

ENERGY BULL

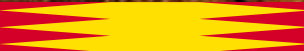
**ON BOARD POWER FOR
HOBBIES AND LEISURE**



ENERGY BULL_LIMITLESS POWER

Banner

A POWER-PACKED,
TOUGH COMPANION





THE SECURITY OF A MAJOR BRAND

Banner is at home in the global market. For customers, this means the security of a major brand. Banner is characterised by uncompromising, customer awareness, the greatest professionalism and outstanding innovative strength. With the new Energy Bull, Banner once again provides clear evidence of these qualities.

FULL POWER FOR LEISURE

The Banner Energy Bull is THE special battery for hobbies and leisure, an area in which the demands on modern, long-time discharge batteries are constantly increasing. The new Energy Bull is Banner's response. Excellent cyclical resistance and easy charging form the basis. Moreover, comfort maintenance, leak protection and operational reliability are more important than ever and have therefore been greatly improved.

With the new edition of the Energy Bull, Banner reaffirms its position as a full-line supplier with a modern product programme that extends to special applications.



Banner

THE NEW ENERGY BULL – BETTER, SAFER, MORE DURABLE

The Banner Energy Bull is the perfect battery for hobbies and leisure, and is ready and waiting to be used. In order to provide maximum performance in this area of application, a battery requires very special characteristics. The Energy Bull meets these demands with supreme ease and offers even more features, such as a long service life, high cost-efficiency, great operational safety and simple handling. All of which combine in an ideal manner with maximum battery performance.





CONVINCING CHARACTERISTICS

- **EXTREMELY CYCLE RESISTANT AND DURABLE.** Thanks to the use of robust grid structures, special mass compositions and pocket separators with glass web cover, the Energy Bull offers up to three times the cycle resistance of standard starter batteries.
- **MAINTENANCE-FRIENDLY.** MIN/MAX markings on the transparent battery casing provide information concerning the ideal acid level. Thanks to the easy-to-open screws, the battery water can be topped up at any time.
- **OPERATIONAL SAFETY.** The labyrinth structure in the 4-chamber cover and the use of special screws with O-rings improves the uncontrolled escape of battery acid due to powerful vibrations.
- **BACKFIRE PROTECTION.** Integrated backfire protection is provided in the battery cover and by surge protectors.
- **REDUCED WATER CONSUMPTION AND SELF-DISCHARGE.** This derives from the use of low-antimony grid alloys and a V-add-on in the separator.
- **EASY CHARGING.** Standard chargers can be used and the employment of an IU characteristic is recommended.
- **VIBRATION-RESISTANCE.** This is furnished by bottom bonding, a robust grid structure and pocket separators with glass web layer.
- **BATTERY CAPACITY.** The battery has been optimised to deal with cyclical loads.
- **ENVIRONMENT AND USER-FRIENDLY.** All Energy Bull types can be supplied in a filled and charged condition and are fitted with practical handles.

ENERGY BULL *THE FIRST CHOICE*

Banner

GOODBYE TO THE DAILY
GRIND, HELLO FREEDOM.





Banner tip!

A starter battery is the best solution for motorboat ignition (in- or outboard engine).

WHERE THE ENERGY BULL IS AT HOME

The Banner Energy Bull is an absolute specialist in the battery world. And like any other specialist does its job perfectly. It is uncompromising in its quality and ideally suited to a diversity of applications, which include utilisation as a portable source for yachts and motorboats, campers/caravans and camping.

In addition, the Energy Bull is used in signal systems, solar panels and electric wheelchairs. Should more detailed information be required, your Banner expert will be pleased to oblige.



ENERGY BULL_DURABILITY

Banner



... TO THE ENDS
OF THE EARTH...



LONG, LONGER, ENERGY BULL – THE BATTERY THAT NEVER GIVES OUT!

With up to three times the cyclical life, the Energy Bull simply leaves standard starter batteries standing.*

DURABILITY CHARACTERISTICS

A top quality, long-time discharge battery is characterised by virtually boundless energy. It should offer uncompromising power over a prolonged period and stand out due to its cyclical resistance. Small wonder therefore, that Energy Bull is the first choice whenever such features are required! The adjacent table shows the characteristics that differentiate a long-time discharge battery from a normal starter battery. This allows the correct choice of battery in line with the desired application.

