PowerFit

Powerway Tracking System







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Third Generation - PowerFit Horizontal Single-axis Decentralized Tracker



PowerFit

This is the basic model of PowerFit. It is driven by the horizontal single axis and arranged modules in single portrait. PowerFit adapts monofacial and bifacial modules(include: Frameless module).The new design improves the performance of wind load and snow load while the high power modules were installed.

PowerFit-Plus

This is the advanced model of PowerFit.It is driven by horizontal single axis and arranged modules in two portrait.Compared with the system of fixed structure which installed monofacial modules, PowerFit-Plus increases 10~26% yield of power generation while the high bifacial modules were installed.





PowerFit-DUO

PowerFit-DUO is composed of a single motor and two single-axis tracker which arranged modules in single portrait. Compared with independent-row trackers, PowerFit-DUO has 50% less motors and controllers, further reducing costs and failure rates. With its stronger wind resistance ,PowerFit-DUO realizes the installation arrangement in high wind speed areas.

PowerFit-Blade

PowerFit-Blade is a new generation of single-axis multidrive transmission tracker of Powerway and adapt high power modules. The compact design enables PowerFit-Blade to reduce the number of parts for higher installation efficiency .With its excellent performance, PowerFit-Blade realizes the installation arrangement in high wind speed areas. With intelligent tracking algorithms, PowerFit-Blade will maximize potential of each module in the power station.



Tracking System Independent horizontal single-axis tracker Capacity 48~72 kW Tracking Range ±45 / ±60 (Customizable) Area 1.1~1.4 ha/MW Drive System Rotary reducer, Geared DC Motor Material Strings on Tracker 3-6 Strings Slope East-West Unlimited Slope North-South ≤18%(Customizable) System Dimension Different as the Module Dimension Module Type Structure Adaptable to Available PV Modules Types On Markets Configuration Horizontal | Vertical Ground Clearance >400mm(Customizable) Foundation Driven Pile | Concrete Protection Wind Speed 20m/s(ASCE 7-10) Survival Wind Speed 50m/s(ASCE 7-10), higher wind load available Design Code **Electrical Technical Parameter**

| Power Supply | L+N 90~260VAC(Wide Voltage Inpu |
|---------------------------|-------------------------------------|
| Control Algorithm | Astronomical Algorithm + Tilt Senso |
| Tracking Method | Active Tracking Closed-loop Control |
| Control Core | MCU (32bit) |
| Strong Wind Protection | Yes |
| Night-time Stow | Yes |
| Rotation Limit Protection | Yes |
| Backtracking | Yes |
| Rain and Snow Mode | Yes |
| Motor Protection | Yes |
| Motor Voltage | 24VDC |
| Wireless/Wired Network | ZigBee, RS485, ZigBee+Rs485,Lo |
| Operating Temperature | -30°C ∼70°C |
| Tracking Accuracy | ±2° |
| Tracker SCADA | Yes |
| UPS | Yes |
| | |

Hot Dip Galvanized Steel | Aluminum Alloy | Hot Dip Zn-Al-Mg Coating Steel | Zinc Alloy Coated Steel

ASCE7,EN1991,SBC301,MS1553,AS1170,NZS1170,Nch432,NBR6123,A1J,GB50009etc.

ut) | 37VDC | PV String Power(1000-1500VDC)

or Close Loop

ra

Data acquisition and Monitoring control system (SCADA)



Real-time monitoring

With graphical interfaces, plant O&M engineers intuitively monitor key informations of different areas and can operate a specific tracker through the feedback parameters at the first time.



The SCADA system collects real-time environmental information through sensors. Through specific settings, the system automatically controls the overall or partial trackers according to different environmental datas.

| AR | | | | AE | 00 00 120 | 模式: 自动 | 構式 |
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| | 保护风速 后动时间 | 5712.0 | RH142 | - | - | C CAR | - |



Intelligent interactive system(\$)

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Mobile Device Debugging

Based on the previous generation of controllers, the Power Smart One system has integrate multiple technological applications for intelligent PV power station. During the construction at the project site, Power Smart One enable the tracker to achieve the quick deployment and group commissioning, etc. The site engineer can largely enhance O&M efficiency with the Power Smart One through mobile devices. It will simplify the operation procedure. By OTA (Over - the - Air Technology), functions and program upgrade will improve the performance tracker controller.









