The Professionals Choice Quasi Sine Inverters 100 - 2700 watt New 3000-6000 range

General opinion over the last few years was that the Quasi-sine wave inverter was dead and the pure sine-wave inverter would rule the world (an opinion not shared by Sterling). Sales of quasi-sine wave inverters have continued to out-grow sales of pure sine-wave, proving that there is plenty of life left in this technology. The principle reason is that most of the equipment such as mobile phones, t.v.s, drill chargers and all that type of equipment which used to have a problem working with quasi-sine wave tends to now work fine on quasi-sine as the effected equipment tends to use a switch mode power supplies in the design which works fine with quasi sine wave. This meant that rather than the problems getting worse over the years the problems have diminished, however, this is not to say that the odd micro wave, drill, vacuum cleaner would not work (if there is a thyristor control circuit employed then this can still be an issue) but there is no question this is becoming more rare as the years go past, plus it usually is a lot cheaper to replace a £ 35 microwave to a different model which will work rather than spend £ 700 on a sine wave model to make it work .

Sterling has invested in a new range of quasi-sine inverters because they are smaller, lower cost, offer better performance, are more efficient and more reliable than sine-wave. We at Sterling have always found the quasi-sine wave inverter more than adequate for general requirements in boats and vehicles. There is still the odd appliance, such as washing machines, where quasi-sine wave inverters simply do not work, but all in all they do a great job - especially considering their cost. With this in mind, we have made a new range of DIGITAL quasi-sine inverters called the Pro Power Q. The idea behind this was to push forward this technology and bring in some new features. The most obvious change in this new inverter is its style, tough aluminum extrusion with great looking plastic end caps, euro and British sockets are on all this range ,enabling the unit to be compatible across Europe without problem. The new extrusion design has allowed us to reduce the size of the 1000-2500 watt units by nearly 40% , but still offer their full power and even better performance over the previous models. If you also require a battery charger then look at our new Pro Combi Q range

ALL THESE INVERTERS ARE
e marked to 95/54/EC



I12150

350 WATT

800 watt

1800 watt

2700 watt



I12150CT

150 watt oval style is available in 2 versions
I12150 = this model is the most popular with a universal socket which can be used for all different plugs round the world.

I12150CT = this model has a English socket on one side and a German style socket on the other, this unit tends to be used where companies want to have the inverter standard rated as a mains power source, where in actual fact its a isolated power supply



New turbo coke can inverter:
The popular 100 watt inverter which can lie flat or fits in a standard coke can holder in cars / lorries / boats now has a new big brother which keeps the same convenient style and application, but now has an internal fan to keep it cool. The end result is that it can produce comfortable 170 watts. The new turbo model is about 20 mm longer and requires either an open cup holder or a cup holder with at least 5 mm larger diameter than the unit to allow the fan enough room to let the air flow through the product.



I12100



I12170T

Fan cooled 200 watt

The quasi sine wave inverter is by far the most popular for the above reasons. All Sterling inverters are continuously rated, with all the usual overload, over voltage and low voltage cut outs, all the inverters come with cable and 24 kt gold connectors, in order to prevent battery terminal corrosion. Available in 230 volts for UK and Europe and also 110 volt for building sites / off vehicle use or for equipment supplied on boats made in the USA (not suitable for washing machine / some bread makers)

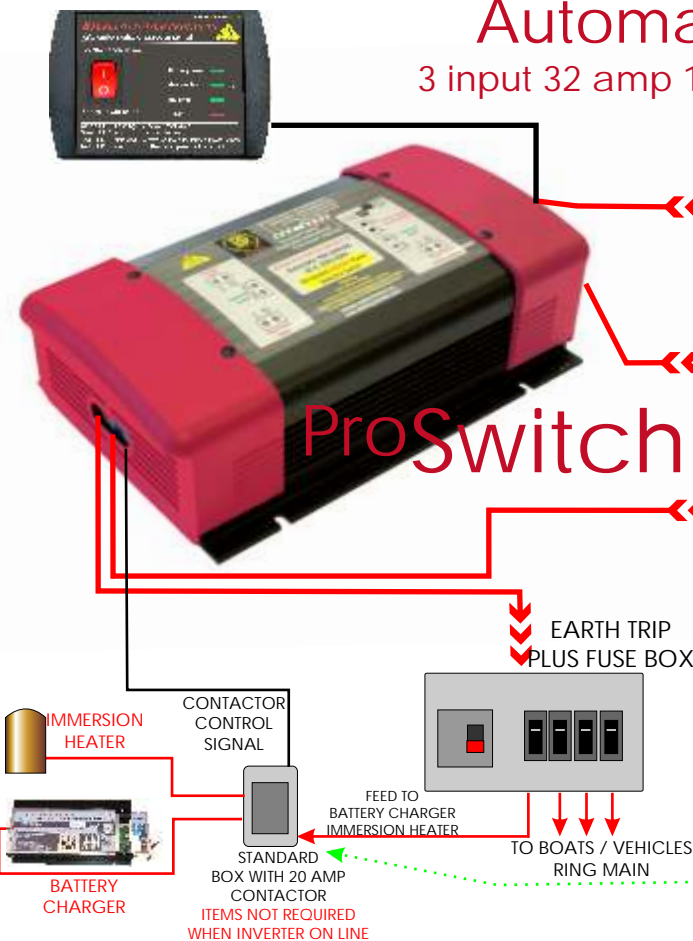


230 v 50 hz Quasi Sine wave inverters						
Socket type	Voltage d/c	Power(continuous)	Size L x W x Dmm	Weight	Part nos	
Universal	12	100 watts	65 dia 145	0.2	I12100	
Universal	12	150 watts	100 mm oval 145L	0.3	I12150	
British/Euro	12	150 watts	100 mm oval 145L	0.3	I12150CT	
Universal	12	200 watts	65 dia 145	0.3	I12170T	
British/Euro	12	350 watts	120 x 150 x 65	1.0	I12350	
British/Euro	12	600 watts	150 x 150 x 65	1.3	I12600	
British/Euro	12	800 watts	180 x 150 x 65	1.8	I12800	
1000-2700 watt Inc Remote control and 10 metres of cable						
British/Euro	12	1000watts	180 x 250 x 100	2.0	I121000	
British/Euro	12	1800watts	270 x 250 x 100	4.0	I121800	
British/Euro	12	2700watts	370 x 250 x 100	5.0	I122700	
5000 watt inc remote control , not compact design as above						
British/Euro	12	5000watts	700 x 250 x 250	10.0	I125000	
New High power versions no remote						
Hard wired	12	3000watts	510 x 230 x 155	7.0	I123000	
Hard wired	12	4000watts	510 x 230 x 155	7.0	I124000	
Hard wired	12	5000watts	510 x 230 x 155	7.5	I125000	
Hard wired	12	6000watts	691 x 230 x 155	12.0	I126000	
24 v versions						
Universal	24	100 watts	65 dia 145	0.3	I24100	
Universal	24	150 watts	100 mm oval 145	0.3	I24150	
British/Euro	24	150 watts	100 mm oval 145	0.3	I24150CT	
Universal	24	200 watts	65 dia 145	0.3	I24170T	
British/Euro	24	350 watts	120 x 150 x 65	1.0	I24350	
British/Euro	24	600 watts	150 x 150 x 65	1.3	I24600	
British/Euro	24	800 watts	180 x 150 x 65	1.8	I24800	
1000-2700 watt Inc Remote control and 10 metres of cable						
British/Euro	24	1000watts	180 x 250 x 100	2.0	I241000	
British/Euro	24	1800watts	270 x 250 x 100	4.0	I241800	
British/Euro	24	2700watts	370 x 250 x 100	5.0	I242700	
5000 watt inc remote control , not compact design as above						
British/Euro	24	5000watts	700 x 250 x 250	10.0	I245000	
New High power versions no remote						
Hard wired	24	3000watts	510 x 230 x 155	7.0	I243000	
Hard wired	24	4000watts	510 x 230 x 155	7.0	I244000	
Hard wired	24	5000watts	510 x 230 x 155	7.5	I245000	
Hard wired	24	6000watts	691 x 230 x 155	12.0	I246000	
110 v models for UK building sites with remote control and Engine interlock						
Yellow 16 amp	12	1800watts	270 x 250 x 100	2.0	A1121800	
Yellow 16 amp	12	2700watts	370 x 250 x 100	4.0	A1122700	
Yellow 16 amp	24	1800watts	270 x 250 x 100	2.0	A1241800	
Yellow 16 amp	24	2700watts	370 x 250 x 100	4.0	A1242700	

Automatic power selector switch

3 input 32 amp 110/230 v a/c auto selector with remote control

Make your own combi tailored to your needs



Generator

(UP TO 8000 WATT CONTINUOUS
32 AMP 230 VOLT A/C , FUSED ,OR OTHER SOURCE)

Inverter

(UP TO 8000 WATT CONTINUOUS
32 AMP 230 VOLT A/C ,FUSED, OR OTHER SOURCE)

Shore Supply

(UP TO 8000 WATT CONTINUOUS
32 AMP 230 VOLT A/C , FUSED, OR OTHER SOURCE)

Boat/vehicle electrics

Pro switch 32 amp 110-230 v a/c auto crossover
Description Part nos
Main control box AC32A
Extra 230 v 20 amp contact relay CON1

The new simple power selector offers many new features not available on the older 16amp crossover switch, due to its digital control system.

