

• Technology empowers to realize green dreams •

Versolsolar Product Manual



Customer Focus
Cooperation Undertaking

Innovation Striving
Excellence Pursuit

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COMPANY PROFILE

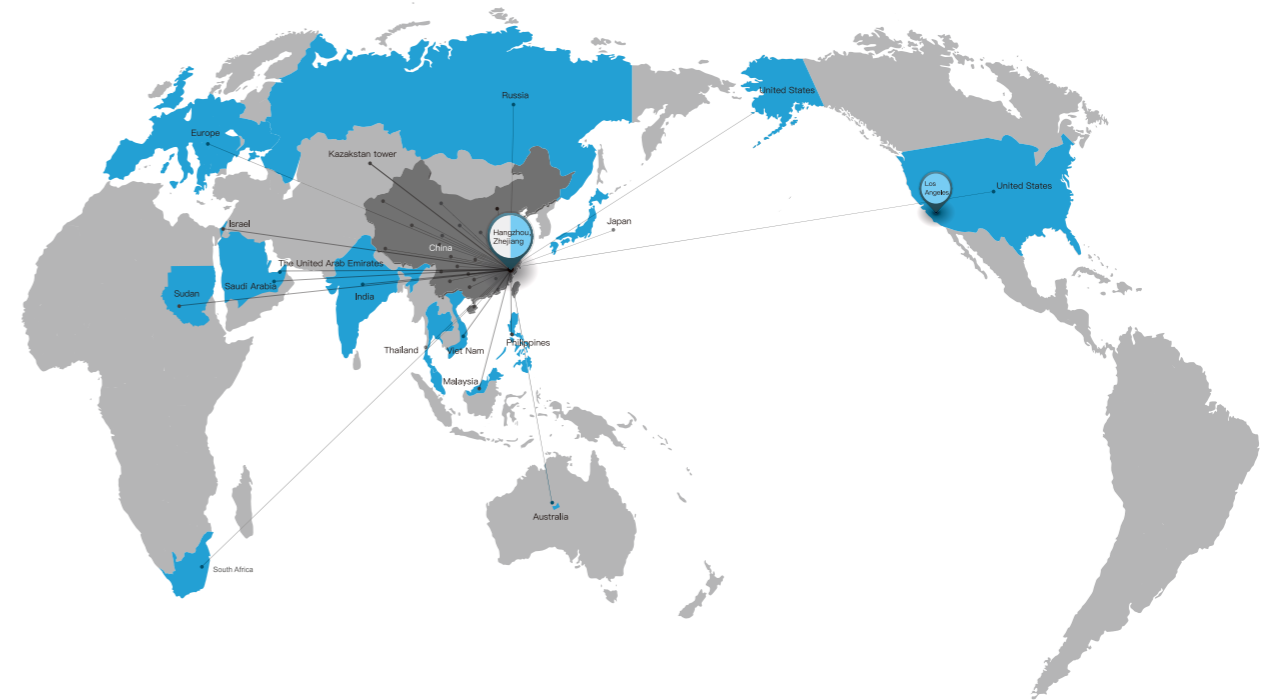


Versolsolar was founded in 2009, headquartered in Yuhang Economic and Technological Development Zone, Linping District, Hangzhou, covering an area of 60 acres and an area of structure more than 20,000 square meters. Its main business including various tracking photovoltaic mounting structure, adjustable photovoltaic mounting structure, the fixed ground photovoltaic mounting structure, building-attached photovoltaic (BAPV), photoelectric construction, flexible photovoltaic mounting structure, photovoltaic intelligent cleaning , architecture support post and distributed power plant development, it is one of the largest professional manufacturers of photovoltaic mounting structure in the Asia-pacific region . As a global leader in photovoltaic mounting structure manufacturing and system solutions, Versolsolar is highly committed to becoming a global leader in high-end equipment and intelligent services for new energy.

Versosolar always adheres to the development concept of technological innovation and leads the development of the industry by integrating excellent technical resources both domestic and overseas. Its R&D team consisted of experts who come from different fields (civil, structure, material, machinery, automation, wind engineering, meteorology, computer, artificial intelligence, etc.) formed a multidisciplinary and professional team which has been awarded the "Zhejiang provincial enterprise research institute", "national high-tech enterprise" and "China power station outstanding service provider" and so on.

The company has also obtained more than 200 authorized patents, including more than 15 invention patents. It is the first Asia-Pacific enterprise to pass the evaluation and certification of tracking systems such as B&V, UL, ETL, PE STAMP, CPP and SBP. And widely used in the United States, Japan, the Middle East and Southeast Asia and other countries photovoltaic projects, so far products global application references has already exceeded 30GW.

BUSINESS STRENGTH



200+
Employees

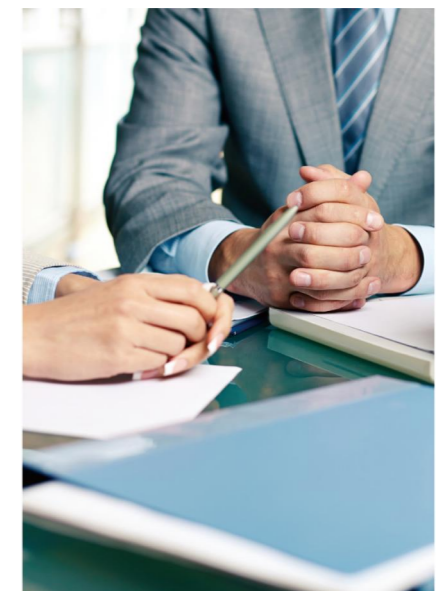
10GW
Annual Production Capacity

8500+
PV Solutions

30GW+
Global Reference Projects

70+
Countries Application

50+ Over 100-MW
PV Projects Service Experience



R&D STRENGTH

Established Zhejiang Provincial PV System Research Institute



5%+
Proportion of R&D investment

5+ Provincial and National Awards
Provincial Enterprise Research Institute
Provincial High-tech Enterprise R&D Center
China Electric Power Construction Science
and Technology Progress Award

10+
Zhejiang Province Science and Technology
Achievement Registration Certificate

10+
Industry & local standard compilation

15+ Invention Patents
200+ patents

20%+
Proportion of R&D engineers
Multidisciplinary professional and technical
personnel in civil engineering, structure,
machinery, wind engineering, meteorology,
computer, artificial intelligence, etc.



