Sunshine for you   Multifit to all

MULTIFIT ®
众能力电

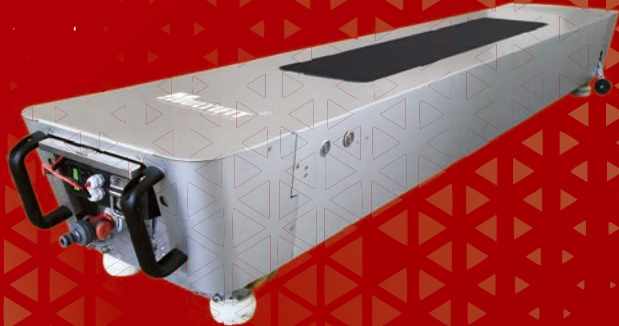**Beijing Multifit Electrical Technology Co.,Ltd**

Solar Panel Cleaning Robot

Introduction

Beijing Multifit Electrical Technology Co.,Ltd

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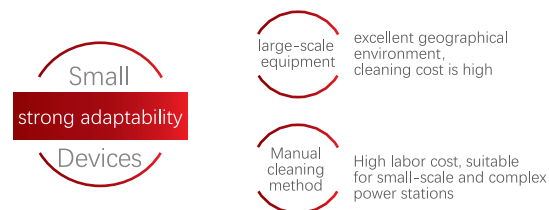
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About US

MULTIFIT 12+Years in Solar Industry focus on the technology development, production, sales and system integration of solar cleaning robots.

MULTIFIT supporting products design, development, investment, construction, operation and maintenance of solar power system projects and electrical automation projects.

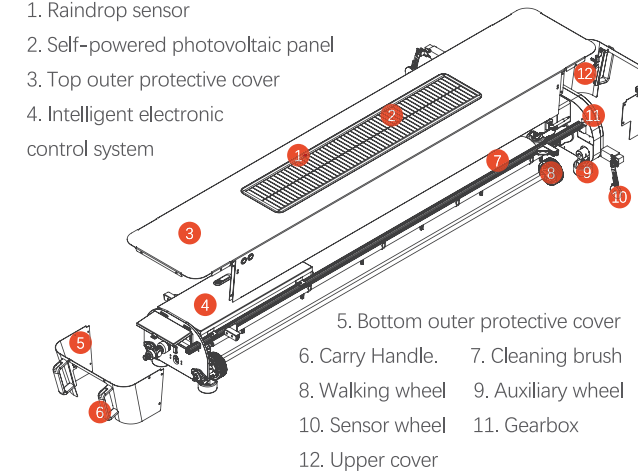| Stock	CE	Patent	Export
280768 Exchange	**20+** Certificates	**20+** Products	**80+** Countries

R&D background

As a new type of green energy, solar power generation is developing rapidly all over the world. The global installed capacity is 114.9GW in 2019 , and it has reached 627GW in total.
However, because solar power stations are usually built on higher terrain, where sunshine is sufficient, but there is a lot of wind and sand, and water resources are scarce.Therefore, it is easy to accumulate dust and dirt on solar panels, and the power generation efficiency can be reduced by 8%-30% on average.The hot spot problem of photovoltaic panels caused by dust also greatly reduces the service life of photovoltaic panels.

Small
strong adaptability
Devices

large-scale equipment — excellent geographical environment, cleaning cost is high

Manual cleaning method — High labor cost, suitable for small-scale and complex power stations
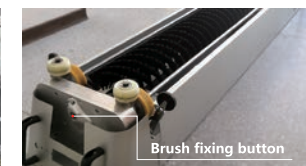
It is suitable for most photovoltaic panel installations, high cleaning efficiency, and flexible cleaning cycles. Based on this, our company has selected an automatic cleaning method for small smart equipment and independently developed a small smart photovoltaic cleaning robot to serve the photovoltaic energy industry.

