

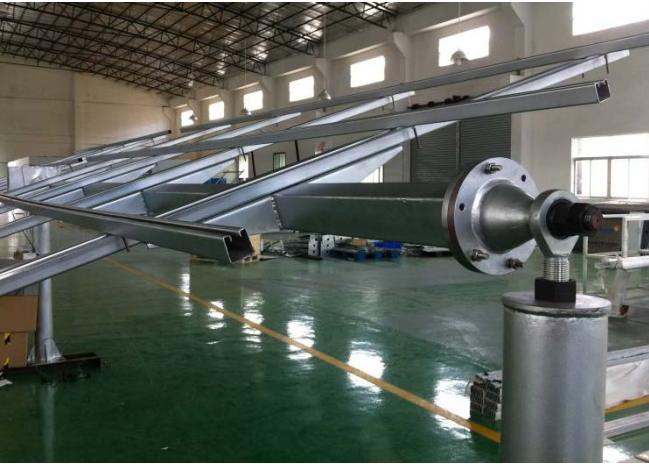


# Power Tracker

## Powerway PV Tracking System

[www.pvpowerway.com](http://www.pvpowerway.com)

## PowerTracker , Since2011

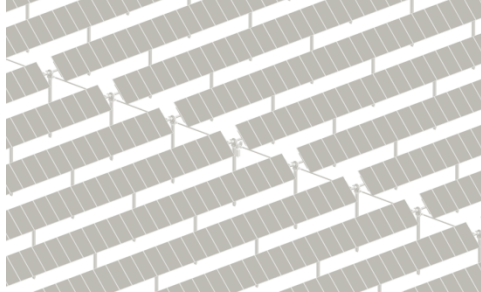
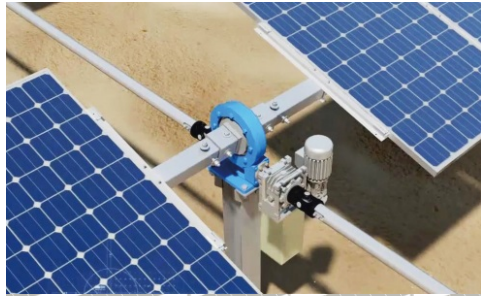


To increase energy yield of solar farm ,  
Powerway has strived researching and developing since 2011 ,  
Above pictures are the early product of PowerTracker

# PowerTracker 3 Major Products

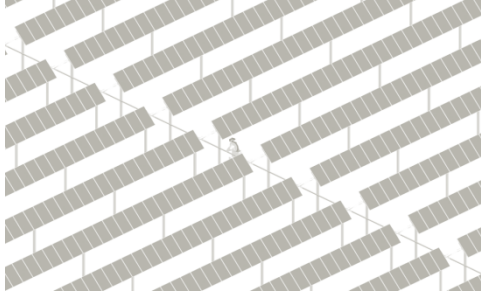
## PowerLink

Centralized System  
-Universal Coupling



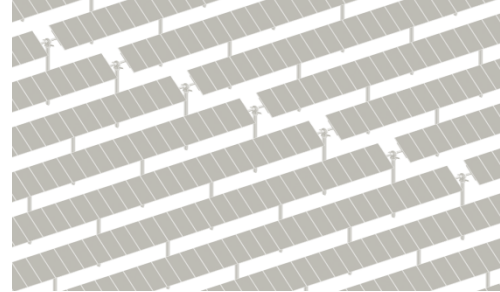
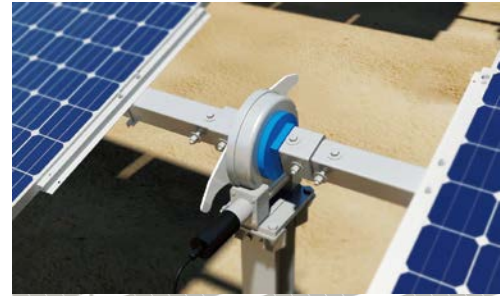
## PowerMax

Centralized System  
-Linear Actuator



## PowerFit

Distributed System






## PowerTracker Project Experiences



<b>Project site</b>	<b>AikoSolar-Guangdong, China</b>
<b>Solution</b>	○ PowerLink+PowerMax
<b>Commission Time</b>	2015~2016



<b>Project Site</b>	<b>JIT-Poitiers, France</b>
<b>Solution</b>	PowerMax
<b>Commission Time</b>	2016.10





<b>Project Site</b>	<b>Stion-USA</b>
<b>Solution</b>	PowerMax
<b>Commission Time</b>	2016.10





**Project site**

**Guangdong, China**

**Solution**

PowerLink

**Commission Time**

2016.12

# Advantages

**High Return  
Lower Cost**

①

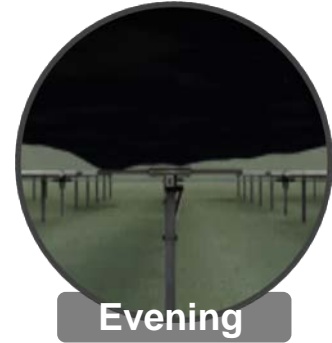
②  
**Good Flexibility**

③  
**Strong  
Reliability**

④  
**Intelligent  
O&M**

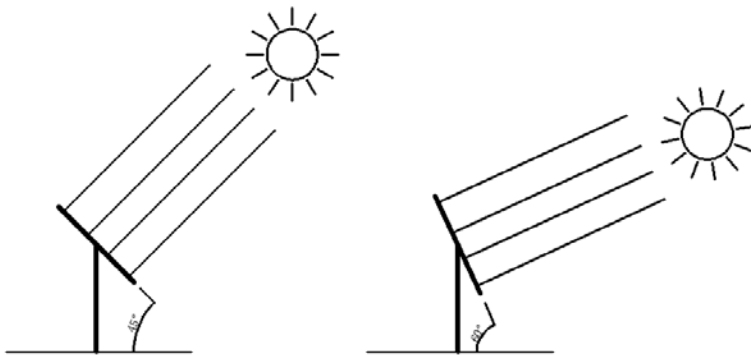


## High Return

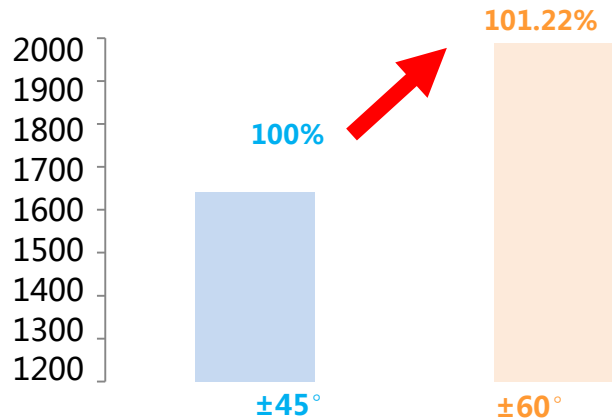


- Smart Tracking guarantees **10%~25% generation increase**
- $\pm 60^\circ$  large angle tracking produces 1-2% more generation than regular tracker

# High Return $\pm 60^\circ$ Tracking Range=Generation Increase



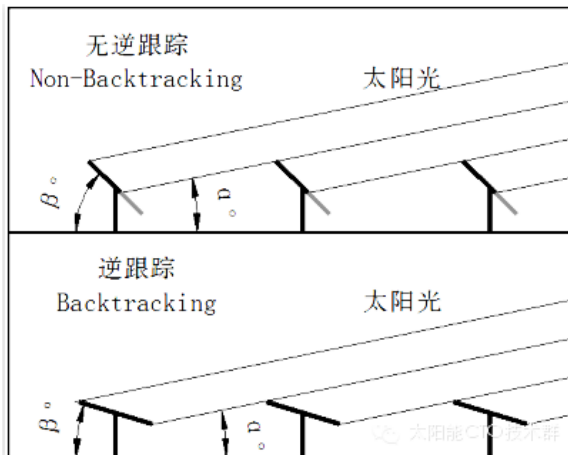
**$\pm 60^\circ$  GENERATION INCREASE 1.22%!!**



