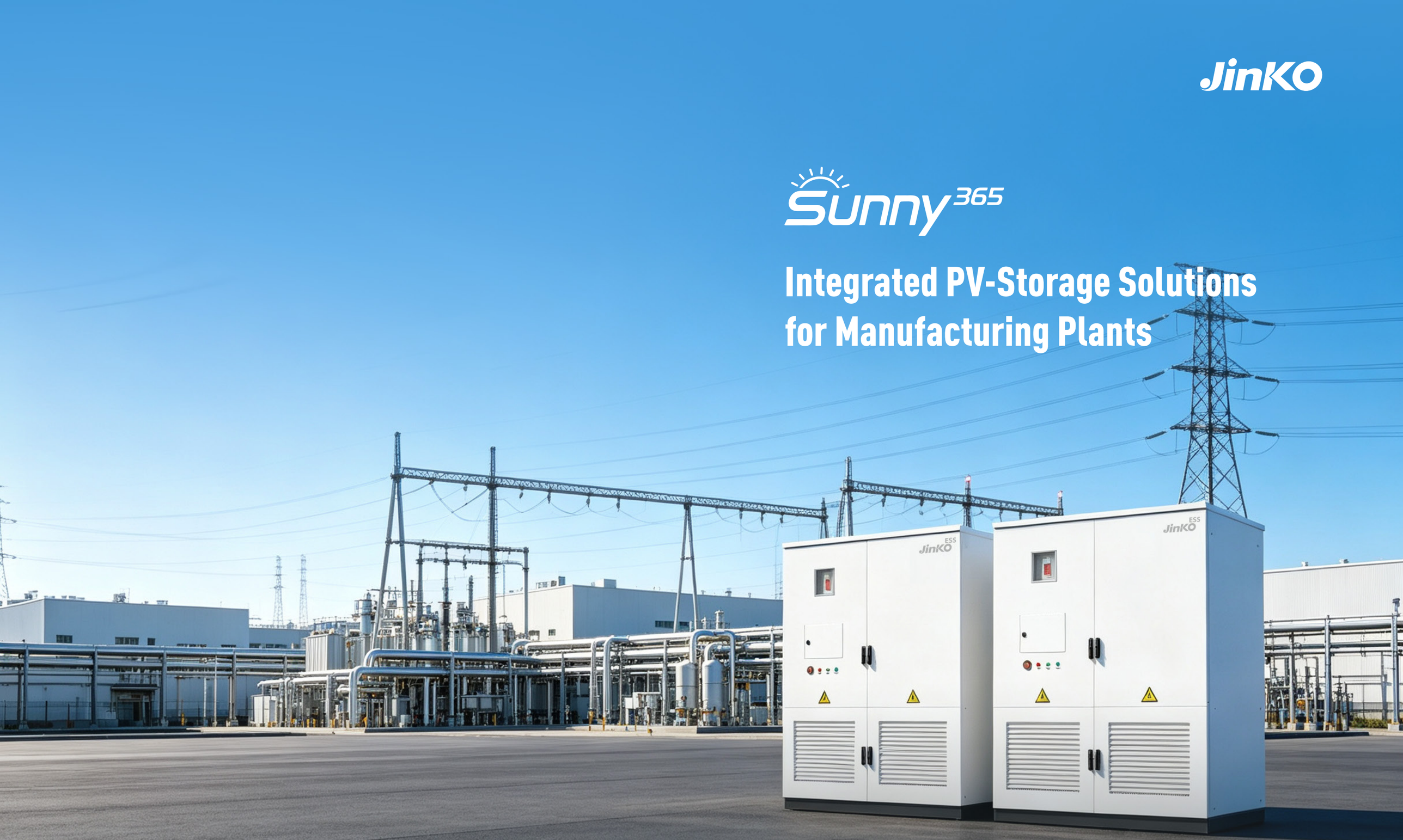
JinKO

Sunny 365

Integrated PV-Storage Solutions for Manufacturing Plants



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Integrated PV-Storage Solutions for Manufacturing Plants

Key challenges facing the market

From Distributors/Installers

How to choose storage systems for PV?
complex pre-sales, O&M, warranty?

