



Banner

THE POWER COMPANY

THE BOOK OF POWER

POWER TO THE WORLD



Banner

THE POWER COMPANY



THINKING AHEAD SHAPING CHANGE.

Ever since its foundation in 1937, the family-owned Banner company has been characterised by ceaseless efforts aimed at the optimisation of its products and services. This is because Banner represents an enterprise that adapts to current, global developments and in addition wishes to play an active role in shaping change.

In this regard, digitalisation offers additional opportunities for the enhancement of our product range and processes and we intend to employ these to the benefit of both our customers and society. Foresight guides our actions and we constantly have our sights set firmly upon the future.

Trends such as global warming also affect the needs of our customers and if there were once seasonal peaks, today batteries are in demand throughout the year. We support our customers with rapid delivery times and appropriate stocking of both our central warehouse and 23 branches. Banner customers are thus in a position to take advantage of additional business at any time.

As Austria's only battery manufacturer, we have always been ready to assume responsibility and therefore for us sustainability is far more than just a buzzword. This is reflected by the fact that the further development of environment-friendly battery technologies is one of our primary objectives.

This approach and the positive relationship with our customers have made us one of the leading pan-European companies in the industry. These attributes are not only a source of pride, but also motivate us to continue to serve you with full buffalo power!

Banner – The Power Company.



Andreas Bawart
Commercial CEO



Mag. Thomas Bawart
Technical CEO

POWER TO THE WORLD.

Banner THE AUSTRIAN BRAND BATTERY. Banner is one of Europe's largest battery manufacturers and produces starter and on-board batteries, which reliably meet the highest technical requirements of modern vehicles. The company also markets traction, semi-traction, stand-by batteries and a range of customised accessories. Accordingly, in these pages you can discover why Banner, the Austrian quality battery, is always the first choice for you and your customers! We wish you good luck and great business!!

AN INDEPENDENT, PRIVATELY OWNED COMPANY. Banner is owned entirely by the Bawart family and is managed in the third generation by Andreas and Thomas Bawart.

EXPERIENCE DATING BACK TO 1937. More than 80 years of starter battery production expertise mean that Banner numbers among Europe's most experienced battery manufacturers.

MADE IN AUSTRIA. The Banner production plant in Linz-Leonding is one of the most modern and environment-friendliest battery plants in Europe. Since 2015, some €30 million have been invested in the updating and enlargement of the production facilities.



A EUROPEAN LEADER. With current sales of 4.1 million starter and on-board batteries and revenues of €270 million (FY 2020/2021), Banner is one of the largest suppliers in Europe. A modern product range consisting of six "Bull families" covers virtually every starter and electrical system battery application, from ATV quads to delivery trucks.

LEADING FIRST FITTERS AS CUSTOMERS. Some 30 per cent of Banner's starter battery production goes to the European plants of important automotive manufacturers such as VW, BMW, Porsche, Seat, Mitsubishi, Volvo, Mercedes Truck, Caterpillar, Kässbohrer, Liebherr, Jungheinrich and Knaus Tabbert, etc.

A CLAIM TO QUALITY. Banner batteries for the aftermarket are manufactured in OEM quality, i.e. on the same production lines by the same personnel using technologies and quality assurance systems identical to those employed for batteries for automotive manufacturers.

HIGHLY INNOVATIVE POWER. Among others, Audi, BMW, Mercedes, Porsche, Volvo and VW all employ both the AGM battery for micro-hybrid applications (start-stop, braking energy recuperation or maximum energy demand) and the EFB battery (start-stop without/with braking energy recuperation or high energy demand). Moreover, other patented developments ensure success.

TOP CUSTOMER SERVICE. Over 250 sales staff at 23 branches in fourteen European countries, guarantee first class consulting and comprehensive customer service.



ASTON MARTIN AUDI BMW BOMAG CATERPILLAR
KÄSSBOHRER KNAUS TABBERT KTM LIEBHERR
MITSUBISHI MERCEDES PORSCHE RAMMAX ROLLS-ROYCE
SEAT SUZUKI VW VOLVO ASTON MARTIN
AUDI BMW BOMAG CATERPILLAR KÄSSBOHRER
KNAUS TABBERT KTM LIEBHERR MITSUBISHI MERCEDES
PORSCHE RAMMAX ROLLS-ROYCE SEAT
SUZUKI VW VOLVO ASTON MARTIN AUDI BMW BOMAG
CATERPILLAR KÄSSBOHRER KNAUS TABBERT
KTM LIEBHERR MITSUBISHI MERCEDES PORSCHE
RAMMAX ROLLS-ROYCE SEAT SUZUKI VW VOLVO
ASTON MARTIN AUDI BMW BOMAG



LEADING BRANDS TRUST Banner QUALITY.

FIRST FITTING POWER FOR START/STOP VEHICLES. As a result of the very latest AGM and EFB technologies, Banner covers fully the high-potential start-stop or micro-hybrid vehicle segment. Makes such as Audi, BMW, Mercedes, VW, Volvo and Seat are already employing the power packs from Austria and they are not alone, as many producers of commercial vehicles and special machinery are also using Banner batteries for first fitting purposes.

ORIGINAL QUALITY FOR RETROFITTING. Banner manufactures batteries for the OE and the aftermarket in accordance with current standards and on the same production lines. As a result, identical quality assurance measures are employed for both types of manufacture. Banner implements technical developments in partnership with vehicle producers and these advances then appear almost simultaneously in the aftermarket.

SUCCESSFUL PARTNERSHIPS THROUGH QUALITY IN EVERY AREA. The Banner battery plant delivers roughly 30 per cent of its starter battery output for first fitting, while the remainder is sold to the aftermarket. The main factors in the company's successful partnerships with various automotive manufacturers are comprised by technical competence, a strong brand, top product quality, flexibility, punctuality of delivery and stable production. Banner's exemplary process and procedural quality is subject to ongoing monitoring according to IATF 16949/2016 and is implemented on a daily basis. An in-house quality management team supports the various company areas with their respective processes.

Banner CONVINCES. The leading European touring clubs, ADAC (D), ÖAMTC (A), TCS (CH), Stiftung Warentest Germany and Testfakta Sweden, are all convinced by first class quality from Banner.

For many years, the automobile clubs in Germany (AvD), Finland (Autoliitto), the Netherlands (ANWB) and France (ACTA) have all relied upon Banner's quality products and used them for their breakdown assistance services.



BMW AG first fitter
certificate



RECYCLING

Spent batteries are ideally suited to recycling and most new parts are manufactured from recycled materials. This keeps prices stable, conserves resources and protects the environment.



SPENT BATTERY COLLECTION

The return of spent batteries is stipulated by law. Banner collects spent batteries free of charge for regulated recycling at its plant.



CONSUMERS
drive with Bull power.



AVAILABILITY
14 national companies
with 23 sales branches.



TRANSPORT
We attach great value to quality, personal customer service and quick delivery, which are ensured by our tightly knit branch network.



PACKAGING
Our miniature power plants are labelled and packed in precise quantities in accordance with customer requirements and orders.



TESTING






100 % OK! Following production, every battery is subjected to thorough testing and no battery leaves the Banner plant without a functional check.



CHARGING

The power is now added to the Banner batteries. These are placed in cooling baths in order to prevent overheating and then fully charged with direct current (DC).



<p>PLASTIC Battery boxes and lids are produced using plastic granulate recycled from spent batteries.</p>  <p>Box and lid granulation</p>  <p>Plastic granulate New boxes and lids New battery boxes and lids are largely manufactured from recycled material.</p>  <p>New battery boxes and lids</p>	<p>LEAD Using a melt reduction process, materials containing lead are cast into bars, which are then used to produce new alloys for batteries.</p>  <p>Melt mesh & lead bars</p> <p>New mesh and lead oxide New battery mesh is produced using recycled lead. Recovered lead oxide is also employed in new battery production.</p>  <p>New mesh & lead oxide</p>
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New Banner batteries are recyclable and consist of reprocessed materials.



BATTERY RECYCLING FOR A CLEAN ENVIRONMENT.

LEAD

Pure lead is the basic raw material employed in Banner batteries. It is delivered in 45 kg bars with a recycled lead content of 90%.



LEAD POWDER

In our reactors, lead is combined with oxygen to form lead oxide and is then placed in interim storage in silos prior to further processing.



MESH PRODUCTION

Lead alloys are used for the production of positive and negative charged mesh, which transfers the electricity in the battery to the electrodes in optimum fashion.



PLATE PRODUCTION

Positive and negative plates are manufactured from lead powder and various additives, and then attached to the mesh.



MATURATION

In order that the finished battery can store power to an optimum degree, the electrodes must mature in an atmosphere with a defined temperature and humidity.



ASSEMBLY

The electrodes are "jacketed" to form sets and then welded into the battery box, which is subsequently sealed with a lid.



ACID FILLING

During this production phase, the battery is filled with a precisely measured amount of electrolyte, which in this case consists of diluted sulphuric acid.

ELECTROLYTE

The reprocessing of used electrolyte (diluted sulphuric acid) results in sodium sulphate, which is then employed as a solid in textile, glass, cleaning agent and fertiliser production.

Icons: Battery Council International



Neutralised electrolyte



Sodium sulphate

Textiles, glass, cleaning agents and fertilisers



FULL POWER FOR ENVIRONMENT- FRIENDLY MOBILITY.

Banner ASSUMES RESPONSIBILITY. Among Banner's key values are a great sense of ecological awareness and the fulfilment of our responsibilities to customers, employees, neighbours, consumers and the environment. For these reasons, the company builds on environmentally compatible production processes, the economical use of energy and raw materials, a closed product loop from production to recycling and constant improvements aimed at minimising or preventing environmental impact. The Banner plant possesses ISO 14001 certification.

Banner's RECYCLING LOOP MEANS REDUCED ENVIRONMENTAL IMPACT. Many of the components in top quality Banner batteries can be manufactured from recycled raw materials. At the important workshop/retail interface, new batteries are installed and spent ones collected in containers to await collection by Banner. The company's in-plant battery recycling system then prepares the raw materials received for production. This saves resources, keeps prices stable and protects the environment.





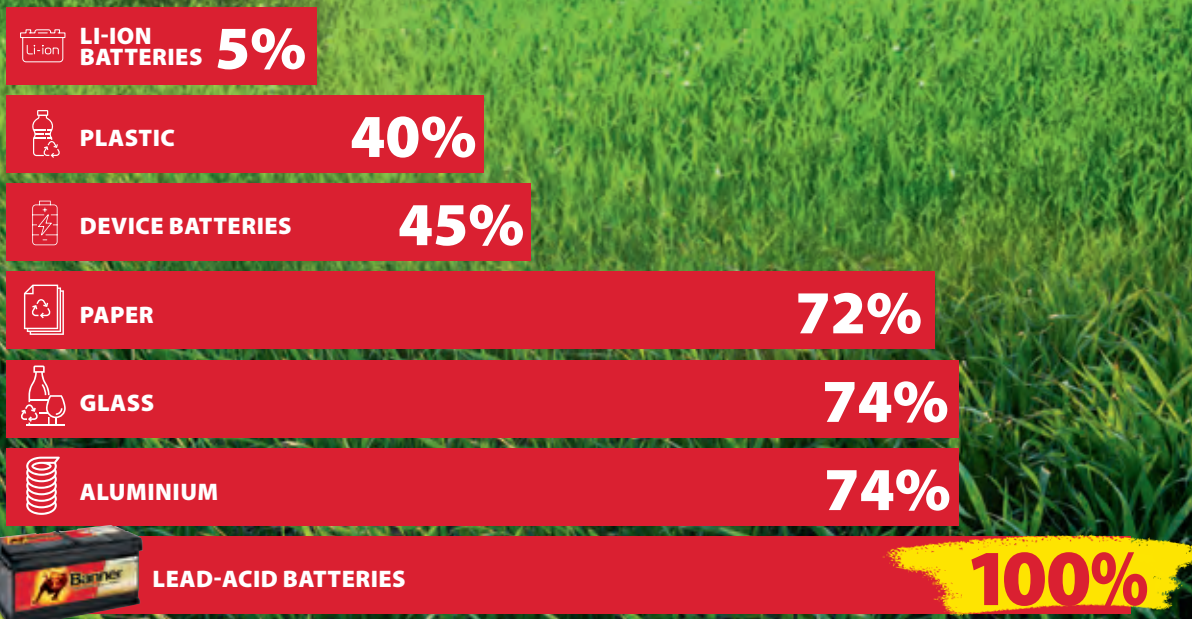
- Pioneering EFB and AGM technology for start-stop vehicles.
- Certification pursuant to ISO 9001:2015 and IATF 16949:2016.
- Certified sales according to ISO 14001:2015.
- 95-98 per cent recycled lead is used in the production process.
- Battery boxes are manufactured using 80 per cent recycled polypropylene.
- Since 2015, Banner has obtained its electricity from renewable sources.
- 60 per cent of the electricity used is employed for battery charging.





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Comparison of EU recycling quotas

SUSTAINABLE POWER - ASSUMED RESPONSIBILITY.

Banner has been committed to optimum safety, sustainability and health and environmental protection for many decades. Strict guidelines that are constantly adapted to new findings offer optimum protection for employees, neighbours, customers, consumers and the environment.

MODERN & ENVIRONMENT-FRIENDLY. Banner has one of the most modern and environment-friendly battery plants in Europe. Indeed, effective resource use and production that correspond with the latest quality standards, as well as sustainable management, have always been part of our business activities. Banner is also one of the founder members of the Environmental Forum for Starter Batteries (UFS).

SAFEGUARDING RESOURCES. Banner is able to autonomously supply its production plant in Linz-Leonding with water from its own wells. Furthermore, 100% of its electricity requirements are met from renewable energy sources. An established recycling system with the highest collection rate of all the recyclable goods on the market makes the lead-acid battery a resource-saving and sustainable, flagship product. Moreover, a large number of other measures are implemented and in the Sustainability Report, which is updated every two years, processes are documented and Banner's partners informed about innovative developments.



99% of the components in lead-acid batteries can be recycled, which is probably a record.

**100%
80%**

A Banner battery only employs recycled lead. Represents the share of recycled material in all the other components.



Lead can be recycled endlessly. Furthermore, lead-acid batteries stand out owing to the highest collection and return rates in the entire EU market.



FULL POWER FOR THE ENTIRE WORLD.

THE Banner BATTERY SALES OUTLETS. Always in your vicinity! Banner's success derives from its comprehensive range of top quality starter and supply batteries, unbeatable customer service and uncompromisingly rapid deliveries. Capabilities secured by our closely-knit network of branches in 14 countries and over 70 export markets:

Albania

Armenia

Australia

Austria

Belarus

Belgium

Bosnia Herzegovina

Bulgaria

Cameroon

China

Croatia

Cyprus

Czech Republic**Denmark**

Estonia

Finland

France

Dominican Republic

Gabon

Gambia

Germany

Ghana

Great Britain

Greece

Guadeloupe

Guinea-Bissau

Hong Kong

Hungary

Iceland

Iraq

Ireland

Israel

Italy

Ivory Coast

Japan

Jordan

Kosovo

Kuwait

Lebanon

Liberia

Lithuania

Luxembourg

Macedonia

Malaysia

Malta

Martinique

Moldavia

Montenegro

Morocco

Netherlands

Netherlands Antilles

Norway

Poland

Portugal

Republic of Korea

Romania**Russia**

Senegal

Serbia

Singapore

Slovakia

Slovenia

South Africa

Spain

Sweden

Switzerland

Taiwan

Thailand

Turkey

Ukraine

United Arab Emirates

THE Banner POWER PORTFOLIO.

Banner POWER – ALWAYS THERE WHEN YOU NEED IT. Whether for motor vehicle starter batteries, or on-board batteries in e-cars, leisure purposes, traction, semi-traction and stand-by use, Banner always has the ideal power package ready and waiting. In addition, a comprehensive range of accessories, chargers, start boosters, testing devices and services ensures perfect maintenance, long service life and a decisive safety plus for every application.

CARS / E-CARS STARTER AND ON-BOARD BATTERIES



STARTING BULL
For vehicles without a start-stop function.



POWER BULL / PRO
For modern vehicles without a start-stop function.



**RUNNING BULL AGM /
BACKUP / EFB / EFB PRO**
Full cover for the energy supply needs of vehicles in the start-stop segment and e-cars.

COMMERCIAL VEHICLE BATTERIES



BUFFALO BULL
Starter and on-board batteries for high vibration and cyclical resistance; including a high-current version.



**BUFFALO BULL SHD /
SHD PRO**
Starter and on-board batteries in OE quality for high vibration and cyclical resistance.



BUFFALO BULL EFB / AGM
Starter and on-board batteries using EFB and AGM technology (OE quality) for maximum energy needs.

LEISURE BATTERIES



BIKE BULL
Power for motorcycles, scooters, mopeds and rollers.
ENERGY BULL
for hobbies & leisure.



BIKE BULL AGM
The latest AGM-technology for universal bike use.



**BIKE BULL GEL /
BIKE BULL AGM PRO**
GEL power for off-road and touring riders. Professional AGM Power for the strictest demands in OE quality.



YOU CAN FIND DETAILED INFORMATION REGARDING OUR PRODUCTS UNDER bannerbatterien.com



Banner BATTERY ACCESSORIES

Everything that a professional needs. The technology for first class battery service.

**CHARGERS,
START BOOSTERS,
TESTING DEVICES
FOR STARTER
BATTERIES**

**TRACTION
BATTERIES**

**STAND-BY
BATTERIES**

**CHARGING
TECHNOLOGY,
ENERGY
SOLUTIONS**



CHARGERS

For constant full power.



**TRACTION BULL
BLOC PZF/GIS**



**STAND BY BULL
GIV, GIV-S, GIVC**



PULS 50 HZ



START BOOSTERS

Starting power for all.



**TRACTION BULL
AGM/GEL**



**STAND BY BULL
SBV, FAV,
SBG, SCV, SBX**



HF BASIC



TESTING DEVICES

Controls for longer service life.



TRACTION BULL



**STAND BY BULL
OGI, OPZS,
OPZV, FPL**



SELECT



RUNNING BULL – INNOVATIVE POWER FOR ENVIRONMENT-FRIENDLY MOBILITY.

OUR BEST BATTERIES FOR MODERN START-STOP VEHICLES AND E-CARS. The Running Bull AGM, Running Bull EFB / EFB PRO and Running Bull BackUp. With the highly specialised batteries of the Running Bull series, Banner covers the entire start-stop vehicle energy supply segment. The combination of top starting performance and high cyclical resistance makes the Running Bull series the ideal power pack for dealing securely with the extreme stresses caused by multiple starting processes and the constant charging and discharging in micro-hybrid vehicles. Running Bull batteries are also increasingly employed as on-board batteries in e-cars.

The Running Bull is used currently for first fitting by Porsche, BMW, Audi, Mercedes, VW, Volvo, Seat, Aston Martin, Rolls-Royce and Knaus Tabbert.

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Cars



Start-stop cars



Taxis



LCV



Off-road



Motorhomes



Motorboats



Construction machinery

CORRECT REGISTRATION OF START-STOP BATTERIES



FUNCTIONS...



WRONG BATTERY RESULTS



MORE INFO UNDER
bannerbatterien.com

AGM FOR START-STOP VEHICLES AND E-CARS WITH MAXIMUM ENERGY NEEDS.

Over 95 per cent of all new vehicles are currently equipped with an engine start-stop function, in order to achieve the CO₂ limitation targets set by the EU by means of sustained fuel consumption savings and emission reductions. In general, two differing starter battery types are used in these environment-friendly vehicles consisting of the absorbent glass mat (AGM) and the enhanced flooded battery (EFB) systems.

The use of the appropriate technology depends largely upon the fuel and CO₂ attained. AGM technology is employed for start-stop systems with maximum energy requirements and braking energy recuperation. Within this context, in particular the Running Bull AGM constitutes the optimum solution for mid-range to premium and luxury class vehicles.

TECHNICAL DATA AND INFORMATION

- Valve-regulated AGM battery (VRLA)
- Range of six types with capacities from 50-105Ah
- Three times greater cycle resistance than standard batteries: highest M3 classification pursuant to EN 50342-1:2016
- Leak-proof due to electrolyte bonding into an absorbent glass mat
- Zero maintenance owing to recombination technology
- High V3 vibration resistance pursuant to EN 50342-1:2016
- Maximum starting performance due to the very low internal resistance
- Installation in a lateral position possible (max. 90° angle)
- Flexible use as a starter and electrical system power supply battery
- Original equipment quality



BACK-UP FOR START-STOP VEHICLES AND E-CARS WITH EXTREMELY HIGH ENERGY NEEDS.

The use of the same trendsetting AGM technology as contained in the “big” Running Bull AGM makes the Running Bull BackUp the ideal support for the starter battery. This small power pack is utilised in vehicles fitted with start-stop systems and additional consumers with high energy requirements such as redundant safety and power steering. It is also being increasingly employed as a battery for the on-board systems in e-cars.

TECHNICAL DATA AND INFORMATION

- Valve-regulated AGM battery (VRLA)
- Range of three types with capacities from 9-20 Ah
- Used by Audi, BMW, Mercedes and Volvo for first fitting
- Three times greater cycle resistance than standard batteries: highest M3 classification pursuant to EN 50342-1:2016
- Zero maintenance owing to recombination technology
- Leak-proof due to electrolyte bonding into an absorbent glass mat
- Installation in a lateral position possible (max. 90° angle)

BACKUP



DIFFERENCE BETWEEN AGM AND EFB BATTERIES



START-STOP BATTERY TIP



E-MOBILITY



MORE INFO UNDER bannerbatterien.com

EFB / PRO FOR START-STOP VEHICLES AND E-CARS WITH HIGH ENERGY NEEDS.

The new, performance-enhanced top versions of the Running Bull EFB PROfessional are based on proven Running Bull EFB technology and meet, or even exceed, the specifications for start-stop car batteries of leading German car manufacturers such as BMW and VW. These power packs are designed for modern, start-stop cars with high energy requirements and are also increasingly used as on-board batteries in e-cars.

TECHNICAL DATA AND INFORMATION

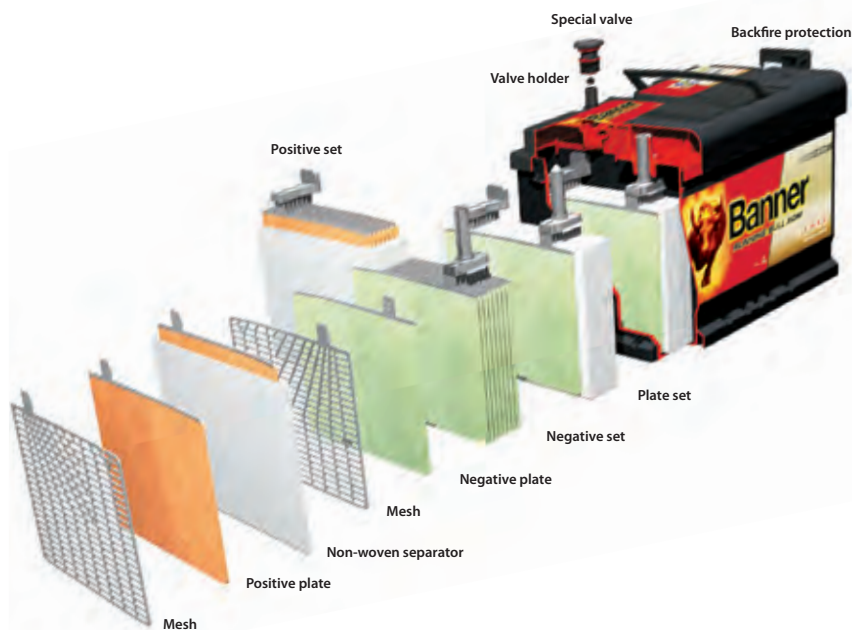
- Range of eleven types with capacities from 38-95Ah
- Glass fleece cover on the separator and special active mass composition
- Twice the cycle resistance of standard batteries: M2 classification pursuant to EN 50342-1:2016
- Top V3 vibration resistance rating pursuant to EN 50342-1:2016
- Measures to reduce acid stratification and improve charge absorption
- "Carbon loaded": The carbon additives lead to a marked reduction of the charging time!
- Double lid for maximum protection against leaks and operational safety
- Zero maintenance owing to modern calcium/calcium mesh technology
- Original equipment quality



+ **Banner tip.** What must be considered when upgrading the technology of start-stop batteries from EFB to AGM? The heat-resistant EFB battery with a fitted thermal protection cover is located directly next to the engine block (combustion engine) and is to be preferred if it has already been installed as the original battery ex-works.

