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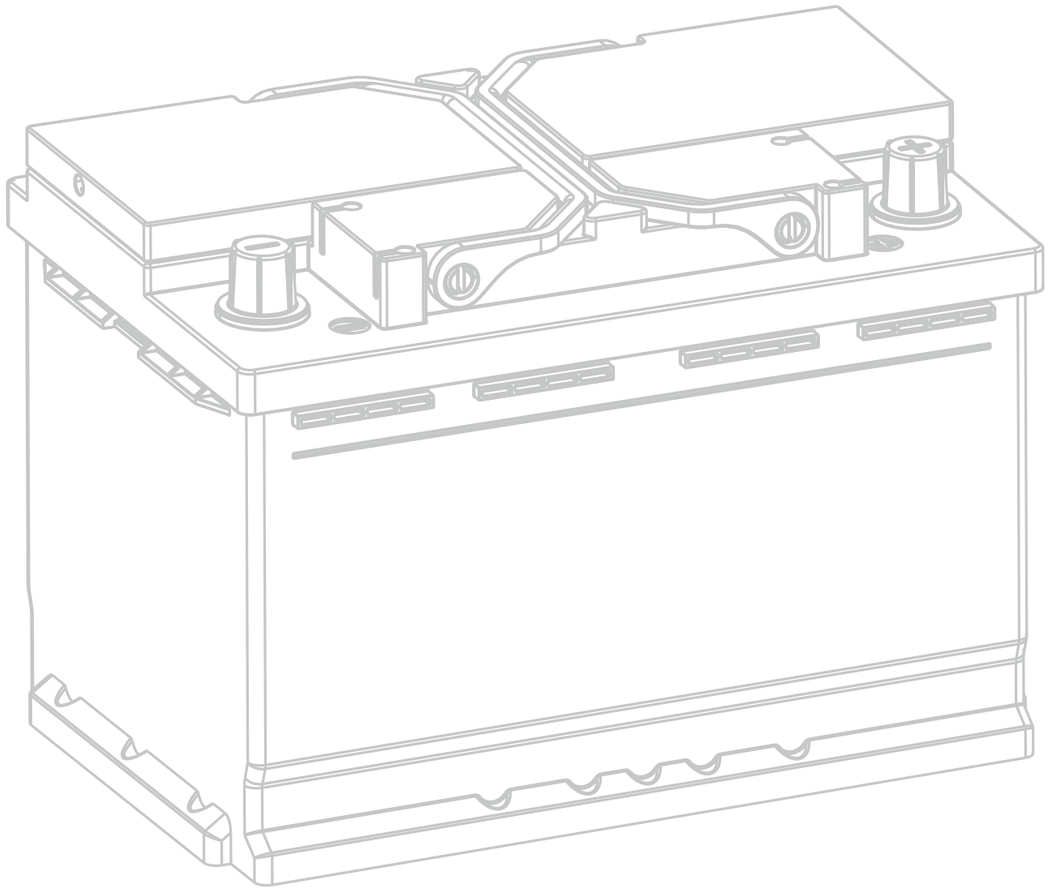

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FOR START-STOP

SPACEFLIGHT POWER

START AND STOP BATTERY SALES MANUAL

SPACEFLIGHT POWER SUPPLY (LONGNAN) CO., LTD.

SPACEFLIGHT POWER

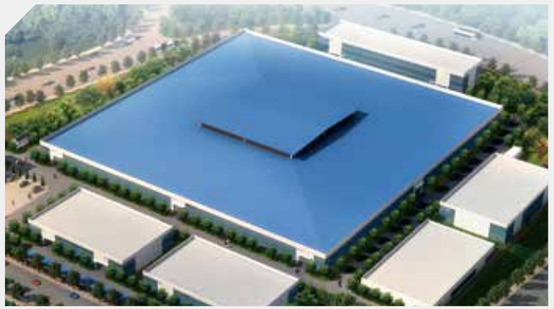
ABOUT SPACEFLIGHT

Spaceflight Power Supply is a professional battery manufacturer with business scope covering R & D, production, sales and service etc.; founded in 1994, the company is known for its advanced production and rich experience in technology development and application. With fixed assets of 600 million yuan, the company covers an area of 440 acres. The annual outputs of automotive battery, backup battery, motive battery and energy reserve battery have reached 5 million and above.

The company boasts advanced equipment for production, test and detection in the industry, and the productive process of lead-acid battery has passed the certification of IS09001 international quality management system, ISO14001 Environment Management System Certification, OHSAS18001 occupational health and safety management system, IATF16949 management system certification. In terms of its properties and functions, the products have reached and outperformed international standards such as JIS (Japan), BS (UK), DIN (Germany), IEC (International Electro Technical Commission), GB5008.1-92, GB5008-91, TB/G4282-92 and TB/T6457.2-92.

Spaceflight is specialized in the production and sales of automotive start-stop batteries. Its products such as EFB and AGM batteries apply to the stop/start system on the micro hybrid vehicles. The products incorporate the advantages and durability of the lead-acid battery, and they are adaptable to the frequent start-ups of the engine of start/stop system. Its advantages include high capacity,
excellent performance of deep cycle and long service life and so on.

Spaceflight Power Supply gains development with excellent workmanship and the company will abide by the enterprise spirit of “stay realistic, pragmatic, professional and dedication” by exploring and developing new technology of lead-acid battery. The company aims to become a world-leading group in the energy industry.



