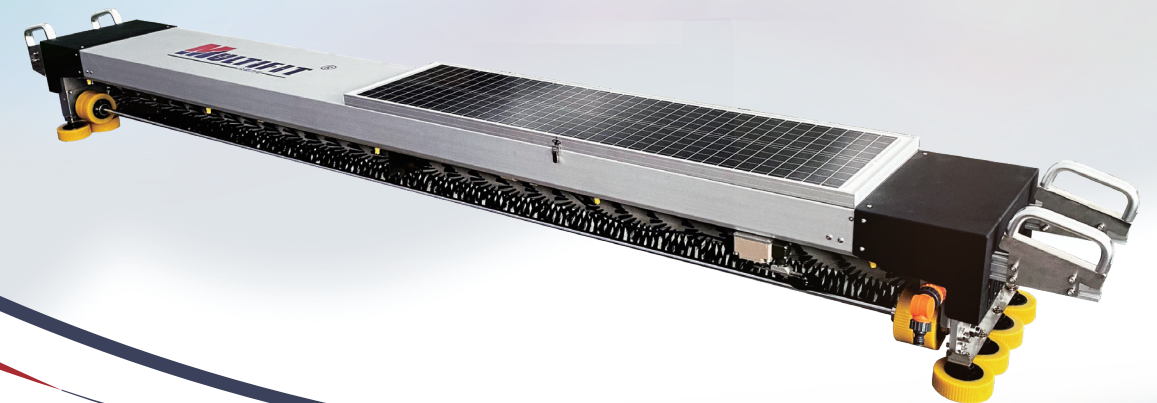


众享阳光 能惠万家
左右式光伏清洗机器人
MR-G2



Beijing Multifit Electrical Technology Co.,Ltd
北京众能力电科技有限公司

MULTIFIT GROUP

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✉ multifit@multifitele.com

☞ Multifit



<http://vmaxpowerpv.com>
<http://www.multifitsolar.com>
<http://www.multifitele.com>

Sunshine for you Multifit to all

Right & Left Solar Cleaning Robot

广东众能光伏设备有限公司

GUANGDONG MULTIFIT SOLAR CO.,LTD

公司介绍

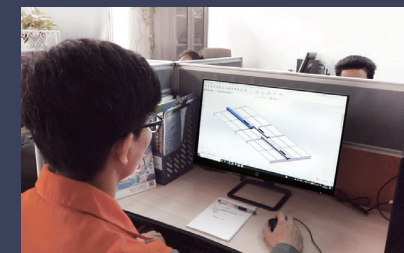
广东众能光伏设备有限公司是一家致力于太阳能发电等绿色能源的研发、生产、销售和光伏电站建设与清洗运维服务的国家高新技术企业，总部位于北京，生产基地位于广东汕头市国家高新技术产业开发区，深圳设有分公司。旗下企业包括众能力电，众能光伏，众能智汇。

公司专注于太阳能清洗机器人及配套设备、光伏逆变电源、光伏移动电源、MPPT光伏控制器、太阳能LED路灯照明系统及其配套产品的技术研发、生产、销售、系统集成；太阳能发电系统项目及电气自动化项目的设计、开发、投资、建设和光伏电站的清洗与运维。众能自2009年成立以来，立足于提供高效的光伏电站建设、清洁及运维解决方案及新能源电气产品的创新研发，培育了一批有理想、有经验、有技术的销售和研发团队。产品已获得五十多项专利证书，现已批量出口到欧美，亚非拉等世界五十多个国家及地区。

公司已通过ISO9001:2008质量管理体系认证、ISO14000:2000环境质量管理体系认证、ISO45001:2018 职业健康安全管理体系认证，CE认证，FCC认证，国家科技型中小企业，中关村高新技术企业，守合同重信用认证，广东省高新技术产品认证，华侨板上市挂牌企业，汕头市瞪羚企业。

未来，公司将秉承“高效节能，让更多人享用绿色能源”的发展使命，立足于光伏产业，努力将公司打造成为光伏发电及机器人清洗运维行业的领跑者。

Company introduction



Multifit Solar is a high-tech manufacturer which is mainly dedicated to research and development, produce, sale and construct of solar power systems and other green energy.



