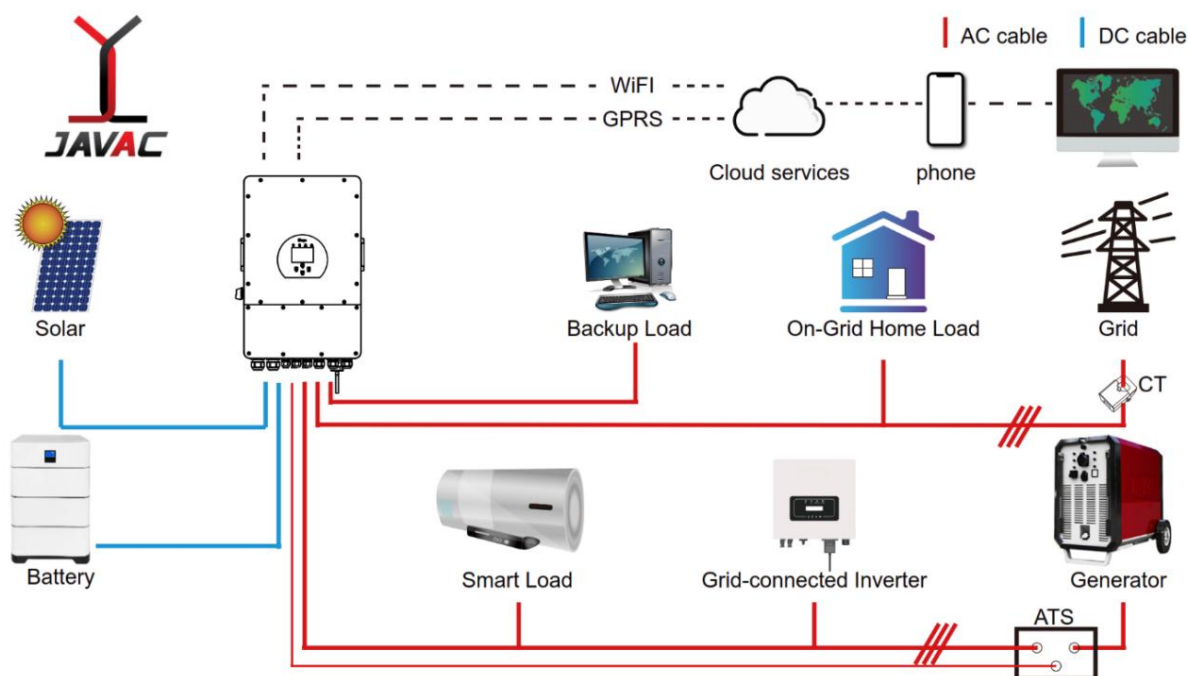




# JAVAC: AFFORDABLE QUALITY

## JAVAC Total Energy Solution



## 1. Cover page



Kalmthout, December 01, 2022

Dear Customer,

We are very pleased to be able to talk to you to highlight our product and service portfolio. As an Energy and Industrial Solution Partner, we will present a proposal adapted to your needs in this offer. We will apply the JAVAC strategy: 'offering affordable quality products and services that add value and unburden the customer through the total solution' to this offer.

As an SME company, we see it as a challenge to perform better than the global competition, especially in terms of quality, affordable service and competitive pricing. But certainly also to innovation, especially our exclusive hybrid generators and PM technology that push the boundaries of what is possible in power generators. We don't compromise on material choice; technology and quality selection are of the same quality as the market leaders.

Javac also responds to the strongly increased demand for storage batteries. Especially SME battery systems. Whether or not in island operation (off-grid) or with a connection to the grid. For our industrial application we have resolutely opted for an extremely high-quality A+ grade 'storage battery'. The most important property of a battery system is how much energy it can store and for how long. Due to your request, we present our proposal below. With, among other things, our energy management software package (supplied with the battery) and smart hybrid inverter, they form an excellent basis for controlling the hybrid system. This platform intelligently manages your assets.

Javac is not the only supplier of storage battery systems, but our position becomes unique when we look for a solution of a hybrid installation with a generator, not the conventional asynchronous generators, but with the exclusive Javac PM generator technology.