Type	Common Model $\pm 45^\circ$	PowerMax $\pm 60^\circ$
Capacity (DC)	3MW	3MW
Module No. Per Pow	40	40
Capacity Per Array	250kW	250kW
Generation Per Year	1964KWh/KWp/year	1988KWh/KWp/year
Generation Increase Rate		1.22%



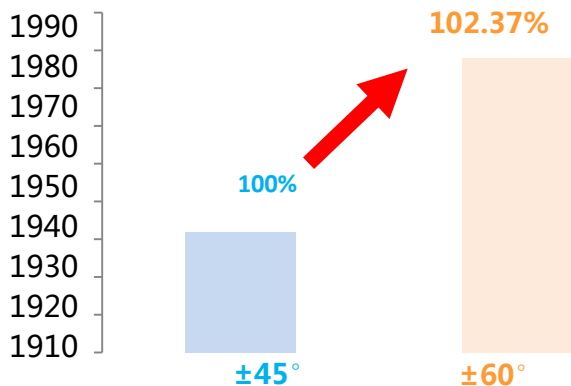
# High Return



**Backtracking=Generation Increase**

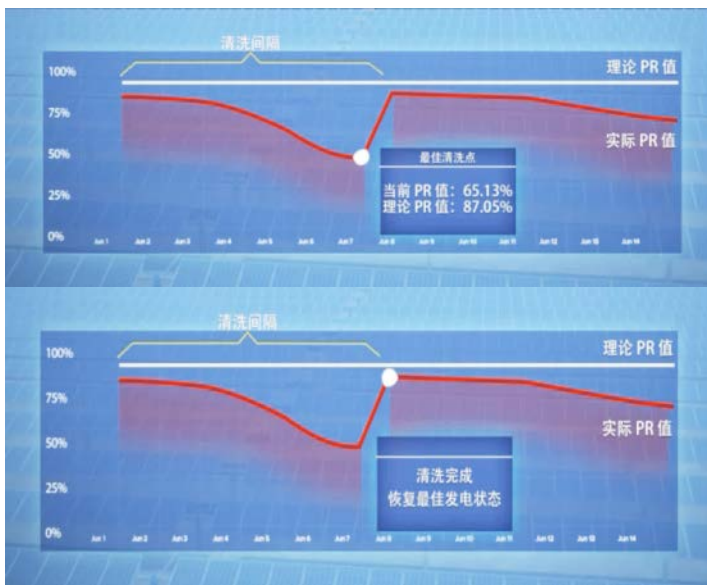
**BACKTRACKING GENERATION INCREASE  
2.37%!!**

Type	Common Model-Without	PowerMax-With
Capacity (DC)	3MW	3MW
Module No. Per Pow	40	40
Capacity Per Array	250	250
Generation Per Year	1942KWh/KWp/year	1988KWh/KWp/year
Generation Increase Rate		2.37%



# High Return

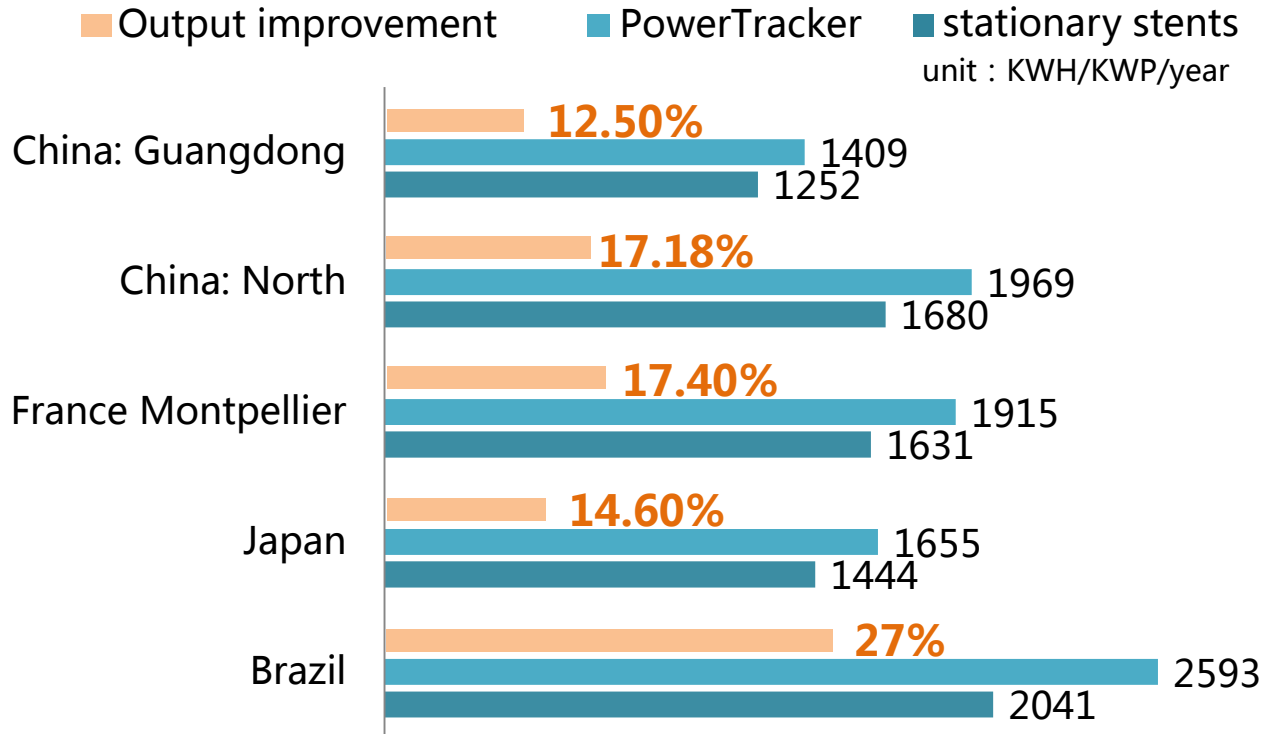
## Auto-Cleaning=Generation Increase!





# High Return

## Generation Comparison at Different Sites



# Easy Installation



Fast  
Piling

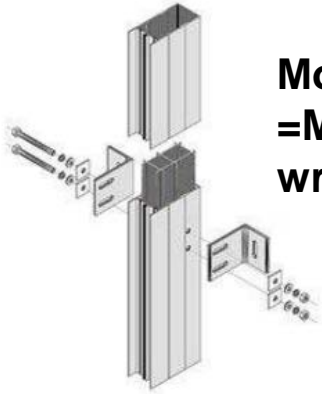
No  
Welding

Simple  
Clamp

Proper Pile Height ,  
Friendly Installation



# ► Easy piling, only need to ram it



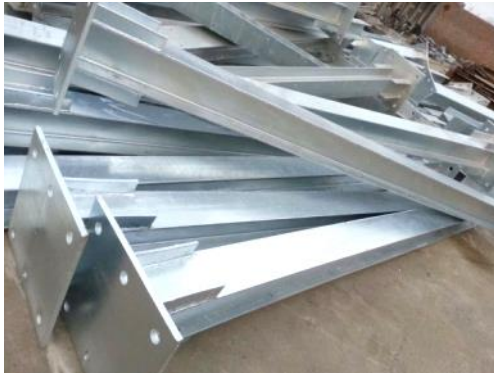
**More connections  
= More potential  
wreckage**