60⁺ Patents
20⁺ CE Certificates
20⁺ Software Copyright



3GWP
In Total



Stock Exchange
280768
2009 Multifit Establish

Our cleaning equipments include solar panel tracking cleaning robots, track-mounted fully automatic walking solar cleaning trolley, the third generation four-wheel drive mode of the solar cleaning robot with stronger cross-barrier ability, crawler-type upper and lower cleaning robot and semi-automatic photovoltaic cleaning brush for civil power stations.

Our cleaning robots realize the remote intelligent control and have many functions: automatic avoidance function to prevent the robot from slipping, automatic rectify correction mechanism and automatic adjustment to prevent the machine from deviation, running tilt, jamming, and good obstacle surmounting performance to surmount certain slopes, steps, and dislocations.

Also, a new intelligent management cloud platform for remote photovoltaic panel cleaning robot has been set up in our robot. And our cleaning robot has our own unique technology in intelligent cleaning of photovoltaic panels by robots, automatic detection, tracking and positioning, group communication and control functions, as well as the establishment of an intelligent management platform with multi-terminal control.

In the future, Multifit will be continually committing to improve the renewable energy industry and develop more efficient and cost-effective solar cleaning solutions.

► 太阳能电站清洗的重要性

The importance of cleaning solar power station

太阳能光伏发电作为一种新型清洁能源正在全世界范围内迅速发展，2021年全球装机容量 150GW，预测到2025年全球累计装机容量将达到1870GW；

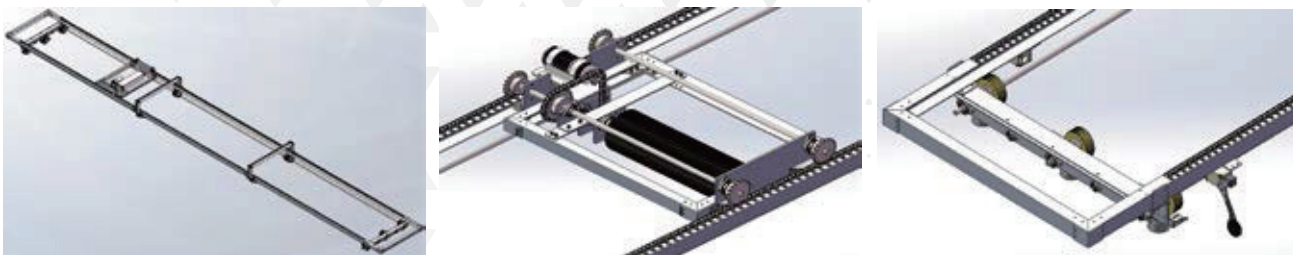
As a new clean energy, solar power generation is developing rapidly all over the world. The global installed capacity had over 150 GW in 2021, and it is predicted that the global cumulative installed capacity will reach to 1870 GW by 2025.

但由于太阳能光伏电站通常建在地势较高，日照充足，但风沙大，水资源匮乏的地方，所以太阳能电池板上很容易积累沙尘及脏物。如果不及时除去电池板上的沙尘及脏物，将会严重影响发电效率 8%-30%。而由灰尘产生的光伏板的热斑问题，也大大缩减了光伏板的使用寿命。

Since solar power stations are usually built in places with high terrain, sufficient sunshine, strong wind and lack of water resources, it is easy to accumulate sand and dirt on solar panels. If the dust and dirt are not removed in time, the power generation efficiency will be seriously affected by 8% to 30%. The hot spot problem on the pv panels caused by dust also greatly reduces the service life.

► 光伏清洗机器人的研发 Solar Robot Development

针对以上痛点，众能目前已经开发出了多款适应不同光伏电站的清洗机器人。



包括最新的光伏板循迹清扫机器人, 轨道式全自动行走光伏清洗小车, 第三代四驱模式, 跨障能力更强的太阳能清洗机器人, 履带式上下清洗机器人和针对民用电站的半自动光伏清洗刷, 并搭建了全新的远程光伏板清洗机器人智能管理云平台; 在机器人对光伏板的智能清洗, 自动检测追踪及定位、以及群组通信和控制功能, 构建多终端控制的智能管理平台都具备自己独特的技术。

In order to solve above problems, Multifit Solar had developed many different kinds of cleaning robots suitable for different solar power stations. Its included Tracking Solar Cleaning Robot, Right & Left Solar Cleaning Robot, Up & Down Solar Cleaning Robot, Shuttle Solar Robot Transfer Vehicle, Semi-Automatic Solar Cleaning Brush, etc.



