



Banner

ENERGY BULL

ON-BOARD POWER FOR
HOBBIES AND LEISURE



Banner

ENERGY BULL. PORTABLE POWER.

The Banner Energy Bull is an absolute specialist among batteries and like any specialist is fully focused on its tasks. It is perfect for your area of application and uncompromising in its quality. Among other uses, the battery supplies portable power for yachts and e-boats, motorhomes, camping/caravanning and solar energy units.



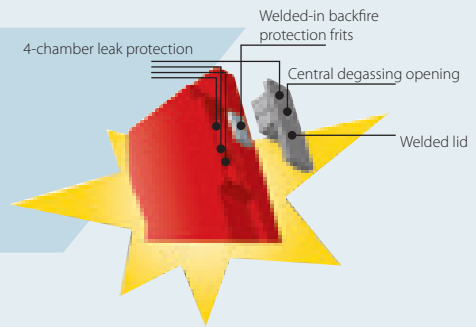
Banner Tip!

Use a starter battery to start your engine. With the Running Bull AGM and the Power Bull PROfessional Banner offers original, first fitting batteries.

TECHNICAL INFORMATION

4C LEAK PROTECTION

Proven 4-chamber leak protection is employed in virtually all types of Energy Bull battery. In this system, four chambers counteract escapes of battery acid even in the case of extreme vibrations. Furthermore, central degassing and welded-in, backfire protection frits ensure optimum operational safety. The result is a significant increase in safety levels during deployment and handling.



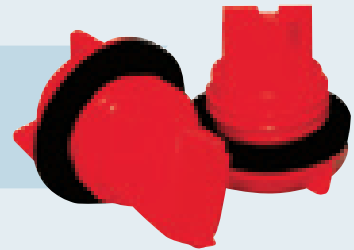
100% LEAK PROTECTION

Through AGM and GEL technology.



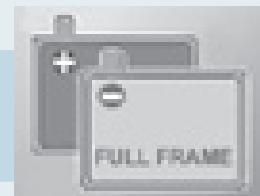
SURGE PROTECTORS

In the conventional battery types with a flat lid, special safety screws prevent the escape of battery acid due to extreme levels of vibration. In addition, reliable backfire protection and integrated sealing and O-rings have been included.



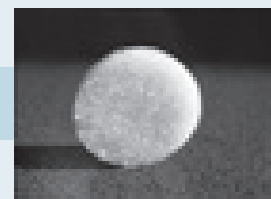
EXTREMELY CYCLE-RESISTANT AND DURABLE

Owing to the use of thick and tough grid structures with a closed frame, special mass combinations and bag separators covered with a non-woven, the Energy Bull offers four times the cyclical resistance of a standard starter battery.



NO DANGER OF BACKFIRING

Owing to integrated backfire protection.



VIBRATION RESISTANT

Thanks to floor bonding, robust grid structures and bag separators with a glass nonwoven covering or web separators.



MINIMAL WATER CONSUMPTION AND SIMPLE CHARGING

Owing to MIN/MAX markings, the maintenance-friendly Energy Bull requires little servicing. Moreover, in the case of AGM and GEL technology it offers zero water consumption and can be charged using standard chargers, even after deep discharge.



ENERGY BULL

**THE SPECIAL, CYCLE-RESISTANT BATTERY
FOR HOBBIES AND LEISURE. POWER TO TAKE WITH YOU.**

With the Energy Bull, Banner offers a special battery for hobby and leisure purposes. The Energy Bull's features mean that it is robust and an ideal energy source for camping/caravanning, on boats and a wealth of other applications that extend to signalling systems and the powering of e-motors.

In conjunction with bag separators and a special mass composition, the battery's robust grid structure ensures extreme cycle-resistance. The advantages at a glance:

TECHNICAL DATA AND INFORMATION

- ▶ Extremely cycle-resistant and durable – four times the cyclical resistance of a starter battery
- ▶ Maintenance-friendly – easy to open and MIN/MAX marking on the transparent housing
- ▶ Backfire safety – safeguards are integrated into the surge protectors in the battery lid
- ▶ Low-maintenance – reduced water consumption and self-discharge
- ▶ Simple charging – charging with conventional chargers
- ▶ Vibration-resistant – floor bonded plate sets and bag separators covered with a glass mat; V3 classification pursuant to EN 50342-1
- ▶ Optimised capacity – ideal for cyclical loads
- ▶ Environment- and user-friendly – delivered filled and charged
- ▶ Practical handles