QUALIFICATIONS

ISO 14001

IATF 16949

OHSAS 18001

ISO 9001

RoHs

Excellent suppliers in the government procurement

Famous Trademark of China

Top 10 products of China' s battery industry

Recommended products for China' s engineering construction

Pass CE&MSDS certification

Certificate of new high-tech enterprise

License for pollutant emission

Business License

START/STOP SYSTEM

Most vehicles are now fitted with start-stop system to improve vehicle fuel efficiency and reduce CO_2 emissions to satisfy global carbon emission targets.When specified conditions are created, the engine stops working for a while (not the traditional idling). The lubricating oil in the engine works continuously to make sure that the engine remains lubricant in the engine; at the same time, the electric power of the vehicle is supplied by AGM/EFB battery, so the oil can be saved and the consumption reduced (the average rate of fuel saving reaches 8% to 15%). When the brake pedal is released, the engine is started once again. At the time, because the lubricating oil keeps on circulating, frequent stops and starts won't cause wear inside of the engine. If the vehicle is kept static for a long time, and AGM/EFB battery is low, then the vehicle automatically turns off the start/stop system, and the system will be restarted until the battery is charged.

Working principle of the automotive lead-acid battery in the general status and start/stop status

VEHICLE STATUS	Start	Acceleration (~constant speed)	Deceleration	Stop	Stop (→advance)	Acceleration (~constant speed)
General battery	Efficient discharge Start	Charge	Charge	Charge	Charge The battery is charged continuously by consuming gasoline to meet the electric power needed by the vehicle.	Charge
Start-stop batteries	Efficient discharge Start	Charge	Feedback charge	Low-rate discharge	High-rate discharge The engine stops working, and the entire vehicle is powered by the start-stop batteries, so that the oil is saved.	Charge

FEATURES OF AGM START-STOP BATTERIES

SCOPE OF APPLICATION

The full name of the AGM automotive battery is VRLA-AGM-Battery. It is a valve-regulated and maintenance-free lead-acid battery that incorporates new technology with electrolyte attached to AGM separator. The battery is developed to meet the stringent requirement of Start/Stop vehicle, and it is designed to reduce fuel consumption and exhaust emissions. Spaceflight AGM battery incorporates advanced science and technology and production technology, and based on the repeated tests and loading tests for a long time, generally, the battery outperforms other batteries in the market.

Excellent technical characteristics

- Internal oxygen recombination helps realize extremely low water loss;
- The fiberglass absorbs electrolyte: no acid leakage.
- Die-casting grid, and the plates growing phenomena won't occur;
- Because there is combination pressure on the plates, the performance degradation is relieved;
- The service life of AGM automotive battery is quite long, which is three times the normal maintenance-free battery.

STOP START
Start/stop system that incorporates high and new technology

Fiberglass absorption technology

No need to add water and maintenance-free

3x The start-stop battery has a cycle life three times longer than the normal battery.

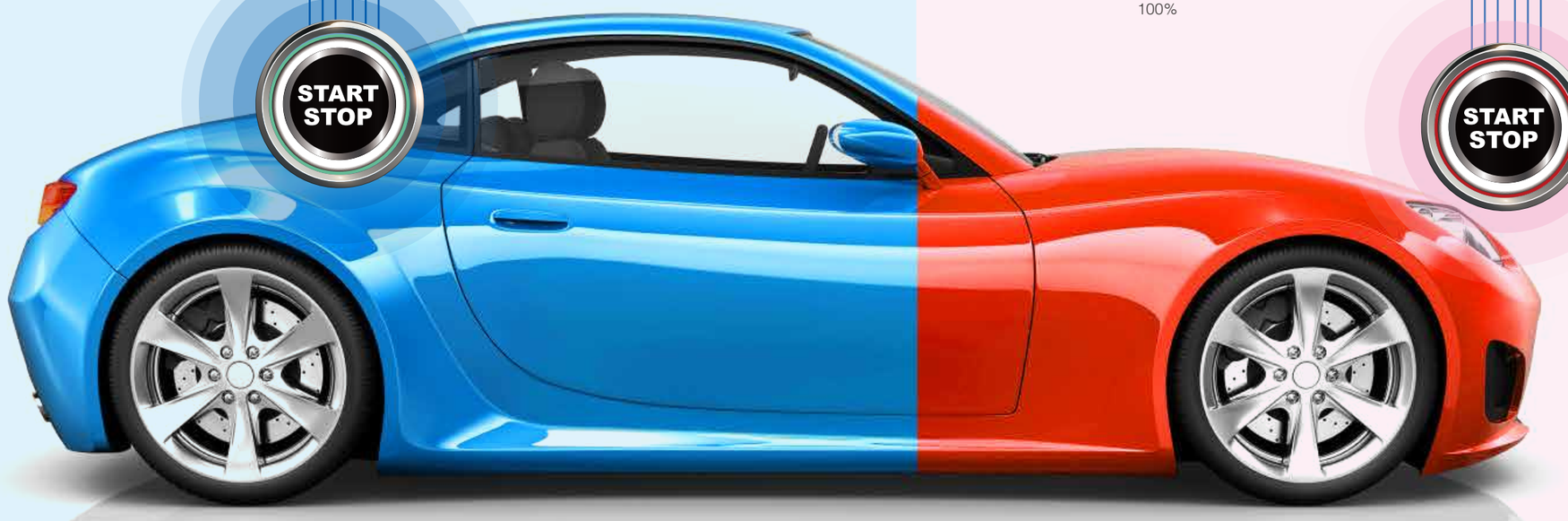
CO_2 The carbon emission is reduced if the vehicle uses the start-stop battery.