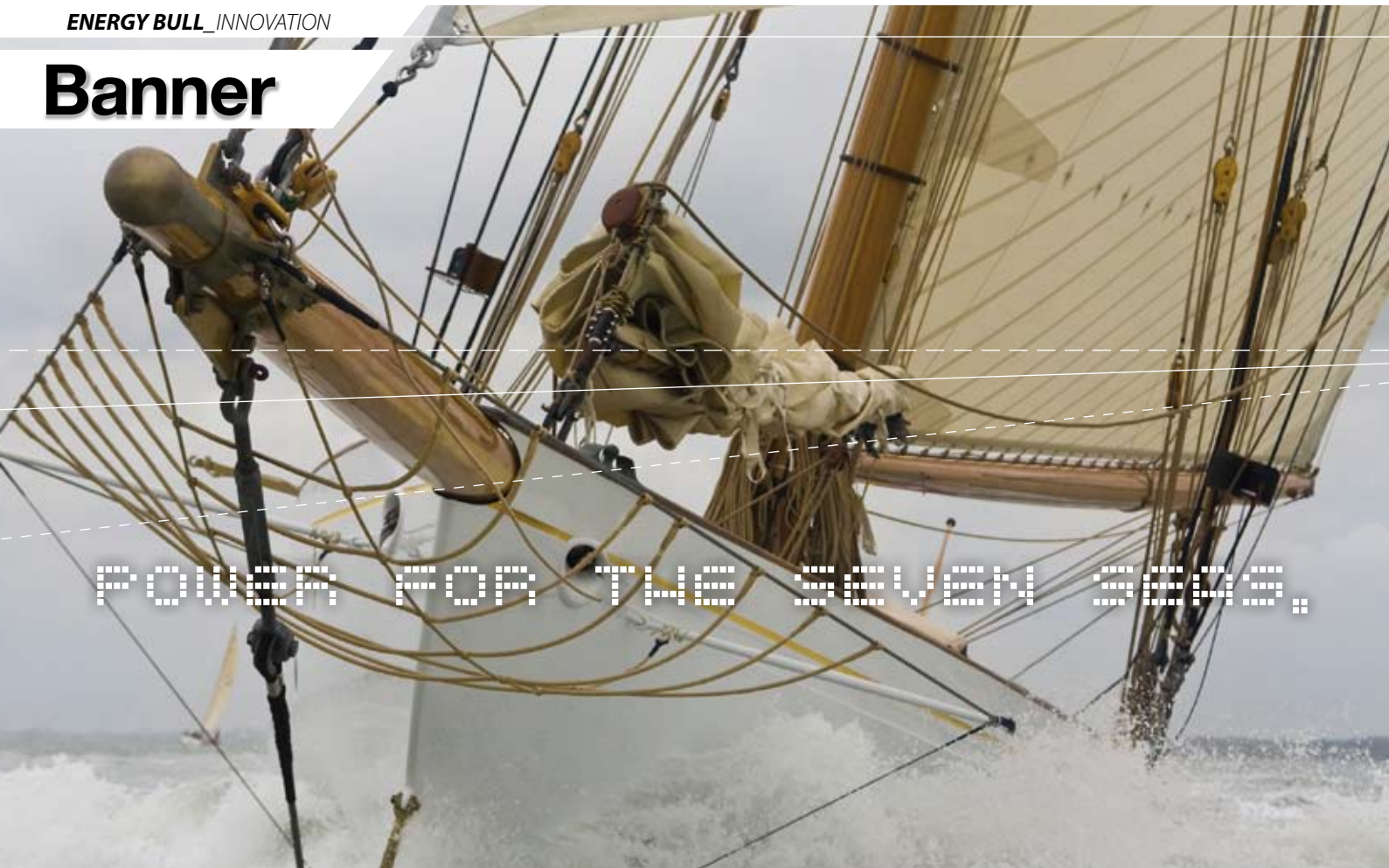
Characteristic	Starter battery	Long-time discharge battery
Grid alloy	Part or full calcium	Low antimony
Grid design	Fine structure	Coarse structure
Plate design	Thin plates	Thick plates
Mass type	Cold start optimised	Special cycle mass
Battery design	Large plate surface	Large plate volume
Separator type	PE separator with glass mat	PE separator glass mat

* Test result: BCI cycle test at 50% discharge

ENERGY BULL_INNOVATION

Banner

POWER FOR THE SEVEN SEAS.

