

We provide products and services
for 1850MW solar plants
all over the world.

Design and Engineering Company
CDS SOLAR

10th
2008-2018

CDS SOLAR

A Design and Engineering Company

Branch & Email:

CDS-China	E-mail: cmo@cds-solar.com
CDS-EURO	E-mail: cds-euro@cds-solar.com
CDS-Africa	E-mail: cds-africa@cds-solar.com
CDS-Australia	E-mail: cds-australia@cds-solar.com

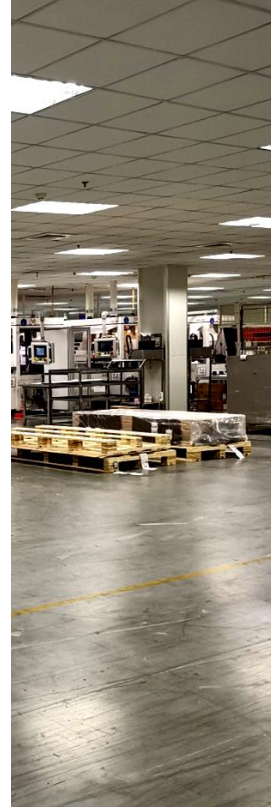


Products And Services

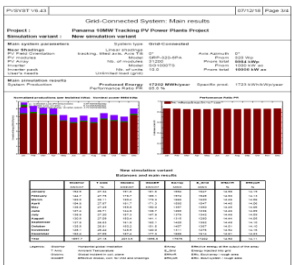
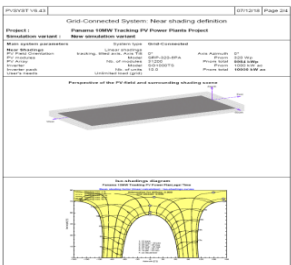
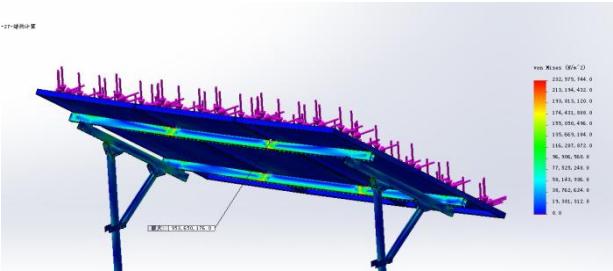
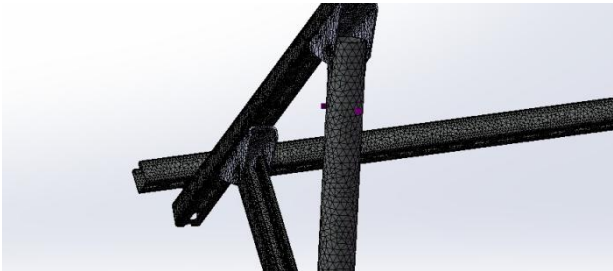
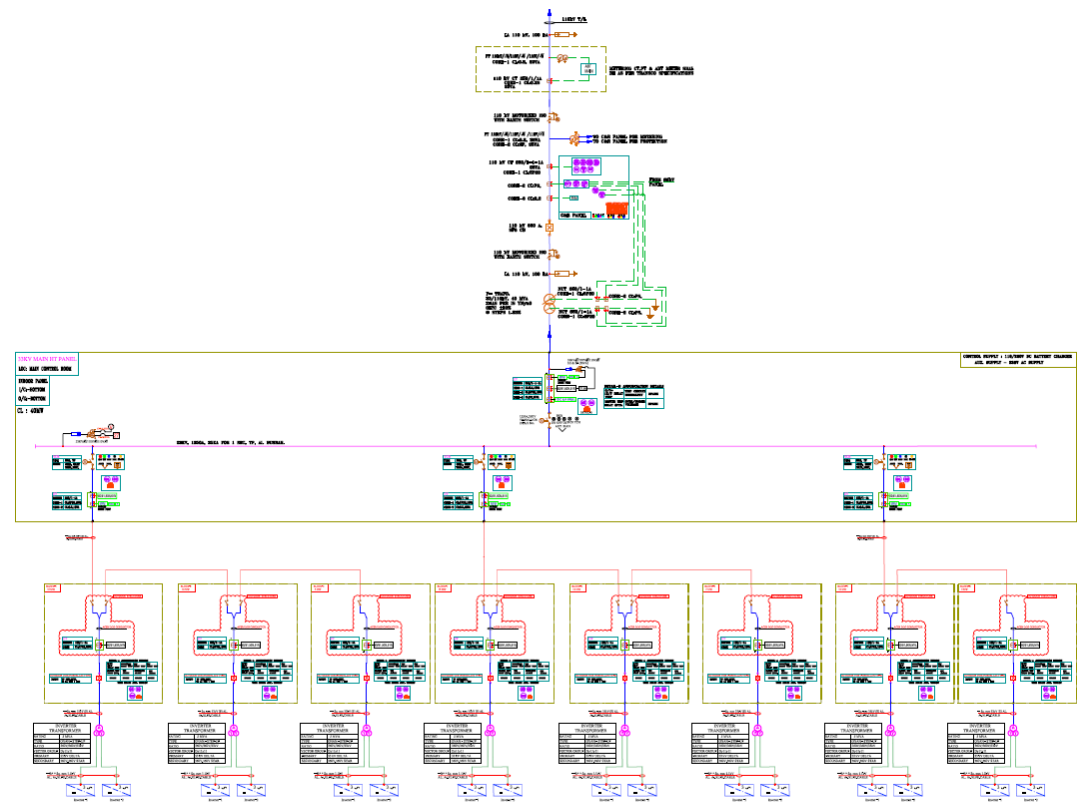
Products	Design	Project Management	Services
SunBox	Product Design	Project Management Consulting	Design Services
PowerBox	On Grid PV System Design	Construction Management	EPC Services
PowerStation	Off Grid PV System Design	Site Surveys	One-stop Solution Services
HZ-SC Tracker	PV Power Storage System Design	Cost Control & Planning	Turnkey Project Services
Power Plants Monitoring System	Solar Energy Analysis	Procurement	7*24h After Services
Intelligent O&M System	Structural Stress Analysis	Supply Chain Management	365days Online Services



