



Company Profiles

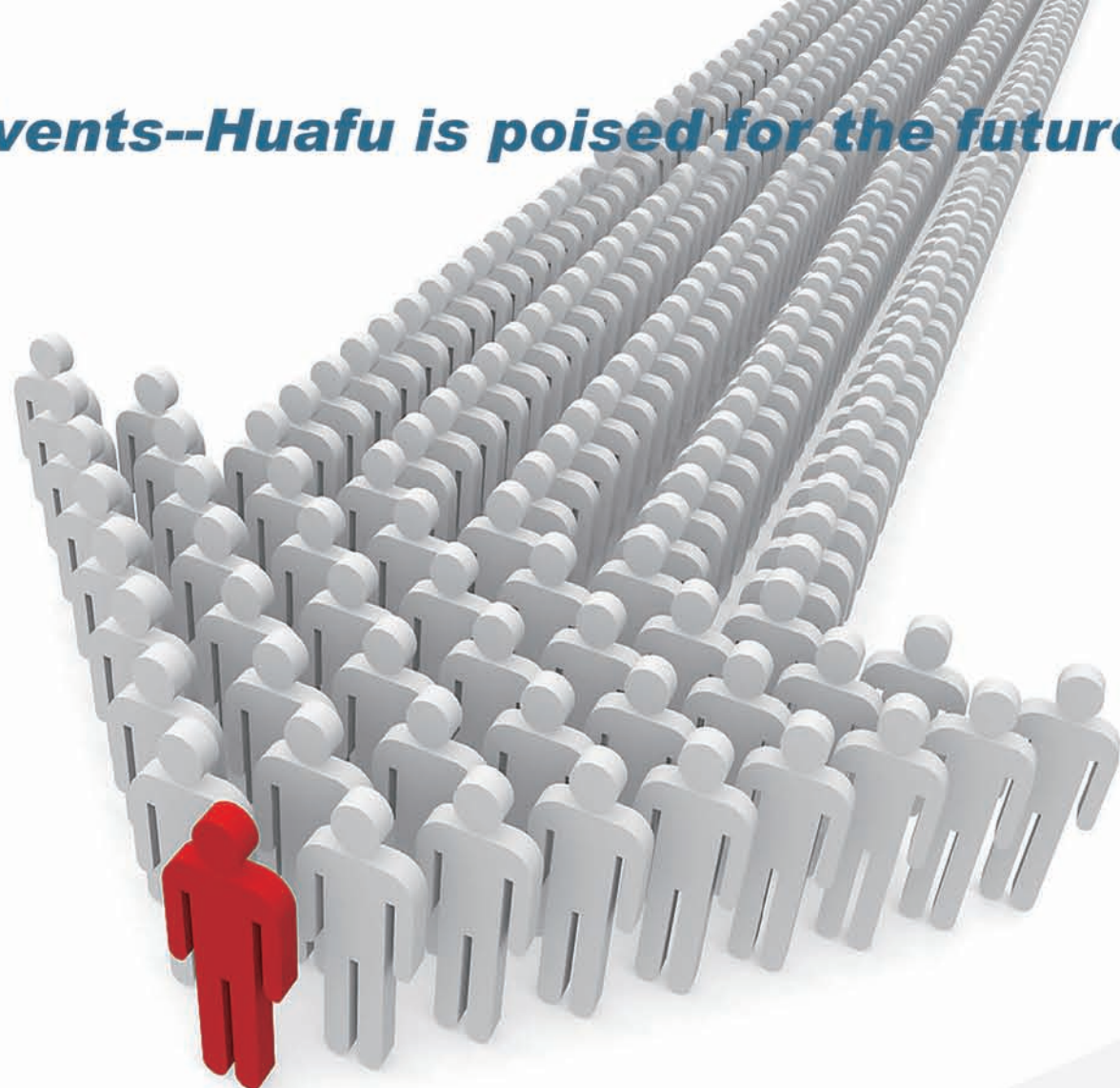
Huafu High Technology Energy Storage Co., Ltd., invested by Jiangsu Huafu Holding Group, listed on New OTC Market, is a cross-regional, cross-industry, high-tech company involved in new energy, battery, logistics, trade, research & development and other fields.

The company was founded in 1990, located in Gaoyou city of Jiangsu province which was known as "the capital of Eastern Post Capital".

It owns Jiangsu Huafu Energy Co., Ltd., Tibet Guosheng New Energy Co., Ltd. IPS technology(Tianjin). Ltd., and other holding companies.

The company is the national key high-tech enterprise, Jiangsu province innovative leading enterprises, Jiangsu province scientific and technological listed foster enterprise, the member of national standards technical committee of lead-acid battery. The company has established a national post-doctoral scientific and postgraduate research workstation, provincial enterprise academician workstation and graduate workstation, the provincial energy storage materials engineering technology research center, enterprise technology center, energy storage materials and application engineering center and other institutions. The production and sales of gel battery developed by independent research has been ranked first in the country.

Big Events--Huafu is poised for the future



1990

The establishment of the company

1995

The GFM battery is introduced

2001

Plant relocation, achieves the second start-up

2004

The second generation of gel battery launched on the market

2006

2007

HUAFU Group ranks NO.1 in the sales of gel battery & energy storage battery in China

2010

Set-up provincial technology center and Academician Workstation

2012

Leading domestic specialty gel batteries for plateaus

2013

Set-up national postdoctoral workstation

2016

Moving into the battery industrial park, has achieved the third start-up, and has been successfully listed in NEEQ

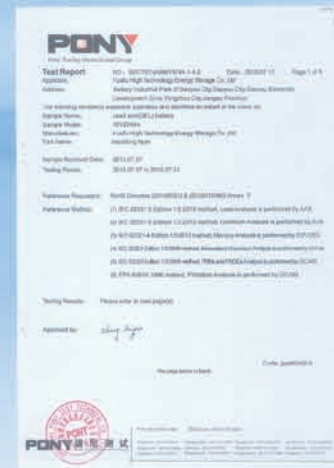




CE certification



UL certification



RoHS certification



Quality management system Certificate (ISO 9001:2008 Standard)



Occupational health and safety management system certificate (OHSAS 18001:2007)



Environmental management system Certificate (ISO 14001:2004)



High-tech Enterprise



China Well-known Trademark



SGS certification



TLC Certificate for Product Certification



CGC-SOLAR certification



01

Energy storage battery series

Application fields: Energy storage battery series are widely applied into the new energy fields, such as solar (wind) household system, off-grid power station, solar (wind) energy communication, communication base station, solar (wind) energy street lighting system, mobile energy storage system, solar traffic lights, solar building system, etc.

Battery series for energy storage

Application field

Battery series for Energy storage are widely applied into the solar (wind) household system, off-grid power station, solar (wind) energy communication, communication base station, solar (wind) energy street lighting system, mobile energy storage system, solar traffic lights, solar building system, etc.

Executive standards

GB/T22473-2008<Lead acid battery used for energy storage>, IEC61427-2005<Secondary cells and batteries for photovoltaic energy system(PVES)-General requirements and methods of test>.

Integrated performance

The major products can be divide into two series: lead acid and gel, of which gel batteries is more outstanding in respects of wider temperature range, better recovery ability after over-discharge , longer cycle life etc.

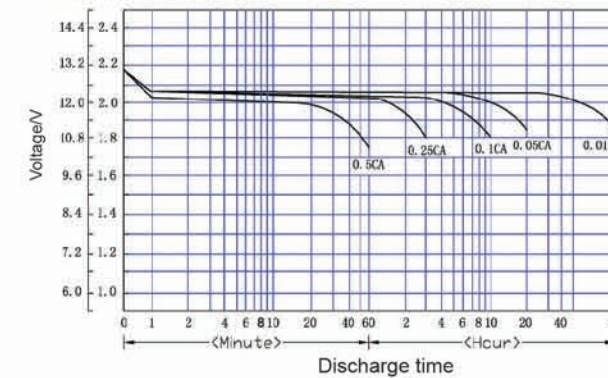
1. Patent structure: Convenient wire type structure for connection (patent No.ZL200720045887.1and ZL200720037066.3) achieves a true underground installation, which help avoid the pole corrosion.
2. Recovery performance: The adoption of special alloys and lead paste formulations make a low self-discharge rate, good deep discharge tolerance , and strong recover capability.
3. Charging efficiency: The usage of imported low resistance raw materials and advanced process help make the internal resistance smaller and the acceptance ability of small current charging stronger.
4. High and low temperature tolerance: Wide temperature range (lead-acid:-25~50 ℃ ,and gel:-35~60 ℃), suitable for indoor and outdoor use in varies environments.
5. Long cycle-life: The design life of lead acid and gel series reach to more than 15 and 18 years respectively, for the grid is corrosion- resistant, and electrolyte is without risk of stratification by using multiple rare-earth alloy of independent intellectual property rights, nanoscale fumed silica imported from Germany as base materials, and electrolyte of nanometer colloid all by independent research and development.
6. Environment-friendly: Cadmium (Cd), which is poisonous and not easy to recycle, does not exist. Acid leakage of gel electrolyte will not happen. The battery operates in safety and environmental protection.



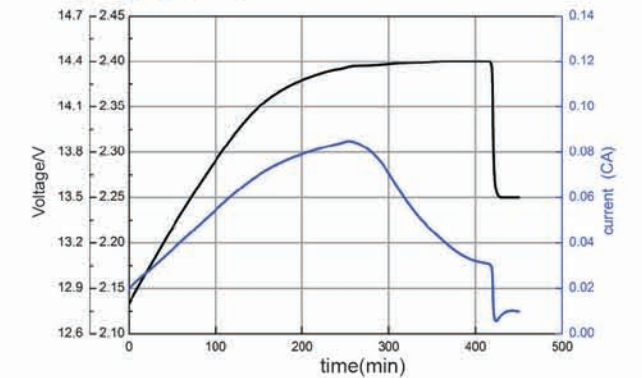
Lead acid (gel) storage battery series

Product model	Rated voltage(V)	Rated capacity (Ah/10Hr)	Dimension (mm,±3%)			
			length	width	height	total height
CN(J)-200	2	200	171	106	330	342
CN(J)-300	2	300	171	151	330	342
CN(J)-400	2	400	196	171	330	342
CN(J)-500	2	500	241	171	330	342
CN(J)-600	2	600	285	171	330	342
CN(J)-800	2	800	383	171	330	342
CN(J)-1000	2	1000	471	171	330	342
CN(J)-1200	2	1200	510	175	337	347
CN(J)-1500	2	1500	318	341	341	351
CN(J)-2000	2	2000	433	342	341	351
CN(J)-2500	2	2500	629	346	341	351
CN(J)-3000	2	3000	629	346	341	351
6-CN(J)-8	12	8	151	65	95	99
6-CN(J)-12	12	12	151	100	97.5	102
6-CN(J)-14	12	14	151	100	97.5	102
6-CN(J)-20	12	20	181	77	170	175
6-CN(J)-24	12	24	165	126	175	181
6-CN(J)-30	12	30	196	165	174	181
6-CN(J)-40	12	40	196	165	174	181
6-CN(J)-50	12	50	229	138	210	230
6-CN(J)-60	12	60	350	166	174	174
6-CN(J)-65	12	65	350	166	174	174
6-CN(J)-70	12	70	350	166	174	174
6-CN(J)-80	12	80	329	172	214	236
6-CN(J)-90	12	90	329	172	214	236
6-CN(J)-100	12	100	329	172	214	236
6-CN(J)-110	12	110	406	174	208	232
6-CN(J)-120	12	120	406	174	208	232
6-CN(J)-150	12	150	483	170	240	240
6-CN(J)-180	12	180	522	240	219	244
6-CN(J)-200	12	200	522	240	219	244
6-CN(J)-220	12	220	522	240	219	244
6-CN(J)-250	12	250	520	269	220	245

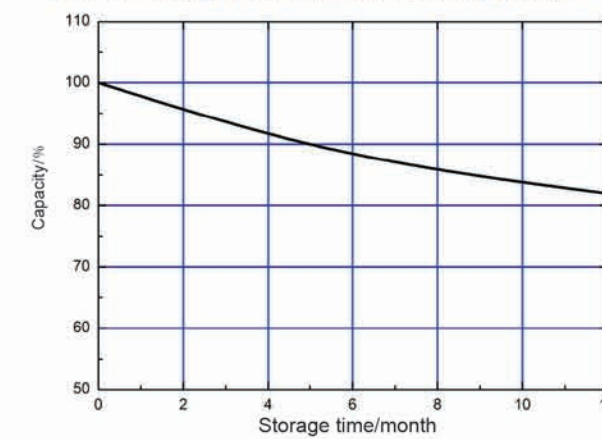
Discharge curve



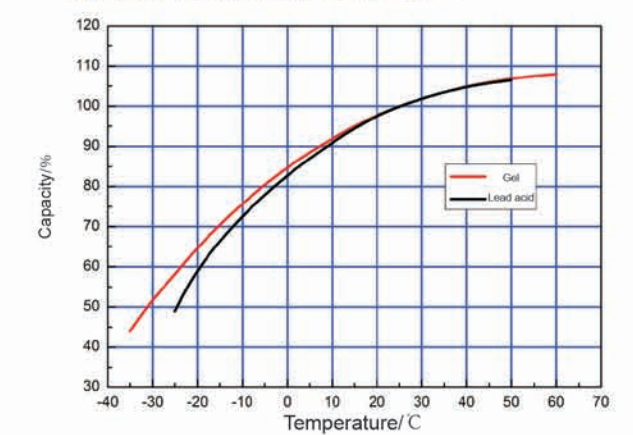
Charging curve



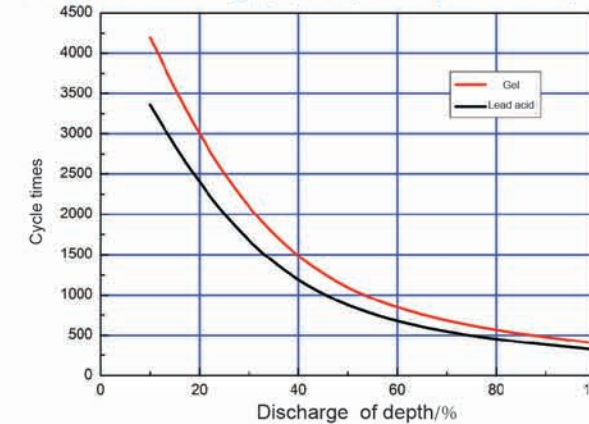
Self-discharge rate under room temperature (25 °C)



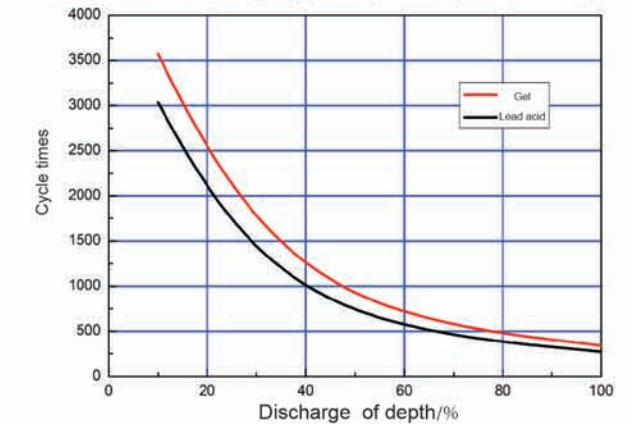
Capacity VS. Ambient temperature



Depth of discharging(DOD) and cyclic times (2V)



Depth of discharging(DOD) and cyclic times (12V)



An off grid power station for military defense



A solar street lighting system in Dubai

Specialty batteries for plateaus

Application field

Energy storage system located at the area of 1500 m above sea level, such as solar energy (wind) household systems, off-grid power station, solar energy (wind) communication base station, solar energy (wind) lamps, mobile energy storage system, solar traffic lights, solar building system, etc.