Versolsolar tracker is the **leading Chinese manufacturer**
in the **Asia Pacific region** to obtain the following certification



As a national high-tech enterprise, Versolsolar PV power station installation products have obtained more than 200 authorized patents and a number of international certifications. Products are sold to more than 70 countries and regions in the world, and have entered mainstream markets, such as North America, Europe, Japan, Southeast Asia etc.



B&V World-renowned engineering financing evaluation organization

UL3703/2703 World famous product safety assessment certification

CPP World famous tracker wind tunnel laboratory

ETL Certification World-renowned system-wide assessment and certification

PE Stamp U.S. third-party registered structural engineer calculation approval

PE Stamp U.S. third-party registered mechanical engineer calculation approval

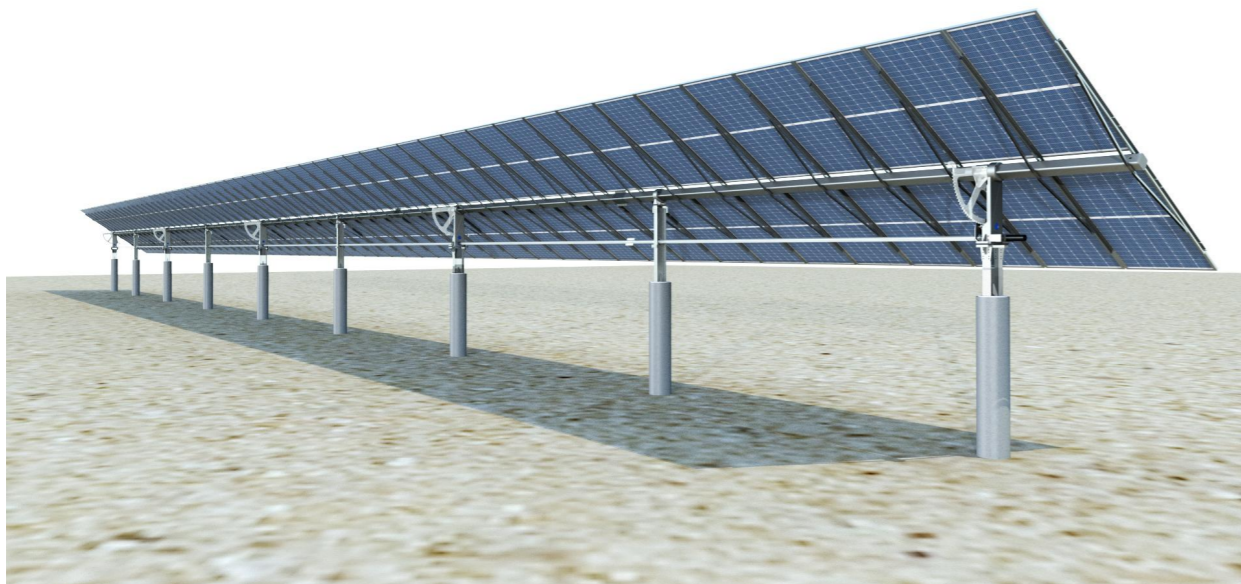
SBP European professional third-party design evaluation



TRACKING PHOTOVOLTAIC MOUNTING STRUCTURE

01 Single Axis Tracking System

V-Multi Tracking System



The V-Multi tracking system adopts one single row with multi-point drive design, especially for the 2 high-power modules in portrait layout, which has higher wind resistance stability. The irregular ground can be flexibly arranged at the same time also has a good slope adaptability. A single set can install a maximum of 150 pieces of modules, the number of posts is very small, which can reduce the comprehensive investment cost of the project.

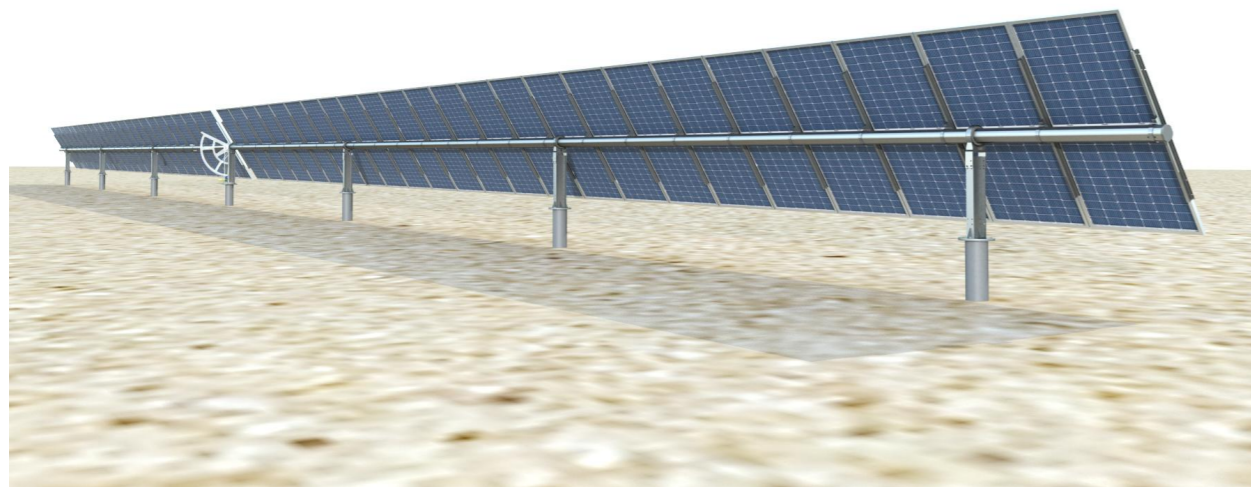
System Features

- Multiple driving devices run and brake synchronously through mechanical linkage devices, which is more suitable for photovoltaic power plant projects with high wind pressure.
- Single row independent operation, unobstructed channel between rows which brings convenient cleaning and free passage of agricultural machinery.
- Flexible arrangement of narrow and irregular terrain increases installed capacity, improves land utilization rate, and reduces the investment cost of photovoltaic power plant.
- In the Gobi, desert, grassland and other PV power plant with large slope, it has better terrain adaptability.
- The overall protection level is high, with long-term reliable operation in harsh outdoor environment.