How to choose PV modules for storage?
multiple suppliers to coordinate?

Complex system design and installation.

Finger-pointing among suppliers when faults occur

From Plant Owners:

From Plant Owners:
Complex after-sales, O&M, warranty – multiple vendors.

Low system integration, poor synergy.

Finger-pointing among suppliers in case of failures.

Lack of unified standards for future expansion/upgrades.

Jinko: A one-stop solution provider

- We provide a comprehensive warranty and after-sales service for the entire solar-storage system, and will always take responsibility for any issues that may arise.
- We offer an integrated approach covering solution design, product delivery, installation, commissioning and operation and maintenance, to ensure optimal performance.
- Comprehensive technical support for PV-Storage systems and partner training.
- We guarantee a stable supply of the latest PV-Storage products.
- A standardised quality assurance system for after-sales operation and maintenance.

35	4000+	200+	120+
Global Service Centers	Strategic Customers	Distribution Countries	Global Marketing Branches

Scenario 1: Textile Manufacturing

1. Description and Typical Load Characteristics

Scenario Description:

A manufacturing plant with a dedicated high-voltage transformer rated at 10 kV or higher. Production loads are significantly higher during daytime hours and on weekdays than at night or on holidays. This is one of the most economically viable scenarios for “rooftop PV + customer-side energy storage,” featuring a high proportion of self-consumed PV power, while energy storage can be used for peak-valley arbitrage, demand response, and distribution capacity relief.

Typical Load Characteristics:

Load Curve

High load during daytime on weekdays, baseline load maintained at night, and reduced load on weekends and holidays.

Key Equipment

Production lines, electric motors, air compressors, cooling/circulating water systems, air conditioning, and plant utility power distribution systems.

Electricity Consumption Patterns

Highly correlated with production schedules, with distinct peaks in the morning and afternoon; consumption is even higher during hot summer months.

Billing Characteristics

Primarily dual rate structures, demand charges or capacity charges have a significant impact on billing statements.

2. Key Challenges

- Electricity costs account for a significant portion of manufacturing costs, and peak-hour and super-peak electricity rates have a major impact on production costs.
- Power rationing or load shedding disrupts continuous production, and the losses from production line downtime may far exceed the electricity costs themselves.
- Short-term load spikes may lead to insufficient transformer capacity; capacity expansion involves long lead times and high investment costs.
- Although rooftop space is abundant, PV output does not perfectly align with production loads; energy storage is needed to improve grid integration and maximize returns.

3. Standardized Design for PV and Energy Storage Capacity

PV Capacity	15 MWp (rooftop + carport PV; assuming full coverage of 0.12–0.16 kWp/m² on rooftops; approximately 100,000–120,000 m² of usable rooftop space required; annual power generation of 16.5 million kWh).
Energy Storage Capacity	1.5 MW / 3 MWh (can be configured to cover 15%–30% of peak load).
Control System	EMS integrates PV, energy storage, main transformer loads, production schedules, and time-of-use electricity rates to achieve demand response.

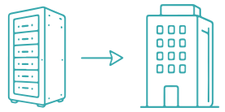
Scenario 1: Textile Manufacturing

4. Charging and Discharging

Charge during off-peak electricity rate periods (e.g., at night) to reduce electricity purchase costs.

Off-Peak Charging

Discharge stored energy during peak electricity rate periods to replace high-cost grid purchases.

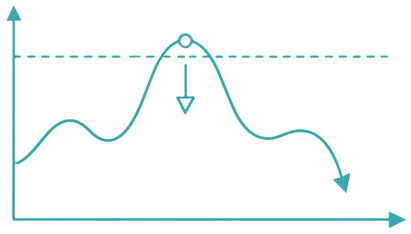


Peak-Hour Discharging

Make appropriate adjustments during off-peak periods based on production load requirements; prioritize solar power to meet the load, and feed excess electricity into the energy storage system.