80,000 m² Factory And Production Scale



Design & Analysis



Management & Services



EPC Projects



安徽六安舒城（山七镇俞河村）3.76MWp光伏扶贫并网发电项目



安徽六安舒城（千人桥镇）1.59MWp光伏扶贫并网发电项目



安徽六安舒城（沙棚镇余塘村）4.56MWp光伏扶贫并网发电项目

EPC Projects



内蒙古通辽科左中旗国电中兴30MWp地面光伏并网发电项目



安徽蒙城20MWp农光互补并网发电项目



安徽六安舒城(万佛湖镇羊山村)7.08MWp光伏扶贫并网发电项目



安徽六安舒城(万佛湖镇梅岭村)8.03MWp光伏扶贫并网发电项目



河北张家口张北20MWp地面光伏并网发电项目

Major Clients



Brand & Key Suppliers

OUR BRAND : CDS SOLAR

CDS SOLAR strive to build partnerships with our clients. We are committed to providing clients with best products and engineering solutions to maximize clients benefits.

CDS Brand Product : SunBox
CDS Brand Product : PowerBox
CDS Brand Product : PowerStation
CDS Brand Product : HZ-SC Solar Tracker
CDS Brand Product : Monitoring System



AGENT BRAND : SERAPHIM & HIGEE

Currently, Seraphim has a global production capacity of 4GW. Seraphim is a tier 1 solar module maker listed by BNFF.

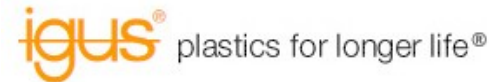
SERAPHIM Brand Product : Solar Module
SERAPHIM Brand Product : Solar Cell
HIGEE Brand Product: Lithium Battery



SUPPLIER BRAND : H-FANG & IGUS

H-Fang is slewing solutions world leader, committed to providing high quality products to the global marketplace with both standard and custom solutions.