Basic parameters			
Product type	Single row independent operation Horizontal single axis tracker	Driving mode	Chain Wheel+Reduction Gears (Multi-row mechanic linkage)
Tracking range	±60°	Foundation type	PHC/Ramming pile/Cast-in-place pile
Wind load	47m/s	Wind protection mode	18m/s
Module quantity	≤150PC	Module layout arrangement	2PC Portrait
The lowest point above the ground level	0.5m(Or according to actual project requirements)	Land utilization rate (GCR)	≥30%
Automation system parameters			
Tracking mode	Astronomical Algorithms/Active tracking/Shadow evasion/AI	Tracking accuracy	≤1°
Control mode	MCU closed-loop feedback control	Control accuracy	≤0.3°
Power supply mode	String/Minor module/Box-type transformer substation alternating current	Power supply voltage	DC1500V/AC220V
Backup battery	Lithium battery,≥6Ah	Level of protection	≥IP65
Communication mode	Zigbee wireless/Modbus	Monitoring device	SCADA(optional)
System consumption	~40kWh/Set/Year	weather protection	Gale/Snowfall/Hail
Standard and Certification			
《Steel Structure Design Code》	GB50017	《Load code for the design of building structures》	GB50009
《CPP Wind tunnel experiment report》		UL2703/UL3703/AISC360-16/ASCE 7-22/SBP/BV	
Patent No.:CN215222101U			

| V-In Tracking System |



The V-In tracking system adopts single row independent operation design, especially for the 1P arrangement of high-power components, which has the advantages of stable structure, fast installation and low operation and maintenance cost. The irregular ground can be flexibly arranged at the same time also has a good slope adaptability. It is an ideal product solution for large-scale ground, agriculture sharing, fishery sharing photovoltaic power plant project

System Features

- "Chain Wheel + RV reducer" drive form design has high transmission efficiency and good environmental adaptability, of which RV reducer can be maintenance-free for 25 years;
- Single row independent operation, unobstructed channel between rows which brings convenient cleaning and free passage of agricultural machinery
- Flexible arrangement of narrow and irregular terrain increases installed capacity, improves land utilization rate, and reduces the investment cost of photovoltaic power plant
- In the Gobi, desert, grassland and other PV power plant with large slope, it has better terrain adaptability
- Built-in wireless communication device, communication is more reliable



Basic parameters			
Product type	Single row independent operation Horizontal single axis tracker	Driving mode	Chain Wheel+Reduction Gears
Tracking range	±60°	Foundation type	PHC/Ramming pile/Cast-in-place pile
Wind load	47m/s	Wind protection mode	18m/s
Module quantity	≤90PC	Module layout arrangement	1PC Portrait
The lowest point above the ground level	0.5m(Or according to actual project requirements)	Land utilization rate (GCR)	≥30%
Automation system parameters			
Tracking mode	Astronomical Algorithms/Active tracking/Shadow evasion/AI	Tracking accuracy	≤1°
Control mode	MCU closed-loop feedback control	Control accuracy	≤0.3°
Power supply mode	String/Minor module/Box-type transformer substation alternating current	Power supply voltage	DC1500V/AC220V
Backup battery	Lithium battery, ≥6Ah	Level of protection	≥IP65
Communication mode	Zigbee wireless/Modbus	Monitoring device	SCADA(optional)
System consumption	~20kWh/Set/Year	weather protection	Gale/Snowfall/Hail
Standard and Certification			
《Steel Structure Design Code》	GB50017	《Load code for the design of building structures》	GB50009
《CPP Wind tunnel experiment report》		UL2703/UL3703/AISC360-16/ASCE 7-22/SBP/BV	
Patent No.:CN113064454A			

| V-Link Tracking System |



The V-Link tracking system adopts multi-row linkage design, which has the characteristics of low project investment cost and low subsequent operation and maintenance cost. The unique linkage structure has good slope adaptability, large installed capacity and lower failure rate, which is an ideal product solution for large-scale farming sharing and fishery sharing photovoltaic power plant project.

