2024

HIVE ELECTRIC CATALOG

HIVE ELECTRIC

ENERGY STORAGE PRODUCTS AND SOLUTIONS

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COMPANY OVERVIEW

Our History

Founded in Lille (France), Hive Electric SAS is a French company specializing in energy storage systems with recognized expertise in the study of electrochemistry, cells, and battery packs. In a context where energy transition and environmental preservation are major issues, Hive Electric is committed to developing sustainable, high-performance solutions using mature cutting-edge technology : $LiFePO_4$ (Lithium Iron Phosphate). This developed chemistry offers maximum safety by preventing thermal runaway, and efficiency, setting it apart from other technologies. In addition, the battery uses no critical materials or heavy metals such as cobalt, manganese, or nickel, making it even more environmentally friendly and responsible. Hive Electric is also developing a breakthrough post-lithium technology : metal-ion technology. This technology is in the development phase. This technology could achieve 90% recyclability, higher energy density, and maximum safety. As a result, Hive Electric is working on the best technologies to guarantee a better, safer, and more efficient future ensuring continuous technological evolution.

Our Mission

At its R&D center, Hive Electric puts its technical expertise at the service of its customers, supporting them in the realization of their projects by proposing customized cells and batteries to meet their specific needs. International engineering, product quality and team responsiveness are the company's key assets. Faced with today's environmental challenges, Hive Electric's commitment to sustainable and responsible solutions is more relevant than ever. Hive Electric shares its know-how and technological transfer to industrials by providing unique licenses and franchises for cell and battery turnkey plant. With innovative technology, recognized expertise and a personalized approach, Hive Electric is the partner to support its customers' energy storage projects and contribute to a more sustainable future in many fields, such as renewable energy, residential, buildings, infrastructure, aerospace, railways and electric mobility.

Finally, the head office is based in Hauts-de-France, the leading automotive and rail region in France and the leading renewable energy region in Europe. HES is located at the heart of the London-Paris-Brussels triangle. This gives us access to 5 European capitals within 300 km, and 2/3 of Europe's automakers within 500 km. Lille's ideal geographical location and ultra-efficient infrastructure network give Hauts-de-France an exceptional competitive edge.

5+	10+	15+	15+
Patent & Certification	**International Expert**	**Partnership**	**Awards & Distinction**

COMPANY QUALIFICATION

Hive Electric has been awarded by more than 15 awards in technology, innovation, energy transition, automotive and many more.

ADVANCED TECHNOLOGIES

HIVE ELECTRIC

LiFePO4 technology

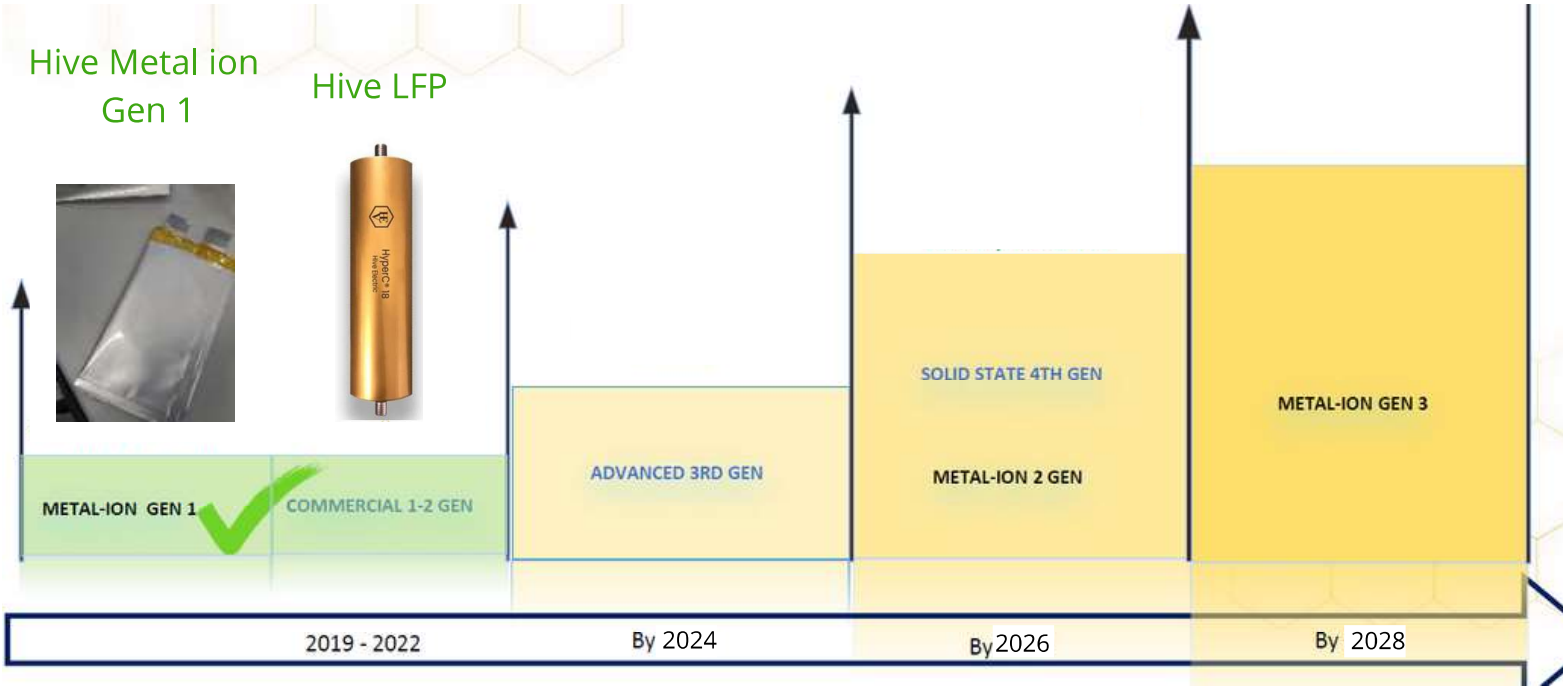
(Lithium Iron Phosphate)