Executive standards

GB/T 22473-2008 <Lead acid battery used for energy storage>, IEC 61427-2005<Secondary cells and batteries for photovoltaic energy systems (PVES) -General requirements and methods of test>.

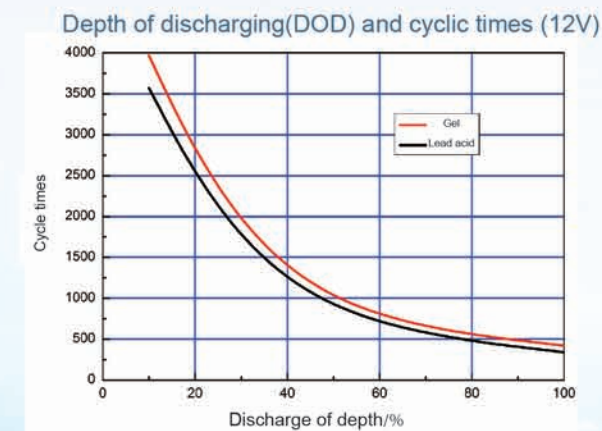
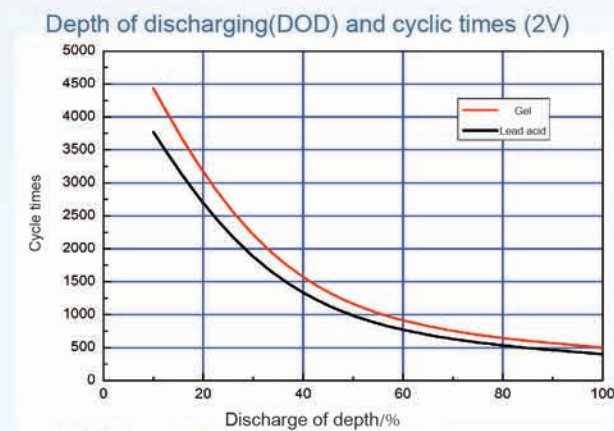
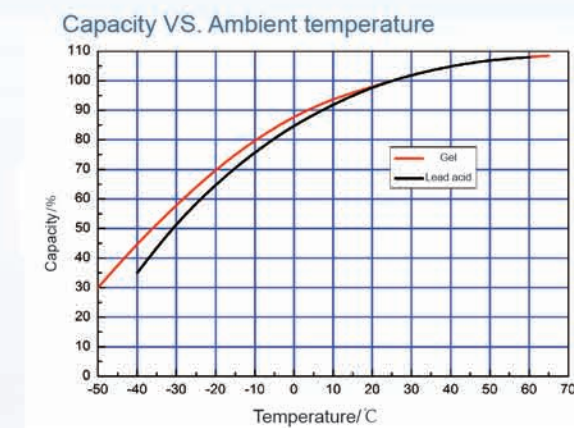
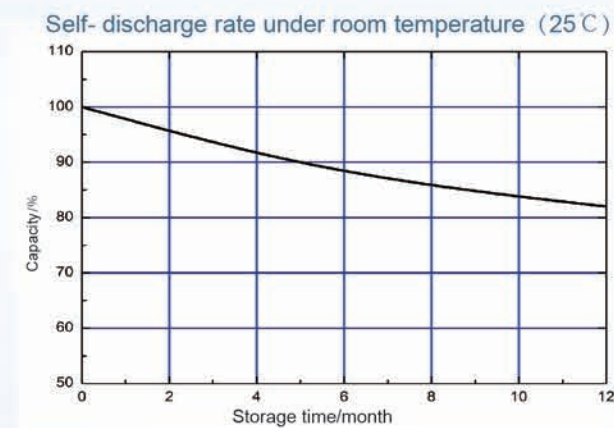
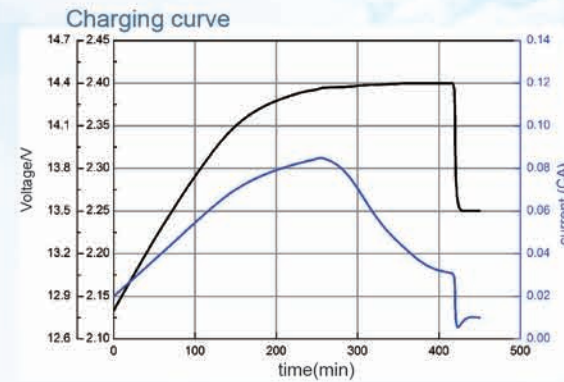
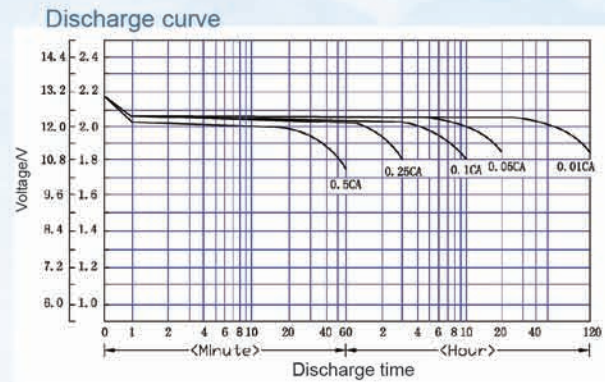
Integrated performance

1. Available in Plateau: By breaking through the traditional craft, the batteries work properly in the high altitude area of more than 5500 m above sea level.
2. Wide operational temperature range: polymer electrolyte of low temperature tolerant makes the battery temperature range from -50℃ to 65℃.
3. Low pressure tolerance: Using special pressure design, the battery internal components in a very low pressure environment is still good to run.
4. Long cycle-life: Using special alloy patent, battery design life can reach to 15 ~ 18 years.
5. Recovery easily: Using plateau special craft formula, after over-discharge, the battery can be recovery fast and effectively.
6. Easy to install: Batteries with independent patent design, can be connected fast, simply and conveniently.



Lead-acid(gel) storage battery series used in plateau

Product model	Rated voltage(V)	Rated capacity (Ah/10Hr)	Dimension (mm,±3%)			
			length	width	height	total height
CN(J)-200	2	200	171	106	330	342
CN(J)-300	2	300	171	151	330	342
CN(J)-400	2	400	196	171	330	342
CN(J)-500	2	500	241	171	330	342
CN(J)-600	2	600	285	171	330	342
CN(J)-800	2	800	383	171	330	342
CN(J)-1000	2	1000	471	171	330	342
CN(J)-1200	2	1200	510	175	337	347
CN(J)-1500	2	1500	318	341	341	351
CN(J)-2000	2	2000	433	342	341	351
CN(J)-2500	2	2500	629	346	341	351
CN(J)-3000	2	3000	629	346	341	351
6-CN(J)-8	12	8	151	65	95	99
6-CN(J)-12	12	12	151	100	97.5	102
6-CN(J)-14	12	14	151	100	97.5	102
6-CN(J)-20	12	20	181	77	170	175
6-CN(J)-24	12	24	165	126	175	181
6-CN(J)-30	12	30	196	165	174	181
6-CN(J)-40	12	40	196	165	174	181
6-CN(J)-50	12	50	229	138	210	230
6-CN(J)-60	12	60	350	166	174	174
6-CN(J)-65	12	65	350	166	174	174
6-CN(J)-70	12	70	350	166	174	174
6-CN(J)-80	12	80	329	172	214	236
6-CN(J)-90	12	90	329	172	214	236
6-CN(J)-100	12	100	329	172	214	236
6-CN(J)-110	12	110	406	174	208	232
6-CN(J)-120	12	120	406	174	208	232
6-CN(J)-150	12	150	483	170	240	240
6-CN(J)-180	12	180	522	240	219	244
6-CN(J)-200	12	200	522	240	219	244
6-CN(J)-220	12	220	522	240	219	244
6-CN(J)-250	12	250	520	269	220	245



'Tianjiao' Gel battery series

Application field

Tianjiao gel series is applies to solar energy (wind) household systems, off-grid power station, solar energy (wind) communication base station, solar energy (wind) lamps, mobile energy storage system, solar traffic lights, solar building system, solar energy(wind) communication base station, power station, power transmission and transformation system, computer protection system, emergency power supply, uninterrupter power supply (UPS) systems, radio and broadcasting stations and automatic control of standby power, and automatic control and other standby power supply, etc.

Executive standards

GB/T 22473-2008 <Lead acid battery used for energy storage>, IEC 61427-2005 <Secondary cells and batteries for photovoltaic energy systems (PVES) -General requirements and methods of test>, GB/T 19638.2—2005<Stationary valve-regulated sealed lead acid battery >, YD/T 1360—2005<Valve-regulated sealed gel battery for communication>.

Integrated performance

By adopting imported polymer microporous separator and high density gel electrolyte, the advantage of TIANJIAO is more outstanding: wider operating temperature range, stronger recovery ability after over-discharging, longer cycle-life at deep discharging.

1. Patent structure: The use of convenient wire type structure for connection (patent No.ZL200720045887.1 and ZL200720037066.3), helps achieve a true underground installation, avoid the pole corrosion.

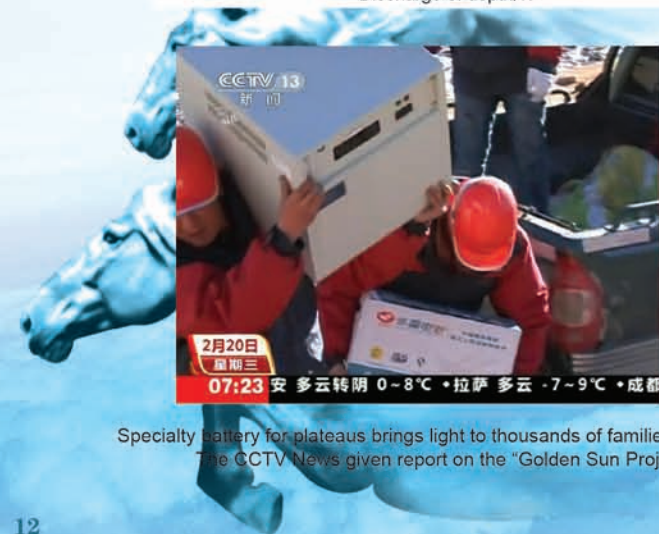
2. Recovery performance: The adoption of high-quality alloys and lead paste formulations makes a low self-discharge rate, good deep discharge tolerance, and strong recover capability.

3. Charging efficiency: The Usage of raw material of low resistance and advanced process makes a small internal resistance and strong small current charge acceptance.

4. High and low temperature tolerance: A wide temperature range of -50~65°C, suitable for indoor and outdoor use in varies environments.

5. Long cycle-life: By using corrosion-resistant alloy and high density of quality nanoscale fumed silica gel electrolyte, the product is corrosion -resistant, free of electrolyte stratification. The design life can reach to 18 years.

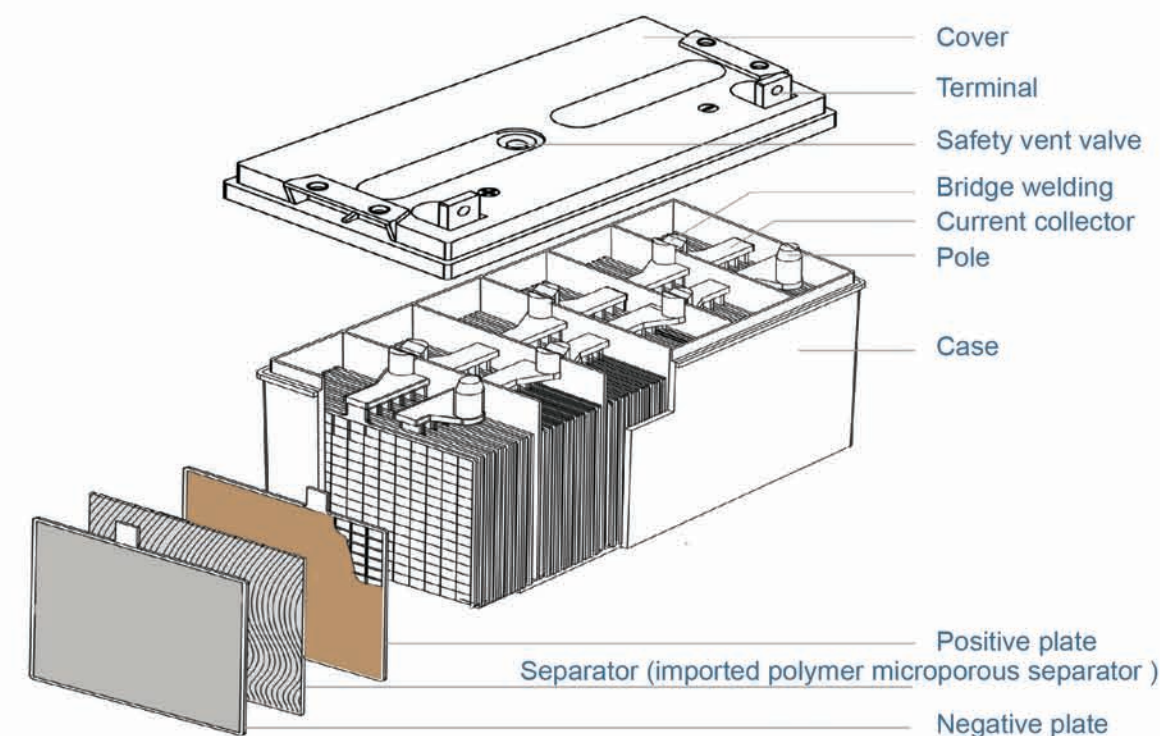
6. Environmental-friendly:Cadmium(Cd), which is poisonous and not easy to recycle, is not existing. It is free of acid leakage of gel electrolyte. All guarantee batteries can operate in safety and environmental protection.