+ **Banner note.** Slight deviations in capacity or cold starting have no effect upon safety or the optimum electrical system power supply!

SCHEMATIC DIAGRAM OF A RUNNING BULL WITH AGM TECHNOLOGY



DIFFERENCE BETWEEN AGM AND EFB BATTERIES



EFB AGM UPGRADING



MORE INFO UNDER
bannerbatterien.com

RUNNING BULL – TYPE LISTS

Type	Info	Box	Ah 20 h	A EN		
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RUNNING BULL

AGM BATTERY WITH A GLASS MAT FOR PREMIUM START-STOP APPLICATIONS

AGM 550 01 NEW		H4 / L1	50	540	0	1
AGM 560 01		H5 / L2	60	640	0	1
AGM 570 01		H6 / L3	70	720	0	1
AGM 580 01		H7 / L4	80	800	0	1
AGM 592 01		H8 / L5	92	850	0	1
AGM 605 01		H9 / L6	105	950	0	1

AGM BATTERY WITH A GLASS MAT AS AN ELECTRICAL SYSTEM BACK-UP BATTERY

509 00/AUX 09			9	120	1	10
514 00/AUX 14			12	200	1	10
518 01/AUX 18L			20	300	0	10

EFB PROFESSIONAL BATTERY WITH EXTRA POWER FOR START-STOP APPLICATIONS

EFB PRO 565 11 NEW	replaces EFB 560 11	H5 / L2	65	640	0	1
EFB PRO 575 11 NEW	replaces EFB 570 11	H6 / L3	75	700	0	1
EFB PRO 585 11 NEW	replaces EFB 580 11, Starting Bull 588 34	H7 / L4	85	780	0	1

EFB BATTERY FOR STANDARD START-STOP APPLICATIONS

EFB 538 15		35NS/B19	38	400	0	3
EFB 555 15		45NS/B24	55	460	0	1+3
EFB 560 11	= EFB PRO 565 11					
EFB 565 12		T6 / LB3	65	650	0	1
EFB 565 15	replaces EFB 565 00	D23	65	550	0	1
EFB 565 16	replaces EFB 565 01	D23	65	550	1	1
EFB 570 11	= EFB PRO 575 11					
EFB 570 15		D26 / MO60	70	680	0	1
EFB 575 12		T7 / LB4	75	730	0	1
EFB 580 11	= EFB PRO 585 11					
EFB 595 15	replaces EFB 595 00	D31 / 56AT	95	760	0	1

DT = Double Top | **4K** = 4-chamber leak protection

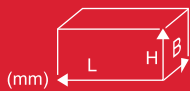
RF = vibration-resistant | GA = battery with central degassing | HGI = hard rubber set | mG = with handle | RZS = flame arrestor

* limited use | ** with base hold-down adapter

Ah
20 h Capacity Ah 20 h rate

A
EN Cold discharge test current in A





Application

Length	Width	Box height	Total height			
210	175	190	190		B13	BMW, Mini, VW, Audi, Opel, Hyundai, Kia, Suzuki
241	175	190	190	mG	B13	BMW, Mini, VW, Audi, Opel, Hyundai, Kia, Suzuki
278	175	190	190	mG	B13	BMW, VW, Audi, Mercedes, Porsche, Taxis
315	175	190	190	mG	B13	BMW, VW, Audi, Mercedes, Porsche, Taxis
354	175	190	190	mG	B13	BMW, VW, Audi, Mercedes, Porsche, Taxis
394	175	190	190	mG	B13	BMW, VW, Audi, Mercedes, Porsche, Taxis

Hint: replace AGM with AGM.

Length	Width	Box height	Total height			
150	88	106	106		B00	Volvo Start-Stop, DRiVe
150	88	145	145		B00	Audi, BMW 5/7 Start-Stop, Mercedes E/S-Class, Volvo Automatic, Start-Stop
206	91	163	163		B00	BMW i3

Hint: replace AGM with AGM.

Length	Width	Box height	Total height			
241	175	190	190	mGGA	B13	Alfa Romeo, Audi, BMW, Citroen, Fiat, Peugeot, Seat, Skoda, Toyota, VW
278	175	190	190	mGGA	B13	Alfa Romeo, Audi, BMW, Citroen, Fiat, Peugeot, Seat, Skoda, Toyota, VW
315	175	190	190	mGGA	B13	Alfa Romeo, Audi, BMW, Citroen, Fiat, Peugeot, Seat, Skoda, Toyota, VW

Hint: replace EFB with EFB/AGM.

Length	Width	Box height	Total height			
187	127	204	226	mGGA	B07	Mazda, Mitsubishi, Nissan, Subaru, Toyota
238	129	203	225	mGGA	B00	Mazda, Mitsubishi, Nissan, Subaru, Toyota
278	175	175	175	mGGA	B13	Ford, Opel
233	173	203	225	mGGA	B00	Mazda, Mitsubishi, Nissan, Subaru, Toyota
233	173	203	225	mGGA	B00	Mazda, Mitsubishi, Nissan, Subaru, Toyota
260	174	200	222	mGGA	B00	Mazda, Mitsubishi, Nissan, Subaru, Toyota
315	175	175	175	mGGA	B13	Ford, Opel
303	173	203	225	mGGA	B00	Mazda, Mitsubishi, Nissan, Subaru, Toyota - D, Fiat tractors

Hint: replace EFB with EFB/AGM.



Max. dimensions mm
Length x Width x
Box/total height



Base hold-down



Battery specifications



POWER BULL – INNOVATIVE POWER FOR ENVIRONMENTALLY COMPATIBLE MOBILITY.

SUCCESS THROUGH INNOVATION. The Power Bull is Banner's brand quality flagship and THE choice for modern cars without automatic start-stop. Top ratings in the independent battery tests of Europe's leading automobile clubs underline this high standard. The Banner Power Bull meets the constantly increasing requirements caused by the ever-growing demand for on-board power and quite simply represents original part quality for retrofitting! Thanks to calcium technology and the patented double top lid, Power Bull offers greater safety, an improved deep discharge capability and easier charging.

Banner

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Cars



Taxis



LCV



Motorboats

POWER BULL

BATTERY
TECHNOLOGIES



WRONG BATTERY
RESULTS



MORE INFO UNDER
bannerbatterien.com

POWER BULL / PRO – SUPERBLY POWERFUL AND SAFE! MODERN CALCIUM TECHNOLOGY FOR ALL CARS WITHOUT A START-STOP FUNCTION.

The Power BULL PRO constitutes the “PROlongation” of a success story and hence the continuation of the triumphal progress of Power Bull PRO starter batteries. This is because Banner’s “TOP-seller” offers proverbial, multiple award-winning product attributes and premium performance in a perfect symbiosis, which quite simply adds up to original part quality for retrofitting. The top, performance-enhanced Power Bull PROfessional versions are based on proven Power Bull technology and meet the car battery specifications of leading German car manufacturers such as BMW and VW. These power packs are designed for modern passenger cars with very high energy requirements, but without start-stop systems.

+ Banner tip. A Power Bull battery can be upgraded to an even more powerful Power Bull PRO battery in H5/L2 (62 Ah), H6/L3 (74 Ah) und H8/L5 (95 Ah) boxes. Please contact your Banner customer advisor.

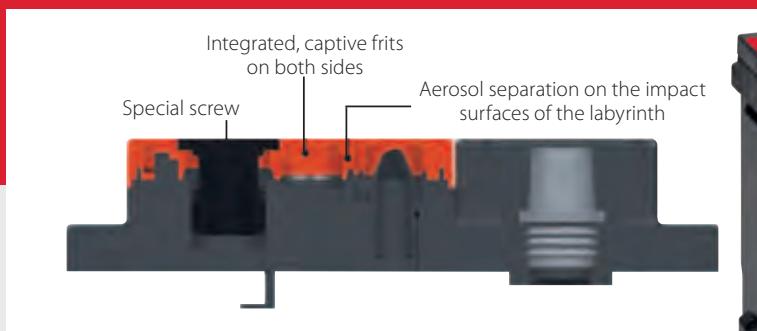
TECHNICAL DATA AND INFORMATION

- Robust cyclical behaviour with E2 classification pursuant to EN 50342-1:2016
- Double Top for twice the leak protection and 100 per cent leak protection up to an angle of 55°
- Absolutely maintenance-free due to modern calcium/calcium technology
- Optimised cold start values, highest starting power
- Extensive coverage of the European and Asian vehicle fleets owing to 26 battery types from 40-110 Ah
- V2 vibration resistance rating pursuant to EN 50342-1:2016 due to the bonding of the plates to the battery floor and robust cell connections
- Improved flame arrest and ESD safety levels (against electrostatic discharge)



DOUBLE TOP OFFERS COMPLETE LEAK PROTECTION UP TO A MAX. 55° ANGLE.

Safety in the fast lane. The Power Bull's patented Double Top leak protection ensures absolute safety at angles of up to 55° and even survived the tough roll-over test according to VW standards. Improved protection against backfiring and electrostatic discharge (ESD), as well as flexible gas vents, mounted on both sides, round off the Double Top safety package in style and help to also make the Power Bull, as well as ideal for SUVs.



POWER BULL STARTING ENERGY FOR ASIAN VEHICLES.

As a result of its enormous range of capacities and box sizes, the Power Bull can provide the energy supply for virtually all the types of vehicle manufactured in the Far East.

THE Banner POWER BULL IS ALSO AVAILABLE FOR:

- | | |
|--------------------|--------------|
| • Chevrolet-Daewoo | • Mitsubishi |
| • Daihatsu | • Nissan |
| • Honda | • Proton |
| • Hyundai | • SSangyong |
| • Isuzu | • Subaru |
| • Kia | • Suzuki |
| • Mazda | • Toyota |



Banner LEXICON: ESD














MORE INFO UNDER
bannerbatterien.com

Type	Info	Box	Ah 20 h	A EN		
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POWER BULL

PROFESSIONAL CALCIUM CAR BATTERY OF THE LATEST GENERATION

PRO P50 40 	= Power Bull P50 03					
PRO P50 42 	= Power Bull P44 09					
PRO P63 40 		H5 / L2	63	620	0	1
PRO P63 42 	= Power Bull P60 09					
PRO P77 40 		H6 / L3	77	700	0	1
PRO P77 42 	= Power Bull P72 09					
PRO P84 40 		H7 / L4	84	760	0	1
PRO P100 40 		H8 / L5	100	820	0	1
PRO P110 40 		H9 / L6	110	900	0	1

 = Double Top |  = 4-chamber leak protection

RF = vibration-resistant | GA = battery with central degassing | HGI = hard rubber set | mG = with handle | RZS = flame arrestor

* limited use | ** with base hold-down adapter

**Ah
20 h** Capacity Ah 20 h rate

**A
EN** Cold discharge test current in A





Application

Length	Width	Box height	Total height			
241	175	190	190	mGGA	B13	Audi, BMW, VW, Citroen, Mercedes, Peugeot, Renault, Fiat, Skoda
278	175	190	190	mGGA	B13	Audi, BMW, VW, Citroen, Mercedes, Peugeot, Renault, Fiat, Skoda
315	175	190	190	mGGA	B13	Audi, BMW, VW, Citroen, Mercedes, Peugeot, Renault, Fiat, Skoda
354	175	190	190	mGGA	B13	Audi, BMW, VW, Citroen, Mercedes, Peugeot, Renault, Fiat, Skoda
394	175	190	190	mGGA	B13	Audi, BMW, VW, Mercedes



Max. dimensions mm
Length x Width x
Box/total height



Base hold-down












Battery specifications

Type	Info	Box	Ah 20 h	A EN		
------	------	-----	------------	---------	---	---

POWER BULL

A CALCIUM CAR BATTERY OF THE LATEST GENERATION

P40 25		35NS/B19	40	330	0	3
P40 26		35NS/B19	40	330	0	3
P40 27		35NS/B19	40	330	1	3
P42 08		H3 / L0	42	390	0	1
P44 09 	replaces PRO P50 42	T4 / LB1	44	420	0	1
P45 23		45NS/B24	45	390	0	1+3
P45 24		45NS/B24	45	390	1	1+3
P50 03 	replaces PRO P50 40	H4 / L1	50	450	0	1
P50 41	no alternative type					
P60 09 	replaces PRO P63 42	T5 / LB2	60	540	0	1
P60 62	= Power Bull P60 68					
P60 68	replaces P60 62	D23	60	510	0	1
P60 69		D23	60	510	1	1
P62 19 		H5 / L2	62	550	0	1
P70 24		D26 / MO60	70	600	1	1
P70 29		D26 / MO60	70	600	0	1
P72 09 	replaces PRO P77 42	T6 / LB3	72	670	0	1
P74 12 		H6 / L3	74	680	0	1
P80 09		D26 / MO60	80	640	0	1
P80 14 		T7 / LB4	80	700	0	1
P88 20 	= Starting Bull 588 20					
P95 04		D31 / 56AT	95	740	0	1
P95 05		D31 / 56AT	95	740	1	1
P95 33 		H8 / L5	95	780	0	1

 = Double Top |  = 4-chamber leak protection

RF = vibration-resistant | GA = battery with central degassing | HGI = hard rubber set | mG = with handle | RZS = flame arrestor

* limited use | ** with base hold-down adapter

**Ah
20 h** Capacity Ah 20 h rate

**A
EN** Cold discharge test current in A





Application

Length	Width	Box height	Total height			
187	137	204	226	mGGA	B01	535 04
187	127	204	226	mGGA	B00	535 20, 540 26
187	127	204	226	mGGA	B00	535 22, 540 27
175	175	190	190	mGGA	B13	540 08, 542 08
210	175	175	175	mGGA	B13	536 46**/53, 540 45**/63, 544 09/59*, 545 59*
238	129	203	225	mGGA	B00	545 23/84
238	129	203	225	mGGA	B00	545 24/51
210	175	190	190	mGGA	B13	544 09*/59, 545 59, 550 03
241	175	175	175	mGGA	B13	545 19**, 555 19/59*, 560 09
233	173	203	225	mGGA	B07	560 62, 560 68, 565 33
233	173	203	225	mGGA	B07	560 69, 565 34
241	175	190	190	mGGA	B13	560 09*, 562 05*/19
260	174	200	222	mGGA	B01	560 49, 570 24
260	174	200	222	mGGA	B01	560 48, 570 29, 580 09
278	175	175	175	mGGA	B13	563 18**, 564 20**, 566 13/38*, 570 44, 571 13, 572 09/12*, 574 05/12*
278	175	190	190	mGGA	B13	566 13*/38, 570 44*, 572 09*/12, 574 05*/12
260	174	200	222	mGGA	B01	560 48, 570 29, 580 09
315	175	175	175	mGGA	B13	575 39, 580 14/35*/42*
303	173	203	225	mGGA	B07	595 04, 600 32
303	173	203	225	mGGA	B07	595 05, 600 33
354	175	190	190	mGGA	B13	595 21/33, 600 44



Max. dimensions mm
Length x Width x
Box/total height



Base hold-down



Battery specifications



STARTING BULL – PROVEN A MILLION TIMES OVER.

AFFORDABLE QUALITY. Robust, fully proven and thoroughly optimised, the Starting Bull represents a powerful entry into the Banner brand world. This absolutely maintenance-free battery scores with top features and performance. In addition to calcium / calcium technology, the Starting Bull series offers twelve types with reliable four-chamber leak protection and enhanced safety due to central degassing and integrated backfire frits. First class, attractive design with new terminal covers represents a clear indication of the potential of this battery.

Banner

THE POWER COMPANY



Cars



LCV



Motorboats



BATTERY TECHNOLOGIES



WRONG BATTERY RESULTS



MORE INFO UNDER
bannerbatterien.com

STARTING BULL

STARTING BULL THE ENTRY TO THE Banner BRAND WORLD.

The Banner Starting Bull is the entry level product to the Banner brand. However, safety knows no compromises and therefore this product, which has been proven millions of times meets the very latest battery design standards.

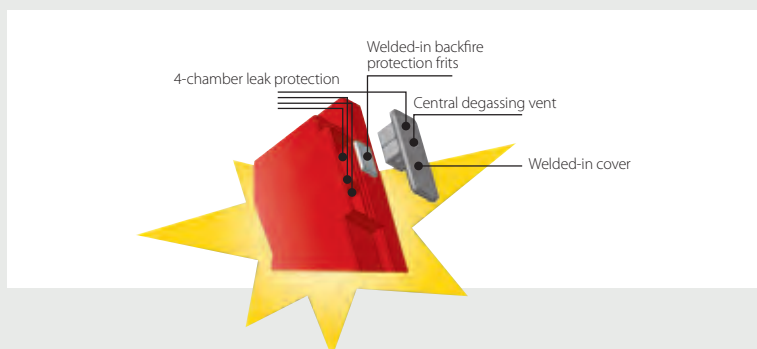
STARTING BULL ADVANTAGES AT A GLANCE

- Four-chamber leak protection with integrated flame arrestor safeguard for 12 best sellers from 44-95 Ah
- Absolutely maintenance-free due to the use of calcium technology
- Reliable cold starting behaviour
- Niche and supplementary types ensure complete coverage of the current vehicle fleet in Europe
- Simple classification owing to the use of DIN and UK numbers for type designations
- Quality and know-how from Austria
- Optimum price-performance ratio



4-CHAMBER LEAK PROTECTION. THE INNOVATIVE SAFETY GUARANTEE.

Tried and tested, four-chamber leak protection is used in twelve Starting Bull Europa types. In this system, four chambers provide a safeguard against escapes of battery acid during extreme vibrations. Moreover, central degassing and welded-in backfire frits secure optimum operational safety. All these features add up to a significant increase in safety during vehicle use and handling.





Banner

THE POWER COMPANY

















**THE WORLD
STARTS WITH Banner.**

STARTING BULL – TYPE LISTS

Type	Info	Box	Ah 20 h	A EN		
------	------	-----	------------	---------	---	---

STARTING BULL CAR BATTERY IN OEM QUALITY

6 Volt						
066 12			66	360	0	1
077 18			77	450	0	1
12 Volt						
530 30	replaces Bike Bull 528 16		30	300	0	4
530 34			30	300	1	4
544 09 		T4 / LB1	44	360	0	1
545 59 		H4 / L1	45	400	0	1
545 77		E2	45	300	0	1
545 79		E2	45	300	1	1
555 19 		T5 / LB2	55	450	0	1
560 08 		T5 / LB2	60	480	1	1
560 09 		T5 / LB2	60	480	0	1
560 10		BCI 75	60	675	1	5
562 19 		H5 / L2	62	510	0	1
570 44 		T6 / LB3	70	640	0	1
572 12 		H6 / L3	72	650	0	1
572 33 		H6 / L3	72	650	1	1
580 14 		T7 / LB4	80	660	0	1
588 20 	replaces Power Bull P88 20	T8 / LB5	88	680	0	1
588 34 RF	= Running Bull EFB PRO 585 11					
595 33 		H8 / L5	95	740	0	1

 = Double Top |  = 4-chamber leak protection

RF = vibration-resistant | GA = battery with central degassing | HGI = hard rubber set | mG = with handle | RZS = flame arrestor

* limited use | ** with base hold-down adapter

**Ah
20 h** Capacity Ah 20 h rate

**A
EN** Cold discharge test current in A





Application

Length	Width	Box height	Total height		
178	175	166	188	B04	VW - 1968, Trabant
216	170	166	191	B06	VW, Ford D, Trabant, Tatra 613

Length	Width	Box height	Total height			
187	128	165	165	mGGA	B00	Small tractors, BMW motorcycles
187	128	165	165	mGGA	B00	Small tractors
210	175	175	175	mGGA	B13	Ford, Opel
210	175	190	190	mGGA	B13	Audi, BMW, VW, Citroen, Peugeot, Renault, Fiat, Skoda
218	135	203	225		B01	Renault R8-R13, Dacia
218	135	203	225		B01	Peugeot, Honda, Dacia
241	175	175	175	mGGA	B13	Ford, Opel
241	175	175	175	mGGA	B13	Lada, Moskvië
241	175	175	175	mGGA	B13	Ford, Opel
248	178		184	mGGA	B07	Chrysler Sebring/Stratus, GM Buick Regal/Chevy Camaro, Acura Integra/TL
241	175	190	190	mGGA	B13	Audi, BMW, VW, Citroen, Peugeot, Renault, Fiat, Skoda
278	175	175	175	mGGA	B13	Ford, Opel
278	175	190	190	mGGA	B13	Audi, BMW, VW, Citroen, Peugeot, Renault, Fiat, Skoda
278	175	190	190	mGGA	B01	Chrysler Voyager
315	175	175	175	mGGA	B13	Audi D, BMW D, Ford D, Opel D, Nissan D, Renault D, VW D
354	175	175	175	mGGA	B13	Ford D, Opel D
354	175	190	190	mGGA	B13	Audi, BMW, Mercedes, Porsche, VW



Max. dimensions mm
Length x Width x
Box/total height



Base hold-down



Battery specifications



BUFFALO BULL – NEXT GENERATION POWER.

AS TOUGH AS THEY COME. The Buffalo Bull is suitable for all commercial vehicles such as trucks, buses, agricultural/forestry/construction machinery and snow groomers, and is available in four product variations. These range from a robust entry-level model to the Buffalo Bull SHD, a super heavy-duty quality version supplemented with SHD PRO battery types. These power packs are certain to start any engine whatever the conditions and because a truck battery also has to reliably supply power on board after a hard day on the road, we have developed two special models for long-distance trucks. These consist of the Buffalo Bull EFB for high energy requirements and the completely redesigned Buffalo Bull AGM for maximum energy demand.



Buses



Trucks



Construction machinery



Agricultural machinery



Snow groomers

BUFFALO BULL

BUFFALO BULL AGM –
TOP NEWS



TRUCK BATTERY
SERVICE LIFE



COMMERCIAL VEHICLE
BATTERIES



MORE INFO UNDER
bannerbatterien.com

THE BUFFALO BULL AGM MEGA-POWER FOR LONG-DISTANCE TRUCKS.

Starter and on-board batteries in the commercial vehicle sector must increasingly meet special needs such as the maximum energy demand emanating from the growing number of comfort functions in long-distance trucks. Drivers often spend the night in their vehicles and use a variety of different electrical consumers, including auxiliary air conditioning or heating.

Banner has launched the new Buffalo Bull AGM onto the market for precisely these toughest requirements because now a long-distance truck is more than just a means of transporting goods from A to B. It is the driver's workplace (keyword: office) and home (keyword: kitchen, living room/bedroom) for more than three days a week and therefore the Buffalo Bull AGM has been designed specifically for this situation.

TECHNICAL DATA AND INFORMATION

- Valve-regulated lead acid battery (VRLA)
- Available in standard battery sizes (C-box) with 210 Ah
- Threefold cyclical resistance as compared to standard starter batteries, owing to the active mass recipe and glass fleece covers
- Robust design und maximum vibration resistance due to special set bonding
- Improved mesh corrosion resistance through the use of a continuous production process
- No acid stratification due to AGM design
- Outstanding charging: the vehicle's regulator voltage is also sufficient for deeply discharged batteries
- Calcium technology for minimal water consumption
- Designed for the maximum energy requirements resulting from increasing comfort functions in long-distance trucks
- Ideal for rear chassis integration (EURO Emission Class 5/6)
- Add-ons such as short-circuit protection and ESD plug for heightened product safety
- Central degassing with integrated flame arrestor
- Dimensions in accordance with EN 50342-4:2009



NEW

THE BUFFALO BULL EFB

THE POWER PACK FOR LONG-DISTANCE TRUCKS.

Starter and on-board batteries in the commercial vehicle field must fulfil a growing variety of special needs such as the maximum energy demand emanating from the increasing number of comfort functions in long-distance trucks. Drivers often spend the night in their vehicles and use various electrical consumers. Moreover, in the case of battery integration into the rear chassis, extreme vibration-resistance is essential.

Banner has launched the new Buffalo Bull EFB onto the market for precisely these toughest requirements because today a long-distance truck is more than just a means of transporting goods from A to B. It is the driver's workplace (keyword: office) and home (keyword: kitchen, living room/bedroom) for often three nights per week and therefore the Buffalo Bull EFB has been designed specifically for this situation.