The battery and subsequent generator represent an important investment. But the depreciation period of at least 20 years makes up for a lot, the payback period at the current electricity rates is also getting shorter. In addition, you avoid possible power failures or disconnection plans. An average family has a consumption of 12 to 15 KWH per day, and then the 10 KWH combination is sufficient. People who think of an off-grid system often already have a PV installation of 6 to 10 KWH. With the advent of the "smart meter" (B), there are indeed few choices left other than an additional investment in a storage battery.

I hope our offer meets your expectations and thank you again for approaching JAVAC for filling your need.

A handwritten signature in cursive script that reads 'Tim Peng'.

Technical commercial advisor

## **2. Content**

**1. Cover page**

**2. Content**

**3. Javac Edge Battery**

**4. Javac Force BMS**

**5. Javac Premium Casing**

**6. Hybrid Inverter**

**7. Generator**

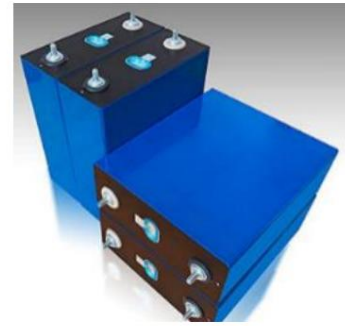
**8. Certificates**

**9. Terms and Conditions**



### 3. Javac Edge Battery

Javac works exclusively with the cobalt-free **A+ grade Prismatic Lifepo4 batteries**, which, in contrast to the NCM storage batteries (Tesla), are much more fire-resistant and have a considerably longer lifespan. Javac Edge Batteries have 90% usable storage capacity and a life cycle of 6000. This equates to an estimated lifespan of more than 10 years, at an average temperature of 25°C. Some advantages compared to NCM battery listed:



**LiFePO4**



**NCM BATTERY**



#### 1. High safety performance

Most important of all, the reason for choosing LFP battery for city buses is the essential concern of safety. There have been many fire accidents involving consumer Tesla cars since the Tesla Model S was launched, although the immediate cause of fire can vary. One reason is that Tesla's battery pack is composed of more than 7,000 units of Panasonic/Tesla NCA lithium batteries. If these units or the entire battery pack has an internal short circuit, they can cause open flames, even large fires, especially in car accidents; luckily things are getting better. Although LFP material is much less likely to burn when short circuited, and its high temperature resistance is much better than NCA/NMC lithium batteries.



#### 2. Long service life

The life of the lithium iron phosphate (LFP) battery is better than the NMC/NCA lithium battery. The theoretical life of the NMC lithium battery is 2000 cycles, but the capacity quickly fades to maintain 60% when it runs for 1000 cycles; even the best-known Tesla NCA battery can only retain 70% of its capacity after 3000 cycles, while the lithium iron phosphate (LFP) battery remains at 90% after 6000 cycles.



#### 3. Good temperature performance

The lithium iron phosphate (LFP) battery performs better because of its high temperature resistance, while NCA/NMC is better because of its low temperature resistance. At a temperature of -20°C, the NMC lithium battery can release 70.14% of its capacity; while the lithium iron phosphate (LFP) battery can only release 54.94%. The discharge voltage plateau of the NMC lithium battery is much higher and starts earlier than that of the LFP battery at low temperature. Therefore, the NMC battery is a better choice for low temperature applications.



## 4. Javac Force BMS

Javac has developed its own battery management system (BMS), which has implemented numerous safety mechanisms and optimized cell balancing, based on extensive internal research in combination with studies from renowned knowledge institutions.



Thanks to a unique balancing algorithm, our BMS can combine a large daily usable battery capacity with a conservative voltage range of the lithium cells. In addition, the system takes into account the weather forecast: on partly cloudy days the battery will be able to charge faster, and on summer days the battery will be fully charged with a lower power so that the cells do not experience unnecessary stress. Each installation is automatically monitored from the 'Cloud' (IOT with TLS encryption) and the entire telemetry is stored in a database for visualization and analysis. Firmware updates with improvements or customer-specific functionality are also performed remotely.

All our batteries are monitored remotely and updates are sent as soon as a bug occurs, or the operation is not optimal. Our system automatically monitors all process values: powers, voltages, currents, temperatures, error codes, etc.