Off-Peak Regulation

When the main transformer load approaches the demand threshold, the energy storage system enters demand control mode to limit peak demand and reduce demand-based electricity charges.



Demand Control

During power rationing alerts or critical production processes, the EMS can increase the energy storage system's SOC to prioritize critical production loads.

Off-Grid Protection

5. Economic Benefits

Cost Reduction and Efficiency Improvement	Reduce electricity expenses through peak-off-peak arbitrage and demand management.
Green Energy Consumption	The self-consumption rate of solar power is increased to over 90%, preventing curtailment.
Grid Stability	Smoothing out load fluctuations and improving power quality.
Emergency Support	Ensuring uninterrupted power supply to critical production loads during power rationing or grid failures.

Scenario 2: Cement Plant

1. Description and Typical Load Characteristics

Description:

A manufacturing facility that is a high-voltage dedicated transformer user operating at 10 kV or higher. Production loads are significantly higher during daytime hours and on weekdays than at night or on holidays. This is one of the scenarios where the “rooftop PV + customer-side energy storage” model offers the greatest economic viability, featuring a high proportion of self-consumed PV power, while energy storage can be used for peak-valley arbitrage, demand response, and distribution capacity relief.

Typical Load Characteristics:

Load Curve

High load during daytime on weekdays,
baseline load maintained at night,
and reduced load on weekends and holidays.

Key Equipment

Production lines, electric motors,
air compressors, kilns/heating equipment,
cooling systems, air conditioning,
circulation pumps, plant utility systems.

Electricity Consumption Patterns

Highly correlated with production schedules,
with distinct peaks in the morning and afternoon;
electricity consumption is even higher during
high summer temperatures.

Billing Characteristics

Primarily dual rate structures,
demand charges or capacity charges
have a significant impact on billing statements.

2. Key Challenges

- Electricity costs account for a significant portion of manufacturing costs, and peak-hour and super-peak electricity rates have a major impact on production costs.
- Power rationing or load shedding disrupts continuous production, and the losses from production line downtime may far exceed the electricity costs themselves.
- Short-term load spikes may lead to insufficient transformer capacity; capacity expansion involves long lead times and high investment costs.
- Although rooftop space is abundant, PV output does not perfectly align with production loads; energy storage is needed to improve grid integration and maximize returns.

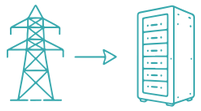
3. Standardized Design for PV and Energy Storage Capacity

PV Capacity	60 MWp (ground-mounted PV project, annual power generation of 66 million kWh)
Energy Storage Capacity	10 MW / 20 MWh
Control System	The EMS integrates PV, energy storage, main transformer loads, production schedules, and time-of-use electricity rates to achieve demand response.

Scenario 2: Cement Plant

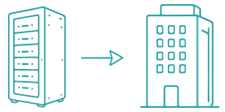
4. Charging and Discharging

Charge during off-peak electricity rate periods (e.g., at night) to reduce electricity purchase costs.



Off-Peak Charging

Discharge stored energy during peak electricity rate periods to replace high-cost grid purchases.



Peak-Hour Discharging

Make appropriate adjustments during off-peak periods based on production load requirements; prioritize solar power to meet the load, and feed excess electricity into the energy storage system.

Off-Peak Regulation

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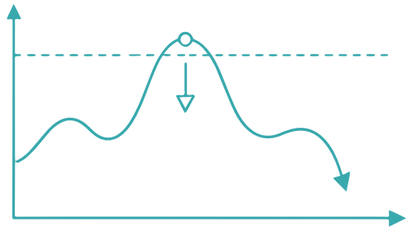


Demand Control

In the event of a grid failure or power rationing, the energy storage system can quickly switch to off-grid mode to provide uninterrupted power to critical loads.

Off-Grid Protection

5. Economic Benefits

Cost Reduction and Efficiency Improvement	Reduce electricity costs through peak-off-peak arbitrage and demand management.
Green Energy Consumption	Increase the self-consumption rate of solar power to over 90% to avoid curtailment.
Grid Stability	Mitigate load fluctuations and improve power quality.
Emergency Support	Ensure uninterrupted power supply to critical production loads during grid failures or power rationing.