Yachts



Motorhomes



Caravans



Camping



Solar power



Typ	Info	Box	Ah 5 h	Ah 20 h	Ah 100 h						Classification			
955 01		H5 / L2	50	60	70	0	1	241	175	190	190	mGGA	B13	Wheelchairs
955 51		D26 / MO60	55	72	85	1	1	256	174	205	225	mGGA	B00	Boats, wheelchairs
955 81		BCI 24	58	75	85	1		273	171	208	238	mGGARZS	B00	Boats/marine, camping/caravan, wheelchairs
956 01		H6 / L3	60	80	90	0	1	278	175	190	190	mGGA	B13	Wheelchairs
957 01		BCI 27	70	90	100	1		318	171	208	238	mGGARZS	B00	Boats/marine, camping/caravan, wheelchairs
957 51		H8 / L5	75	100	110	0	1	354	175	190	190	mGGA	B13	Boats
958 01		BCI 31	80	105	115	1		330	171	222	241	mGGARZS	B00	Boats/marine, camping/caravan, wheelchairs
959 01		LOT7	90	115	135	0	1	350	175	230	230	mGGA	B00	Boats
960 51		A	105	130	140	3	1	514	189	195	220	mGRZS	B00	Boats, signal systems
963 51		B	135	180	195	3	1	514	223	195	220	mGRZS	B00	Boats
968 01		C	180	230	250	3	1	517	273	212	240	mGRZS	B00	Boats

= Dual terminal, = 4-chamber leak protection, mG = with handle, GA = battery with central degassing, RZS = backfire protection



Yachts



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Camping



Solar power

Banner

ENERGY BULL DEEP CYCLE AGM

**THE SPECIAL BATTERY WITH DOUBLE CYCLE-RESISTANCE
FOR HOBBIES AND LEISURE. POWER TO TAKE WITH YOU.**

With the Energy Bull Deep Cycle AGM, Banner offers a special battery for hobby and leisure purposes. The Energy Bull's features mean that it is robust and an ideal energy source for camping/caravanning, on boats and a wealth of other applications that extend to signalling systems and the powering of e-motors.

The battery's AGM technology (nonwoven web) ensures 100% leak protection, zero water consumption and twice the cyclical resistance of the Energy Bull.

TECHNICAL DATA AND INFORMATION

- ▶ ZERO water consumption
- ▶ AGM technology
- ▶ 100% leak-proof
- ▶ Highest V3 vibration resistance pursuant to EN 50342-1
- ▶ Extra deep discharge protection
- ▶ Simple charging with standard chargers
- ▶ Twice the cycle resistance of the Energy Bull
- ▶ Installation in a lateral position possible



Typ	Info	Box	Ah 5 h	Ah 20 h	Ah 100 h						Classification			
								Length (mm)	Width	Height	Total			
956 02 AGM		BCI 24	60	79	90	1		276	171	221	251	mGGARZS	B00	Boats/marine, camping/caravan, wheelchairs
957 02 AGM		BCI 27	70	92	100	1		324	171	221	251	mGGARZS	B00	Boats/marine, camping/caravan, wheelchairs
958 02 AGM		BCI 31	80	105	115	1		329	171	219	238	mGGARZS	B00	Boats/marine, camping/caravan, wheelchairs

= Dual terminal, = 4-chamber leak protection, mG = with handle, GA = battery with central degassing, RZS = backfire protection



Yachts



Motorhomes



Caravans



Camping



Solar power

ENERGY BULL DEEP CYCLE GEL

**THE SPECIAL BATTERY WITH DOUBLE CYCLE-RESISTANCE
FOR HOBBIES AND LEISURE. POWER TO TAKE WITH YOU.**

With the Energy Bull Deep Cycle GEL, Banner offers a special battery for hobby and leisure purposes. The battery's features mean that it is even more robust and durable, and it is therefore an ideal energy source for camping/ caravanning, on boats and a wealth of other applications that extend to signalling systems and the powering of e-motors.

TECHNICAL DATA AND INFORMATION

- ▶ ZERO water consumption
- ▶ Installation in a lateral position possible
- ▶ GEL technology
- ▶ 100% leak-proof
- ▶ Highest V3 vibration resistance pursuant to EN 50342-1
- ▶ Extra deep discharge protection
- ▶ Simple charging with standard chargers
- ▶ Three times the cycle resistance of the Energy Bull
- ▶ Safe against backfires owing to integrated protection



Typ	Info	Box	Ah 5 h	Ah 20 h	Ah 100 h						Classification			
								Length	Width	Height	Total			
956 03 GEL		BCI 24	60	74	85	1		276	171	221	251	mGRZS	B00	Boats/marine, camping/caravan, wheelchairs
958 03 GEL		BCI 31	80	98	110	1		329	171	219	238	mGRZS	B00	Boats/marine, camping/caravan, wheelchairs

= Dual terminal, = 4-chamber leak protection, mG = with handle, GA = battery with central degassing, RZS = backfire protection