Over Current



Over Voltage



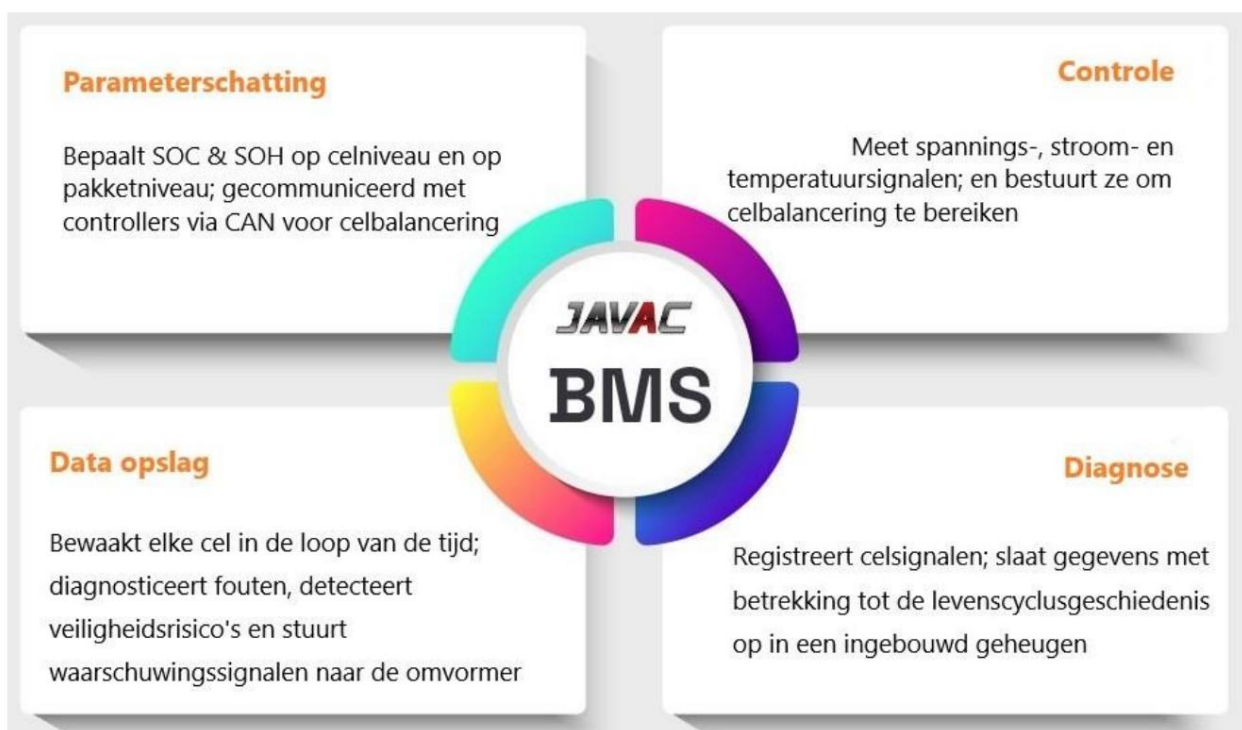
High Temperature



Low Voltage



Short Circuit



## 5. Javac Premium Casing

*Expandable at any time*



*Robust design*

*Modular design*

*High protection IP55*

*Secure installation*

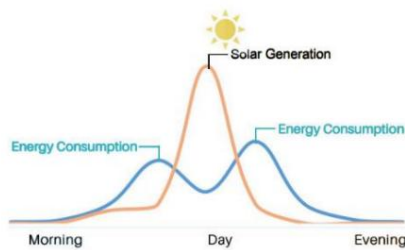


*Protection against electric shock*

*Stable foot module*

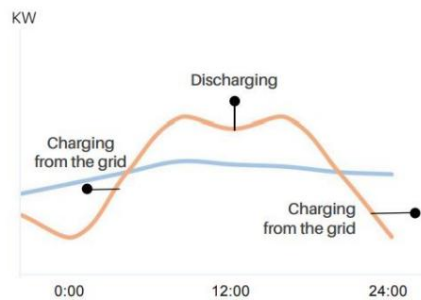
## 6. Hybrid Inverter

Our ALL-In-ONE LiFoPO4 batteries are equipped with the intelligent bi-directional hybrid inverter, which means that the inverter, for example, allows to store solar energy, while the generator and PV installation generate power. All these current sources work together unilaterally and in both directions. This allows you to feed a 'heavy load' on the one hand and that the excess energy is stored in the battery. At least as important is the load / unload capacity of the inverter, with a capacity of 2500 watts you are of course nowhere. Our hybrid inverters have a minimum capacity of 6,000 watts, up to 50 kW. The inverter can be programmed to choose where the priority is to send the current. The 6 time periods allow the user to charge the battery during off-peak hours and discharge the battery during peak hours. The inverter also has a custom connection for the Javac generator and works seamlessly together. Number of functions visualized:

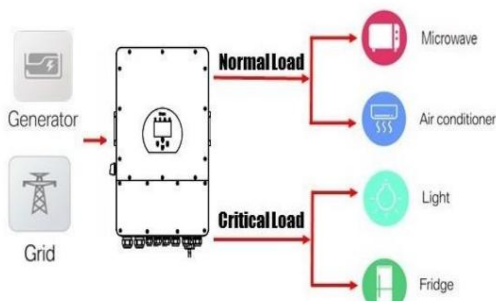


**Optimization:** Javac Hybrid inverter ensures maximum optimization of the solar energy. During the afternoon the solar energy is most sufficient, while high energy demand takes place in the morning and evening.

Hybrid inverter balances power supply and requirements. This means that you can take full advantage of solar energy and use energy much smarter, so that grid independence can be achieved.



**Peak Shaving:** The network operator requests a higher tariff for peak consumption. Families that start cooking after work and/or even turn on the washing machine and dryer during off-peak hours will generate a peak load. Such peaks will be charged quite dearly. The "Peak Load Shaving" function allows you to set the grid exchange powers so that consumption is spread out and regulates the available battery capacity



**Critical Load:** There is an independent output port for the critical load and a net port. Allows critical loads such as refrigerators, routers, lamps, computers and other critical devices to be powered when the power grid

fails. The system can automatically switch from on-grid to off-grid mode within **4 milliseconds**. The fast switching prevents 99% of electrical disturbances.