Scenario 3: Steel Mill

1. Description and Typical Load Characteristics

escription:

A manufacturing facility. Production loads are significantly higher during daytime hours and on weekdays than at night and on holidays. This is one of the scenarios where the “rooftop PV + consumer-side energy storage” model offers the greatest economic viability, with a high proportion of self-consumed PV power and energy storage capable of participating in peak-valley arbitrage, demand response, and distribution capacity relief.

Typical Load Characteristics:

Load Curve

High load during daytime on weekdays,
baseline load maintained at night,
and reduced load on weekends and holidays.

Key Equipment

Production lines, electric motors,
air compressors, kilns/heating equipment, c
ooling systems, air conditioning,
circulation pumps, plant utility systems

Electricity Consumption Patterns

Highly correlated with production schedules,
with distinct peaks in the morning and afternoon;
consumption is even higher during
high summer temperatures

Billing Characteristics

Primarily dual rate structures,
demand charges or capacity charges
have a significant impact on billing statements.

2. Key Challenges

- Electricity costs account for a significant portion of manufacturing costs, and peak-hour and super-peak electricity rates have a major impact on production costs.
- Power rationing or load shedding disrupts continuous production, and the losses from production line downtime may far exceed the electricity costs themselves.
- Short-term load spikes may lead to insufficient transformer capacity; capacity expansion involves long lead times and high investment costs.
- Although rooftop space is abundant, PV output does not perfectly align with production loads; energy storage is needed to improve grid integration and maximize returns.

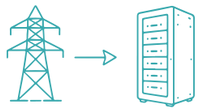
3. Standardized Design for PV and Energy Storage Capacity

PV Capacity	60 MWp (ground-mounted PV project, annual power generation of 66 million kWh)
Energy Storage Capacity	10 MW / 20 MWh
Control System	The EMS integrates PV, energy storage, main transformer loads, production schedules, and time-of-use electricity rates to achieve demand response.

Scenario 3: Steel Mill

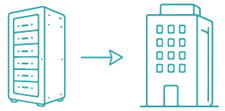
4. Charging and Discharging

Charge during off-peak electricity rate periods (e.g., at night) to reduce electricity purchase costs.



Off-Peak Charging

Discharge stored energy during peak electricity rate periods to replace high-cost grid purchases.

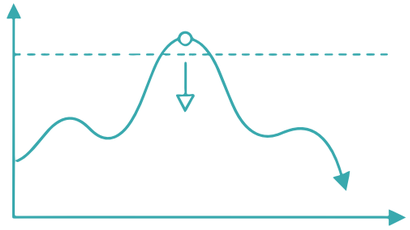


Peak-Hour Discharging

Make appropriate adjustments during off-peak periods based on production load requirements; prioritize solar power to meet the load, and feed excess electricity into the energy storage system.

Off-Peak Regulation

When the main transformer load approaches the demand threshold, the energy storage system enters demand control mode to limit peak demand and reduce demand-based electricity charges.



Demand Control

In the event of a grid failure or power rationing, the energy storage system can quickly switch to off-grid mode to provide uninterrupted power to critical loads (such as electric furnaces and continuous casting machines), ensuring production safety

Off-Grid Protection

5. Economic Benefits

Cost Reduction and Efficiency Improvement

Reduce electricity expenses through peak-valley arbitrage and demand management (can reduce steel mill electricity costs by 24.9%).

Green Energy Consumption

Increases the self-consumption rate of solar power to over 90%, preventing curtailment.

Grid Stability

Smooths out load fluctuations and improves power quality.

Emergency Support

Ensures uninterrupted power supply to critical production loads during grid failures or power rationing.

Carbon Emissions Reduction

Reduces annual carbon emissions by more than 37,000 metric tons.