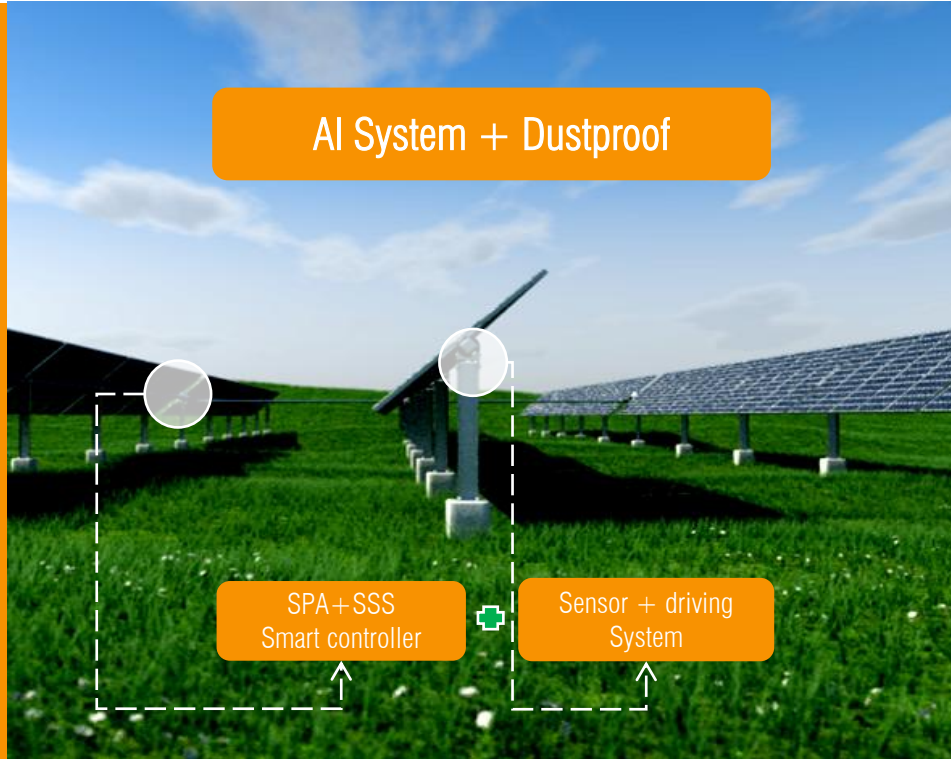
H-FANG Brand Product : Slewing Driver
IGUS Brand Product : Self-lubricating Bearing



CDS SOLAR Intelligent Solar Tracker

Advantage

1. Hardware innovation and artificial intelligence.
2. More stable, more intelligent.
3. Obtained 11 patents.



AI System Benefits

1. It can reduce the O&M workload up to 10%.
2. It can add 5% more power.

Dustproof Function Benefits

1. It can reduce the cost of PV module cleaning fee up to 40%.
2. It can save cleaning water up to 40%.

CDS SOLAR Intelligent Solar Tracker Benefits

Item	Intelligent Solar Tracker PV Power Plants	Traditional Solar Tracker PV Power Plants
Scale	10MWp	10MWp
Environment	Mild Contamination	Mild Contamination
Sunshine Duration	3800 hours	3800 hours
Dustproof Function	Yes	No
Facedown Time	4960 hours / years	0 hour / years
The Time Affected by Dust	3800 hours / years	8760 hours / years
Average Cleaning Interval	360 hours	360 hours
PV Module Cleaning Times	10.5 times / years	24.3 times / years
Cleaning Cost per 1 times	8,000 USD / times	8,000 USD / times
Cleaning Cost per Year	84,000 USD / years	194,400 USD / Years
25 Years Cleaning Cost	2,100,000 USD / Years	4,860,000 USD / Years

In a 25-years operating period, the intelligent solar tracker can **save 2.76 million cleaning cost** over a conventional solar tracker.

CDS SOLAR Energy Storage System

Perfect Design

- All in one design
- Plug and play

High Safety

- Higher standards
- Multi-protection

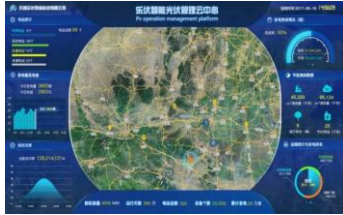
Long Life

- Cycle life up to 5000
- Intelligent management



CDS SOLAR Monitoring and O&M System

Based on the IoT (Internet of Things) technology , we can achieve the perfect combination of the on-line remote monitoring & fault diagnosis and off-line operation & management.



