

green energy solutions



Power storage • maintenance free batteries • battery instrumentation



Power storage

Batteries as 'energy tank'

Batteries are increasingly becoming the centre of independent power systems, whether it's for vessels, vehicles or remote land based locations. Batteries are used in hybrid systems in cars and vessels, in combined fossil and renewable systems combining for example wind and solar power sources or for emergency backup systems. Batteries are the key to a better energy balance in any system, a key to lower operational costs and reduction of emissions.



In a WhisperPower system the battery has a central role: it is the energy tank, dictating when power sources (battery charging devices) should start to refill 'the energy tank'. The selection of the right battery capacity and

technology determines the functionality and durability of such systems. WhisperPower has a strong expertise in this field as a supplier of premium batteries and would like to share all the knowledge with all our customers.



What all our batteries have in common

- They are all sealed and maintenance free
- They are safe - no danger of electrolyte spill or gassing
- They can be installed at different angles
- They are non-hazardous and can be transported in airplanes
- They are shockproof, if the battery is damaged no liquid will come out
- They are designed for a large number of charge/ discharge cycles
- They are built to last for 5-10 years
- They are supplied through the WhisperPower network with appropriate charging devices
- Self discharge is limited, batteries can be stored for many months without charging
- Minor ventilation is needed in the location of instalment
- They are delivered with an extended system warranty
- Our warranties extend across the globe meaning any replacement parts will always fit

Manufacturing partners

Specifications of all WhisperPower batteries are meticulously defined by us, based on the requirements of our systems. The manufacturing of our batteries is carried out by carefully selected factories according to some very important criteria:

- Only the best is good enough, we only operate with premium manufacturing partners
- The process of manufacturing has to be top class and absolutely non-polluting
- The working conditions of the employees have to match Western standards
- Cradle to cradle – this should be our mutual goal

Our manufacturing partner is a NASDAQ listed company, employing more than 2000 people and is, fully ISO 9001 : 2000 approved.



AGM

GEL

Lithium-ion

Accessories



Always energy to spare

AGM Power

Batteries are an essential part of any power system. In the past, batteries were mainly used for 12, 24 or 48VDC power provision, either to start engines or to supply power to DC appliances such as lights and electronics. With the introduction of inverters, batteries became popular as a power source for 230V or 120VAC power as well. Nowadays batteries have to be suitable to provide high amperage draws and deep discharges. WhisperPowers' AGM batteries are the best in their class suitable for use as either starter, universal service or inverter batteries. They are all maintenance free, sealed and safe.

Our AGM - Absorbed Glass Matt - batteries are offering the best price/performance. The electrolyte of these batteries is absorbed by glass fibre separators between the positive and negative battery plates. These batteries have very low internal resistance making them particularly suitable for high current discharge applications which includes starting engines, starting high power AC and DC electrical motors and pumps etc.

We offer 2 different AGM technologies:

Our standard 12V version, deep cycle, long life high performance, dual purpose battery with maximum ruggedness. Our 6V multi cycle, high performance, dual purpose battery. 6V batteries were originally designed for golf carts which make tough demands on their batteries with daily discharge/charge cycles and high amperage draw. Our 6V batteries are capable of 700 complete charge/ discharge cycles.

In many countries AGM is used as a long life deep cycle battery. The GEL model range offers more deep cycles and better durability and, as a result, a longer life (see next page). This is the battery we supply with our Genverter hybrid generator systems.

All of our AGM batteries are supplied with M8 drilled, flat copper terminals offering the best possible connection contact and eliminating the need for battery terminals.

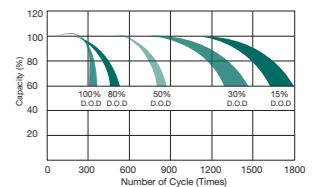
- 6 & 12V models
- Multi purpose battery
- For start and service use
- Maintenance free, recombination (VRLA) type
- Robust and shock resistant
- Limited ventilation needed
- Transportation by air approved
- Superb all-round behaviour
- Matches all WhisperPower 3-stage charging devices



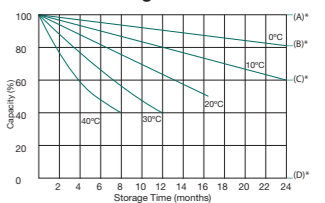
Our 12 V batteries are supplied as standard with a bolt connection. In case battery poles are needed, we offer poles that can be fitted to the 12 V batteries.