Integrated PV-Storage Solutions for Manufacturing Plants

Core Product Advantages

Tiger Neo 3.0 — Seven Core Advantages

- **Ultra-high power:** front power output reaches 670 W with a conversion efficiency of 24.8%. Boasting power and efficiency far above industry benchmarks, these modules generate more electricity per square meter of rooftop area, making them ideal for manufacturing factories with limited roof space.
- **Ultra-high bifaciality:** bifaciality of **85%±5%**, exceeding the national standard requirement of 75%. The modules efficiently capture ground-reflected light and ambient scattered light to greatly boost overall power generation.
- **Excellent temperature coefficient (-0.26%/°C):** maintains stable power generation performance under high-temperature conditions. Manufacturing factory rooftops get extremely hot in summer, and Tiger Neo 3.0 suffers less power degradation at high temperatures to guarantee steady power output.
- **Ultra-low annual degradation (only -0.35%):** the first-year degradation rate is 1%, followed by an annual degradation rate of merely 0.35%, securing power generation revenue throughout its 30-year service life.
- **Strong low-irradiance performance:** the modules perform excellently under low irradiance conditions such as cloudy days, dawn and dusk, delivering a power generation gain of over 4%.
- **Maximum safety:** certified Class A under stringent IEC and UL standards, representing the highest fire resistance level in the photovoltaic industry.
- **Protection against extreme weather:** hail resistance up to **55 mm**, with a rear wind load capacity of **-5000 Pa.** Adaptable to extreme climates, it outperforms the common industry standard of 2400 Pa for wind load resistance.

Industry-leading Safety Performance

- **Material-level Thermal Isolation**

  Nano thermal insulation layers are embedded between cells to prevent thermal runaway propagation of a single cell.

- **Electrical-grade Armored Protection**

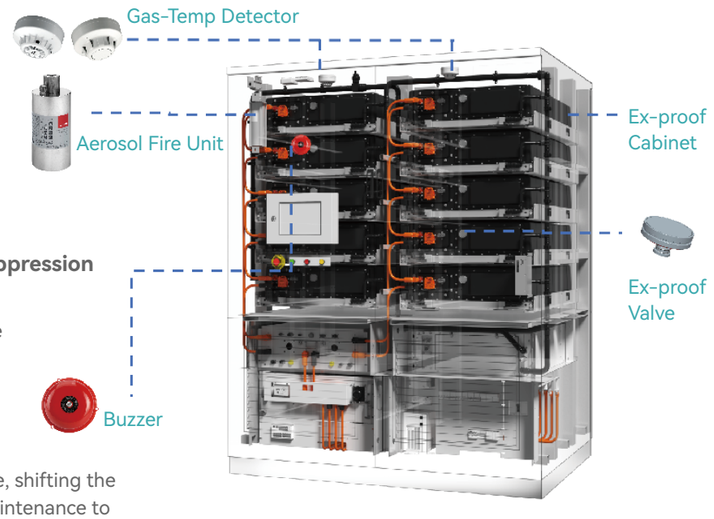
  Full metal encapsulation combined with flexible circuit sampling boards eliminates short circuits and fire hazards physically at the source.

- **Multi-sensor Integrated Rapid Fire Suppression**

  The system adopts multi-dimensional joint detection and utilizes perfluorohexanone fire suppression solution to silently contain hazards within seconds.

- **Full-stack Early Warning**

  The BMS monitors abnormal cells in real time, shifting the operation mode from passive emergency maintenance to proactive risk avoidance.



TIGER Neo III

66QL6-BDV

650-670 Watt

85±5% Bifaciality

BIFACIAL MODULE

Higher Power on Front Side

Leading power class based on the enhanced N-type TOPCon platform, through cutting-edge technology and an optimized layout that captures more sunlight.

Better Generation on Rear Side

Enabling industry-leading bifaciality in TOPCon cells through an improved structure that enhances light absorption and trapping.

Optimized Heat Resistance

Optimized temperature coefficient via advanced graphical patterning, busbar and multi-cells technology.

Proven Low Light Performance

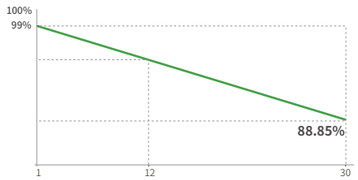
Enhanced cell structure ensures superior module performance under low-light conditions.