**Fast Piling**



**Ramming it to finish  
it !!**

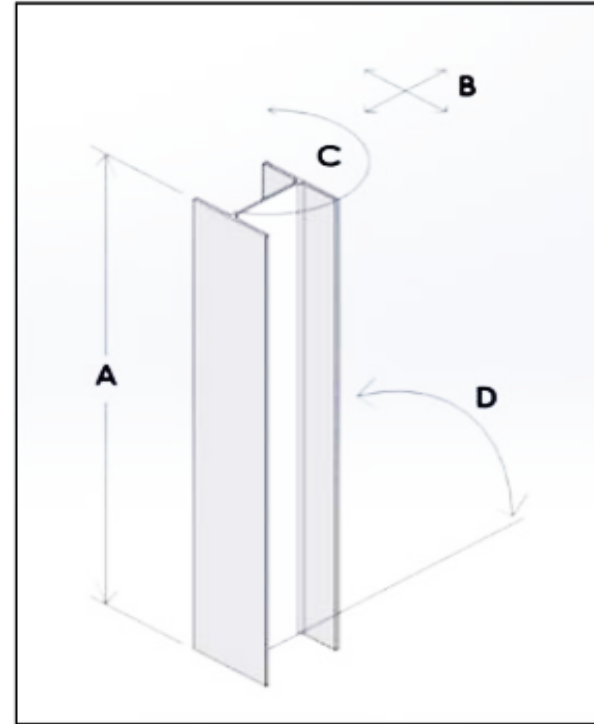


**More bots  
=  
More labor costs**



# Easy Work On Site-High Flexibility

N-S Tilt Degree-D:  $1.5^\circ$  ;  
Tilt Degree-C:  $2^\circ$  ;  
Vertical Tolerance-A :  $\pm 25\text{mm}$ ;  
Horizontal Tolerance-B:  $\pm 15\text{mm}$ .



## Easy Installation-Work simply

1. Single worker required
2. No welding
3. Fasteners easily assembled





# Easy Work On Site-Say No To Heavy Equipment



NO!



NO!



WORK BY HAND



# ► Easy Installation-Work in bulk



**More connections  
=More potential  
wreckage**



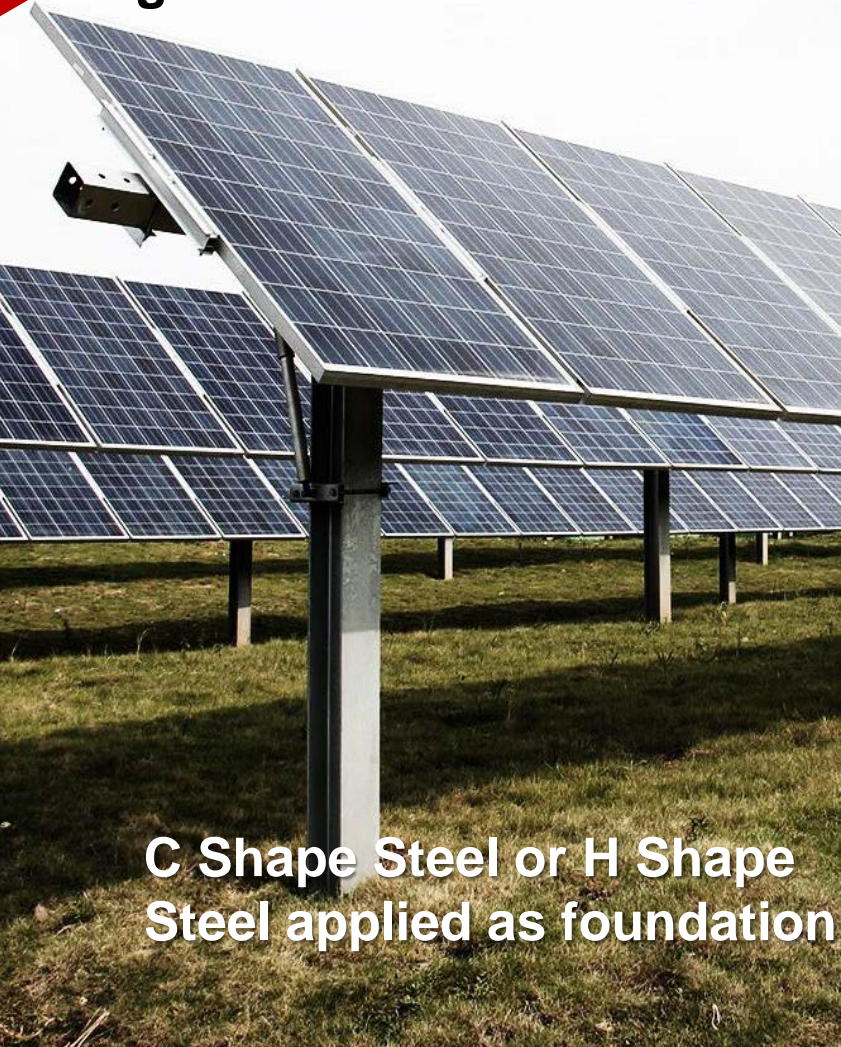
**No  
Welding**



**Rapid fastening  
makes work  
easier.**



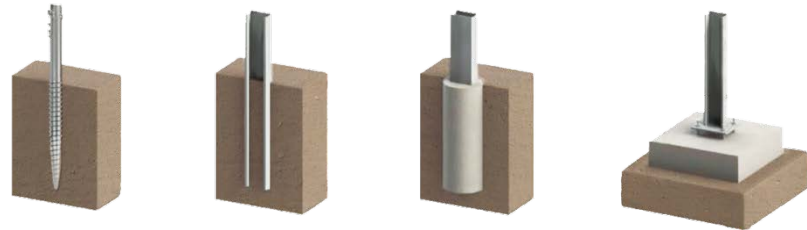
## Higher Return- Lower Cost



C Shape Steel or H Shape  
Steel applied as foundation

Balanced Design Saves

**25%~35% Foundation !**



Per 100MW :

- **Saves 10,000 foundations** approximately
- Saves 900 tons of steel or aluminum approximately
- Saves 2 US cents installation cost per Watt approximately