Comply with the national policy of energy conservation and environment protection, and the battery recovery rate is about 100%

Maintenance-free sealed start-stop batteriesMaintenance-free, safe and reliable

Low self-discharge and long resting period deep cycle discharge and excellent performance

AGM
When the battery is replaced, it should be used the AGM battery in the same technology



FEATURES OF EFB START-STOP BATTERIES

SCOPE OF APPLICATION

The full name of the EFB battery is an enhanced maintenance-free lead-acid battery. It is an upgraded version of a normal flooded battery. At the same time, thanks to the great investment in the new materials, new technologies and new production equipment, the stability of EFB battery performance and quality is guaranteed. The product is mainly developed to meet the stringent requirement of Start/Stop vehicle and designed to reduce fuel consumption and exhaust emissions. Spaceflight EFB battery is using new-type alloy, lead paste formula and new separator,and it can effectively prevent the lead paste from softening and falling off during the use. Meanwhile a new guiding device is installed in the battery to effectively prevent acid stratification, and enhance the safety of battery during use.

Excellent technical characteristics

- The hyper-pure lead-calcium alloy grid is adopted for the negative plates, with small self-discharge, and there is no need to add water;
- Labyrinth cover is adopted with liquid-gas separated, and there is no splash of acid liquor, so the safety is enhanced.
- In terms of casting, there is no phenomenon like the plates growing;
- The grid made of the rare earth and the lead silver alloy is adopted for the positive plates, and PE compound separator helps realize longer battery service life.

STOP START
Start/stop system that incorporates high and new technology

PE septum absorption technology

No need to add water and maintenance-free

2x The start-stop battery has a cycle life three times longer than the normal battery.

CO_2 The carbon emission is reduced if the vehicle uses the start/stop battery.

Comply with the national policy of energy conservation and environment protection, and the battery recovery rate is about 100%

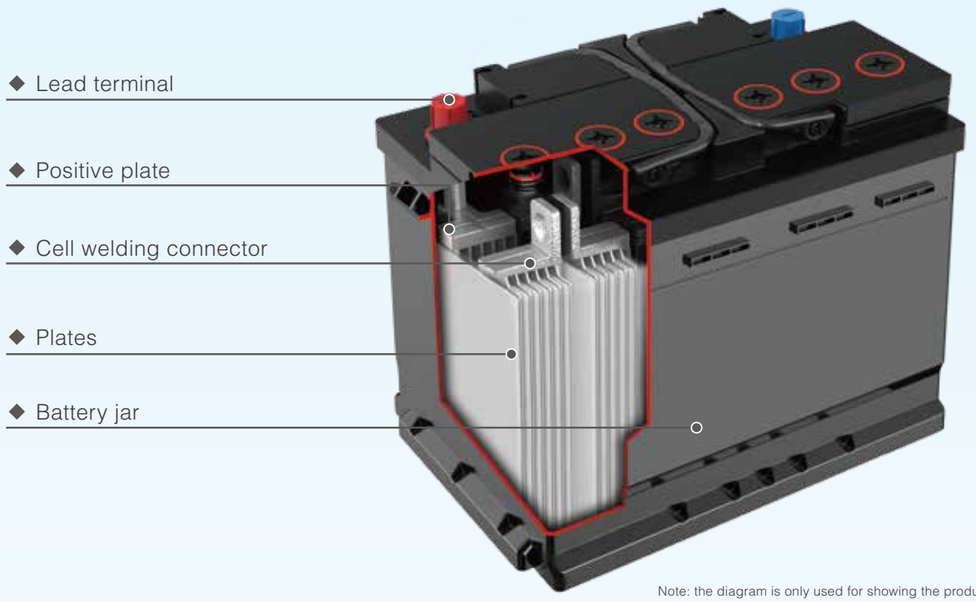
Maintenance-free sealed start-stop batteriesMaintenance-free, safe and reliable

Low self-discharge and long resting period deep cycle discharge and excellent performance

AGM
When the battery is replaced, the EFB battery with the same technology should be used.

STRUCTURE DIAGRAM OF START-STOP BATTERY

SCOPE OF APPLICATION



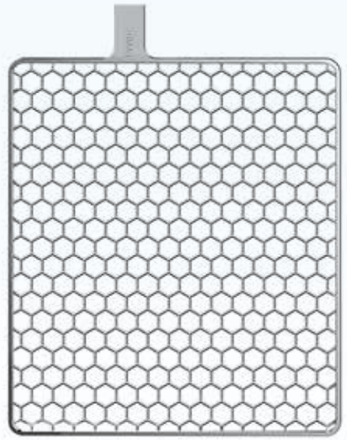
Note: the diagram is only used for showing the product structure.

PROPRIETARY TECHNOLOGY OF “BIOMIMETICS”

The honeycomb “biomimetics” technology for the plates is a lately developed battery technology, which has been independently researched and developed by Spaceflight Power Supply. It is put on the market with a ground-breaking design. Compared to the traditional grid, the active substance of battery is attached to the grid more effectively, while the efficient and stable energy density is maintained, so it helps give full play to the performance of automotive battery.

The biomimetics grid battery is both powerful and durable, and it outperforms other traditionally manufactured batteries; the current flows quicker, and its capacity is 30% higher than the traditional battery. This means that every battery that uses the biomimetics grid has extremely high starting power, and it helps start the vehicle quickly and ensures good corrosion resistance.

1. Extremely low self-discharge rate, and longer battery storage.
2. Excellent corrosion-resistance, which slows the grid corrosion and extends the service life.
3. With proper mechanical strength and rigidity, it avoids the deformation of the batteries
4. Perfect combination with the active substance, prevents the plates from softening or falling off.



SCOPE OF APPLICATION

MODELS OF SPACEFLIGHT START-STOP BATTERY

DIN A DOUBLE-LAYER COVER

THE UPPER LID

> when the acid gas in the battery shell reaches the second layer of shell, due to the temperature variation effect, the acid gas gets cool and flows back to the battery shell, which reduces the fluid loss.