- 40 amp internal contractors** : Switches live and neutral with a 0.25 sec time delay between switch off and on, to prevent wave doubling of the voltage and destroying sensitive equipment.
- Multiple internal power sources** : The system powers itself from each attached power supply; and not from the boats/vehicles d/c system. This is to ensure the system will work even if your batteries are flat. There is no point having an a/c selector switch powered from the d/c system, because if the d/c system fails then you cannot switch the system on to charge the batteries. The Sterling system obtains its control power from each input source, so preventing this problem.
- Sequential switching** : The unit has a simple operation mode; channel 1 is the priority, then channel 2, then 3. In other words if you allocate the inverter to channel 3 then plug in the shore power on channel 1, the switch will automatically switch the system to the shore power etc.
- Lock out circuit** : It is assumed that channel 3 would be your inverter (it could be another power supply depending on how you wire the system up). With a lower power inverter you may not wish your immersion heater or battery charger to work when the inverter is on line; so connected to this circuit is a small relay which can break the control circuit on an external contactor /relay block. This then allows you to wire the battery charger and immersion heater to a separate connector block, preventing these items

being on line when the inverter is operational.

- Remote control** : The remote control will tell you which circuit is the current power circuit; and if the light is flashing, then it will also show if power is available on another circuit. There is also a fault light.
- Faults / Reverse polarity check**: The unit will show if there is a reverse polarity on channel 'A' which is assumed to be the shore supply system.
- Internal fuses** : The control box has 6 internal fuses; one on each live and neutral, so that even in the event of a reverse polarity the neutral line is also fused for safety reasons.
- Remote on/off**. This switch enables the shore power to be switched off (the priority circuit) in the event of the shore power not being powerful enough to do a specific job, for example if your shore power was limited to say 5 amps (about 1.2 kw) but your immersion heater/washing machine may be 3000 watt, you may wish to shut down the shore supply and allow the more powerful inverter or an onboard generator to do the job.
- 230 v or 110 volt** or a mixture of each can be used at the same time, ensuring operation in all the worlds different power supply conditions.
- Other features** includes a 10 sec time delay on the generator line to allow generator start up

230 v manual 16-30-50 amp 3 way cross over switch

ideal where 3 power sources are used such as inverters, shore power and generators on a boat/vehicle

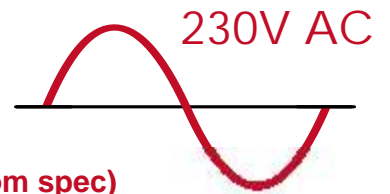
Easy to install
Front panel waterproof
Easy to use
Supplied with 2 shafts for thin panel mounting and 1/2" panel mounting



Pro switch 32 amp 110-230 v a/c auto crossover

Input sources	Output	Continuous Amps	Max Voltage	Number of poles	Part nos
3	1	20	300	3	SC20A
3	1	32	300	3	SC32A
3	1	50	300	3	SC50A

Pro Power S



ADVANCED DIGITAL PURE SINE WAVE INVERTER (high quality telecom spec)
150 watt - 2000 watt conventional stand alone inverters
3000 watt with 30 amp a/c crossover switch

We have developed the new Sterling pure sine wave, heavy-duty inverter with very high quality wave form, because most of Sine wave inverters will not run some sensitive equipment. This inverter ensures all electrical products run at their very best. This model is of telecom output standard, and simply the best. It removes all problems linked with even the so called best pure sine wave inverters. It works perfectly with all sensitive equipment which even so called pure sine wave can cause problems with.

The 2000-3000 watt unit is capable of running a standard washing machine and all thyristor controlled devices which cannot be run by quasi-sine. However, if there is a washer dryer then the 3000 would be best. The units all come with a standby circuit which offers a 0.2 amp consumption with no load and a low on line loss of about 1.2 amps if power saver is not engaged.

The remote control is a standard feature that comes complete with a 10 metre connecting cable.



1500/2000 watt
inc remote control

350 watt



200 watt



700/1000 watt

230 v 50 hz Pure Sine wave (telecom standard wave form)						
Socket type	Voltage d/c	Power(continuous)	Size L x W x D mm	Weight	Part nos	
Universal	12	200 watts	230 x 120 x 75	1.4	SI12200	
Universal	12	350 watts	230 x 120 x 75	1.7	SI12350	
British/Euro	12	700 watts	290 x 175 x 80	3.5	SI12700	
British/Euro	12	1000 watts	340 x 175 x 80	4.1	SI121000	
with remote control (below)						
British/Euro	12	1500 watts	390 x 300 x 100	3.5	SI121500	
British/Euro	12	2000 watts	390 x 300 x 100	3.5	SI122000	
with remote control (below)						
Universal	24	200 watts	230 x 120 x 75	1.4	SI24200	
Universal	24	350 watts	230 x 120 x 75	1.7	SI24350	
British/Euro	24	700 watts	290 x 175 x 80	3.5	SI24700	
British/Euro	24	1000 watts	340 x 175 x 80	4.1	SI241000	
with remote control (below)						
British/Euro	24	1500 watts	390 x 300 x 100	3.5	SI241500	
British/Euro	24	2000 watts	390 x 300 x 100	3.5	SI242000	
With a/c automatic 16 ms crossover 30 amp a/c						
Hard Wired	12	3000 watts	450 x 300 x 300	6	SI123000U	
Hard Wired	24	3000 watts	450 x 300 x 300	6	SI243000U	

ONBOARD ENTERTAINMENT EQUIPMENT INVERTER

400 watt, Pure sine wave (low frequency)

With auto cross over switch (U.P.S. FUNCTION)

Dedicated for use with AV systems these models have particularly low levels of noise emissions to which very sensitive equipment can be susceptible. The auto crossover function means that when power is transferred from inverter to another available source, there is no loss of power to the appliances. As a result there is no interruption to operation and clock settings etc are preserved.

Output continuous power 400 watts
 Surge rating (5 seconds) 800 watt
 Output voltage 230 volts +/- 3 volts
 Efficiency 88%
 Power draw in stand by 0 amps



includes
 d/c input cables
 a/c input cables
 plus
 remote and 10 meters
 cable

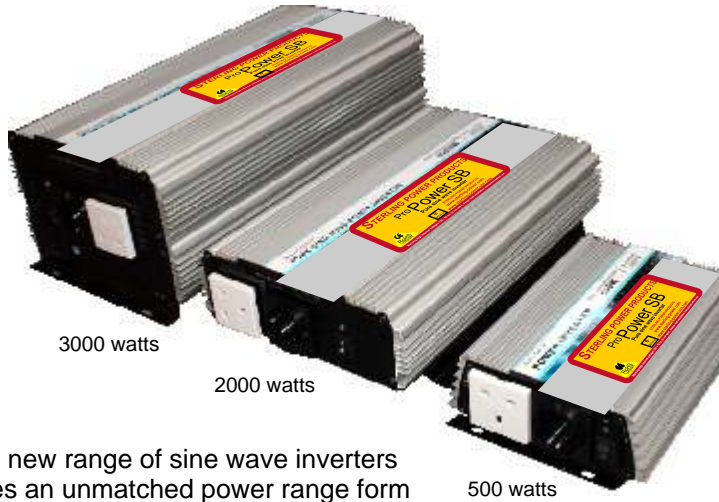
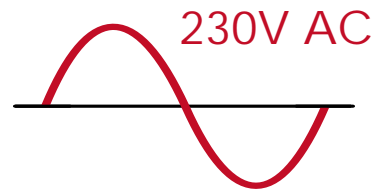


230 v 50 hz Pure Sine wave (telecom standard wave form)						
Socket type	Voltage d/c	Power(continuous)	Size L x W x D mm	Weight	Part nos	
Universal	12	400 watts	250 x 100 x 85	5.5	SI12400	
Universal	24	400 watts	250 x 100 x 85	5.5	SI24400	