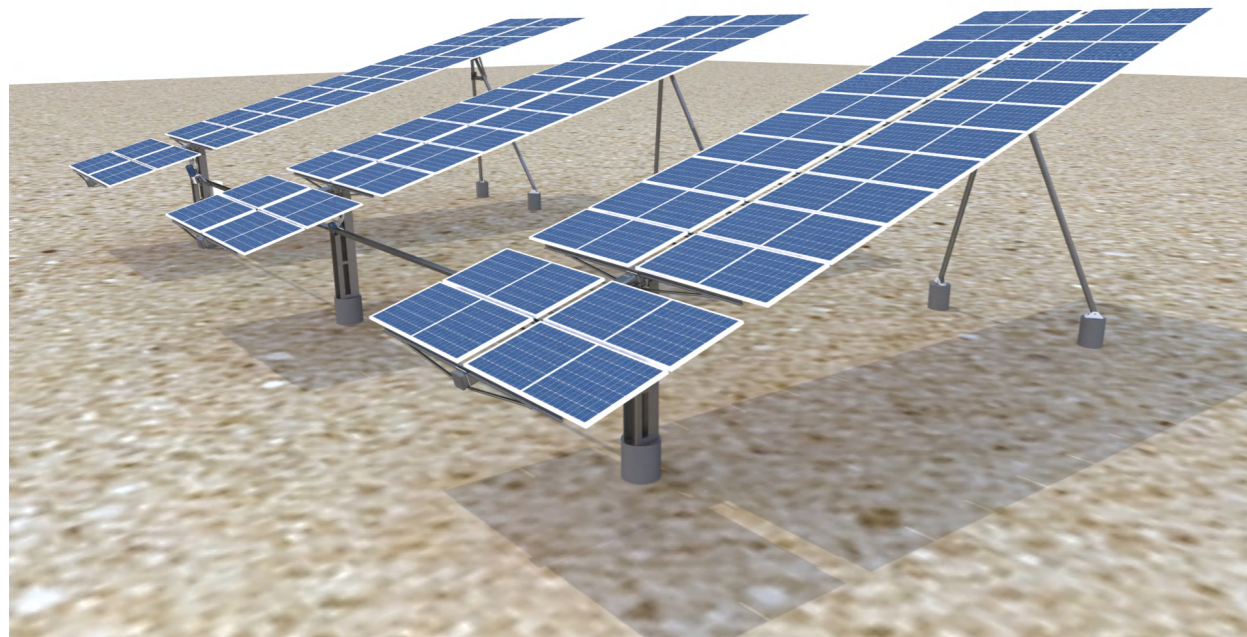
System Features

- Multi-row linkage design, reduce project investment and operation and maintenance cost
- Unique structure design, It can adapt to the continuous relief of the terrain and
- With the lowest point can be more than 2.5m high, Agricultural machinery can work normally
- The driving mechanism and the mounting structure share the foundation, the number of foundations is small, which can reduce the investment cost of photovoltaic power plant and improve the utilization area of both land and water



Basic parameters			
Product type	Muti-row linkage operation Horizontal single axis tracker	Driving mode	Chain Wheel+Reduction Gears (Multi-row linkage)
Tracking range	±60°	Foundation type	PHC/Ramming pile/Cast-in-place pile
Wind load	47m/s	Wind protection mode	18m/s
Module capacity	500-1000kWp	Module layout arrangement	1PC or 2PC Portrait
The lowest point above the ground level	2.5m(Or according to actual project requirements)	Land utilization rate (GCR)	≥30%
Automation system parameters			
Tracking mode	Astronomical Algorithms/Active tracking/Shadow evasion/AI	Tracking accuracy	≤1°
Control mode	Siemens PLC closed-loop feedback control	Control accuracy	≤0.3°
Power supply mode	Box-type transformer substation alternating current	Power supply voltage	AC380V
Communication mode	Zigbee wireless/Modbus	Level of protection	≥IP65
System consumption	~185kWh/Set/Year	weather protection	Gale/Snowfall/Hail
Standard and Certification			
《Steel Structure Design Code》	GB50017	《Load code for the design of building structures》	GB50009
《CPP Wind tunnel experiment report》		UL2703/UL3703/AISC360-16/ASCE 7-22/BV	
Patent No.:CN210111921U			

02 Tilt Single Axis Tracking System



The Tilt single-axis tracking system is a tracking product designed for large photovoltaic power plant in the areas of middle and high latitudes. It can realize 10~30° inclined main axis tracking operation, and can increase the annual power generation by about 20% compared with the traditional fixed mounting system. It is an ideal product solution for large ground photovoltaic power plant in the areas of middle and high latitudes.

System Features

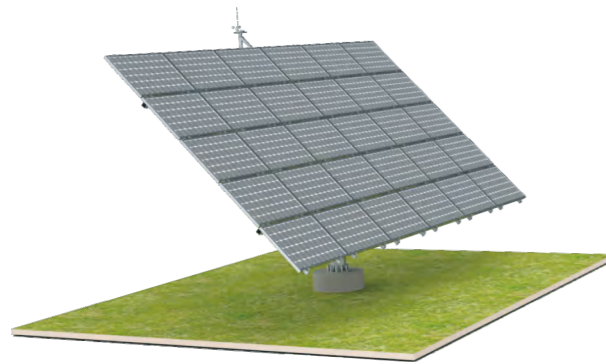
- Large installed capacity, the maximum installed capacity of a single array reaches 50~300kWp
- Multi-row linkage design, Low project investment and maintenance cost maintenance
- Free polymer material bearing and drive device, More than 25 years of service life
- Intelligent and fully automatic operation, To realize the automatic identification of all kinds of severe weather and system protection
- The overall protection level is high, with long-term reliable operation in the outdoor harsh environment



Basic parameters			
Product type	Tilting single axis tracker	Driving mode	Chain Wheel+Reduction Gears (Multi-row linkage)
Tracking range	±60°	Foundation type	PHC/Ramming pile/Cast-in-place pile
Wind load	47m/s	Wind protection mode	18m/s
Main axis inclination angle	10-30°	Module capacity	50-300kWp
The lowest point above the ground level	0.5m(Or according to actual project requirements)	Area	14,800 Square meter/MW (20°Latitude)
Automation system parameters			
Tracking mode	Astronomical Algorithms/Active tracking/Shadow evasion/AI	Tracking accuracy	≤1°
Control mode	Siemens PLC closed-loop feedback control	Control accuracy	≤0.3°
Power supply mode	Box-type transformer substation alternating current	Power supply voltage	AC380V
Communication mode	Zigbee wireless/Modbus	Level of protection	≥IP65
Monitoring device	SCADA (optional)	weather protection	Gale/Snowfall/Hail
Standard and Certification			
《Steel Structure Design Code》	GB50017	《Load code for the design of building structures》	GB50009
《CPP Wind tunnel experiment report》		UL2703/UL3703/AISC360-10/ASCE 7-10	
Patent No.:	CN102738272A		

03 Dual Axis Tracking System

The Dual Axis tracking system adopts two sets of driving devices to realize E-W and N-S direction tracking at the same time, and adopts the envelope mode of swing drive parts, which can run more smoothly and adapt to the harsh outdoor climate environment. Compared with the fixed ground mounting system, it can increase the annual power generation by about 30%, and is an ideal product solution for large ground photovoltaic power plants in middle and high latitudes.