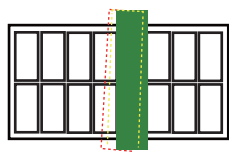
Multifit Solar had set up Smart Remote Control and Management Cloud Platform for our patent cleaning robot. In the process of intelligent cleaning, robots can automatically detect, track, locate, communicate and control groups, to meet the demands of different kinds of devices control and management.

► 清洗机器人-源头厂家
Original Manufacturer

MULTIFIT[®]
众能力电



► 产品特点 Product Features

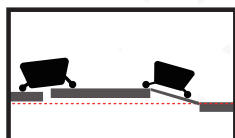


自动姿态纠偏机制

Automatic Adjustment:

自动姿态调整，防止机器跑偏、跑斜、卡机。

Automatically correct and adjust to prevent machine deviation and jamming

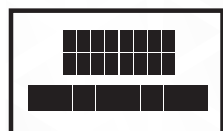


良好的越障性能 Stronger Obstacle-crossing Ability

Automatic Adjustment:

具备一定的斜坡、台阶、错位等过障能力，可跨过超50mm的平面或端面错位。

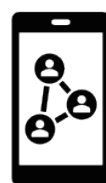
Including slope, step and misalignment, etc. Capable of spanning over 50mm misalignment of flat or end faces.



适应能力强 Strong adaptability:

可适用于各种排布阵列适用于各种电站。

Applicable to various arrangement arrays and various power stations.



智能控制\物联网应用技术

Intelligent control

Internet of things technology application:

可独立控制 可编组，远程控制，可设定自动清洗时间，清洗模式等。

Independent control, grouping, Control by mobile, automatic cleaning time and cleaning mode can be set



设备轻便≈30kg Lightweight equipment ≈30kg:

整机 30kg 左右，比同类产品重量小30% 以上，搬运方便。

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



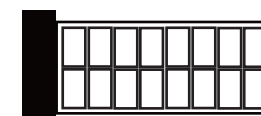
太阳能供电系统 Solar power system:

自充电 - 自带太阳能供电系统，便捷高效，可续航 4-6小时。 Self-charging-comes with a solar power system, convenient and efficient, can last 4-6 hours.



环境温度 Ambient temperature:

-10°C (不结冰 Unfrozen) ~50°C



自避危险 Danger avoidance:

边缘自动感知技术，防止机器人滑落，自避危险

Automatic edge sensing technology to prevent the robot from sliding down and avoid danger



1min 拆装毛刷

1min disassembly and assembly of brushes:

可适用于各种排布阵列适用于各种电站。

Applicable to various arrangement arrays and various power stations.



毛刷上下调节

Adjusting the brush up and down:

当毛刷磨损后，清洗能力下降，可以将毛刷向下调整，提高清洗能力，使毛刷寿命增加一倍。

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.



自感应模式 Self-sensing mode:

雨天智能化开启清洗模式。

Intelligent opening and cleaning mode in rainy days.

Main Features

Core Features

更多智能化特点 Intelligent Control

- 自动姿态纠偏机制：自动姿态调整，防止机器跑偏、跑斜、卡机
Automatic adjustment: Automatic correction and adjustment during running, to prevent machine deviation and jamming.
- 良好的越障性能：具备一定的斜坡、台阶、错位等过障能力
Stronger obstacle crossing ability: Include slope, step and misalignment.
- 性能优越：采用锂电池、无刷电机，经久耐用
Excellent running property: Work with lithium battery and brushless motor, more durable.
- 高效清洗：特种毛刷、清洗更干净，单台机器可清洗 1.2MWp/ 天
High efficient cleaning: 360° rolling brush, one day can clean 1.2MWp.
- 自动启停：自动回位，自适应，亦可遥控控制
Auto start and stop: Full automatic remote control of running and back to docking station.
- 干洗水洗合成一体：方便使用不同光伏电站需求
Integrated dry and watering clean: To meet different cleaning requirement of different solar power plants.
- 性价比高：用户投入成本不高，通过提高产电量，能够快速回本。
Competitive Cost: Quick money return by increasing the electricity production.