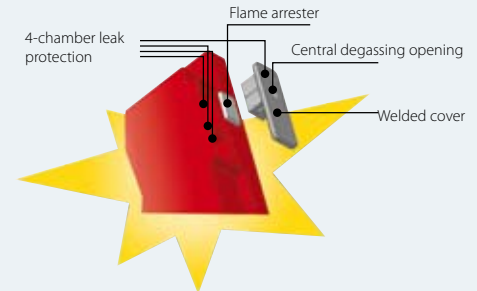




ENERGY BULL – INNOVATION THAT SPELLS SAFETY

4C LEAK PROTECTION

Banner now uses the proven 4-chamber system in virtually all types. The four chambers provide a safeguard against battery acid leaks even in the case of extreme vibrations. Moreover, welded backfire frits and central degassing guarantee security of operation. The cell screws are fitted with moulded on O-rings, which makes the use and handling of the Energy Bull even safer!



SURGE SAFEGUARDS

The Energy Bull is also crowned by a further innovation, as in the types with a flat cover, special safety screws protect against escapes of battery acid during extreme vibration. Moreover, reliable backfire protection and a sealing with O-ring are also integrated. These screws can be opened for battery testing or topping up the acid without any special tools.



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THE ENERGY BULL CAPACITY CALCULATOR

Which is the most suitable battery? This question is often asked when an optimum power supply is being sought for a certain piece of equipment. In such situations, the Banner Capacity Calculator is just what's needed, as in only three steps one can quickly and easily determine the power needed for a particular application and hence the suitable battery type.

STEP 1

Establish the power need for the desired application, or device, etc. in watts (from various technical descriptions, instructions, ...).

STEP 2

Consider and define the period of time that use of the device/application will involve before possible recharging.

STEP 3

Once this information has been gathered, use the Banner Capacity Calculator on www.bannerbatteries.com, by entering the values directly online. The energy requirement and the ideal type of Banner Energy Bull will then be determined automatically.

THE ENERGY BULL PROGRAMME FOR EVERY APPLICATION

Banner bietet seinen Kunden die Energy Bull in verschiedenen Varianten – so können Sie sicher sein, dass Sie in allen Bereichen von Hobby und Freizeit perfekt versorgt sind.

Battery Type	Order number	Set/Box	Rated capacity (V)	Capacity K 20 (Ah)	Capacity K 5 (Ah)	Capacity K 100 (Ah)	Switching
955 01	010 955 01 0101	H5	12	60	50	70	0
955 51	010 955 51 0100/0101	D26	12	72	55	85	1
956 01	010 956 01 0101	H6	12	80	60	90	0
957 51	010 957 51 0100/0101	H8	12	100	75	110	0
959 01	010 959 01 0101	95Ah	12	115	90	135	0
960 51	010 960 51 0101	A	12	130	105	140	3
963 51	010 963 51 0100/0101	B	12	180	135	195	3
968 01	010 968 01 0100/0101	C	12	230	180	250	3

WH = with handles GA = central degassing with backfire protection BP = with backfire protection

Banner tip!

Take care with regard to battery switching! In the case of parallel switching, the current required by the consumers adds up although the voltage remains unchanged. In the case of serial switching, the voltage adds up but the current remains unaltered!