TECHNICAL DATA AND INFORMATION

- Range of three standard battery sizes (A, B and C boxes) with 150 Ah, 190 Ah and 240 Ah
- Increased cyclical resistance owing to the active mass recipe and glass fleece covers
- Robust design und maximum vibration resistance due to special set bonding
- Improved mesh corrosion resistance through the use of a continuous production process
- Calcium technology for minimal water consumption
- Designed for high energy requirements resulting from increasing comfort functions in long-distance trucks
- Maintenance-free (no topping up with water) under normal operating conditions
- Add-ons such as short-circuit protection and ESD plug for heightened product safety
- Central degassing with integrated flame arrestor
- Dimensions in accordance with EN 50342-4:2009



Banner LEXICON: ESD



MORE INFO UNDER
bannerbatterien.com

BUFFALO BULL SHD/SHD PRO PUTS FULL POWER INTO EVERY COMMERCIAL VEHICLE, FROM DISTRIBUTION TRUCKS TO BUSES.

Tough and continuous use in commercial vehicles presents batteries with massive challenges and the demands on cyclical and vibration resistance have increased enormously over the years. Therefore, properties such as freedom from maintenance, operational and cold start performance are now more important than ever and the optimised Buffalo Bull SHD batteries represent the answer. The Buffalo Bull SHD PROfessional battery types are the problem solver for stop & go, cold starts and co. and tough conditions that would cause others to quickly give up the ghost! Moreover, they also hold their own in the lucrative aftermarket. In fact, Banner has equipped these batteries with unbeatable advantages, which make them ideal for modern distribution trucks and buses!

TECHNICAL DATA AND INFORMATION

- Meets the requirements of Mercedes Trucks
- Maintenance-free: calcium technology ensures minimum water consumption
- Central degassing and patented four-chamber leak protection
- Captive, welded-in flame arrestors and safety screws
- ConCast mesh production process and optimised mesh design provide reliable cold start performance
- SHD means extra cycle/vibration resistance in the highest E3/V3 category pursuant to EN 50342-1:2016
- Short circuit protection against short circuits caused by tools
- EN 50342-4:2009 box height



BUFFALO BULL MEANS RELIABLE BRAND QUALITY.

If they opt for the Buffalo Bull, those looking for a suitable and reliable starter battery for their commercial vehicles will have made precisely the right decision. This is because the Buffalo Bull is a brand battery with proven Banner quality.

TECHNICAL DATA AND INFORMATION

- Niche and supplementary types for agricultural machinery and unusual commercial vehicles
- Simple maintenance due to the externally visible electrolyte level markings and practical screws
- Robust design with set bonding
- Bag separators for backfire protection and high starting current levels



BUFFALO BULL

BUFFALO BULL HIGH CURRENT THE MEGA COLD START POWER!

Special machines and vehicles (e.g. municipal vehicles such as sweepers or high-pressure rinsing vehicles, construction machinery and snow groomers) require ever-higher cold start current. This is due to the high lag loads (e.g. in hydraulic units), which have to be dealt with during starting. The Buffalo Bull high current battery has been specifically developed to meet these requirements.

TECHNICAL DATA AND INFORMATION

- Offer of two standard battery sizes (boxes A and B) with 1,150 A or 1,400 A cold start current
- High vibration-resistance
- Calcium technology for minimal water consumption
- Maintenance-free under normal operating conditions
- Central degassing with integrated flame arrestor
- Add-ons for heightened product safety: short circuit protection, ESD plugs*
- Dimensions in accordance with EN 50342-4:2009



Banner LEXICON: ESD




**MORE INFO UNDER
bannerbatterien.com**

* ESD = electrostatic discharges are disruptive voltage breakdowns caused by major potential differences. These discharges (sometimes visible due to sparks) cause brief, high electrical current and can lead to the ignition of flammable materials. It is precisely this that the ESD plugs prevent with absolute safety.

Type	Info	Box	Ah 20 h	A EN		
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BUFFALO BULL AGM

COMMERCIAL VEHICLE BATTERY IN OEM QUALITY – AGM TECHNOLOGY

AGM 710 01 	available in 2022	C	210	1200	3	1
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BUFFALO BULL EFB



COMMERCIAL VEHICLE BATTERY IN OEM QUALITY – EFB-TECHNOLOGY

EFB 650 17		A	150	850	3	1
EFB 690 17		B	190	1050	3	1
EFB 740 17		C	240	1200	3	1

BUFFALO BULL SHD / SHD PROFESSIONAL

COMMERCIAL VEHICLE BATTERY IN OEM QUALITY – SUPER HEAVY DUTY VARIATION

SHD 610 40		MAC 110	110	760	3	1
SHD 635 44		MAC 110	135	900	3	1
SHD 640 35	= SHD PRO 645 03					
SHD PRO 645 03	replaces SHD 640 35	A	145	800	3	1
SHD 670 33		MAC 140	170	1000	3	1
SHD 680 32	= SHD PRO 680 08					
SHD PRO 680 08	replaces SHD 680 32	B	180	1000	3	1
SHD 725 11	= SHD PRO 725 03					
SHD PRO 725 03	replaces SHD 725 11	C	225	1150	3	1

 = Double Top |  = 4-chamber leak protection

RF = vibration-resistant | GA = battery with central degassing | HGI = hard rubber set | mG = with handle | RZS = flame arrestor

* limited use | ** with base hold-down adapter

**Ah
20 h** Capacity Ah 20 h rate

**A
EN** Cold discharge test current in A





Application

Length	Width	Box height	Total height			
517	273	212	240	mGGARZS	B00	Long-distance trucks:: MAN, Mercedes, Volvo, Scania, Steyr Trucks

Replace AGM with AGM

Length	Width	Box height	Total height			
513	189	195	220	mGGARZS	B00	Long-distance trucks:: MAN, Mercedes, Volvo, Scania, Steyr Trucks
513	223	195	220	mGGARZS	B00	Long-distance trucks:: MAN, Mercedes, Volvo, Scania, Steyr Trucks
517	273	212	240	mGGARZS	B00	Long-distance trucks:: MAN, Mercedes, Volvo, Scania, Steyr Trucks

Length	Width	Box height	Total height			
513	175	210	210	mGGARZS	B03	MAN, Mercedes, Roman, Robur
513	175	210	210	mGGARZS	B03	MAN, Mercedes, Roman
513	189	195	220	mGGARZS	B00	Neoplan, MAN, Mercedes, Volvo, Scania, Steyr Trucks
513	218	210	210	mGGARZS	B03	MAN, Mercedes, Liaz
513	223	195	220	mGGARZS	B00	Neoplan, MAN, Mercedes, Volvo, Scania, Steyr Trucks
517	273	212	240	mGGARZS	B00	Neoplan, MAN, Mercedes, Volvo, Scania, Steyr Trucks



Max. dimensions mm
Length x Width x
Box/total height



Base hold-down





Battery specifications

Type	Info	Box	Ah 20 h	A EN		
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BUFFALO BULL

COMMERCIAL VEHICLE BATTERY IN OEM QUALITY

Type	Info	Box	Ah 20 h	A EN		
600 26			100	600	0	1
600 35			100	600	1	1
605 02		BCI 31	105	1000	9	1
610 11		Compact	110	800	0	1
610 47		Compact	110	800	0	1
610 48		Compact	110	800	1	1
620 34		A	120	720	3	1
625 11		Compact	125	760	0	1
625 13		Compact	125	760	1	1
625 23		NATO 6TN	125	720	2	1
632 11		MAC 132	132	900	0	1
640 35		A	140	760	3	1
650 11		A	150	1150	3	1
680 11		B	180	1400	3	1
680 32		B	180	950	3	1
680 89		MAC 154	180	950	4	1
725 11		C	225	1050	3	1

 = Double Top |  = 4-chamber leak protection

RF = vibration-resistant | GA = battery with central degassing | HGI = hard rubber set | mG = with handle | RZS = flame arrestor

* limited use | ** with base hold-down adapter

**Ah
20 h** Capacity Ah 20 h rate

**A
EN** Cold discharge test current in A





Application

Length	Width	Box height	Total height			
413	175	195	220	mG	B00	Mercedes D, Steyr Traktoren, Daihatsu D, Barkas, Ursus
413	175	195	220	mG	B00	Daihatsu, Nissan, Mitsubishi D
330	171	218	241	mGGA	B00	AGCO Fendt - Massey Ferguson, Caterpillar, US Trucks
344	175	214	230	mG	B01	Iveco Daily 01.05-, Renault
344	172	214	230	mG	B00	IHC, Massey Ferguson
344	172	214	230	mG	B00	IHC, McCormick
513	189	195	220	mG	B00	MAN, Mercedes, Roman, MAZ
345	172	260	283	mG	B00	Massey Ferguson
345	172	260	283	mG	B00	McCormick
280	267	213	230	mG	B00	NATO 6TN
508	174	205	205	mG	B01	CNH Case New Holland, John Deere, Landini, McCormick
513	189	195	220	mG	B00	Steyr LKW, MAN, Mercedes
513	189	195	220	mGGARZS	B00	Municipal vehicles , construction machinery, snow groomers
513	223	195	220	mGGARZS	B00	Municipal vehicles , construction machinery, snow groomers
513	223	195	220	mG	B00	Steyr-Trucks, MAN, Roman, Multicar, Magirus
510	216	205	225	mGGA	B03	Fiat LKW, Tractors
517	273	212	240	mG	B00	Steyr, MAN, Volvo-LKW, Caterpillar, Tatra

BUFFALO BULL



Max. dimensions mm
Length x Width x
Box/total height



Base hold-down



Battery specifications



ENERGY BULL – FULL POWER FOR TOTAL RELAXATION.

THE LEISURE SPECIALIST. Designed as a long-duration discharge battery, the Energy Bull is THE special battery for hobby and leisure activities. The battery is characterised by excellent cyclical stability, simple charging, easy maintenance and operational safety. The Energy Bull thus provides portable energy for sailing and e-boats, yachts, motorhomes and caravans, as well as for camping and caravanning. The battery is also suitable for powering wheelchairs and for use as an energy storage device for signalling systems and solar panels.

+ **Banner tip.** It is best to use a starter battery for engine ignition. With the Running Bull EFB / PRO and the Power Bull / PRO Banner offers original equipment batteries (OE quality for replacement needs).



Banner

THE POWER COMPANY



Yachts



Motorhomes



Caravans



Camping



Solar power systems

HOBBY & LEISURE BATTERIES



BATTERY DEGASSING



SERIAL AND PARALLEL SWITCHING



OPENING THE BATTERY LID SCREWS



MORE INFO UNDER
bannerbatterien.com

ENERGY BULL FOR CONVINCING DEEP CYCLE CHARACTERISTICS.

With the Energy Bull, Banner presents a special battery for hobbies and leisure. The robust Energy Bull's characteristics make it an ideal power pack for camping/caravans, boats and use in many other applications, which extend to signal systems and electrical motor drives.

In tandem with bag separators and a special mass composition, the robust mesh structure of the battery ensures extreme cyclical 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 box
- Backfire safety – a flame arrestor is integrated into the surge protectors in the battery lid
- Low-maintenance – reduced water consumption and low self-discharge
- Simple charging – charging with standard chargers
- Vibration-resistant – floor bonded plate sets and bag separators covered with a glass mat; V3 classification pursuant to EN 50342-1:2016
- Optimised capacity – ideal for cyclical loads
- Environment- and user-friendly – delivered filled and charged
- Practical handles



LONG, LONGER, LONGEST. NO LETTING UP ALLOWED!

A top quality, long-duration discharge battery is characterised by the fact that its power never seems to weaken. Such batteries offer uncompromising power over an extended period, as evidenced by the Energy Bull, which according to the EN cycle test provides four times the cyclical resistance of standard starter batteries. This characteristic is a recommendation for the use of the Energy Bull as a special battery for the supply of energy in every type of leisure application.



Characteristic	Starter battery	Long-duration discharge battery
Mesh alloy	Part or full calcium	Low antimony
Mesh design	Fine structure	Coarse structure
Plate type	Thin plates	Thick plates
Mass type	Cold start optimised	Special cycle mass
Battery design	Large plate surface	Large plate volume
Separator type	PE separator without glass mat	PE separator with glass mat

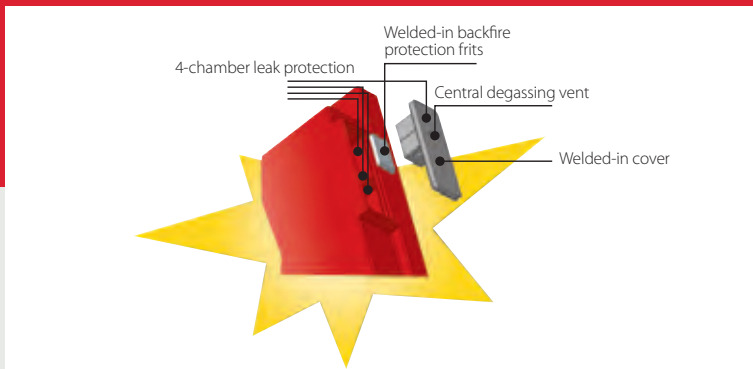
Banner LEXICON: ESD



MORE INFO UNDER
bannerbatterien.com

4-CHAMBER LEAK PROTECTION. THE INNOVATIVE SAFETY GUARANTEE.

Tried and tested, four-chamber leak protection is used in virtually all Energy Bull types. In this system, four chambers provide a safeguard against escapes of battery acid during extreme vibration. Moreover, central degassing and welded-in backfire frits secure optimum operational safety. All these features add up to a significant increase in safety during vehicle use and handling.



SURGE PROTECTORS. ENTIRELY ACID-TIGHT AND EASY TO HANDLE.

The cell screws with O-rings on the flat battery lid represent another safety bonus. These can be opened and closed without using tools, which facilitates both battery testing and refilling with water.



CAPACITY REQUIREMENT CALCULATION. HOW TO CALCULATE THE CORRECT CAPACITY FOR YOUR ELECTRICAL SYSTEM BATTERY.

The table below shows an example of how you can determine the electricity requirement of your motorhome.

Device	Power P in W	Voltage U in V	Electricity I = P/U in A	On time t in h	Capacity C = Ixt in Ah
Mini-refrigerator	100	12	8.3	8	66
Mini-television	80	12	6.7	2	13
Lighting	40	12	3.3	4	13
E-kettle	200	12	16.7	0.15	3
Hob	500	12	41.7	0.2	8
Total					103
Required battery capacity (= Total multiplied by a safety factor of 1.7)					175

REQUIRED BATTERY: ENERGY BULL 96801 K5=180AH

If the average on time amounts to approx. 5 hours, the K5 is used. The K20 is employed for approx. 20 hours and the K100 for approx. 100 hours.

In the case of wet batteries, a standard safety factor (for the prevention of deep discharging) of 1.7 should be established (1.3 in the case of AGM and Gel recombination batteries).

WHAT DOES CAPACITY MEAN?



MORE INFO UNDER
bannerbatterien.com

Type

Info

Box





Ah
5 h



Ah
20 h

Ah
100 h



ENERGY BULL LONG-DURATION DISCHARGE BATTERY

Type	Info	Box	Ah 5 h	Ah 20 h	Ah 100 h	Terminal
955 01 		H5 / L2	50	60	70	0
955 51		D26 / MO60	55	72	85	1
956 01 		H6 / L3	60	80	90	0
957 51 		H8 / L5	75	100	110	0
959 01 		LOT7	90	115	135	0
960 51		A	105	130	140	3
963 51		B	135	180	195	3
968 01		C	180	230	250	3

 = Double Top |  = 4-chamber leak protection

RF = vibration-resistant | GA = battery with central degassing | HGI = hard rubber set | mG = with handle | RZS = flame arrestor

* limited use | ** with base hold-down adapter

**Ah
20 h** Capacity Ah 20 h rate

**A
EN** Cold discharge test current in A





Application

		Length	Width	Box height	Total height			
	1	241	175	190	190	mGGA	B13	Wheelchairs
	1	256	174	205	225	mGGA	B00	Boats, wheelchairs
	1	278	175	190	190	mGGA	B13	Wheelchairs
	1	354	175	190	190	mGGA	B13	Boats
	1	350	175	235	235	mGGA	B00	Boats
	1	513	189	195	220	mGRZS	B00	Boats, signal devices
	1	513	223	195	220	mGRZS	B00	Boats
	1	517	273	212	240	mGRZS	B00	Boats



Max. dimensions mm
Length x Width x
Box/total height



Base hold-down



Battery specifications



BIKE BULL – THE MOTORCYCLE BATTERY WITH Banner POWER.

HEAD FOR FREEDOM. Biking means a feeling of unlimited freedom. Sun, hot tarmac and seemingly endless curves. However, the fun element soon disappears if the bike fails to start. Therefore, when perfect starting and plentiful power are required, the Bike Bull is always the first choice. Especially for bikers, this power pack offers everything that is required for pure cruising pleasure. In addition, the Bike Bull also provides equally safe starts for all-terrain vehicles/quads, jet skis, snowmobiles, utility-vehicles and tractor mowers. The Bike Bull programme contains 55 battery types divided into four grades, which are available all year round.

Banner

THE POWER COMPANY



Motorcycles road/cross



ATV/Quads



Jetskis



Riding mowers



Snowmobiles

MOTORCYCLE OVERWINTERING



MOTORCYCLE DEWINTERISING



STARTING



MORE INFO UNDER
bannerbatterien.com

BIKE BULL CLASSIC POWER FOR MOTORBIKES.

Entry into the world of the Banner brand is comprised by classic lead batteries with an electrolyte pack. The robust technology has been specially designed for the burdens relating to motorcycle riding. These batteries are only opened for start-up and maintenance.

TECHNICAL DATA AND INFORMATION

- High load-bearing capacity
- Safe starting even in the case of short run use
- Extensive programme consisting of 27 types
- Dry, pre-charged; enclosed electrolyte in the precisely required volume



BIKE BULL AGM THE LATEST AGM TECHNOLOGY FOR UNIVERSAL APPLICATIONS.

This is Banner power for motorbikes, ATVs/quads, jet skis and tractor mowers. The Bike Bull AGM is an absolutely maintenance-free battery employing the latest absorbent glass mat (AGM) technology. The acid is bound into a glass fibre web and therefore cannot escape.

TECHNICAL DATA AND INFORMATION

- High start performance with safety reserves
- AGM technology (absorbent glass mat)
- Absolute maintenance-free
- Vibration-resistant
- Dry, pre-charged; enclosed electrolyte in the precisely required volume



BIKE BULL GEL

GEL POWER FOR OFF-ROAD AND TOURING RIDERS.

The Bike Bull GEL combines innovative GEL technology with outstanding user satisfaction levels and operational safety. It is ideally suited to enduro and touring bikes. The Bike Bull GEL is an advanced, top quality battery with non-woven web separator and fixed electrolyte for increased start performance and outstanding vibration and cyclical resistance.

TECHNICAL DATA AND INFORMATION

- First class start performance
- Excellent vibration and cyclical resistance
- Absolutely maintenance-free
- Completely leak-proof
- Lateral installation possible
- Pre-charged and ready for immediate use



BIKE BULL AGM PROFESSIONAL

PROFESSIONAL AGM POWER FOR THE TOUGHEST DEMANDS

The Bike Bull AGM PROfessional is a top product in first fitter (OEM) quality. This premium AGM battery is used for Harley Davidsons and BMW bikes, as well as for models with ABS and numerous special features. Due to its excellent stability in low temperatures, it is also ideal for snowmobiles. In combination with tipping safety, this leak-proof battery also stands out due to its vibration resistance and exceptional starting performance.

TECHNICAL DATA AND INFORMATION

- Top class start performance
- Maximum vibration and cyclical resistance
- Absolutely maintenance-free
- Completely leak-proof
- Lateral installation possible
- Excellent stability in low temperatures
- Pre-charged and ready for immediate use



Banner LEXICON: ESD

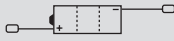







MORE INFO UNDER
bannerbatterien.com

Banner battery type	First fitting designation	Banner order number	Ah 10 h					Drawing
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BIKE BULL CLASSIC

6 VOLT

					Length	Width	Height			
004 12	B6N4B-2A	020 004 12 0100	4	5	102	48	96	0.20	B00	
007 14	BB39-6	020 007 14 0100	7	6	126	48	126	0.30	B00	
008 11	BB49-6	020 008 11 0100	8	6	91	83	160	0.50	B00	
012 11	B6N11A-3A	020 012 11 0100	11	6	122	62	132	0.40	B00	
012 14	B6N11A-1B	020 012 14 0100	11	6	122	62	132	0.40	B00	
013 14	BB38-6A	020 013 14 0100	14	6	119	83	161	0.70	B00	

Ah 10 h Capacity in Ah (10h)

A EN Low-temperature test current

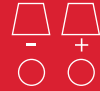


**Banner
battery type**

**First fitting
designation**

**Banner
order number**

**Ah
10 h**



Drawing

BIKE BULL CLASSIC

12 VOLT

					Length	Width	Height			
503 12 = 503 13										
503 13	BB3L-B	020 503 13 0100	3	6	98	56	110	0.20	B00	
504 11	BB4L-B	020 504 11 0100	4	5	120	70	92	0.30	B00	
505 12	BB5L-B	020 505 12 0100	5	6	120	60	130	0.40	B00	
506 11	B12N5,5-3B	020 506 11 0100	6	6	135	60	130	0.40	B00	
507 13	BB7-A	020 507 13 0100	8	6	135	75	133	0.60	B00	
507 14	BB7C-A	020 507 14 0100	8	3	130	90	114	0.60	B00	
509 14	BB9-B	020 509 14 0100	9	6	135	75	139	0.60	B00	
511 12	BB10L-A2	020 511 12 0100	11	8	135	90	145	0.80	B00	
511 13	BB10L-B	020 511 13 0100	11	6	135	90	145	0.80	B00	
512 11	BB12A-A	020 512 11 0100	12	6	134	80	160	0.80	B00	
512 13	BB12AL-A2	020 512 13 0100	12	8	134	80	160	0.80	B00	
512 15	BB12A-B	020 512 15 0100	12	6	134	80	160	0.80	B00	
514 11	BB14L-A2	020 514 11 0100	14	8	134	89	166	0.90	B00	
514 12	BB14-A2	020 514 12 0100	14	8	134	89	166	0.90	B00	
514 13	BB14L-B2	020 514 13 0100	14	8	134	89	166	0.90	B00	
516 15	BB16B-A1	020 516 15 0100	16	7	160	90	161	1.00	B00	
516 16	BB16AL-A2	020 516 16 0100	16	2	207	71	164	1.10	B00	
518 14	Europa	020 518 14 0100	19	10	186	82	171	1.00	B00	
519 12 = AGM PRO 516 21										
520 12	B50-N18L-A	020 520 12 0100	20	7	205	90	162	1.40	B00	
528 16 = Starting Bull 530 30										
530 30		010 530 30 0101	30	10	187	128	165	1.60	B00	
530 34		010 530 34 0101	30	10	187	128	165	1.60	B00	

BIKE BULL



Max. dimensions in mm
Length x Width x Total height



Bottom strip



Acid in
approx. litres

Banner battery type	First fitting designation	Banner order number	Ah 10 h	A (EN)					Drawing
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BIKE BULL 12 V AGM-TECHNOLOGY

AGM = ABSORBENT GLASS MAT WITH ELECTROLYTE

						Length	Width	Height			
AGM 503 14	BTX4L-BS	021 503 14 0100	3	50	5	113	70	87	0.19	B00	
AGM 504 12	BTX5L-BS	021 504 12 0100	4	80	5	113	70	105	0.24	B00	
AGM 506 14	BTX7L-BS	021 506 14 0100	6	100	5	113	70	130	0.33	B00	
AGM 506 15	BTX7A-BS	021 506 15 0100	6	105	5	150	87	95	0.38	B00	
AGM 508 12	BTX9-BS	021 508 12 0100	8	110	5	151	87	106	0.45	B00	
AGM 510 12	BTX12-BS	021 510 12 0100	10	160	5	150	87	130	0.60	B00	
AGM 512 14	BTX14-BS	021 512 14 0100	12	190	5	150	87	146	0.69	B00	
AGM 514 22	BTX16-BS	021 514 22 0100	14	210	4	150	88	161	0.80	B00	
AGM 518 21	BTX20L-BS	021 518 21 0100	18	250	4	175	87	154	0.90	B00	
AGM 518 22	BTX20CH-BS	021 518 22 0100	18	220	4	150	87	161	0.70	B00	
AGM 522 14	BTX50L-BS	021 522 14 0100	22	320	4	205	90	164	1.08	B00	

Ah 10 h Capacity in Ah (10h)

A EN Low-temperature test current



Banner
battery typeFirst fitting
designationBanner
order numberAh
10 hA
(EN)

Drawing

BIKE BULL 12 V GEL-TECHNOLOGY

GEL POWER – PLUG-IN POWER

						Length	Width	Height			
GEL 503 01	BGTR4A-5	023 503 01 0101	3	53	12	113	48	85	-	B00	
GEL 506 01	BGT7B-4	023 506 01 0101	6	90	11	150	65	92	-	B00	
GEL 506 21	BGT7-3	023 506 21 0101	6	95	5	114	71	106	-	B00	
GEL 508 01	BGT9B-4	023 508 01 0101	8	115	11	150	69	105	-	B00	
GEL 509 01	BGTZ10-4	023 509 01 0101	9	180	11	150	86	94	-	B00	
GEL 510 01	BGT12B-4	023 510 01 0101	10	185	11	150	69	130	-	B00	
GEL 510 21 replaces AGM PRO 509 01	BGT12A-4	023 510 21 0101	10	185	11	150	87	106	-	B00	
GEL 512 01	BGTZ14-4	023 512 01 0101	11	190	11	151	87	110	-	B00	
GEL 512 21	BGTZ14B-4	023 512 21 0101	12	200	11	150	69	145	-	B00	
GEL 521 01	BGT20H-3	023 521 01 0101	19	310	10	183	79	171	-	B00	
GEL 530 01	BGT30-3	023 530 01 0101	30	380	5	168	127	177	-	B00	

BIKE BULL

Max. dimensions in mm
Length x Width x Total height

Bottom strip

Acid in
approx. litres

Banner battery type	First fitting designation	Banner order number	Ah 10 h	A (EN)					Drawing
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BIKE BULL 12 V AGM PROFESSIONAL

FOR THE HIGHEST DEMANDS

						Length	Width	Height			
AGM PRO 509 01 = GEL 510 21											
AGM PRO 514 01	BETX 14	024 514 01 0101	12	220	10	150	88	145	-	B00	
AGM PRO 514 21	BETX 14L	024 51421 0101	12	220	10	150	88	145	-	B00	
AGM PRO 516 01	BETX 16L	024 516 01 0101	19	325	10	175	100	155	-	B00	
AGM PRO 516 21	BETX 16	024 51621 0101	19	325	10	170	100	155	-	B00	
AGM PRO 520 01	BETX 20L	024 520 01 0101	18	310	10	175	88	155	-	B00	
AGM PRO 530 01	BETX 30L	024 530 01 0101	26	400	10	168	131	176	-	B00	

Ah 10 h Capacity in Ah (10h)

A EN Low-temperature test current



Terminal

Terminal

TERMINALS

CONNECTING TERMINALS

	Front	Side	Top		Front	Side	Top
1				8			
2				9			
3				10			
4				11			
5				12			
6				13			
7				14			

BIKE BULL





Banner BATTERIES ARE AS STRONG AS A BULL. TECHNOLOGY PRODUCES THE POWER!