THE LOWER LID

> When the acid gas in the battery shell reaches the top of battery shell, it gets cool and flows back to the battery shell.

DIN B DESIGN OF INTEGRATED BATTERY COVER

INTEGRATED BATTERY LID

> When the acid gas in the battery shell reaches the top of battery shell, it gets cool and flows back to the battery shell.

SPECIFICATION AND MODEL OF AGM BATTERY

SCOPE OF APPLICATION

DIN A

Model 6-QTF-60(700)

[Reference: H5/ L2-400L]

RATED VOLTAGE	12V	PRODUCT SIZE	242×174×190×190 mm
C_{20} RATED CAPACITY	60Ah	PRODUCT WEIGHT	18.0 kgs
CCA STARTING CURRENT (25℃)	700A	TYPE OF BATTERY	AGM BATTERY

Applicable automotive models:

Audi(import)A1 with start-stop, Audi(import)A3 with start-stop, Audi(import)A4 with start-stop, Audi (import) TI with start-stop, new Peugeot 408 with start-stop, BMW MINI with start-stop, BMW 320i with start-stop, BMW 325i with start-stop, BMW 330i with start-stop, Mercedes-Benz C-class with start-stop, new BYD F3 with start-stop and so on.

DIN A

Model 6-QTF-70(800)

[Reference:H6157217]

RATED VOLTAGE	12V	PRODUCT SIZE	280×174×190×190 mm
C_{20} RATED CAPACITY	70Ah	PRODUCT WEIGHT	20.5 kgs
CCA STARTING CURRENT (25℃)	800A	TYPE OF BATTERY	AGM BATTERY

Applicable automotive models:

Audi Q3, A1, A3, BMW X1, Peugeot 3008, 308S, 408, 4008, 508, BuickEncore, Coreview, Excelle, Sagitar, Lavida, Magotan, Passat, Chevrolet Malibu, Cavalier, Volvo Asia-Pacific S60L, XC60, Chevrolet Sail, Citroen C3-XR, C4/L, C5 Elysee and so on.

DIN A

Model 6-QTF-80(880)

[Reference:H7/58043]

RATED VOLTAGE	12V	PRODUCT SIZE	318×174×190×190 mm
C_{20} RATED CAPACITY	80Ah	PRODUCT WEIGHT	23.2 kgs
CCA STARTING CURRENT (25℃)	880A	TYPE OF BATTERY	AGM BATTERY

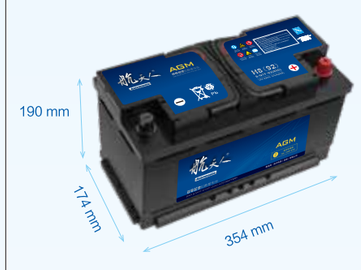
Applicable automotive models:

Audi (import) A8, A4L, A6L, Q5; BMW L, BMW 320, 1328, 1520, 1528, IX124; Benz A, B, C, E, S; Buick Verone; Jeep Grand Cherokee; Cadillac ATS-L; land rover (import) Discovery Sport, Range Rover Evoque; MIN(import); Volvo (import)V40; Chevrolet Cruze and so on.

SCOPE OF APPLICATION

SPECIFICATION AND MODEL OF AGM BATTERY

DIN A



Model 6-QTF-60(700)

[Reference: H5/ L2-400L]

RATED VOLTAGE	12V	PRODUCT SIZE	354×174×190×190 mm
C_{20} RATED CAPACITY	92Ah	PRODUCT WEIGHT	26.1 kgs
CCA STARTING CURRENT (25℃)	960A	TYPE OF BATTERY	AGM BATTERY

Applicable automotive models:

BMW Brilliance 3, 5; Volkswagen Phaeton, Touareg; Benz C, E, GL, M, R, S; BMW (import) 3, 5, 7, X5, X6, 320Li, 528Li, 535i, 730i; Audi (import) A8, Q7, Audi (FAW-VW) A4L, Q5; Porsche Cayenne

DIN A

Model 6-QTF-105(1020)

[Reference: H9/ 27-110]

RATED VOLTAGE	12V	PRODUCT SIZE	400×174×190×190 mm
C_{20} RATED CAPACITY	105Ah	PRODUCT WEIGHT	29.0 kgs
CCA STARTING CURRENT (25℃)	1020A	TYPE OF BATTERY	AGM BATTERY

Applicable automotive models:

Audi A4, A5, A6, A8, Q5, Q7; BMW 520Li, 523Li, 525Li, 528Li, 530Li, 535Li, 5201, 5281, 5351, 730, 740, X3, X4, X5, X6; Porsche MACAN, Cayenne, Panamera; Benz (import) S:

40%

The performance is 40% higher than normal battery

Advanced silver alloy grid Excellent anti-corrosive performance

Advanced active substance High output voltage

START STOP

High starting power ratio Adaptable to frequent start

AGM EFB

Safe High anti-explosion performance Good anti-vibration performance

OEM

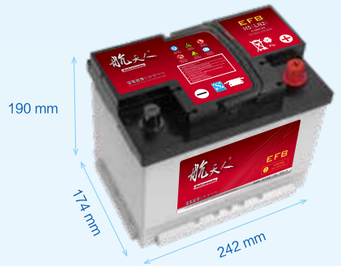
OEM partner Core technology of manufacturing

Note: Because year of the car and version are constantly changing, you can consult customer service for model matching

SPECIFICATION AND MODEL OF EFB BATTERY

SCOPE OF APPLICATION

DIN A



Model 6-QW-60(600)