System Features

- Compared with the fixed ground mounting system, the annual power generation can be increased by more than 30%, and the power generation income of photovoltaic power plants can also be increased.
- Flexible installation, superb terrain adaptability, no need for large-scale leveling of the site
- Intelligent control, realize automatic identification and system protection of all kinds of weather
- The overall protection level is high, with long-term reliable operation in harsh outdoor environment

Basic parameters			
Product type	Single post dual-axis tracker	Driving mode	GFB/Linear motor
Tracking range	E-W:±120°, N-S:0-70°	Foundation type	Concrete foundation
Wind load	47m/s	Wind protection mode	18m/s
Module quantity	≤30PC	The lowest point above the ground level	0.5m(Or according to actual project requirements)
Automation system parameters			
Tracking mode	Astronomical Algorithms/Active tracking/Shadow evasion/AI	Tracking accuracy	≤1°
Control mode	MCU closed-loop feedback control	Control accuracy	≤0.3°
Power supply mode	String/Box-type transformer substation alternating current	Power supply voltage	DC1500V/AC220V
Communication mode	Zigbee wireless/Modbus	Level of protection	≥IP65
Monitoring device	SCADA (optional)	weather protection	Gale/Snowfall/Hail
Standard and Certification			
《Steel Structure Design Code》	GB50017	《Load code for the design of building structures》	GB50009
《CPP Wind tunnel experiment report》		UL2703/UL3703/AISC360-16/ASCE 7-22	

Adjustable Photovoltaic Mounting Structure

Different from the traditional fixed installation system, the adjustable PV mounting system can manually adjust the north-south installation Angle of the mounting structure according to the seasonal change, which to meet the requirements of different angles throughout the year, and the system can increase the generating capacity by 4% to 8% per year.

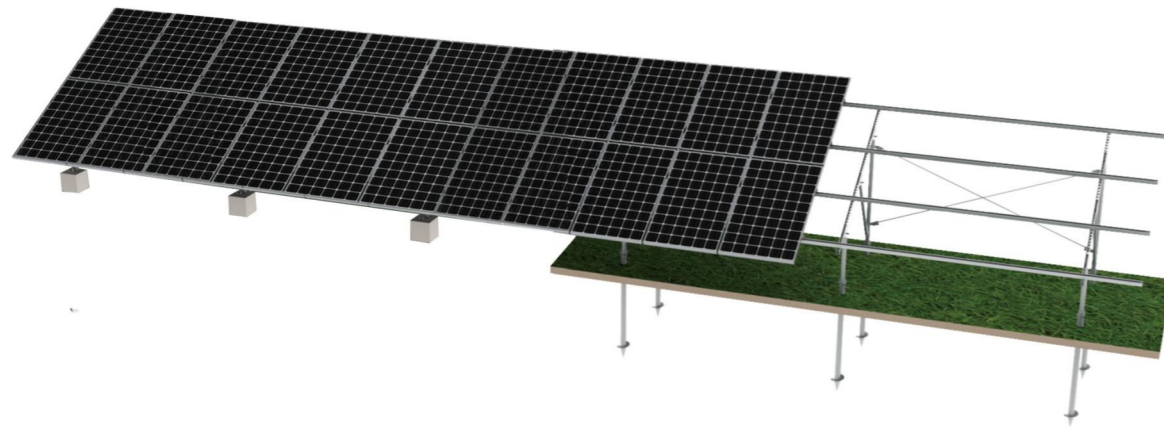


System Features

- Adopt single post support form with low foundation cost
- Adjust the Angle by manual flexible stick which easy to achieve the solo work
- One array can be adjusted in about 2 minutes by one person, and more than 3MW can be adjusted by one person per day.

FIXED GROUND PHOTOVOLTAIC MOUNTING STRUCTURE

01 All-steel system



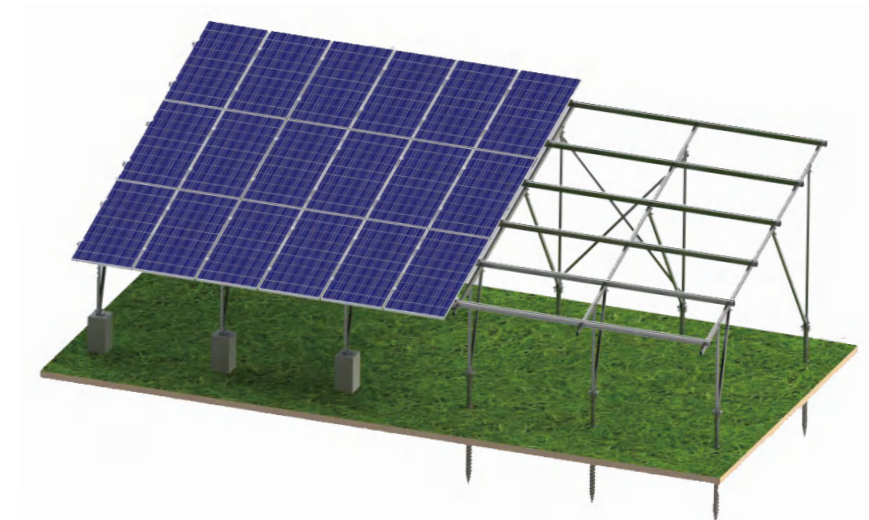
System Features

- Zero welding: All parts are connected with fastening parts.
- High compatibility: The mounting structure system is suitable for screw pile, ramming pile and concrete foundation, and is compatible with different arrangement of modules at the same time. It also can be interchanged randomly.
- High cost performance: through strict calculation and analysis, the standardized mass production of components can be realized, and the production cost can be controlled by large quantity



Capacity: 12MWp
Location: Japan

02 All-aluminum high-strength light PV mounting system



System Features

- Suitable for all kinds of terrain, Installation of PV modules
- High strength aluminum profiles, Ensure the strength which meet the specification requirements
- Light dead weight, reduce the ground bearing capacity requirements
- Less parts, High standardization, high installation efficiency
- Superior anti-corrosion performance, can adapt to all kinds of harsh environment