MORE THAN EIGHT DECADES OF BATTERY KNOW-HOW. Every Banner battery contains the specialist knowledge derived from over eight decades of battery development. We understand all the technical requirements in the automotive sector and therefore offer our products in numerous variations. This section also contains comparative tables, circuits, terminal versions, bottom strips and the general instructions for the use of starter and on-board batteries.



Banner

THE POWER COMPANY



6 SHORT TIPS...



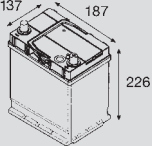
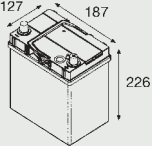
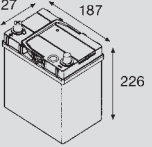
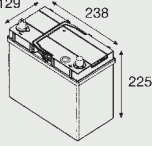
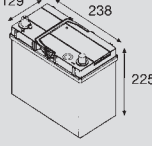
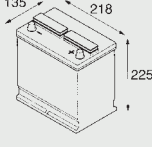
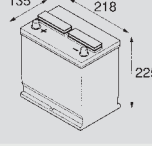
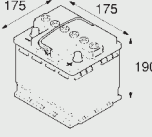
8 FACTS ABOUT
BATTERIES



MORE INFO UNDER
bannerbatterien.com

PRODUCT VARIATIONS

Banner **PRODUCT VARIATIONS IN IDENTICAL OR ALTERNATIVE BOXES**

Box type	Max. dimensions in mm	Running Bull	Power Bull	Starting Bull
B19 / 35NS		EFB 538 15	P40 25	
			P40 26	
			P40 27	
B24 / 45NS		EFB 555 15	P45 23	
			P45 24	
E2				545 77
				545 79
H3 / L0			P42 08	

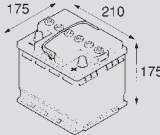
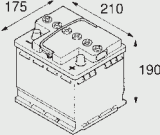
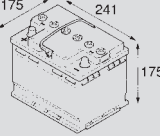
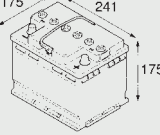
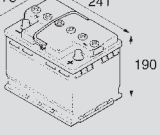
DT = Double Top | **4K** = 4-chamber leak protection

RF = vibration-resistant | GA = battery with central degassing | HGI = hard rubber set | mG = with handle | RZS = flame arrestor

* limited use | ** with base hold-down adapter

PRODUCT VARIATIONS

Banner PRODUCT VARIATIONS IN IDENTICAL OR ALTERNATIVE BOXES

Box type	Max. dimensions in mm	Running Bull	Power Bull	Starting Bull
T4 / LB1			P44 09 DT	544 09 4K
H4 / L1		AGM 550 01	P50 03 DT	545 59 4K
T5 / LB2				560 08
			P60 09 DT	555 19 4K
H5 / L2		AGM 560 01	PRO P63 40 DT	562 19 4K
		EFB PRO 565 11	P62 19 DT	

PRODUCT VARIATIONS

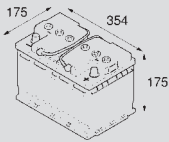
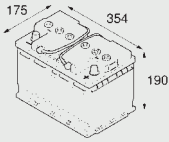
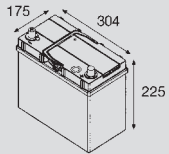
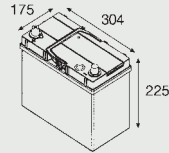
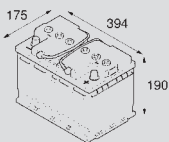
Box type	Max. dimensions in mm	Running Bull	Power Bull	Starting Bull
T6 / LB3		EFB 565 12	P72 09 DT	570 44 4K
H6 / L3		AGM 570 01	PRO P77 40 DT	572 12 4K
		EFB PRO 575 11	P74 12 DT	
D23				572 33 4K
		EFB 565 15	P60 68	
D26 / MO60		EFB 565 16	P60 69	
			P70 24	
D26 / MO60		EFB 570 15	P70 29	
			P80 09	
T7 / LB4		EFB 575 12	P80 14 DT	580 14 4K
H7 / L4		AGM 580 01	PRO P84 40 DT	
		EFB PRO 585 11		

DT = Double Top | **4K** = 4-chamber leak protection

RF = vibration-resistant | GA = battery with central degassing | HGI = hard rubber set | mG = with handle | RZS = flame arrestor

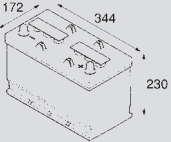
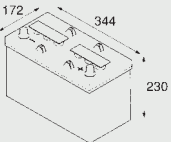
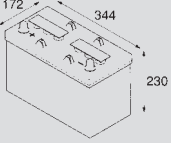
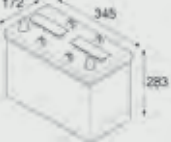
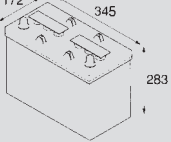
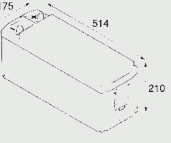
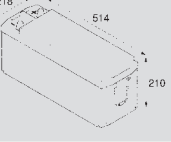
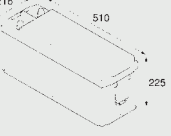
* limited use | ** with base hold-down adapter

PRODUCT VARIATIONS

Box type	Max. dimensions in mm	Running Bull	Power Bull	Starting Bull
T8 / LB5				588 20 4K
H8 / L5		AGM 592 01	PRO P100 40 DT P95 33 DT	595 33 4K
D31 / 56 AT		EFB 595 15	P95 04	
			P95 05	
H9 / L6		AGM 605 01	PRO P110 40 DT	

As at 9/2021

PRODUCT VARIATIONS

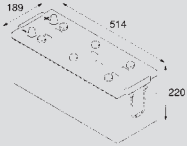
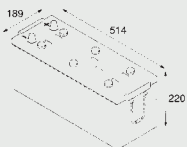
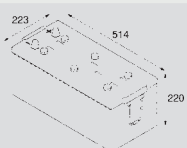
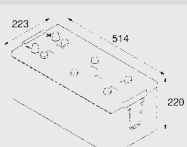

Box type	Max. dimensions in mm	Buffalo Bull	Energy Bull
Compact 110 Ah		610 11	
		610 47	
		610 48	
Compact 125 Ah		625 11	
		625 13	
MAC 110		SHD 635 44 SHD 610 40	
MAC 140		SHD 670 33	
MAC 154		680 89	

DT = Double Top | **4K** = 4-chamber leak protection

RF = vibration-resistant | GA = battery with central degassing | HGI = hard rubber set | mG = with handle | RZS = flame arrestor

* limited use | ** with base hold-down adapter

PRODUCT VARIATIONS

Box type	Max. dimensions in mm	Buffalo Bull	Energy Bull
A		EFB 650 17 SHD PRO 645 03 650 11 High Current	960 51
		640 35 620 34	
B		EFB 690 17 SHD PRO 680 08	963 51
		680 32 680 11 High Current	
C		AGM 710 01 EFB 740 17 SHD PRO 725 03 725 11	968 01

As at 9/2021

COMPARISON TABLE

UK NO./Banner NO.

UK No.	Banner No.	UK No.	Banner No.	UK No.	Banner No.
002L / 202	P42 08	096 EFB OE	EFB 570 11	678 Box Premium Leisure	955 51
002R	532 02	096 UR	PRO P77 40	678 Standard Leisure	VL678
004L / 008	P50 41	100	P72 09, 570 44	679 Standard Leisure	VL679
005L	P60 68	100 EFB OE	EFB 565 12	6TN	625 23
005L BH	P60 62	100 UR	PRO P77 42	895 / 101	530 30
005L EFB OE	EFB 565 15	110	P80 14, 580 14	896	530 34
005L HD	EFB 565 15	110 / 679 Box Premium Leisure	959 01	AUX9 OE	509 00/AUX 09
005R / 014	P60 69	110 AGM OE	AGM 580 01	AUX14 OE	514 00/AUX 14
012	P50 03, 545 59	110 / 115	P80 14, 580 14	GR 31	610 50*
012 UR	PRO P50 40	110 EFB OE	EFB 575 12	MAC 140 SHD	SHD 670 33
017	588 34 RF	110LB / 019 Box Premium Leisure	957 51	Type 31 / DP110 Centre Post	605 02
017 / 024	P88 20, 588 20	115 EFB OE	EFB 580 11	U.S.A.	560 10
019	P95 33, 595 33	115 UR	PRO P84 40		
019 AGM OE	AGM 592 01	221 / 616	600 26		
019 UR	PRO P100 40	221R	600 35		
020	PRO P110 40	249 / 335	P95 04		
020 AGM OE	AGM 605 01	249 / 335 EFB OE	EFB 595 15		
025 / 027	P62 19, 562 19	250 / 334	P95 05		
027 AGM OE	AGM 560 01	404	077 18		
027 EFB OE	EFB 560 11	421	066 12		
027 UR	PRO P63 40	615 SHD	SHD 610 40		
037	538 37	623	680 89		
038	538 80	624	700 29		
043 / 057 / 159	P45 24	625 Box Premium Leisure	968 01		
044 / 053 / 158	P45 23	627	620 34		
044 / 053 / 158 EFB OE	EFB 555 15	627 Box Premium Leisure	960 51		
048	545 77	629 (170Ah)	680 32, 680 11 High Current		
049	545 79	629 (180Ah)	680 32, 680 11 High Current		
054	P40 26	629 Box Premium Leisure	963 51		
054 BH	P40 25	629 EFB OE	EFB 690 17		
054 EFB OE	EFB 538 15	629 SHD	SHD 680 32		
055	P40 27	629 SHD PROfessional	SHD PRO 680 08		
063 (40Ah)	P44 09, 544 09	630 SHD	SHD 635 44		
063 (44Ah)	P44 09, 544 09	632	725 11		
063 UR	PRO P50 42	632 EFB OE	EFB 740 17		
065 Box Premium Leisure	955 01	632 SHD	SHD 725 11		
065 / 075	P60 09, 560 09, 555 19	632 SHD PROfessional	SHD PRO 725 03		
068	P70 29	637	640 35, 650 11 High Current		
068 EFB OE	EFB 570 15	637 SHD	SHD 640 35		
068 HD	P80 09	637 SHD PROfessional	SHD PRO 645 03		
069	P70 24	643	590 17*, 610 47		
072	570 72	644	590 18*, 610 48		
075	P60 09, 560 09, 555 19	647	625 11		
075 UR	PRO P63 42	648	625 13		
078	560 08	655	635 11		
082 / 086	572 33	656	635 13		
088	570 88	663	610 47		
089	570 89	663 BH	610 11		
096	P74 12, 572 12	664	610 48		
096 AGM OE	AGM 570 01				
096 Box Premium Leisure	956 01				

JAPANESE PART NO. (JIS)/Banner NO.

JIS No.	Banner No.
J 40 L	P40 26
J 40 LS	P40 26
J 40 RS	P40 27
J 45 L	P45 23
J 45 LS	P45 23
J 45 R	P45 24
J 45 RS	P45 24
J 50 L	P50 41
J 50 R	550 42*
J 60 L	P60 68
J 60 R	P60 69
J 70 L	P70 29, P80 09
J 70 R	P70 24
J 90 L	P95 04
J 90 R	P95 05
LO 7650	P70 24
LO 7651	P70 29, P80 09
LO 7652	P45 24
LO 7653	P95 05
LO 7654	P60 68
LO 7655	P60 69
LO 7656	P60 69
MF36-20GL	P50 41/PRO P50 40
MF36-21GL	P50 41/PRO P50 40
MF48-25GL	AGM 560 01
MF54-26GL	P70 29, P80 09
MF56-28GL	AGM 570 01
MF64-26GL	P70 29, P80 09

PRODUCT VARIATIONS

JAPANESE PART NO. (JIS)/Banner NO.

JIS No.	Banner No.	JIS No.	Banner No.	JIS No.	Banner No.
MF64-31GL	AGM 580 01	NS 40 ZAL	P40 27	55 D 23 L	P60 68
MF72-30FR	P95 05	NS 40 ZAL (S)	P40 27	55 D 23 R	P60 69
MF72-30GL	P95 04	NS 40 ZL	P40 26	55 D 26 L	P70 29, P80 09
N 100	P95 05	NS 40 ZL (S)	P40 26	55 D 26 R	P70 24
N 40	P45 24	NS 60	P45 24	65 D 23 L	P60 68
N 40	P45 24	NS 60 (S)	P45 24	65 D 23 R	P60 69
N 40 L	P45 23	NS 60 L	P45 23	65 D 26 L	P70 29, P80 09
N 40 L	P45 23	NS 60 L (S)	P45 23	65 D 26 R	P70 24
N 50	P70 24	Y 100 S6	P45 23	65 D 31 L	P70 29, P80 09
N 50 L	P70 29, P80 09	12N 24 - 3	530 30	65 D 31 R	P70 24
N 50 Z	P70 24	12N 24 - 4	530 34	70 D 23 L	P60 68
N 50 ZL	P70 29, P80 09	26 A 19 L	530 30	70 D 23 R	P60 69
N 60	P60 69	26 A 19 R	530 34	70 D 26 L	P70 29, P80 09
N 60	P45 24	28 B 19 L	P40 26	70 D 26 R	P70 24
N 60 (S)	P45 24	28 B 19 R	P40 27	70 D 31 L	P95 04
N 60 L	P60 68	32 A 19 L	530 30	70 D 31 R	P95 05
N 60 L	P45 23	32 A 19 R	530 34	75 D 26 L	P70 29, P80 09
N 60 L (S)	P45 23	32 B 20 L	P40 26	75 D 26 R	P70 24
N 70	P95 05	32 B 20 R	P40 27	75 D 31 L	P95 04
N 70 L	P95 04	32 C 24 L	P45 23	75 D 31 R	P95 05
N 70 Z	P95 05	32 C 24 R	P45 24	80 D 26 L	P70 29, P80 09
N 70 ZL	P95 04	34 B 17 L	P40 26	80 D 26R	P70 24
N S 100 S6S	P70 29, P80 09	34 B 17 R	P40 27	85 E 41 L	600 26
N S 70	P70 24	34 B 17 R (S)	P40 27	85 E 41 R	600 35
N T 60 S4	P45 24	34 B 19 L	P40 26	95 D 26 L	P70 29, P80 09
N T 60 SL4	P40 27	34 B 19 L (S)	P40 26	95 D 26 R	P70 24
N T 80 S 6	P40 26	36 B 20 L	P40 26	95 D 31L	P95 04
N T 80 S6LS	P45 23	36 B 20 R	P40 27	95 D 31R	P95 05
N T 80 S6S	P45 24	38 B 19 R	P40 27	95 E 41 L	600 26
N X 100 S6	P45 24	38 B 20 L	P40 26	95 E 41 R	600 35
N X 100 S6L	P45 23	38 B 20 L (S)	P40 26	105 D 31 L	P95 04
N X 100 S6LS	P45 23	38 B 20 R	P40 27	105 D 31 R	P95 05
N X 100 S6S	P45 24	38 B 20 R (S)	P40 27	105 E 41 L	600 26
N X 110 S	P70 24	40 B 19 L	P40 26	105 E 41 R	600 35
N X 110 S L	P70 29, P80 09	40 B 19 R	P40 27	110 D 26 L	P70 29, P80 09
N X 120 7	P70 24	46 B 24 L	P45 23	110 D 26 R	P70 24
N X 120 7L	P95 04	46 B 24 L (S)	P45 23	110 F51	620 34
N X 120 L	P95 04	46 B 24 R	P45 24	115 F51	620 34
N 100	600 35	46 B 24 R (S)	P45 24	115 D 31 L	P95 04
N 100 L	600 26	48 D 26 L	P70 29, P80 09	115 D 31 R	P95 05
N 100 Z	600 35	48 D 26 R	P70 24	130 E 41 L	600 26
N 100 ZL	600 26	50 B 24 L	P45 23	135 G51 R	680 89
N 150	680 89	50 B 24 LS	P45 23	135 G51 L	680 32
N 150 L	680 32	50 B 24 R	P45 24	145 G51 R	680 89
N 200	700 29	50 B 24 R (S)	P45 24	145 G51 L	680 32
N 200 L	725 11	50 D 20 L	P50 41	165 G51 R	680 89
N 120	620 34	50 D 20 R	550 42*	165 G51 L	680 32
NS 40	P40 27	55 B 24 L	P45 23	170 F51 L	680 32
NS 40 L	P40 26	55 B 24 LS	P45 23	180 G61 L	680 32
NS 40 Z	P40 27	55 B 24 R	P45 24	190 H52 R	700 29
NS 40 Z (S)	P40 27	55 B 24 R (S)	P45 24	190 H52 L	725 11
NS 40 ZA	P40 26	55 D 20 L	P50 41	210 H52 L	725 11
NS 40 ZA (S)	P40 26	55 D 20 R	550 42*	245 H52 L	725 11

LAYOUT

	6 Volt	12 Volt		6 Volt	12 Volt
0			5		
1			6		
2			9		
3			10		
4					

TERMINALS

Terminal 1	Terminal 4	Terminal T4	Terminal 8	Terminal 20
Terminal 3	Terminal 5		Terminal 19	Terminal K
				Terminal 21

BASE HOLD-DOWNS

B 00	Without hold-down			B 09		
B 01				B 11		
B 03				B 12		
B 04				B 13		
B 05				B 14		
B 06						
B 07						

INSTRUCTIONS FOR STARTER & ON-BOARD BATTERIES

1. STORAGE AND TRANSPORT

- Store batteries in a dry, light-protected and cool environment (frost-free).
- At the latest, recharge starter batteries in the case of off-load voltage ≤ 12.5 V (see Note 3).
- Banner declares all its conventional starter batteries to be wet and filled with acid in accordance with UN 2794. All recombination batteries (AGM, GEL, VRLA) correspond with UN 2800.
- Wet-filled batteries must be transported in an upright position, as otherwise acid may escape.
- During transportation secure the battery to prevent it falling over or sliding around.
- First in, first out (FIFO) receipt.

2. INSTALLATION AND REMOVAL FROM THE VEHICLE

Only install batteries with an off-load voltage of > 12.5 V.

- Follow the vehicle instructions.
- Switch off the engine and all power consumers prior to installing or removing the battery.
- Avoid short circuits due to tools.
- When removing the battery, first disconnect the negative (-) terminal and then the positive (+) terminal.
- Interruptions to the power supply may result in data loss.

+ **Banner tip.** Before spent batteries are disconnected or removed, without exception we recommend the use of a Memory Saver or a voltage retainer (such as a functional 12V battery or a power booster with an OBD-L adapter cable).

- Prior to installing the battery, clean the battery compartment.
- Ensure that the battery is secured tightly.
- Clean terminals and battery clips and lubricate slightly with acid-free grease.
- When fitting the battery first connect the positive (+) terminal and then the negative (-) terminal. Ensure that the clips are secured.
- Some vehicle batteries are fitted with a hose and an elbow attachment for the discharge of the battery gases. Should this be the case in your vehicle, the hose is to be inserted into the corresponding degassing vent in the battery via the elbow. If a degassing vent exists on the other side, this must be closed with a sealing plug.
- Should you require a replacement sealing plug, or a degassing hose, please contact your local Banner specialist.

3. BATTERY RECHARGING

- Before recharging wet batteries, check the electrolyte level and top up if necessary with de-ionised or distilled water to the acid level mark or 15 mm above the upper edge of the plates at a maximum.

Banner recommends that standard wet batteries be charged outside the vehicle for 24 hours. For the correct charging voltage per battery type, please see the technical data sheet (for every Banner battery, this is integrated into the menu tab "Downloads")

+ **Warning!** Many chargers have a type of recovery mode for deeply discharged Ca/Ca batteries. However, these only maintain a charging voltage of 16 V for a short period.

Running Bull AGM/BackUp. Always recharge with a voltage-controlled charger (max. 14.8 V). The use of a standard charger without voltage control destroys the battery due to overloading and causes the electrolyte to escape

+ **Warning!** Follow the vehicle manufacturer's instructions when disconnecting the terminals.

- Batteries may only be charged with direct current. Connect the positive (+) battery terminal to the positive (+) terminal of the charger, and the negative (-) battery terminal to the negative (-) terminal of the charger.
- Do not switch on the charger until the battery has been connected. First switch off the charger when charging is completed.
- It is recommended that the charging current be equal to at least one tenth of the capacity (e.g. 44 Ah: 10 = 4.4 A charging current).
- The temperature of the acid may not be higher than 55°C during charging. If the temperature exceeds this level, the charging process must be discontinued.
- Charging is finished when the current drops to 0 or stops falling, or if the automatic charger switches off.
- Charging must be performed in a well-ventilated room.
- The battery screws may not be opened.
- Ensure that recharging amounts to 1.2 times the consumed capacity (e.g. Consumed capacity 30 Ah, recharge 36 Ah).

STARTER BATTERY STORAGE AND HANDLING



CAR BATTERY CHANGES



START-STOP BATTERY REGISTRATION



BATTERY DEGASSING



MORE INFO UNDER bannerbatterien.com

INSTRUCTIONS FOR STARTER & ON-BOARD BATTERIES

+ Warning! Oxyhydrogen gas is formed during charging! Fires, sparks, open flames and smoking are strictly prohibited!

Recharging batteries in the vehicle.

As a rule, fully automatic chargers (max. charging voltage 14.8 V) are well suited to the charging of batteries installed in the vehicle.