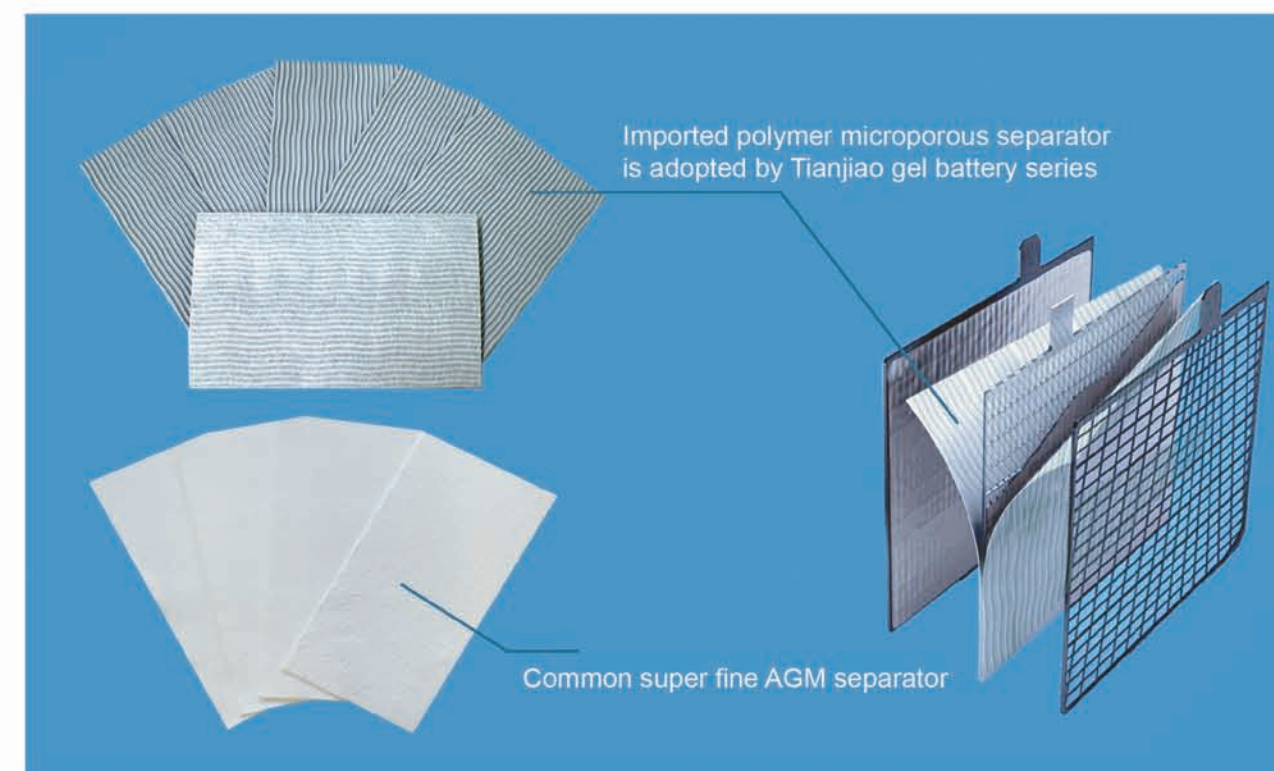
'Tianjiao' gel battery series

Product model	Rated voltage(V)	Rated capacity (Ah/10Hr)	Dimension (mm,±3%)			
			length	width	height	total height
2V200Ah	2	200	171	106	330	342
2V300Ah	2	300	171	151	330	342
2V400Ah	2	400	196	171	330	342
2V500Ah	2	500	241	171	330	342
2V600Ah	2	600	285	171	330	342
2V800Ah	2	800	383	171	330	342
2V1000Ah	2	1000	471	171	330	342
2V1500Ah	2	1500	355	337	330	342
2V1600Ah	2	1600	355	337	330	342
2V2000Ah	2	2000	476	337	330	342
2V2200Ah	2	2200	476	337	330	342
2V2900Ah	2	2900	696	340	330	342
2V3000Ah	2	3000	696	340	330	342
2V3600Ah	2	3600	696	340	330	342
12V50Ah	12	50	260	168	212	218
12V65Ah	12	65	260	168	212	218
12V70Ah	12	70	260	168	212	218
12V80Ah	12	80	329	172	214	236
12V90Ah	12	90	329	172	214	236
12V100Ah	12	100	406	174	208	232
12V120Ah	12	120	406	174	208	232
12V150Ah	12	150	483	170	240	240
12V180Ah	12	180	522	240	219	244
12V200Ah	12	200	522	240	219	244
12V220Ah	12	220	520	269	220	245
12V250Ah	12	250	520	269	220	245

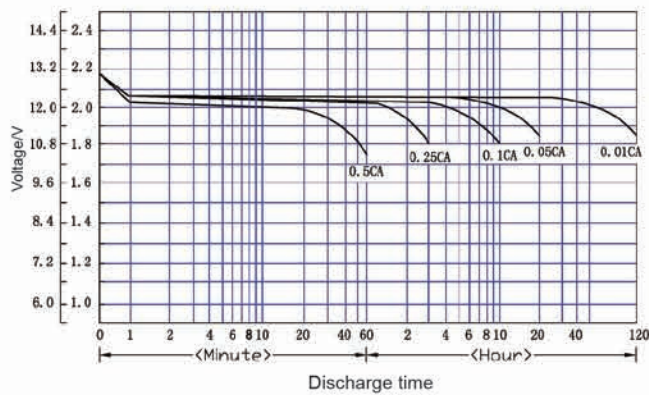
Scheme of the battery



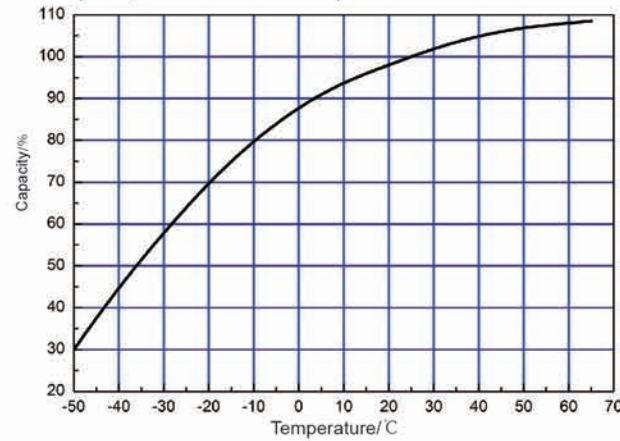
Comparison of separators



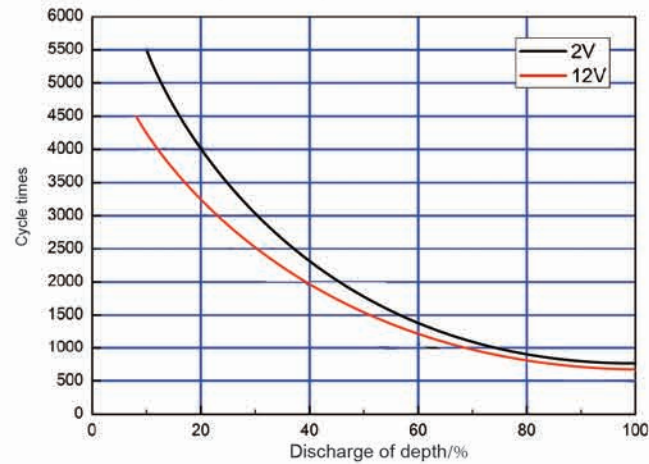
Discharge curve



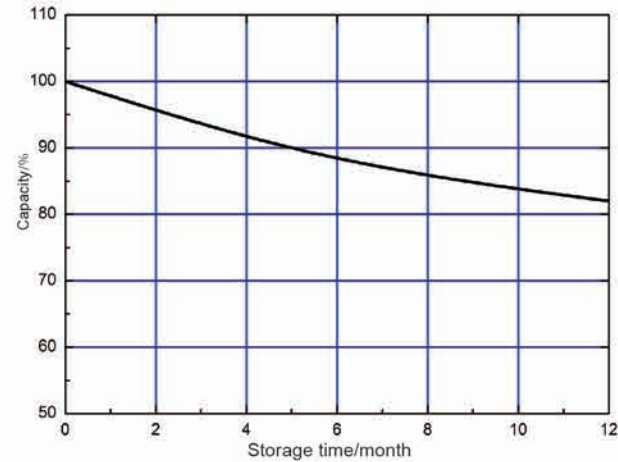
Capacity VS. Ambient temperature



Discharge of depth and cycle life



Self-discharge rate under room temperature (25°C)



Off grid power station in Lagos ,Nigeria



Solar street lamp in Spain



Lead-carbon battery

Application field

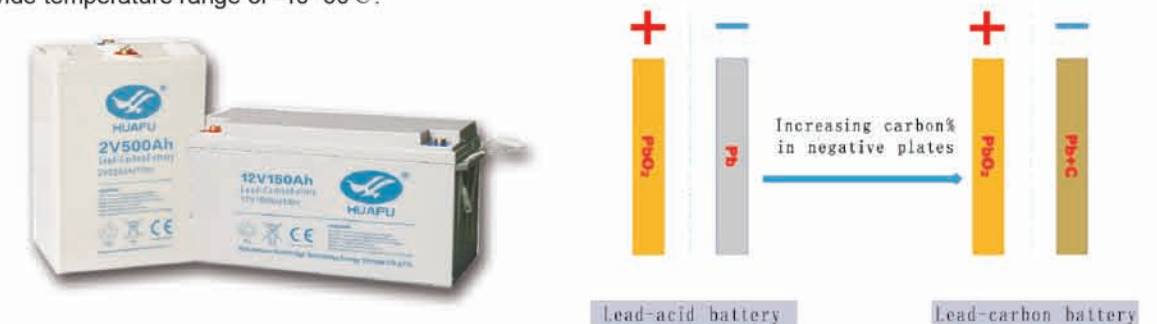
Solar (wind) household system, Off-Grid or on-grid power station, Distributed energy storage power station, Solar (wind) communication base station, Solar (wind) street light, Mobile energy storage system, Solar traffic light, Solar building system, and motive power source for electric vehicles, electric tricycles, electric forklift, golf cars, tourism cars, patrol cars and mini trucks.

Executive standards

IEC 60896-21/22:2004 < Stationary lead-acid batteries >, GB/T 22473-2008 < Lead acid battery used for energy storage >, IEC 61427-2005 < Secondary cells and batteries for photovoltaic energy systems (PVES) -General requirements and methods of test >, GB/T 18332.1 -2009 < Lead acid battery used for electric vehicles >.

Integrated performance

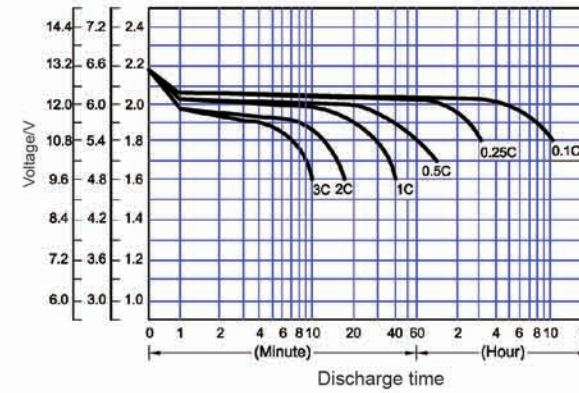
1. High power density: Nano carbon composited with good hydrophilicity and special high surface area is adopted in negative plate, as well as special paste preparation process, lead-carbon battery series holds the advantages of both lead acid batteries and super capacitor. The high conductive carbon particles bond tightly with active materials, to construct a 3D conductive network, which decrease the inner resistance, make the battery of high power density and good recovery ability.
2. Good charging characteristics: It holds a higher charging rate and the max accepted charging current reaches to 4 times of normal VRLA series.
3. Excellent high rate discharge performance: Polarization is smaller in lead-carbon batteries. It holds a lower charging but higher discharging voltage level, which is beneficial to discharging at high rate.
4. Long cycle-life: The carbon nanocomposites can limit the growth of PbSO₄ crystal, and inhibit the sulfation of negative plates when operate in partial state of charge (SoC) of 20%-80%. By using the hydrogen evolution inhibitor, water loss is less. The advanced technology of "crystal introduced" is adopted in positive plate, which makes the porosity high, and delays the problem of positive active material softening and shedding during using. So, the battery is very suitable for high rate partial state of charge (HRPSoC), and the cycle life reaches to 15 years(25°C).
5. Good environmental adaptation: Adopting cloudy gel electrolyte and synthetic tanning agent, which improve the environmental adaptation and free maintenance, the batteries can be operate at a wide temperature range of -40~60°C.



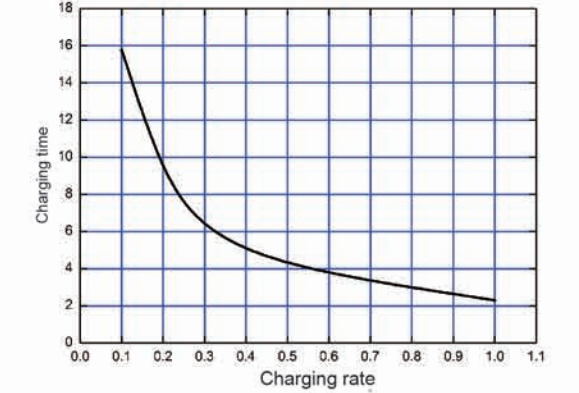
Lead-carbon battery series

Product model	Rated voltage(V)	Rated capacity (Ah/10Hr)	Dimension (mm,±3%)			
			length	width	height	total height
2V200Ah	2	200	106	171	330	342
2V300Ah	2	300	151	171	330	342
2V400Ah	2	400	196	171	330	342
2V500Ah	2	500	241	171	330	342
2V600Ah	2	600	285	171	330	342
2V800Ah	2	800	383	171	330	342
2V1000Ah	2	1000	471	171	330	342
6V180Ah	6	180	260	180	270	275
6V200Ah	6	200	260	180	270	275
12V24Ah	12	24	165	126	175	175
12V35Ah	12	35	196	165	174	174
12V50Ah	12	50	229	138	212	216
12V60Ah	12	60	260	168	212	218
12V80Ah	12	80	329	172	214	218
12V100Ah	12	100	407	174	209	218
12V120Ah	12	120	407	174	209	218
12V150Ah	12	150	497	203	228	236
12V200Ah	12	200	497	259	228	236

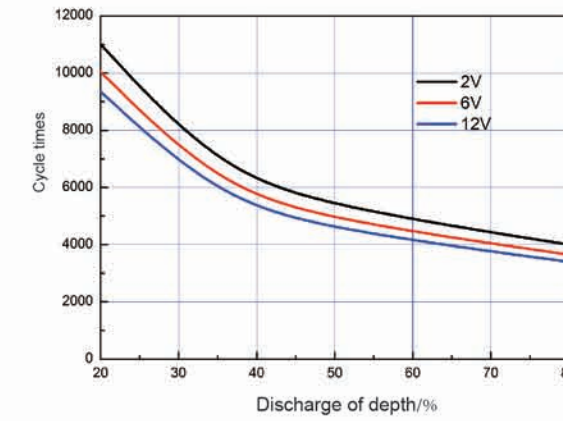
Discharge curve



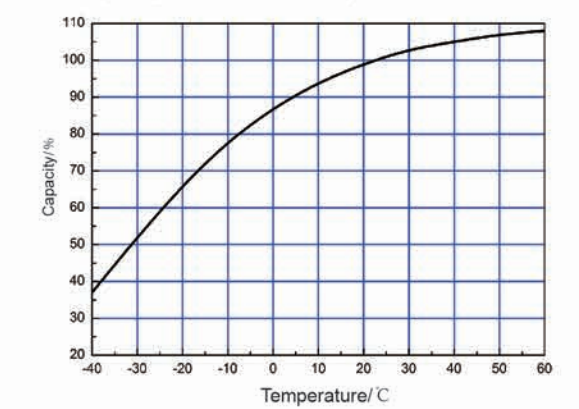
Charging time vs Charging rate



Depth of Discharge (DOD) and cycle life



Capacity vs Ambient temperature



Heat-tolerant battery

GFMH series

Product model	Rated voltage(V)	Rated capacity (Ah/10Hr)	Dimension (mm,±3%)			
			length	width	height	total height
GFMH-200	2	200	171	106	330	342
GFMH-300	2	300	171	151	330	342
GFMH-400	2	400	196	171	330	342
GFMH-500	2	500	241	171	330	342
GFMH-600	2	600	285	171	330	342
GFMH-800	2	800	383	171	330	342
GFMH-1000	2	1000	471	171	330	342
GFMH-1500	2	1500	355	337	330	342
GFMH-2000	2	2000	476	337	330	342
GFMH-3000	2	3000	696	340	330	342

Application field

Communication base station or solar(wind)power station in tropical, subtropical regions (the operating temperature above 35 °C throughout the year), remote areas, frequent power outages and other harsh environment areas. Solar(wind) household system, energy storage for off-grid or wind-solar complementary and grid connected power station; Standby power supply for power station, nuclear power plant; petrochemical industry and marine; Standby power supply for signal and communication systems of telecommunication, internet, railway, and airport; Ocean signal and beacon communication board, switching stations and etc..