- **Mature and commercialized**
- **HIVE's LFP technology has been developed with low lithium content and high performance. Extreme Temperature, Durability, Tailor-made**

- **-30%** Lithium content
- **+40%** increased lifetime
- **+6%** Output Voltage at cell
- **+10%** Higher energy density
- **+20%** Higher cycle time
- **+15%** Recycling
- No need for expensive cooling system for stationary and mobile applications.
- Augmented Security in case of short circuit failure.
- Specific Formfactor enabling quick assembly without soldering or wiring.
- Certification : UN38.3 / IEC 62133

Metal-ion technology

- **In the development phase**
- **HIVE's Metal ion technology has been developed without lithium using more recyclable materials such as Alumnium.**



OUR EXPERTISE & KNOW-HOW

MADE IN FRANCE

Premium quality

French touch

Sovereignty

	NMC TECHNOLOGY (Nickel, Manganese, Cobalt)	HYPERC Metal-ion HIVE
Time durability (cycle)	Up to 3 000 ✗	> 10 000 ✓
Charging time	Minutes ✗	Secondes ✓
Available raw materials	< 2% (in Europe) ✗	100% (in Europe) ✓
Recyclability	< 20% ✗	> 90% ✓
Energy density (Wh/kg)	< 350 ✓	130 ✓
Theoritical Potential	< 350 ✓	1160 ✓
Technology maturity	TRL9 - Market ✓	TRL5 – Proven ✓
Max Temperature	-10 to 50°C ✓	-40 to 60°C ✓
Environmental footprint	> 120g CO2eq/kWh ✗	< 60g CO2eq/kWh ✓

	LFP of Competitors	HIVE LFP
Time durability (cycle)	6 000 * at 0.2C to 0.5C ✓	3 000 to 7 500 ✓
Available raw materials	> 80 % ✓	> 80% ✓
Recyclability	< 80 % ✓	Up to 80% ✓
Energy density (Wh/kg)	< 200 ✓	Up to 200 ✓
Local made	No ✗	Yes ✓
Tailor-made	No ✗	Yes ✓
Max Temperature	-10 to 50°C ✓	-40 to 72°C ✓ ✓
Environmental Footprint	> 120g CO2eq/kWh ✗	<100g CO2eq/kWh ✓