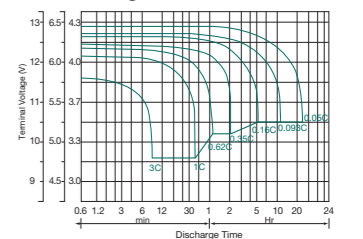
Life characteristics of cyclic use



Storage characteristics



Discharge characteristics curve



AGM POWER - 12 VOLT BATTERIES - MAINTENANCE FREE HEAVY-DUTY BATTERIES

Type	Dimensions (l x w x h)	Weight
40290060 12V / 55Ah deep cycle AGM battery	229 x 138 x 235 mm	18 kg
40290061 12V / 80Ah deep cycle AGM battery	350 x 167 x 180 mm	24 kg
40290031 12V / 100Ah deep cycle AGM battery	328 x 172 x 222 mm	30 kg
40290062 12V / 145Ah deep cycle AGM battery	340 x 173 x 285 mm	44 kg
40290063 12V / 200Ah deep cycle AGM battery	522 x 240 x 219 mm	60 kg
40290064 12V / 260Ah deep cycle AGM battery	520 x 268 x 220 mm	74 kg

AGM POWER - 6 VOLT BATTERIES - TRACTION QUALITY

Type	Dimensions (l x w x h)	Weight
40290261 6V / 260Ah AGM-Power HD	295 x 180 x 274 x 298 mm	37 kg
40290262 6V / 312Ah AGM-Power HD	295 x 180 x 346 x 366 mm	48.5 kg
40290263 6V / 390Ah AGM-Power HD	295 x 180 x 405 x 428 mm	54.5 kg
40290264 6V / 335Ah AGM-Power HD	295 x 178 x 346 x 364 mm	48 kg

BATTERY POLE

40290099 Battery pole suitable for the WhisperPower AGM and GEL batteries - complete with M6 bolt.
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Technical Data

AGM = Absorbed Glass Matt. Maintenance-free, sealed batteries, suitable for use as start and service batteries. Supplied with a M6 bolt connection. Detachable battery pole (see below on this page) optional. The Ah capacity is based on a 20-hour discharge rate (C 20). Batteries must be charged with a multi-stage battery charger, combi or DC generator with temperature sensor. Warranty period 2 years.

Capacity is based on a 20-hour discharge rate (C20). AGM traction batteries can be supplied for example for electric vehicles such as golf carts. Cycle life > 700 full charge / discharge cycles. Supplied with pole-type battery terminal connection. Warranty period 2 years.

12 Volt Batteries - 2 Volt Cells OPzV

GEL Power

Our GEL batteries are state of the art A class batteries, designed for numerous deep discharge/charge cycles. They are the real “energy tank”, strong enough to power up all DC appliances, inverters or combi’s, and starter engines. All our batteries have minimal self discharge. We offer both 12V versions with an extended cycle life and the tubular sealed 2 Volt Gel “traction” versions.

12 Volt Batteries

Our Gel batteries are the best choice for extended charge/discharge cycles. The electrolyte is absorbed by a gel, the positive and negative battery plates are strong and separated by rubber-type separators. No extra ventilation is required, but batteries should not be placed in one big bank without small air gaps between the batteries. Charging of the Gel cells is, similar to our AGM batteries should be done with multi stage chargers with temperature sensors connected to the batteries.

2 Volt Cells OPzV

2 volt GEL cells are the best and most durable batteries, designed for regular and deep discharging (it is important never to discharge the battery below 25% of its nominal capacity). These batteries are used in fork lift trucks, working every day, the whole year around. Our WhisperPower 2 Volt OPzV batteries can be stacked horizontally or vertically, and stowed away at any hidden place. Maintenance is not needed. Cycle life is 1000-2000 full cycles, dependent on ambient temperature and depth of discharge (DOD).