Pro Power SB

ADVANCED DIGITAL PURE SINE WAVE INVERTER

150 watt - 5000 watt conventional stand alone inverters



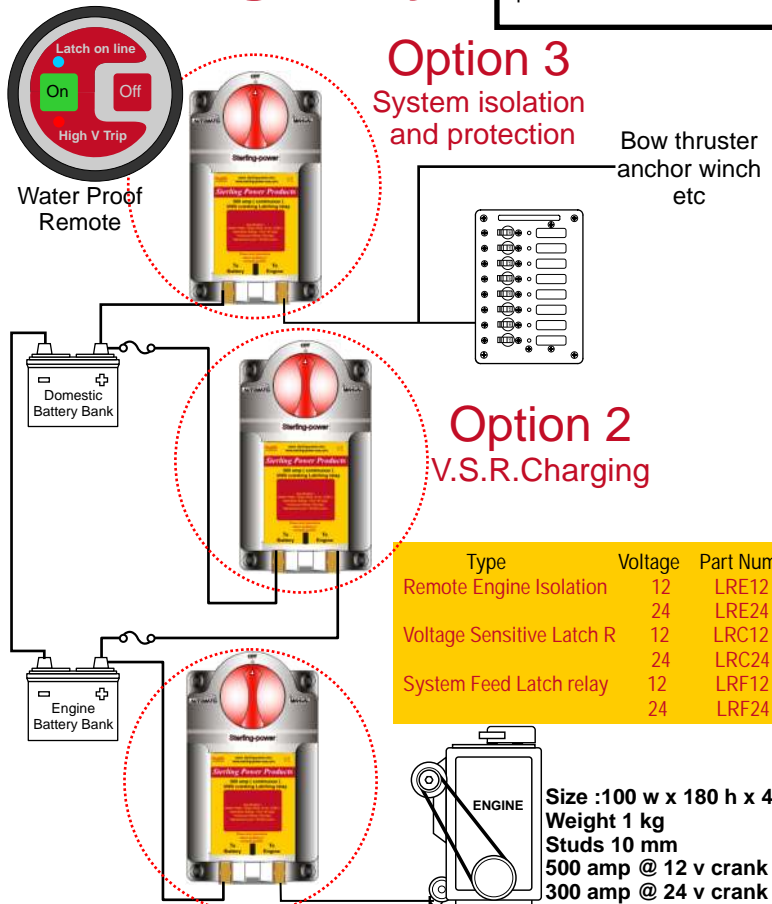
230 v 50 hz Pure Sine wave (telecom standard wave form)					
Socket type	Voltage d/c	Power(continuous)	Size L x W x D mm	Weight	Part nos
Universal	12	150 watts	230 x 120 x 75	1.4	SIB12150
Universal	12	300 watts	230 x 120 x 75	1.7	SIB12300
British/Euro	12	500 watts	290 x 170 x 75	3.3	SIB12700
British/Euro	12	1000 watts	330 x 170 x 75	4.1	SIB121000
British/Euro	12	1500 watts	390 x 300 x 100	5.5	SIB121500
British/Euro	12	2000 watts	390 x 300 x 100	6.0	SIB122000
Hard wired	12	3000 watts	400 x 265 x 159	10.0	SIB123000
Hard wired	12	4000 watts	420 x 265 x 159	12.6	SIB124000
Hard wired	12	5000 watts	450 x 265 x 159	10.0	SIB125000
Universal	24	150 watts	230 x 120 x 75	1.4	SIB24150
Universal	24	300 watts	230 x 120 x 75	1.7	SIB24300
British/Euro	24	500 watts	290 x 170 x 75	3.3	SIB24700
British/Euro	24	1000 watts	330 x 170 x 75	4.1	SIB241000
British/Euro	24	1500 watts	390 x 300 x 100	5.5	SIB241500
British/Euro	24	2000 watts	390 x 300 x 100	6.0	SIB242000
Hard wired	24	3000 watts	400 x 265 x 159	10.0	SIB243000
Hard wired	24	4000 watts	420 x 265 x 159	12.6	SIB244000
Hard wired	24	5000 watts	450 x 265 x 159	10.0	SIB245000

This new range of sine wave inverters gives an unmatched power range from 150-5000 watts, the no frills approach ensures an unmatched price and performance with all the standard safety aspects one would expect to find on any inverter.

High Power Specification				
Continues power (watts)	2000	3000	4000	5000
Surge power	4000	6000	8000	10000
Fuse required amps 12v/24v a/c connection	350/180 Euro/English	450/230 Hard wired	550/260 Hard wired	700/350 Hard Wired
Pure sine wave 230 volt 50 hz ac output +/- 2 hz				
Voltage range, 10.5-15 v d/c for 12 v model			21.0 - 30 v d/c for 24 v model	
Off load current 1.5 amps				
Efficiency > 84%				
Low battery shutdown 10.5 v (12 v).	21 v (24 v)			
High voltage trip 15.0 v (12 v).	30 v (24 v)			

Protection Features: Overload shutdown. Over temperature shutdown . Low voltage alarm. Low voltage shutdown. High battery voltage shutdown. Short circuit protection. Polarity reverse connection protection.

500 amp continuous 2500 amp cranking Latching relays



Option 3
System isolation
and protection

Option 2
V.S.R.Charging

Option 1
Engine Isolation

This new range of High Power Latching relays are available in 3 formats for 3 different main functions. They include a waterproof remote control with 30 ft of pre wired loom. The Latching relays also have a built in emergency manual override facility in case of faults and also for safety when undergoing maintenance.

Latching relays vers conventional relays:
A conventional relay requires power to hold the relay on line, however a latching relay only uses power to change the contractors position , then the relay latches into position and uses no more power to remain in that position. Ideal for long term use where power is important.

Option 1: Remote Engine isolation switch.

- Features includes:
- 1) Waterproof remote on/off.
 - 2) Safety interlock to prevent unit being switch off with engine running .
 - 3) High voltage trip, in event of alternator failure the unit will disengage the engine and so save your system auxiliary system
 - 4) Internal **emergency safety alternator circuit** to protect the alternator in the event of the relay opening when the engine is running to protect the alternator
 - 5) 2500 amp surge / cranking rating to deal with engine start

Option 2: Voltage Sensitive Latching relay

- Features includes
- 1) Water proof remote with automatic or manual select
 - 2) Connection to up to 2 engines starter solenoids to disengage the relay during engine start to protect voltage sensitive equipment and voltage spikes
 - 3) 20 second delay on latch on and 20 second delay on latch off
 - 4) High voltage disengage (to protect battery bank)
 - 5) Automatic voltage sensitive relay charging ability on automatic , on at 13.3 off at 13 with time delays (x 2 for 24 v)
 - 6) Over-ride ability via remote for starting assist, or manual override for emergency

Type	Voltage	Part Number
Remote Engine Isolation	12	LRE12
	24	LRE24
Voltage Sensitive Latch R	12	LRC12
	24	LRC24
System Feed Latch relay	12	LRF12
	24	LRF24

Size :100 w x 180 h x 40 d
Weight 1 kg
Studs 10 mm
500 amp @ 12 v crank 2500
300 amp @ 24 v crank 1800

Option 3 Remote System feed Latching relay. This unit will have the same operations as Option 1 but without the alternator safety protection.

- Features includes
- 1) Waterproof remote on off
 - 2) High voltage 16 volts High voltage protection x 2 for 24 v of expensive secondary equipment in event of alternator failure

Power Management Panel able to read 4 X AMPS , 4 X VOLTS AND 1 X Amp Hr Counter Shunt Type (POS OR NEG SHUNTS)

The latest software driven Power Management Panel is an extremely effective unit designed to monitor and display all the vital electrical information on an average boat. This enables important (potentially expensive) decisions to be made regarding faults and general on-board D/C electrical power management. The information obtained also helps any third party engineer to identify problems.

The operation of the panel is based on 100 mV shunts. Shunts enable all current measurement to take place remotely from the instrument clusters, thus removing all the voltage drop and R.F.I. problems associated with running heavy duty cables up to a control panel and navigation instruments.

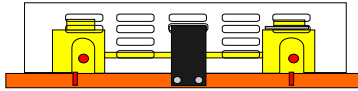
The new panel has a built in amp hour counter on one channel, and in total enables 4 different amp readings, 4 different volt readings, and one

amp hr counter. The shunts of the system can be fitted in negative or positive cables (unlike most others). The counter counts the amps going into and out of the battery system. The amp hour counter set up and function are completely automatic and requires no intervention from the user.

The background light ensures perfect legibility in daylight, direct sunlight and at night. Each panel comes complete with a 200 amp shunt, (up to 3 extra shunts may be purchased) and a list of labels for the panel front. The plastic box can either be surface or flush mounted by using the new parts.