Industry Leading Warranty

Advanced metallization and iterated module encapsulation deliver superior resistance to PID, LID / LeTID, and UV degradation.

Mechanical Load Enhanced

Certified to withstand:
5400 Pa front side max static test load
2400 Pa rear side max static test load



12 Year Product Warranty | **30** Year Linear Power Warranty | **1**% First-year Degradation | **0.35**% Annual Degradation Over 30 Years

- IEC61215:2021 / IEC61730:2023
- IEC61701 / IEC62716 / IEC60068 / IEC62804
- ISO9001:2015: Quality Management System
- ISO14001:2015: Environment Management System
- ISO45001:2018: Occupational health and safety management systems

JKM650-670N-66QL6-BDV-F2-EN

66QL6-BDV 650-670 Watt

Mechanical Characteristics

Cell Type	N- type Mono-crystalline
No. of Cells	264 (66×4)
Dimensions	2382×1134×30 mm
Weight	32.5 kg
Front Glass	2.0 mm, Anti-reflection Coating
Back Glass	2.0 mm, Heat Strengthened Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Protection Class	Class II
IEC Fire Type	Class C
Connector Type	JK03M / JK03M2 / Others*
Output Cables (Including Connector)	4.0 mm^2 (+): 600 mm , (-): 400 mm or Customized Length

*MC4-EVO2 available upon request and subject to availability

Packaging Configuration

Pallet Dimensions	2396×1110×1251 mm
Packing Detail (Two pallets = One stack)	36 pcs/pallet, 72 pcs/stack, 720 pcs/ 40'HQ Container

Specifications (STC)

Maximum Power - Pmax [Wp]	650	655	660	665	670
Maximum Power Voltage - Vmp [V]	42.57	42.70	42.83	42.96	43.09
Maximum Power Current - Imp [A]	15.27	15.34	15.41	15.48	15.55
Open-circuit Voltage - Voc [V]	50.26	50.44	50.62	50.80	50.98
Short-circuit Current - Isc [A]	15.98	16.04	16.10	16.16	16.22
Module Efficiency STC [%]	24.06	24.25	24.43	24.62	24.80
Bifacial Factor	85 ± 5%				
Power Tolerence	0 ~ +3 %				
Temperature Coefficient of Pmax	-0.26 %/°C				
Temperature Coefficient of Voc	-0.24 %/°C				
Temperature Coefficient of Isc	0.046 %/°C				

STC: Irradiance 1000W/m^2, Cell Temperature 25°C, AM=1.5

Specifications (BNPI)

Maximum Power - Pmax [Wp]	724	729	735	741	746
Maximum Power Voltage - Vmp [V]	42.52	42.69	42.86	43.03	43.20
Maximum Power Current - Imp [A]	17.04	17.10	17.17	17.23	17.30
Open-circuit Voltage - Voc [V]	50.38	50.56	50.74	50.92	51.10
Short-circuit Current - Isc [A]	17.80	17.87	17.94	18.00	18.07

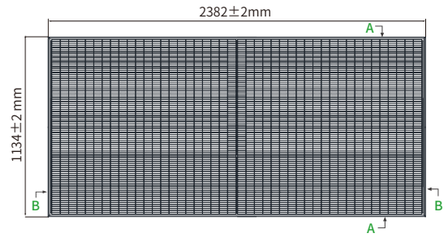
BNPI: Irradiance: Front 1000W/m^2, Rear 135W/m^2, Cell Temperature 25°C, AM=1.5

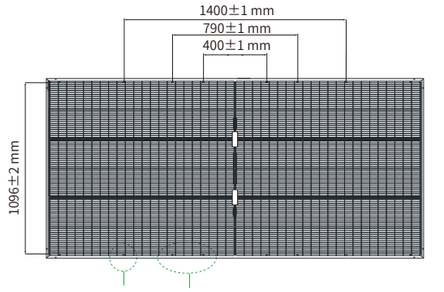
Application Conditions

Level T_{98} ⩽ 70 °C	-40 °C ~ +70 °C*
Maximum System Voltage	1500 VDC (IEC)
Maximum Series Fuse Rating	35 A
Bifaciality Coefficents	φVoc: 98±5 %, φIsc: 85±5 %, φPmax: 85±5 %