Executive standards

YD/T 2657-2013 <High temperature valve-regulated lead acid batteries for telecommunications >

Structure features

(1) Plate: the grid alloy adopts non-Cadmium rare earth alloy with independent intellectual property rights, which helps feature as good corrosion resistance, high temperature resistance performance, and long cycle life. The adoption of formula of anti-impact active substance and mixed technology of multiple additives, effectively improve PAM/NAM dynamics, thermodynamics and electrochemical properties in a round .

(2) Separator: The composite separator of high thermal capacity, stable performance, strong adsorptive force that can effectively adsorp electrolyte , prevent the battery from losing water to the large extent and prolongs the service life of the battery effectively.

(3) Electrolyte: Equipped with electrolyte technology of independent intellectual property rights, It is of high safety, and less risk of water loss.



(4) Cover: the battery cover adopts high temperature resistant materials and enhanced design, with characteristics of corrosion- resistance, high temperature- resistance, impact- resistance, high strength, beautiful appearance, free of potential leakage and deformation risk.

(5) Safety vent valve: The special selection of materials based on the environment in high temperature area, can open or close the valve effectively, which avoid the battery shell deformation and electrolyte dry problem.

Integrated performance

① High temperature -tolerant: The max tolerant temperature attains to 80 °C , the normal temperature range is between -35 to 65 °C .

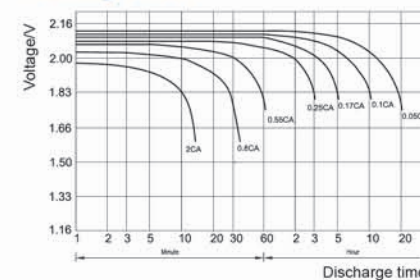
② Harsh environment- tolerant: Suitable for remote areas, frequent power outages, and harsh environment areas.

③ High safety: By adopting the enhanced design of key components and advanced electrolyte, the batteries are of high safety with good pressure and impact resistance, and the water-loss decreases effectively.

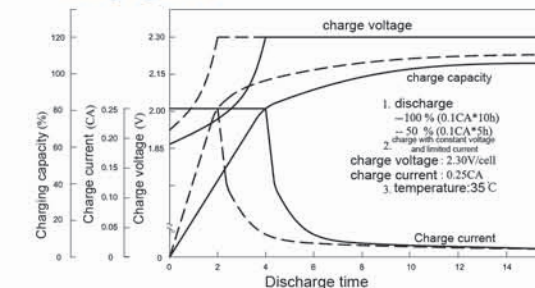
④ Long cycle-life: The designed life at the temperature of 25 and 35 °C attain to 20 and 10 years, respectively.

⑤ Green and environmental-friendly: Cd, Cr(VI), Hg and other material which are environment-polluted and hard to recycle, are excluded in the battery formula, and no leakage occurs for gel electrolyte. All of this make the batteries environment-friendly and safe.

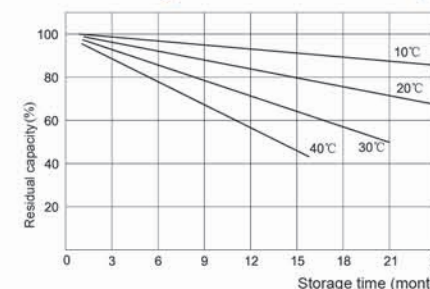
Discharge curve



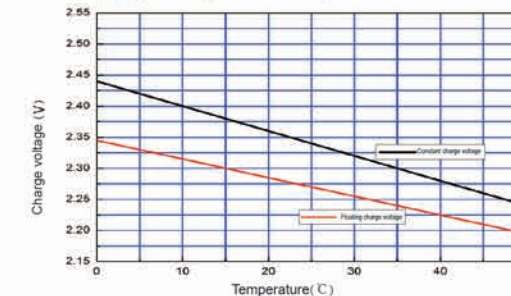
Charging curve



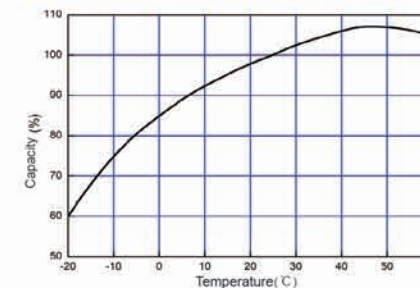
Self- discharge rate under room temperature



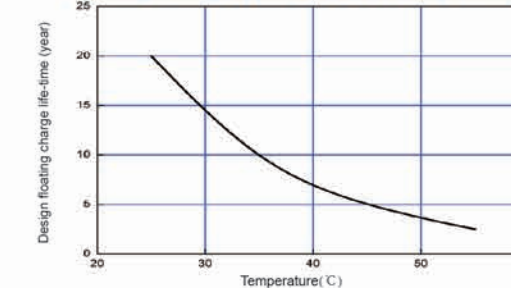
Charging voltage vs Temperature



Capacity VS. Ambient temperature



Floating charge cycle-life VS. Temperature (2V)



6-GFMH series

Product model	Rated voltage(V)	Rated capacity (Ah/10Hr)	Dimension (mm,±3%)			
			length	width	height	total height
6-GFMH-100	12	100	558	125	230	230
6-GFMH-150	12	150	546	125	311	311
6-GFMH-180	12	180	546	125	324	324
6-GFMH-200	12	200	546	125	324	324

Application field

Communication base station or solar(wind)power station in tropical, subtropical regions (the operating temperature above 35 °C throughout the year), remote areas, frequent power outages and other harsh environment areas. Solar(wind) household system, energy storage for off-grid or wind-solar complementary and grid connected power station; Standby power supply for power station, nuclear power plant; petrochemical industry and marine; Standby power supply for signal and communication systems of telecommunication, internet, railway, and airport; Ocean signal and beacon communication board, switching stations and etc..

Executive standards

YD/T 2657-2013 <High temperature valve-regulated lead acid batteries for telecommunications >



Structure features

(1) Plate: the grid alloy adopts non-Cadmium rare earth alloy with independent intellectual property rights, which helps feature as good corrosion resistance, high temperature resistance performance, and long cycle life. The adoption of formula of anti-impact active substance and mixed technology of multiple additives, effectively improve PAM/NAM dynamics, thermodynamics and electrochemical properties in a round .

(2) Separator The composite separator of high thermal capacity, stable performance, strong adsorptive force that can effectively adsorp electrolyte , prevent the battery from losing water to the large extent and prolongs the service life of the battery effectively.

(3) Electrolyte: Equipped with electrolyte technology of independent intellectual property rights , It is of high safety, and less risk of water loss.

(4) Cover: the battery cover adopts high temperature resistant materials and enhanced design, with characteristics of corrosion- resistance, high temperature- resistance, impact- resistance, high strength, beautiful appearance, free of potential leakage and deformation risk.

(5) Safety vent valve: The special selection of materials based on the environment in high temperature area, can open or close the valve effectively, which avoid the battery shell deformation and electrolyte dry problem.

Integrated performance

- ① High temperature -tolerant: The max tolerant temperature attains to 80 °C , the normal temperature range is between -35 to 65 °C .
- ② Harsh environment- tolerant: Suitable for remote areas, frequent power outages, and harsh environment areas.
- ③ High safety: By adopting the enhanced design of key components and advanced electrolyte, the batteries are of high safety with good pressure and impact resistance, and the water-loss decreases effectively.
- ④ Long cycle-life: The designed life at the temperature of 25 and 35 °C attain to 20 and 10 years, respectively.
- ⑤ Green and environmental-friendly: Cd, Cr(VI), Hg and other material which are environment-polluted and hard to recycle, are excluded in the battery formula, and no leakage occurs for gel electrolyte. All of this make the batteries environment-friendly and safe.



Tubular lead-acid battery (OPzS)

Application field

Solar/wind energy storage, complementary solar/wind grid connected energy storage; standby power supply for power station, nuclear power plant, petrochemical industry and marine; standby power supply for signal and communication system of communication, Internet, railway, and airport as well as ocean signal and beacon communication board, switching station, etc.

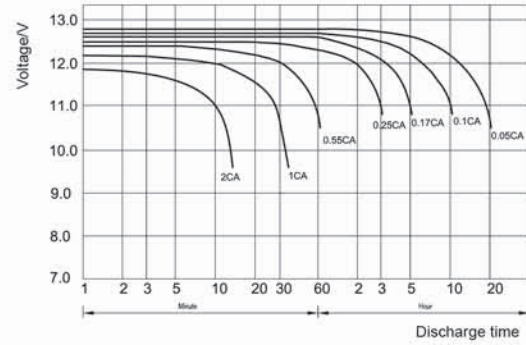
Executive standards

IEC60896-21/22:2004、IEC61427:2005、YD/T1360-2005、GB/T22473-2008

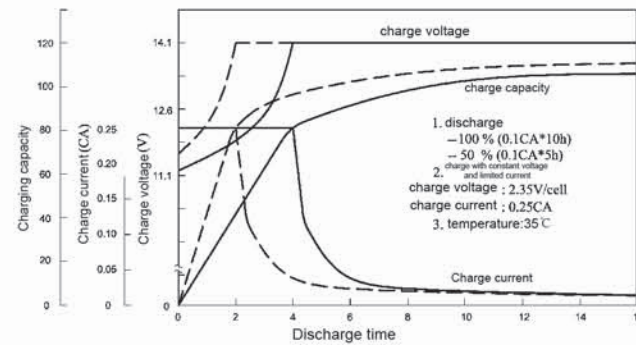
Tubular lead-acid battery series(OPzS)

Product model	Rated voltage(V)	Rated capacity (Ah/10Hr)	Dimension (mm,±3%)			
			length	width	height	total height
2V200Ah	2	200	102	206	356	429
2V250Ah	2	250	124	206	356	429
2V300Ah	2	300	145	206	356	429
2V350Ah	2	350	124	206	471	544
2V400Ah	2	400	145	206	471	544
2V500Ah	2	500	166	206	471	544
2V600Ah	2	600	145	206	646	719
2V800Ah	2	800	191	210	646	719
2V1000Ah	2	1000	233	210	646	719
2V1200Ah	2	1200	275	210	646	719
2V1500Ah	2	1500	275	210	796	869
2V2000Ah	2	2000	399	214	771	844
2V2500Ah	2	2500	487	212	769	842
2V3000Ah	2	3000	576	212	769	842

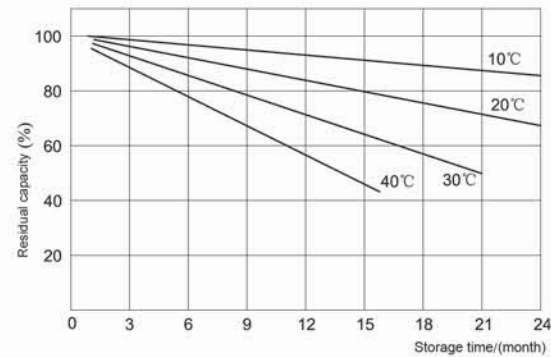
Discharge curve



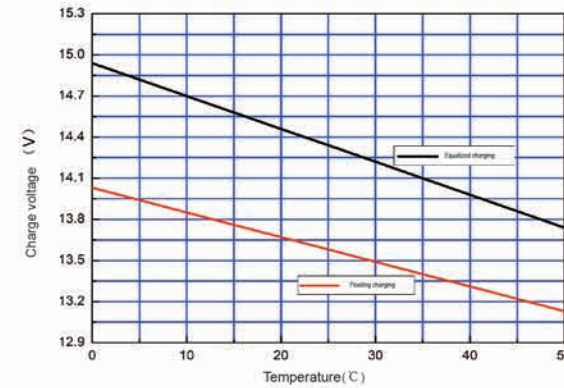
Charging curve



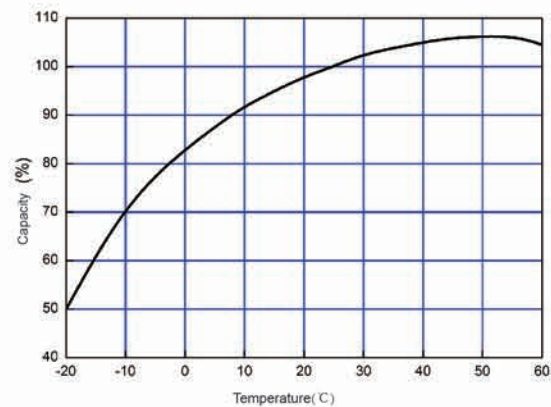
Self-discharge rate under room temperature (25°C)



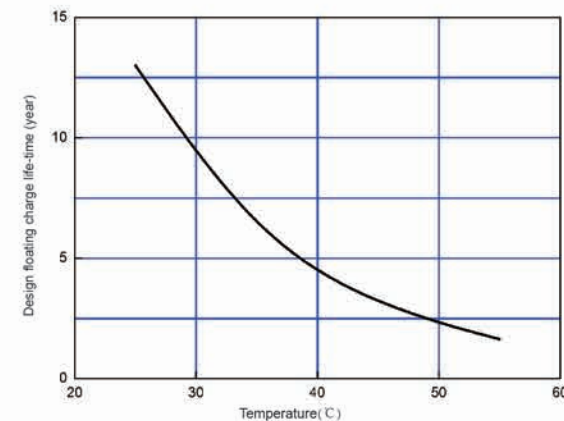
Charging voltage vs Temperature



Capacity VS. Ambient temperature



Floating charge cycle-life VS. Temperature (2V)





Tubular gel battery (OPzV)

Application field

Solar(wind) energy storage fields, complementary solar-wind grid connected energy storage; standby power supply for power station, nuclear power plant, petrochemical industry and marine; standby power supply for signal and communication system of communication, Internet, railway, and airport as well as ocean signal and beacon communication board, switching station, etc.