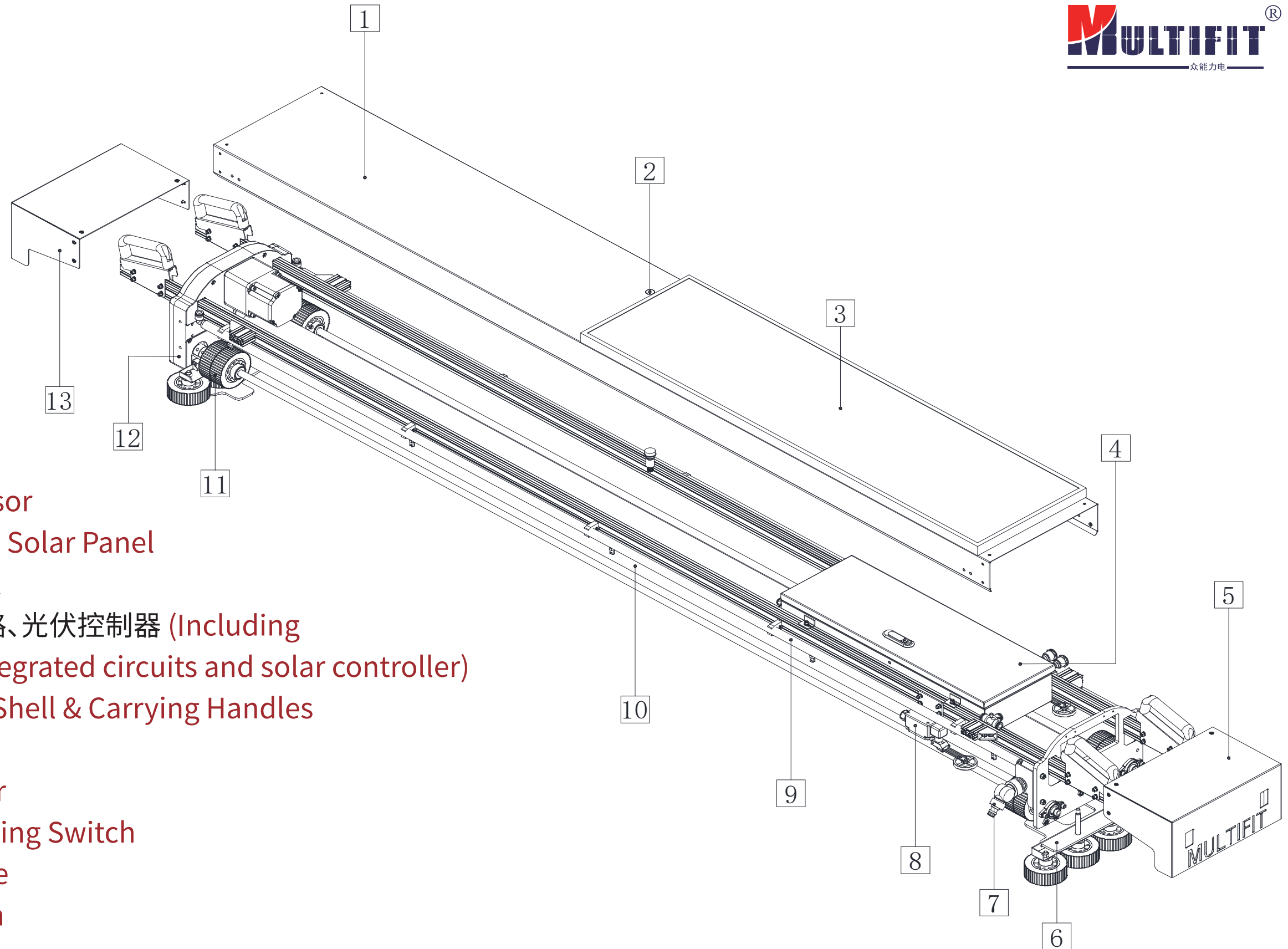
► 产品优势 Product Advantage

第二代清洗机器人，从性能，产品设计，智能化控制等方面比市场上的机器人更有优势，比如轻便化，长寿命，智能 APP 控制器，毛刷拆装调整及维护方便。

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.