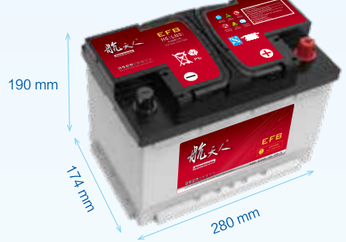
[Reference:H5/LN2]

RATED VOLTAGE	12V	PRODUCT SIZE	242×174×190×190 mm
C_{20} RATED CAPACITY	60Ah	PRODUCT WEIGHT	17.9 kgs
CCA STARTING CURRENT (25℃)	600A	TYPE OF BATTERY	EFB BATTERY

Applicable automotive models:

Honda 14 Spirior, 15 Crider, 16 Accord, 15 CR- -V,Toyota Levin, Toyota 16 RAV4, RAV4 2.0L, Mazda 3 Axela, ATENZA, CX-4, CX-5, BESTUNE B50, X40, Senia R7, Kia Keaion and so on.

DIN A



Model 6-QW-70(700)

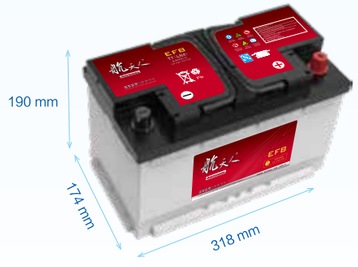
[Reference: H6/LN3 / 57217]

RATED VOLTAGE	12V	PRODUCT SIZE	280×174×190×190 mm
C_{20} RATED CAPACITY	70Ah	PRODUCT WEIGHT	19.4 kgs
CCA STARTING CURRENT (25℃)	700A	TYPE OF BATTERY	EFB BATTERY

Applicable automotive models:

Audi A1, A3, Q3, TT, ANCIER, Blackview, Passat, Honda URV, Camry 8, Kadjar, Koleos, Excelle 15, Envision, Enclave, Touran, Teramont, Golf and Tiguan.

DIN A



Model 6-QTPE-75(800)

[Reference:T71LN4158043]

RATED VOLTAGE	12V	PRODUCT SIZE	318×174×190×190 mm
C_{20} RATED CAPACITY	75Ah	PRODUCT WEIGHT	21.4 kgs
CCA STARTING CURRENT (25℃)	800A	TYPE OF BATTERY	EFB BATTERY

Applicable automotive models:

Ford Kuga, Edge, Mondeo, Taurus, Focus, Escort, Everest, Jinzhongzuo, Carnival, Zhisheng, CHIA-X, Ford S-MAX, Audi A4L, Audi A6, BMW X3, COMPASS;

SCOPE OF APPLICATION

SPECIFICATION AND MODEL OF EFB BATTERY

JIS

Model 6-QTP-60(650)

[Reference: Q85 / 75D23L]

RATED VOLTAGE	12V	PRODUCT SIZE	230×170×202×227 mm
C_{20} RATED CAPACITY	60Ah	PRODUCT WEIGHT	17.8 kgs
CCA STARTING CURRENT (25℃)	650A	TYPE OF BATTERY	EFB BATTERY

Applicable automotive models:

Honda 14 Spirior, 15 Crider, 16 Accord, 15 CR-V, Toyota Levin, Toyota 16 RAV4, RAV4 2.0L, Mazda 3 Axela, ATENZA, CX-4, CX-5, BESTUNE B50, X40, Senia R7, Kia Keaion and so on.

JIS

Model 6-QTP-64(700)

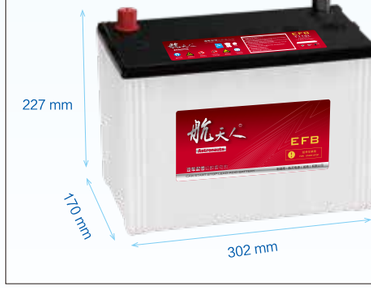
[Reference: S95 / 80D26L]

RATED VOLTAGE	12V	PRODUCT SIZE	258×170×202×227 mm
C_{20} RATED CAPACITY	64Ah	PRODUCT WEIGHT	19.5 kgs
CCA STARTING CURRENT (25℃)	700A	TYPE OF BATTERY	EFB BATTERY

Applicable automotive models:

Honda Odyssey, Elysion, Honda Yaris, Camry 16, Highlander, RAV4 16, RAV4 2.5L, Vios 17, pula 18, Lexus, Bluebird, Odyssey, Infiniti QX.

JIS



Model 115D31L(730)

[Reference: T110L]

RATED VOLTAGE	12V	PRODUCT SIZE	302×170×202×227mm
C_{20} RATED CAPACITY	95Ah	PRODUCT WEIGHT	21.4 kgs
CCA STARTING CURRENT (25℃)	730A	TYPE OF BATTERY	EFB BATTERY

Applicable automotive models:

Lexus ES, RX, GX, LX, LS, Dongfeng, Isuzu and so on.