ENERGY STORAGE PRODUCTS

STATIONARY BATTERIES

For residential, back up, container, charging station

Hex Power® E-Home® 1.5

E-Container®

Deep cycle battery

EMBEDDED BATTERIES

FOR EV, Gulf cars, Aerospace, Railways, Defense, Marine

Percheron® 1

Percheron® 3

Batteryfly® 18/36/54

HES® 24 Starter battery

MOBILE BATTERIES

For mobile EV charger, isolated place, aircraft

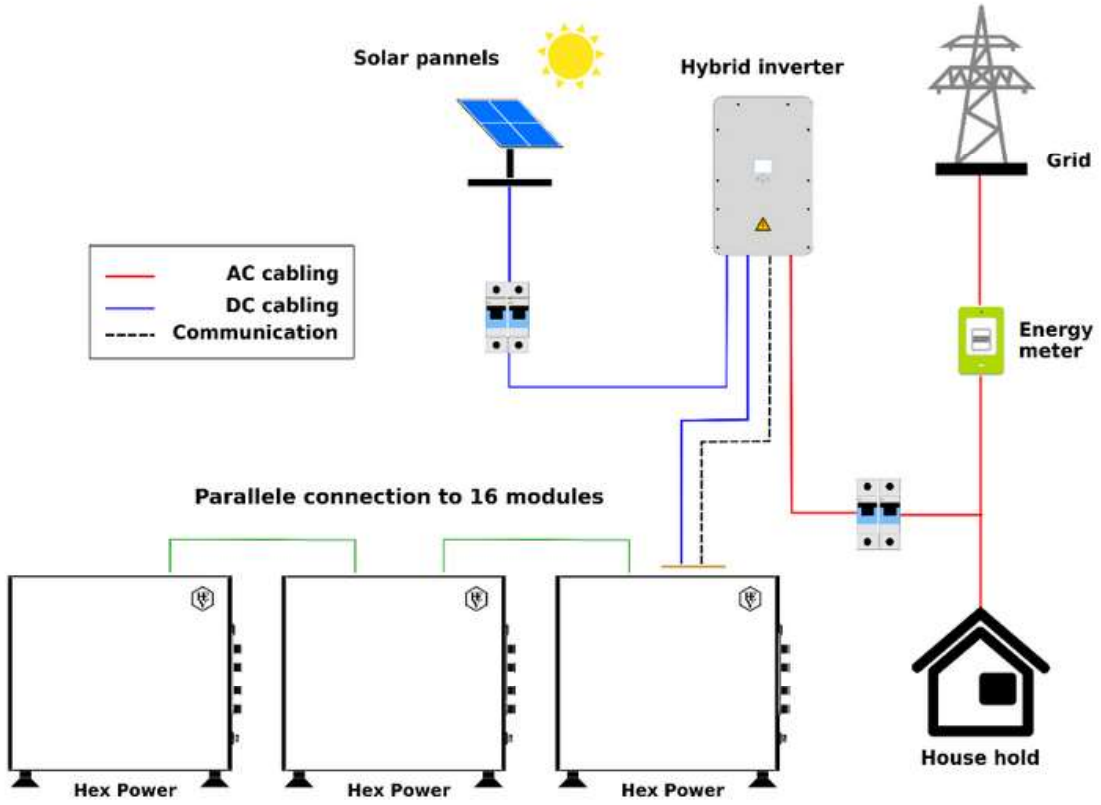
Mobile micro energy storage

Trolley®

GPU battery

HyperC®

ENERGY STORAGE SOLUTIONS

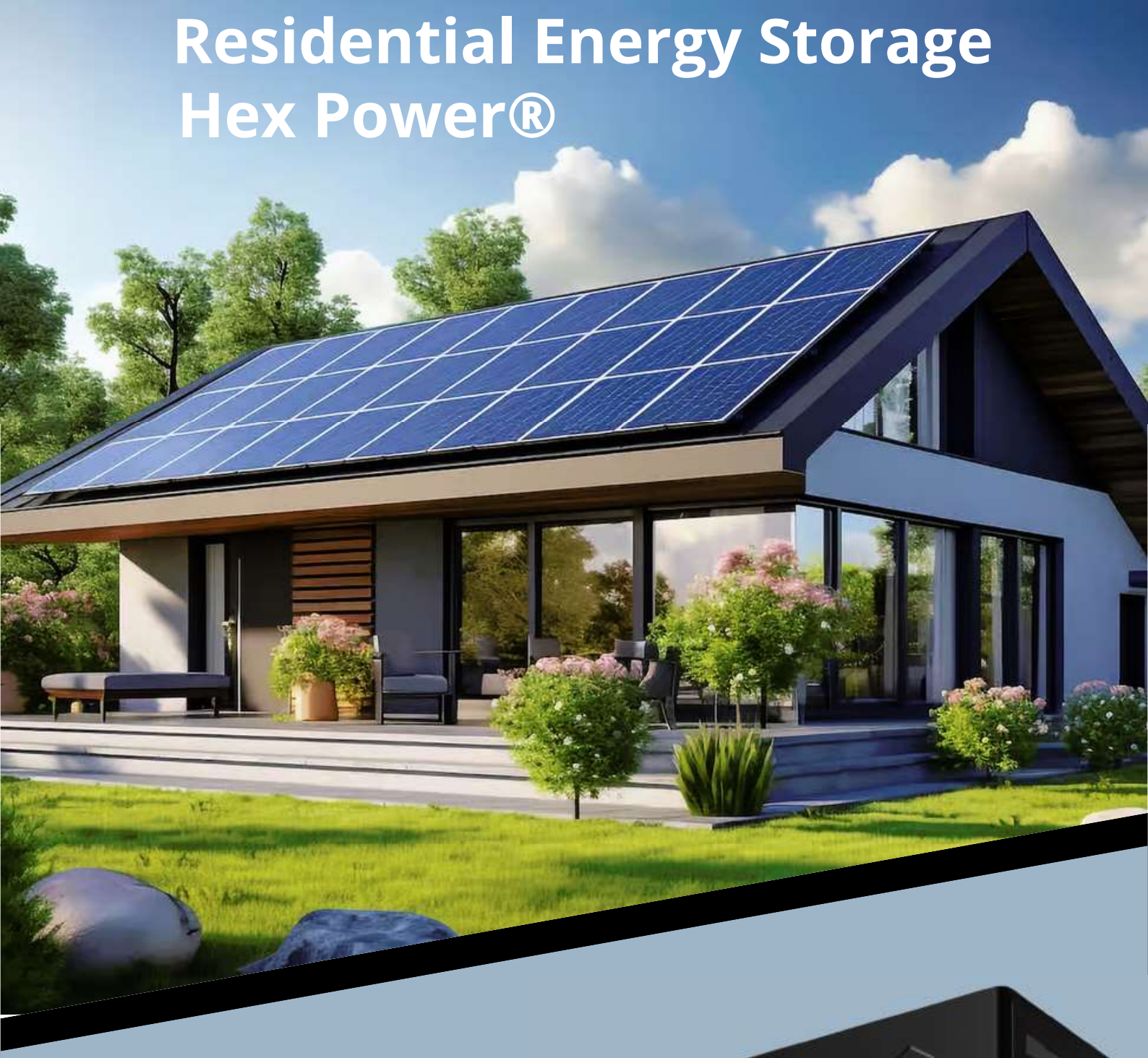


PRODUCTS COMPARISON

	HIVE ELECTRIC SOLUTIONS	CONVENTIONAL MARKET
Technology	LiFePO4	LiFePO4 / NMC
Tailor made	✓	✗
Easy to install	✓	✗
Quick delivery	✓	✗
Customer support	✓	✗
Assembly area	EU	China
Temperature performance	-30°C	0°C
Scalability	Up to 256 modules	Less than 10 modules
Guarantee	10 years	7 to 10 years

STATIONARY ENERGY STORAGE

Residential Energy Storage Hex Power®



Target profile : Residential, Back up, Office, Renewable energies

>3000 cycles	- 40°/72° C	Up to 80%	Up to 256
Sustainability	High range of temperature	recyclability	scalable modules

TÜVRheinland CERTIFIED

UN38.8 CERTIFIED

Hex Power®

Scalable up to 256 modules for 1.2 MWh

TECHNICAL SPECIFICATIONS

PARAMETERS	SPECIFICATIONS
Total number of cells	80
Nominal Capacity	90 Ah
Nominal Energy	4.75 kWh
Nominal Power	2.37 kW
Nominal Voltage	52.8 V
Operating Voltage Range	43.2 - 57.6 V
Continuous current	45 A
Max continuous power	4 kW
Max continuous current	90 A
Communication	CAN / RS485
Optimal Temperature	-10 to 55°C
Dimensions (L x W x H)	539.5 x 225.8 x 449 mm
Warranty	10 years
Number of cycles	>3000 cycles
Battery cell technology	LiFePO4
Weight (Kg)	46

The Hex Power features high-performance Hive LFP technology with a high level of security. It allows you to power an off-grid home with renewable energies.