► 产品细节 Product Details



- 1.顶部外壳 Outer Top Shell
- 2.雨滴感应器 Raindrop Sensor
- 3.设备自充电光伏板 Flexible Solar Panel
- 4.电控柜 Power Control Box
包含电路板、电池、集成线路、光伏控制器 (Including circuit boards, batteries, integrated circuits and solar controller)
- 5.下端外壳及搬运把手 Side Shell & Carrying Handles
- 6.辅助轮 Positioning Wheel
- 7.水管接头 Water Connector
- 8.行程开关(感应轮) Running Switch
- 9.喷淋水管 Water Spray Pipe
- 10.清洗毛刷辊 Rolling Brush
- 11.行走轮 Running Wheel
- 12.变速箱 Gearbox
- 13.上端外壳及搬运把手 Side Shell & Carrying Handles

► 左右式光伏清洗机器人-干洗
Solar panel cleaning robot - Dry cleaning



▶ 遥控器 Remote Controller

随时启动，随时停止，反复搓洗，在没有网络的地方，可以使用遥控器启动和操作太阳能清洗机器人。



Start at any time, stop at any time, scrub repeatedly, where there is no network, you can use the remote control to start and operate the soalr panel cleaning robot.

Smart Management Control System（智能管理控制系统）

MY ROBOTS

STATION INFORMATION

ROBOT MANAGEMENT

GROUP MANAGEMENT

TASK MANAGEMENT

ALARM LOG

OPERATION LOG

PROFILE

CHANGE PASSWORD

LOGOUT

Robot Information

Group:

Board No.: 434843047526

Model: 单板

Name:

Area:

Address:

Remote Control:

WiFi Name:

WiFi Password: *****

Clean No.: 3 Times

Manufacturing Time: 2022-03-04 16:21:54

Back

Robot Current Status

Robot running status

Being Disconnected

Distance from Station

1Meter

Robot Speed(Actual)

0 m/m

Rainfall

No Rain

Real-time Power

Real-time Power : 100.00%

Robot alarm information

1.Low Power

2.Sensors are out of range both

3.Motor failure

4.Collision sensor occurs

STATION INFORMATION

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Real-time Power

Real-time Power : 100.00%

Robot alarm information

1.Low Power

2.Sensors are out of range both

3.Motor failure

4.Collision sensor occurs

MULTIFIT platform平台:

1.全自动 Fully automatic. 2.不用您到现场操作No need for you to be on site.

3.多台清洗机器人工作，一目了然。Multiple cleaning robots work simultaneously.

STATION INFORMATION

ROBOT MANAGEMENT

GROUP MANAGEMENT

TASK MANAGEMENT

ALARM LOG

OPERATION LOG

PROFILE

CHANGE PASSWORD

LOGOUT

Processed Unprocessed

#	No.	Model	Power Station	Robot Area	Fault Type	Fault Status	Fault Time	Content	Status	Operate
<input type="checkbox"/>	28388	434843047526		BJ	Robot	Pending	2022-06-22 17:00:52	The robot exceeds the response time, it is judged to be offline.(Connect time : 2022-06-22 15:58:08)	Pending	Processed
<input type="checkbox"/>	28281	434843047526		BJ	Robot	Pending	2022-06-17 11:02:41	The robot exceeds the response time, it is judged to be offline.(Connect time : 2022-06-17 09:44:55)	Pending	Processed
<input type="checkbox"/>	28275	434843047526		BJ	Robot	Pending	2022-06-16 17:29:31	The robot exceeds the response time, it is judged to be offline.(Connect time : 2022-06-16 17:25:47)	Pending	Processed
<input type="checkbox"/>	28274	434843047526		BJ	Robot	Pending	2022-06-16 17:26:52	The robot exceeds the response time, it is judged to be offline.(Connect time : 2022-06-16 14:41:05)	Pending	Processed
<input type="checkbox"/>	28273	434843047526		BJ	Robot	Pending	2022-06-16 14:35:02	The robot exceeds the response time, it is judged to be offline.(Connect time : 2022-06-16 10:18:29)	Pending	Processed
<input type="checkbox"/>	28083	434843047526		BJ	Robot	Pending	2022-05-24 11:03:04	The robot exceeds the response time, it is judged to be offline.(Connect time : 2022-05-24 09:36:54)	Pending	Processed
<input type="checkbox"/>	27920	434843047526		BJ	Robot	Pending	2022-05-09 17:16:37	The robot exceeds the response time, it is judged to be offline.(Connect time : 2022-05-09 17:01:41)	Pending	Processed
<input type="checkbox"/>	27893	434843047526		BJ	Robot	Pending	2022-05-	The robot exceeds the response time, it is judged	Pending	Processed