Executive standards

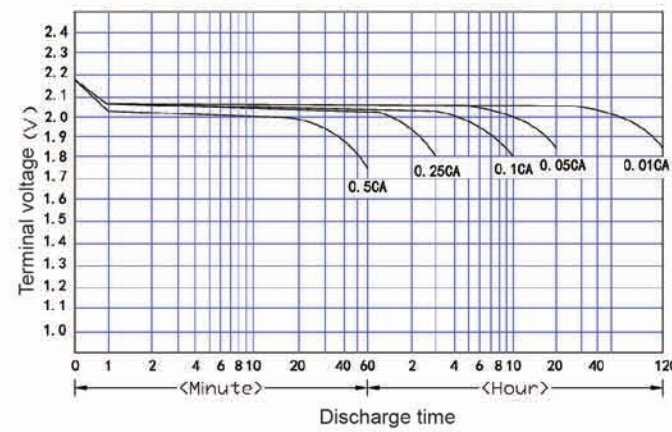
IEC60896-21/22:2004、IEC61427: 2005、YD/T1360-2005、GB/T22473-2008

Integrated performance

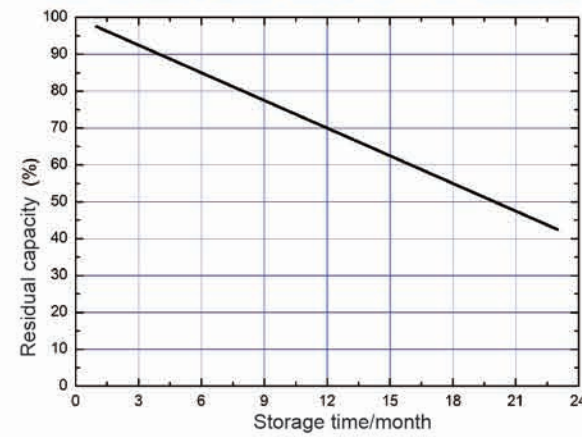
1. Long cycle-life
2. Reliable sealing performance
3. High initial capacity
4. Small self-discharge performance
5. Good discharge performance at high-rate
6. Flexible and convenient installation, esthetic overall look



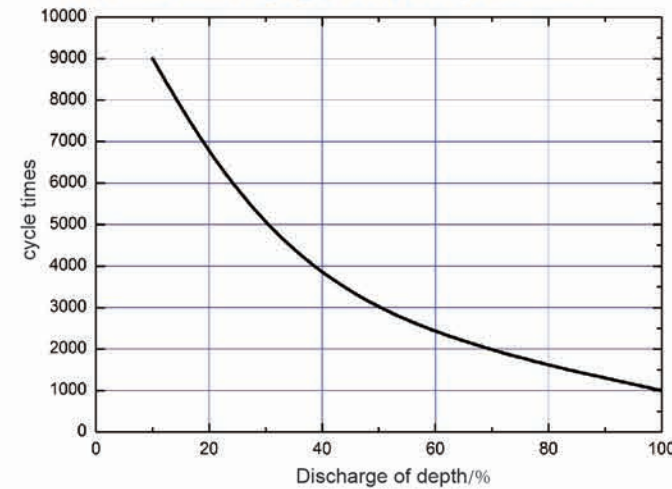
Discharging curve



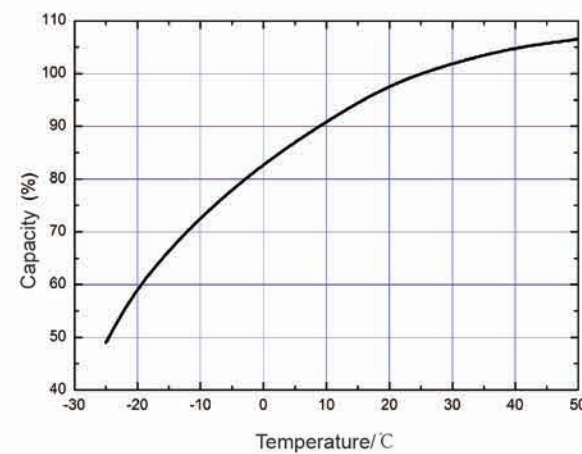
Self-discharge rate under room temperature (25°C)



Depth of Discharging (DOD) vs Cyclic times



Capacity vs Ambient temperature



Tubular gel battery series

Product model	Rated voltage(V)	Rated capacity (Ah/10Hr)	Dimension (mm,±3%)			
			length	width	height	total height
2V200Ah	2	200	102	206	355	389
2V250Ah	2	250	124	206	355	389
2V300Ah	2	300	145	206	355	389
2V350Ah	2	350	124	206	470	504
2V400Ah	2	400	145	206	470	504
2V500Ah	2	500	166	206	470	504
2V600Ah	2	600	145	206	645	679
2V800Ah	2	800	191	210	645	679
2V1000Ah	2	1000	233	210	645	679
2V1200Ah	2	1200	275	210	645	679
2V1500Ah	2	1500	275	210	795	829
2V2000Ah	2	2000	399	214	770	804
2V2500Ah	2	2500	487	212	768	802
2V3000Ah	2	3000	576	212	768	802

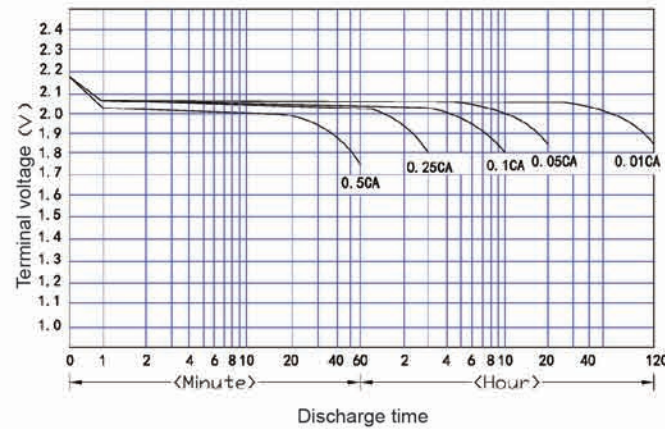


02

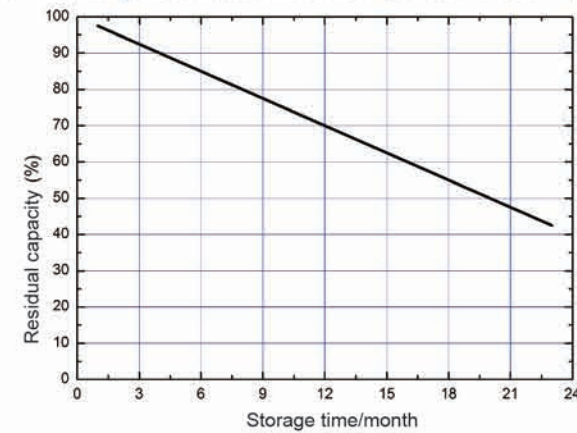
Backup battery series

Application field: Used as Back-up power supply for Communication base station, power station, power transmission and transformation systems, computer protection system, emergency power supply(EPS), uninterruptible power supply (UPS)system, radio and broadcasting stations and automatic control, etc.

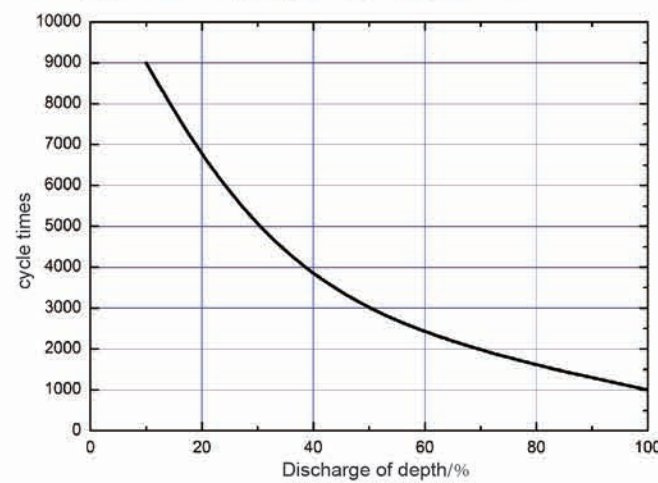
Discharging curve



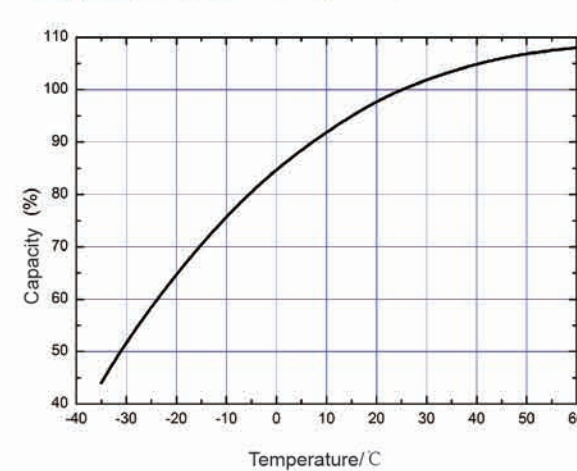
Self-discharge rate under room temperature (25°C)



Depth of discharging (DOD) vs Cyclic times



Capacity vs Ambient temperature



Valve Regulated Sealed Lead-acid Battery for Communication Systems

GFM series

Product model	Rated voltage(V)	Rated capacity (Ah/10Hr)	Dimension (mm,±3%)			
			length	width	height	total height
GFM-200	2	200	171	106	330	342
GFM-300	2	300	171	151	330	342
GFM-400	2	400	196	171	330	342
GFM-500	2	500	241	171	330	342
GFM-600	2	600	285	171	330	342
GFM-800	2	800	383	171	330	342
GFM-1000	2	1000	471	171	330	342
GFM-1200	2	1200	510	175	337	347
GFM-1500	2	1500	318	341	341	351
GFM-2000	2	2000	433	342	341	351
GFM-3000	2	3000	629	346	341	351

Product description

"Huafu" GFM series valve regulated sealed lead-acid and gel battery series for communication systems, are the fruits gained by all over digestion, absorption and innovation of advanced technology at home and abroad, as well as jointly developed by the enterprise academician workstation and domestic research institutions GFM series have met the requirements of YD/T799-2010、QZTT 1010-2015 and IEC60896-2, 2004. Its performance index has reached the leading level in China, and enjoys reputation in domestic. The products can be widely used in large data centers and windows, communication and telecommunication stations, power plant, power transmission system, computer system protection, emergency power supply, UPS uninterruptible power supply systems, and radio broadcasting stations and automatic control systems and other fields.

Structure features

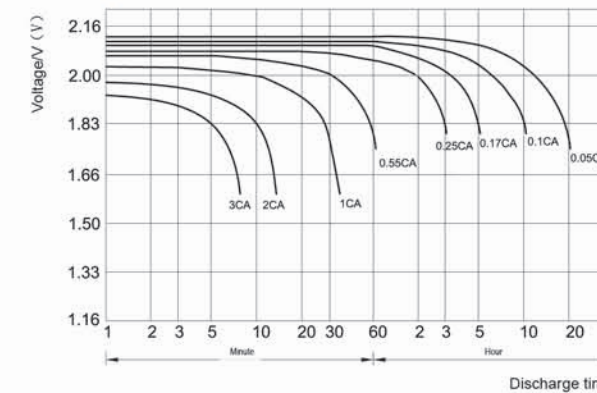
- (1) Grid plate: the grid alloy adopts non-Cadmium rare earth alloy with independent intellectual property rights and thick plate design make batteries of good corrosion resistance performance and long cycle life.
- (2) Plate: using 4BS nucleation technique, high temperature and humidity curing process and special additives, rich utilization rate of the active material , it has strong charging ability and long cycle life;
- (3) Separator: with ultra-fine AGM separator, the battery has high oxygen recombination capability, , low internal resistance, high rate discharge performance;
- (4) Cover: using high strength ABS materials, the batteries are characterized with anti-corrosion, anti-impact, high strength, beautiful appearance, free of potential leakage and deformation risk;
- (5) Terminal: Copper core with large diameter and high conductivity, It is of good corrosion resistance performance and strong current carrying capacity ;
- (6) Terminal seal: using the unique sealing technology and special sealant to ensure no leakage, no acid mist overflows, it is safe and reliable;
- (7) Safety vent valve: using labyrinth structure, double filter acid explosion-proof valve structure, which can accurately control the open/close valve pressure and acid mist filtering function.

Product performance

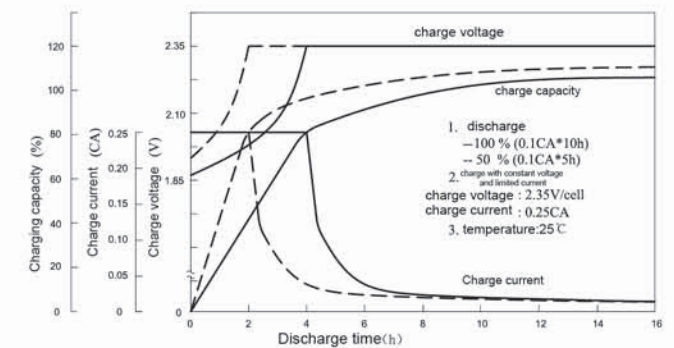
- (1) long design life: the designed life at the temperature of 25 °C attain to 15 years ;
- (2) Low self discharge rate: $\leq 2\%$ per month(25°C)
- (3) High efficiency of sealing performance: $\geq 99\%$;
- (4) The consistency of capacity: excellent production and intelligent formation technology, high consistency of the battery.



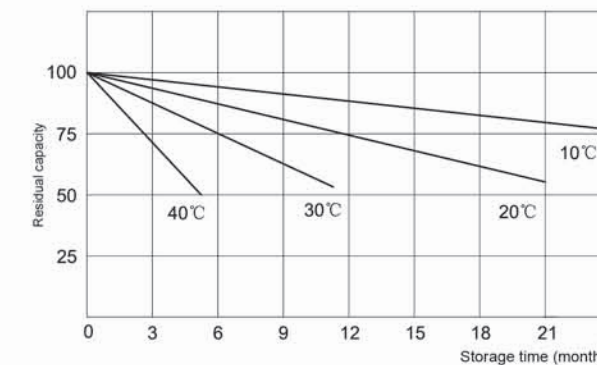
Discharge curve



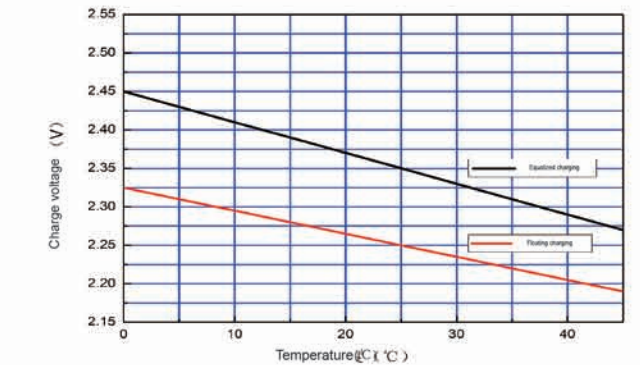
Charging curve



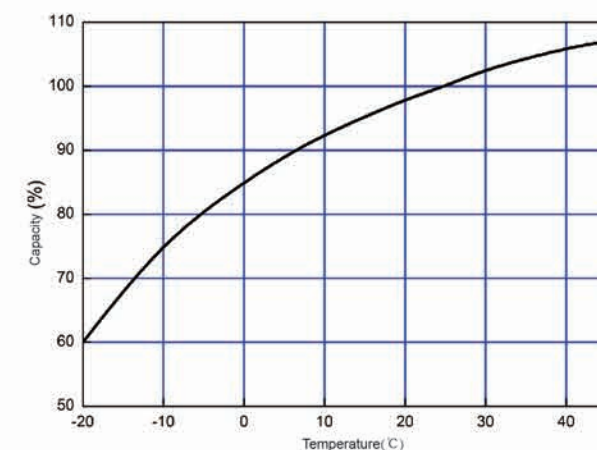
Self-discharge rate under room temperature