RENEWABLES & MICROGRID | BUILDINGS & INDUSTRIES | DATACENTER | POWER GENERATORS | TELECOM

RESIDENTIAL
E-Home®

>3000 cycles
Sustainability

- 30°/60° C
High range of temperature

Up to 16 scalable modules

Up to 80%
recyclability

E-Home® 1.5

Scalable to power big installations

TECHNICAL SPECIFICATIONS

PARAMETERS	SPECIFICATIONS
Nominal Capacity	30 Ah
Nominal Energy	1.536 kWh
Nominal Voltage	51.2 V
Nominal Power	768 W
Operating Voltage Range	43.2 - 57.6 V
Circuit protection	30 A
Max discharge current	19 A
Operating Temperature	-10 to 55°C
Number of cycles	>3000 cycles
Battery cell technology	$LiFePO_4$
Weight max (Kg)	16.5
Communication	CAN / RS485
Dimensions	620,5 x 115,52 x 180 mm
Application	Stationary battery

RENEWABLES & MICROGRID | BUILDINGS & INDUSTRIES | DATACENTER | POWER GENERATORS | TELECOM

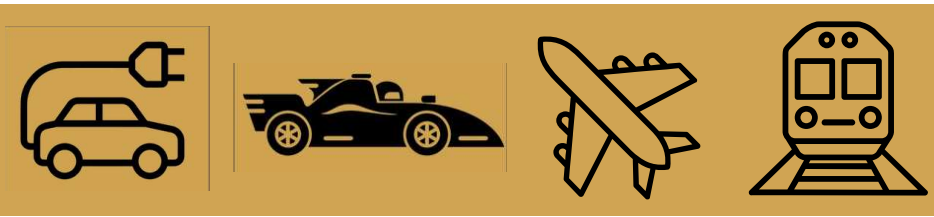
Deep cycle battery

Solutions - Deep cycle battery

MODEL	ENERGY CAPACITY	VOLTAGE	NOMINAL POWER	PULSE CURRENT	CYCLE LIFE	DIMENSION (mm)			WEIGHT
	kWh	V	W	CCA (>15 S)	Cycles	L	W	H	Kg
HES 12 - LCA - 1	1.30	12.8	261	200	≥ 5000	332	172	220	≥ 12
HES 12 - HCA - 1	1.18	13.2	237	1250	≥ 3500	332	172	220	≥ 13
HES 24 - LCA - 1	1.28	25.6	640	250	≥ 7000	332	172	220	≥ 15
HES 24 - HCA - 1	1.43	26.4	285	750	≥ 3500	345	190	245	≥ 15
HES 12 - LCA - 2	2.06	12.88	1030	320	≥ 4000	345	190	245	≥ 15
HES 12 - HCA - 2	2.37	13.2	475	1250	≥ 3500	520	220	225	≥ 22
HES 24 - LCA - 2	2.56	25.6	1280	200	≥ 5000	501	185	242	≥ 22
HES 24 - HCA - 2	2.37	26.4	475	1250	≥ 3500	520	220	225	≥ 22
HES 200 - LCA - 2	2.56	12.8	522	400	≥ 5000	501	185	242	≥ 22

Comparison

LEAD ACID BATTERIES	HIVE PRODUCTS
Limited Usable Capacity (30 - 50%)	100 % Usable capacity
Limited Life Cycle (500 - 1000)	Extend Life Cycle (3500 - 7000)
High-capacity retention due to temperature and power • 100% usable capacity at C/20 • 50% usable capacity at C/1 • 30% usable capacity at C/2	Negligible Capacity retention 100 % usable capacity at C/20, C/1, C/2
Rapid Voltage sag	Negligible Voltage sag (80-20%)
Slow and Inefficient charging - The final 20% of charging consumes equal time to the 80% of charging	Fast and Efficient Charging - constant charging till 100%
High maintenance	Zero maintenance
1.5x larger and 2.5x heavier	1.5x smaller and 2.5x lighter



BESS CONTAINER

E-Container®

<u>Target profile</u> : Renewable Energies, Charging Station, Construction Site, Events

>8000 cycles
Sustainability

- 10°/55° C
High range of temperature

1MWH
scalable

Up to 80%
recyclability

Container BESS®

AC (ON / OFF GRID)	
Nominal Energy	1 MWh
Apparent Power	550 kVA
Rated Power	500 kW
Rated Voltage	400 VAC (45~55/55~65Hz)
Voltage Range	360 ~ 440V
Rated Current	722 A
Maximum Current	866 A
Transfer On-Off grid	Manual / Automatic(≤10mS)
PV INFORMATION	
Maximum Power	250 kW
MPPT Voltage Range	350 ~ 850 V
Number of MPPT	5
Maximum Input Current per MPPT	115 A
Maximum Number of String	40 (8*5)
BATTERY INFORMATION	
Nominal Voltage	792 V
Maximum Current	772 A
Battery cell technology	Lithium Iron Phosphate ($LiFePo_4$)
GENERAL INFORMATION	
User Interface	Display, Modbus TCP/IP, CAN, RS485
Expected enclosure protection rating	IP21
Dimensions (L*W*H)	6100 x 2440 x 2900
Life cycle	> 3000 cycles, 100% DOD, capacity ≥ 80%
Weight (Approx.)	15 Ton
Warranty	10 years
Application	Stationary Energy Storage System, Back-up energy