# Advantages

High Return  
Lower Cost

①

②

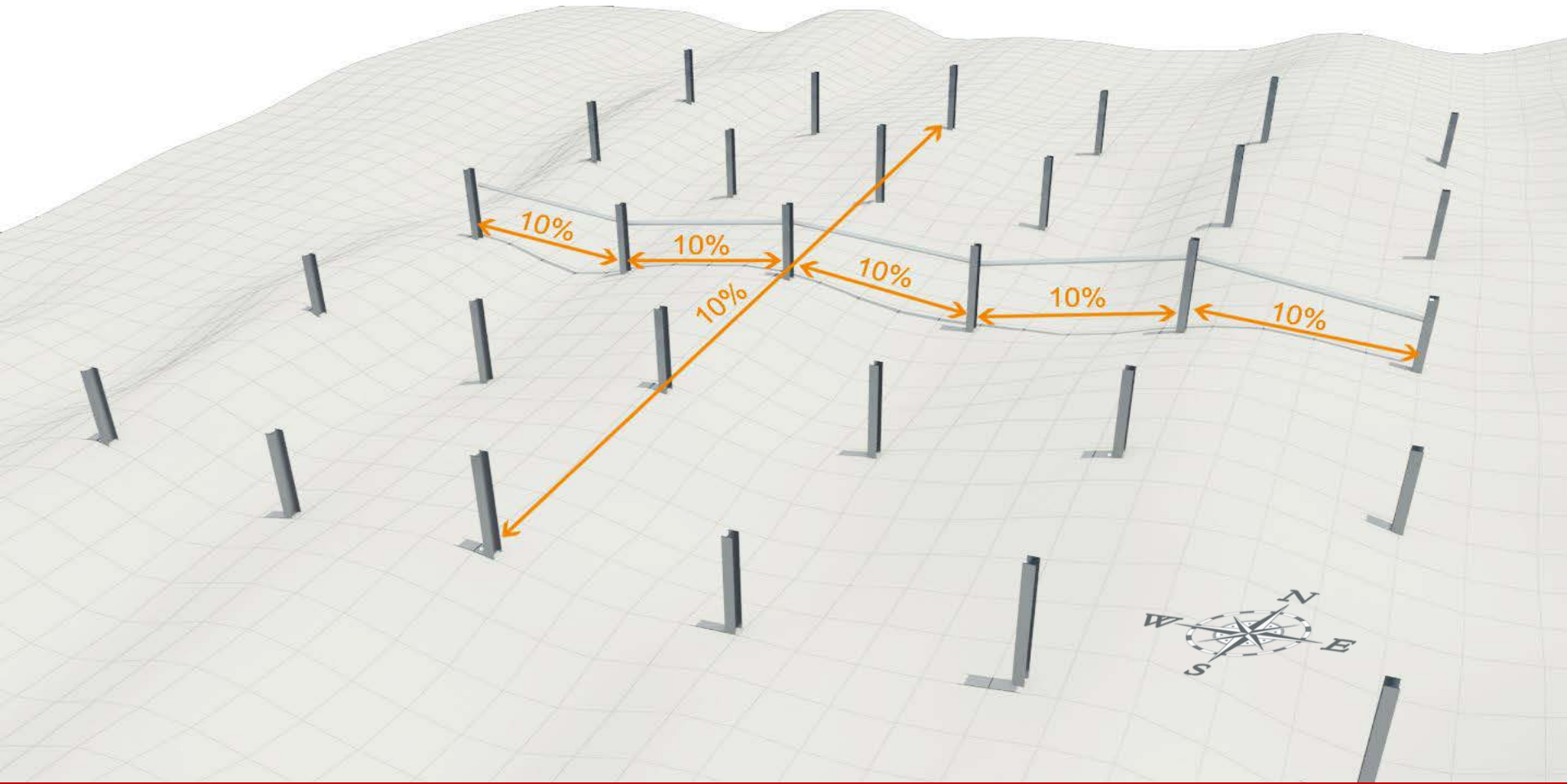
**Good  
Flexibility**

Strong  
Reliability

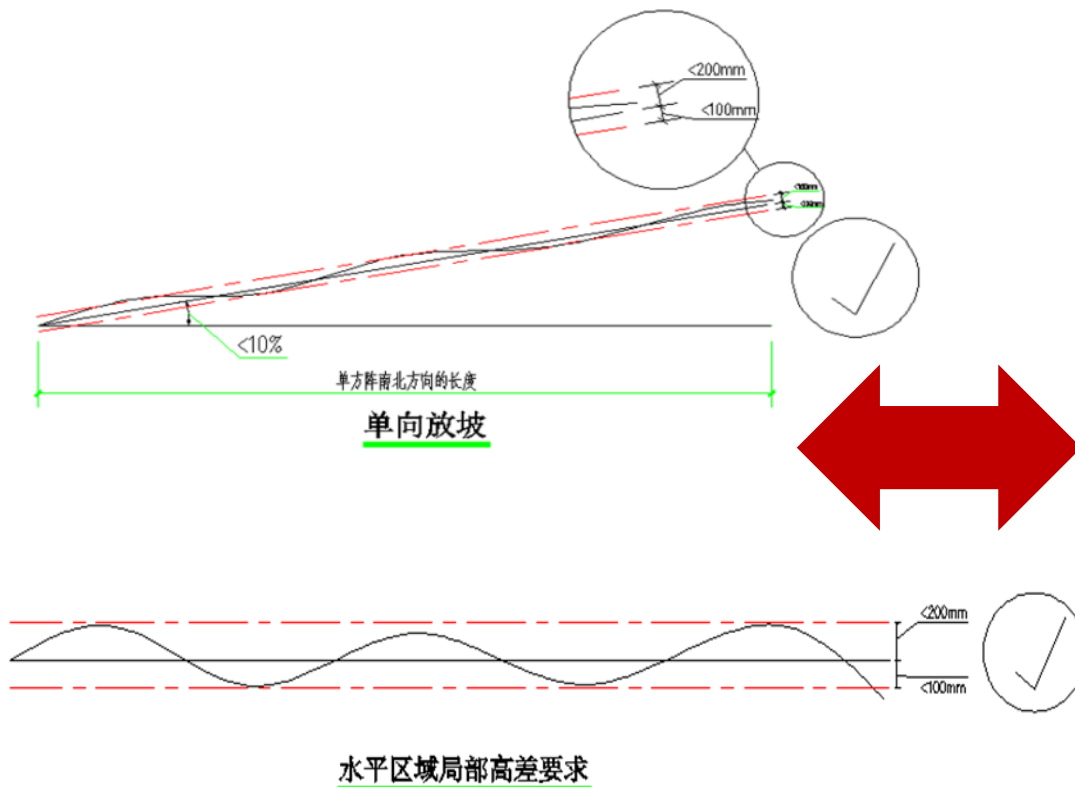
③

④  
Intelligent  
O&M

# High flexibility for uneven topography



# Lower Leveling Cost



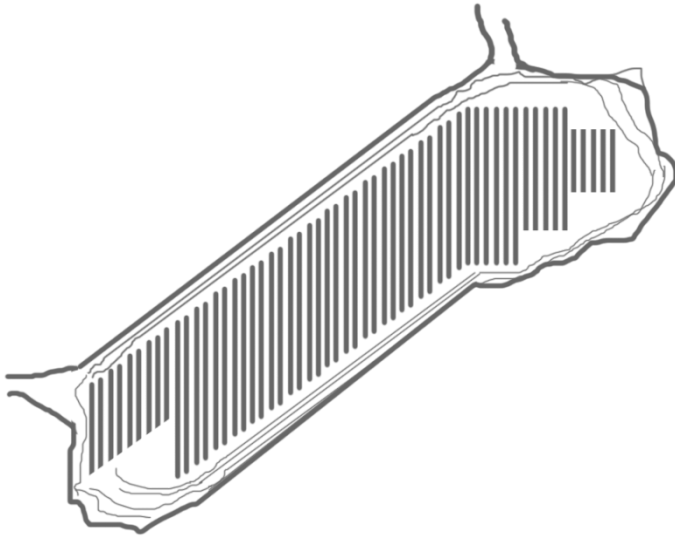
**LESS LEVELING  
=  
LOWER COST**



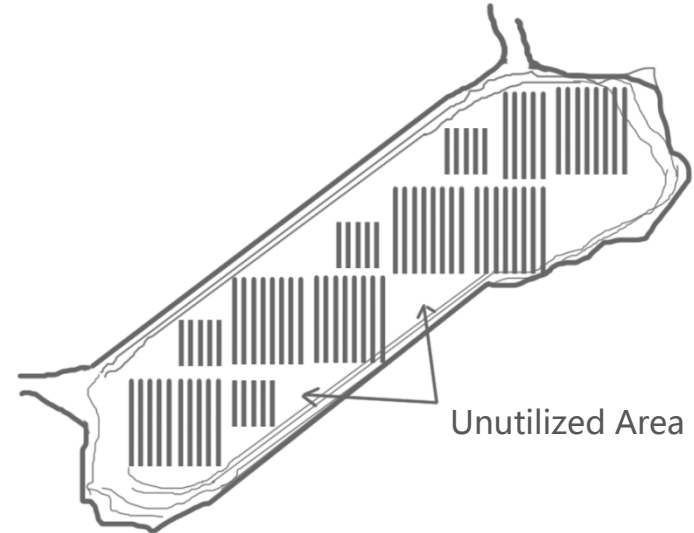


## Higher Utilization

34% Land Utility Increase  
after Layout Optimization



Un-utilized Land



# Advantages

High Return  
Lower Cost

①

Good Flexibility

②

Strong  
Reliability

③

Intelligent  
O&M

④



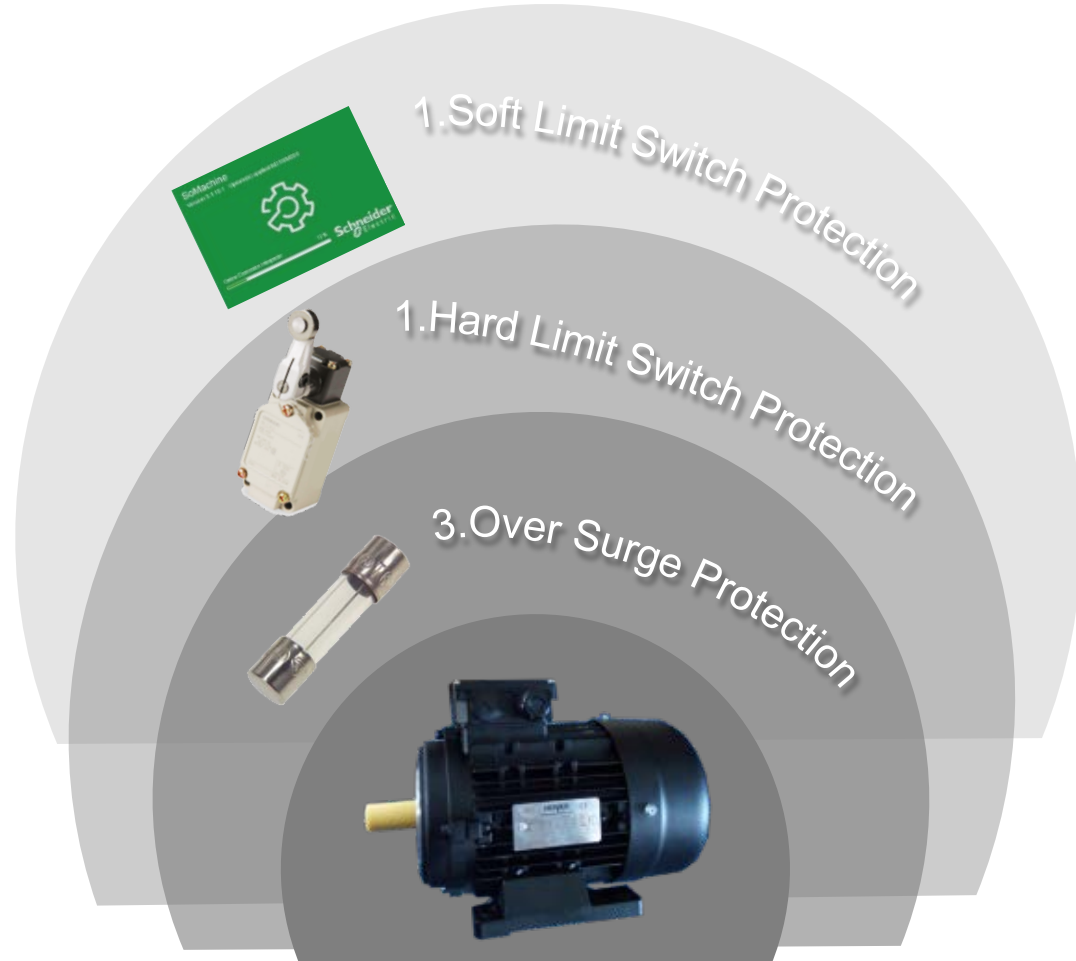
## Anti-vibration—**Damper**

Dual Direction Damper interlocks to offer rigid support to avoid fasteners' resonance & loosening in case of tornado