Capacity: 70MWp
Location: Thailand

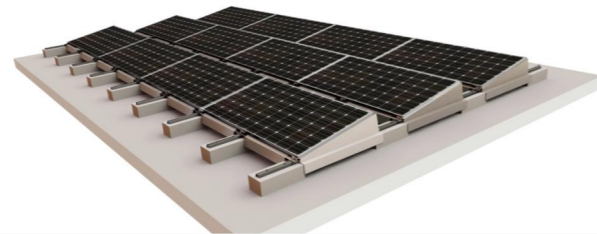
BUILDING-ATTACHED PHOTOVOLTAIC (BAPV)

01 V-Top Rooftop System

V-Top Rooftop wind stream system I



V-Top Rooftop wind stream system II



System Features

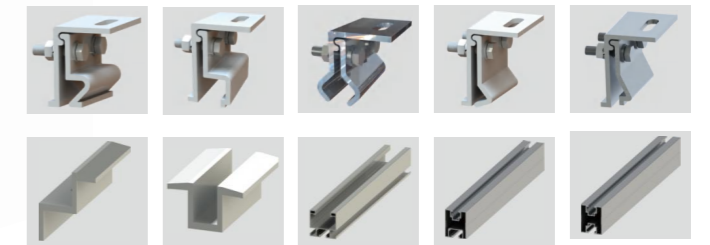
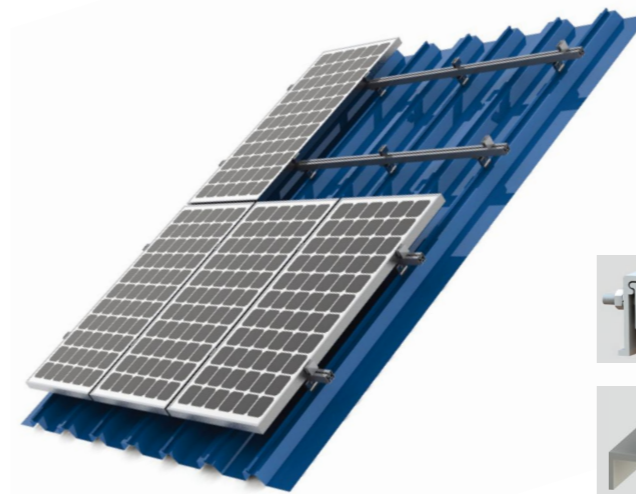
- Streamlined design that passes wind tunnel experiment and has strong wind resistance
- Few Weight blocks usage and are suitable for flat roofs with small loads or limited installation methods
- Modular design, module in landscape , installation Angle of 10°-15°, less kinds of parts, easy to install
- Aluminum magnesium zinc plate, excellent anti-corrosion performance, smart structural design which does not destroy the original roof structure, no drilling design, without leakage risk
- The new generation of upgraded wind stream system, adapted to high-power module which can resist class 12 grade typhoon



Capacity: 2MWp Location: BeiJing

02 Metal sheet rooftop system

Color steel tile roof system usually adopts the corresponding special fixture to fix the module rail on the roof, after the optimization design, so that to minimize the part types of the whole system, fast and flexible installation.



System Features

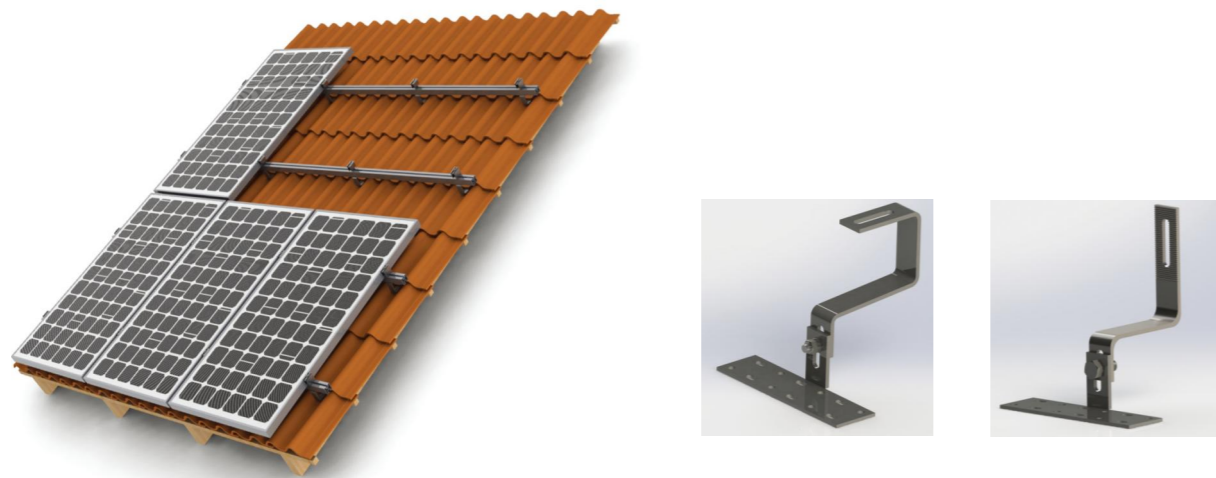
- Few parts, easy to install, complete product line
- The fastening parts designed for the shape and size of the color steel tile with good compatibility, and the parts are mainly made of high-quality aluminum alloy and stainless steel



Capacity: 5.5MWp Location: JiangSu

03 Tile-on rooftop system

The tile roof external hanging system adopts advanced modular design, with good universality of parts and components, convenient installation and no need for secondary processing on site. According to the different roof structure and tile shape to optimize the design, using the roof hook fixed on the roof structure, through the rail beam and clamp to fix the module, simple and reliable structure.