# Three Phase Hybrid Inverter

SUN- 6 / 8 / 10 / 12 K-SG04LP3-EU/AU



100%

100% unbalanced output, each phase  
Max. output up to 50% rated power

48

48V low voltage battery,  
transformer isolation design

6

6 time periods for battery  
charging/discharging

240

Max. charging/discharging  
current of 240A

16

Frequency droop control,  
Max.16pcs parallel



DC couple and AC couple to  
retrofit existing solar system



Support storing energy from  
diesel generator



## 7. Generator

If you are looking for a total off-grid system, or a back-up solution in case of power failure, in combination with the hybrid inverter and battery, an external generator is the last indispensable piece of the puzzle of this complete solution

Inverters and electrical appliances place high demands on the generator, as the power supply from a normal generator is more variable than power supply from the mains. Inverters are extremely sensitive to this and will reject power outside of programmed settings, preventing the device from connecting, syncing and charging. AVR-equipped generators will audibly struggle and eventually stall when overloaded, indicating a problem. Inverter based generators have the property that the motor continues to run even if the unit is electronically overloaded and no longer supplies power. It may appear that the generator is running and the system is charging when it is not.



These are also quickly overloaded by peak loads, as they are limited electronically rather than mechanically. With the nanomag generators with a net power of 7 KW you kill 2 birds with 1 stone, firstly the Nanomag generators are not equipped with an AVR, since the magnetic field is permanently present. The absence of a diode bridge also makes the nanomag generators very reliable, as these 2 critical components are not present. And especially the excellent properties to bridge peak load, and this for continuous load. This makes the Nanomag generators extremely suitable. For all PV installations where the battery must have a back-up system. Click here to our website and read the Q&A contribution about this problem and the solution with our Nanomag generators: <https://javac.eu/product/nm-8500-b/>

---



For heat pumps and EV applications, industrial customers, we recommend a 400 volt battery system of at least 30 KWh, and an SL class generator (15 to 40 KVA). For more information, see our website: <https://javac.eu/product/sl-serie-12-32-kw/>

---

## 8. Certificates

All our products have the necessary certificates to CE, Safety EMC IEC/EN 61000-6-1/2/3/4, IEC/EN 62109-1, IEC/EN 62109-2, Grid Regulation EN 50549-1...