Yachts



Motorhomes



Caravans



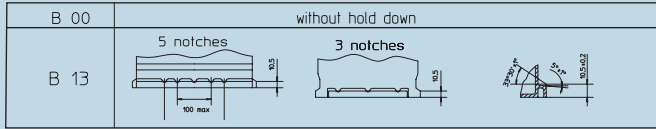
Camping



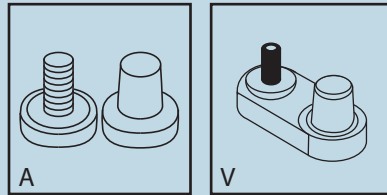
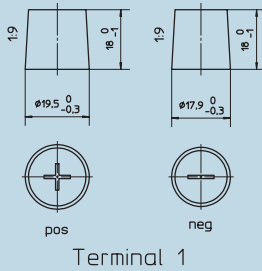
Solar power

TECHNICAL DETAILS

FLOOR STRIP

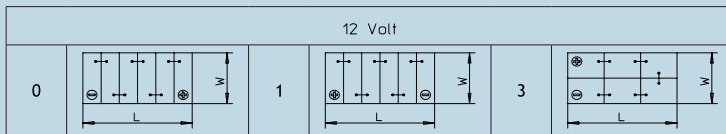


TERMINALS

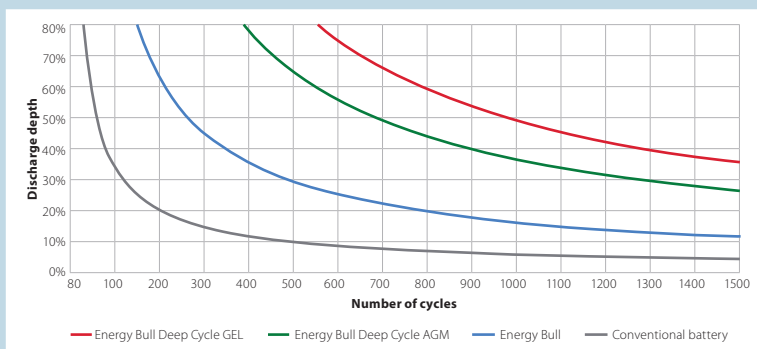


A: double terminal consisting of an SAE round and a 3/8 inch threaded pole
 V: double terminal consisting of an SAE round and a 5/16 inch threaded pole

CIRCUITS



CYCLE RESISTANCE



Banner Tip!

In spite of higher initial costs, it pays to purchase a battery with greater cyclical resistance throughout its service life. One also saves the costs involved in partly complex battery installation and removal, as well as a new purchase including transport.

COST INDICATOR PER CYCLE



Conventional battery



Energy Bull



Energy Bull Deep Cycle AGM

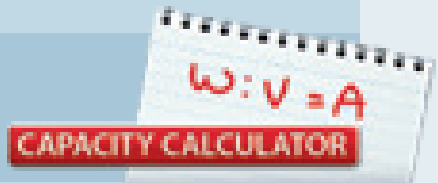


Energy Bull Deep Cycle GEL

CAPACITY CALCULATOR

WHICH BATTERY FITS?

THE ENERGY BULL CAPACITY CALCULATOR HAS THE ANSWER!



Which battery is the right choice? This is a question that is often asked when optimum supply is required for a certain device. In such situations, the Energy Bull Capacity Calculator on www.bannerbatteries.com comes to the rescue! In three steps it quickly and smoothly calculates the power requirement for your application and thus the ideal battery.

STEP 1

Establish the power requirement of the planned application, or device in watts (e.g. from the technical description, information stickers, or operating instructions).

STEP 2

Consider and define the amount of time that you will be using the device or application without being able to recharge the battery.

STEP 3

Once you have gathered this information, use the Banner Capacity Calculator at www.bannerbatteries.com, to directly enter your values online. The necessary power requirement and the optimum Energy Bull will be determined automatically.

STEP 4

You can calculate the correct capacity for your Energy Bull as follows, e.g. You are seeking a battery for your e-boat, which has a 24V electrical system and a 600W motor. In addition, a radio, various navigation lights and a sonar device must be supplied with power (50W combined). You also wish to have 5 hours of free sailing.