Should the charger have an automatic mode with > 14.8V voltages, the battery must be separated from the vehicle electrical system or removed from the vehicle. Otherwise, in a worst-case scenario the installed control devices can be destroyed due to overvoltage with huge resultant damage.

Please take careful note of the battery charger type. Useful tips regarding charging in the vehicle are often contained in the operating instructions of the vehicle manufacturer or those of the charger producer..

4. MAINTENANCE

In order to ensure long battery life, the following instructions should be followed:

- Keep the surfaces of the battery clean and dry.
- Check the acid levels regularly and if necessary top up with deionised or distilled water. Never top up with acid. If a substantial water loss occurs, an expert should check the voltage regulator.
- Do not put so-called additives into the battery acid.

+ Warning! Should the off-load voltage fall to ≤ 12.5 V, recharge immediately in order to prevent lasting battery damage.

Running Bull AGM/BackUp. AGM batteries may not be opened. Acid density measurement and topping up with distilled water are neither possible nor necessary.

+ Banner tip. Treat your battery to an extra portion of external recharging using a Banner Accucharger. Ideally, combine this with tyre changes in spring and autumn.

5. ASSISTED STARTING

- In view of the sensitive electronic components in the vehicle, as a rule starting assistance should only be provided by means of a Banner Booster.

CORRECT STARTING ASSISTANCE



BATTERY OVERWINTERING



HEAT TIPS...



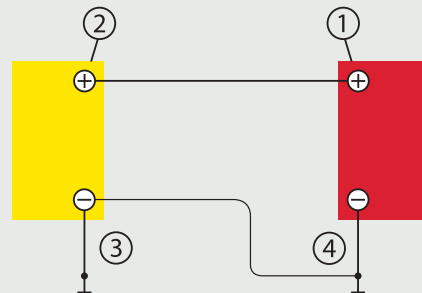
MORE INFO UNDER bannerbatterien.com

- Starting assistance from vehicle to vehicle can lead to voltage peaks during disconnection, which can damage or even destroy vehicle electronic systems.
- Therefore, it is essential that the following procedure be strictly observed when using starter cables!
- Standardised starter cables (e.g. in accordance with DIN 72 553) should always be used for giving starting assistance.
- Observe the instructions for use of the starter cables.
- Only connect batteries with the same nominal voltage..
- **When connecting the terminals, switch off both vehicle engines!**

First connect the two positive terminals (1) with (2). Then connect the negative terminal of the assisting vehicle (3) with (4), the blank metallic point on the vehicle needing assistance, away from the battery. (Observe the instructions of the vehicle manufacturer.)

Battery of the assisting vehicle

Battery of the vehicle requiring assistance



- Now start the vehicle needing assistance for a maximum of 15 seconds. Do not start the assisting vehicle.
- When disconnecting the terminals, remove the cables in the reverse sequence to the above.

6. DECOMMISSIONING

- Charge the battery (see Note 3) and store in a cool dry place.
- Should the battery be left in the vehicle, disconnect the negative terminal.
- Regularly check the off-load voltage (see Note 4).

7. INFLUENCE OF HIGH TEMPERATURES

If batteries are subjected to high temperatures for long periods, this promotes both increased water consumption and grid corrosion. A corroded grid is no longer able to conduct current and therefore the battery fails. Resultant grid growth can also result in battery short circuits.

WARNINGS AND SAFETY RULES FOR LEAD-ACID BATTERIES



Take note of the information on the battery, the instructions for use and the operating instructions of the vehicle.



Wear eye protection.



Keep children away from acid and batteries.



Explosion danger:

- A highly explosive oxyhydrogen gas is emitted during battery charging therefore:



No naked flames, sparks, naked lights or smoking:

- Avoid sparking when handling cables and electronic devices.
- Avoid short circuits.



Chemical burns danger – Acid is highly caustic therefore:

- Wear gloves and eye protection.
- Do not tilt the battery, as acid could spill out from the de-gassing vents.



First Aid:

- If acid splashes into the eyes rinse immediately with clear water for several minutes. Then consult a physician.
- If acid splashes onto the skin or clothes neutralise immediately by using an alkaline solution or soap and rinse with large amounts of water.
- If acid is swallowed consult a physician immediately.



Warning:

- Do not expose batteries to direct sunlight without protection.
- Always store batteries in a frost-free area, as discharged batteries can freeze.



Disposal:

- Hand in used batteries at a collection centre. During transportation take note of the instructions contained in Item 1. Never dispose of old batteries with domestic waste.

LOW-TEMPERATURE TEST CURRENT FOR STARTER BATTERIES ACCORDING TO VARIOUS STANDARDS

Low-temperature test current is a benchmark for the starting capacity of a battery at minus 18°C.

1. DIN (DEUTSCHE INDUSTRIE-NORM) DIN EN 50342

The test is carried out at minus 18°C. Following a discharge with low-temperature current I with an end voltage of 7.5 V, the discharge period should amount to at least 10 seconds. In addition, the battery must fulfil two additional requirements.

The period up to 6V final voltage shall amount to:

After C1:t 6 V \geq 90 seconds

After C2:t 6 V \geq 150 seconds

2. SAE (US STANDARD)

The test is carried out at minus 18°C. With low-temperature current of up to 7.2 V, the discharge period should amount to at least 30 seconds.

$$SEA = \frac{DIN}{2} \times 3 + 40$$

3. IEC (INTERNATIONAL ELECTROTECHNICAL COMMISSION) 95-1

The test is carried out at minus 18°C. Following a discharge with the lowtemperature current (I_{cc}) after 60 seconds the voltage should amount to at least 8.4 V.

$$IEC = \frac{DIN}{0.85}$$

RESERVE CAPACITY

Following dynamo failure, reserve capacity represents the num-

ber of minutes during which a battery can supply power until the next repair shop can be reached. However, this figure is dependent upon the consumers in the vehicle.

IEC envisages the following test: discharge with 25 A down to an end voltage of 10.5 V at a temperature of 27°C.

$$\text{Measured time in minutes} = \text{reserve capacity}$$

4. EN (EUROPA-NORM) DIN EN 50342

The test is carried out at minus 18°C. Following a discharge with the low-temperature current I with an end voltage of 7.5 V, the discharge period should amount to at least 10 seconds.

In addition, the battery must fulfil two additional requirements.

The period up to 6 V final voltage shall amount to:

After C1:t 6 V \geq 90 seconds

After C2:t 6 V \geq 150 seconds

$$\begin{aligned} EN(C_1) &= \frac{IEC}{0.6} & IEC &= \frac{DIN}{0.85} \\ EN(C_2) &= \frac{DIN}{0.6} & EN(C_1) &= \frac{DIN}{0.6 \times 0.85} = \frac{DIN}{0.51} \end{aligned}$$

As the prescribed graduations are defined in the EN, the currents are to be adjusted by rounding up or down:

- < 200 A – Level 10 A
- 200 – 300 A – Level 20 A (220, 240, 260, 280 A)
- 300 – 600 A – Level 30 A (330, 360, 390, 420, 450, 480, 510, 540, 570 A)
- 600 – 800 A – Level 40 A (640, 680, 720, 760 A)
- > 800 A – Level 50 A

Banner KNOW-HOW – THE INFO PLATFORM FOR MORE POWER.

Banner offers an informative and up-to-date information platform, which covers the most important subjects relating to the world of batteries.

SIX CURRENT MENU ITEMS:

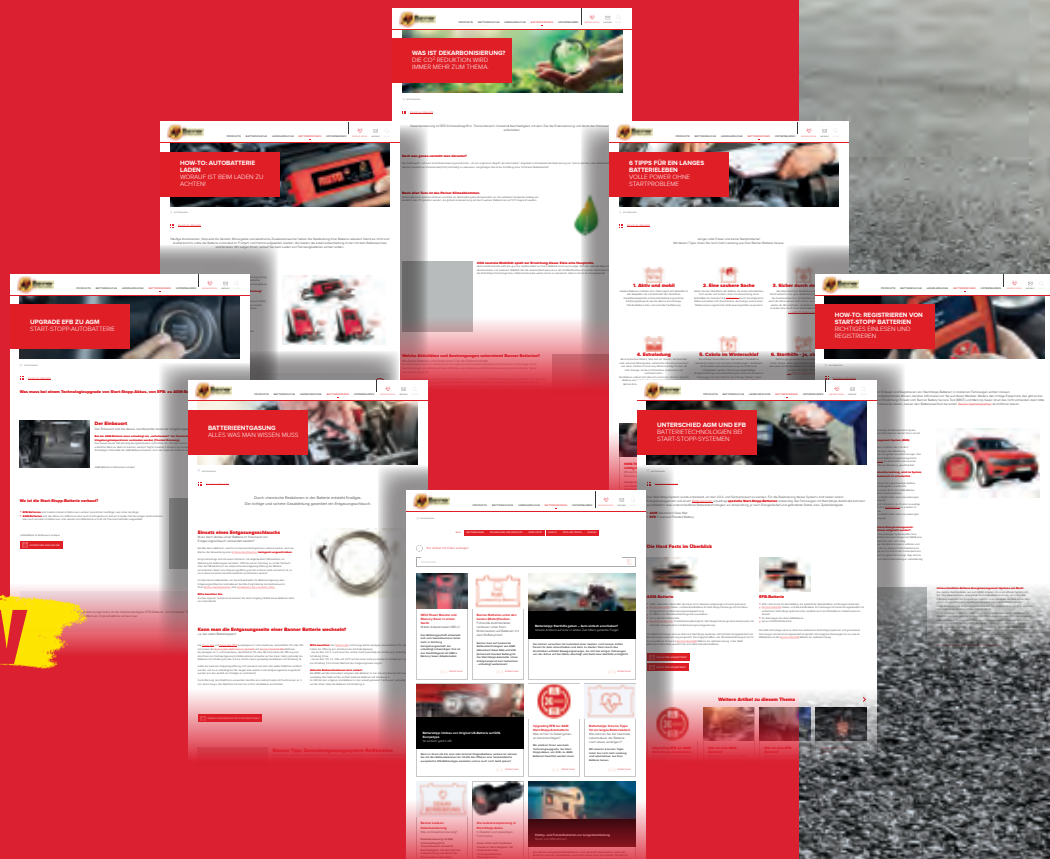
- Battery know-how
- Technologies and products
- Start-stop
- HOW-TO
- Tips and tricks
- Lexicon

This battery know-how is constantly updated and expanded to include interesting topics and is already one of the most comprehensive information platforms in the industry. Its main premises are user-friendly design, simple and fast function!

Banner sales partners will find an inexhaustible source of topics for their own information and inspiration, professional customer advice and a multitude of marketing activities such as newsletters and much more besides. Indeed, irrespective of whether you are a parts retailer, workshop, commercial end user, mechanic or automotive engineer, anyone can make proactive use of this information system!

SO CLICK ON AND TEST THE SYSTEM RIGHT AWAY!

NEW





**Banner
BATTERY KNOW-HOW**



**BATTERY DEGASSING
TIPS**



**THE DIFFERENCES
BETWEEN AGM & EFB
BATTERIES**



**UPGRADING AN EFB
INTO AN AGM BATTERY**



**START-STOP BATTERY
REGISTRATION**



**CORRECT CAR
BATTERY CHARGING**



**TIPS FOR LONG
BATTERY LIFE**



**Banner
DECARBONISATION
LEXICON**



MORE INFO UNDER
bannerbatterien.com

Banner BATTERY SEARCHES - QUICK, EFFICIENT AND SIMPLE.



AS OF NOW, Banner IS USING THE AVAILABLE DVSE TOPMOTIVE VEHICLE MASTERS IN ITS ONLINE BATTERY SEARCH. These relate to all the passenger vehicle applications, i.e. cars, commercial vehicles and motorbikes. For all other applications, without DVSE Topmotive vehicle masters, the updating of the company's own Excel vehicle masters, e.g. for agricultural and construction machinery, ATV quads and much more besides, will continue.

The Banner battery search is available for online call-up at <https://www.bannerbatterien.com/en/Battery-search>. The aim is to name the best Banner battery for you quickly and easily. Initially, in the form of the most popular type and then, wherever feasible and sensible, with a possible upgrade option. The database is constantly updated in cooperation with battery experts and selected workshops with the goal of making your daily work simpler and more efficient.



WITH THE NEW NUMBER SEARCH we offer our distribution partners an additional service. Here a start with an OE = Original Equipment or Original Spare Part number search is possible. For example, the OE number VW/Audi 000 915 105 CF, can be read on the top label of the original battery = Banner Running Bull AGM 605 01/016605010101. At the moment, more than 3,400 such numbers are recorded here and more are being added every day.



THE SEARCH ON THE APPROVAL CERTIFICATE will give you a result according to the following selections 1. Manufacturer, 2. Model, 3. Fuel type, 4. Engine (type). Further possible search options are undergoing clarification (design, kW/hp, ...).



THE KBA NUMBER SEARCH FOR GERMANY. The KBA number is a unique code under which the vehicle type is registered with the Federal Motor Transport Authority. By searching using the KBA number, you can be sure that exactly the right vehicle is selected. The KBA number is comprised of two parts consisting of the HSN manufacturer key number (four-digit numeric) and the TSN type code number (eight-digit alphanumeric). The first three digits stand for the model and are therefore relevant for the search. You will find the KBA number in the vehicle/registration certificate in the fields 2. or 2.1 and 3. or 2.2.

CHANGING A BATTERY IS NO LONGER AN EASY TASK. Complexity and variety mainly constitute the overall spare parts management challenge. Primarily, it is the diversity of models and the wealth of variants within individual car series that make precise battery identification and ordering difficult.

A typical issue in this connection is vehicle and part identification and the objective of making this easier and more effective. Fewer incorrect orders and lower return rates reduce costs for workshops and retailers. In addition, repair appointments can be better calculated and more reliably kept, which therewith increases customer satisfaction. This is important because in the European parts market the return rate of ordered parts, including batteries, due to insufficient identification is still around 10 to 15 %! In fact, finding the appropriate starter or electrical on-board and dealing with the changes between EFB and AGM technology for start-stop batteries in the same year of manufacture, constitute a genuine challenges!

SPECIFICALLY FOR YOU, AS THE PLATFORM FOR BATTERY IDENTIFICATION AND PROFESSIONAL BATTERY BUSINESS, THE Banner BUFFALO WILL BE CONSTANTLY UPDATED AND FURTHER DEVELOPED FOR ONLINE BATTERY SEARCHES!

PS: Further search options and possibilities for various European countries are currently being clarified (e.g. national codes, number plate searches, Vehicle Identification No. (VIN) searches -, ...).

**Banner
BATTERY SEARCHES**



**MORE INFO UNDER
[bannerbatterien.com](https://www.bannerbatterien.com)**



ROBUST & RELIABLE ACCESSORIES.

READY AT ANYTIME. "Trust is good, control is better!" is a well-known truism. Accordingly, Banner accessories provide professional certainty regarding the status of every battery, as well as facilitating maintenance, completing charging, or assisting starts. Banner's comprehensive programme contains chargers, start boosters, test and battery service items. The entire Banner range of accessories is trimmed to the retention of the optimum performance and long service life of starter and special batteries.

Banner

THE POWER COMPANY



BATTERY TIPS



MORE INFO UNDER
bannerbatterien.com

ACCESSORIES

CORRECT CAR BATTERY CHARGING



BATTERY OVERWINTERING



CAR BATTERY CHANGES



MORE INFO UNDER
bannerbatterien.com

CHARGERS FOR CONSTANT FULL POWER.

Available for all types of batteries and in a range of versions, Banner chargers leave no wish unanswered. From a favourably priced model for first-time buyers to a professional standard device, Banner chargers always ensure that any battery is optimally charged. Ideal systems are also on offer for the retention of car and motorcycle battery charge levels during overwintering.



START BOOSTERS FOR POWER JUST IN CASE.

What does one do, when suddenly nothing functions? Banner boosters supply mobile power anytime and anywhere, even for power tools. These portable starting devices are quick and simple to use. Moreover, thanks to maximum power, first class quality, a solid housing and technical details such as reverse polarity protection and fully insulated brass clamps with a practical LED work light, are good enough for any professional under the toughest conditions.

CORRECT STARTING ASSISTANCE

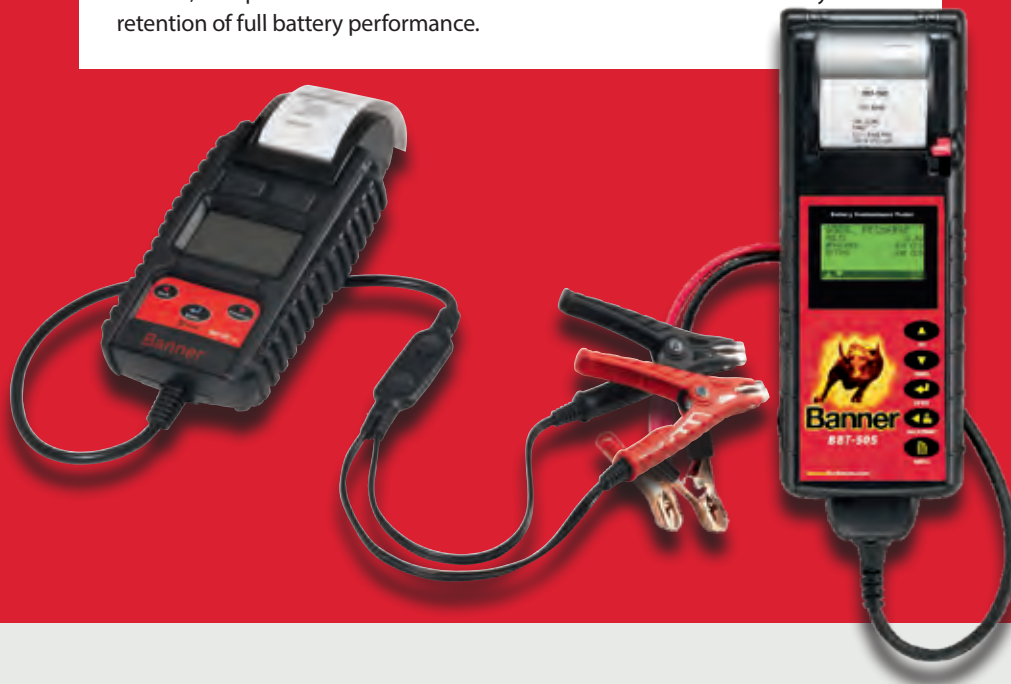


MORE INFO UNDER
bannerbatterien.com



TESTING AND CHECKING DEVICES FOR EXTENDED SERVICE LIFE.

A battery provides a constant supply of energy when it is kept in an optimum condition. Using Banner testing and checking devices, one can assess the battery charge status, the voltage, the battery acid level and much more besides. As a result, it is possible to determine if and what measures are necessary for the retention of full battery performance.



BATTERY TESTING



CORRECT START-STOP BATTERY REGISTRATION



MORE INFO UNDER bannerbatterien.com

SERVICING DEVICES FOR OPTIMUM BATTERY CARE.

The range of Banner servicing aids extends from protective terminal sprays, to connecting cables and battery equalisers. In other words, everything that is needed for perfect battery maintenance and servicing. This also provides a decisive plus with regard to safety, owing to discharge protection, fire prevention and safeguards against unauthorised use.



USE OF BATTERY CLAMPS



MORE INFO UNDER bannerbatterien.com

Banner ACCUCHARGER CHARGERS FOR PROFESSIONALS.

These devices facilitate the charging of conventional starter batteries without disconnecting the vehicle's electrical system and are especially suitable for cars, commercial vehicles, veteran cars and boats. Accuchargers offer automatic charging with an IUoU characteristic, buffer charging, back-up operation and retention charging, and are therefore an ideal tool for any workshop.

Banner PROFICHARGER THE FLEXIBLE WORKSHOP PROFESSIONAL.

Rated voltage from 12 to 120V, adjustable setting with three different characteristics. Solid steel sheet design with four robust roller legs. Automatic checks / fault display / reverse polarity protection, LCD display, operational status display and main charging time surveillance.

Suitable for: standard, start-stop (EFB, AGM), GEL.

Voltage: 400V AC

Rated voltage: 12 / 24 / 36 / 48 / 80 / 120V

Charging voltage: 2 - 144V

Charging current: max. 30 A

Charging characteristic: Ia, IUa, IUoU

Dimensions: 500 x 700 x 360 mm

Art. No.: 1200006000



Banner PRO 25A ACCUCHARGER THE PROFESSIONAL CHARGER.

A fully automatic battery charging system with special 16V refresh mode for deeply discharged batteries. A large graphic display offers simple operation and clear readings. Automatic charging and buffering of parallel consumers. Flash operation supplies the vehicle during diagnosis and software updates. A support function and power adapter mode are included. IUoU / IU, charging characteristic. Robust design with maximum safety features.

Suitable for: 6/12/24V standard, start-stop (EFB, AGM), GEL batteries up to 250Ah.

Ideal for: workshops and emergency vehicles.

Battery capacity: 3-250Ah

Charging current: max. 25A

Charging characteristic: IUoU / IU

Art. No.: 1232403025



Banner PROF. 35A ACCUCHARGER THE DEVICE FOR WORKSHOP SPECIALISTS.

An intelligent battery charging system in a robust aluminium housing with simple user guidance by means of an animated graphics display. Fully automatic charging and user mode for the individual setting of charging parameters. Constant voltage for diagnosis and software flashes. Including 16V refresh mode for deep discharged battery and support operation function. Maximum electrical and thermal protection. Suitable for 6/12/24V wet, AGM, Ca/Ca, start/stop and GEL batteries.

Suitable for: 6/12/24V standard, start-stop (EFB, AGM), GEL.

Battery capacity: 3-350Ah

Charging current: bis 35A

Ladekennlinie: IUoU / IU

Art. No.: 1232403035



Banner PRO 100A ACCUCHARGER PROFESSIONAL 12V CHARGER WITH FLASH MODE.

An extremely powerful device, which guarantees the perfect charging of even very large batteries. The latest charging program offers a choice between fully automatic and manual setting, while a special flash mode for software updates provides constant voltage for current of up to 100A. A large LED display shows current and voltage readings. Maximum safety features, robust aluminium design and simple handling. Ideal for professional workshops and service centres.

Suitable for: standard, start-stop (EFB, AGM), GEL.
Charging current: max. 100A (3 min) / 70A constant
Charging voltage: max. 14.8V
Art. No.: 1240005100



Banner 4X5A MULTICHARGER FULLY-AUTOMATIC QUADRUPLE CHARGER FOR 12V BATTERIES.

This charger offers the very latest, charging technology, maximum safety and the simplest possible operation. LED display with a charge status indicator at each outlet. Ideal for therecharging of stored batteries in outlets or workshops and secure charge retention for several batteries over a number of months.

Charging current: 5A per outlet
Charging voltage: max. 14.7V.
Suitable for: 12V standard, start-stop (EFB, AGM), GEL.
Art. No.: 1240004500



Banner 2A ACCUCHARGER FULLY AUTOMATIC 6/12V CHARGER.

The very latest, microprocessor-controlled technology guarantees first class battery charging, maximum safety and very simple operation. Charge levels are shown per LED display. Ideal for charging motorcycle and vehicle batteries, as well as safe charge retention. Including mounting hooks and an extensive range of accessories

Charging current: 2A
Charging voltage: max. 14.7V.
Suitable for: 6/12V standard, start-stop (EFB, AGM), GEL.
Art. No.: 1240000020



Banner 3A ACCUCHARGER THE PERFECT ALL-ROUNDER.

Fully automated, 8-stage charging with automatic charge retention. LED text display with information and instructions in English, German and French. Extremely easy operation and maximum safety. Including mounting hooks and an extensive range of accessories.

Charging current: 3A
Charging voltage: max. 14.7V.
Suitable for: 12V standard, start-stop (EFB, AGM), GEL.
Art. No.: 1240000030



Banner ACCUCHARGER CHARGERS FOR PROFESSIONALS.

Banner 6A RECOVERY ACCUCHARGER THE UNIVERSAL CHARGING DEVICE.

Fully automatic 8-step charging with automatic charge retention and special recovery mode for deeply discharged batteries. Animated LED text display with instructions and information in English, German and French. The latest technology for maximum safety and operational simplicity. An extensive range of accessories including mounting hooks and eyelet adapter.

Charging current: 6A

Charging voltage: max. 14.7V (Recovery Mode 15.8V)

Suitable for: 12V standard, start-stop (EFB, AGM), GEL

Art. No.: 1240000260



Banner ACCUCHARGER 10A RECOVERY INCL. RECOVERY MODE FOR DEEP DISCHARGED BATTERIES.