*Short-term up to 85°C; higher operation requires IEC TS 63126 testing

Engineering Drawings

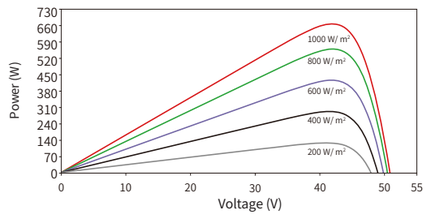




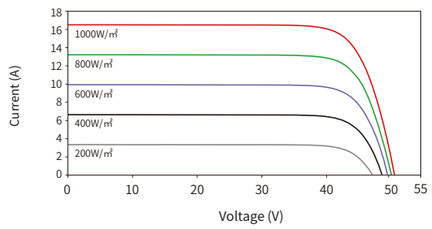
Note: For specific dimensions and tolerance ranges, please refer to the corresponding detailed module drawings.

Electrical Performance

Power-Voltage Curves (66QL6-BDV 660W)



Current-Voltage Curves (66QL6-BDV 660W)



Note: Please read the safety and installation manual before using the product. We reserve the right of final interpretation. The specifications in this datasheet are subject to change without notice.

SunGiga G2 Plus

520kWh

Liquid Cooling ESS Solution

The Jinko ESS 520 Liquid-Cooled Integrated Cabinet is a high-density, modular 1000V energy storage system. It consolidates battery modules, BMS, PCS, and fire protection into one cabinet, providing 522 kWh of capacity and 130.5 kW of power. Engineered for scalable and diverse applications, it offers exceptional safety, reliability, intelligent cooling, and smart software management.

High Integration, Flexible Deployment

All-in-one design integrating PCS（Power Conversion System) simplifies transportation, installation, and operation & maintenance. Modular architecture supports parallel connection of multiple units for scalable capacity expansion.

Enhanced Safety and Reliability

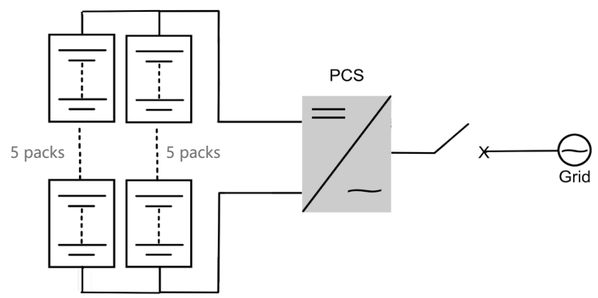
Comprehensive intelligent monitoring ensures real-time protection of the battery system. Built-in heating function maintains optimal operating temperatures, improving performance and reliability in varying climates.

Advanced Liquid Cooling Technology

Non-uniform liquid cooling pipeline design minimizes temperature differences between cells (ΔT ⩽ 2℃). Multiple cooling control modes adapt to operational needs, reducing auxiliary power consumption.

Intelligent Cloud-based Operation

Remote firmware updates ensure continuous system optimization. Cloud monitoring platform enables multi-device access for real-time oversight, analytics, and control.



DC Side

Cell Type	LFP 3.2V/314Ah
Nominal Capacity	522 kWh
Rated Voltage	832 Vdc
Nominal Voltage Range	728V~936V
Pack Quantity	10 pcs
Max. Charge/Dischage Power	0.25 P
System Configuration	2P260S

AC Side

Rated AC Power	130.5 kW
Rated Voltage	400 Vac
AC Connection	3P4W
Rated Frequency	50/60 Hz
THDi	＜3%