Tem

er Supply

ll Function

on Control

Motor

Battery nanagement

nunication

perature

Cabinet Characteristics

PV String Power 37-1500VDC+UPS High-performance processor OTA upgrade procedure Powerway AI astronomical algorithm Powerway AI backtracking Intelligent motor driver chip Motor software current limit protection/recovery Motor inrush current limit start and stop Intelligent management of battery charge and discharge time Low temperature battery management system RS485/ZigBee Lowest to -40 °C

Current protection, anti-aging, flame retardant

Power Supply

ll Function

on Control

Battery management

nunication

erating perature

Cabinet Characteristics L+N 90-240VAC

37VDC+UPS

High-performance processor

OTA upgrade procedure

Night protection mode

Strong wind protection mode

Rain mode、Snow mode、flood mode

Low consumption power station monitoring Intelligent management of battery charge and discharge time

and discharge time

Low temperature battery management system

RS485/ZigBee/Lora

Communication timeout strategy

Lowest to -40 °C

I P67

Current protection, anti-aging, flame retardant

Product Advantages





Precisely in chasing the solar electriciity yield increased by 10%~26%



Backtracking astronomical algorithm





Enter stow mode under the wind speed of 18m/s dure the maximum wind force of 55m/



Automatic snow removaling mode

Software Simulation Tests





Velocity distribution on windward/leeward side





Pressure distributionon surface on windward/leeward side







Wind tremor resistant



Automatic cleaning mode



Backtracking : With shadow analysis , the tracking system ensure no shadow blocking between two adjacent rows during an entire day's tracking process, and maximum light-emission intensity of module and improves the powergeneration efficiency up to 6%.

Benefit Comparison Of Electricity Yield















Backtracking Increase The Electricity Yield

Strong Wind Resistance

Strong wind protection mode: Adjust from the maximum angle to the protection state within 5 minutes to avoid strong wind and damage caused by strong winds on modules and structure. Unique design wind zone, which can effectively resist the strong wind climate, and has a good economy.



Wind Load Region



With the layout arrangement, the outer array is subject to the maximum wind load, and the wind load on the inner array is correspondingly reduced due to the shielding of outarray.

Atmospheric corrosion analysis

Pull-out Test





Professional design





JON PROTECTION

environment at the project site could I edian Corrosivity" for the zinc coating.

e calculated based on equation (1) and the years is used for the following calculations

ated earlier, in µm/a ment, reported in Table 2 of 9224

| Original Thickness, um 900 78 85 122 Part Vare Corrosion Age, umb 7.7 0.5 0.6 0.2 After Table Consision, um 41.5 6.8 6.8 3.1 1010 Consolon, Su, | Materi | 10010 1 001 | Steel Tube | 550 GSM | HDC | Δ7-1 |
|--|----------------------------------|---|--|---|--|---|
| Test Sam Correlation Bala, jump 7.7 0.5 0.5 0.2 Alem Total Concesson, jum 41.5 6.8 6.8 3.3 7 1041 Concesson, junc 41.5 6.8 6.8 7.2 7.8 2.1 7.1 1.9 3.3 7.8 2.4 7.0 7.1 7.1 1.9 1.1 7.8 2.1 7.1 7.1 1.9 1.1 7.8 2.4 7.0 7.1 7.1 1.9 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 </th <th colspan="2">Original Thickness, um</th> <th>900</th> <th>78</th> <th>85</th> <th>122</th> | Original Thickness, um | | 900 | 78 | 85 | 122 |
| After Table Concession, ym 41.5 6.8 6.8 33. Stradie Concession, % 5%, 9%, 11, 9, 12, 11, 30, 9%, 10%, 9%, 10%, 9%, 10%, 9%, 10%, 9%, 10%, 9%, 10%, 9%, 10%, 9%, 10%, 11%, 11%, 11%, 11%, 11%, 11%, 11%, 11%, 11%, 11%, 11%, 11%, 11%, 11%, 11%, </th <th>First Y</th> <th>ear Corrosion Rate, um/a</th> <th>7.7</th> <th>0.5</th> <th>0.5</th> <th>0.22</th> | First Y | ear Corrosion Rate, um/a | 7.7 | 0.5 | 0.5 | 0.22 |
| Total Connexion, % 9% 9% 9% 2% 2% Name Trade Connexion, µm 456.6 77.2 7.82 11.1 Alter Table Connexion, µm 456.6 77.8 7.9 3.1 | After | Total Corrosion, um | 41.5 | 6.8 | 6.8 | 3.0 |
| Yeard Remaining Materials, un 808.5 712 722 732 11 May Teld Concepton, Un 456 746 74 75 33 Vear Table Concepton, Un 554 757 75 33 Teld Concepton, Un 554 757 757 757 757 757 757 Teld Concepton, Un 554 757 757 757 757 757 757 757 757 757 | 25 | Total Corrosion, % | 5% | 9% | 8% | 2% |
| After Total Corrosion, µm. 45.6 7.9 7.9 3.1 Total Corrosion, ½m. 55.5 10% P6 3.3 Yoms Remaining Materials, µm. 656.4 10.1 7.1 119 Total Corrosion, ½m. 0.55 10% P6 3.3 3.4 10.1 7.1 119 Total Corrosion, ½m. 0.55 10% P1m. Non- 119 119 11 119 11 119 110 110 110 110 110 110 110 110 110 110 110 110 110 110 111 1 | Years | Remaining Materials, µm | 858.5 | 71.2 | 78.2 | 119 |
| 30 Taté Conserve, 55, 10%, 9%, 33 Winner, Revening Matchia, jun 854.4 701. 177.1 118 Urst Bernarium Matchia, jun 854.4 701. 177.1 118 The atmospheric contracility at the Oron Sclar Power Plant in Koluna Division is con- 72 Low Consel/Info Sets et al. 72 Low Consel/Info Ten Era Contang. UR 11 is estimated that the 30 years of usage, 91% or 71 µm of the HOD 2xic coating will obs/s or 70 µm of the 50 GSM zin coating will remain, and 75% or 119 µm of the coating will remain. Regardless of the coating option selected, at the end of the 30-year life, only assisted contrasion is expected on the surface of the steel posts. | After | Total Corrosion, µm | 45.6 | 7.9 | 7.9 | 3.5 |
| Yeeli's Recenting Materials, un. 854.4 701 77.1 119 The almospheric provide yith 40-Con Solf Poser Pair I have Tukina Division is con- 72 <i>Low Corrowity</i> for sheel and 'C2 <i>Low Corrowity</i> ' for the <i>Euro</i> coaling. It is estimated that the 30 years of usage 31% or 71 to rofts HoC 30x coaling up 105% or 70 µm of the 550 GSM Junc coaling will remain, and 51% or 110 µm of the Acading up it manuf, Ragardies of the coaling up it mains, and 51% or 150 µm of the 16¢, only aesthetic corristion is expected on the surface of the sheel pools. | 30 | Total Corrosion, % | 5% | 10% | 9% | 3% |
| 1. The atmospheric controlling at the Okon Solar Power Plant in Yolana Direkton is control "C2 Low Controlling" at sheet and "C2 Low Controlling" for the zinc costing. It is estimated that 63 years of usage, 61% or 71 µm of the HO2 zinc costing will in Costing will remain. Regardless of the costing option selected, a the end of the 30-year life, only aesthetic controls is expected on the surface of the skeel posts. | Years | Remaining Materials, µm | 854.4 | 70.1 | 77.1 | 118. |
| | 2. It is 90% coat life, | Islimated that after 30 years or 70 µm of the 550 GSM z or 70 µm of the 550 GSM z mg will remain. Regardless of only aesthetic corrosion is ex | of usage, 91% c inc coating will the coating opti pected on the s | r 77 µm of the I remain, and 93 on selected, at urface of the st | HDG zinc coa 7% or 119 µn the end of the sel posts. | ting will re n of the A 30-year o |