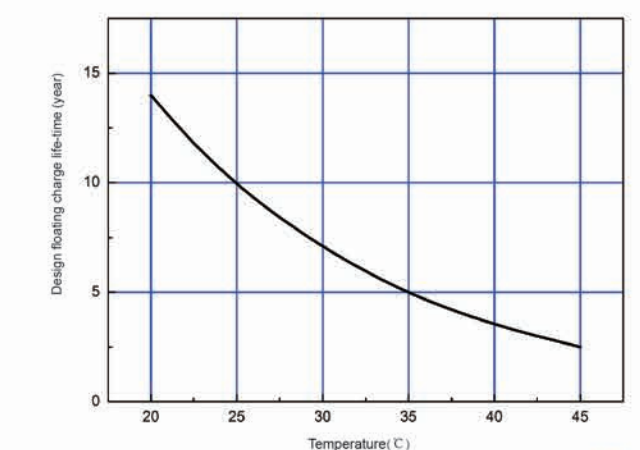
Charging voltage vs Temperature



Capacity VS. Ambient temperature



Floating charge cycle-life VS. Temperature (2V)



Valve Regulated Sealed Lead-acid Battery for Communication Systems

6-GFM series

Product model	Rated voltage(V)	Rated capacity (Ah/10Hr)	Dimension (mm,±3%)			
			length	width	height	total height
6-GFM-24	12	24	165	126	175	181
6-GFM-38	12	38	196	165	174	181
6-GFM-50	12	50	229	138	210	230
6-GFM-60	12	60	350	166	174	174
6-GFM-65	12	65	350	166	174	174
6-GFM-80	12	80	329	172	214	236
6-GFM-90	12	90	329	172	214	236
6-GFM-100	12	100	329	172	214	236
6-GFM-110	12	110	406	174	208	232
6-GFM-120	12	120	406	174	208	232
6-GFM-150	12	150	483	170	240	240
6-GFM-180	12	180	522	240	219	244
6-GFM-200	12	200	522	240	219	244
6-GFM-220	12	220	522	240	219	244
6-GFM-250	12	250	520	269	220	245

Product description

"Huafu" 6-GFM series valve regulated sealed lead-acid and gel battery series for communication systems, are the fruits gained by all over digestion, absorption and innovation of advanced technology at home and abroad, as well as jointly developed by the enterprise academician workstation and domestic research institutions GFM series have met the requirements of YD/T799-2010, QZTT 1010-2015 and IEC60896-2, 2004. Its performance index has reached the leading level in China, and enjoys reputation in domestic. The products can be widely used in large data centers and windows, communication and telecommunication stations, power plant, power transmission system, computer system protection, emergency power supply, UPS uninterruptible power supply systems, and radio broadcasting stations and automatic control systems and other fields.

Structure features

- (1) Grid plate: the grid alloy adopts non-Cadmium rare earth alloy with independent intellectual property rights and thick plate design make batteries of good corrosion resistance performance and long cycle life.
- (2) Plate: using 4BS nucleation technique, high temperature and humidity curing process and special additives, rich utilization rate of the active material , it has strong charging ability and long cycle life;
- (3) Separator: with ultra-fine AGM separator, the battery has high oxygen recombination capability, , low internal resistance, high rate discharge performance;
- (4) Cover: using high strength ABS materials, the batteries are characterized with anti-corrosion, anti-impact, high strength, beautiful appearance, free of potential leakage and deformation risk;

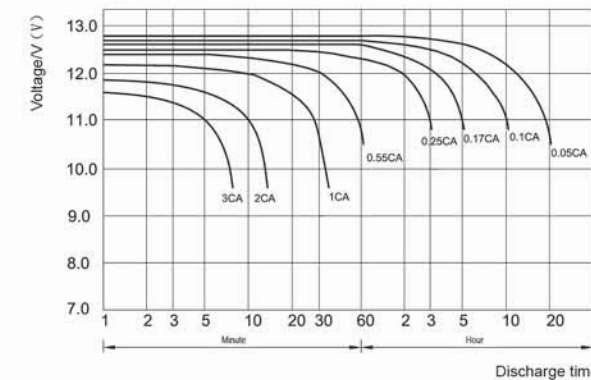
- (5) Terminal: Copper core with large diameter and high conductivity, It is of good corrosion resistance performance and strong current carrying capacity ;
- (6) Terminal seal: using the unique sealing technology and special sealant to ensure no leakage, no acid mist overflows, it is safe and reliable;
- (7) Safety vent valve: using labyrinth structure, double filter acid explosion-proof valve structure, which can accurately control the open/close valve pressure and acid mist filtering function.

Product performance

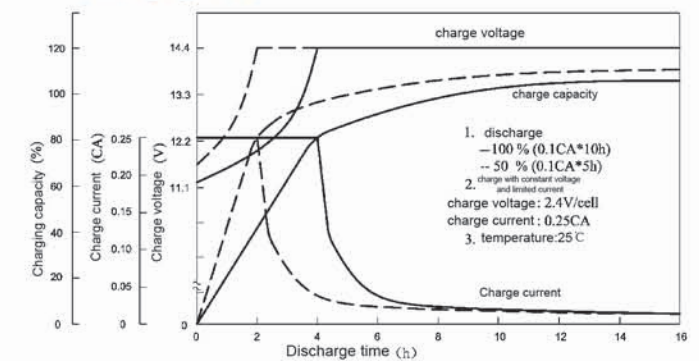
- (1) long design life: the designed life at the temperature of 25 °C attain to 10 years ;
- (2) Low self discharge rate: $\leq 2\%$ per month(25°C)
- (3) High efficiency of sealing performance: $\geq 99\%$;
- (4) The consistency of capacity: excellent production and intelligent technology, high consistency of the battery.



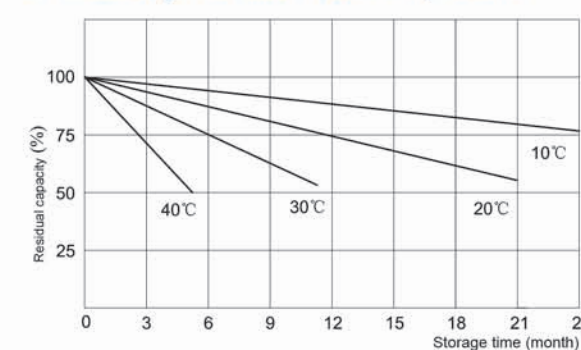
Discharge curve



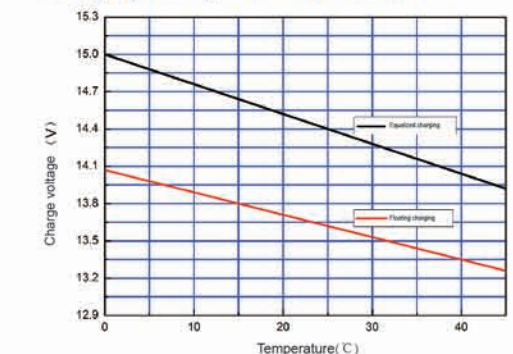
Charging curve



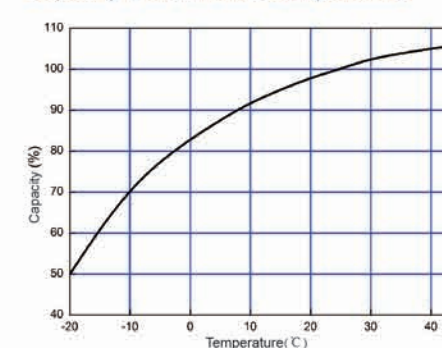
Self-discharge rate under room temperature



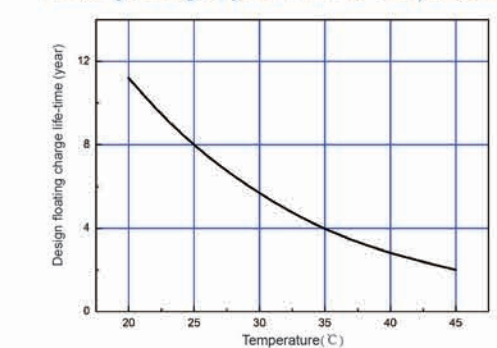
Charging voltage vs Temperature



Capacity VS. Ambient temperature



Floating charge cycle-life VS. Temperature (12V)



Front Terminal Sealed Valve Regulated Lead Acid Battery for Communication Systems

6-GFMZ series

Product model	Rated voltage(V)	Rated capacity (Ah/10Hr)	Dimension (mm,±3%)			
			length	width	height	total height
6-GFMZ-100	12	100	558	125	230	230
6-GFMZ-150	12	150	546	125	311	311
6-GFMZ-180	12	180	546	125	324	324
6-GFMZ-200	12	200	546	125	324	324

Product Summary

“Huafu” brand 6-GFMZ series valve regulated sealed lead acid battery is specially designed for power supply cabinets with size 19, 23 inch and electronics industry. It has advantage of space saving, easy heat-radiation and convenient installation. The product meets the requirement of YD/T 2343-2011, YD/T799-2010, QZTT 1010-2015 standard, its all performance index reaches the domestic advanced level, and praised by the community. The 6-GFMZ series is widely used for communication base station, uninterruptible power system, power station, transformer substation, control system, microwave relay stations, telemetry equipment, solar and wind energy storage filed, etc.

Structure Feature

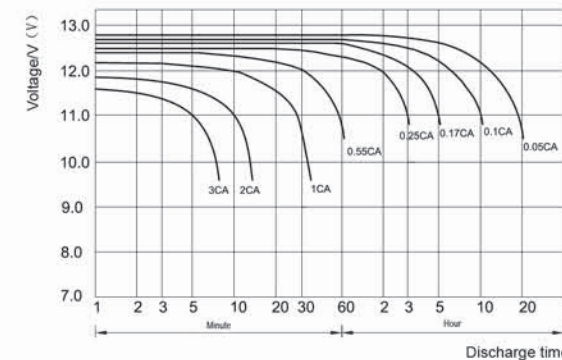
- (1) Outline Shape: Using long and narrow type design, 2*3 internal monomer structure (6 cells), which is conducive to heat dissipation.
- (2) Terminal: The front terminal structure makes the battery connect, maintenance, install conveniently. And the large-diameter copper core pole has the outstanding property of corrosion resistance, strong current carrying ability.
- (3) Battery grid: The grid alloy has adopted non-Cadmium rare earth alloy with independent intellectual property rights, thick plate design make the battery has good corrosion resistance performance and a long cycle life.
- (4) Battery plate: 4BS technology, high-temperature and high-humidity curing process and special additives are applied in producing of batteries, which makes battery perform good feature of high active material utilization, strong charging ability and long cycle life;
- (5) Separator: Adopted micro Absorptive Glass Met (AGM), the battery has high Oxygen recombination efficiency, low internal resistance, good high-rate discharge performance;
- (6) Battery case: The high strength ABS case is of corrosion resistance, impact resistance, high strength, with beautiful appearance, no potential leakage and deformation risk;
- (7) Terminal seal: using the unique sealing technology and special sealant to ensure no leakage, no acid mist overflows, it is safe and reliable;
- (8) Safety valve: Applied high sensitivity valve, the internal pressure can be adjusted automatically. The structure can accurately control the open/close valve pressure and acid mist filtering function.

Product performance

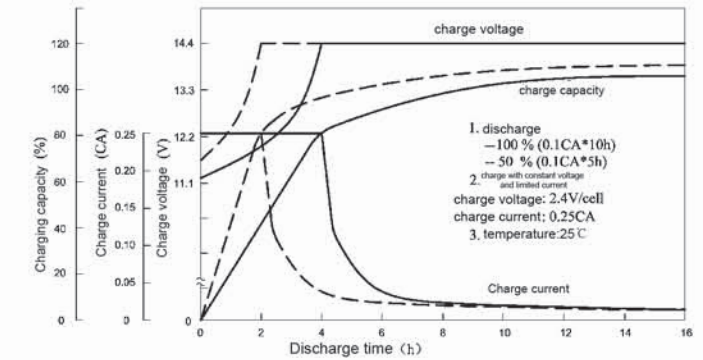
- (1) long design life: the designed life at the temperature of 25 °C attain to 12 years;
- (2) Low self discharge rate: $\leq 2\%$ per month(25°C)
- (3) High efficiency of sealing performance: $\geq 99\%$;
- (4) The consistency of capacity: excellent production and intelligent technology, high consistency of the battery.



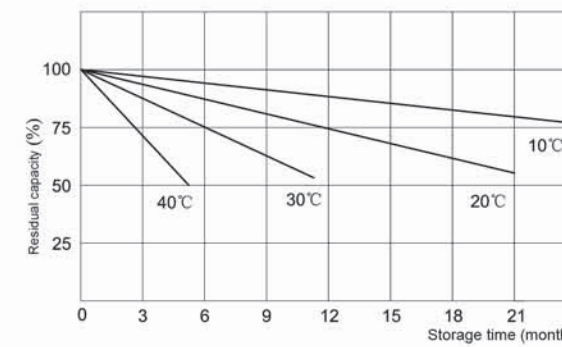
Discharge curve



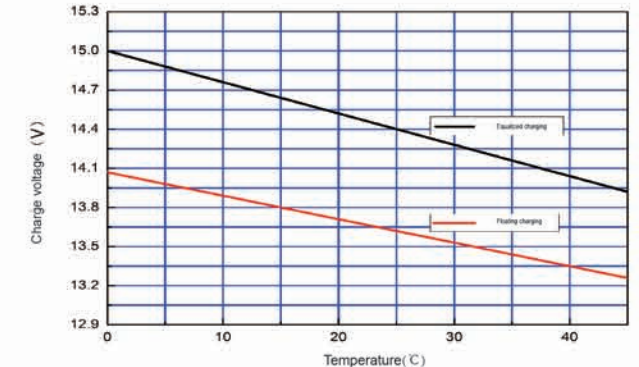
Charging curve



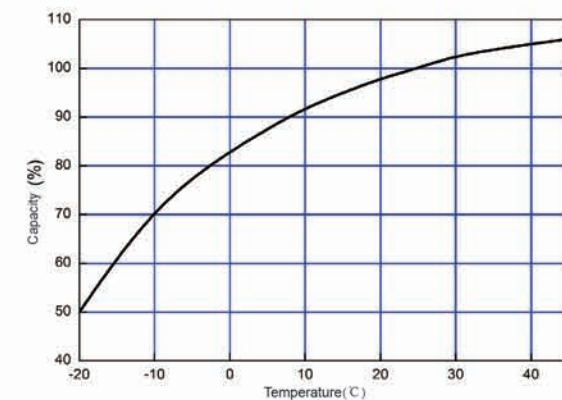
Self-discharge rate under room temperature



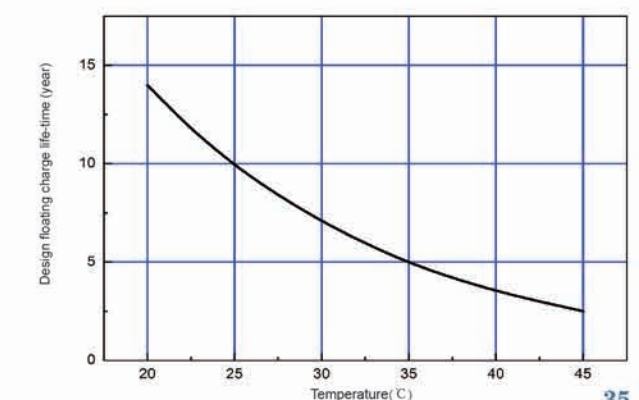
Charging voltage vs Temperature



Capacity VS. Ambient temperature



Floating charge cycle-life VS. Temperature (12V)



Battery installed in horizontal

Application field

Battery series for energy storage, Specialty battery for plateaus, Lead-carbon battery, valve-regulated sealed battery(GFM series), Heat-tolerant battery.