Terminal	Max. length (mm)	Max. width (mm)	Max. box height (mm)	Max. Gesamthöhe (mm)	Remarks	Bottom strip	Dry	Wet
1	241	175	190	190	mGGA	B13		x
1	256	174	205	225	mGGA	B00	x	x
1	278	175	190	190	mGGA	B13		x
1	354	175	190	190	mGGA	B13	x	x
1	350	175	230	230	mGGA	B00		x
1	514	189	195	220	mGRZS	B00		x
1	514	223	195	220	mGRZS	B00	x	x
1	517	273	212	240	mGRZS	B00	x	x

POWER TIPS FOR CORRECT HANDLING AND MAINTENANCE

A Banner battery is a power pack brimming with the latest technology and top innovations. In order to conserve this quality and use service life and performance to the full, the battery must be handled correctly. Banner's power tips ensure that the Energy Bull provides optimum performance over a long period.

Banner tip!

Lead-acid batteries contain diluted sulphuric acid, which can cause burns. Always wear protective clothing and eye protection when handling the battery.

INSTALLATION

- In 24V systems always install two batteries simultaneous and never exchange only one!
- Min.12.50V open circuit voltage during installation.
- Should batteries be discharged to below 12.50V, they must be recharged immediately.
- Measure the open circuit voltage as a control of the charging level (minimum five hours unenergised).
- The charging level can also be ascertained by measuring the acid density (not below 1.23-1.25 at approx. 25°C).
- Use deep discharging protection wherever possible.



MAINTENANCE

- Check the acid level at regular intervals using the MIN/MAX marking on the battery casing!
- Top up with distilled or demineralised water should the acid level fall below the MIN marking (fill to the MAX marking).
- Ensure that the acid level in all six cells is as uniform as possible.
- Open the screws when refilling with distilled water. All six cells can be individually filled in this manner.
- First recharge the battery when the water levels have been replenished.

STORAGE

- Filled batteries that are ready for use must always be kept in a clean, dry and cool place (cellar temperature) as this reduces self-discharge.

Banner tip!

Lead-acid batteries contain diluted sulphuric acid, which can cause burns. Always wear protective clothing and eye protection when handling the battery.

POWER TIPS FOR CORRECT CHARGING AND CHARGE RETENTION

CHARGING

- Check the level of charging of the battery with a voltmeter or acid level ... Use a charger with a max. charging voltage of 14.4V (recommendation).
- The battery should be removed for recharging in order to prevent possible damage to the object. **Warning! Follow the instructions of the charger manufacturer when disconnecting!**
- Batteries may only be charged with DC. Connect the positive pole (+) on the battery with that on the charger (+) and the negative pole (-) on the battery with that on the charger (-). Only switch on the charger following connection with the battery. The charger should first be switched off following the end of charging.
- A tenth of capacity is recommended as charging current (e.g. 180Ah ÷ 10 = 18A charging current).
- The acid temperature may not exceed 55°C during charges. Should this temperature be surpassed, charging is to be interrupted.
- Charging is complete when the charging current approaches 0, or the automatic charger switches itself off.
- Ensure good ventilation when charging. **Warning! Highly explosive oxy-hydrogen gas forms during charging!** Open flames, sparks, open lights and smoking are forbidden!



CHARGE RETENTION

- Should the battery not be in regular use, deep charging may occur. This creates lasting battery damage.
- Discharged batteries should therefore be immediately recharged, otherwise capacity loss will result.
- A charger with charge retention function should be employed. Full charging is achieved through measured current feeding.

As part of its range, Banner offers test and charging devices from respected producers, which are specially suited for employment with long-time discharge batteries. A current overview is available on the company website

www.bannerbatteries.com



Banner

PATENTE

AccuSafe joint patent with Gore – usufruct rights allocated to Gore DE 197 03 444

AccuSafe newly registered by Banner A – 943/2001

Double cover joint patent with Moll U – 02027 9204 (process proceeding, also registered in USA)

Screws and Magic Eye double cover utility model with Moll 202 18730.6

Valve stoppers AGM joint registered design protection with Accumalux

Banner Batteries (GB) Ltd., Units 5-8 Canal View Business Park, Wheelhouse Road, Rugeley, WS15 1UY Staffordshire,
Tel. +44/ (0)1889/ 57 11 00, Telefax +44/ (0)1889/ 57 73 42,
e-mail: office.bgb@bannerbatteries.com



THE POWER COMPANY