EMBEDDED ENERGY STORAGE

AUTOMOTIVE
Percheron® 1

Target profile : Automotive, Electric Vehicles, Retrofit, Embedded

>3000 cycles
Sustainability

- 30°/60° C
High range of temperature

Up to 14C
discharge

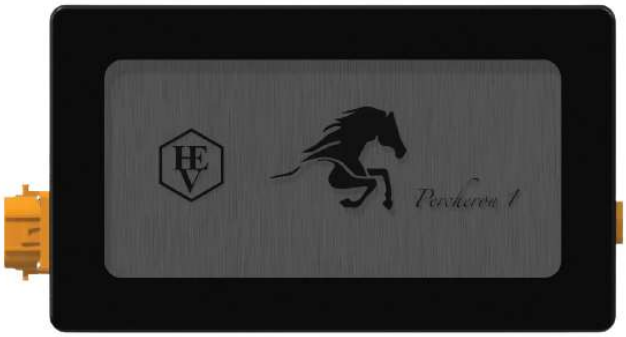
Up to 80%
recyclability

Percheron® 1

Scalable up to 168 modules

TECHNICAL SPECIFICATIONS

PARAMETERS	SPECIFICATIONS
Total number of cells	12
Nominal Capacity	18 Ah
Nominal Energy	712.8 Wh
Max Continuous Discharge current	90 A
Nominal Voltage	39.6 V
Operating Voltage Range	32.4 - 43.2 V
Nominal current	18 A
Max charge current	36 A
Peak current	260 A (18s)
Communication	CAN / RS485
Temperature	-10 to 55°C
Dimensions (L x W x H)	35.82 x 10.5 x 19 mm
Warranty	10 years
Number of cycles	>3000 cycles
Battery cell technology	LiFePO4
Weight (Kg)	10



Designed for the traction of any vehicle requiring medium to high voltages. The system can be configured for up to 168 modules either in series or in parallel for better power management.

ELECTRIC VEHICLES | COMMERCIAL & INDUSTRIAL VEHICLES | MARINE | RACING

Starter battery

To start engine with high cranking current

TECHNICAL SPECIFICATIONS

PARAMETERS	SPECIFICATIONS
Nominal Capacity	108 Ah
Nominal Energy	1.425 kWh
Nominal Voltage	13.2 V
Operating Voltage Range	10.8 - 14.4 V
Nominal Power	285 W for 5 hours
Max continuous power	1382 W
Cranking current for 5s	1560 A
Operating Temperature	-10 to 55°C
Dimensions max (L x W x H)	345 x 190 x 245 mm
Number of cycles	>3000 cycles @1C
Battery cell technology	$LiFePO_4$
Weight max (Kg)	15
Communication	CAN / UART
Application	Starter battery

AEROSPACE
Batteryfly®

<u>Target profile</u> : Aircraft, Helicopter, Drones, eVTOL

>3000 cycles
Sustainability

- 30°/60° C
High range of temperature

Up to 14C
discharge

Up to 80%
recyclability

Batteryfly® 18 Ah

Scalable to start engines or power the aircraft's electrical system

TECHNICAL SPECIFICATIONS

PARAMETERS	SPECIFICATIONS
Nominal Capacity	18 Ah
Nominal Energy	475 Wh
Nominal Voltage	26.4 V
Operating Voltage Range	21.6 - 28.8 V
Max continuous power	450 W
Max continuous current	18 A
Operating Temperature	Charge : -10 to 60°C Discharge : -30 to 60°C
Dimensions max (L x W x H)	120 x 385 x 185 mm
Number of cycles	>3000 cycles @1C
Battery cell technology	$LiFePO_4$
Weight max (Kg)	7
Communication	CAN 2.0
Application	Helicpoter AS350 Ecureuil, AS332

Batteryfly® 36 Ah

Scalable to start engines or power the aircraft's electrical system

TECHNICAL SPECIFICATIONS

PARAMETERS	SPECIFICATIONS
Nominal Capacity	36 Ah
Nominal Energy	950 Wh
Nominal Voltage	26.4 V
Operating Voltage Range	21.6 - 28.8 V
Max continuous power	900 W
Max continuous current	36 A
Operating Temperature	Charge : -10 to 60°C Discharge : -30 to 60°C
Dimensions max (L x W x H)	300 x 280 x 215 mm
Number of cycles	>3000 cycles @1C
Battery cell technology	$LiFePO_4$
Weight max (Kg)	12
Communication	CAN 2.0
Application	Airbus A318, A319, A320, A321

Batteryfly® 54 Ah

Scalable to start engines or power the aircraft's electrical system

TECHNICAL SPECIFICATIONS

PARAMETERS	SPECIFICATIONS
Nominal Capacity	54 Ah
Nominal Energy	1.425 kWh
Nominal Voltage	26.4 V
Operating Voltage Range	21.6 - 28.8 V
Max continuous power	1 380 W
Max continuous current	54 A
Operating Temperature	Charge : -10 to 60°C Discharge : -30 to 60°C
Dimensions max (L x W x H)	300 x 310 x 270 mm
Number of cycles	>3000 cycles @1C
Battery cell technology	$LiFePO_4$
Weight max (Kg)	17
Communication	CAN 2.0
Application	Airbus A340-500, A340-600