► 技术参数 MR-G2 系列

Technical Parameters MR-G2 Series

基本参数 Technical Data	MR-G2 series/MR-G2 系列		
太阳能板长度范围 (mm) PV Module Length Range (mm)	单块光伏电池板从990mm到2384mm single pv panel from 990mm to 2384mm	双光伏电池板从990mm到2384mm Double pv panel from 990mm to 2384mm	三块光伏电池板从990mm到2384mm Three pv panel from 990mm to 2384mm
越障能力 (mm) obstacle crossing Ability (mm)	20	20	20
行走距离 (m) Traveling Distance(m)	单向行程one-way travel distance from 3600~4320米 (12m/min)	单向行程one-way travel distance from 2280~ 3600米 (12m/min)	单向行程one-way travel distance from 1800~2700米 (12m/min)
行走速度 Traveling speed(m/min)	12~20	12~20	12~20
电机功率 Generator power(w)	100W/200W	200W/300W	300W/300W*2
机器自重 weight of Machine(kg)	30~50	40~95	60~ 115
机器宽度 width of Machine(mm)	420 (含挂轮)	420 (含挂轮)	420 (含挂轮)
机器高度 Height of Machine(mm)	325	325	325
机器长度(根据光伏板尺寸定制) Length of Machine (customized according to pv panel size)	1410 ~ 2804mm (板缝gap20)	2420- 5208mm (板缝gap20)	3430 ~ 7612mm (板缝gap20)
耗水量 water used per Hour	270L/H (0.3mpa)	330L/H (0.3mpa)	360L/H (0.3mpa)
充电板功率 solar panel(w)	60W or 60W*2		
电池容量 Battery capacity(Ah)	24V/10Ah	24V/20Ah	24V/20Ah
满电工作时间 working Time(Hours)	4~6 Hours/小时		
清洗毛刷寿命 Brush Life(years)	2~3years/年		
环境温度 Applicable Temperature (°C)	- 20°C (不结冰unfrozen) ~70°C		
清洁方式 cleaning Mode	干洗/水洗 Dry/watering cleaning		
清扫模式 cleaning way	一次/多次/搓洗/定时清洗 one Time/Repeated Time/positioning/schedule		
其他功能 other Functions	前进和后退/速度控制 speed Adjust/Direction Adjust		
可选配置 optional configuration 标准配置	桥接装置 Bridge Mounting Rail		
	机器人群组控制系统 Robot Group control Module		
	光伏清洗智能管理平台网页/手机APPs webpage/phone APPs Monitoring & control		
	无线遥控器 wireless Remote controller		
	水洗装置 water washing Device		
	WIFI/4G通讯模块 WIFI Module/4G Module		

► 诚招加盟
RECRUITMENT TO JOIN



Multifit Solar Cleaning Robot - Model



MULTIFIT

► 资质证书 Qualification Certification



- 总部: 北京经济技术开发区荣华南路10号院荣华国际5号楼503
- 生产基地: 广东省汕头市高新技术开发区科技西路6号杰思信息大厦三层
- 深圳分公司: 深圳市龙岗区平湖街道上木古社区平新北路51号城市山海1213



► 资质证书 Qualification Certification



- Beijing Headquarter: 503-No.5 RongHuaGuoJi Building.No.10 Courtyard. Ronghua South Rd.BDA Zone 100176,BeiJing China
- Guangdong Plant: 3/F,JieSi Bldg.,6 Keji West Road,Hi-Tech Zone 515041,Shantou,Guangdong,China
- Shenzhen Branch: Rm1213,ChenshishanHai Bluding.No.51 PingXin North Rd.LongGang District.ShenZhen City GuangDong Province.China