NEW

Battery to Battery Chargers
Non Waterproof (Drip Proof IP21)

12V 24V 36V 48V
30-80A Input Models

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

Read about regenerative braking and the test that Sterling did. **Page 17.**

Regenerative Braking Friendly R.B.F

3 activation modes:

1) Automatic - Default, operates on input voltage (13.3V / 26.6V on) and complements regenerative braking with low voltage timer. No ignition feed required.

2) Ignition feed with timer. As above, however, requires a live ignition feed to operate. Input voltage figures and timings, as above.

3) Ignition feed without timer. As above, however, the timer does not kick in, so it can potentially stay on indefinitely provided input voltage stays above a certain low threshold.

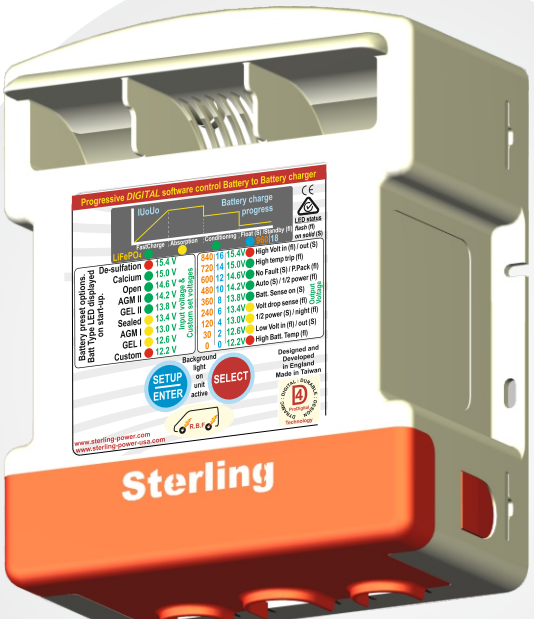
E 24

E marked. Suitable for OEM fitting.

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

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

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



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

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

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

Current is NOT taken from the input battery and given to the output battery except during the low voltage timer for regenerative braking mode. This time frame can be increased in length or brought down to 0 seconds.

B2B turns on at 13.3V and turns off at 13.0V (x2 for 24V). Thus, does not drain input battery. **Regenerative braking mode shall allow the input voltage to drop to 12.2V (x2 for 24V).**

Safety features:
- 100% fire proof plastic box
- no screws to corrode
- thermal power reduction
- multi stage fan cooling

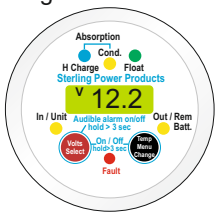
Boost / Reduce Charging. The B2Bs ensure batteries get the correct charging profile irrespective of high or low input voltages.

1 x temperature sensor included for battery

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

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

Night time setting allows the unit to run at ½ power so the fan noise is kept down.



Battery to Battery charger built to IP21

DC V (in)	DC V (out)	Current (A)	Weight (Kg)	L x W x D mm	Code
12V	12V	30A input	1.2	190 x 160 x 50	BB1230
12V	12V	60A input	1.4	190 x 160 x 70	BB1260
12V	24V	80A input	1.4	190 x 160 x 70	BB122480
12V	36V	80A input	1.4	190 x 160 x 70	BB123680
12V	48V	80A input	1.4	190 x 160 x 70	BB12480
24V	24V	35A input	1.4	190 x 160 x 70	BB242435
24V	12V	35A input	1.4	190 x 160 x 70	BB241235
12V	12V	120A input			(Check internet)
12V	12V	240A input			(Check internet)
Remote w/ 10m cable					BBCRC
German, French, Spanish main label overlay sticker					

Remote Control (Optional)
Displays: Voltage / Warnings / Temperatures.
Can be used as an independent voltmeter measuring input battery voltage and output battery voltage.
Can remotely modify the Batt. the Batt. Charger:
- Force the unit to float
- Force the unit to 1/2 current limit
- Force the unit to standby
- Force the unit off
- Force the unit to Night Mode
- Reset both Remote and Charger

54mm diameter

BLUE EFFICIENCY ® Trademark of *Mercedes Benz*

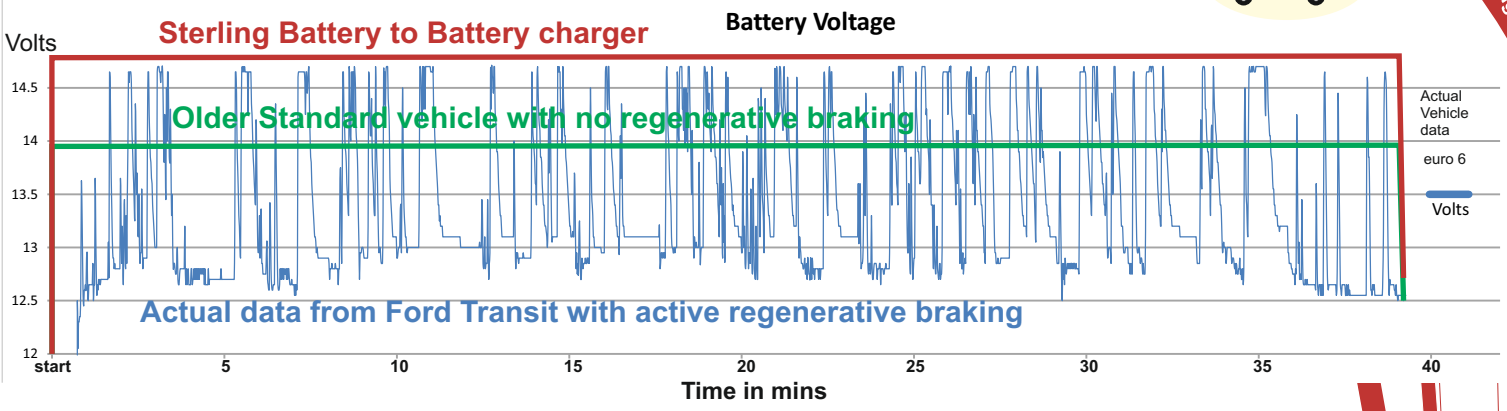
BLUEMOTION ® Trademark of *Volkswagen*

ecoFLEX ® Trademark of *Vauxhall / Opel*

econetic TECHNOLOGY ® Trademark of *Ford*

Regenerative Braking - Introduction to the problem and the solution.

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



What is Smart Alternator / Regenerative Braking?

The initiative behind the introduction of smart alternators / regenerative braking is to lower CO_2 emissions and to improve miles per gallon / KM per litre for EU regulations. These smart alternators are installed on modern European Vehicles (Euro 5, Euro 6 + and newer engine models).

The object of this new system is to utilise a vehicles wasted kinetic energy during braking / deceleration cycles experienced in every day motoring and rapidly convert as much of that energy (which is usually wasted as braking heat) into useful electricity and store this energy in the starter battery. Then, during acceleration and cruising release this energy back into the vehicles running system as "free electrical energy" thus reducing the time where a alternator loads the main engine. This increases MPG/KPL and lowers CO_2 emissions.

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

Problems with Smart Alternator / Regenerative Braking

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

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

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

Problem with using voltage sensitive/controlled relays?

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

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

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

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

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

The Test

Vehicle used in test (use graph for illustration)

Vehicle tested was a new (2013) Ford Transit van. Most, if not all vans and cars are now operating on this principle (no inditement to the Transit).

Route chosen:

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

Graph / Voltage measured.

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

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

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

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

The Vehicle's Route