These values are now used in the formula:

Watt : Volt → Ampere x Hours x Safety factor = Battery capacity in Ah

or:

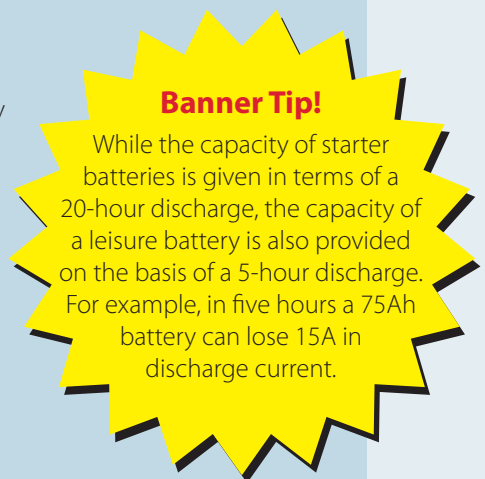
650 : 24 → 27 x 5 x 1,7 = 230Ah (K20)

As a rule, 70% should be taken as a safety factor. In the case above, we would recommend the use of two Energy Bull 968 01 batteries (each 230Ah), as they can be employed in series. Think about and establish the length of time that you be using the device or application without being able to recharge the battery.

Consumer	Watt	:	Volt	=	Ampere
Navigation light		:		=	
Sonar		:		=	
Radio		:		=	
		:		=	
		:		=	
		:		=	

Total x Hours X 1,7 = Ah
Total capacity

* Safety factor



Banner Tip!

While the capacity of starter batteries is given in terms of a 20-hour discharge, the capacity of a leisure battery is also provided on the basis of a 5-hour discharge. For example, in five hours a 75Ah battery can lose 15A in discharge current.

CORRECT! **POWER TIPS FOR PROPER HANDLING**

STORAGE/MOTHBALLING:

- ▶ Only store fully charged batteries with short circuit protection.
- ▶ Batteries are to be kept in a dry, light-protected and cool (frost-free) place.
- ▶ The open circuit voltage of the batteries is to be checked regularly and from 12.50V the batteries are to be recharged.

TRANSPORT:

- ▶ Filled batteries are to be transported and stored in an upright position; otherwise acid spillages can occur (except AGM and GEL).
- ▶ During transport batteries must be secured against tipping and slippage.
- ▶ Short circuit protection is essential.

BATTERY MAINTENANCE:

- ▶ Make sure that the battery cables are connected correctly. Loose battery cables result in increased transitory resistance, which leads to incomplete charging and reduced cold starting current.
- ▶ The battery may not be covered in dirt, as permanent creepage current will lead to higher self-discharge.
- ▶ Terminals must be kept clean and greased.
- ▶ Regular checks of the electrolyte level in Energy Bull batteries and if necessary, top up with demineralized or distilled water to the maximum acid mark, or 15mm above the upper plate edge. Never refill with acid. In the case of high water losses, a specialist should check the governor voltage.

INSTALLATION AND REMOVAL:

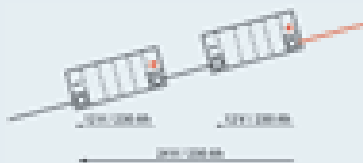
- ▶ Only install batteries with an open circuit voltage of >12.50V in a vehicle!
- ▶ Follow the vehicle instructions.
- ▶ Before fitting or removing the battery, switch off the engine and all power consumers.
- ▶ Avoid short circuits due to tools.
- ▶ When removing the battery, first disconnect the negative (-) terminal and then the positive (+) terminal.

INTERCONNECTIONS:

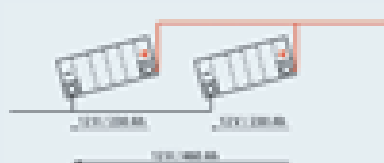
► **Please note:**

- Both batteries must have the same type designation.
- Both batteries must be of roughly the same age.
- Both batteries must have the same charge status.
- The connecting lines must have sufficient dimensions, be as short as possible and of the same length.
- No 12V voltage removal from individual batteries in a battery bank.

Serial interconnection



Parallel interconnection



CHARGING:

- It is recommended that the charging current be equal to at least one tenth of the capacity (e.g. 100 Ah: 10 = 10A charging current).
- Ensure that the charger is suitable for the technology used in the battery and has an appropriate characteristic.
- **Warning:** Highly explosive oxyhydrogen gas is formed during charging!
Fires, sparks, open flames and smoking are strictly prohibited!!

The Banner product range includes chargers and accessories from leading manufacturers that are especially suitable for use with batteries subject to lengthy discharge. The current overview can be found on the company homepage.

www.bannerbatteries.com



Banner Tip!

Please also follow the charging tips contained in the Technical Advice Manual

THE ADVENTURE STARTS TODAY

Banner



POWER NOW.

PATENTS

AccuSafe Joint patent with Gore – usufruct rights assigned to Gore DE 197 03 444

AccuSafe new applicant Banner A – 943/2001

Double Cover joint patent with Moll U – 02027 9204 (registration still in Progress, also registered in the USA)

AGM valve stopper Joint registered Design protection with Accumalux

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THE POWER COMPANY