

Global Photovoltaic Module Automatic Cleaning Robot Market 2026 by Manufacturers, Regions, Type and Application, Forecast to 2032

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Abstracts

According to our (Global Info Research) latest study, the global Photovoltaic Module Automatic Cleaning Robot market size was valued at US\$ 181 million in 2025 and is forecast to a readjusted size of US\$ 440 million by 2032 with a CAGR of 13.7% during review period.

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 is a detailed and comprehensive analysis for global Photovoltaic Module Automatic Cleaning Robot market. Both quantitative and qualitative analyses are presented by manufacturers, by region & country, by Type and by Application. As the market is constantly changing, this report explores the competition, supply and demand trends, as well as key factors that contribute to its changing demands across many markets. Company profiles and product examples of selected competitors, along with market share estimates of some of the selected leaders for the year 2025, are provided.

Key Features:

Global Photovoltaic Module Automatic Cleaning Robot market size and forecasts, in consumption value (\$ Million), sales quantity (K Units), and average selling prices (US\$/Unit), 2021-2032

Global Photovoltaic Module Automatic Cleaning Robot market size and forecasts by region and country, in consumption value (\$ Million), sales quantity (K Units), and average selling prices (US\$/Unit), 2021-2032

Global Photovoltaic Module Automatic Cleaning Robot market size and forecasts, by Type and by Application, in consumption value (\$ Million), sales quantity (K Units), and

average selling prices (US\$/Unit), 2021-2032

Global Photovoltaic Module Automatic Cleaning Robot market shares of main players, shipments in revenue (\$ Million), sales quantity (K Units), and ASP (US\$/Unit), 2021-2026

The Primary Objectives in This Report Are:

- To determine the size of the total market opportunity of global and key countries
- To assess the growth potential for Photovoltaic Module Automatic Cleaning Robot
- To forecast future growth in each product and end-use market
- To assess competitive factors affecting the marketplace

This report profiles key players in the global Photovoltaic Module Automatic Cleaning Robot market based on the following parameters - company overview, sales quantity, revenue, 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.

Market Segmentation

Photovoltaic Module Automatic Cleaning Robot market is split by Type and by Application. For the period 2021-2032, the growth among segments provides accurate calculations and forecasts for consumption value by Type, and by Application in terms of volume and value. This analysis can help you expand your business by targeting qualified niche markets.

Market segment by Type

Fixed

Mobile

Market segment by Clean Form

Dry Brush PV Cleaning Robot

Water-based PV Cleaning Robot

Market segment by Automation

Fully Automatic PV Cleaning Robot

Semi-automatic PV Cleaning Robot

Market segment by Application

Distributed Photovoltaic Power Station

Centralized Photovoltaic Power Station

Major players covered

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.

Market segment by region, regional analysis covers
North America (United States, Canada, and Mexico)
Europe (Germany, France, United Kingdom, Russia, Italy, and Rest of Europe)
Asia-Pacific (China, Japan, Korea, India, Southeast Asia, and Australia)
South America (Brazil, Argentina, Colombia, and Rest of South America)
Middle East & Africa (Saudi Arabia, UAE, Egypt, South Africa, and Rest of Middle East & Africa)

The content of the study subjects, includes a total of 15 chapters:

Chapter 1, to describe Photovoltaic Module Automatic Cleaning Robot product scope, market overview, market estimation caveats and base year.

Chapter 2, to profile the top manufacturers of Photovoltaic Module Automatic Cleaning Robot, with price, sales quantity, revenue, and global market share of Photovoltaic Module Automatic Cleaning Robot from 2021 to 2026.

Chapter 3, the Photovoltaic Module Automatic Cleaning Robot competitive situation, sales quantity, revenue, and global market share of top manufacturers are analyzed emphatically by landscape contrast.

Chapter 4, the Photovoltaic Module Automatic Cleaning Robot breakdown data are shown at the regional level, to show the sales quantity, consumption value, and growth by regions, from 2021 to 2032.

Chapter 5 and 6, to segment the sales by Type and by Application, with sales market share and growth rate by Type, by Application, from 2021 to 2032.

Chapter 7, 8, 9, 10 and 11, to break the sales data at the country level, with sales quantity, consumption value, and market share for key countries in the world, from 2021 to 2026. and Photovoltaic Module Automatic Cleaning Robot market forecast, by regions, by Type, and by Application, with sales and revenue, from 2027 to 2032.

Chapter 12, market dynamics, drivers, restraints, trends, and Porters Five Forces analysis.

Chapter 13, the key raw materials and key suppliers, and industry chain of Photovoltaic Module Automatic Cleaning Robot.

Chapter 14 and 15, to describe Photovoltaic Module Automatic Cleaning Robot sales channel, distributors, customers, research findings and conclusion.

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