System Features

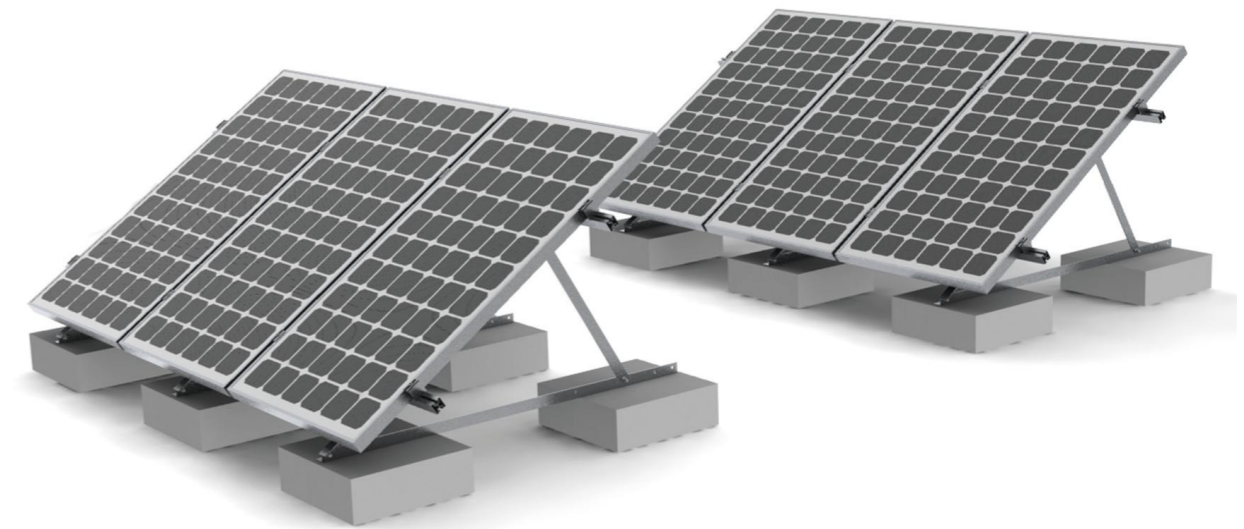
- Adjustable hook, strong adaptability
- Minimal screw design, efficient installation
- High-quality aluminum profile, light weight



Capacity: 3MWp Location: Zhejiang

04 Flat roof system

The flat roof system is suitable for all kinds of flat roofs. According to the roof bearing capacity and waterproof requirements, the system can be fixed on the roof by weight bearing method or chemical anchor bolt. The system uses high quality profiles, firm and beautiful, original aluminum alloy guide rail and unit connection design, fast installation. No secondary processing of parts on site.

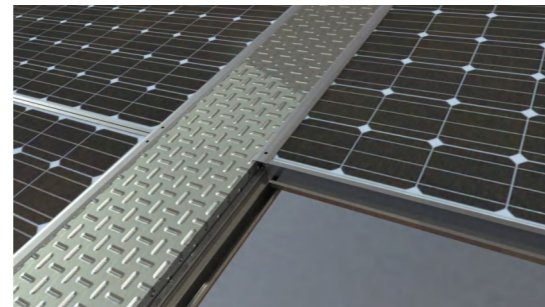


Capacity: 5MWp Location: Zhejiang

PHOTOELECTRIC CONSTRUCTION

01 V-Integral BIPV System

The V-Integral BIPV roof system integrates photovoltaic modules with building materials, replacing the roof, Windows and exterior walls with photovoltaic modules, which can be used as building materials and generate electricity. Not only can further reduce the cost of photovoltaic power generation, and more conducive to the promotion and application of photovoltaic.



System Features

- Use ordinary crystalline silicon PV modules on the roof top to save building materials to the greatest extent.
- Install on the roof purlins, with the structure design integrates lighting belts, maintenance channels, ventilators, etc.
- It can be installed on old large steel structure plants, with strong roof adaptability
- Integrated structure, no water leakage caused by rust and aging of color steel tiles
- 25-year service life, avoid second replacement cost of metal steel tile and power station shutdown loss



Capacity: 6MWp
Location: Hangzhou,China

02 PV Carport

PV carport offers multiple benefits. It uses solar power to provide clean energy for charging electric motor car, lighting, connected to the grid while shielding cars against rain, hail and snow.



System Features

- Simple structure, short production and delivery cycle
- Using common standard parts reduces maintenance and replacement costs
- Bolt connection, quick installation, low requirements for on-site workers
- Regular shape, convenient packing and transportation, maximizing container capacity
- It can be reinstalled and used anyway after being removed
- Provide both non-waterproof and waterproof solutions, and can be customized according to customer requirements



Capacity: 1MWp
Location: Mexico

CLEANING ROBOT



System Features

- Customized design: flexible matching of different components and mounting structures, cross-row cleaning
- High reliability design: self-powered, multiple safety protection, C4 and IP65 protection, -30~60℃ operating temperature range
- Strong obstacle crossing ability: Four-wheel drive adapts to 20° climbing, 50mm obstacle crossing, automatic posture recognition and deviation correction, and active fault avoidance
- Intelligent design: multiple control modes, multiple operation modes, intelligent decision-making, all-round monitoring, rapid fault alarm and location.

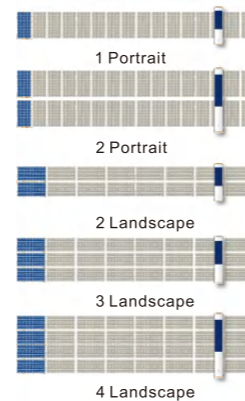
To match with different module sizes and module layouts