Intelligent O&M Centralized Monitoring Center

Power station statistics
Group management
Target management
Decision View



The Intelligent O&M Version for PC

Date analyse
Fault diagnose
Loss statistic



The Intelligent O&M on stations level for PC

Work order mangement
Operation mangement
Stock mangement
Record mangement



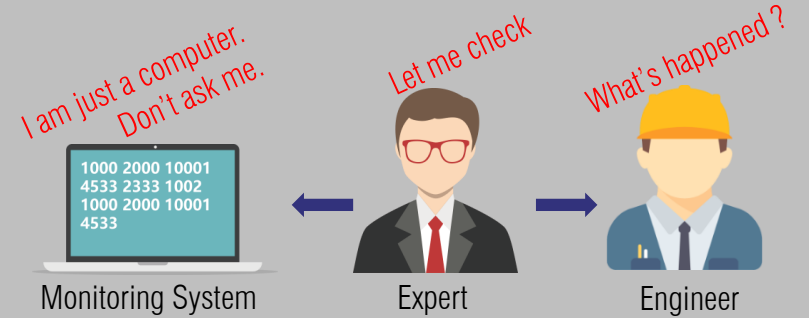
Phone APP

Work order receive
Fault processing
Work order feedback

CDS SOLAR Smart O&M System

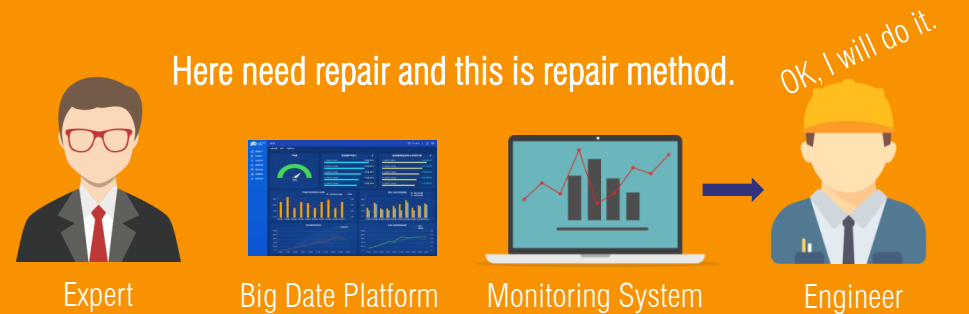
Characteristics of Traditional O&M:

1. Local monitoring, human brain analysis.
2. Passive Maintenance & Waste time.
3. High O&M cost & Low efficiency.
4. Need 7 persons in 10MW PV Power Plants.



Characteristics of Intelligent O&M:

1. Internet cloud monitoring and Big Data Analysis.
2. Real-time alarm and solve & Save time.
3. Save O&M cost up to 30% .
4. Just 2 or 3 persons in 10MW PV Power Plants.



CDS SOLAR Intelligent O&M System Benefits

Item	Intelligent O&M System PV Power Plants	Traditional Monitoring System PV Power Plants
Scale	10MWp	10MWp
Number of O&M Engineer	3	7
Engineer's Salary per Year	50,000 USD / year	50,000 USD /year
O&M Team Salary per Year	150,000 USD / Year	350,000 USD / Year
Mean-Time-To-Repair	8 hours	24 hours
Big Data Analysis	Yes	No
Fault Early Warning	Yes	No
Potential Fault Detection Mode	Automatic	Manual
25 Years O&M Team Salary	3,750,000 USD	8,750,000 USD

In a 25-years operating period, the intelligent O&M system can **save 5 million O&M cost over a conventional monitoring system .**

Warranty

Item & Name	Warranty	Design Life
Solar Tracker & Fixed PV Bracket	10 years on structural components, 5 years on drive and control systems.	25 years
Power Converter	1 year	10 years
PV Inverter	5 years	10 years
Container System	1 year	25 years
PV Module	10 years	25 years
Lithium Iron Phosphate Battery	Cycle life 5000 times(90%DOD,25℃) or 5 years	10 years
Power Cables	1 year	30 years

Quality & Certificate

ZERTIFIKAT • CERTIFICATE • СЕРТИФИКАТ • CERTIFICADO • CERTIFICAT

CERTIFICATE

No. Z2 16 11 76729 058



Holder of Certificate: Seraphim Solar System Co., Ltd.

No. 1-2, Hengyao Rd, Henglin Zhen
Wujin District
213101 Changzhou
PEOPLE'S REPUBLIC OF CHINA



Certification Mark:



Product: Crystalline Silicon Terrestrial Photovoltaic (PV) Modules
Poly-Crystalline Silicon Photovoltaic Module

The product was tested on a voluntary basis and complies with the essential requirements. The certification mark shown above can be affixed on the product. It is not permitted to alter the certification mark in any way. In addition the certification holder must not transfer the certificate to third parties. See also notes overleaf.