Advantages

- 1. Space saving: Because the horizontal installation's wiring is on the side face of the bracket, there is no need to reserve space like upright installed batteries, which greatly saves the whole installation volume; It is convenient and economical for end users to operate batteries in the container and narrow ,small and limited space.
- 2. Easy to Install and maintain: It is convenient to install, replace and maintain the battery. When under the inspection, it is easy to find and deal with the problem directly.
- 3. Aesthetic appearance: The overall visual effect is consistent with the aesthetic design of industrialization



03

Power battery series for electric vehicles source

Application field: power for Electric vehicles, electric tricycle, golf cars, tourism cars, patrol cars, mini trucks, electric forklift, electric truck, electric stackers, etc.

EV series for electric road vehicles

Application field

Source for electric vehicles, electric tricycle, golf cars, tourism sightseeing cars, patrol cars, mini trucks, electric truck, electric pallet trucks and electric stackers, etc.

Executive standards

GB/T18332.1—2009<Lead acid batteries for electric road vehicles >

Integrated performance

The major products can be divide in two series, lead-acid battery and gel battery, of which gel battery is more outstanding in stronger applicability, longer durability ,higher safety.

1. Good starting and climbing ability
2. Far mileage range
3. Low self-discharge rate
4. Good low-temperature performance
5. Long cycle-life
6. Environmental-friendly



Lead acid (gel) batteries for electric road vehicles

Product model	Rated voltage(V)	Rated capacity (Ah/3Hr)	Dimension (mm,±3%)			
			length	width	height	total height
3-EVF(J)-180	6	180	260	180	270	275
3-EVF(J)-200	6	200	260	180	270	275
4-EVF(J)-150	8	150	260	180	280	285
6-EVF(J)-24	12	24	165	126	175	175
6-EVF(J)-32	12	32	222	93	175	175
6-EVF(J)-38	12	38	196	165	174	174
6-EVF(J)-50A	12	50	260	168	212	218
6-EVF(J)-50B	12	50	229	138	212	216
6-EVF(J)-60	12	60	262	165	169.5	169.5
6-EVF(J)-65	12	65	260	168	212	218
6-EVF(J)-70	12	70	260	168	212	218
6-EVF(J)-80	12	80	329	172	214	218
6-EVF(J)-100	12	100	330	176	214	218
6-EVF(J)-120	12	120	407	174	209	218
6-EVF(J)-140	12	140	483	170	240	240
6-EVF(J)-150	12	150	483	170	240	240
6-EVF(J)-200	12	200	522	240	219	224



Battery for electric forklift

Application field

Power source for electric forklifts, electric pallet truck, and electric stackers, etc.

Executive standards

GB/T18332.1—2009<Lead acid batteries for electric road vehicles >, IEC 60896-21/22.

Integrated performance

1. Anti-vibration effect: adopting enhanced vibration - resistance design, battery can be used in electric forklift without a shock proof system.
2. Good recovery performance: Adopting the unique formula of active materials, the battery is resistant to deep discharging and has a good recovery performance.
3. Sealed and maintenance free: With high oxygen composite efficiency, maintenance free of filling water, no acid mist. All help avoid corrosion to the equipment.
4. Good high-rate discharge performance: By adopting low resistance material, the inner resistance is smaller and the charging efficiency is better.
5. Wider temperature range: Suitable for indoor and outdoor use in varies environment.
6. Long cycle-life: By using multiple rare-earth alloy grid with cadmium- free, the grid is corrosion resistant. The electrolyte adopts the nano-scale fumed silica as the colloid base material, so there is no leakage and stratification of electrolyte.

EV series for electric forklift

Product model	Rated voltage(V)	Rated capacity (Ah/3Hr)	Dimension (mm,±2mm)			
			length	width	height	Total height
6-EVF-24	12	24	165	126	175	175
6-EVF-32	12	32	222	93	175	175
6-EVF-38	12	38	196	165	174	174
6-EVF-50	12	50	229	138	212	216
6-EVF-60A	12	60	260	168	212	218
6-EVF-60B	12	60	262	165	169.5	169.5
6-EVF-65	12	65	260	168	212	218
6-EVF-80A	12	80	329	172	214	218
6-EVF-80B	12	80	260	168	212	218
6-EVF-100	12	100	329	172	214	218
6-EVF-120	12	120	407	174	209	218
6-EVF-140	12	140	483	170	240	240
6-EVF-150	12	150	483	170	240	240



Lithium iron phosphate batteries series (LiFePO₄)

Application field

Solar street lighting system, electric passenger cars, electric operating vehicles, electric pallet trucks, large-scale energy storage system, high rate energy storage device, etc.

Executive standards

GB/T 8897.4-2008 , QC/T 743-2006

Integrated performance

1. Safety: the thermo-stability of the lithium iron phosphate material can reach to a high temperature of 400-500 °C (the least amount of heat release even if when abused), which ensured the internal high security of the battery. Battery will not explode or burn due to overcharge, high temperature, short circuit or impact.
2. Long cycle-life: Its capacity retention rate is more than 80% after 5000 cyclic times in 1C at room temperature. Its cycle life is 10 times of lead-acid battery, 5 times of Ni-MH batteries, 4-5 times of Li-Co lithium batteries.
3. Low self-discharge, floating charging-free: The self-discharge rate is lower than 1% per month while stored at room temperature. Due to its low self-discharge rate, its hold performance is excellent. The experiment data shows there is almost no loss of capacity after storage for half a year at room temperature. Compared with lead-acid battery, LiFePO₄ is free of floating charge and easy for application in any energy storage fields.
4. Green and environmental-friendly: It is absolutely green ,with no heavy and rare metal(rare metal is needed in Ni-MH battery). It is non-toxic(passed the SGS certification), with no pollution, complied with European RoHS. LiFePO₄ material is pollution-free during production and usage. The battery has been listed in "863" national high-tech development plan in "10th five -year period" , and become a national key support and encouraged project.

Battery	Product model	Rated voltage(V)	Rated capacity (Ah/10Hr)	weight(Kg)	Total height(mm)	Purpose
Polymer lithium ion battery	1392237	3.2	25	0.54	237*92*13	Energy storage Power
	06140200	3.2	10	0.26	200*140*6	60C power supply Electric tool
	7255145	3.2	5	0.1	145*55*7.2	High temperature of 80

Ternary lithium power battery

Application field

Electric bicycle, electric vehicles, solar (wind) energy storage fields, backup power supply for base station, etc

Executive standards

GB/T 8897.4-2008

Integrated performance

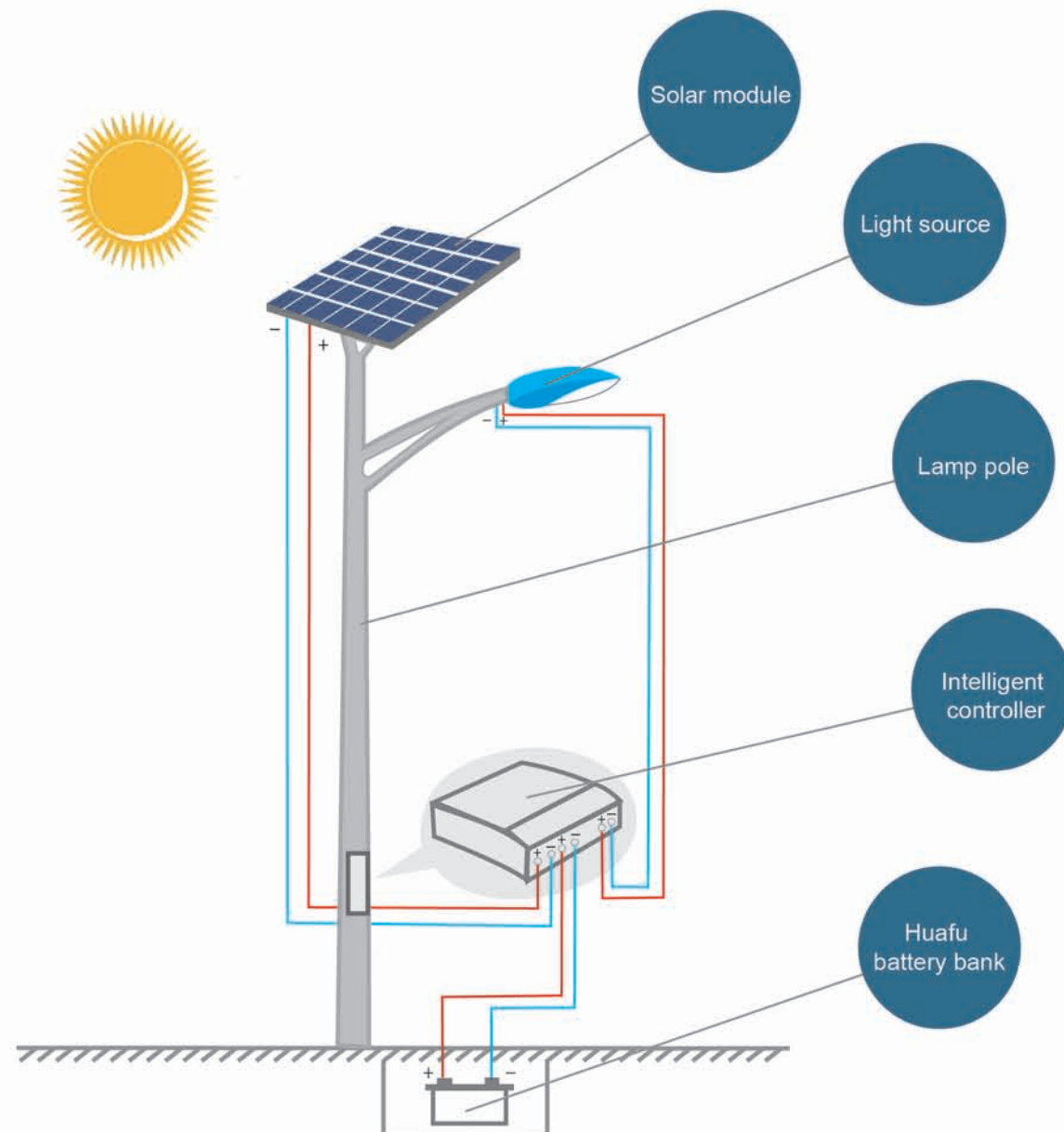
1. High cell voltage: The median discharge voltage is up to 3.7V at 0.2C discharge rate.
2. Better operating performance at low temperature: At -20 °C/0.2C, It can release 80% DOD, and even at -40 °C/0.2C it still can release 50% DOD.
3. High power density : The power density of ternary materials in current lithium battery system is the highest. It can reach four times of the lead acid battery
4. Long cycle-life: cycle life can reach more than 1000 times (at 80%DOD)

Battery	Product model	Rated voltage(V)	Rated capacity (Ah/10Hr)	weight(Kg)	Total height(mm)	Purpose
Polymer lithium ion battery	1265135	3.7	10	0.21	135*65*12	Energy storage Power

Solar street lighting system

Working principles of solar street lighting system

In the daytime, when the sunlight shines, the solar panel can generate electric energy and charging the battery through the controller based on photovoltaic effect. At night, the working voltage and current are continuously dropping as the sunlight is gradually weakening. When the working voltage is below the set voltage of the controller, the controller starts operating the load, meantime, the solar light turns on. When the setting time is up or when the ambient light is too strong that the controller will stop the load automatically.

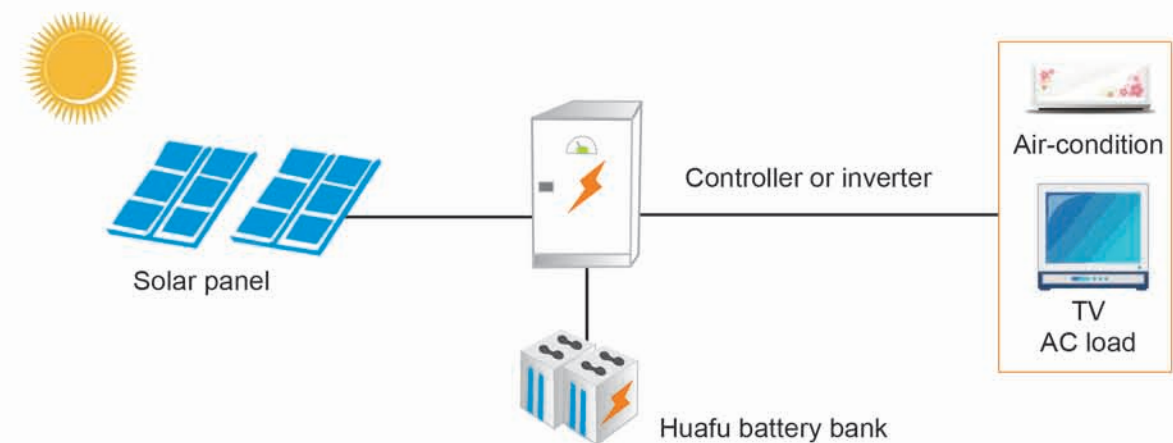


Household solar power system

The system is composed of solar module, controller or inverter, battery bank and the electric loads of users, etc. The solar module and battery belong to power system, the controller and inverter are controller protection system and the user's electric equipment is the system terminal.

Working principles

The solar power generation system is composed of a whole set of multiple components to coordinate together. Firstly, the outdoor solar panel generates continuous direct current when the sunlight shines. Then the charging controller transforms the electric energy into the chemical energy and saves it in the battery bank. The controller can also transform the chemical energy into the electric energy when the electricity is in demand. The controller can control the DC load directly. If it needs to output the 220V AC voltage, the inverter can transform the low DC voltage into the high AC voltage and output for the household electric appliances.



Off-grid solar power system

The system is composed of solar module, controller and battery bank. If the output power supply is AC 220V or 110V, the inverter is needed.

The Solar panel

The solar panel is the core part of the solar power system. It can transform the radiation of the sunshine into the electric energy, or save the energy into the battery bank, or supply electricity to the load directly.