An automatic 10A charger with a special recovery charging program for deep discharged batteries. Animated LED text display in English, German and French. The highest safety standards and simplest handling for perfect charging, as well as mounting hooks and an extensive range of accessories.

Charging current: 10A

Charging voltage: max. 14.7V (Recovery Mode 15.8V)

Suitable for: 12V standard, start-stop (EFB, AGM), GEL

Art. No.: 1240000212



Banner 10A/24V ACCUCHARGER PERFECT FOR TRANSPORTERS AND TRUCKS.

Fully automatic 24V charger for the perfect charging of large batteries. The very latest charging program in combination with maximum safety features and extremely easy operation. Animated LED text display in English, German and French. Including mounting hooks and an extensive range of accessories.

Charging current: 10A

Suitable for: 24V standard, start-stop (EFB, AGM), GEL

Art. No.: 1240000124



Banner ACCUCHARGER ACCESSORIES.

Banner ACCUCHARGER WALL BRACKET FOR ACCUCHARGER DEVICES.

A robust holder for mounting on a wall or lifting platform, or in the service area. Safe and functional anchorage of both the charger and cable. Made from solid plastic and fittings are included.

Suitable for: 6A, 10A and 10A/24V Accuchargers.
Art. No.: 1240000605 for 6A/10A-12V Accuchargers
Art. No.: 1240000606 for 10A-24V Accuchargers



Banner BBC 12 Battery Controller THE BATTERY CONTROLLER WITH QUICK CHARGE CONNECTOR IS THE IDEAL CHARGING STATUS INDICATOR.

Ideal for batteries that are difficult to reach and as a comfort display in the engine compartment. The easy-to-read, multicolour LED display provides information regarding the charging status of the battery and warns of weak battery voltage (flashing red LED). The BBC12 convinces with the latest electronics, extremely simple installation and maximum safety derived from reverse polarity protection. M8 fused eyelet connection (6.7 mm), 600 mm cable.

Suitable for: cars and motorcycles with 12V wet, AGM and GEL batteries.
Charging connection: suitable for: all Banner 12V Accucharger devices.
Art. No.: 1240000612



Banner BBC 24 BATTERY CONTROLLER THE BATTERY CONTROLLER WITH QUICK CHARGE CONNECTOR IS THE IDEAL CHARGING STATUS INDICATOR.

This device is perfect for 24V batteries that are difficult to reach, or as a comfort indicator in the engine compartment. The easy-to-read, multicolour LED display provides information regarding the charging status of the battery and warns of weak battery voltage (flashing red LED). The BBC24 convinces with the latest electronics, extremely simple installation and maximum safety derived from reverse polarity protection. M10 fused eyelet connection (8.4 mm), 120 cm cable.

Suitable for: trucks, buses and construction machinery with 24V wet, AGM and GEL batteries
Charging connection: fits directly into all Banner 24V Accuchargers
Art. No.: 1240000624



Banner EX3 ACCUCHARGER EXTENSION CABLE INCREASED RANGE FOR YOUR ACCUCHARGER.

The top quality EX3 extension cable allows the use of the Accucharger even at greater distances away from your vehicle's battery.

Passend für: all Banner Accuchargers and has a length of 3 m.
Art. No.: 1240000607



Banner STARTING AIDS FOR PROFESSIONALS.

Banner start boosters are fitted with special exchangeable AGM high-current batteries and are ideal for cars, trucks and construction machinery. They even provide reliable assistance in arctic temperatures.

P3 PROFESSIONAL EVO MAX START BOOSTER PROFI 12V BOOSTER FOR ALL STANDARD VEHICLES.

A powerful booster for standard cars and trucks. Possesses a switchable energy supply that can also be used for mobile devices such as electrical tools (230 V devices possible with converter). Solid design for professional use, simple and safe handling, including reverse polarity protection with optical and acoustic warnings. Large LED display, robust design, fully insulated brass tongs with integrated fuse. Including a 25 Ah AGM HD battery.

Starting current: 1,170 A

Peak current: 3,100 A

Suitable for: 12V standard, start-stop (EFB, AGM), GEL

Art. No.: 1220000713



P12/24 START TRUCK EVO START BOOSTER 12V AND 24V BOOSTER FOR PROFESSIONAL USE.

An optimised, powerful booster for all standard cars and trucks. Solid design for simple and safe handling, and including reverse polarity protection with optical and acoustic warnings. Can also be used to supply for mobile devices such as electrical tools with power (230 V devices possible with converter). Large LED display, robust design, fully insulated brass tongs with integrated fuse. Including a 25 Ah AGM HD battery.

Starting current: 2,340/1,170 A

Peak current: 6,200/3,100 A

Suitable for: 12/24V standard, start-stop (EFB, AGM), GEL

Art. No.: 1220000322



Banner PB12 POWER BOOSTER

The performance-enhanced PB12 power booster in Banner design has a high-performance AGM battery for all standard vehicles. A 12V DC output provides DC voltage for battery charging from external devices. A 2.1A USB output allows the charging of smartphones, tablets and electronic devices. The device's solid design is ideal for professional use and offers easy and safe handling including reverse polarity protection with an audible warning. The PB 12 has market exclusivity in Europe and the LED work light at the tip of the negative clamp makes working in the dark easier.

Battery: 23Ah high-performance AGM battery, exchangeable, Banner design

Starting current: 900 A

Peak current: 2,300 A

Suitable for: 12V standard, start-stop (EFB, AGM), GEL

Art. No.: 1220000912



Banner PB12/24 POWER BOOSTER

The performance-enhanced PB12/24 power booster in Banner design has two high-performance AGM batteries for cars, trucks and commercial vehicles with 12V or 24V systems. A 12V DC output provides DC voltage for battery charging from external devices. 2.1 A USB output allows the charging of smartphones, tablets and electronic devices. The device's solid design is ideal for professional use and offers easy and safe handling including reverse polarity protection with an audible warning. The PB 12/24 has market exclusivity in Europe and the LED work light at the tip of the negative clamp makes working in the dark easier.

Battery: 2x23Ah high-performance AGM batteries, exchangeable, Banner design

Starting current: 1,800/900 A

Peak current: 4,600/2,300 A

Suitable for: 12/24V standard, start-stop (EFB, AGM), GEL

Art. No.: 1220000924



OBD-L MEMORY SAVER ADAPTER PREVENTS THE LOSS OF VEHICLE DATA

A handy and compact voltage maintenance device. Always connect it to the OBD interface (OBD II) before replacing the battery. Easy to operate without the loss of vehicle data. The OBD-L adapter is a useful addition to the two Banner PB12 und PB12/24 power boosters. In principle, it is compatible with any power source that has a cigarette lighter socket.

Art.No.: 1030003100



Banner BATTERY TESTER THE CERTAINTY DERIVED FROM CONTROL.

Load, measure and test! Using Banner testers, batteries can be checked quickly and easily.

Banner BBST 2.0 BATTERY SERVICE TOOL THE PERFECT TOOL FOR BATTERY EXCHANGES.

Configuration of the battery in vehicles with battery management systems. Integrated battery finder for the identification of the suitable replacement battery. Read out and erasure of the standard and special manufacturer fault codes. In-vehicle, battery/charging system test. Self-explanatory menu guidance using the symbols on the display. Battery change and new battery teach-in within minutes. Support of the vehicle's electrical system during battery substitution. Free software updates for 12 months.

Art. No.: 1210005000



Banner BBT 505 BATTERY TESTER THE IDEAL TOOL FOR RETAILERS AND WORKSHOPS

With the new and compact BBT 505, motorcycle, car and commercial vehicle batteries can be tested in a matter of seconds. The battery's open-circuit voltage is displayed as soon as it is connected and the user is guided easily and comprehensibly through the selection menu. This tester allows the optimum and accurate rapid diagnosis of new and used batteries.

Suitable for: 6/12V - standard, start-stop (EFB, AGM), GEL

Testing range: 100 - 1500 EN

Art.No.: 1210000505



Banner BBT HD1+ BATTERY TESTER HEAVY DUTY BATTERY TESTER INCLUDING PRINTER

The ideal tool for measuring motorcycle, car and truck batteries. Solidly built and incorporating 12V and 24V battery charging system test. Simple operation, high precision and possibility for immediate, measurement result print-out. **NEW!** Inner resistance measurement, colour display and stronger clamps. Operation in German, English, French, Italian, Czech, Spanish, Portuguese and Russian. Software for measurement result logging is included in the PC.

Suitable for: 6/12V standard, start-stop (EFB, AGM), GEL

Art. No.: 1210000291



Banner BATTERY TESTER

THE CERTAINTY DERIVED FROM CONTROL.

Banner BBT DBA DIGITAL BATTERY ANALYZER

THE QUICK TESTER FOR 12V BATTERIES.

Tests battery voltage and cold cranking amps (CCA) from 90 to 1,125A EN. Including a vehicle charging system test, large display and simple operation. An LED (green/yellow/red) shows the battery status immediately.

Suitable for: 12V standard, start-stop (EFB, AGM), GEL
Art.No.: 1210000131



Banner BBT DV1 DIGITAL VOLTMETER

VOLTMETER FOR VEHICLE BATTERY TESTING.

An easy to use voltmeter for the measurement of voltages in 6/12V batteries. Easy to read LCD display and high precision. Complete with result evaluation table. Including reverse polarity and overvoltage protection.

Suitable for: 6/12V standard, start-stop (EFB, AGM), GEL
Art.No.: 1210000121



Banner BBT LED TESTER

12V BATTERY AND CHARGING SYSTEM TESTER.

A handy device for measuring vehicle battery voltage, start performance and charging systems. 18 x LED display, microprocessor-controlled measurement for immediate results. Reverse polarity protection, insulated clamps, IP65.

Suitable for: 12V standard, start-stop (EFB, AGM), GEL
Art.No.: 1210000111



12V 420A LOAD TESTER

BATTERY LOAD TESTER FOR PRECISE RESULTS.

Testing device for the measurement of capacity and cold start current values. With LED digital display and USB/RS232 interface for the processing and print-out of test results on a PC. RC test (25A, 10.5V end-point discharge voltage), K20 test, parallel linkage with up to four devices. Discharge current: 1-420A, discharge duration: 1-60 sec. Discharge end point -U: 8.4 / 9 / 9.4 / 10 / 10.5 / 11V, interface: USB / RS232

Dimensions: 260 mm x 220 mm x 270 mm
Suitable for: 12V standard, start-stop (EFB, AGM), GEL
Art.No.: 1240001800



Banner BATTERY TESTER

THE CERTAINTY DERIVED FROM CONTROL.

MILTON BATTERY TESTER

TEST RESULTS AFTER ONLY 10 SECONDS.

Car and motorcycle battery analyses using capacity testing (up to 100Ah). Tests the voltage of the starter and charging systems.

Suitable for: 12V standard, start-stop (EFB, AGM), GEL
Art. No.: 1210000200

6/12V
100A



MILTON DIGITAL BATTERY TESTER

TEST RESULTS AFTER ONLY 10 SECONDS.

LED display, temperature equalisation, car and motorcycle battery analyses using capacity testing (up to 100Ah). Tests the voltage of the starter and charging systems.

Suitable for: 12V standard, start-stop (EFB, AGM), GEL
Art. No.: 1210000225

6/12V
100A



BATTERY TESTER 500A2

LOAD TESTER UP TO 500 AMPERE.

Tests 12V batteries, starters and dynamos. Two displays for current and voltage. Battery testing up to 1000 CCA. Fully insulated battery clamps with copper inserts.

Suitable for: 12V standard, start-stop (EFB, AGM), GEL
Art. No.: 1210000230

12V/
500A

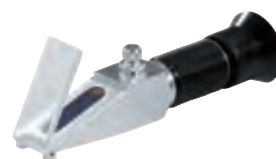


REFRACTOMETER

ACID TESTER.

Optical measurement device for battery acid, coolant and anti-frost, windscreen cleaning agents. Easy-to-read scale, acid-resistant design.

Dimensions: approx. 17 x 4 x 4 cm
Art. No.: 1210000900



AREOMETER

ACID TESTER.

Areometer for acid density measurement. Safe and fast read-offs. 160 mm, bulbous glass body. Colour and numerical scales from 1.10 to 1.30

Art. No.: 1030001400



Banner SERVICE PRODUCTS FOR LONG BATTERY LIFE.

Everything that one needs for the optimum care and maintenance of Banner batteries.

DEGASSING HOSE + ELBOW

Degassing hose of the safe degassing of batteries installed in vehicle interiors.

Hose length: 90 cm including elbow

Art. No.: 1030001700



Banner TERMINAL PROTECTION SPRAY

For the care of battery terminals and clamps. The terminal spray provides lasting and effective protection against corrosion, thereby guaranteeing a good, uniform current flow. Gas-tight connection of the battery terminals and clamps.

Contents: 400ml

Art. No.: 1000000110



Banner TERMINAL GREASE

For the protection of battery clamps. Prevents the formation of corrosion and transfer resistance.

Contents: 1kg

Art. No.: 1000000200



Banner NEUTRALON SPRAY

Neutralises spilt battery acid. Neutralisation shown by means of a colour indicator. Suitable for paints, rubber, cables, plastics, metals and textiles.

Contents: 1000ml

Art. No.: 1010001200



Banner SERVICE PRODUCTS – FOR LONG BATTERY LIFE.

US 3/8" SIDE TERMINAL ON A DIN TERMINAL

Adapter with a 3/8" winding on a DIN terminal
For 56010 Starting Bull.

US 3/8" side terminal on a DIN terminal +
Art. No.: 1020000500

US 3/8" side terminal on a DIN terminal -
Art. No.: 1020000600



FORD BATTERY CLAMPS +/-

Battery clamps for Ford. Set +/-:
Art. No.: 1020001200



THIN DIN TERMINAL SLEEVES

Thin DIN terminal sleeves. For Power Bull P4025, P4026, P4027, Running Bull EFB 53815.

Thin DIN terminal sleeves+
Art. No.: 1020001300

Thin DIN terminal sleeves-
Art. No.: 1020001400



BATTERY CLAMPS FOR THIN TERMINALS

Suitable for Power Bull P4025, P4026, P4027, Running Bull EFB 53815.

Terminal-: 11.2 mm
Art. No.: 1020001700

Terminal+: 12.8 mm
Art. No.: 1020001800



STANDARD BATTERY CLAMPS

Standard negative terminal-, ø 15.9 mm
Art. No.: 1020001900

Standard negative terminal+, ø 17.5 mm
Art. No.: 1020002000



US VEHICLE BATTERY CLAMPS

Suitable for: various US vehicles-: 15.9 mm
Art. No.: 1020001100

Suitable for: various US vehicles+: 17.5 mm
Art. No.: 1020002100



Banner SERVICE PRODUCTS – FOR LONG BATTERY LIFE.

QUICK BATTERY CLAMPS

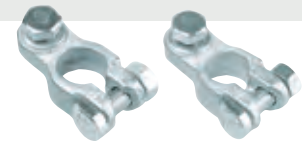
Quick Power-: 15.9 mm including blue plastic cover
Suitable for: cable cross-sections of up to 50 mm²
Art. No.: 1020002200



Quick Power+: 17.5 mm including blue plastic cover
Suitable for: cable cross-sections of up to 50 mm²
Art. No.: 1020002300

PEUGEOT BATTERY CLAMPS

Suitable for: lead-coated and suitable for various Peugeot cars +: 17.5 mm
Art. No.: 1020002500



Suitable for: lead-coated and suitable for various Peugeot cars -: 15.9 mm
Art. No.: 1020002400

DIGATRON VERTICAL CONNECTING CABLE

Suitable for conical DIN and Ford terminals. A highly flexible, PVC-insulated copper cable with short circuit protection, simple handling and insulated clamps.

Resistance: 600V

Constant current: up to 60 A

Cable: 45 cm

Cable cross-section: 10 mm².

Art. No.: 1030000901



Banner TERMINAL BRUSH

For the professional cleaning of battery terminals.

Art. No.: 1030001500



BATTERY STOPPER KEY

For the opening of battery stoppers.

Suitable for: all standard batteries.

Art. No.: 1030001600



WATER REFILL BOTTLE WITH NOZZLE

Manufactured in special acid-, oil- and solvent-resistant plastic. The nozzle in the bottle neck stops the flow of water as soon as the right level is exactly reached.

Contents: 2 L

Art. No.: 1040000400



ENERGY SOLUTIONS. FOR THE TRACTION, SEMI-TRACTION AND STAND-BY FIELD.

RECHARGEABLE "POWER PLANTS". Banner Energy Solutions batteries are reliable and strong power packs that are suitable for all traction, semi-traction and stand-by tasks. Their uses range from electric forklifts, aerial lifts, self-propelled transport systems, golf carts, security, emergency power, signalling and renewable energy, to electric wheelchairs and camping/boat/caravan applications. Banner markets these special batteries as the Traction Bull, Standby Bull and Traction Bull Bloc in wet, AGM and gel versions, thereby always guaranteeing the optimum battery for the specific use. Professional chargers and a comprehensive range of accessories/spare parts make Banner Energy Solutions batteries reliable partners.





Banner

THE POWER COMPANY



Communications systems and telecommunications



Emergency power generators



Explosion protection



Golf carts



AGVs



Small stackers



Cleaning machines



Forklifts



Lifting platforms



Haulers



TRACTION BULL – THE DRIVING FORCE.

RELIABLE, LONG SERVICE LIFE. Traction Bull batteries are ideal for stackers, skids, baggage tractors and other e-vehicles. These high-output power packs are manufactured using two technical systems. The Traction Bull Nass (Wet) employs liquid electrolyte, while Traction Bull Gel uses maintenance-free gel technology. Both battery types are utilised wherever long service life, maximum reliability, top performance and cyclical resistance are required.



Banner

THE POWER COMPANY



AGVs



Small stackers



Cleaning machines



Forklifts



Lifting platforms



Haulers

TRACTION BULL NASS (WET)

OPTIMUM COST EFFICIENCY UNDER HIGH CYCLICAL LOADS.

The Banner Traction Bull PzS/PzB is a lead-acid battery containing liquid electrolyte. This battery is used wherever extensive service life, great reliability and cyclical resistance are needed. PzS batteries are recognised generally as the most cost-efficient and best-proven solution for electrical storage in AGVs, skids and other e-vehicles with high energetic and cyclical requirements.

TECHNICAL DATA AND INFORMATION

- Robust lead-acid technology battery with liquid electrolyte
- Proven tubular plate technology for high performance and reliability
- Top design, material and processing standards (EN 60254-2, IEC 254-2)
- High cyclical resistance

DESIGN

- Positive tubular plates
- High capacity for running times and long battery life
- High energy density
- Fully insulated terminals and connectors
- Electrolyte-tight terminals
- Insulated, maintenance-free terminal screws

APPLICATIONS

- Skids
- Cleaning machines
- Lifting platforms
- Special applications (AGVs, skids)
- Etc.

OPTION: FILLING SYSTEM

In order to replace the water used during electrolysis automatically, Banner Traction Bull batteries can be fitted with a filling system, which guarantees quick, safe and clean refills. This filling system reduces the maintenance requirement and prolongs battery service life.

OPTION: ELECTROLYTE CIRCULATION

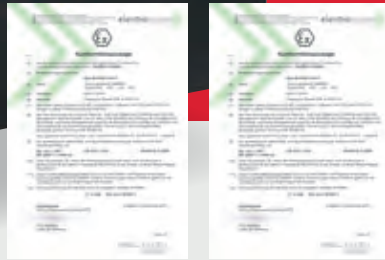
In the case of extreme loads, a pump module ensures homogenous mixing during charging. This prevents electrolyte and temperature stratification, which in practice results in a 20 per cent cut in the energy requirement, charging time reductions of up to 30 per cent and a lowering of water consumption by as much as 80 per cent.





TRACTION BULL EX – FOR EXPLOSION SAFETY.

Traction Bull ATEX batteries are the solution for the drive systems of forklift trucks in areas subject to the danger of explosion. The new drive battery series possesses special accreditation for use in the 1-2 (gas) and 21-22 (dust) zones.



TRACTION BULL GEL – OPERATIONAL RELIABILITY AND MAINTENANCE-FREE.



The Banner Traction Bull PzV/PzVB is a maintenance-free, gel technology drive battery, which is used wherever long service life, great reliability, high performance and cyclical resistance are required. PzV batteries are ideal for forklifts, e-vehicles, diesel-powered vehicles, cleaning and sweeping machines and AGVs. Due to its high levels of operational safety, this series is especially suitable for applications in the foods, pharmaceutical and chemicals industries.

TECHNICAL DATA AND INFORMATION

- Zero maintenance (no topping up with water during the battery's entire service life)
- Proven tubular plate technology for high performance and reliability
- Top design, material and processing standards (EN 60254-2, IEC 254-2)
- High cyclical resistance
- Solid electrolyte as a safeguard against leaks
- Very low self-discharge
- Minimum gassing during operation

DESIGN

- Positive tubular plates
- High capacity for long running times and extended battery life.
- High energy density.
- Fully insulated terminals and connectors.
- Electrolyte-tight terminal design.
- Insulated, zero-maintenance terminal screws

APPLICATIONS

- Industrial trucks
- Cleaning machines
- Lifting platforms
- Special applications (AGVs, skids)
- Etc.

TRACTION BULL BLOC – THE INEXPENSIVE DRIVE ALTERNATIVE.

The Banner Traction Bull Bloc is especially suitable for problematic tasks in the small traction area and as a series, represents a reasonably priced alternative to classic drive batteries. In addition, the Traction Bull Bloc batteries stand out due to their robust design, long service life and above all, high levels of cyclical resistance. The Traction Bull Bloc range also offers a choice of technologies in the form of the Traction Bull Bloc Gel, AGM and Wet variations.

TRACTION BULL BLOC DRY BULL GEL

TECHNICAL DATA AND INFORMATION

- Block batteries with a rated voltage of 6 and 12 V
- Zero-maintenance during the entire service life
- Recommended temperature range of 20°C
- Low self-discharge
- Can be used in any position
- Non-corroding terminals
- No hazardous substances according to FAA and IATA
- Long storage capacity

DESIGN

- Positive electrode: lead/calcium, high-performance mesh with pasted active mass
- Negative electrode: lead/calcium, high-performance mesh with pasted active mass
- Micro-porous synthetic separator
- Casing material: polypropylene
- Electrolyte: high-purity sulphuric acid embedded in a gel
- Terminal design: electrolyte-sealed, safety terminal
- Cell connection: welded on the inside through the casing wall
- Cell stopping: safety valve with overpressure ventilation system

The Banner Trac Bull Bloc DB is a closed, valve-controlled lead battery with gelatinised electrolyte. The embedding of the electrolyte in a gel prevents leaks and the problem of acid stratification. Using recombination (the decomposition of the water is almost entirely compensated for by the recombination of hydrogen on the positive plates), the life of the battery remains unaffected by water losses. The sealed battery system prevents electrolyte leakage and minimum self-discharge means that the maintenance-free Traction Bloc Bull Gel can be stored for longer periods than standard lead-acid batteries.



APPLICATIONS

- Golf caddies
- Lifting platforms
- Cleaning machines
- AGVs
- Camping/caravans
- Wheelchairs
- Marine
- Etc.

TRACTION BULL BLOC GIS – IDEAL FOR SMALL TRACTION APPLICATIONS.

The Trac Bull Bloc GIS batteries with liquid electrolyte and grid-type plate technology represent a powerful, reasonably priced alternative to classic drive batteries. GIS batteries stand out due to their robust design, extremely strong, mesh plates and special alloying. Other advantages include a long service life and high cyclical resistance. These batteries are mainly used in the small traction area.



TECHNICAL DATA AND INFORMATION

- Block batteries with a rated voltage of 6, 8 and 12 V
- High cyclical resistance
- Recommended temperature range of 20°C
- Robust design
- Long service life
- Extremely thick mesh plates
- Special separators
- First fitter quality

DESIGN

- Very thick positive and negative plates
- Special plate design for improved active mass adhesion and improved conduction
- Innovative separators
- Electrolyte: diluted sulphuric acid
- Casing material: polypropylene
- Special, patented active mass composition
- High antimony content

APPLICATIONS

- Small stackers
- Lifting platforms
- E-vehicles
- Cleaning machines
- Golf carts
- Etc.