Power Consumption = 0.5 ma off/0.7 ma on
 Max readable current = 199 a D/C
 Max display volts = 199 volt D/C
 Safe to over 1000 amp surges
 L.E.D. Background light.
 amp hr ctr up to 7999 amps
 Screen = 16 digit 2 line L.C.D.
 Back light/switched
 Accuracy = + or - 1%

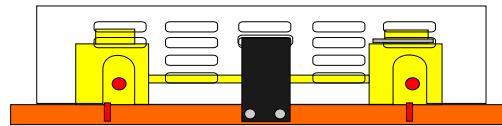
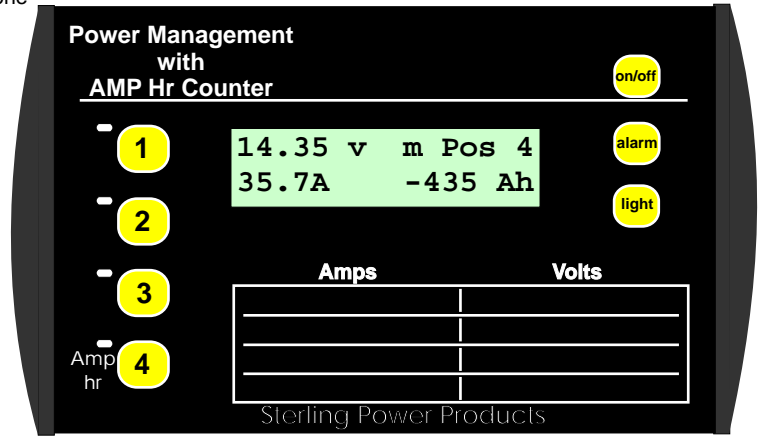
Extra Shunts available, 200 + 400 amp,



200 amp shunt = 200Lx40Wx50H
 400 amp shunt = 260Lx55Wx50H

Power Management Panel with Amp Hour Counter (Includes 1x 200 amp brass shunt)

Power Management Panel			
D/C voltage	Size L x W x D mm	Weight kg	Part nos
12 & 24	170 x 90 x 40	0.25	PMP1
Extra 200 amp shunt			S200A
Extra 400 amp shunt			S400A



A 200 amp shunt is suitable for Inverters up to about 2000 watts at 12 v / 4000 at 24 v the 400 amp shunt is suitable for inverters up to about 4000 watts at 12 volts. The shunts have a very high instant load ability, ie 1000 amps to start a engine etc is no problem on either size

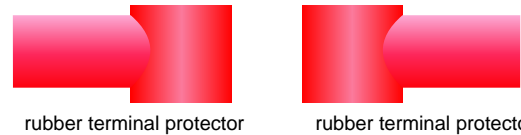
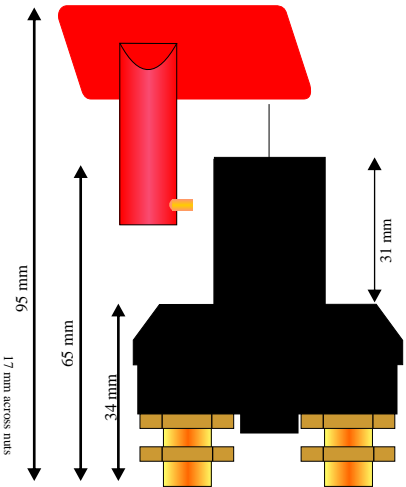
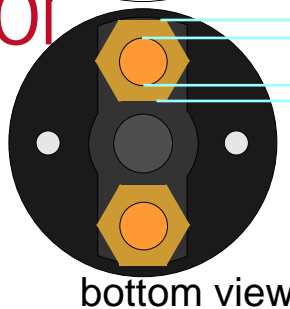
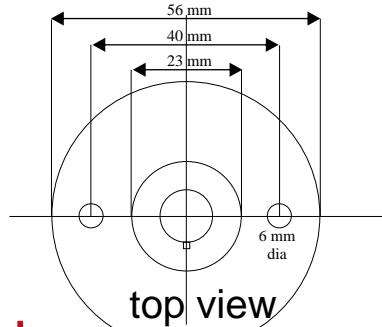
200 amp continuous
 1000 amp overload
 water proof cover
 rubber boots for main cables
 2 keys



200 amp Battery isolator Pro Isolator		
D/C amps	Weight kg	Part nos
200	0.1	IS200

Pro Isolator

pre-boxed ready for shelf



Electrical Specification: Meets IEC 1010 CAT111
 D/C voltage 0-200 volts overload protection 600V
 A/C voltage 0-500 volts overload protection 600V
 D/C current 0-600 amps overload protection
 A/C current 0- 600 amps overload protection
 Resistance 0-200 ohms overload protection 400V
 Continuity beeper
 Data hold function
 A/C frequency response from 40-400 Hz
 A/C speck tested on sine wave 50/60 Hz
 Compact yet heavy duty



D/C Clamp metre

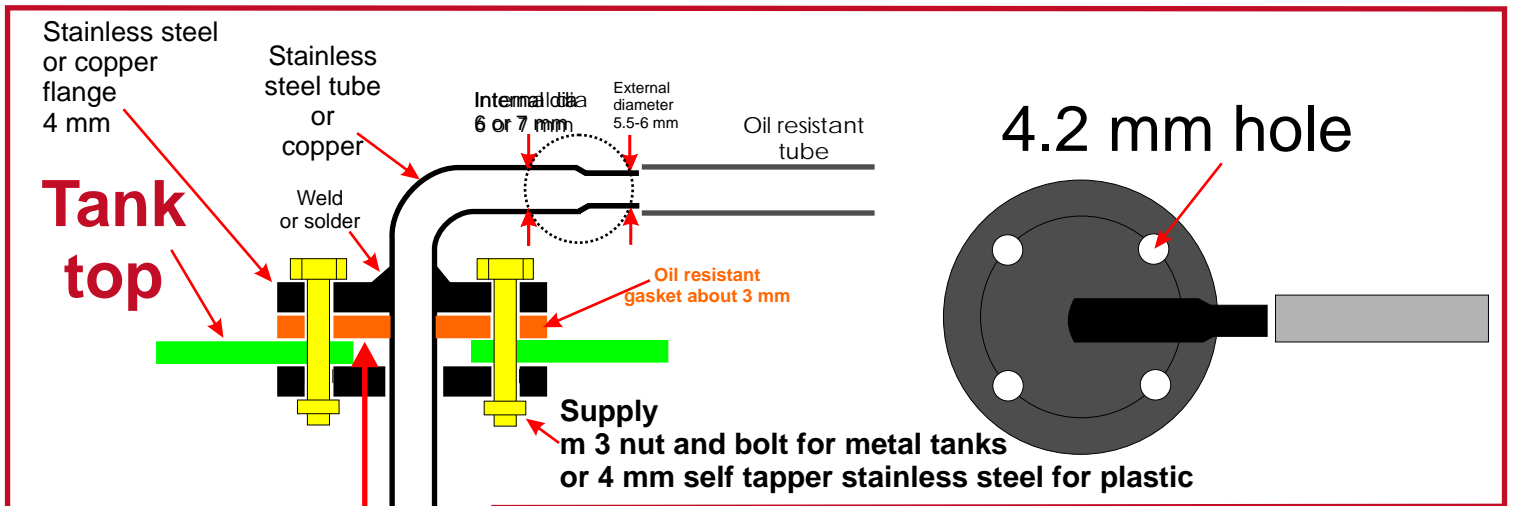
D/C clamp metre plus multi meter		
Size mm	Weight kg	Part nos
160 x 35 x 25	0.1	CLAMP1

D/C Voltage Probe & Diagnostics Tool

At first glance this low cost D/C voltmeter looks like any other one available anywhere, however, on closer inspection you will see it is not. Standard voltage probes only go to 14 volts and is unable to inform you if the advanced charging cycle is in progress or a system has failed and is overcharging your system. The extra 2 LED's are preset to give more useful information than the very limited standard ones. This is a Sterling product and is not available anywhere else. Available in 12 and 24 volt versions.