12 Volt Batteries

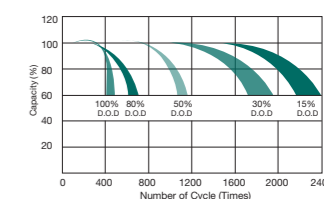
- Deep cycle “long life” battery
- For heavy duty service
- Maintenance free, recombination (VRLA) type
- Shock resistant, heavy duty casing
- Limited ventilation needed
- Transportation by air approved
- For extended cycle life

2 Volt Cells OPzV

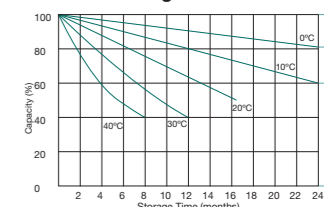
- Deep cycle long life battery
- Maintenance free, recombination (VRLA) type
- Designed to operate with high current DC and AC loads (Inverter)
- Extremely powerful
- For horizontal or vertical installation
- 7 years warranty



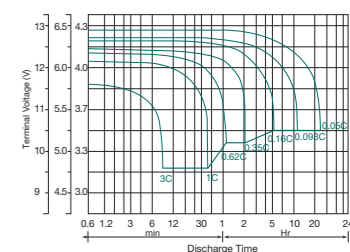
Life characteristics of cyclic use



Storage characteristics



Discharge characteristics curve



GEL POWER - 12 VOLT BATTERIES

Type	Dimensions (l x w x h)	Weight
40290070 12V / 100Ah deep cycle pure GEL battery	328 x 172 x 222 mm	30 kg
40290071 12V / 145Ah deep cycle pure GEL battery	340 x 173 x 280 mm	44 kg
40290072 12V / 180Ah deep cycle pure GEL battery	530 x 209 x 214 mm	53 kg
40290073 12V / 225Ah deep cycle pure GEL battery	522 x 240 x 219 mm	65 kg

GEL POWER - 2 VOLT CELLS OPzV

Type	Dimensions (l x w x h)	Weight
40290040 2V / 600Ah	145 x 206 x 647 (692**)	49 kg
40290041 2V / 800Ah	210 x 193 x 647 (692**)	67 kg
40290042 2V / 1000Ah	210 x 235 x 647 (692**)	81 kg
40290043 2V / 1200Ah	210 x 275 x 647 (692**)	97 kg
40290044 2V / 1500Ah	210 x 275 x 797 (842**)	111 kg

BATTERY POLE

40290099 Battery pole suitable for the WhisperPower AGM and GEL batteries - complete with M6 bolt.
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Technical Data

A-Class GEL batteries for the longest lifespan. Maintenance-free, sealed batteries, suitable for use as start and service batteries. Supplied with a M6 bolt connection. Detachable battery pole (see below on this page) optional. The Ah capacity is based on a 20-hour discharge rate (C 20). Batteries must be charged with a multi-stage battery charger, combi or DC generator with temperature sensor. Warranty period 2 years.

** 2 Volt GEL traction batteries designed for an extended number of charge / discharge cycles. Designed to operate with high current AC and DC loads. For horizontal and vertical installation. Cycle life > 1200 cycles, warranty period is 5 years (pro rata). Recommended for use with high power converters (> 5kVA). Supplied with connection cables for the 2 Volt cells. Capacity at C10 rating.

ION Power Battery Pack

Li-ion batteries

Portable electronics like laptops are powered by Lithium-ion batteries. They are relatively lightweight, have a high energy density and are long lasting. These hallmarks are important for devices like electrical vehicles and hybrid propulsion systems, where the battery is the primary energy source and subject to very frequent charge/ discharges. WhisperPower offers Lithium-ion batteries (LiFePo4) as a system: Li-ion cells as such are not usable, but require BMS cell balancing for correct charge and discharge cycles, and accurate monitoring per CELL (3.2V). In addition, protection against to deep discharge is configured in the installation. We integrate Li-ion compatible battery chargers in our system offerings.