OPTION: FILLING SYSTEM

In order to replace the water used during electrolysis automatically, Banner Traction Bull batteries can be fitted with a filling system, which guarantees quick, safe and clean refills. This filling system reduces the maintenance requirement and prolongs battery service life.

TRACTION BULL BLOC PZF

Banner Traction Bull Bloc PzF batteries with liquid electrolyte and tubular plates represent a powerful and reasonably priced alternative to conventional drive batteries.

PzF batteries are characterised by robust, positive tubular plates and demonstrate additional advantages such as a long service life and high cycle resistance (up to 1100 cycles at 80% K5 discharge depth). In general, these batteries are employed in the small traction area .

TECHNICAL DATA AND INFORMATION

- Block batteries, 6 V and 12 V rated voltages
- High cyclical resistance
- Recommended temperature range of 20° C
- Robust design
- Long service life
- High-quality tubular plate design
- Reliable and durable

DESIGN

- Positive tubular plates and negative grid plates
- Special plate design for improved adhesion of the active mass and transmission
- Innovative separators
- Sulphuric acid diluted with electrolyte
- Polypropylene casing material
- High antimony content

APPLICATIONS

- Lifting platforms
- Golf carts
- Small stackers
- Cleaning machines
- Etc.



TRACTION BULL BLOC AGM DEEP CYCLE

Banner Traction Bull Bloc AGM batteries are valve-regulated, lead batteries for cyclical applications. As maintenance-free block batteries, they are especially suited to the small traction segment. The use of absorbent glass mat technology (microfibre nonwoven web) means that the electrolyte is bound in and therefore the batteries are maintenance-free and leak-proof.

TECHNICAL DATA AND INFORMATION

- Block batteries, 12V rated voltage
- Absolute maintenance-free throughout the life of the battery
- Low self-discharge
- High initial capacity
- Corrosion-resistant terminals
- Not classified as a hazardous item pursuant to FAA and IATA (according to Packaging Directive 806)

APPLICATIONS

- Rehabilitation area
- Wheelchairs
- Camping
- Caddies
- Scooters
- Marine
- Etc.

DESIGN

- Positive electrode
Lead/calcium, high performance grid with pasted in active mass
- Negative electrode
Lead/calcium, high performance grid with pasted in active mass
- Microporous glass fibre separator
- Electrolyte
Sulphuric acid bound into a microfibre nonwoven web
- Terminals
Safety terminal with electrolyte-tight sealing
- Cell connections
Internal welding through the casing wall
- Cell plugs
Safety valve with overpressure ventilation system



TRACTION BULL BLOC WET GIS DEEP CYCLE

Traction Bull Bloc GIS/DC batteries containing liquid electrolyte stand out due to their excellent price/performance ratio. These GIS/DC batteries are also characterised by a robust design and enhanced plates with high mass utilisation. Further advantages are long service life and impressive cycle-resistance.

TECHNICAL DATA AND INFORMATION

- Lead/acid block battery in 6V, 8V and 12V versions
- Cyclical resistance
- Recommended temperature range approx. 20° C
- Robust design
- Long service life
- Enhanced plates

DESIGN

- Special plate design for cyclical use
- Electrolyte, diluted sulphuric acid
- Polypropylene box material
- Active mass with special additives for cyclical applications
- An Aquamatik system can be installed as an option
- Self-discharge approx. 5 % per month at 20° C

APPLICATIONS

- Lifting platforms
- Golf carts
- E-vehicles
- Small stackers
- others



TRACTION BATTERY ENQUIRY DATASHEET

Company data or stamp

Customer no.	
Company	
Address	
Postal code	
Contact partner	
Telephone	
E-mail	

Vehicle

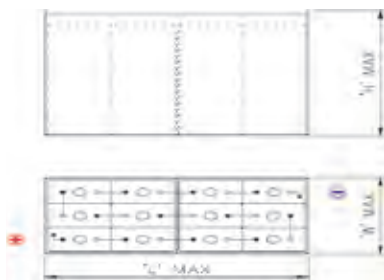
Vehicle make/manufacturer	
Type	

Vehicle

Vehicle make/manufacturer	
Type	

Battery

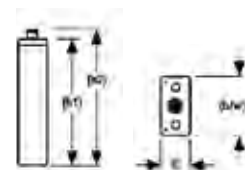
Voltage / Type e.g. 24V 3 PzS 345	
Tray dimensions	Length a
	Width b
	Height h1/h2



If necessary, battery tray sketch and cell layout

If the battery type is unknown, please provide the cell dimensions

Tray cover	Yes	No
Cell dimensions	Length a	
	Width b	
	Height h1/h2	



Accessories

Aquamatik / BFS	Yes	No	EC*	Yes	No
Plug data					
Cable length					Ampere

STAND BY BULL – THE EMERGENCY SUPPLY BATTERY.

THE POWER RESERVE. The Stand By Bull series consists of genuine emergency power supply batteries for areas of major relevance to safety and security. In the case of primary supply failures, these batteries ensure an uninterrupted flow of power to large computer centres, security systems (alarms, emergency exits), renewable energy sources, the diesel starters of generators and emergency systems (switchgear and transmitters). Banner offers the Stand By Bull in lead-acid, gel and web technology versions.



Banner

THE POWER COMPANY



Fire protection systems



Emergency power generators



Energy parks



Transformer stations



Electricity



Alarm systems



Renewable energy



UPS














Emergency/escape route lighting



Communications systems and telecommunications

This product overview is intended to assist the finding of the correct battery for the respective application. It shows the extent of the Banner range and offers a choice of tailor-made battery concept. Banner customer advisors from both the Sales force and Sales office teams are more than happy to assist in the search for the most cost-efficient answer to every enquiry. After all, the Stand By Bull from Banner adds up to greater quality, safety and performance.

Battery Type	OPzS cell	OPzS bloc	OGi bloc	SBV bloc	SBX bloc
Applications Other or misused applications can reduce the performance of the life span of the battery.					
	Telecommunications Emergency power supply Safety lighting Power station operation	Emergency power supply Radio links Safety lighting Solar operation	Diesel starting Safety lighting UPS systems	Fire alarm systems UPS systems Diesel starting Safety lighting	UPS systems High-current application Safety lightning
System	Closed	Closed	Closed	Sealed	Sealed
Capacity range in Ah	100 – 3000 ■	50 – 300 ■	25 – 300 ■	18 – 250 ■■	18 – 250 ■■
Voltage	2V single cells	6V, 12V bloc bat.	6V, 12V bloc bat.	12V bloc bat.	12V bloc bat.
Positive electrode	Tubular plates	Tubular plates	Mesh plates	Mesh plates	Mesh plates
Alloy	Lead-antimony	Lead-antimony	Lead-antimony	Lead-calcium	Lead-calcium
Electrolyte	Liquid	Liquid	Liquid	AGM **	AGM **
Typical discharge times	1h – 10h	30min – 10h	5min – 1h	5min – 1h	5sec – 30 min
Water refilling intervals (with ceramic plugs)	3 years	2 years	2 years	Not required	Not required
Electrolyte-tight, screwed terminal design, fully insulated	●	●	●	●	●
Standard/hinged cover	●	●	●		
Valve				●	●
Ventilation requirement (accord. VDE 0510)	5	5	5	1	1

OPZV cell	FAV bloc	FPL bloc	SCV cell	SBG bloc	GiV bloc	GiV-S bloc	GiVC bloc
							
Solar operation Substations Telecommunications Emergency power supply	UPS systems Telecommunications Switchgear Traffic technology	UPS systems Telecommunications Power station operation	UPS systems Switchgear Telecommunications Safety lighting	Mobile radio Railway technology Remote control systems Emergency power supply	Safety lighting Danger warning systems UPS systems Fire alarm systems	UPS systems Leisure and domestic appliances	Golf caddies Solar operation Wind power plants Rehabilitation technology
Sealed	Sealed	Sealed	Sealed	Sealed	Sealed	Sealed	Sealed
200 – 3000 ■	40 – 180 ■	100 – 190 ■■	50 – 3850 ■	18 – 230 ■■	1,3 – 70 ■■	5,4 – 45 ■■	18 – 250 ■■
2V single cells	12V bloc bat.	12V bloc bat.	2V single cells	6V, 12V bloc bat.	6V, 12V bloc bat.	12V bloc bat.	6V, 12V bloc bat.
Tubular plates	Mesh plates	Mesh plates	Mesh plates	Mesh plates	Mesh plates	Mesh plates	Mesh plates
Lead-calcium	Lead-calcium	Pure lead	Lead-calcium	Lead-calcium	Lead-calcium	Lead-calcium	Lead-calcium
Gel *	AGM **	AGM **	AGM **	Gel *	AGM **	AGM **	Gel *
30min – 10h	5min – 1h	5min – 20h	30min – 3h	30min – 3h	5min – 1h	3min – 30min	30min – 10h
Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
1	1	1	1	1	1	1	1

* With gelatinised electrolyte

** With absorbed electrolyte in a glass fibre mat



Standard

■ Ah – C10/20 °C

■■ Ah – C20/20 °C

■■■ Ah – C5/20 °C

STATIONARY BATTERY CHARGING SYSTEMS – SAFETY FIRST!

When it is vital that a system not go down owing to a power failure, total safety is the number one priority. Therefore, Banner initially determines factors such as the time-related energy requirement, the desired service life and the need for high cyclical resistance. On this basis, Banner offers top quality for the four main areas of application comprised by uninterrupted power supply (UPS), safety lighting, electricity generators for telecommunications systems/transformer substations and charging technology for renewable energy island solutions.

PSS POWER SUPPLY UNIT – SAFETY USING 19" PLUG-IN TECHNOLOGY.

Whether for telecommunications and IT, railway signal systems, or the own consumption systems of power plants and transformer substations, the Banner PSS power supply unit with 19" plug-in technology is the first choice when it comes to maximum security of supply..

APPLICATIONS

- Secured DC current supply in parallel stand-by rectifier and battery operation
- Direct feeding of DC consumers
- Telecommunications and IT
- Railway signal systems
- Process control technology in the chemicals industry
- Plant control systems, e.g. low-voltage transformer substations
- Own requirement systems in power plants and transformer substations
- Emergency power supply on ships and rail vehicles
- Technical industrial applications



SIBECONTROL EMERGENCY SUPPLY DEVICE – COMPATIBLE WITH 19" PLUG-IN TECHNOLOGY.

Sibecontrol stands out due to a fully automatic monitoring system and a modular 19" plug-in design with practical swing frame. The stable, steel sheet cubicle door has a window that allows quick overviews even when the door is closed.

APPLICATIONS

- Fully automatic, processor-controlled monitoring systems
- Modular 19" plug-in design on a swing frame
- Steel sheet cubicle door with window
- Individual switching with free programming per power circuit (DL, BL, DLS, TLS)
- Integrated, freely selectable individual light or power circuit surveillance
- Central substation monitoring
- Free PC programming of plant/customer data
- Individual light monitoring with target location information in clear text
- Internal and external bus system
- Automatic hardware recognition, even for subsequently inserted modules



BATTERY SHELVES, BATTERY CUBICLES AND ACCESSORIES – STATIONARY APPLICATIONS IN PERFECTION.

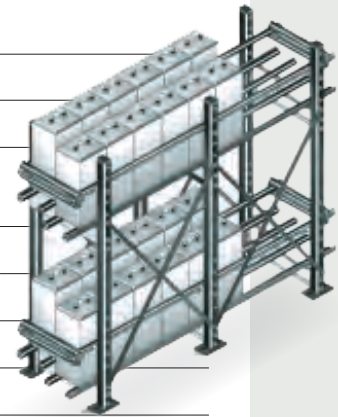
Banner supports its customers not only with the planning, punctual delivery, installation and start-up of the complete system and permanent service, but also delivers tailor-made battery shelving and cubicles. Banner provides secure customised systems, which are available whenever required.

BATTERY SHELVING – UNDOUBTEDLY THE BEST CHOICE.

Banner provides standard and special shelving in earthquake- and tipping-resistant versions. The surfaces are sintered for the highest resistance to corrosion. The shelves have height-adjustable feet, which can be matched to any flooring situation.

VERSIONS

- Standard/special shelving in a practical, modular design system
- Earthquake- and tipping-resistant versions
- Fully insulated, acid-resistant longitudinal and transverse supports with PE sintered coating
- Quick, easy and clean assembly
- Tension resistance tested according to DIN VDE 0100 and DIN VDE 0510 TÜV
- Simple earthing
- Height-adjustable feet in insulated plastic



BATTERY CUBICLES – A TOP CLASS, INGENIOUS SYSTEM.

Fully redesigned for optimum operating conditions. This battery cubicle system facilitates complete battery use in series. In this regard the innovative modular design system offers decisive advantages.

ADVANTAGES

- Multifarious possibilities for diverse cubicle versions
- Guaranteed, optimum storage of various battery blocks/cells
- Adjustments to available systems in dimensions and colours
- Finishing, supply and assembly in a very short period



...AND THE ACCESSORIES – MAKE THE SYSTEM PERFECT.

Banner accessories ensure optimum installation and monitoring. Connections are provided in every length and cross-section with the matching anchorage materials, positive/negative terminal covers, system-adjusted battery connections (BAE fuse), battery monitoring units (BACS), electrolyte sumps, terminal grease and an extensive range of maintenance accessories.



CHARGING TECHNOLOGY – OPTIMUM BATTERY CARE SAVES HARD CASH.

HOW ONE CHARGES TODAY. Using modern, Active Inverter technology from Banner, all the batteries for stackers, industrial trucks, lifting platforms and many other pieces of equipment are not only charged in optimum fashion, but also highly economically. This fact has been proven by a test of the logistics of a leading foods supplier, which demonstrated that as compared to out-of-date systems, with Banner charging up to 30 per cent of energy costs could be saved. This technology also offers other unbeatable advantages that include the charging of many differing batteries, the central control of all the charges via LAN and the definition of charging time by real time clocks. This means that low load charges can be employed, all the battery charging data can be logged via Wi-IQ and the charging device adjusts automatically to the battery temperature, thus offering a type of smart loading.



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Small stackers



Cleaning machines



Forklifts



Lifting platforms



Golf carts



Haulers

Banner CHARGERS – MAXIMUM EFFICIENCY AND HIGHLY INTELLIGENT CHARGING.

Banner chargers are highly sophisticated devices, which apart from their attractive design, impress primarily due to technical innovations. Active inverter technology with the revolutionary Ri charging process (8kW and 16kW output classes) adjusts to battery needs and only charges the battery with the amount of current that it actually requires. LED strips for the improved visualisation of the status display (including the “coolest battery” indication) represent a standard Banner feature.



TECHNICAL DATA AND INFORMATION

- HF-technology
- First class efficiency through the maximum degree of effectiveness
- Protective battery charging and therefore low battery warming
- Reduced water consumption
- Lower energy consumption and therefore significant cost savings
- Additional characteristics can be pre-programmed
- Robust design
- Reduction in servicing frequency
- Longer battery service life



APPLICATIONS

- Intra logistic
- Industrial trucks
- Cleaning machines
- Lifting platforms
- Special applications (AGVs, skids)
- Vehicles for disadvantaged persons
- Wheelchairs

OPTIONS

- External start/stop
- Unintentional start-up protection
- Battery filling system control
- AIR Plus electrolyte circulation
- Etc.



THE HF BASIC – Banner UNIVERSAL CHARGER.

The Banner HF BASIC charger is a proven device for both industrial and leisure purposes, as evidenced by its great success in the commercial cleaning and sport segments. Indeed, leading manufacturers of both cleaning equipment and golf carts employ the Banner HF BASIC charger.

Banner PULS CHARGER – UNCOMPROMISING ECONOMIC RELIABILITY.

For many years, the Banner PULS device family has been characterised by high levels of reliability in combination with optimum cost-efficiency during tough operation. Proven pulse charging on the basis of the Wa characteristic is used as a standard process. As compared to standard Wa and Wsa charging, the Banner PULS series stands out due to reduced water consumption and low gas development in the post-charging phase, in combination with a simultaneously smaller classification. Accordingly, the Banner PULS series represents an economic charging system for drive batteries.



APPLICATIONS

- Industrial trucks
- Cleaning machines
- Lifting platforms
- Special applications (AGVs)
- Skids
- Etc.

OPTIONS

- Electrolyte circulation
- Aquamatics

TECHNICAL DATA AND INFORMATION

- A modern pulse charge system for wet batteries
- Charging times of 6.5 – 14 h possible
- Reduced battery water consumption and thus a low maintenance requirement
- Lower gas development in the post-charging phase, calculation according to the ZVEI "Aeration of battery rooms for drive batteries" code of practice
- Automatic charging procedure, automatic equalising charging
- Energy savings and battery protection through variable post-charging times (longer battery life)
- Simple operation, therefore automatic charging start, but "switching on" may not be forgotten
- Charging status lights

PRODUCT HIGHLIGHTS

- HF technology
- A microprocessor-controlled charging process
- Energy efficiency (> 90 % device efficiency level)
- Flexible characteristics for wet, GEL and AGM batteries
- The equalisation of network voltage fluctuations
- Protection against reverse polarity and short circuits
- An LED display
- Etc.

APPLICATIONS

- Cleaning machines
- Wheelchairs
- E-scooters
- Invalid carriages



Banner

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SERVICE BY Banner – THE COMPLETE RANGE OF A MAJOR BRAND.

Banner IS MORE THAN A BATTERY MANUFACTURER, as its main priority is thinking in terms of customer advantages. This approach commences with the quality and technical superiority of its products. Indeed, a response to new challenges creates great potential for innovations and ongoing improvements with regard to both products and in-company efficiency. Banner offers its customers systematic, full service packages from project planning and realisation to after-sales support and therefore assists its customers in every phase. Moreover, new services such as Banner Rental are continually being created.

Banner RENTAL-SERVICE – BATTERY LEASING FOR A WEALTH OF ADVANTAGES.

No capital commitment. Battery purchases involve pre-financing for use in subsequent periods and amortisation is only achieved after several years. Leasing saves capital commitment and frees up funding for other projects.

High operational security. Optimum battery maintenance guarantees minimum standstills and downtimes.

Budget certainty. As costs are known and fixed from the outset, there are no financial surprises.

Individual solutions. A rental solution accommodates individual requirements and facilitates great flexibility.

Banner RENTAL SERVICE

Bottlenecks due to peak loads? Not enough batteries? No problem! Banner leased batteries are always available for one day, one week or several months as required. Banner offers a maximum degree of flexibility.

Banner SPARE PARTS

Original spare parts are the only means of preventing premature wear, offer optimum safety, minimise downtimes and maintain reliable operational readiness. Banner provides a comprehensive spare part service and can guarantee excellent availability levels owing to its highly modern computing network, which extends right across Europe.

Banner SERVICE

Banner does not merely offer its customers repairs. Clients can put together a service package in line with their individual requirements. A choice is available between regular maintenance and the Banner service package on a quarterly, half-yearly or yearly basis. The customer decides on frequency and hence maintenance costs. Should a fault occur, this is not a problem, as service hotlines in each country mean that highly qualified and experienced engineers are available immediately.

BATTERY ACCESSORIES – TRACTION AND STATIONARY.

Banner has an extensive range of accessories for optimum battery care and maintenance, which extends from plug and socket devices to the end cable, and from connectors to the appropriate tools. The products below represent a cross-section of Banner's extensive accessories programme. A complete overview is available at any time from Banner sales advisors.



PLUG AND SOCKET DEVICES

Battery and equipment plug and socket devices



END CABLES

End cables with Euro socket and grip



CABLE SCREW CONNECTORS

Screw connectors with various cross-sections and lengths



TOOLS

Complete torque keys
Art. No. 0450000122



BATTERY FILLING SYSTEMS

For the automatic filling of traction batteries



WATER CONTAINER & ACCESSORIES

60l tank complete with accessories
Art. No. 0450000318



BATTERY CARRYING BELT

Easy to use. Anchorage without the risk of slippage. Art. No. 00450000822



WATER FILLING WAGON

Including charger, tank and batteries
Art. No.: 0450000620



BATTERY CABLE

16 mm² – 120 mm²



CABLE SHOES

For 16 mm² – 120 mm²
6-10 whole sizes



CABLE SHOES

In various lengths and cross sections



ADAPTER +/-

M6 round pole



ADAPTER +/-
J-type with M8 drilling



END ANGLE
20 mm end angle, 15 mm end angle



TERMINAL END COVER
Horizontal



TERMINAL END COVER
Vertical



CERAMIC FUNNEL PLUG
Ceramic bayonet
Art. No. 0450000256



CERAMIC FUNNEL PLUG
No cover, bayonet
Art. No. 0450000356



REFILL JUG
1.5 l, transparent
Art. No. 0450000457



FUNNEL
Art. No. 0450000557



MAINTENANCE SET
Art. No. 0450000657



RUBBER GLOVES
Size L
Art. No. 0450001157



FASTON ADAPTER
4.7



PROTECTIVE GLASSES
Art. No. 0450001357



EYEWASH BOTTLE
Art. No. 0450001457

1. SCOPE

- 1.1** These general terms and conditions apply to the sale of goods and services between companies, and include both the delivery of such products and related services.
- 1.2** Deviations from the conditions stated under Clause 1.1 shall only take effect subject to the written approval of the Seller.

2. QUOTATIONS

- 2.1** Seller quotations shall be regarded as non-binding.
- 2.2** Without the permission of the Seller, no quotation or project documentation may be reproduced or made available to third parties. The return of the documentation may be demanded at any time and should the order be placed elsewhere, shall be sent back to the Seller without delay.

3. CONTRACTUAL AGREEMENT

- 3.1** A contract shall be regarded as concluded, when following the receipt of the order the Seller has received written confirmation of the contract, or has dispatched a delivery.
- 3.2** Information contained in catalogues and brochures, etc. as well as other written or verbal statements shall only be of material significance when the order confirmation refers to them expressly.
- 3.3** Subsequent alterations and supplements to the contract shall only be valid when confirmed in writing.

4. PRICES

- 4.1** Prices shall apply in accordance with Incoterms 2020 agreed with the customer or ex works, unless otherwise stipulated.
- 4.2** In the case of an order that deviates from the overall quotation, the Seller retains the right to make an appropriate price alteration.
- 4.3** Prices are based on costs at the time of the initial quotation. Should the costs increase in the period up to delivery, the Seller shall be entitled to adjust the prices accordingly.
- 4.4** In the case of service and repair contracts, the performance recognised by the Seller as appropriate will be provided and invoiced on the basis of the related

expenditure. This applies to services and additional services, the necessity of which first becomes apparent in the course of the completion of the order, whereby no special information of the Purchaser is required in this regard.

- 4.5** The Purchaser will be invoiced for expenses relating to the preparation of service and repair quotations or an expertise.

5. DELIVERY

- 5.1** The delivery period commences with the latest of the subsequent dates:
 - a) The date of order confirmation.
 - b) The date of the fulfilment of the technical and commercial obligations and other preconditions incumbent upon the Purchaser.
 - c) The date on which the Seller receives a prepayment or guarantee prior to the delivery of the goods.
- 5.2** The Purchaser shall obtain official and any third party consent required for system implementation. Should such approval not be obtained in time, the delivery period will be extended accordingly.
- 5.3** The Seller shall be entitled to make partial or pre-deliveries and to invoice them. Should on-call delivery have been agreed, at the latest the goods are regarded as having been called off one year after ordering.
- 5.4** Where situations arise that are unforeseen or cannot be influenced by the parties, such as force majeure, that hinder the fulfilment of the agreed delivery deadline, this shall be extended to include the duration of these circumstances. In particular, such circumstances include armed conflict, official intervention and bans, delays relating to transport and customs, transport damage, shortages of power and raw materials, labour disputes and the loss of an important sub-supplier that is difficult to replace. The aforementioned conditions shall also justify a prolongation of the delivery period when they apply to sub-suppliers.
- 5.5** A contractual penalty is completely excluded if not separately regulated.

6. TRANSFER OF RISK AND PLACE OF PERFORMANCE

- 6.1** The use and risk pass to the Purchaser upon the departure of the delivery from the plant or warehouse of the Seller irrespective of the type of pricing agreed (e.g. free delivery, CIF, etc.). This shall also apply when

supply takes place in the course of installation, or should the transport be completed, or organised and managed by the Seller.

- 6.2** The place of performance for supply and performance is the venue at which the performance is completed. The risk related to supply or an agreed partial performance passes to the Purchaser upon their provision.