Note: Because year of the car and version are constantly changing, you can consult customer service for model matching

STRUCTURE DIAGRAM OF START-STOP BATTERY

COMPARISON OF AGM/EFB BATTERY CHARACTERISTICS

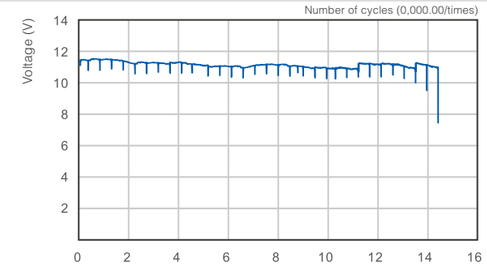
SERIAL NO.	NAME	AGM BATTERY	EFB BATTERY
1	Operating ambient temperature	-35C ~65°C	-35°C~80℃
2	Voltage of full charge	14.4V	16V
3	Separator	AGM fiberglass	PE Composite
4	Electrolyte	Absorbed glass mat battery, to store the electrolyte in a “dry” or suspended state rather than in free liquid form	flooded battery, it contains free liquid electrolyte
5	Gas reaction effect	The oxygen flows through the microcellular structure of separator, and there is no loss of gas.	With free liquor and straight-line, there is no structure of oxygen recombination
6	Grid	Thick anticorrosive silver alloy	Thick anticorrosive silver alloy
7	Positive and negative plate	Adaptable to gravity casting and die-casting of grid	Casting and die-casting of grid
8	Battery cover	Integrated battery cover or double-layer cover, and the seal bolt has a reducing valve	Integrated battery cover or double-layer cover, with labyrinth structure, and without reducing valve
9	lead loss	High	Relatively high
10	CCA 25℃	Higher than EFB CCA of same size (60Ah CCA 700A)	Relatively low (60Ah CCA 600A)
11	Water loss	84d，3g/Ah	84d, 6g/Ah
12	Thermal runaway	There is assembling pressure, and the risk of thermal runaway is high.	The assembling pressure is small, and there is enough space in the battery case, and the risk of thermal runaway is low.
13	17.5% DOD	1530 times	1020 times
14	50% DOD	360 times	270 times
15	Exhaust	The safety valve exhausts with limited pressure	Natural exhaust

Disclaimer:
> This information is only a brief description of product performance and does not mean a guarantee for any battery.
> Our company reserves the right to modify all data in this document, and if there is any update arising from the technical promotion or other reasons, we won't send the notice.
> If you want to know the latest information, please go to the official website of Spaceflight or follow the Official Accounts, and keep in touch to obtain the latest information.

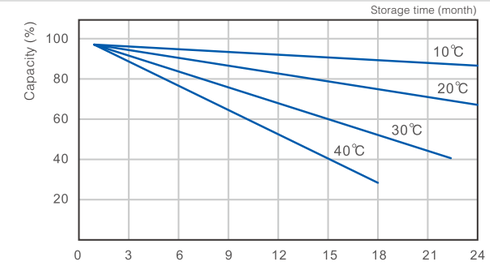
COMPARATIVE ANALYSIS OF AGM/EFB BATTERY PERFORMANCE

A G M

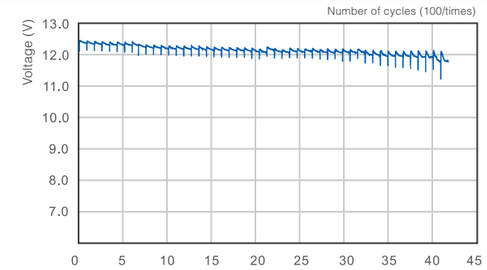
Curve of service life at idling (25°C)



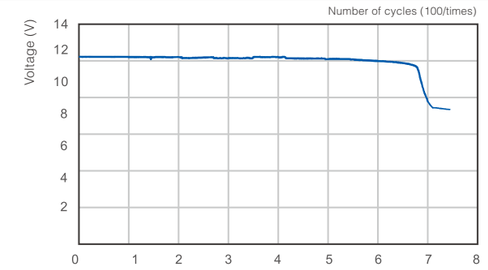
Curve of the relationship between the storage time and the self-discharge at different temperatures



17.5% DOD cycle life curve (25℃)

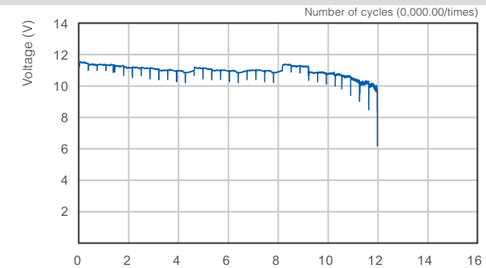


50% DOD cycle life curve (40°C)

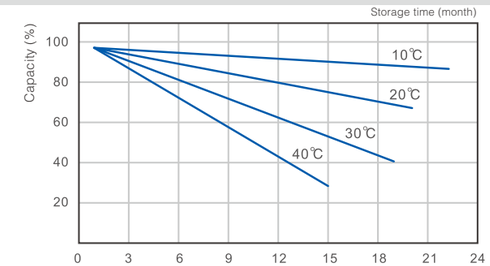


E F B

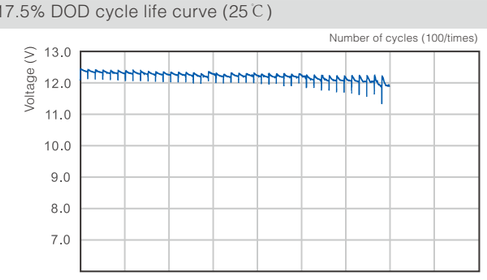
Curve of service life at idling (25°C)



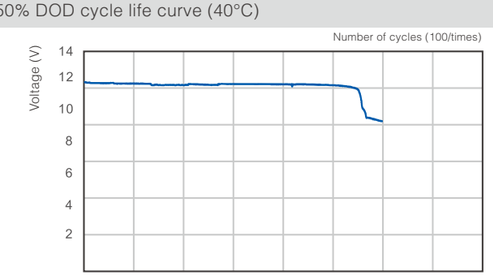
Curve of the relationship between the storage time and the self-discharge at different temperatures



17.5% DOD cycle life curve (25℃)



50% DOD cycle life curve (40°C)



AGM/EFB START-STOP BATTERIES · STORAGE

The battery is a product featuring gradual failure, and if it is stored for a long time after it is fully charged, then the self-discharge process of the battery is initiated. The capacity gradually decreases, and this phenomenon is inevitable. The battery self-discharge is an underlying cause for decreased capacity and shortened service life during the storage, and when the environment temperature is elevated, the process of self-discharge will be accelerated. For every 10℃ the temperature is elevated, the chemical reaction speeds for all raw materials are doubled, and the service life of the battery is halved accordingly. Generally speaking, the battery should be kept at a temperature between 20°C and 35°C, and high or low temperature will be detrimental to the service life of the battery.