D/C Voltage Probe and Diagnostic tools			
D/C voltage	Size L x W x D mm	Weight kg	Part nos
12	100 x 20 x 15	0.25	TM12V
24	100 x 20 x 15	0.25	TM24V



0.95 meter
can be
extended to
2 meters

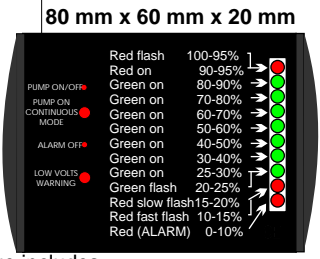
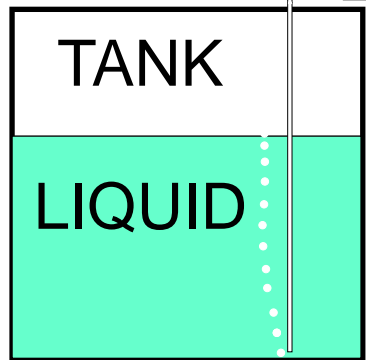
Pneumatic Tank Gauge

Pump /control box must be positioned above the highest point of the tank, i.e. above the filler cap height, in order to prevent liquids from entering the unit and damaging the sensors

1 metre Stainless steel tank tube
Weight kg 0.05 Part nos TGT

Tank Gauge System Pump Package and LED Display
Size L x W x D mm 145 x 90 x 40 Weight kg 0.5 Part nos TGS

MAX TANK DEPTH ON STANDARD MODEL SET ON WATER DENSITY 1.50 metre



- pump package includes
- 1) air pump and transducer box
 - 2) l.e.d. output display
 - 3) 1 meter plastic pipe from pump to tank
 - 4) 5 meter cable from pump to l.e.d. display
 - 5) full instruction set

The problem:
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 in the tank and the fact that float meters are damaged in the tanks.

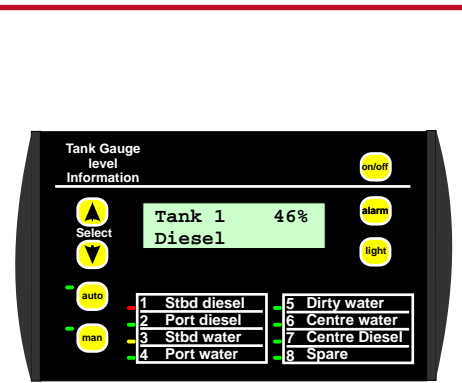
The solution:
The measuring device must not be effected by the movement or the corrosive nature of the fluid it is measuring. The best way to achieve this is the way ships and other quality tank meters work. And this is to use pneumatics. This has always proved too expensive to miniaturize for leisure craft use until now .

How does it work?
The new Sterling gauge works on a very simple principle. If you put a small tube to the bottom of any liquid, then pump air through the tube to remove all the fluid from it, then the atmospheric pressure or back pressure on the liquid is directly proportional to the depth of the fluid (taking density into account). For this to work, we need a simple pipe (approx 2-3 mm diameter) from the top to the bottom of the tank, then pump air through the pipe and measure the back pressure of the air (the transducer) and display it on a display panel. Simple? Well not that simple, we need a compressed air pump with a complex software program control to reduce power consumption to milliamps and to return a highly accurate reading-all at a sensible cost .

The Sterling Tank Gauge is a fully programmable system, where you program in the following information, 1) tank depth 2) fluid density (water, diesel, dirty water, petrol) 3) operation mode (i.e. a water or fuel tank would require the alarms etc to go off when the tank is empty, but a dirty water tank would require its alarms when it is full) with these three pieces of information simply connect the unit to a pipe which is about 10 mm of the bottom of the tank and the L.E.D. display will give a good indication of the depth. For a more accurate analysis the L.E.D display can be connected to the optional L.C.D display which will scan up to 8 tanks and display the depth in % full in rotation, when the fill button is pushed on the tank, for example tank 6, then the L.C.D. display will lock on to that channel.

The system must only be used where the pump sensor unit can be fitted above the level of the highest point on the tank system, i.e. above the height of the deck filler system or a U bend in the tube going above the filler, i.e. in an over fill condition liquid must not run into the unit.

- Quick check list**
- No moving parts in the tank
 - No electricity in the tanks
 - Cannot stick corrode or jam up
 - Not effected by any corrosive fluid
 - Easy to replace or repair if faulty
 - No need to test (set up in software program)
 - Very accurate
 - Alarms adjustable both ways
 - Set for water, diesel, petrol, sea water
 - Voltage 8-32 volts
 - Self cleaning
 - Local and remote readings



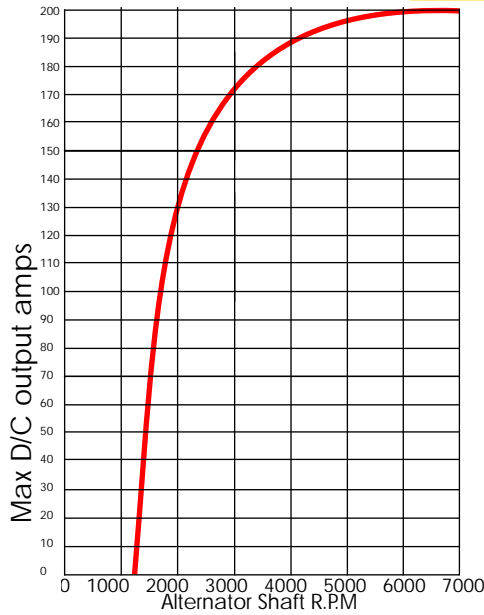
- Multi tank gauge kit includes
- 1) 8 tank l.c.d. reader / scanner panel
 - 2) selection of sticky labels with tank names
 - 3) 2 x 10 meter cables for 2 tanks
- extra tank cables can be purchased

Tank L.C.D. Display Scanner Unit
Size L x W x D mm 90 x 60 x 20 Weight kg 0.2 Part nos TGM
Extra 10 metre of cable for pumps TGL10M
Extra 5 meter of cable for pumps TGL5M

High amperage alternators with or without advanced alternator regulator

12 v 200 amp

GOOD LOW R.P.M. PERFORMANCE

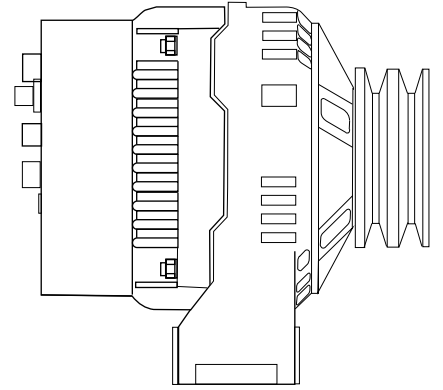


Description

12 v 200 amp alternator with standard reg
12 v 200 amp alternator with standard & PDAR

Part nos

AL12200
AL12200PDAR



12 v 145 amp

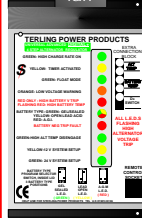
GOOD LOW R.P.M. PERFORMANCE

alt supplied with multi v and twin v pulley
photo shows multi v

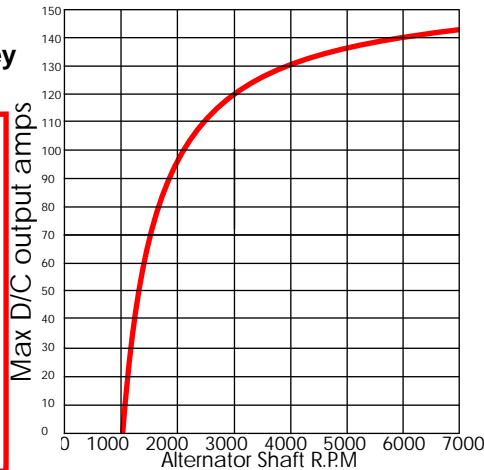


CS144 Delco

with or without
the best
advanced
alternator reg on
the market



PDAR
DIGITAL 4 STAGE
ADVANCED
ALTERNATOR
REGULATOR

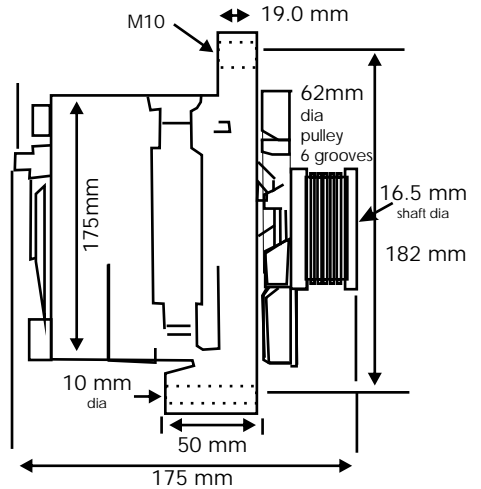


Description

12 v 140 amp alternator with standard reg
12 v 140 amp alternator with standard & PDAR