Controller

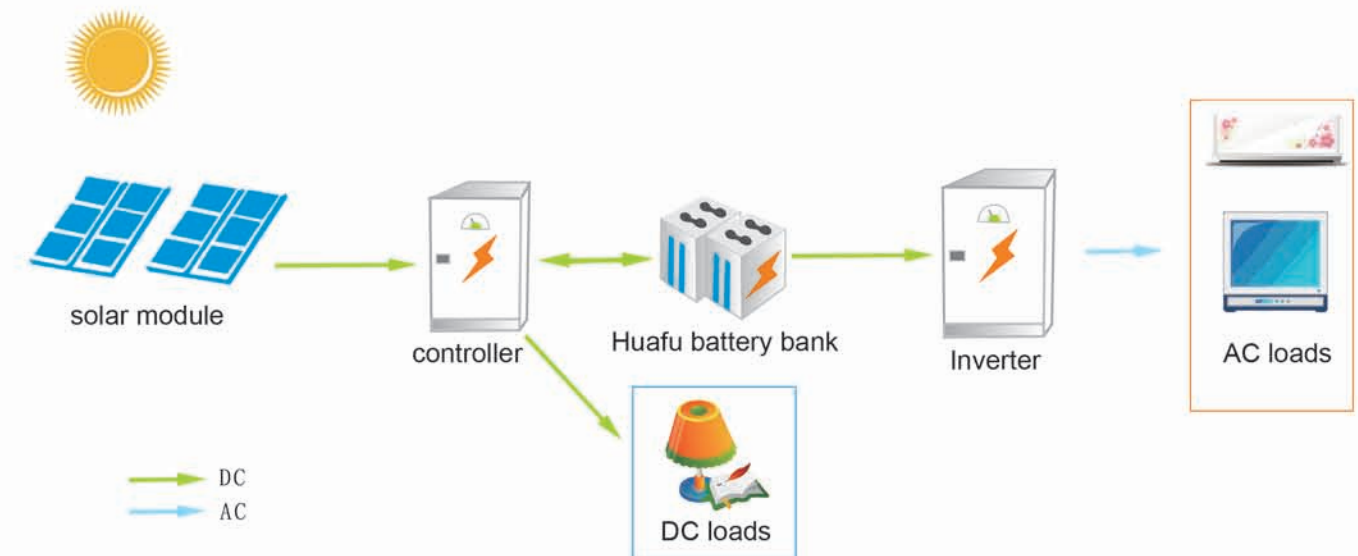
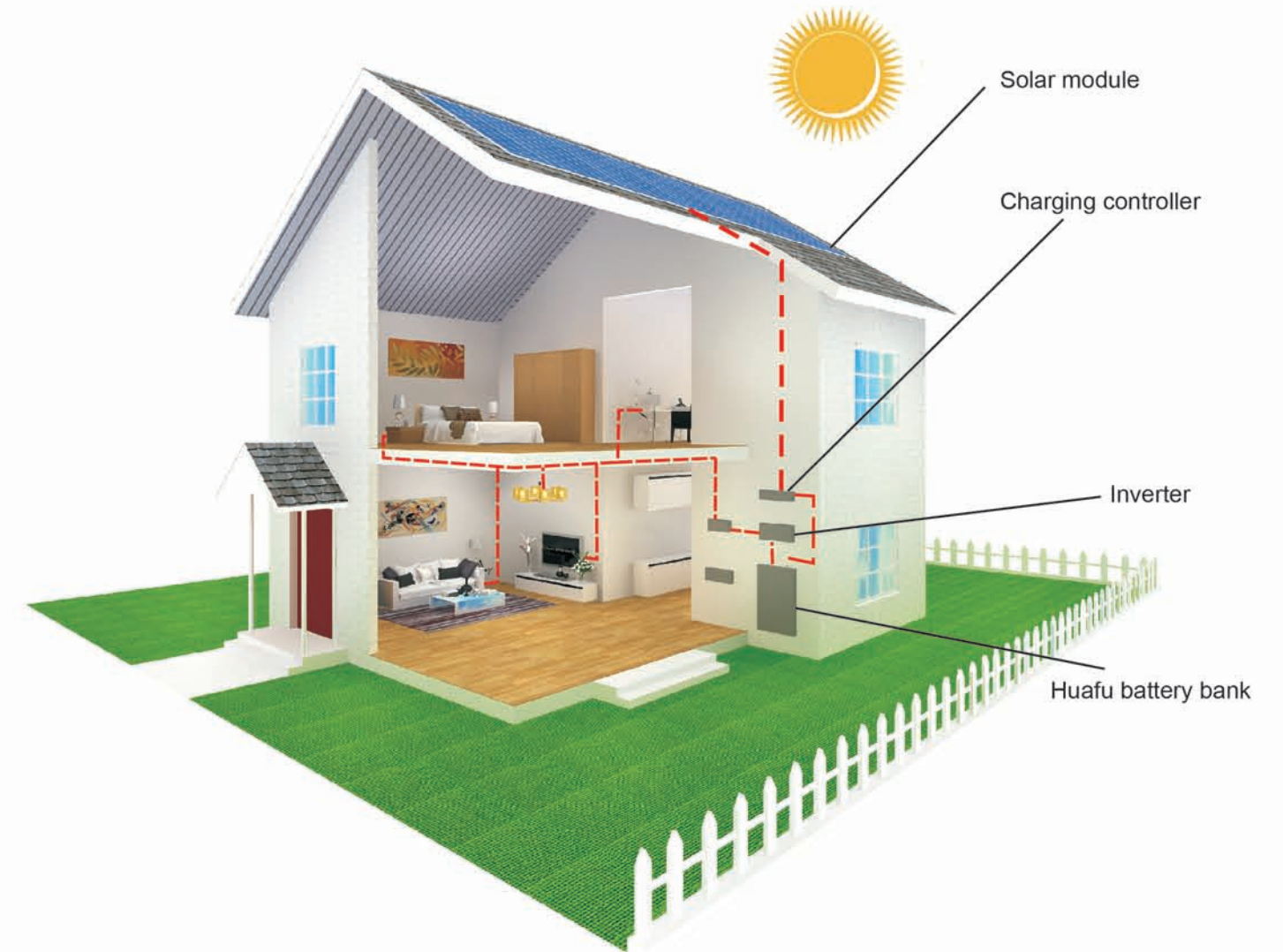
The controller is used to control the operating condition of the whole system, and protect the battery against over-charge or over-discharged. The controller should have the temperature compensation function, as well as other additional functions, such as optical control switch and time switch, etc.

Battery bank

It is usually lead acid battery. The function is to save the electric energy generated from the solar panel when sunlight shines in, and to release the electric energy when needed.

Inverter

The AC voltage of 220V or 110V is needed in many occasions. However, the output DC voltage of the battery bank is mainly 12V and 48V, etc. The DC electric energy generated from the solar system is needed to be transformed into the AC energy to provide electric energy for the appliances of 220V AC, so the DC-AC inverter is needed. The DC-AC inverter is also needed when various DC loads are used.

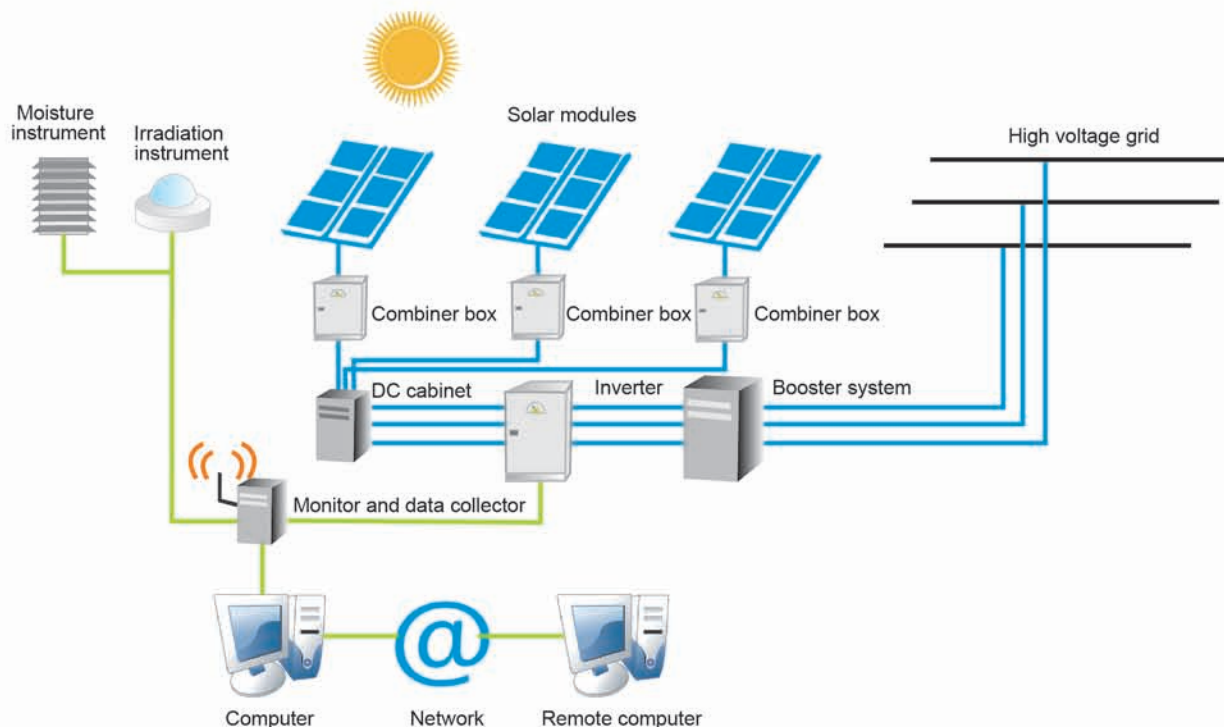


On-grid solar power system

Components: The system is composed of solar module, grid-connected inverter, metering devices and power distribution system.

Working principle

The solar energy is transformed into DC electricity through the PV module, and then the DC electricity is transformed into the sine wave current of the same frequency and same phase as the grid through the grid connected inverter. Part of the sine wave current supplies for the local load, and the surplus current is returned to the grid. The grid-connected inverter returns the maximum electricity generated from the solar panel to the grid through the inner power regulator.



Micro grid

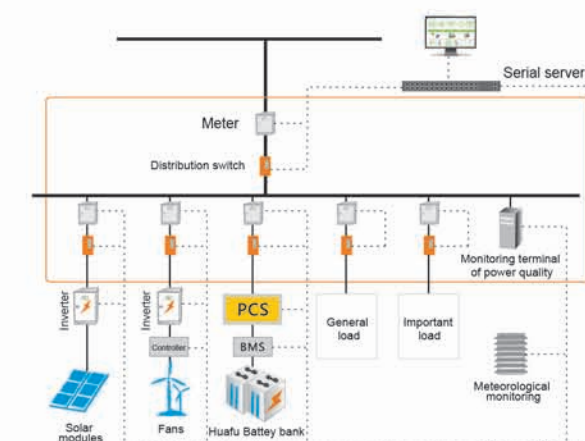
The micro-grid is a small power generation and distribution system composed of distributed power supply, energy storage device, energy transformation system, related load and monitoring system and protection devices. It is an autonomous system which can realize self-control, protection and management. It can operate connected with grid or independently.

Working principle

The micro-grid is a system connected closely by load and distributed power supply. It includes many energy modes (wind, photovoltaic and energy storage, etc), an energy outputting form (AC with the same quality as the grid) and many energy transformation methods (wind/electricity, electricity and DC/AC, etc). By integrating the relations between distributed generation unit, power network and terminal users in a local area, the micro-grid can arrange structure and allocation and optimize the power dispatching conveniently. The micro-grid and the grid exchange energy are spare to each other, which enhance the reliability of power supply, and raise the utilization efficiency of the energy and decrease the effect of energy power system on the environment.

System characteristics

1. The system can realize the connection of multiple distributed power generation modes, such as photovoltaic power, wind power, diesel power, the micro gas turbine and etc.
2. Multiple energy storage devices can be connected to the system, such as lithium battery, lead acid battery, supercapacitor and redox flow battery, etc.
3. It can be operated in the modes of grid-connected, off-grid operation, and two-way operation of charging and discharging.
4. During off-grid operation, the system can supply power for load to decrease the loss of power failure.
5. During grid-connected operation, the system is charged smoothly, which can reduce the volatility of the grid, guarantee the generation balance and improve the generation quality.
6. PCS is of function of active and inactive power regulation. The power factor (-1,1) can be regulated.
7. The monitoring system can monitor the operation state of grid, PCS as well as energy storage device in real.
8. It takes the quick response grid dispatching system which can realize the demand management and peak load shifting.



Smart grid power station for energy storage

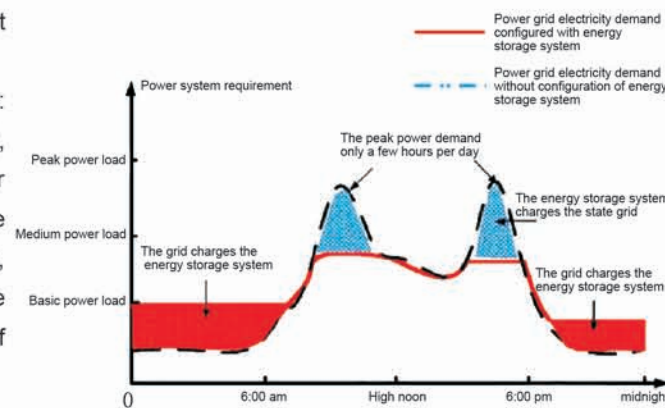
Huafu targets to create a smart R&D and manufacturing base for energy storage products and intelligent micro-grid systems.

Smart micro-grid system "china's electricity treasure" is assembled with distributed generation, energy storage device, energy conversion device, energy control system, and relative load monitoring and protection devices. It provides solution in the power generation, PTD and end users' sides.

- ① Plug and play type of distributed energy storage system are mainly applied into home and small enterprise unit.
- ② Flexible modular energy storage systems are mainly used in large and medium-sized industrial and commercial farming enterprises as well as public institutions.
- ③ Distributed multifunctional complementary energy storage subsystem are mainly used in systems of stabilizing the power fluctuation, adjusting the grid power and the emergency powers supply systems.

Components of energy storage system for smart grid power station

The system is mainly composed of three parts: battery pack of lithium iron phosphate (LiFePO₄), battery management system (BMS) and power conversion system (PCS). The system can also be equipped with monitoring system, transformer, grid-connected switch cabinet and two-way active and inactive electric meter, etc. the power level of the system varies from tens of KW to tens of MW.



Working principle

The system includes BMS and battery pack. There are large grid-connected, two-way inverters, complete power environment monitoring system and lighting system inside. It is a complete intelligent power station for battery system which is functioned with battery management and is of abundant exterior communication interfaces. The system is of good heat dissipation and heat preservation function. Meanwhile, it can satisfy the strict waterproof and quake level requirements. It can choose the container-type installation or house construction installation for the energy storage power station, and the dimensions and interface types can be made based on the actual demands.

Although there are various energy storage methods, the LiFePO₄ battery is of long life, low cost, high efficiency, good safety performance, convenient construction, mature technology, pollution free and large space for cost saving and life improvement, so it is the development focus all over the world.

The intelligent grid is the development goal of the regular grid. It aims to make the whole process of the grid system, like resource development, transformation (power generation), transmission, storage, distribution, supply, sale, use, communication intelligently with each other to realize accurate supply and complementary supply by informational strategy. Under the premise of safety power supply, it also aims to improve the energy utilization efficiency, take in renewable energy with highest limit to save cost and reduce the environmental pressure. The energy storage power station can help balance interests, and regulate electric resources. It is the important premise of renewable energy application and the effective means in realizing grid interactive management. It is impossible to realize the intelligent grid without energy storage.

Functional features

(1) Peak load shifting

To put it simply, it means to store the electricity into the battery bank when it is abundant, and output the saved electric energy to the grid by inverter when it's lacking. This is the basic function of the energy storage system-peak regulation function

(2) Emergency independent inversion

When the power failure happens to the grid, the energy storage system can provide continuous AC power for the important load as the independent inversion power supply, which provide further guarantee for the users

(3) Receiving the regulating instructions from the grid flexibly

The energy storage system can exchange information with the grid distant terminal devices and data collecting and monitoring controller system conveniently. It can receive the regulation from the automatic monitoring system to realize remote command, telemetering, control and regulation. The system abides by the intelligent grid communication protocol strictly. There are several specific communication media, such as wire and wireless way.

(4) Dynamic and static grid support and reactive power compensation

The energy storage system can realize many functions based on the grid regulating instructions, mainly including:

- (a) Provide needed active power for the grid;
- (b) Provide needed reactive power for the grid;
- (c) Realize low voltage ride-through to enhance the stability of the grid.