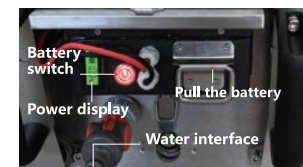## Product structure and composition of the Solar Robot

1. Raindrop sensor
2. Self-powered photovoltaic panel
3. Top outer protective cover
4. Intelligent electronic control system
5. Bottom outer protective cover
6. Carry Handle.
7. Cleaning brush
8. Walking wheel
9. Auxiliary wheel
10. Sensor wheel
11. Gearbox
12. Upper cover

Independently developed a new generation of cleaning robot.
Brush

Easy to disassemble, easy to maintain and long service life.
Brush fixing button

Battery digital display, easy to disassemble, the robot will start automatically when rain falls.
Battery switch / **Power display** / **Pull the battery** / **Water interface**

MULTIFIT factory production Factory direct delivery, no middleman
start switch Equipment switch

Learn about Solar cleaning robots ▶

Product Features

Main Features ◀

📱 Intelligent control: Mini APP control by mobile, automatic cleaning time and cleaning mode can be set.

🔌 Solar power system: self-charging-comes with a solar power system, convenient and efficient, can last 8-10 hours.

Strong adaptability: applicable to various arrangement arrays and various power stations.

Internet of things technology application: independent control, grouping, automatic cleaning.

Lightweight equipment ≈23 kg,The whole machine is about 30kg, which is more than 30% lighter than similar products, and it is convenient to carry.

Core Features ◀

🌡°C Ambient temperature: Adapt to ambient temperature: -40-+70°C

☁ Self-sensing mode: Intelligent opening and cleaning mode in rainy days.

〰 Adjusting the brush up and down: When the brush wears out, the cleaning ability decreases. You can adjust the brush downward to increase the cleaning ability and double the service life of the brush.

✦ 1min disassembly and assembly of brushes: applicable to various arrangement arrays and various power stations.

Danger avoidance: automatic edge sensing technology to prevent the robot from sliding down and avoid danger.
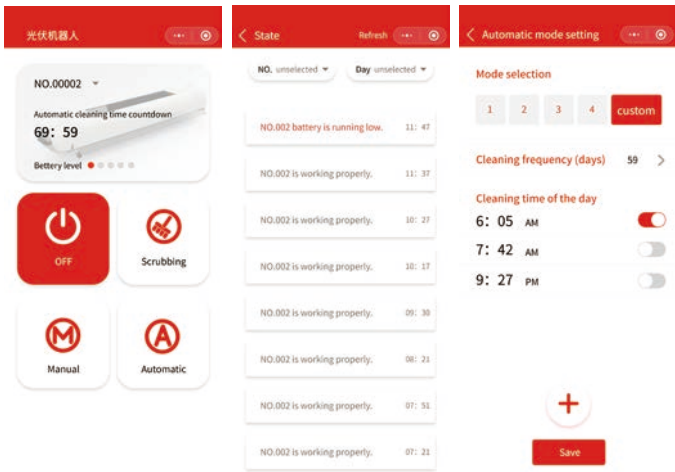
Product Features

▷ Excellet performance：
  lithium battery,brushless motor, durable.
▷ Efficient cleaning:
  special brush, cleaner, single machine can clean 1.2MWp per day.
▷ Automatic start and stop:
  automatic return, adaptive and remote control.
▷ Integrated dry cleaning and washing:
  to facilitate the use of different photovoltaic power plants.
▷ High cost performance:
  the cost can be quickly paid back by increasing the electricity production.

Poduct Advantage

MULTIFIT The second generation cleaning robot has more advantages than the robots on the market in terms of performance, product design, intelligent control, etc., such as portability, long life, intelligent APP controller, and easy to disassemble, install, adjust and maintain brushes.