Anti sudden shock;



# Multiple Protection System



# High Reliability-Anti-thunder



Anti-thunder design protects the electric equipments from damages during thunderstrike

# Quality Control



- All main components come from famous brand and UL certificate.
- All components have large temperature range.



## Motor

UL certificate  
Same quality standard to wind power motor.

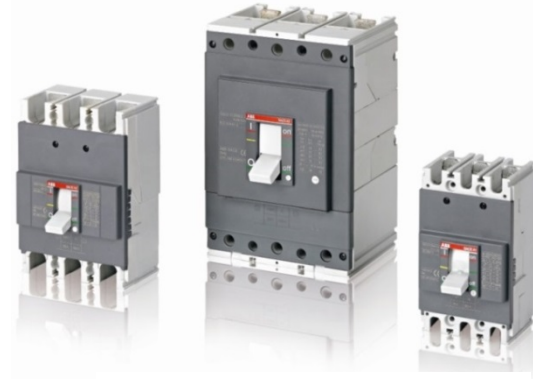


## Control Box

Strict material selection  
Special coating material.  
Prevent the corrosion of acid rain



## ▶ Leading Brands Guarantee Quality

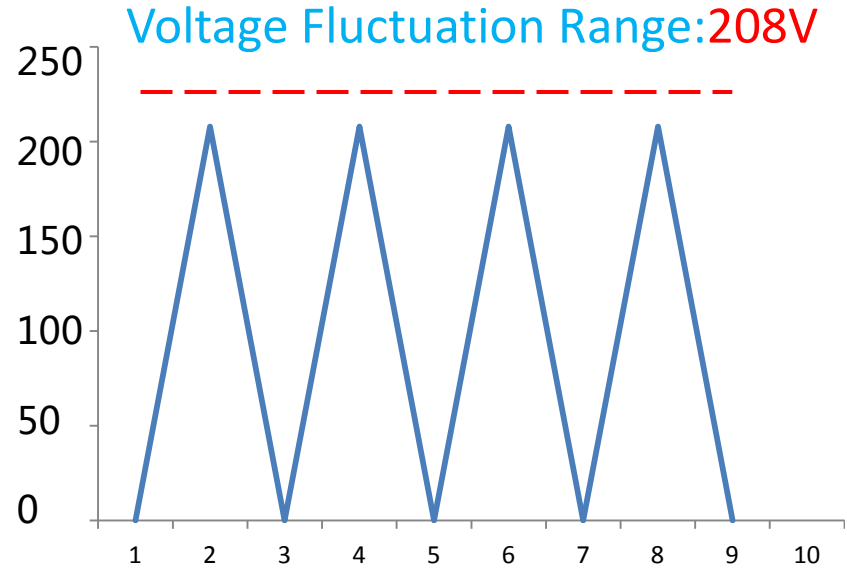
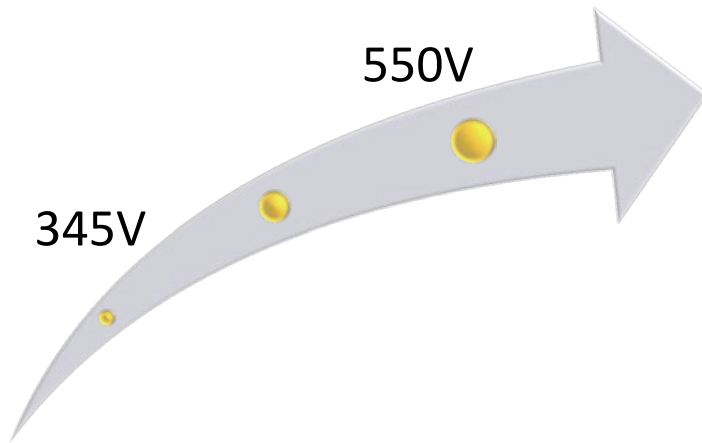