When excellent performance is needed, Ion Power is the best Choice

If you are looking for batteries that will survive strong charge and discharge currents, day after day, year after year, without carrying the weight of conventional batteries, ION power battery based on LiFePo4, battery is the only solution. Our ION power battery is the right choice for electrical vehicles, hybrid systems for yachts and commercial craft and combined high capacity inverter/generator systems. Ion Power is the answer for weight reduction with savings up to 70% on weight and space, providing much more electrical power as a result of its LiFePo4 technology. The result is six times more cycle life resulting in at least three times the life span of ordinary batteries. The integrated Battery Management and Cell Balancing System ensures safe use and protects your investment securely. Ion Power is the only battery providing a greener and more durable future as the battery lasts longer, while the manufacturing and recycling processes are much more environmentally friendly compared to ordinary lead acid batteries. **WhisperPower ION power is built from the safest Li-ion chemistry available, LiFePo4 (Ferro Phosphate), which has been tested by international independent Battery Testing Laboratory Authorities organisations.**

Advanced technology

Industrial quality Lithium-ion batteries emerged onto the market in 2005 and now have the highest energy density of all batteries available. The LiFePo4 battery chemistry is robust and safe, designed for use in durable power storages and hybrid power-generation applications.

Fully charged in 60 to 120 minutes

With a Lithium-ion charge system a power bank can be recharged with in one to two hours. Running the generator only for the time needed means no maintenance absorption time is required, unlike lead-acid batteries. A fast, safe and economical re-charge is the result.

No more maintenance

Conventional lead-acid batteries require periodical maintenance and water refill to prevent permanent damage to the battery. A Lithium-ion battery does not need any maintenance during its life cycle.

Long life time, 5 years warranty

To ensure proper battery functionality over the course of 5 years, an extended conditional product warranty is offered with all WhisperPower batteries. This

extended conditional product warranty is based on the assumed load balance for the battery banks as described below:

- Estimated annual number of cycles (80% DOD): 375 cycles per year
- Estimated State Of Health (SOH) of 80% after 8 years (3000 cycles)

45% better for the environment

Lithium-ion batteries are the most environmentally friendly batteries to produce. A study carried out at the University of Brussels has shown that over the total life cycle of a lithium-ion battery is 45% more sustainable than a lead acid battery. Lithium-ion also offers approximately 15% energy efficiency improvements compared to lead acid batteries and their commonly low efficient charges.

10% improved total cost of ownership

Although the batteries are more expensive, the total lost of ownership (TCO) is lower. No maintenance, a longer cyclic life and higher charge efficiency result in an overall improvement of owner cost. This includes a reduction in fuel.

- Extremely high energy density
- Less volume: 70% reduction on space
- Less weight: up to 70% reduction
- Long lifespan - three times more cycles
- Fast charging in combination with high DC discharging
- High charge efficiency factor
- Safe LiFePo4 chemistry for safe use
- Flexible configurations: from 12 V - to 750 V DC, and from 90 Ah to 1000 Ah
- Suitable for high voltage banks up to 1000 Ah



Technical Data

LI-ION BATTERIES - TECHNOLOGY: LiFePo4 (LITHIUM ION IRON PHOSPHATE)* - 12V SYSTEMS		
Type	Dimensions (l x w x h) & Weight	
40290202 12V / 160Ah - incl. BMS **)	Ask for specifications	
40290203 12V / 200Ah - incl. BMS	Ask for specifications	
40290204 12V / 400Ah - incl. BMS	Ask for specifications	

LI-ION BATTERIES - TECHNOLOGY: LiFePo4 (LITHIUM ION IRON PHOSPHATE)* - 24V SYSTEMS		
Type	Dimensions (l x w x h) & Weight	
40290212 25.6V / 160Ah	Ask for specifications	
40290223 25.6V / 200Ah	Ask for specifications	
40290224 25.6V / 400Ah	Ask for specifications	
40290225 25.6V / 700Ah	Ask for specifications	
40290226 25.6V / 1000Ah	Ask for specifications	
40290227 25.6V / 1000Ah	Ask for specifications	

LI-ION BATTERIES - TECHNOLOGY: LiFePo4 (LITHIUM ION IRON PHOSPHATE)* - 48V SYSTEMS		
Type	Dimensions (l x w x h) & Weight	
40290243 51.2V / 200Ah	Ask for specifications	
40290244 51.2V / 400Ah	Ask for specifications	
40290245 51.2V / 700Ah	Ask for specifications	
40290246 51.2V / 1000Ah	Ask for specifications	
40290247 51.2V / 1000Ah	Ask for specifications	

ACCESSORIES FOR LITHIUM ION BATTERIES (SEE OUR DC DISTRIBUTION BROCHURE)		
40290250	Bi-stable relay for tripping on voltage / deep discharge 12V	
40290251	Bi-stable relay for tripping on voltage / deep discharge 24V	
40290252	Bi-stable relay for tripping on voltage / deep discharge 48V	