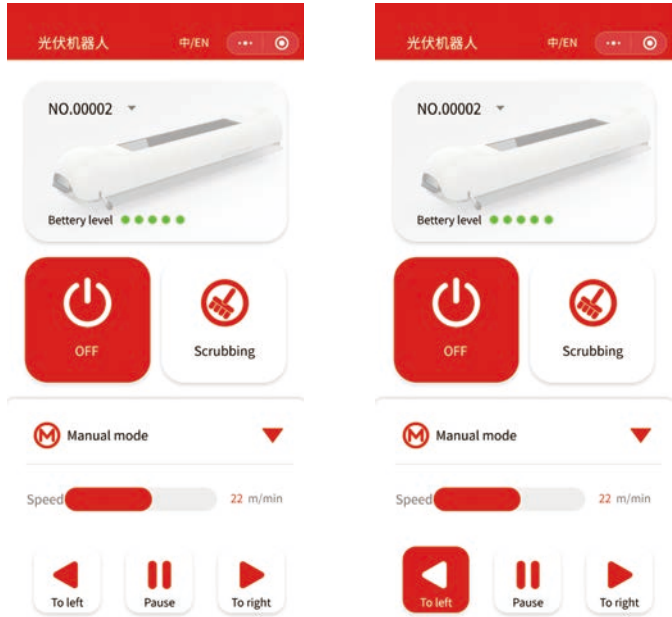| Name	Traditional robot	Multifit robot
weight	over 40KG	Lightweight design,single machine only 30KG
Control system	Intelligent ordinary field remote contro	two ways of intelligent remote control and field control with small program of mobile phone.
IOT	Not support	Internet of Things cloud platform to monitor the working state of machines.
Automatic working mode	None	When it rains, the machine will start automatically and enter the washing mode.
Automatic precipitation cleaning mode	None	Simple maintenance, easy to disassemble brush design and brush up and down adjustment, longer life.
easy to maintain	Difficult maintenance & brush replacement	Master design, simple and beautiful appearance.
Cleaning mode	Dry cleaning	Dry cleaning & water cleaning
Product	Integrated equipment, complex structure, poor reliability, high cost	Modular design, simple structure, reliable, low cost.

APP Platform Operating Instruction

APP Platform ◁

▷ It can be displayed on the platform of mobile phone: whether the robot is running normally.
▷ It can be displayed on the platform: the working status of multiple robots.
▷ Operation functions : start, scrub and stop.
▷ The robot cleaning start time, end time and time interval can be set.
▷ Automatic start and stop and automatic working time and cycle can be set.

Description of automatic cleaning mode ◁

▷ Mode 1 Cleaning process: The host machine will automatically stop after 2 cycles of cleaning, after every 3 days (72 hours), the host machine will start automatic cleaning again .
▷ Mode 2 Cleaning process: The host machine will automatically stop after 3 cycles of cleaning, after every 7 days (168 hours), the host machine will start automatic cleaning again .
▷ Mode 3 Cleaning process: The host machine will automatically stop after 3 cycles of cleaning, after every 10 days (240 hours), the host machine will start automatic cleaning again .
▷ Mode 4 Cleaning process: The host machine will automatically stop after 3 cycles of cleaning, after every 15 days (360 hours), the host machine will start automatic cleaning again .

▷ Mode switching: Manual cleaning mode switch to automatic cleaning mode: Directly press the function button of automatic cleaning mode to automatically switch to automatic cleaning mode.
▷ Automatic cleaning mode switch to manual cleaning mode: press the "stop" button first and then press the manual cleaning mode function button to switch to manual cleaning mode.
▷ Location memory function: Only after pressing the "stop" button or "pause" button will the power off location saving function start. Or the power off location saving function will not be started.
▷ Speed adjustment: When adjusting the running speed of the cleaning robot, press the "stop" button first and then press the speed adjustment button, the interval between each pressing is at least one second to ensure the speed setting is completed.