**Schneider**  
Electric

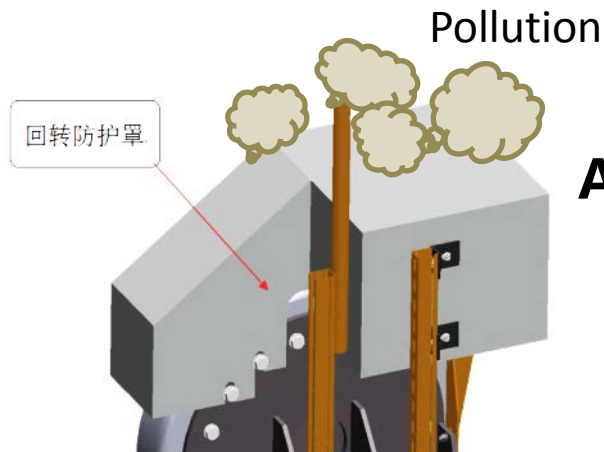
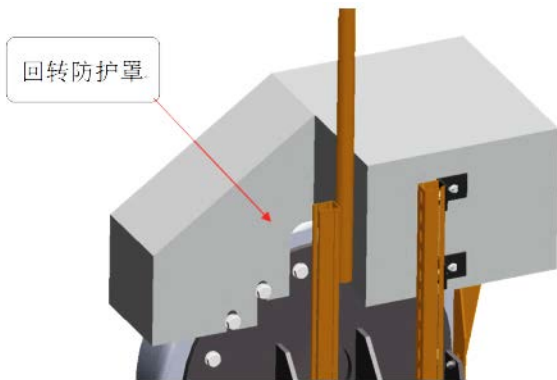
**ABB**

International Leading Brands guarantee  
Excellent Performance & Precise Control!

## Wide Voltage Range



**Fluctuating electric net grid 342—550 V in the range of 208 V , with low requirement on electric net grid.**



## Anti-sand Shield

Every slew drive can resist the corrosion from pollution with the use of shield.

## Protection Level——IP65

Completely sealed from dust at 20 milibar air pressure;  
No rain leakage





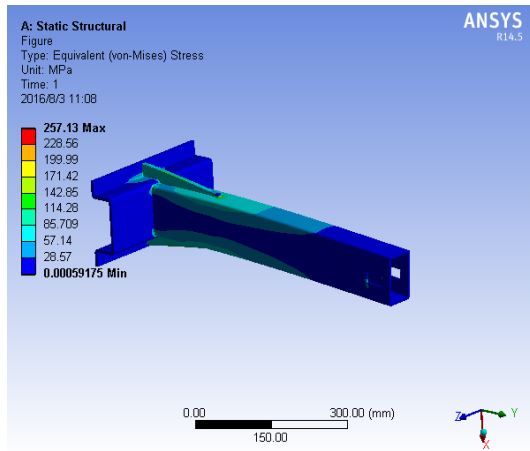
# PowerTracker Datasheet

System datasheet			
Type	Powerlink	PowerMax	PowerFit
Model	Horizontal single-axis tracker		
Capacity(DC)	100kW ~ 400kW	100kW ~ 250kW	25~30kW
Maxomal system voltage	1000V/1500V		
Range of Tracker	± 60°		
Generation gain(VS fixed tilt)	10% ~ 25% (subject to our terms)		
Mechanical data			
Drive model	Universal couple	Linkrod	Self-drive
Material	Hot dip galvanized steel + aluminium alloy		
Maximal linkage	24	24	
Modules in each string	Max 90	Max 64	Max 90
Slope(E-W)	<10°	<5°	No limit
Slope(N-S)	<10°		
Size	Different as the module quantity		
compatibility	mono-crystalline/Polycrystalline /Thin film		
Layout	Landscape/Portrait		
Terrain clearance	>400mm		
Foundation	H section steel/concrete		
Maximal load wind	144km/h (or be customized)		
Maximal operation wind	72m/s (3S)adjustable		
Stow time	<5 mins		
Electrical data			
Power voltage	3W+PE 380/480VAC L+N+PE 110/220VAC	3W+PE 380/480VAC L+N+PE 110/220VAC	24VDC
Power frequency	50/60HZ	50/60HZ	
Rated power	1.5kW	1.5kW	300W
Motor	AC motor	AC motor	DC motor
Controller	PLC		
Track strategy	astronomical algorithms +tilt sensor close loop		
Accuracy	± 2° (or customized)		
Night model	Yes		
Backtracking	Yes		
Rain model	Yes		
Snow model	Yes		
Operation temperature	-25° C to 55° C		
IP Grade	IP65		
Communication interface	RS485/Modbus		

# Simulation Testing

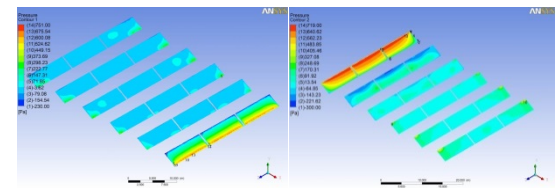
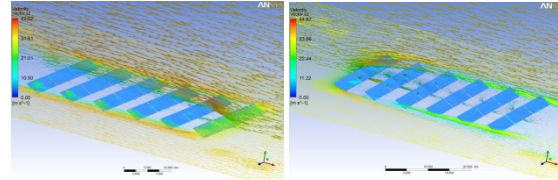
## Ansys

Simulating the stress of the parts



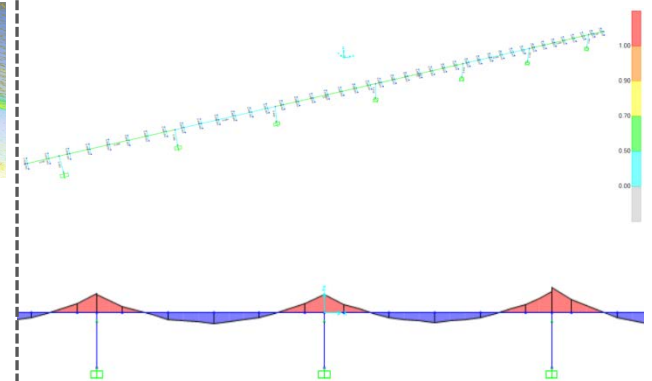
## FLUENT

Fluid mechanics analysis



## SAP2000

Structural analysis and design



# Testing



**Wind tunnel test**



**Neutral Salt Spray Test**



**Mechanics Performance Test**



**Extension Test**  
Verify the theoretical calculation data accuracy many times



**Lifetime test:**  
Main components reliability test ;  
Include : Load、 impact load、 accelerated aging , high-low temperature test、 IP grade、 UV.