THE CHANGE IN THE CAPACITY OF THE BATTERY THAT HAS BEEN STORED FOR A LONG TIME

⩾ 80%	= 60~80%	⩽ 60%
Actual capacity ⩾80% design capacity, and no additional charge is needed.	Actual capacity = 60~80% design capacity. The additional charge is needed before use, and the original capacity can be recovered if an additional charge is made at the time.	Actual capacity ⩽60% design capacity. It is strictly forbidden to store the battery in this situation, because the original capacity cannot be recovered even with the additional charge.

> It is strictly prohibited to keep the storage battery at an insufficient voltage (the voltage is not lower than 12.6V)
> To make sure that the battery is always maintained in good working condition, be sure to keep the battery in a clean and dry environment.
> The battery leaves unused for a long time should be discharged and charged at regular intervals, to restore the original capacity of the battery.
> The battery leaves the factory in fully charged condition, and the storage time is limited. To maintain its performance, do not leave the battery for a long time.
> To ensure the good working condition of the battery, the battery leaves unused for a long time should be discharged and charged at regular intervals, to activate the battery and restore the original capacity of the battery.
> If the battery is stored at different environment temperatures, it is suggested that the additional charge is made at different intervals:
If the storage temperature is smaller or equal to 20 ℃, perform additional charge every six months;
If the storage temperature is between 20 ℃ and 30℃, perform additional charge every three months;
If the storage temperature is greater than 30℃, do not store the battery and improve the storage environment.

RELATIONSHIP BETWEEN BATTERY STORAGE TEMPERATURE AND SUPPLEMENTARY ELECTRICITY

Temperature	⩽20℃	20℃-30℃	⩾30℃
Suggested recharging time	Perform additional charge every six months	Perform additional charge every three months	Improve storage environment

AGM/EFB START-STOP BATTERIES · CHARGE

After the battery is discharged, let the direct current flow through the battery in the direction opposite to the discharge current, so that the operational capability is recovered. The process is called battery charge. When charging the battery, the positive terminal is connected to the positive terminal, while the negative terminal is connected to the negative terminal. Make sure that supply voltage for the charge is always higher than the general electrodynamic potential of the battery.

Start-stop batteries should be charged in an environment with good ventilation and heat dissipation. Keep the environment temperature between 10°C to 30℃ (the optimal charging temperature is between 15 ℃ and 25 ℃). When charging the battery in summer, it is strictly prohibited to expose the battery to the sun!

AGM BATTERY

Constantvoltage charging:
The lower limit for the constant voltage of 14.4V is 0.25 C20 (A) ; determination of charging time: when the current value is smaller than 0.5A at the last stage of charge, the charge should last for 2 hours.

Constant current charging:
the constant current is kept at 0.1 C20 (A). The charging time is determined according to the initial charging voltage of the battery, and the open-circuit voltage should be greater than 13.0V when the battery is charged.

EFB BATTERY

Constantvoltage charging:
the lower limit of constant voltage 16.0V is 0.25C20(A). When the charge current is reduced until it is approximate to zero, and kept for 2 hours to 3 hours;

Constant current charging:
charge the battery in the constant current of 0.05C20(A). The battery is charged until the terminal voltage of the battery is 14.4V, and then charges the battery for another 2 hours to 3 hours.

I. Charging method
In the case of normal the battery, in the last stage of battery charged using the constant current, the terminal voltage of the battery reaches 2.6-2.8V/unit cell. Under such a high charging voltage, the battery generates a large amount of gas, and the chemical combination of the gas will lead to an increase in the battery temperature and affect the service life of battery. In the worst cases, the thermal runaway of battery will take place, which leads to the scrapping of the battery. Therefore, it is necessary to charge the battery using the constant current if AGM/EFB battery is installed.

II. Setting of charging values: The charging voltage for AGM battery in constant voltage and limited current is 14.4V (the charging voltage for EFB battery in constant voltage and limited current). Charge current⩽5I20 (I20 is the value worked out by dividing the rated capacity of the battery by 20, for example, in the case of AGM70Ah, the value is I20=3.5A). Check the change in battery temperature when charging the battery and observe the battery status every two hours. In the case of over temperature, stop charging the battery immediately.

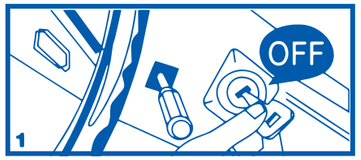
> Perform multi-stage intelligent charging for the battery with dedicated charging equipment.
> Do not overcharge the battery, and high accuracy of voltage control is required, or else the overcharge of battery or inadequate charge saturation will be caused.
> In the last stage of charging, the maximum voltage should not be higher than 14.8V. Please control the heat generation and keep it at a low level throughout the battery charging, in case the battery gets damaged due to the thermal runaway.
>Additional charge should be performed for the battery at regular intervals.