Performance Batteryfly® 36 Ah

TECHNICAL COMPARISON

	HIVE LFP	Previous technology
Technology	Certified $LiFePO_4$	Nickel-cadmium
Voltage	26.4 V	24 V
Capacity	36 Ah	23 Ah
Weight	12 kg	25.5 kg
Dimensions of Pack Battery	170 x 170 x 175 mm	248 x 254 x 156 mm
Maintenance	No maintenance	Maintenance : Add of electrolyte
Operating Temperarure	-30 to 60 °C	-40 to 71 °C
Optimum Temperarure	-10 to 50 °C	5 to 45 °C

Hive Electric Solutions :

- **Made in Europe**
- **Critical raw material free**
- **Safety**
- **Sustainability**

RAILWAYS
HES® 24

<u>Target profile</u> : Train, Wagon, Communication and signalling system

>3000 cycles
Sustainability

- 30°/60° C
High range of temperature

HIVE LFP
Up to 14C discharge

Up to 80%
recyclability

HES 24®

Scalable to power the railways electrical system

TECHNICAL SPECIFICATIONS

PARAMETERS	SPECIFICATIONS
Nominal Capacity	54 Ah
Nominal Energy	1.425 kWh
Nominal Voltage	26.4 V
Operating Voltage Range	21.6 - 28.8 V
Max continuous power	1080 W
Max continuous current	54 A
Operating Temperature	-10 to 55°C
Dimensions max (L x W x H)	345 x 190 x 245 mm
Number of cycles	>3000 cycles @1C
Battery cell technology	$LiFePO_4$
Weight max (Kg)	13.4
Communication	CAN / RS485 / Modbus RTU
Application	Auxiliary battery

MARINE
Percheron® 3

<u>Target profile</u> : Electric Propulsion, Auxiliary and Emergency Power, Port and Dockside

>3000 cycles
Sustainability

- 30°/60° C
High range of temperature

HIVE LFP
Up to 14C discharge

Up to 80%
recyclability

Percheron® 3

Scalable up to 576 modules for 1.6 MWh

Model	Percheron 3 S1P1	Percheron 3 S2P1	Percheron 3 S8P4
Number of Percheron 3	1	2	32
Nominal capacity	54 Ah	54 Ah	216 Ah
Nominal energy [1]	2.85 kWh	5.7 kWh	91.2 kWh
Minimum usable energy [2]	2.5 kWh	5 kWh	80 kWh
Nominal power [3]	2.8 kW	5.6 kW	90 kW
Nominal voltage	52.8 V	105.6 V	422.4 V
Operating Voltage Range	43.2 - 57.6 V	86.4 - 115.2 V	345.6 - 460.8 V
Continuous current	54 A	54 A	216 A
Maximum continuous power	7 kW	14 kW	224 kW
Maximum continuous current [4]	162 A	162 A	648 A
Battery cell technology	Lithium Iron Phosphate		
Communication	CAN		
Life cycle	> 3000 cycles		
Operating temperature	-10°C to 55°C		
Dimensions (L*W*H) per module	198 * 401 * 340 mm		
Package dimensions per module	220 * 420 * 360 mm		
Weight (Kg)	28	56	896
Enclosure protection rating	IP 32 (up to IP 65)		
Certification	CE - UN38.3		
Warranty	10 years		
Application	Automotive and Marine solutions, Back-up energy		

MOBILE ENERGY STORAGE

MOBILE STORAGE Trolley®

Target profile : Camping Car, construction site, residential back-up, isolated place