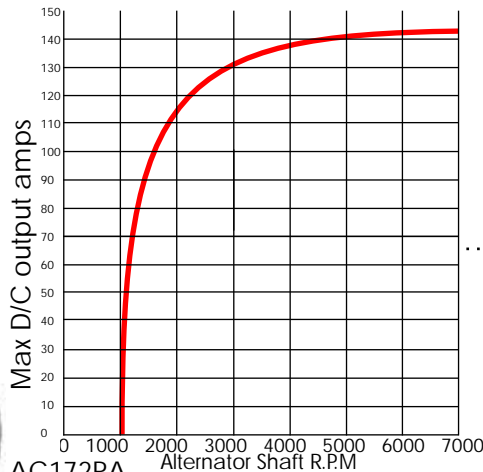
Part nos

AL12140
AL12140PDAR



24 v 140 amp

GOOD LOW R.P.M. PERFORMANCE



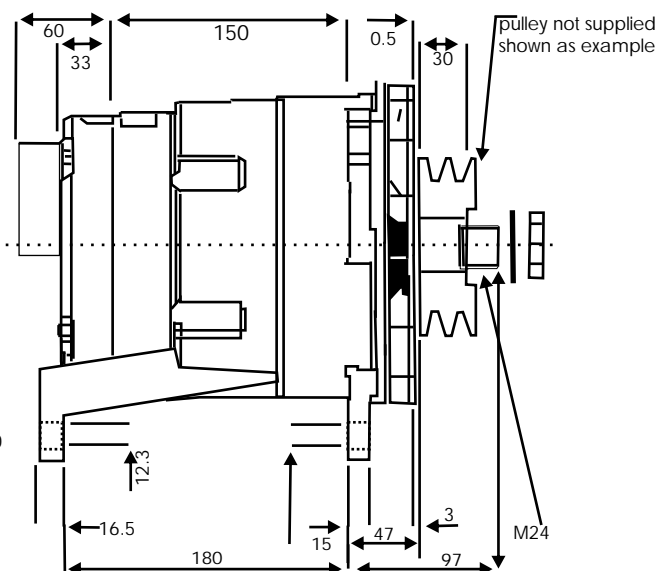
AC172RA
Bosch 0120 689 520
Prestolite 1277640
Equivalent product part numbers

Description

24 v 150 amp alternator with standard reg
24 v 150 amp alternator with standard & PDAR

Part nos

AL24150
AL12150PDAR



BATTERY TERMINALS sets (come in pairs)



GBT-600PN
8mm bolt
80g



GBT-1000PN
10mm bolt
100g



GBT-100PN
8mm bolt with WING NUT
110g



GBT-700PN
10mm CABLE CLAMP
95g

All products are precision machined from solid brass with a 24kt gold finish. Do not confuse with lower cost zinc-lead alloy die-casting.

SOLID BLOCK POWER DISTRIBUTION

Ideal for negative returns



Footprint: 105 mm x 65 mm



Footprint: 105 mm x 65 mm



Footprint: 90 mm x 5 mm

GPB-102468

CABLE DIAMETERS
1 X 12 mm 2 X 10 mm 6 X 8mm
407g

GPB-10244

CABLE DIAMETERS
1 X 12 mm 4 X 10mm
431g

GPB-2488

CABLE DIAMETERS
2 X 10 mm 8 X 8mm
232g

FUSE BLOCK SERIES FUSE TYPE AMT RANGE 20-80A 0-32 V MAX

Ideal for fused high current positive distribution fused outputs



Footprint: 110 mm x 80 mm



Footprint: 110 mm x 80 mm



Footprint: 110 mm x 45 mm



Footprint: 105 mm x 55 mm

GMFB 4848

4 X 6mm IN AND FUSED OUT
4 X FUSED 6mm OUT 320g

GMFB 3448

3 X 10 mm IN (SOLID)
2 X 6mm IN AND FUSED OUT
170g

GMFB 2828

1 X 10 mm IN 2 X 6 mm OUT
170g

GMFB 3428

1 X 10 mm IN 2 X 6 mm OUT
170g

FUSE BLOCK SERIES FUSE TYPE ATQ RANGE 3-35A 0-32 V MAX

Ideal for lower current positive distribution fused outputs



Footprint: 90 mm x 65 mm



Footprint: 90 mm x 65 mm



Footprint: 85 mm x 40 mm



Footprint: 85 mm x 40 mm

GATC 4848

4 X 6 mm IN AND FUSED OUT
220g

GATC 3448

3 X 10 mm IN (SOLID)
4 X 6 mm FUSED OUT 223g

GATC 2828

2 X 6 mm IN FUSED OUT
115g

GATC 1428

1 X 10 mm
2 X 6 mm FUSED OUT 115g

FUSE BLOCK SERIES FUSE TYPE AUE 1-80A 0-32 V/125V/250V

Positive fuse distribution where ignition protection regulations apply for R.C.D or U.L directives



Footprint: 105 mm x 80 mm



Footprint: 105mm x 80 mm



Footprint: 105 mm x 55 mm



Footprint: 05 mm x 55 mm

GFB 3448

3 X 10 mm IN (SOLID)
4 X 6 mm FUSED OUT 410g

GFB 4848

4 X 6 mm IN
4 X 6 mm FUSED OUT 371g

GFB 2828

2 X 6 mm IN
2 X 6 mm FUSED OUT 203g

GFB 1428

1 X 10 mm IN
2 X 6 mm FUSED OUT 228g

24kt Gold Plated

SINGLE FUSE BLOCK SERIES FUSE TYPE ANL 60-500A 0-32 VOLT

Used for large inverter's, bow thrusters, engine feeds and any other high current application



Footprint: 105 mm x 65 mm

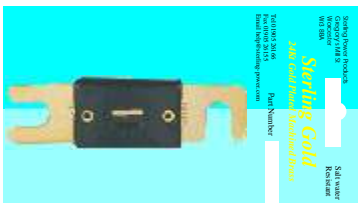


Footprint: 185 mm x 55 mm

GANL 1
1 X 12 mm IN
1 X 12 mm FUSED OUTPUT
290 g

GANLW 1
1 X 12 mm IN
1 X 12 mm FUSED OUTPUT
340 g

* All pre-packed*

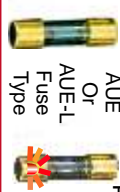


* All pre-packed*

SINGLE IN LINE FUSE HOLDERS FOR AUE FUSE



Footprint: 90 mm x 20 mm



Footprint: 80 mm x 35 mm



Footprint: 90 mm x 10 mm



Footprint: 100 mm x 50 mm

GFH-04-1

Single AUE fuse holder 10mm cable with eye Bolt for battery terminal 50g

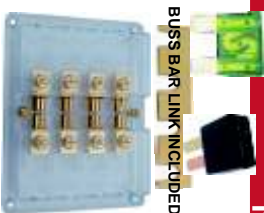
GFH-168

Single AUE fuse holder for ring terminals with 90 amp fuse plus spare fuse in internal holder can be used with all AUE fuses. 50g

GFH-80

NEW RING CONNECTOR TYPE

Same as GANL1 but suitable for ring terminal fitting



BUSS BAR LINK INCLUDED



BUSS BAR LINK INCLUDED



BUSS BAR LINK INCLUDED



BUSS BAR LINK INCLUDED

FUSE TYPE RESET or ATQ

Footprint: 148mm x 110 mm

FUSE TYPE AUE+AUEL

Footprint: 148mm x 110 mm

FUSE TYPE ANL

Footprint: 90 mm x 60 mm

SOLID BLOCK RING

Footprint: 100 mm x 60 mm

GMFBR

4 X Holder for RESET FUSE and AMT fuse range

GFBR

4 X holder for AUE fuse range

GANLR

Fuse holder with ring terminals for GANL fuse

GPBR

Solid connector block with ring terminal connectors

FUSE SERIES 24 KT GOLD PLATED

2 FUSES PER PACK

2 FUSES PER PACK

2 FUSES PER PACK

1 FUSE PER PACK



ATQ / ? AMPS

GAWT / ?AMPS GAUE / ?AMPS

GANL / ?AMPS

GF ?AM

3A VIOLET
5A TAN
10A RED
15A LT BLUE
20A YELLOW
30A LT GREEN
30A PURPLE

2A YELLOW
4A 4A
6A 6A
10A 15A 20A
25A 30A 40A
50A 60A 70A
80A
15A 50A 60A

80A 250A
100A 300A
150A 350A
200A 400A
500A

RESET FUSE (MANUAL)
NOT GOLD PLATED
5A
10A
15A
20A
30A

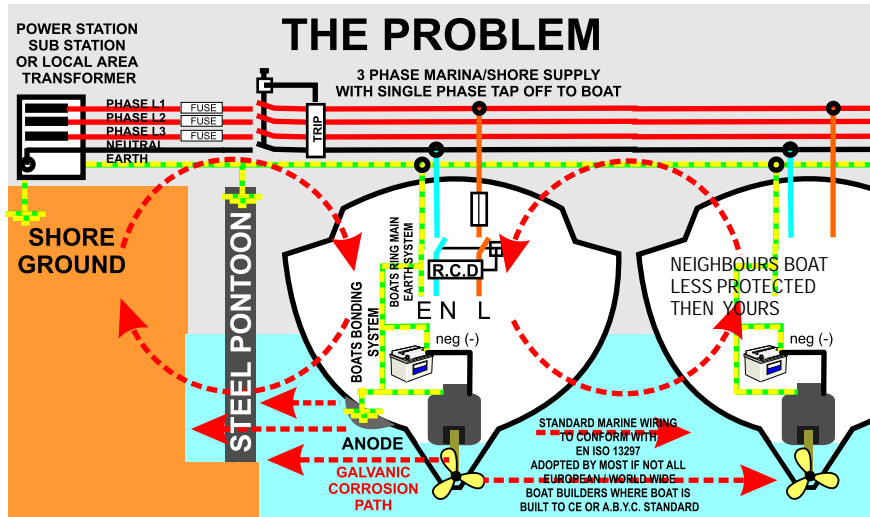
Galvanic Isolators / Zinc Savers

ProSave

THE PROBLEM:

Recent interest in damage done to boats due to the 230V shore mains has highlighted the need to fit a galvanic isolator to your boat. 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 / fuel tanks / engine blocks / shafts / propellers / stern tubes / rudders / rudder glands / water intakes / etc. This ensures that any 230V mains faults will operate the R.C.B on the boat in order to save your life. The down side of these standards is that electrically speaking your boat is now connected to the rest of the boats in the marina and any other metal structures in the area. Electrically speaking they become one and the same. If you follow the earth line you can see everything bonded to the earth, this includes your boat, the one next to you, metal work etc. This results in two main problems. 1) Any earth problem on any boat or

shore earth will increase the voltage in the common earth cable and dissolve adversely affecting your boat by dissolving your anodes at an alarming rate (this could result in the total loss of all the metal on the boat below the waterline) 2) Because all the boats are now one, if you have a zinc anode on your boat, but the boat beside you does not or even worse, the marina has not put anodes on its structures (metal pontoons etc) then your boat's zinc (or aluminium / magnesium) will protect all the structures and boats around you, resulting in dramatic zinc loss and expensive lift-outs to replace the zinc. For boats on inland waterways, if you have a magnesium anode and every one else has zinc or no anodes at all, your magnesium anode will protect all.



THE SOLUTION:

The trick is to maintain the continuity with the earth to ensure the safety of your life but remove the continuity with the shore power for the safety of your boat. The solution is very simple. By installing a Galvanic Isolator / Zinc Saver we maintain a good earth link with the shore, but prevent any stray currents coming up the earth line and damaging the boat. The isolator is in theory a simple device but it

has to be built to a stringent specification and tested by an independent test house to ensure they comply with the relevant standards, be it the less stringent CE standard or the more stringent American Boating and Yachting Council standard. This means in a major fault condition it can carry its rated current for 24 hrs without exceeding 90 C on the heat sink. The Galvanic Isolator has the following extra features:

TOTAL PROTECTION:

Recent upgrades in the new A.B.Y.C. have removed the need for a monitoring system on the zinc saver as long as, if the unit was to fail (which in the excess of 500,000 of the older version sold with 0% failure rate), the internal devices must fail in such a way as to continue to ensure the safe connection of the earth circuit. Having spent a lot of money on a new mono

silicon block to ensure the unit will perform as per the new specification and many hrs testing by UL labourites, the new Pro Save FS (see next page) is now fully certified as a fail safe device and as such no longer needs any monitoring system. This ensures a simpler and lower installation cost for this new product.



ProSave A

By far the most common used device in Europe, complies with all the requirements, and is also low cost and very effective

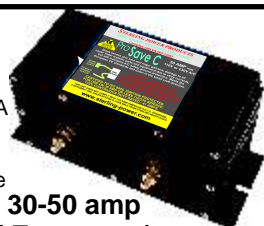
16-30-50 amp (European)

new 16 amp version

Galvanic Isolators / zinc savers Standard euro version			
Amps	Size mm	Weight kg	Part nos
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

ProSave C

Looks the same as the Pro Save A except has a internal 25,000 uf 2.5 v capacitor to raise the performance of the unit in extreme a/c leakage conditions



INTERNALLY INSTALLED

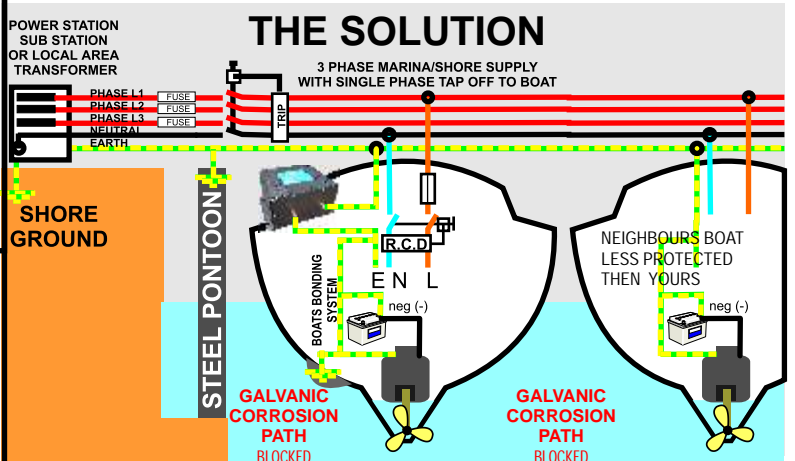
25,000 uF

2.5v

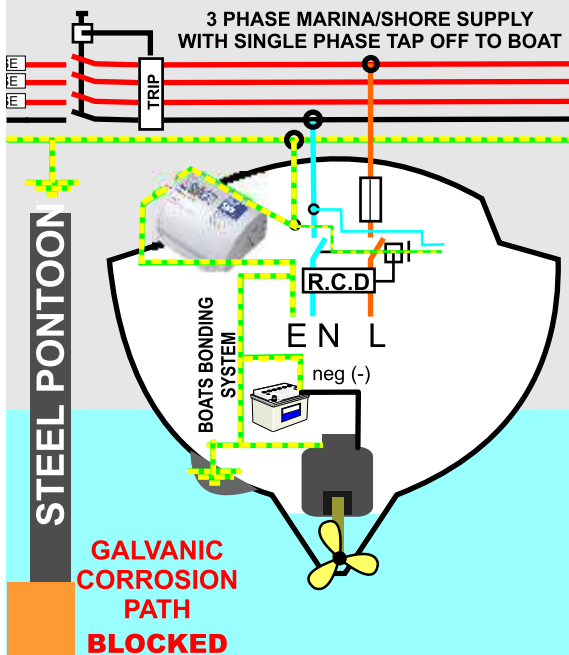
30-50 amp (European)

Galvanic Isolators / zinc savers Standard euro version with Cap			
Amps	Size mm	Weight kg	Part nos
30	220 x 120 x 100	1.5	ZS30C
50	220 x 165 x 100	1.8	ZS50C

Suitable for use in Europe and the rest of the world except the U.S.A if A,B,Y,C compliance is required



Pro Safe FS 30 & 60 amp Fail Safe to the latest A,B,Y,C specification tested by UL Suitable for use in the U.S.A.



UL Certified
205007

ProSafe FS installs easily and does not require a dedicated monitor to verify the operational status of the galvanic isolator as required by non FailSafe Certified galvanic isolators.

ProSafe FS 30 & 60 are built on robust FlatPack semiconductor platforms ensuring that in the event of a failure, the failure is safe by not compromising the ground continuity on-board when connected to AC Shore Power.

ABYC A-28 July '08 Compliant and Fail Safe Certified
Certified by Underwriters Laboratories (UL). Insures shore power safety ground wire is maintained through the isolator.

Flat Pack High Power Semiconductors
Robust high power diodes allow the FS Series to meet the new FailSafe criteria for conducting inrush currents of 5,000 amps for the required duration period.

Innovative Design
The FS 60 will cool itself in the event it must conduct current insuring cooler operation in this mode.