**Zertifikat Certificate**

**TÜVRheinland**

Zertifikat Nr. Certificate No. Blatt Sheet  
R 50560890 0001

Ihr Zeichen Client Reference Unser Zeichen Our Reference Ausstellungsdatum Date of Issue  
J1 Dehai 01-XGJ-CN24F95 001 15.10.2022 (day/month/year)

**Genehmigungsinhaber License Holder**  
NingBo Deye Inverter Technology Co., Ltd.  
No. 26 South Yongjiang Road, Daqi, Beilun NingBo, 315800 Zhejiang P.R. China

**Fertigungsstätte Manufacturing Plant**  
NingBo Deye Inverter Technology Co., Ltd.  
No. 26 South Yongjiang Road, Daqi, Beilun NingBo, 315800 Zhejiang P.R. China

**Prüfzeichen Test Mark**  
TÜVRheinland  
www.tuv.com  
© 1111200154

**Geprüft nach Tested acc. to**  
IEC 62109-1:2010  
IEC 62109-2:2011  
EN 62109-1:2010  
EN 62109-2:2011

**Zertifiziertes Produkt (Certificate Identification)**  
**FV-Wechselrichter (Hybrid Inverter)**

**Lizenzentgelte - Einheit License Fee - Unit**

Type Designation : SUN-xK-SG04LP3-EU-AM2 (x=5,6) 11

For PV String input side : See below  
Vmax PV [Vd.c.] : 1000  
Isoc PV [Ad.c.] : 30+30  
MPPT Voltage Range [Vd.c.] : 150-850  
MPPT Full Power Voltage Range [Vd.c.] : 150-850  
Max. Input Current [Ad.c.] : 20+20  
Overvoltage Category (OVC) : II

For Battery side : See below  
Voltage range [Vd.c.] : 140-700  
Max. charge/discharge Current [Ad.c.] : 37  
Overvoltage Category (OVC) : II  
Battery type : Li-Ion

continued on page 0002

ANLAGE (Appendix) : 1.0

**TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg**  
http://www.zus.com/safety E-mail: markcheck@tuv.com  
Fax: +49 221 606-9335

**Zertifizierungsstelle**  
Weichun Li

**BUREAU VERITAS**

**Certificate of compliance**

**Applicant:** NingBo Deye Inverter Technology Co., Ltd.  
No. 26 South Yongjiang Road, Daqi, Beilun, NingBo, China

**Product:** Photovoltaic (PV) and battery inverter

**Model:** SUN-5K-SG04LP3-EU  
SUN-6K-SG04LP3-EU  
SUN-8K-SG04LP3-EU  
SUN-10K-SG04LP3-EU  
SUN-12K-SG04LP3-EU

Inverter for three-phase parallel connection to the public grid. The network monitoring and disconnection device is an integral part of the above-mentioned model.

**Applied rules and standards:**  
EN 50549-1:2019  
Requirements for parallel connection of installations with distribution networks - Part 1: Connection to an LV distribution network - Production of installations up to and including Type B  
4.4 Normal operating range  
4.5 Immunity to disturbances  
4.6 Active response to frequency deviation  
4.7 Power response to voltage variations and voltage changes  
4.8 EMC and power quality  
4.9 Interface protection  
4.10 Connection and starting to generate electrical power  
4.11 Ceasing and reduction of active power on set point  
4.13 Requirements regarding single fault tolerance of interface protection system and interface switch  
DIN V VDE V 0126-1:2006 (4.1 Functional safety)  
Automatic disconnection device between a generator and the public low-voltage grid  
Commission Regulation (EU) 2016/631 of 14 April 2016  
Establishing a network code on requirements for grid connection of generators (NC RFG)  
Type approval for generation units to use in Type A  
At the time of issue of this certificate, the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