>3000 cycles
Sustainability

- 30°/60° C
High range of temperature

HIVE LFP
Up to 14C discharge

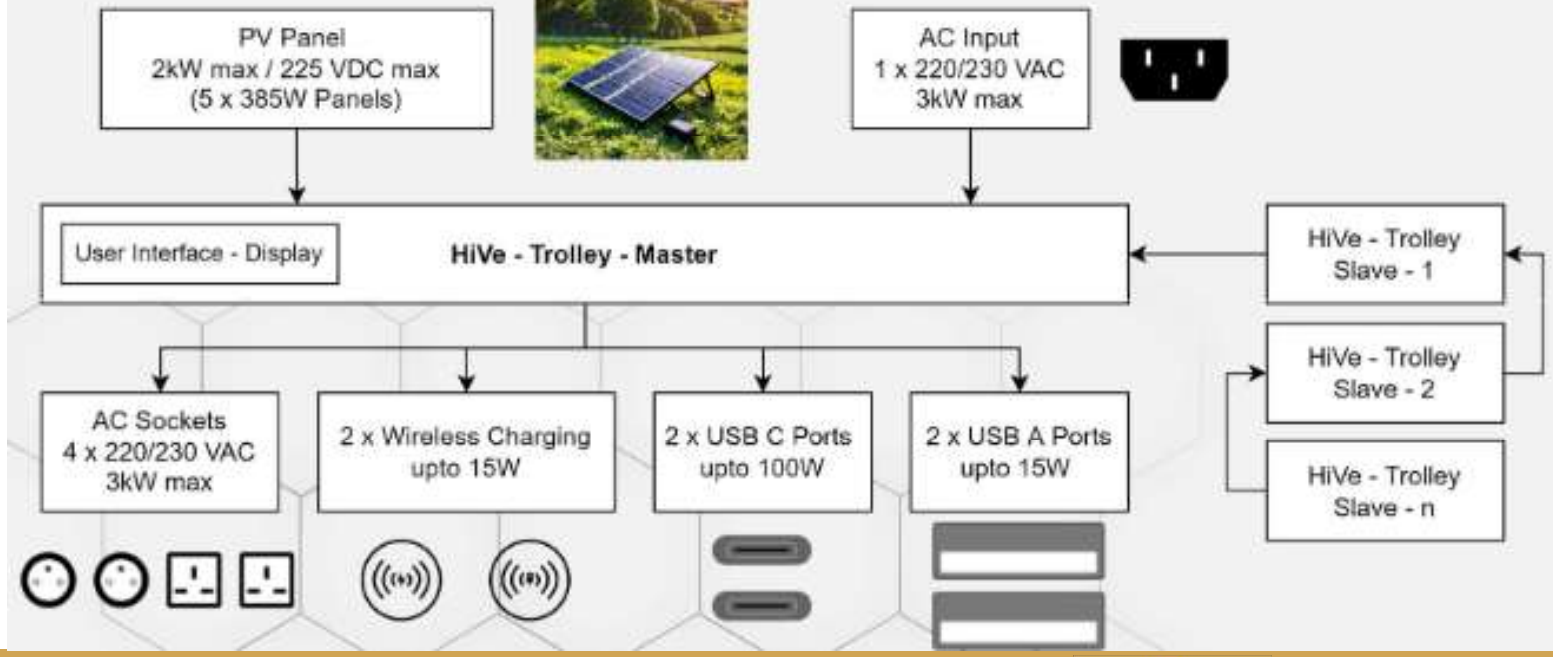
Up to 80%
recyclability

HiVe-TROLLEY

we can provide a Customized Battery Trolley depending on your requirements

The HiVe Trolley serves as a portable power station with the versatility to operate in both grid UPS mode and off-grid energy storage. It is designed to be scalable for varying energy capacities, providing flexibility in meeting power requirements.

Parameters	Master	Slave
Energy Capacity	3 kWh	3 kWh
Nominal Power	3 kW	-
Output Ports AC	4 x 220/230 VAC	-
Output Ports DC	1 x 12VDC, 10A 1 x 12VDC, 30A 2 x USB C Port, 100W 2 x USB A Port, 15W Wireless Charging, 15W	1 x 48VDC, 50A
Input port AC	1 x 220/230 VAC	-
Input Ports DC	Portable PV Input: 2kW Max 210VDC Max, 1 x 12A	1 x 48VDC, 50A
Temperature Range	-10 to 55°C	
Standards Compliance	IEC62619, CE, UL	
Application	Recreational Vehicle (RV), Residential Backup	



BUILDINGS & INDUSTRIES

MOBILE MICRO ENERGY STORAGE

<u>Target profile</u> : Mobile EV charger, power construction, aircraft, business site