Ignition Protected
Meets ISO 8846 and can be mounted within an engine compartment
Gold Plated Terminations

LATEST A B Y C PROTECTION

120/240 VAC / 30A max/ 50 or 60 HZ



For 30 Amp Shore Cord Applications

120/240 VAC / 60A max/ 50 or 60 HZ



For (1) 50 Amp or (2) 30 Amp Shore Cord Applications

specifications:

shore cord inlet - Single 15,16,20
compatibility or 30
ratings VAC/Max - 120/240 VAC/41A
AMPS/Hz 50 or 60 HZ
max unit temp - 50 deg C
size L x W x H mm - 175 x 185 x 65
weight kg - 1.5 kg

Galvanic Isolators / zinc savers Fail Safe New ABYC

Amps	Size mm	Weight kg	Part nos
30	175 x 185 x 65	1.5	ZSFS30
60	190 x 165 x 95	1.8	ZSFS60

Specifications:

shore cord inlet - Single 50 or dual
compatibility 15,16,20 or 30
ratings VAC/Max - 120/240 VAC/41A
AMPS/Hz 50 or 60 HZ
max unit temp - 50 deg C
size L x W x H mm - 190 x 165 x 95
weight kg - 1.8 kg

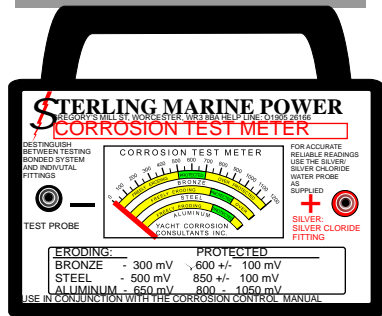
Yacht Corrosion Monitoring Equipment

This equipment highlights any electrical and electrolytic problems which will cause expensive corrosion on a boat

Yacht Corrosion Test Meter And Workbook

Corrosion Test Kit comprises of an easy to follow instruction manual, which includes survey report documents. The kit also includes the required test meter and silver/silver chloride test leads. The portable meter is the only way to test each individual item on the boat (overboard bronze skin fittings, bronze valves, rudders, prop shafts, etc). Having tested the individual fittings, the survey report will clearly show if your boat is completely bonded correctly or if there are problems with your bonding. **The unit also shows up if there are stray D/C or A/C currents on the boat which can cause horrendous damage very quickly.** The kit should be used every 6 months on a boat to ensure the anodes are still working and all the bonding cables are correct.

Where continuous onboard monitoring is required see Onboard Yacht Corrosion Monitor below.



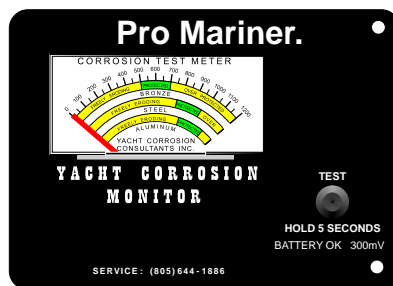
The Analog Corrosion Test Meter is supplied complete with:-
 20ft red lead with essential Silver/Silver chloride half cell
 10ft black lead test probe
 This easy to read meter finds all corrosion problems instantly.
 Scale needs no interpretation Green=Good Yellow=Bad.

Product	Code
Corrosion test metre and book	CTMB

Yacht Corrosion Meter

Yacht Corrosion Meter

This onboard, panel mounted meter monitors galvanic voltage and is suitable for boats up to 65ft. It instantly confirms adequate protection or identifies damaging corrosion voltages. Simple yellow and green scale monitors the voltage. Supplied with Silver/Silver Chloride half-cell sensor. Gives clear indication if anodes need to be replaced and instantly picks up any problems with shore power, earth leaks etc. The unit permanently monitors your bonding cable, using a Silver / Silver chloride through hull reference point. This product should be used after the survey system (above) confirms that your bonding system is correctly connected to all your fittings



Silver silver anode though hull fitting



Product	Code
Yacht Corrosion Monitor	CYM

UNITED KINGDOM:

Marathon Leisure
 Teal Building
 Northney Marina
 Hayling Island
 Hampshire
 PO11 0NH
 Tel +44 2392 637711

Midland Chandelers
 Parkgate Lock
 Teddesley Road
 Penkridge
 Staffordshire
 ST19 5RH
 Tel +44 1785 712437

Battery Megastore
 5 Kennet Close
 Tewkesbury Business Pk
 Tewkesbury
 G120 8TY
 Tel: +44 1684 298800

Down Marine Co Ltd
 163 Comber Road
 Dundonald
 Belfast
 Co Antrim
 Tel +44 2890 480247

RoadPro Ltd
 Stephenson Close
 Daventry
 Northants
 NN11 8RF
 Tel +44 1327 312233

Navimo UK Ltd
 Hamilton Business Pk
 Botley Road
 Hedge End
 SO302HE
 Tel 08707 514 666

ANTILLES:

Island Water World Off Shore
 1 Wellsburg Road
 Cole Bay
 St. Maarten
 Tel +39 06 39746889

AUSTRALIA:
RV Powerstream P/L
 Lot 25
 Macwood Road
 Smiths Lake
 NSW 2428
 Tel +61 265 544 444

AUSTRIA:
Mörth Marine
 Triesterstr. 150-152
 8073 Feldkirchen/Graz
 Tel +43 316 293 929

Werkhof Diskontmarin GmbH & Co.KG
 Jägerstr. 17
 1200 Wien
 +43 133 078 24

FRANCE:
Plastimo
 (branches around the world)
 15 Rue Ingenieur Verriere
 BP 435
 56325 Lorient Cedex
 Tel +33 297 873 648

Seatronic
 Le Cap, CS 18807
 54 Rue du Grand Jardin
 35418 Saint Malo Cedex
 Tel +33 299 19 69 64

GERMANY:

Ocean Marine HandelsGmbH
 Pinkertweg 10
 22113 Hamburg
 Tel +49 40 2191042

Herman Gotthardt GmbH
 Leunastr. 50
 22761 Hamburg
 Tel +49 4085 1505 0

Compass Yachtzubehoer
 Luedinghauser.34
 D-59307 Ascheberg
 Tel ++ 49 2593 915 340

GIBRALTAR
M. Sheppard's Chandlery
 Waterport
 Tel: +350 751 48

GREECE:
Nautilus Ltd.
 2 Metamorfoseos
 Alimos
 Athens 1745
 Tel +30 2109854238

Boatsman World
 The Boat House
 Kontokali
 Corfu 49100
 Tel +30 26610 80104

Contract Yacht Services
 Charlton Robyn& Sia E.E
 Petrou Filipa 3a
 Lefkas, 31100
 Tel +30 26450 24490

FINLAND
Navigreen Oy Ltd
 Pursilahdenranta 2D
 00980 Helsinki
 +358 400 697424

ICELAND
Aukaraf EHF
 Dalbrekku 16
 Kopavogur
 Is200
 Tel +354 585 0000

ISRAEL
Levinson Energy Solutions
 37a Shagar St.
 POB 10205
 Tel Aviv 61101
 Tel: +972 54 4408086

ITALY:
Kenix Marine S.A.S
 Circonvallazione Trionfale 25
 I-00195 Roma
 Tel +39 06 39746889

NETHERLANDS
A.S.A.Boot Electro
 De Dollard 1
 1454 Atwatergang
 Tel +31 204369100

NORWAY
Becker, Jörg
 Elveveien 150
 3271 Larvik
 Tel +47 33179554

Seatronic AS
 Sjalombakken 2
 1598 Moss
 Tel +47 69250960

PORTUGAL:
Nautel Portachel
 46 Rua Fernao Mendes
 1400-146 Lisboa
 Tel +35 121 300 70 30

RUSSIA
Fordevind
 Petrovskaya Kosa 7
 St. Petersburg 19711
 Tel +812 320 1853

SPAIN:
Garmin Iberia S.A.
 Cl Riera Montalegre
 N.50 P.I. Poma
 Polind.Pomar de dalt
 08916 Barcelona
 Tel +34 933572608

SWEEDEN:
Odelco AB
 Skogsövågen 22
 133 33 Saltsjobaden
 Sweden
 Tel +46 8 7180300

SWITZERLAND:
X-P Edition
 Meggenhus 458
 9402 Morschwil
 Tel +41 79457 44 84

TURKEY
Turimpeks Ltd.
 Depolar B7
 48700 Marmı
 Mugls
 +90 252 4133041

U.S.A. (partner company)
Sterling Power USA

2 YEAR GUARANTEE: RETURN TO FACTORY IF IN THE FIRST 2 YEARS YOU HAVE A FAULTY STERLING PRODUCT, THE PRODUCT SHOULD BE RETURNED DIRECT TO STERLING (TO SPEED UP THE HELP PROCESS) AND WE WILL ENDEAVOUR TO REPLACE THE PRODUCT OR REPAIR IT WITHIN 24 HRS AT THE FACTORY. STERLING CANNOT BE HELD RESPONSIBLE FOR THE RETURN CARRIAGE.

LIFE TIME REPAIR POLICY AFTER 2 YEARS IF IT IS UNECONOMIC TO REPAIR THE PRODUCT THEN A SPECIAL DISCOUNT WILL BE OFFERED ON A SIMILAR PRODUCT AT THE FACTORY'S DISCRETION. THIS ONLY APPLIES AT THE FACTORY.

This is not the full list by any means. there is simply no room for this, please e mail Sterling if you country/area is not on this list

www.sterling-power.com

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 Hampton Lovett Ind Est
 Droitwich
 WR9 0NX
 England
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 Fax(44) 0 1905779434
 email help@sterling-power.com