General Parameters

Life cycle	8000 @70%EOL
Operating Temperature	-30°C~55°C, derating＞45°C
Operating Humidity	⩽95%RH, without condensation
Operating Altitude	⩽3000m
Ingress Protection	IP55 (Cabinet); IP66 (PCS)
Corrosion Protection Class	C3 (C5 Optional)
Fire suppression system	System aerosol gas extinguisher + Somke detection + Temperature sensing + Flammable gas detection
Cooling Method	Liquid cooling
Max. Parallel Quantity	6 Units in parallel
Communication Protocol	RS485/CAN/Ethernet
Dimensions（W×D×H)	1920x1430x2400 mm
Weight	≈5,000 kg
Compliance Standards	IEC 62619, IEC 62477, IEC 60730, IEC 63056, IEC 61000, IEC 62040, IEC 62933, UN 38.3, UL 9540A, NFPA 69

Version: IEC_2026_A3

SunGiga G2

261kWh

Liquid Cooling ESS Solution

The Jinko 261 kWh Liquid-Cooled Integrated Cabinet is a compact, all-in-one energy storage solution for 1000V applications. It fully integrates the battery, BMS, PCS, and fire protection to deliver 261 kWh of capacity and 130.5 kW of power. Designed for flexible deployment, it ensures high safety, intelligent thermal management, and advanced system control in a single, streamlined unit.

In-house LFP Cell for Longevity & Reliability

Utilizes proprietary 314Ah $LiFePO_4$ cells, ensuring quality control and supply stability. Supports over 8,000 cycles for extended service life and lower lifecycle cost.

Higher Energy Density in Compact Design

Achieves 28% higher energy density with 10% reduced volume. Occupies only 1.5m^2 footprint, boosting system density by 33%.

Pre-integrated & Plug-and-play System

Fully assembled and tested at factory for quick installation. Reduces on-site deployment time and simplifies logistics and commissioning.

Flexible & Safe Operation

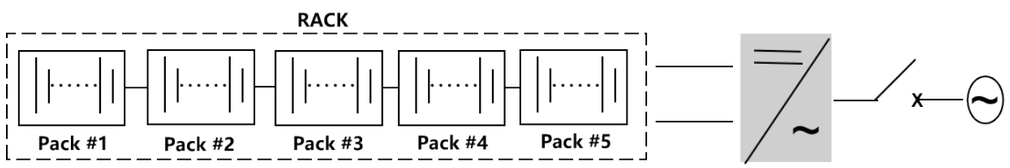
Hybrid inverter (PCS) supports both on-grid and off-grid modes. Features controlled venting for thermal runaway management and integrated fire alarm linkage.

Advanced Thermal Management

Precise temperature control with non-uniform flow channel design. Maintains cell temperature variation within ⩽2°C, enhancing safety and lifespan.

Scalable & Rugged Configuration

Supports expansion of up to 12 cabinets for flexible capacity. Wide operating temperature range ensures performance in harsh climatic conditions.



DC Side

Cell Type	LFP 3.2V/314Ah
Max. Charge/Dischage Power	0.5P
System Configuration	1P260S
Pack Quantity	5 pcs
Nominal Capacity	261 kWh
Rated Voltage	832V
Nominal Voltage Range	728V~936V

AC Side

Rated AC Power	130.5 kW
Rated Voltage	400 Vac
AC Connection	3P4W
Rated Frequency	50/60 Hz
THDi	＜3%

General Data

Operating Temperature	-30°C~55°C, derating > 45°C
Operating Humidity	⩽95%RH, without condensation
Operating Altitude	⩽3000m
Ingress Protection	IP55
Cooling Method	Liquid cooling
Max Parallel Quantity	12 units in parallel
Fire Suppression System	System aerosol gas extinguisher + Smoke detection + Temperature sensing +Flammable gas detection
Corrosion Protection Class	C3 (C5 Optional)
Communication	RS485/CAN/Ethernet
Dimensions（W×D×H）	1100x1430x2400 mm
Weight	≈2,850 kg
Compliance Standards	IEC 62619, IEC 62477, IEC 60730, IEC 63056, IEC 61000, IEC 62040, IEC 62933, UN 38.3, UL 9540A, NFPA 69

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