As the core component of vehicle, start-stop batteries should be installed in the insulated battery box, and maintain good ventilating and heat dissipation conditions. The installation spacing for the battery should be ⩾10mm. Take measures to reduce the pressure intensity of the fastening compression bar in case the battery is crushed. The fastening pressure of the compression bar should not exceed 10kgF/cm2 (that is, the bearing capacity of the battery case should not exceed 1 Mpa). Meanwhile, bilateral nuts of the compression bar should be fastened evenly, but do not generate too much stress on the battery case. As to the battery connecting line, install the sheathed soft cable that complies with the national standard in case the short circuit occurs.

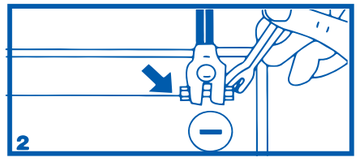
PROCEDURE OF BATTERY REPLACEMENT

Procedures for changing the battery When changing the battery, it is necessary to take measures for safety and strictly follow the procedures.Do not make short circuit of the battery by using tools.

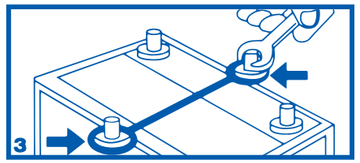
1). Read manufacturer's operation manual
2). Change the battery by following the sequence shown in the diagram



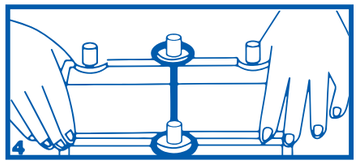
1). Turn off the engine and pull out the key
2). Do not put the battery near the fire.



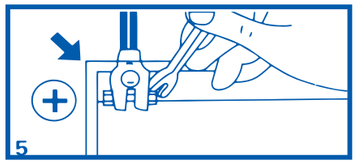
1). Remove the cable from the negative terminal of the automotive battery.
2). Then remove the cable from the positive terminal



1). Release the fasteners at the mounting rack and replace the battery



1). put the new battery on the mounting rack.
2). Press the battery with hands to make sure that the battery is fastened.
3). Fasten the battery using fastening bolts.



1). Connect the cable to the positive terminal.
2). Then connect to the negative terminal.

MATTERS NEED ATTENTION DURING THE INSTALLATION OF START-STOP BATTERIES

> Please read the vehicle manual and refer to the advice of the automotive manufacturer.
> Before a new battery is installed, if the new battery has a different brand and model, compare new and old battery in terms of their boundary dimension and post positions, and it is necessary to check the battery capacity and the CCA carefully.
> The red one is the positive terminal, while the black (or blue) one is the negative terminal
> Do not carry the battery using tools.
> When wiring the battery, wire the positive terminal before wiring the negative terminal.
> If conditions permit, test the battery using the battery detector in case the virtual circuit occurs.
> Put the new storage battery in a suitable position for installation, and make sure that the angle of inclination of the battery does not exceed 30° and fasten the battery.
> Pray antirust agent or acid free grease to the post of automotive battery for protection when the installation is completed.
> After it is confirmed that the battery is fastened well, start the engine and check the voltage of the engine is normal or not.
> If the fastening compression bar of the battery imposes excessive pressure on the battery, it will crush and damage the battery case, lead to liquid leakage and electric leakage or even cause dangers!
> When it is confirmed that the electrical system is perfect, install the protector, remove the vehicle protection facility, and close the engine hood or trunk lid.

IN ORDER TO USE THE PRODUCT CORRECTLY, SAFELY AND EFFECTIVELY, PLEASE READ THIS PAGE CAREFULLY

CAUTIONS

> For your safety, please do not open or disassemble the battery without permission.
> If the maintenance personnel have not received professional training, the battery shall not be disassembled at will.
> If you need to replace or maintain the product, please contact a professional maintenance person or call our free service hotline 400-831-3830 for consultation.
> The vehicle with a start-stop system installed cannot use standard batteries, even if the capacity is large, it cannot be used.
> Do not replace the AGM&EFB start-stop battery with a normal lead-acid battery.
> It is suggested that EFB battery is installed near the engine compartment.
> Do not leave the AGM battery at a high temperature, and generally, it is installed in the trunk.
> For EFB start-stop batteries of the same model and size, it can be replaced with AGM start-stop batteries based on the test by professional maintenance personnel. The battery cannot be changed if it is not tested by professional maintenance personnel.
> If it is necessary to store the battery for a long time, it should be recharged every month in case the capacity is reduced.
> The charger mounted in the vehicle should have functions such as voltage stabilization and current stabilization.
> It is strictly prohibited to use the charger of inferior quality or with unstable function or the charger that does not apply to the maintenance-free battery, or else it will affect the service life of battery.
> If the battery case is broken accidentally, corrosive dilute sulfuric acid might leak out, and if anyone is stained with the acid on their skin or eyes, immediately rinse the skin or eyes with plenty of water and seek medical treatment.
> Do not allow the children and minors to touch the battery!
> Power off the vehicle before the battery is maintained or installed (including the power switch of charger and vehicle system), please wear insulated gloves and take protective measures.
> Waste batteries are recyclable. Please observe relevant laws and regulations to properly dispose of used batteries, and hand them over to qualified institutions or units for disposal.
It is strictly forbidden to discard the batteries at will, so as not to pollute the environment!

BATTERY MAINTENANCE

> Measure the ambient temperature, the battery case temperature and the terminal temperature of battery during charging and discharging, and keep records of relevant data;
> Measure the battery voltage, starting current, normal working current, full load current and capacity, and keep records of the relevant data;
> Check the battery case and terminal, and make sure that they are clean, free of damage and defects;
> Check the battery box to ensure its good performance in ventilation and heat dissipation, and make sure that it has sound rainproof and waterproof performances, and make sure that there is no water in the battery box;
> If any other safety hazards are identified, please eliminate them in time