**Report number:** ASUE-ESH-P22010034 **Certification Program:** NSOP-0032-DEU-ZE-V01  
**Certificate number:** U22-0168 **Date of issue:** 2022-03-30

**Certification body**  
Bureau Veritas Consumer Products Services Germany GmbH  
Testing laboratory, accredited according to DIN EN ISO/IEC 17025  
A partial representation of the certificate requires the written approval of Bureau Veritas Consumer Products Services Germany GmbH

**BUREAU VERITAS**  
Consumer Product Services Germany GmbH  
Gefleckenring 48, 22611 Hamburg, Germany  
Tel: +49 40 74061-0  
cps-hamburg@bureauveritas.com  
www.bureauveritas.de/cps

Form QAT\_10-M05, version 00, effective since March 25th, 2020

**Certificate of Compliance**

No. 0P220322.SNEU035  
Test Report / Technical Construction File no. TCF-TLM/22031547861

**Certificate's Holder:** SUG New Energy Co., Ltd.  
298# Wei 11th Road, Industrial Zone Yueqing, China

**Certification ECM Mark:**  Type Approved

**Product:** Lithium Battery  
**Brand:** SUG  
**Model(s):** (see the following annex)

**Verification to:** Standard:  
EN IEC 61000-6-1:2019,  
EN IEC 61000-6-3:2021  
related to CE Directive(s):  
2014/30/EU (Electromagnetic Compatibility)

**Remark:** This document has been issued on a voluntary basis and upon request of the manufacturer. It is our opinion that the technical documentation received from the manufacturer is satisfactory for the requirements of the ECM Certification Mark. The conformity mark above can be affixed on the products accordingly to the ECM regulation about its release and its use.

**Additional information and clarification about the Marking:**  
The manufacturer is responsible for the CE Marking process, and if necessary, must refer to a Notified Body. This document has been issued on the basis of the regulation on ECM Voluntary Mark for the certification of products, RG01\_ECM rev.3 available at: www.entecma.it

**CE**

**Issuance date:** 22 March 2022  
**Expiry date:** 21 March 2027

**Reviewer:** Technical expert Amanda Payne  
**Approver:** ECM Service Director Luca Badonni

**Ente Certificazione Macchine Srl**  
Via Ca' Bella, 243 - Loc. Castello di Serravalle - 40053 Valsamoggia (BO) - ITALY  
+39 051 6705141 +39 051 6705156 info@entecma.it www.entecma.it

Form QAT\_10-M05, version 00, effective since March 25th, 2020

**Certificate of Compliance**

No. SU210708.JJMT052  
Test Report / Technical Construction File no. 2021-ORD-01031, 2021-ORD-01032

**Certificate's Holder:** JAVAC HONG KONG CO., LIMITED  
804 REVERLY HOUSE, 93-107 LOCKHART ROAD, WAN CHAI, HONGKONG

**Certification ECM Mark:**  Type Approved

**Product:** Diesel Generator Set  
**Model(s):** (see the following annex)

**Verification to:** Standard:  
EN ISO 12100:2010, EN ISO 8528-13:2016,  
EN 55012:2007 +A1:2009  
related to CE Directive(s):  
2006/42/EC (Machinery)  
2014/30/EU (Electromagnetic Compatibility)

**Remark:** This document has been issued on a voluntary basis and upon request of the manufacturer. It is our opinion that the technical documentation received from the manufacturer is satisfactory for the requirements of the ECM Certification Mark. The conformity mark above can be affixed on the products accordingly to the ECM regulation about its release and its use.

**Additional information and clarification about the Marking:**  
The manufacturer is responsible for the CE Marking process, and if necessary, must refer to a Notified Body. This document has been issued on the basis of the regulation on ECM Voluntary Mark for the certification of products, RG01\_ECM rev.3 available at: www.entecma.it

**CE**

**Issuance date:** 08 July 2021  
**Expiry date:** 07 July 2026

**Reviewer:** Technical expert Amanda Payne  
**Approver:** ECM Service Director Luca Badonni

**Ente Certificazione Macchine Srl**  
Via Ca' Bella, 243 - Loc. Castello di Serravalle - 40053 Valsamoggia (BO) - ITALY  
+39 051 6705141 +39 051 6705156 info@entecma.it www.entecma.it