7. PAYMENT

- 7.1** Unless other conditions of payment have been agreed, the invoice shall be due for payment 14 days after delivery.
- 7.2** In the case of partial invoices, appropriate partial payments shall be made upon receipt of the respective billing. This shall also apply to clearing amounts, which are additional to the original total amount and relate to subsequent deliveries or other agreements, irrespective of the payment conditions agreed for the main delivery.
- 7.3** Payments without deductions shall be made to the free paying agent of the Purchaser in the agreed currency. The general acceptance of cheques or bills only takes place in lieu of payment. All related interest and costs (e.g. collection and discount
- 7.4** The Purchaser shall not be entitled to withhold or offset payments for reasons of warranty claims or other counterclaims.
- 7.5** A payment shall be regarded as made on the day that it becomes available to the Seller for disposition.
- 7.6** Should the Purchaser be in arrears with an agreed payment or other obligations relating to this or other transactions, the Seller may undertake the following without prejudicing its other rights:
- a) Postpone the fulfilment of own obligations until this payment has been made, or other obligations have been met and claim a reasonable prolongation of the delivery period.
 - b) Call in all open claims from this or other transactions and charge default interest at a rate of 1.25% per month plus sales tax on the respective debt, unless the Seller proves costs in excess of this amount. In all cases, the Seller shall be entitled to invoice for preliminary litigation costs, in particular, reminder costs and legal expenses.
- 7.7** Agreed rebates or bonuses shall be subject to the prompt provision of the complete payment.

- 7.8** The Seller shall retain ownership of all the goods supplied until complete payment of the invoiced amounts, including interest and costs, has been made. To secure the purchase price claim, the Purchaser hereby assigns to the Seller any claims relating to the further sale of reserved goods, even if these have been processed, altered or mixed and undertakes to make an appropriate entry into its books or on its invoices. On request, the Purchaser shall make known to the Seller the assigned claim together with the debtor and provide the information and documentation needed for a recovery of the debt and to inform the indebted third party of the transfer of the claim. In the case of seizure or other recourse, the Purchaser shall be obliged to point out the right of ownership of the Seller and to inform the latter without delay.

8. WARRANTY AND ACCEPTANCE OF RESPONSIBILITY FOR DEFECTS

- 8.1** In accordance with the following provisions, the Seller assumes a warranty on the goods delivered or services rendered. No warranty claims may be made on the basis of information contained in catalogues, brochures, advertising materials, written or verbal statements, which have not been accepted into the contract.
- 8.2** The warranty period amounts to 12 months, unless special warranty periods have been agreed for individual delivery items. This shall also apply to supplies and services, attached to a building or real property. The warranty period shall commence with the risk transfer in accordance with Clause 6.
- 8.3** A prerequisite for warranty claims is that the Purchaser has immediately made the defect known in writing. The Purchaser shall prove the existence of a defect immediately and provide the Seller with the information and data available to it. In the case of a defect subject to warranty, in accordance in Clause 8.1 the Seller may either choose to repair the defective article at the place of performance, have it returned for the purpose of repair, or provide an appropriate price reduction.
- 8.4** In the case of guarantee-, damage- and compensation-related claims asserted by the customers of the Purchaser owing to defects, claims on the part of Purchaser to the exclusion of all other rights shall only exist if the Purchaser verifies the contractual agreement with its customers in documentary form (e.g. through a customer receipt).

- 8.5** Should the Seller manufacture an item on the basis of design information, drawings, models or other specifications of the Purchaser, then the warranty of the Seller shall only extend to completion according to the stipulated conditions.
- 8.6** Excluded from the warranty are defects originating from arrangement and installation not carried out by the Seller, insufficient setting-up, a failure to adhere to the installation requirements and conditions for use, overloading of the components beyond the performance levels stated by the Seller, negligent or incorrect handling and the use of unsuitable materials. This shall also apply to defects, which can be traced to material supplied by the Purchaser. In addition, the Seller shall not be liable for damage caused by the actions of third parties, atmospheric discharges, overloads and chemical influences. The warranty does not extend to the replacement of components subject to natural wear and tear. In the case of the purchase of second-hand goods, the Seller does not provide a warranty.
- 8.7** Liability of the Seller is excluded when defects or damage result from the use by the Purchaser of a battery with insufficient capacity or rated power for the intended application. In addition, when a conventional starter battery is employed contrary to the recommendations of the manufacturer (e.g. AGM or EFB battery), or when for hobby or leisure applications, the Purchaser installs a conventional starter battery instead of a long-term discharge battery (e.g. for a caravan, camper or boat). Battery utilisation shall always correspond with the Banner Battery Search <https://www.bannerbatterien.com/en/Battery-search>, or the battery type (OE number, technology, power requirement) prescribed by the manufacturer of the equipment, otherwise resultant defects and damage shall not justify Seller liability.
- 8.8** The conditions contained in Clauses 8.1 to 8.8 shall also apply to each case of defects arising for other legal reasons.
- 9. WITHDRAWAL FROM THE CONTRACT**
- 9.1** Unless a special regulation has been agreed, the prerequisite for the withdrawal of the Purchaser from the contract shall be a delay in delivery, which can be traced to the gross negligence of the Seller, as well as the unsuccessful completion of a reasonable, legally permitted extension to the delivery period. Withdrawal shall be made known in the form of a registered letter.
- 9.2** Irrespective of other rights, the Seller shall be entitled to withdraw from the contract when:
- a) For reasons that are the responsibility of the Purchaser, completion of the delivery, or the beginning or continuation of contractual performance are impossible, or despite a reasonable extension, are subject to further delay.
 - b) When concerns relating to the solvency of the Purchaser have arisen and despite the request of the Seller, the Purchaser neither makes a prepayment, nor provides suitable collateral prior to delivery.
 - c) Due to the circumstances listed under Clause 5.4, the extension to the period of delivery amounts to more than half of the period agreed originally, or at least six months.
- 9.3** Withdrawal from the contract may also be declared for the reasons listed above with regard to an open portion of the supplies or services.
- 9.4** Should insolvency proceedings be initiated against one of the contractual parties, or an application for the introduction of insolvency proceedings be rejected on the grounds of a lack of assets, the other contractual party shall be entitled to withdraw from the contract without setting a period of grace.
- 9.5** In the case of withdrawal and irrespective of the damage claims of the Seller, including preliminary litigation costs, supplies and services already completed shall be settled in accordance with the contract and paid. This shall also apply to supplies and services not yet accepted by the Purchaser, as well as preparations made by the Seller. Instead, the Seller shall also have the right to demand the return of items delivered previously.
- 9.6** Other consequences of withdrawal are excluded.
- 10. LIABILITY**
- 10.1** The Seller shall be liable for damage outside the area of application relating to product warranty law only where intent or gross negligence can be proven under the provisions of legal regulations. Liabilities of the Seller for minor negligence, restitution for subsequent damage and asset losses, lost savings, interest losses and damages derived from third party claims against the Purchaser are excluded. Personal injury is excluded therefrom.
- 10.2** Any claims for damages shall be excluded in the case of a failure to adhere to the conditions relating to installation, commissioning and use (e.g. as contained

in the operating instructions), or the official licensing conditions.

- 10.3** Should contractual penalties be agreed, additional claims under the respective item are excluded.

11. ASSERTION OF CLAIMS

Unless shorter deadlines have been agreed separately in individual cases or are foreseen under the terms of legal provisions, all Purchaser claims must be asserted before a court within a period of three years following the transfer of risk, otherwise the claims lapse.

12. COMMERCIAL PROPERTY RIGHTS, COPYRIGHTS AND RIGHTS OF USE

- 12.1** Should the Seller manufacture an item in accordance with design instructions, drawings, models or other specifications provided by the Purchaser, then the Purchaser shall indemnify the Seller against claims in the case of any infringements of property rights.

- 12.2** Production documentation, e.g. plans, sketches and other technical information, as well as models, catalogues, brochures, picture, etc. shall remain the property of the Seller and are subject to standard legal provisions with regard to reproduction, copying, competition, etc. Clause 2.2 also applies to production documentation.

- 12.3** All photos, illustrations, text and other bannerbatterien.com content and the brochures, circulars, pamphlets and advertising of Banner GmbH and its sales companies are subject to copyright.

- 12.4** Any type of application, use, reproduction, provision to the public, etc. requires the prior written approval of Banner GmbH or its sales companies after approval by Banner GmbH.

- 12.5** The unauthorised use of pictures, illustrations, text and content subject to copyright in the either private or the business area, shall constitute an infringement of copyright and upon coming known will be met by a cease and desist warning, together with the assertion of claims for damages and legal action.

13. MISCELLANEOUS

Should individual terms of this contract or their stipulations become invalid, this shall not result in the invalidity of the remainder of the contract. The in-

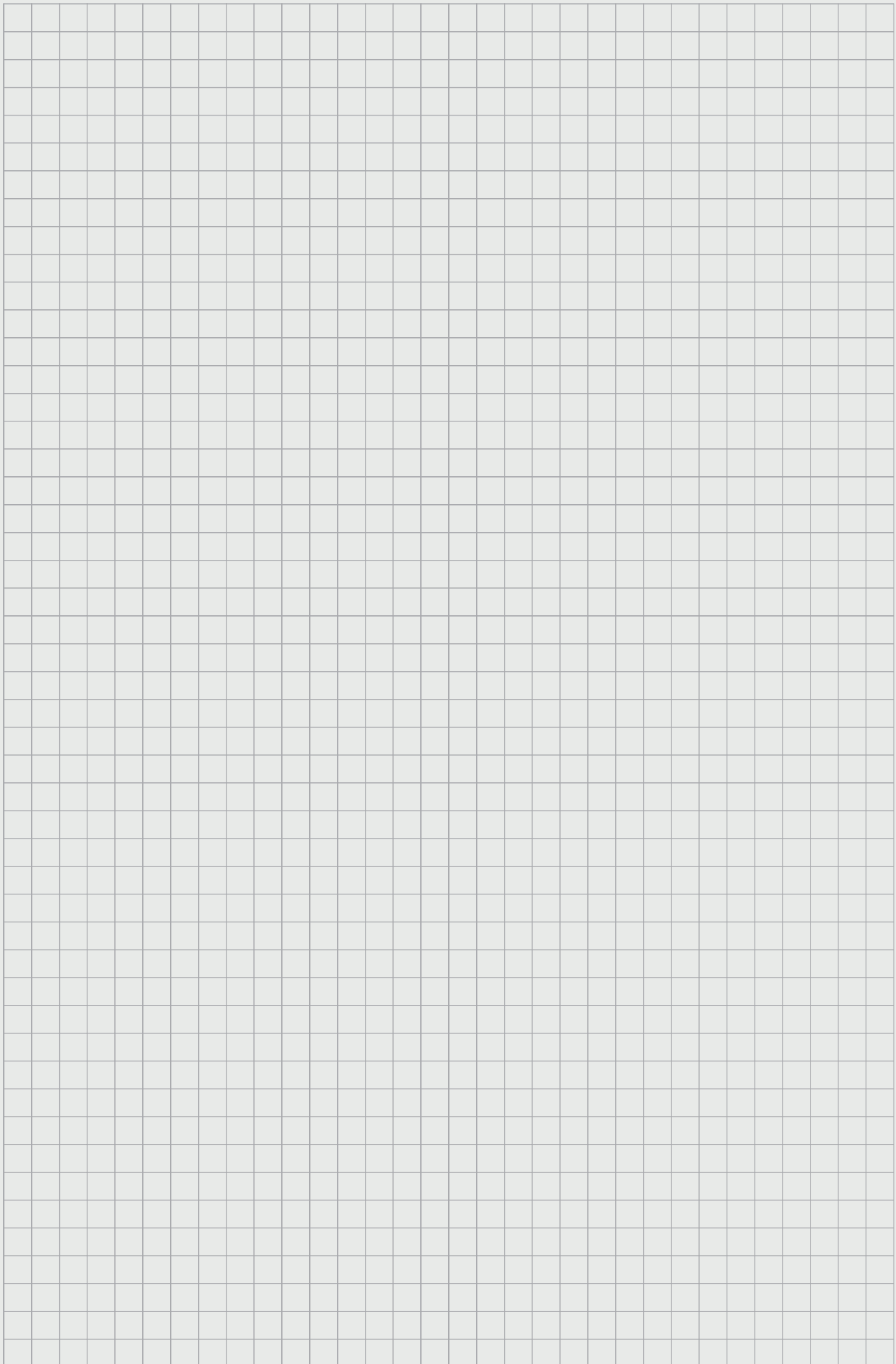
valid term shall be replaced by one that serves the purpose of the contract as closely as possible.

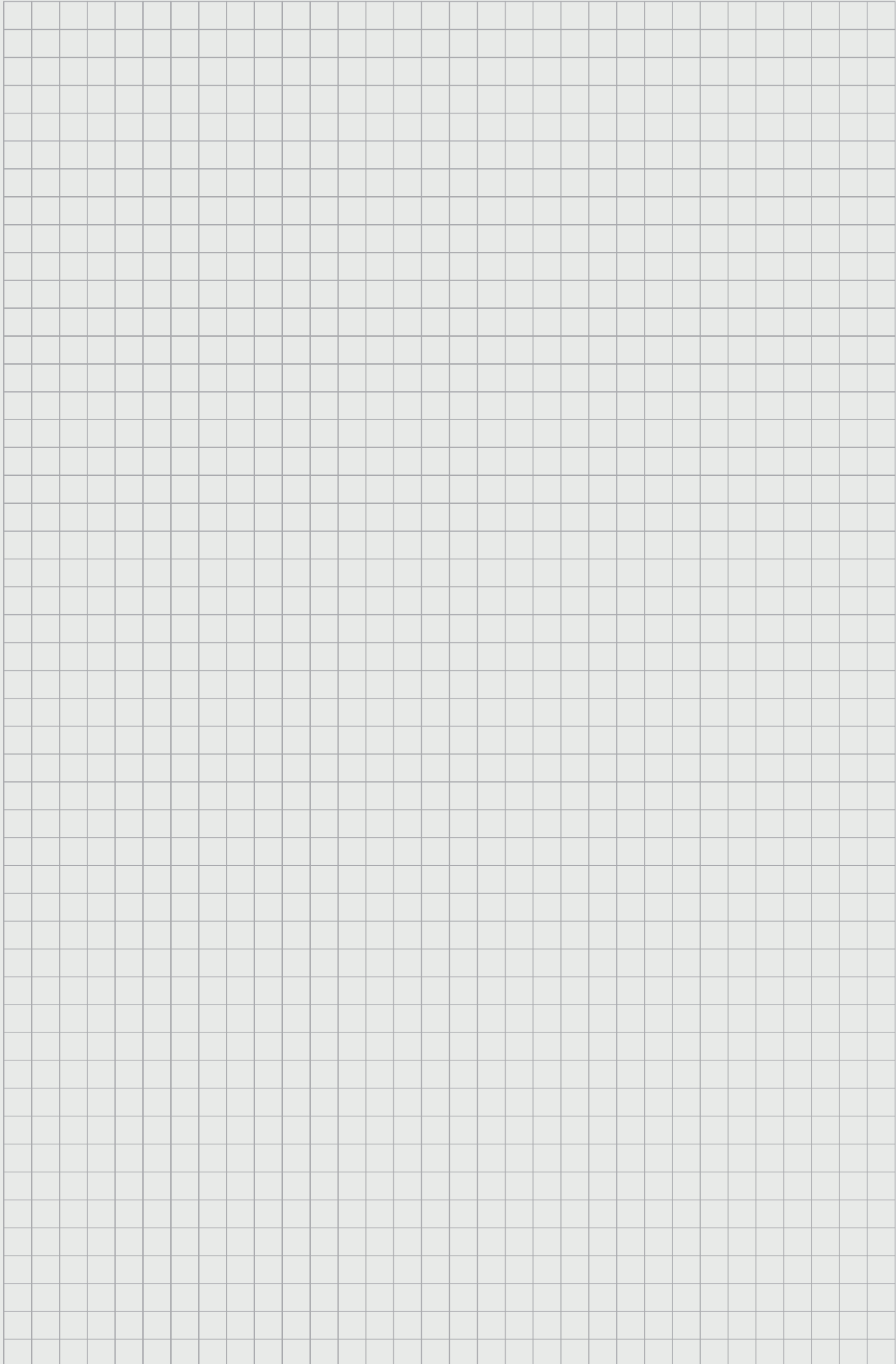
14. COMPETENT COURT/APPLICABLE LAW

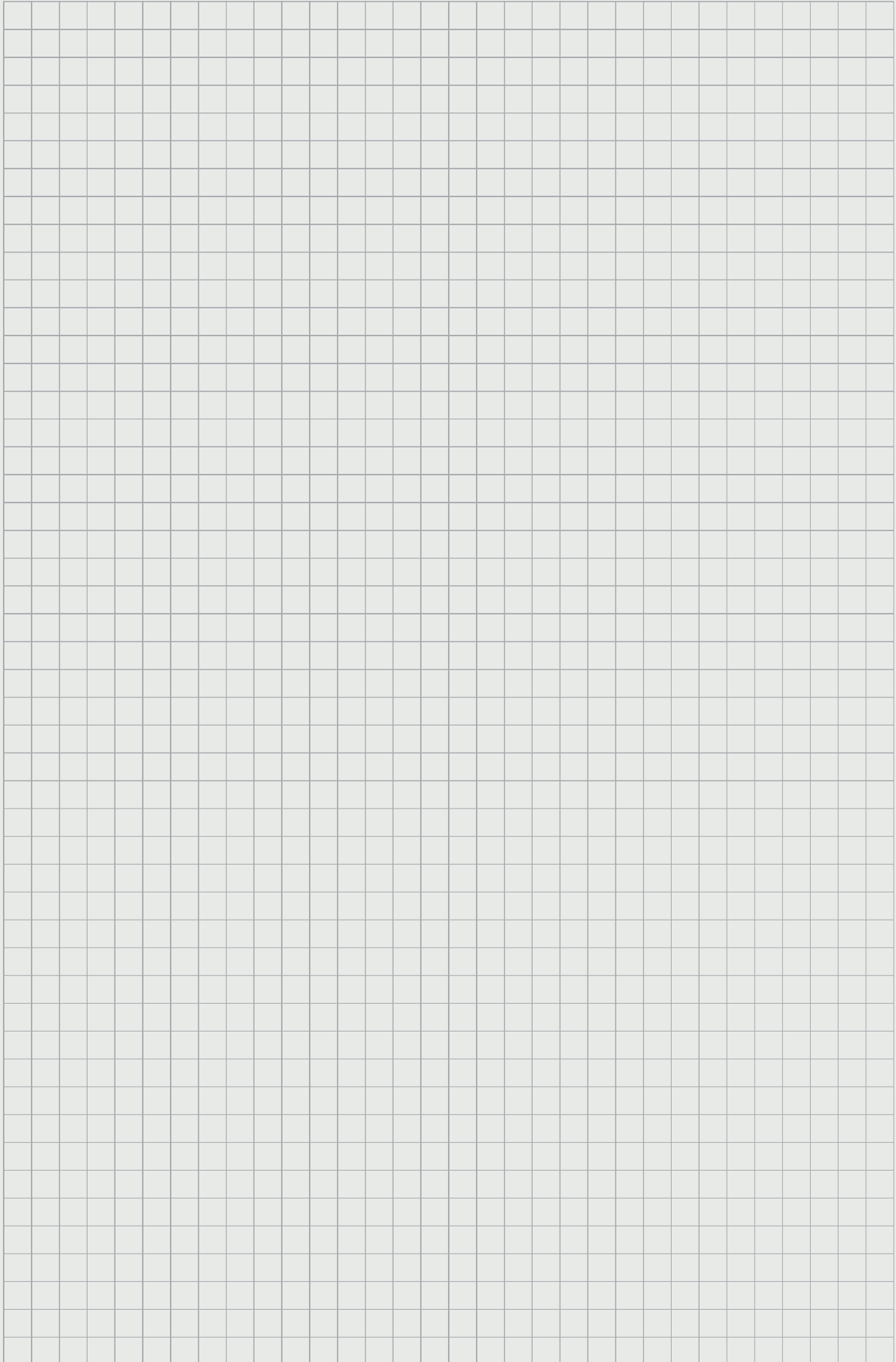
Any disputes arising from this contract, including those relating to its existence or non-existence, are to be dealt with exclusively by the competent court at the head offices of the Seller. **The contract is subject to Austrian law and further transfers of the case are excluded.** The application of the United Nations UNCITRAL agreement concerning the international sale of goods is excluded.

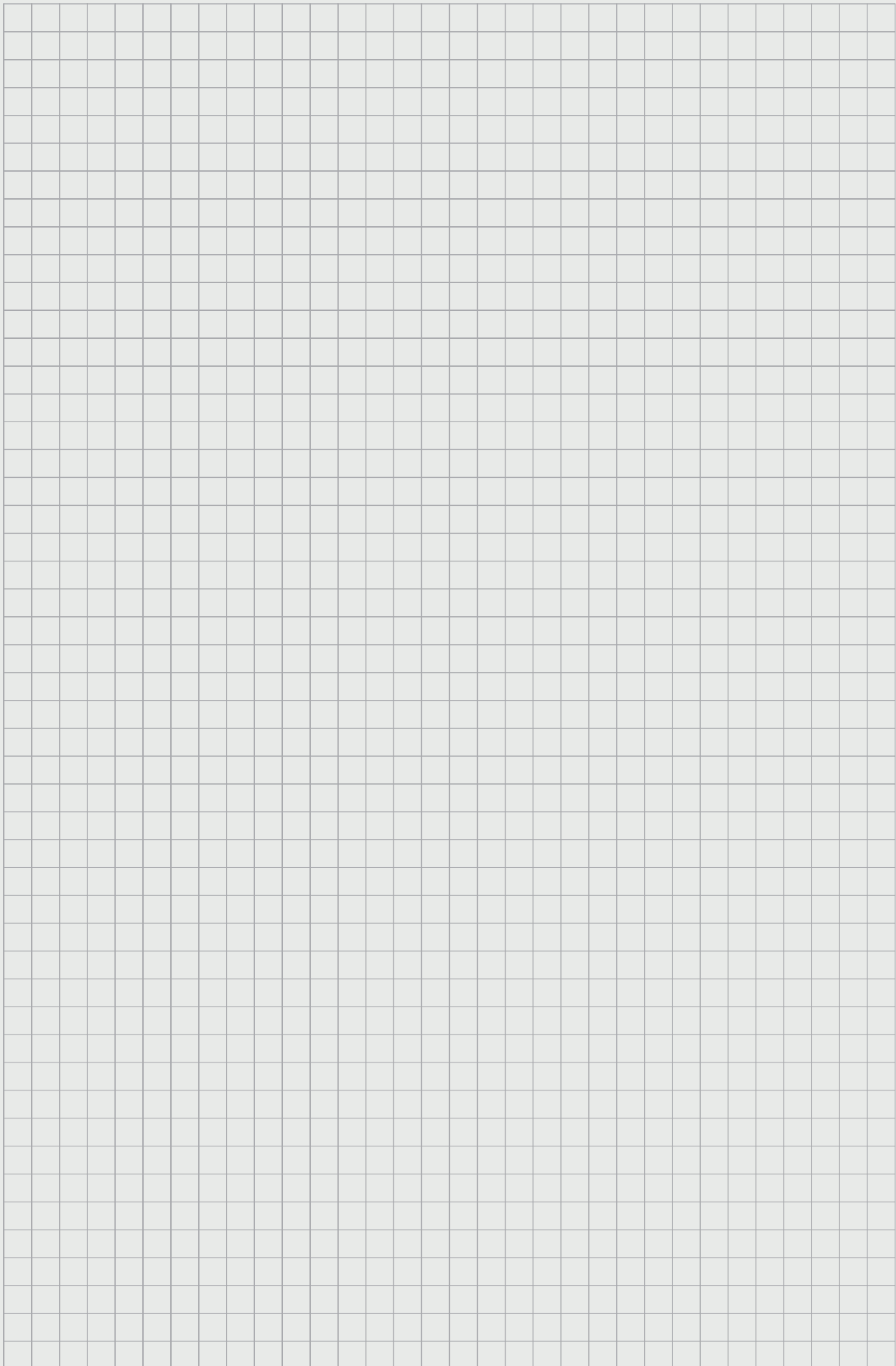
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Banner

THE POWER COMPANY

PATENTS

Double cover joint patent with Moll U - 02027 9204 (registration still in progress, also registered in the USA)

Double lid screw connection utility model with Moll 202 18730.6

AGM valve stopper joint registered design protection with Accumalux

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