>8000 cycles
Sustainability

- 30°/60° C
High range of temperature

HIVE LFP
Up to 14C discharge

Up to 80%
recyclability

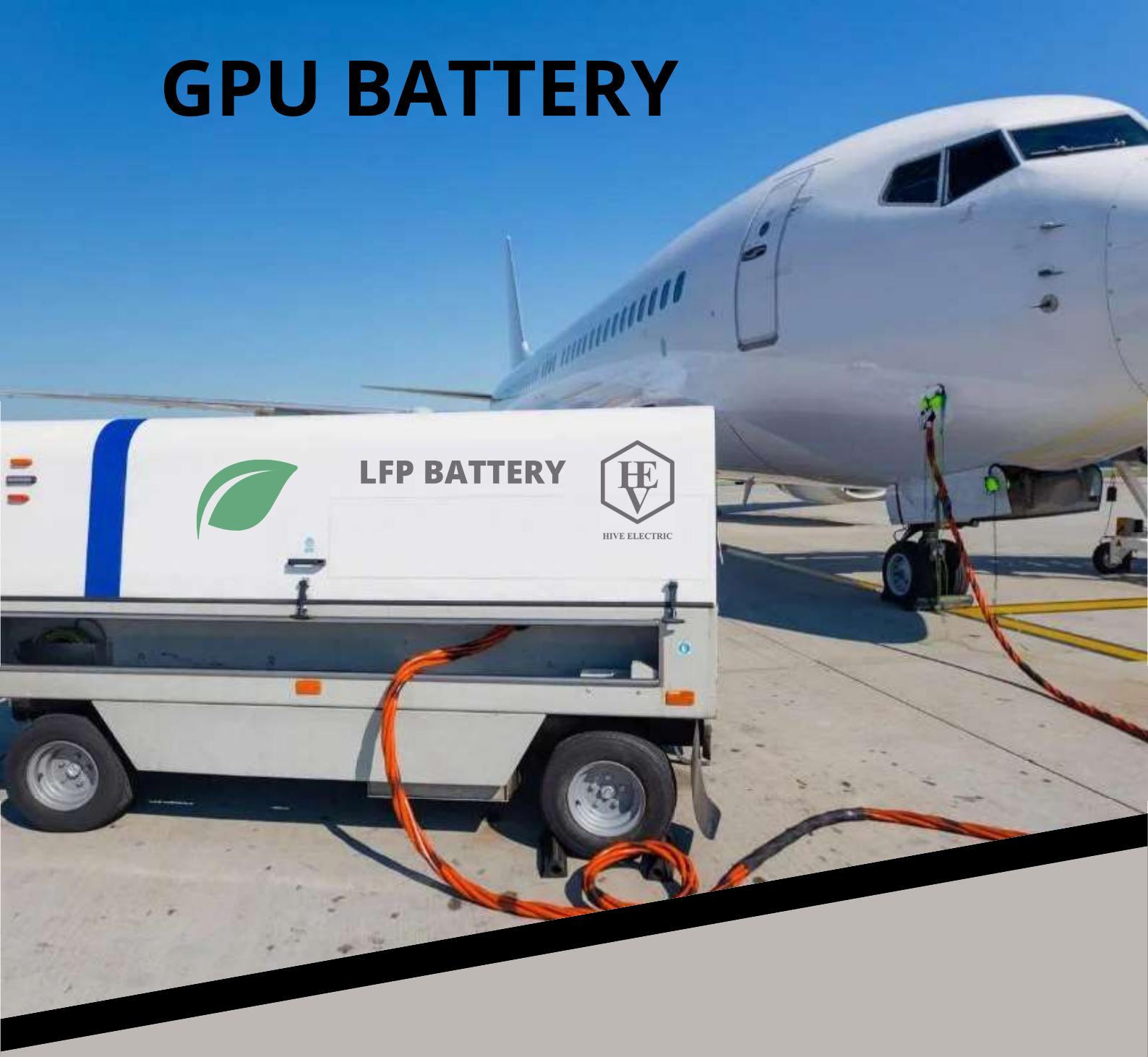
MOBILE MICRO ENERGY STORAGE

PARAMETER	VALUE
Energy Capacity	200 kWh
Maximum Power	120 kW
Rated Voltage	360 - 440 VAC (45~55/55~65Hz)
Maximum Current	183 A
Power Input	400 VAC (45~55/55~65Hz) / 300 A
Weight Approx	1200 kg
Cooling	Air Cooled
User Interface	Display, CAN 2.0, ModBus RTU
Operating Condition	IP65, Ambient Temperature: -25 to 50°C
Standard	IEC 62619, CE, UL

This energy storage system can fit to your requirements with tailor-made specifications. We can reach up to X MWh for the battery to power huge installations which require high energy and power.

BUILDINGS & INDUSTRIES

GPU BATTERY



<u>Target profile</u> : Aircraft, Helicopter, Tourist aircraft

>8000 cycles
Sustainability

- 30°/60° C
High range of temperature

HIVE LFP
Up to 14C discharge

Up to 80%
recyclability

GPU BATTERY

PARAMETER	HIVE-GPU90	HIVE-GPU180
Energy Capacity	100 kWh	200 kWh
Nominal Power	90 kVA	180 kVA
Output Voltage	3 x 115/200 VAC 400Hz 28VDC / 800A Continuous (Peak: 1000A/10 Seconds; 2000A/5 Seconds) 270 VDC (Optional)	
Maximum Continuous Power	100 kVA	200 kVA
Power Input	400 VAC (45~55/55~65Hz) / 75 A	400 VAC (45~55/55~65Hz) / 150 A
Weight Approx	4000 kg	5000
Cooling	Forced Air	
User Interface	Display, CAN 2.0, ModBus RTU	
Operating Condition	IP65, Ambient Temperature: -25 to 50°C	
Standard	IEC 62619, CE, UL	

We are developing GPU batteries to replace diesel-powered GPUs, which are polluting and noisy. Our green energy battery will be able to recharge the various aircraft on the tarmac with scalable capacity and power. We are always ready to listen to your needs and can produce a tailor-made battery if required.

BATTERY APPLICATIONS
HyperC®

Target profile : Military, Automotive, Stationary, Aerospace, Railways

>3000 cycles
Sustainability

- 30°/60° C
High range of temperature

HIVE LFP
Up to 14C discharge

Up to 80%
recyclability

HyperC®

Large format for maximum energy storage

TECHNICAL SPECIFICATIONS

PARAMETERS	SPECIFICATIONS
Capacity	18 Ah
Technology	LFP
Internal Resistance	< 4 mΩ
Nominal Voltage	3.3 V
Charge Voltage	3.65 V
Max. Continuous Discharge Current	90 A
Pulse Discharge Current	260 A (18s)
Working Temperature	Charge (-10 ~ 60 °C) Discharge (-30 ~ 60 °C)
Weight	410 g
Dimensions	138.8 mm
Energy Density	Gravimetric : 145 Wh/kg Volumetric 332 Wh/L
Power Density (at 100% SOC, 18s peak)	Gravimetric : 2072 W/kg Volumetric 4750 W/L

Available in several sizes

TAILOR MADE BATTERIES

<u>Target profile</u> : Vehicle batteries and stationary energy storage systems

>3000 cycles
Sustainability

- 30°/60° C
High range of temperature

HIVE LFP
Up to 14C discharge

Up to 80%
recyclability

TAILOR MADE SOLUTIONS

We adapt to your specifications and applications

CLIENT TECHNICAL SPECIFICATIONS

Nominal Capacity	Max continuous power
Nominal Energy	Max continuous current
Nominal Power	Communication
Nominal Voltage	Temperature
Operating Voltage Range	Dimensions (L x W x H)
Continuous current	Number of cycles
Battery cell technology	Weight (Kg)

For Automotive, Residential, Renewables, Railways, Aerospace, Marine, Defense, Industry and many more

Our team of storage experts will design a battery to your specifications, creating a unique battery customized to your needs. We use our technology and know-how to improve your storage devices performance.

CONTACT US

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Join us for a better future