

Global Photovoltaic Module Automatic Cleaning Robot Supply, Demand and Key Producers, 2026-2032

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Abstracts

The global Photovoltaic Module Automatic Cleaning Robot market size is expected to reach \$ 440 million by 2032, rising at a market growth of 13.7% CAGR during the forecast period (2026-2032).

Automatic photovoltaic module cleaning robots are intelligent equipment used in the operation and maintenance of photovoltaic power plants. They automatically remove dust, sand, bird droppings, and other contaminants from the surface of photovoltaic modules using roller brushes, bristle brushes, airflow, or waterless/low-water cleaning methods to continuously restore and maintain the modules' power generation efficiency. These robots typically possess autonomous walking or navigation capabilities, can complete large-area continuous operations without shutdown, and support remote monitoring and scheduled operation. They significantly reduce the safety risks and operation and maintenance costs of manual cleaning, making them crucial equipment for achieving refined operation and maintenance in large ground-mounted power plants and high-dust, water-scarce areas. Sales in 2025 were 36,000 units, with an average price of \$4,900, total production capacity of 40,000 units, and a gross profit margin of 41%.

From the demand side, with the continuous expansion of global photovoltaic (PV) installations and the increasing emphasis on refined management of levelized cost of electricity (LCOE), the negative impact of module surface contamination on power generation efficiency is becoming increasingly significant, prompting higher requirements for cleaning and maintenance capabilities from the operation and maintenance (O&M) side. Especially in deserts, high-dust areas, and large-scale ground-mounted power plants, manual cleaning is costly, inefficient, and poses safety hazards, driving automated cleaning robots to become essential equipment for increasing power

generation, reducing O&M costs, and ensuring safe production. At the same time, the data linkage capability between cleaning equipment and PV monitoring systems enables owners to achieve intelligent scheduling based on pollution levels and weather conditions, further strengthening the value of automated cleaning robots in intelligent O&M systems.

From the supply and competitive landscape perspective, the PV module automated cleaning robot market is evolving from single hardware supply to a comprehensive solution of 'equipment + O&M services + digital platform'. Leading manufacturers are enhancing customer loyalty by improving robot adaptability to complex terrain, tilt angles, and environmental conditions, as well as by introducing path planning, autonomous navigation, and remote monitoring capabilities. As technology matures and mass production scales up, market competition will increasingly focus on product stability, system integration capabilities, and after-sales service network development. Suppliers with long-term project delivery experience and industry expertise will have a greater chance of gaining an advantage in the trend of industry consolidation.

This report studies the global Photovoltaic Module Automatic Cleaning Robot production, demand, key manufacturers, and key regions.

This report is a detailed and comprehensive analysis of the world market for Photovoltaic Module Automatic Cleaning Robot and provides market size (US\$ million) and Year-over-Year (YoY) Growth, considering 2025 as the base year. This report explores demand trends and competition, as well as details the characteristics of Photovoltaic Module Automatic Cleaning Robot that contribute to its increasing demand across many markets.

Highlights and key features of the study

Global Photovoltaic Module Automatic Cleaning Robot total production and demand, 2021-2032, (K Units)

Global Photovoltaic Module Automatic Cleaning Robot total production value, 2021-2032, (USD Million)

Global Photovoltaic Module Automatic Cleaning Robot production by region & country, production, value, CAGR, 2021-2032, (USD Million) & (K Units), (based on production site)

Global Photovoltaic Module Automatic Cleaning Robot consumption by region & country, CAGR, 2021-2032 & (K Units)

U.S. VS China: Photovoltaic Module Automatic Cleaning Robot domestic production, consumption, key domestic manufacturers and share

Global Photovoltaic Module Automatic Cleaning Robot production by manufacturer, production, price, value and market share 2021-2026, (USD Million) & (K Units)

Global Photovoltaic Module Automatic Cleaning Robot production by Type, production, value, CAGR, 2021-2032, (USD Million) & (K Units)

Global Photovoltaic Module Automatic Cleaning Robot production by Application, production, value, CAGR, 2021-2032, (USD Million) & (K Units)

This report profiles key players in the global Photovoltaic Module Automatic Cleaning Robot market based on the following parameters - company overview, production, value, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include SunPower, Innovpower, BOSON, Westrong, SUNPURE, Alion Energy, Ecoppia, SolarCleano, SERBOT AG, Airtouch Solar, etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Stakeholders would have ease in decision-making through various strategy matrices used in analyzing the World Photovoltaic Module Automatic Cleaning Robot market

Detailed Segmentation:

Each section contains quantitative market data including market by value (US\$ Millions), volume (production, consumption) & (K Units) and average price (US\$/Unit) by manufacturer, by Type, and by Application. Data is given for the years 2021-2032 by year with 2025 as the base year, 2026 as the estimate year, and 2027-2032 as the forecast year.

Global Photovoltaic Module Automatic Cleaning Robot Market, By Region:

United States

China

Europe

Japan

South Korea

ASEAN

India

Rest of World

Global Photovoltaic Module Automatic Cleaning Robot Market, Segmentation by Type:

Fixed

Mobile

Global Photovoltaic Module Automatic Cleaning Robot Market, Segmentation by Clean Form:

Dry Brush PV Cleaning Robot

Water-based PV Cleaning Robot

Global Photovoltaic Module Automatic Cleaning Robot Market, Segmentation by Automation:

Fully Automatic PV Cleaning Robot

Semi-automatic PV Cleaning Robot

Global Photovoltaic Module Automatic Cleaning Robot Market, Segmentation by Application:

Distributed Photovoltaic Power Station

Centralized Photovoltaic Power Station

Companies Profiled:

SunPower

Innovpower

BOSON

Westrong

SUNPURE

Alion Energy

Ecoppia

SolarCleano

SERBOT AG

Airtouch Solar

HyCLEANER

Tetraelc

Solenergy

Cooperwind

louluo

Washpanel

Clean Solar Solutions Ltd

Derui Intelligent

Ecobright

Xiamen Lanxu Intelligent Technology

Lingdu (Guangdong) Intelligent

Xingluo Smart Technology(Suzhou) Co., Ltd.

Key Questions Answered:

1. How big is the global Photovoltaic Module Automatic Cleaning Robot market?
2. What is the demand of the global Photovoltaic Module Automatic Cleaning Robot market?
3. What is the year over year growth of the global Photovoltaic Module Automatic Cleaning Robot market?
4. What is the production and production value of the global Photovoltaic Module Automatic Cleaning Robot market?
5. Who are the key producers in the global Photovoltaic Module Automatic Cleaning Robot market?
6. What are the growth factors driving the market demand?

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