**Installation and operation test**  
Ensure the reliability of system





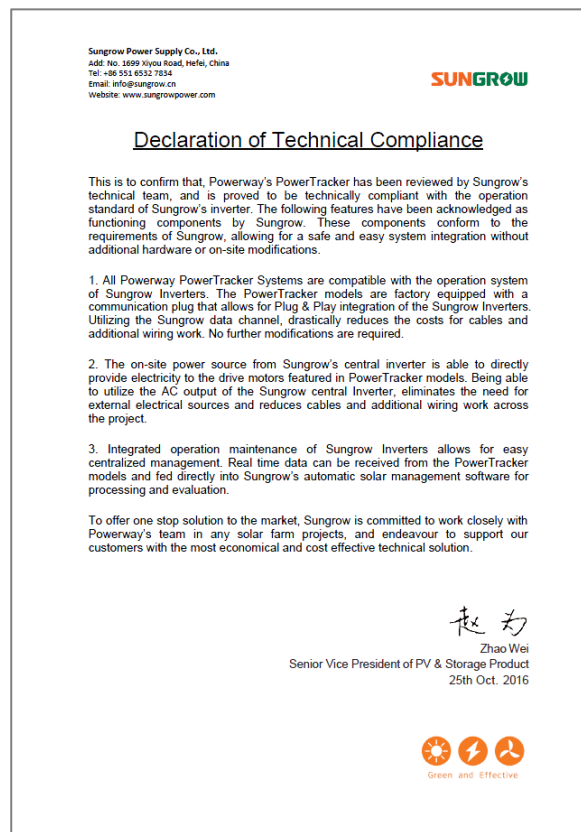
# Third-party certificate and patent certificate

- Authority certificate to guarantee our quality.
- 60 patent certificate





# Certificate of Inverter Compliance



# QC control



**IQA**  
Incoming  
quality  
guarantee



**IPQC**  
Operation  
control



**SQE**  
Venders  
quality



**CQE**  
Customers  
quality



# Advantages

High Return  
Lower Cost

①

Good Flexibility

②

Strong  
Reliability

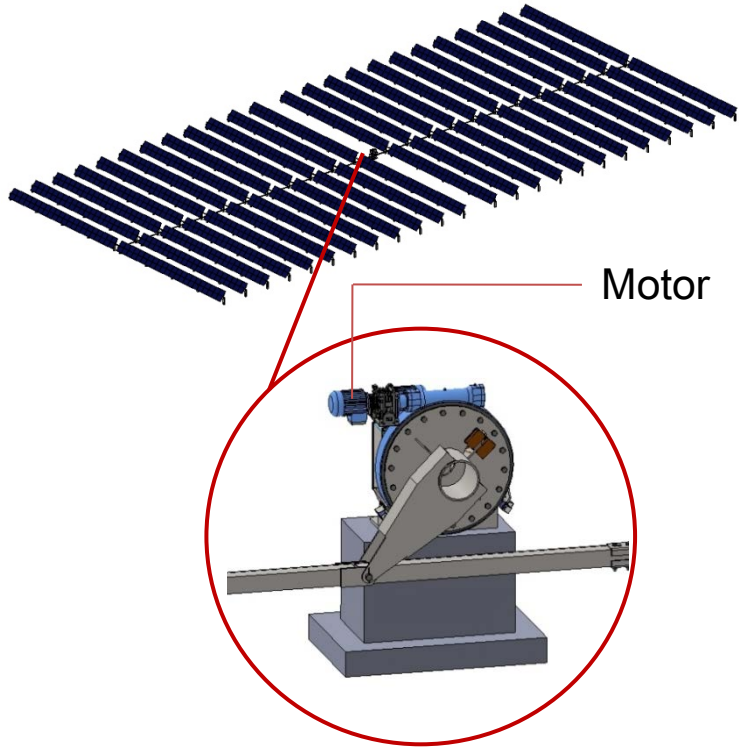
③

④  
Intelligent  
O&M

## ▶ Bearing saves maintenance



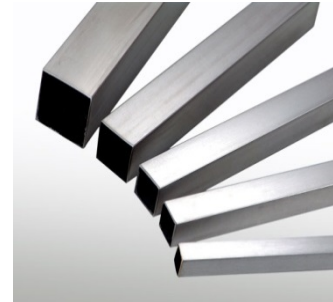
# Lower Maintenance



Powerway 1x40x15 array		1x90x1 array	
Motor No.	6 ✓	Motor No.	40 ✗
Module No.	3600 pcs	Module No.	3600 pcs
Module Rate	320W	Module Rate	320W
Total Rate	1.15MW	Total Rate	1.15MW

**Same Output Rate ,  
Lower Maintenance ,  
WITH 85% LESS MOTORS!!**

## Customized Parts

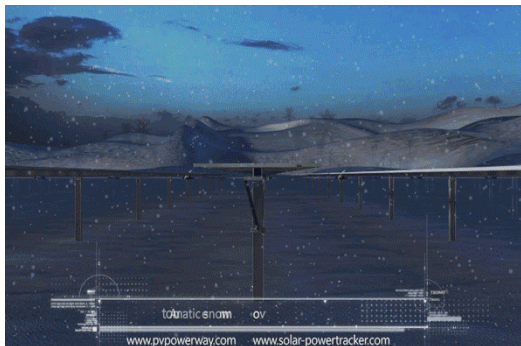


## Localized Fastener

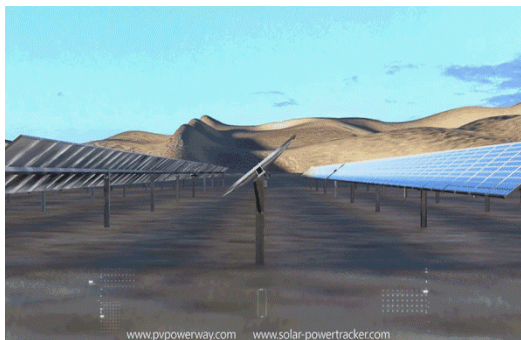
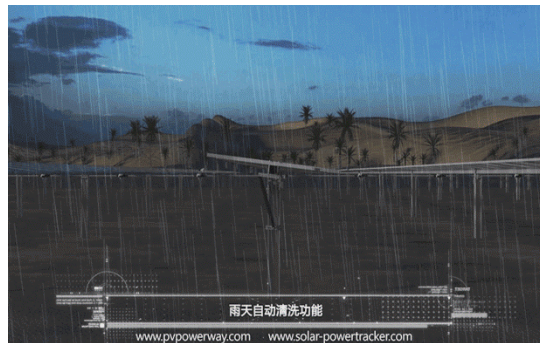