● Various Module Dimensions



L:1.6m-2.4m W:0.99-1.3m
Maximum output power:200WP-600WP

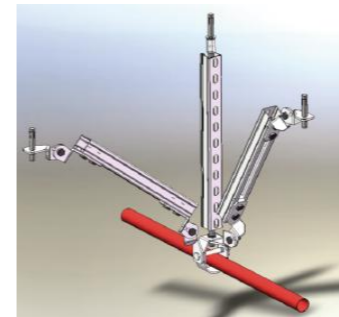
● Various Module Layouts



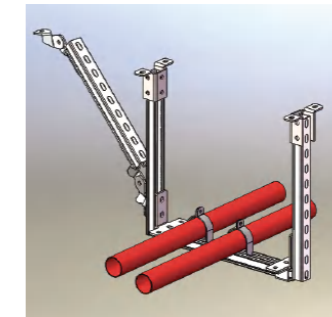
1 Portrait

BUILDING SUPPORT SYSTEM

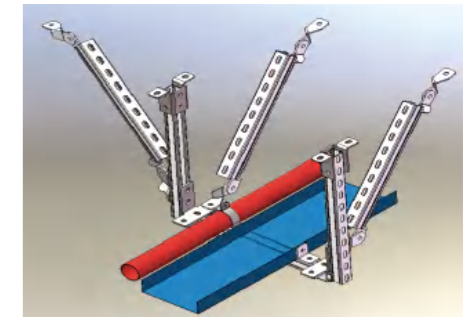
01 Aseismic Support system



Single pipe seismic support and hanger



Portal type multi-tube seismic support and hanger



Portal type comprehensive seismic support and hanger

- The products are mainly used in building water supply and drainage, heating, ventilation, air conditioning, gas, heat, electricity, communication and fire and other mechanical and electrical installation works
- The lateral supports and hangers are arranged crosswise with the longitudinal supports and hangers
- The installation angle of diagonal brace and boom is 30 degrees to 60 degrees (the best installation angle is 45 degrees)

02 Pipe Gallery Support System

The underground comprehensive pipe corridor is to build an intensive tunnel space in the city underground, which integrates the municipal, electric power, communication, gas, water supply and drainage, thermal power and other engineering pipelines, and has a special access port, lifting port and detection system. It is a kind of urban comprehensive pipeline project.

The implementation of unified planning, unified design, unified construction, and management of urban underground comprehensive pipe corridor is an important foundation and "lifeline" to ensure urban operation. The underground comprehensive pipe corridor can effectively avoid the traffic influence brought by the road excavation. After the completion of the tunnel, it is convenient and fast to carry out the internal pipeline installation, increase and decrease, maintenance and daily management.

System Features

- No need of field welding or drilling, quick and easy installation
- No damage to concrete reinforcement and structure, safe and reliable
- The anchor point position can be adjusted along the channel direction
- Suitable for cracking concrete

PROJECT REFERENCES



Capacity: 150MWp Location: Ningxia, China
Application: V-Multi Tracker



Capacity: 460MWp Location: Qinghai, China
Application: V-In Tracker



Capacity: 258MWp Location: Hebei, China
Application: V-Link Tracker



Capacity: 150MWp Location: Zhejiang, China
Application: V-Link Tracker



Capacity: 100MWp Location: Jilin, China
Application: V-Link Tracker



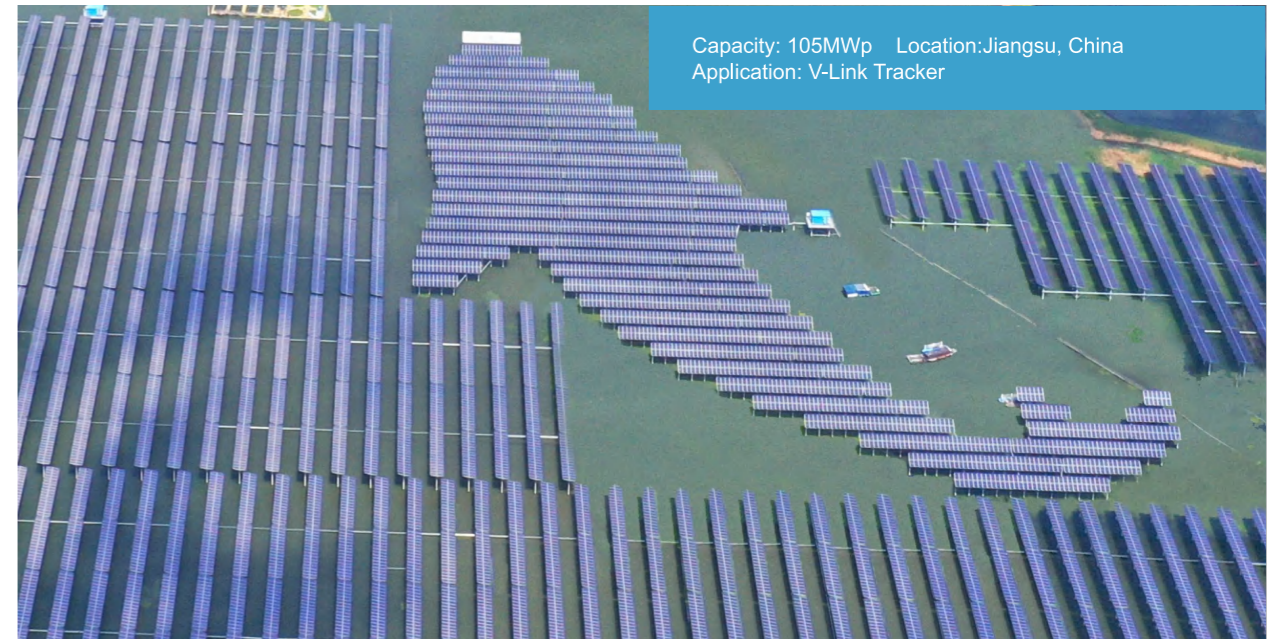
Capacity: 115MWp Location: Neimeng, China
Application: Tilt Single Axis Tracker



Capacity: 111MWp Location: Jiangsu, China
Application: V-Link Tracker



Capacity: 100MWp Location: Jilin, China
Application: V-Link Tracker



Capacity: 105MWp Location: Jiangsu, China
Application: V-Link Tracker



Capacity: 50MWp Location: Hebei, China
Application: V-Link Tracker



Capacity: 200MWp Location: USA
Application: V-Link Tracker



PROJECT REFERENCES



Capacity: 50MWp Location: Vietnam
Application: Fixed ground photovoltaic mounting structure



Capacity: 60MWp Location: Thailand
Application: Fixed ground photovoltaic mounting structure



Capacity: 200MWp Location: Gansu, China
Application: Fixed ground photovoltaic mounting structure



Capacity: 21.5MWp Location: Jiangsu, China
Application: Metal Sheet Roof



Capacity: 3MWp Location: Hebei, China
Application: V-Top Rooftop



Capacity: 6MWp Location: Zhejiang, China
Application: V-Integral BIPV



On Track for Victory