Remote Controller Instruction

1. Remote control range is 50 meters
2. Remote control has a "start", " scrub ", "stop", "automatic mode" "left" "right" "accelerated" "slow" "pause" "debug" button.
3. Press the "Start" button, and the host begins to clean forward on the track. When the forward limit switch is triggered, the host will pause and then clean backward. This process is a cleaning cycle. The host repeats the cleaning process continuously until the "Stop" button is pressed and the host stops
4. When pressing the " scrub " button, the host machine is in the current position, scrub back and forth within the range of 30cm forward and backward. Press the "Run" button again, and the host machine continues the current cleaning process,   there can be "left" and "right" controls in manual mode (The above cleaning process is called manual cleaning mode)
5. Press the "Auto" button, the automatic indicator lights up and the host machine switches to the automatic cleaning mode
6. Press "accelerate" once to increase 1 m/min.
7. Press to "slow down" once to decrease 1 m/min.
8. The remote control is equipped with self-locking power switch.
9. Press the "left" button: control the robot to clean to the left in the manual mode.
10. Press the "right" button: control the robot to clean to the right in the manual mode.
11. Press the "Pause" button: only work out in automatic mode.
12. Press the "Stop" button: Once the robot stops working ,you need to choose the cleaning mode again when restart it .
13. Press the "Debug" button to activate the debugging speed. Press the button again will turn off the debugging function.
14. Press the "Mode" button to switch between "Mode 1", "Mode 2", "Mode 3" and "Mode 4", respectively shown by the indicator light.

Solar Panel Cleaning Robot

Remote Controller ▷

◁ Operating Instruction

Technical Data

Spec	Model Number		
	MULR1650	MULR1950	MULR1650-2
Module Lenth (mm)	1650(1640)	1950(1960)	1650(1640)*2
Obstacle crossing ability (mm)	20	20	20
Traveling distance (m)	0-800	0-800	0-800
Traveling speed m/min	15-20	15-20	15-20
Generator Power (w)	90W	90W	120W
Weight of machine (Kg)	28	30	40
Width of the machine (mm)	340	340	340
Height of machine (mm)	300	300	300
Length of machine (mm)	2020	2330	3690
Water Used Per Hour	270L/H(0.3mpa)	270L/H(0.3mpa)	330L/H(0.3mpa)

Spec	Model Number		
	MULR1950-2	MULR990	MULR990-2
Module Lenth (mm)	1950(1960)*2	990(992)	990(992)*2
Obstacle crossing ability (mm)	20	20	20
Traveling distance (m)	0-800	0-800	0-800
Traveling speed m/min	15-20	15-20	15-20
Generator Power (w)	120W	90W	120W
Weight of machine (Kg)	45	23	35
Width of the machine (mm)	340	340	340
Height of machine (mm)	300	300	300
Length of machine (mm)	4310	1360	2370
Water Used Per Hour	330L/H(0.3mpa)	210L/H(0.3mpa)	270L/H(0.3mpa)

Spec	Model Number		
	MULR990-3	MULR1650-3	MULR1950-3
Module Lenth (mm)	990(992)*3	1650(1640)*3	1950(1960)*3
Obstacle crossing ability (mm)	20	20	20
Traveling distance (m)	0-800	0-800	0-800
Traveling speed m/min	15-20	15-20	15-20
Generator Power (w)	200W	200W	200W
Weight of machine (Kg)	40	50	55
Width of the machine (mm)	340	340	340
Height of machine (mm)	300	300	300
Length of machine (mm)	3380	5360	6290
Water Used Per Hour	330L/H(0.3mpa)	360L/H(0.3mpa)	360L/H(0.3mpa)

Solar Panel:40W
Battery Capacity: 24V/10Ah(MULR*2 is 20Ah)
Working Tim: 8-10 Hours
Brush Life:2-3 Year
Ambient temperature:-20℃~70℃
Cleaning Mode:Dry Cleaning
Cleaning way: One time / Many times / The Rubbing
Other special functions: Speed control of forward and reverse
Optional configuration:
1. The bridge device
2. Water washing device
3. The wireless remote controller / Mini APP of Wechat