# Different operation models

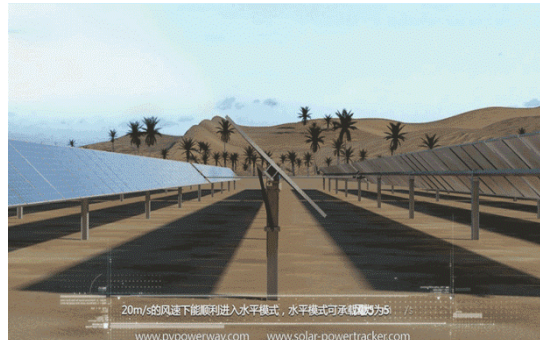
Automatic snow remove



model clean in rainy day



Backtracking



Stow in strong wind

# Different sections and string monitoring , direct management of each motor

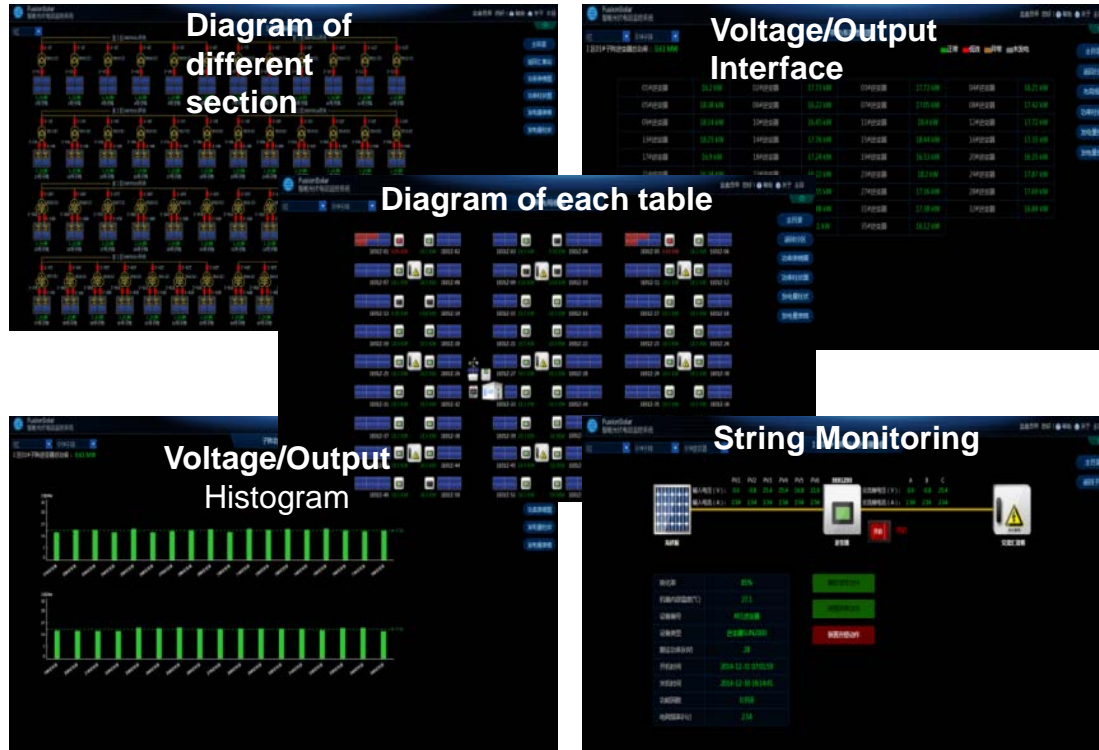
## Layout and state

High precise string monitoring, prompt identification for module failure

Live monitoring based on device location, logical topography and electric allocation, highly visibility.

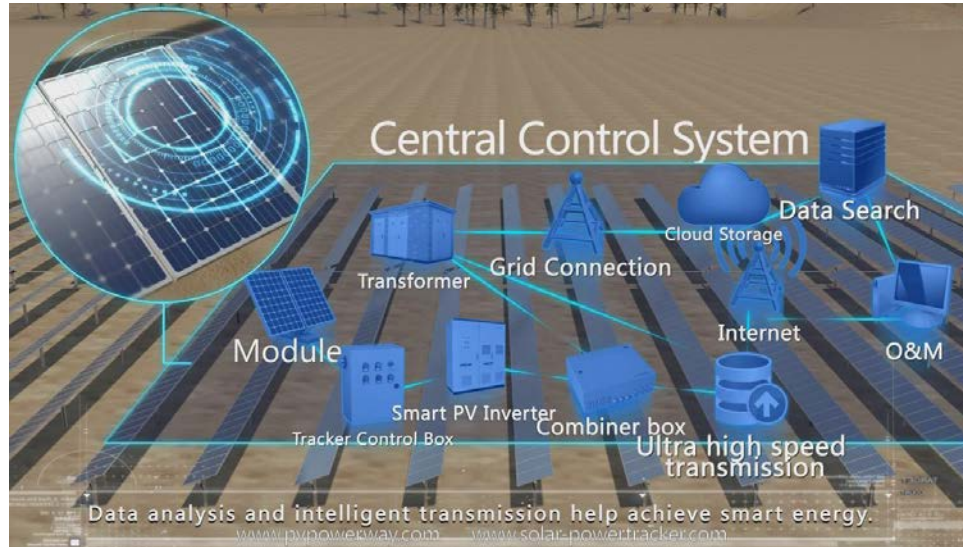
Indicate power generation and power of module by table, histogram.

Precise indicate parameter of individual device



## Intelligence and low-cost O&M

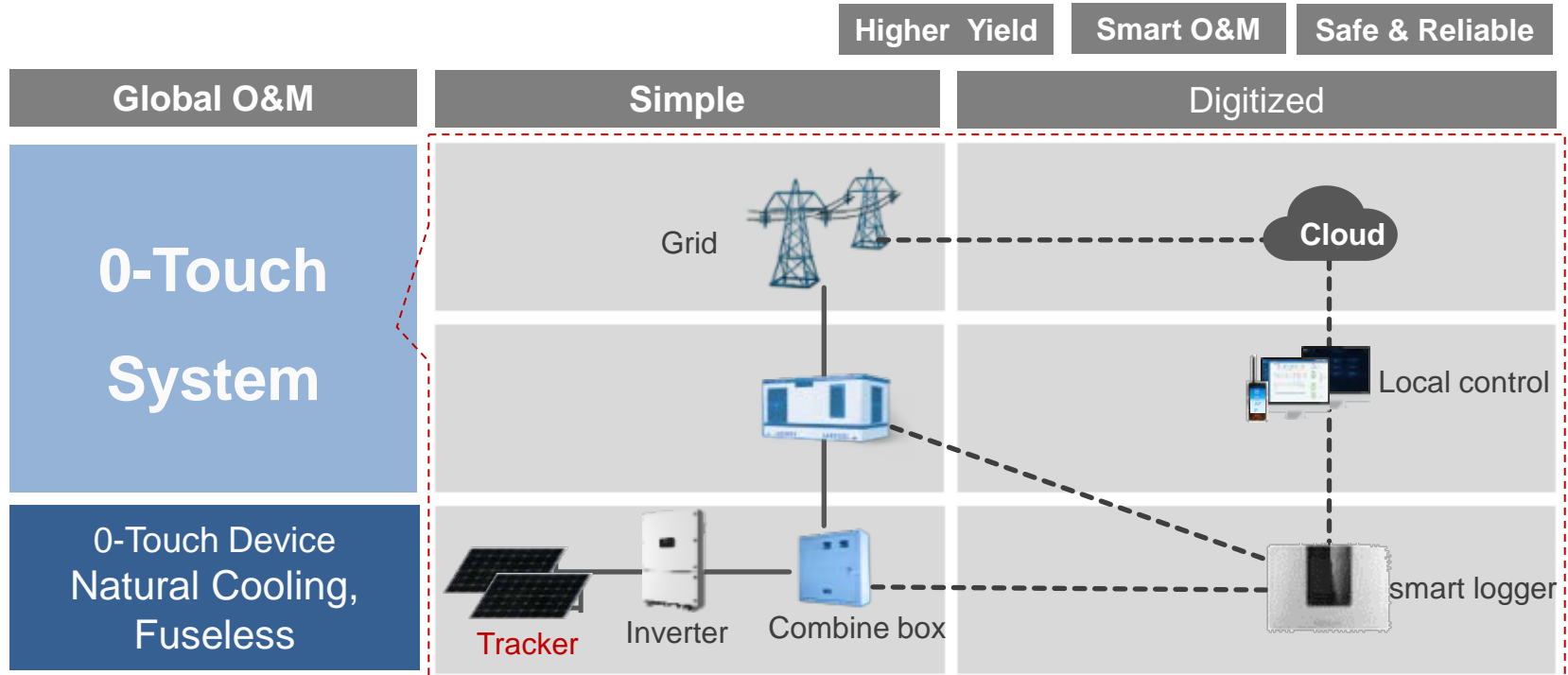
Intelligence tracking system integrate cloud computing, remote monitoring and smart control.



Global power plants centralized managements



# Digital O&M





# Perfect tracking service support

Site survey

Design

Delivery

Project  
management

O&M  
guidance





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**THANK YOU**

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[www.pvpowerway.com/en](http://www.pvpowerway.com/en)