Li-ion Power Packs for hybrid propulsion

For high-power hybrid systems with for example 1 or more 43kWh / 512V battery packages (built from several 4.3kW cells), we have selected a superior, safe, European manufactured Li-ion cell, which is completed with an integrated BMS and charge/discharge modules. The Li-ion Power Pack can be added as a system to the GENVERTER generators and the Hy-Gen flywheel motors / generators. Features of the Li-ion MASTER include:

- Interfaces for CAN, Ethernet, RS232, RS485, FO serial interface and USB connectivity
- Standard CAN open battery profile, Modbus and Profinet
- More information available

*) This technology ensures safe use of the battery system when used with appropriate charging equipment and charge/discharge protection. Li-ion batteries are appr. 3 times more compact and appr. 3 times lighter than lead acid batteries. Extended lifetime with a cycle life > 5000 cycles, depending on ambient temperature, depth of discharge and charge intensity. Can be charged with 1/C (i.e. a 12V-100Ah Li-ion battery can be charged and discharged with 100A. Warranty 5 years (pro rata). Max. discharge 25I./C

**) = BMS Battery Management System. Built-in electronics ensure that the individual cells will be charged and discharged (balancing).

'All around the battery'

Battery instrumentation

Our one-stop-shop service to our customers includes the supply of all necessary components required to install a DC system in a safe way. The WBM battery monitor is an essential device to keep track on the battery status and protect the battery against misuse. All WBM models are easy to read out and to install.

Accurate information, longer battery life

Precise monitoring helps to look after the battery and optimise life span. WhisperPower offers a wide variety of battery monitoring systems, starting with the small WBM round 52mm, up to the extended WP PSCP (Power System Control Panel), incorporating integrated inverter and generator controls. Whisper Power Battery Monitors are available in three versions:

- Our WBM Basic version supplies battery status at a glance, with all the information you need. Read out is provided by a clear LCD display with back light, indicating, volts, amps and battery content in %. This device has two inputs: one for the main battery, one for the starter battery. Digital resolution 0.1 %. A low battery alarm contact is included.

- Our WBM Pro version includes an important feature: it counts in a very accurate way (0.01%) energy-in/ energy-out, indicating the time-remaining in hours and minutes. Extended historical data like depth of discharges, number of cycles etc is registered by this monitor. A low/ high battery alarm is included with a trigger connection to other controlling devices.
- Our WBM Pro high voltage, designed to operate with higher DC voltages like 48 VDC or 96 VDC. Shunts (200 A/ 500 A), cable sets, communication kits, all necessary accessories can be selected when ordering the WBM monitor.

- High Precision Battery Monitoring
- The window to your battery
- Accurate energy monitoring of one or two battery banks
- No sudden empty battery: precise 'time remaining' indicator (hrs, min)
- Calculation of ampere hours consumed
- State of charge indicator in %
- Various programmable alarms
- Easy to use, plug and play installation



Technical Data

WBM WHISPERPOWER BATTERY CONSUMPTION METERS

40290310	WBM-Basic
40290311	WBM-Pro includes 'Time remaining' function
40290312	WBM-Pro HV (High Voltage)

ACCESSORIES

40290300	WBM 6m Connection kit
40290301	WBM 12m Connection kit
40290303	WBM 3m Quick Connection kit
40290304	WBM 10m Temperature Sensor kit
40290305	WBM-RS-232 Communication kit
40290306	WBM-USB Communication kit
40290307	WBM1:5 Voltage prescaler kit
40290308	WBM Alarm output expander kit
40290320	WBM1200A / 50mV shunt
40290321	WBM 500A / 50mV Shunt (standard with the WBM-Basic, WBM and WBM Pro-Pro HV)

BATTERY POLE

40290099	Battery pole suitable for the WhisperPower AGM and GEL batteries - complete with M6 bolt.
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PSCP Power System Control Panel, include Ah counting for servicebattery

 International

 Benelux

 United Kingdom

 Germany

 France

 Spain & Portugal

 America

 China

 Pacific

green
energy
solutions

Information and contact

For more information and advice about WhisperPower products and services you can contact our local distributors and technical sales partners. For an up-to-date list of addresses and phone numbers go to www.whisperpower.com.

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green energy solutions