Powerway Tracking System Project References

| Project Site | Chile |
|-------------------|----------------|
| | |
| Foundation Type | H-shaped Steel |
| | |
| Capacity | 130 MW |
| | |
| Product type | PowerFit |
| | |
| Installation time | 2020 |







| Project Site | Malaysia |
|-------------------|----------------|
| Foundation Type | H-shaped Steel |
| Capacity | 44 MW |
| Product type | PowerFit-Plus |
| Installation time | 2020 |







| Project Site | Lithuania |
|-------------------|----------------|
| Foundation Type | H-shaped Steel |
| Capacity | 4.5 MW |
| Product type | PowerFit-Plus |
| Installation time | 2020 |







| Project Site | Poland |
|-------------------|----------------|
| Foundation Type | H-shaped Steel |
| Capacity | 1 MW |
| Product type | PowerFit-Plus |
| Installation time | 2019 |

| Project Site | Australia |
|-------------------|----------------|
| Foundation Type | H-shaped Steel |
| Capacity | 30 MW |
| Product type | PowerFit |
| Installation time | 2018 |

| Project Site | China |
|-------------------|----------------|
| Foundation Type | H-shaped Steel |
| Capacity | 30 MW |
| Product type | PowerLink |
| Installation time | 2017 |









| | |
|-------------------|----------------|
| Project Site | China |
| Foundation Type | H-shaped Steel |
| Capacity | 2.9 MW |
| Product type | PowerLink |
| Installation time | 2016 |

| Foundation Type | H-s |
|-------------------|-----|
| | |
| Product type | F |
| Installation time | |

| France |
|----------------|
| H-shaped Steel |
| 3 MW |
| PowerMax |
| 2016 |

U.S.A

| Foundation Type | H-shaped Ste |
|-------------------|--------------|
| Capacity | 14 MW |
| Product type | PowerMax |
| Installation time | 2016 |
| | |
| Project Site | Philippines |
| Foundation Type | H-shaped Ste |
| | |

1 MW

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PowerFit

2021

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