Test report no.: 704061604909-02

Valid until: 2021-11-07



Date: 2016-11-09
Page 1 of 2

(Zhulin Zhang)

[Signature]

TÜV SÜD Product Service GmbH · Zertifizierungsstelle · Rüdigerstraße 65 · 80339 München · Germany

TÜV®

MANAGEMENT SYSTEM

ISO 9001: Quality management system
ISO 14001: Standard for environmental management system
OHSAS 18001: International standard for occupational health and safety assessment system

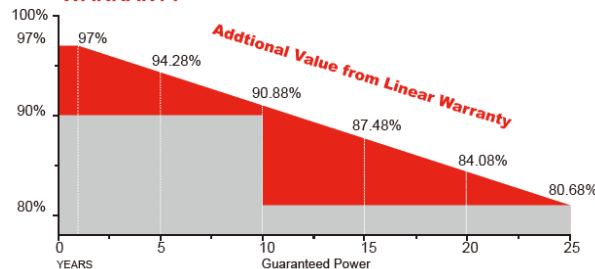
INSURANCE



PRODUCT CERTIFICATES



WARRANTY



Guarantee on product material and workmanship



linear power output warranty

4.1 / 10.1

ZERTIFIKAT • CERTIFICATE • СЕРТИФИКАТ • CERTIFICADO • CERTIFICAT

CERTIFICATE

No. Z2 17 04 76729 066



Holder of Certificate: Seraphim Solar System Co., Ltd.

No. 1-2, Hengyao Rd, Henglin Zhen
Wujin District
213101 Changzhou
PEOPLE'S REPUBLIC OF CHINA



Certification Mark:



Product: Crystalline Silicon Terrestrial Photovoltaic (PV) Modules
Mono-Crystalline Silicon Photovoltaic Module

The product was tested on a voluntary basis and complies with the essential requirements. The certification mark shown above can be affixed on the product. It is not permitted to alter the certification mark in any way. In addition the certification holder must not transfer the certificate to third parties. See also notes overleaf.

Test report no.: 704061604908-02

Valid until: 2022-04-26



Date: 2017-04-27
Page 1 of 4

(Zhulin Zhang)

[Signature]

TÜV SÜD Product Service GmbH · Zertifizierungsstelle · Rüdigerstraße 65 · 80339 München · Germany

TÜV®

CERTIFICATE OF COMPLIANCE

Certificate Number: 20190108-MH63242
Report Reference: MH63242-20181221
Issue Date: 2019-JANUARY-08

Issued to: Jiangsu Hige New Energy Co., Ltd.
NO.55,Jianshe Road,Yunting Town
Jiangyin
Jiangsu 214400, CHINA

This certificate confirms that
representative samples of
COMPONENT - BATTERY CELLS FOR USE IN
STATIONARY AND/OR TRANSPORT APPLICATIONS
Lithium Iron Cells, Model LFP48173170E-120Ah

Have been investigated by UL in accordance with the
component requirements in the Standard(s) indicated on
this Certificate. UL Recognized components are incomplete
in certain constructional features or restricted in
performance capabilities and are intended for installation in
complete equipment submitted for investigation to UL LLC.

Standard(s) for Safety: ANSI/UL 1973, Batteries for Use in Stationary, Vehicle
Auxiliary Power and Light Electric Rail (LER) Applications.
Additional Information: See the UL Online Certifications Directory at
<https://q.ulprospector.com/> for additional information.

This Certificate of Compliance does not provide authorization to apply the UL Recognized Component Mark. Only the
UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Recognized Component Mark should be considered as being UL Certified
and covered under UL's Follow-Up Services.

Look for the UL Recognized Component Mark on the product.

Barry

Barry M. Mendenhall, Director, North American Certification Programs
UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please
contact a world's Customer Service Representative at ul@ulprospector.com



Lithium ion Battery Safety Data Sheet

According to Regulation (EU) 2016/800 (REACH Annex II)



SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product Identifier	
Product form	: Article
Trade name	: Lithium Ion Battery
Product model	: LFP48173170E-120Ah
1.2. Relevant identified uses of the substance or mixture and uses advised against	
1.2.1. Relevant identified uses	
Main use category	: No information available
1.2.2. Uses advised against	
Restrictions on use	: No information available
1.3. Details of the supplier of the safety data sheet	
Supplier	: Jiangsu Hige New Energy Co., Ltd
Address	: NO.55, Jianshe Road, Yunting Town, Jiangyin, Jiangsu Province, China
Zip Code	: 214400
Phone	: 0510-88012065
Fax	: 0510-88013020
E-mail	: xia@hige.com
1.4. Emergency telephone number	
	: +86-13914286740

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture	
Classification according to Regulation (EC) No. 1272/2008 [CLP]	
Not classified	
Adverse physicochemical, human health and environmental effects	
To our knowledge, this product does not present any particular risk, provided it is handled in accordance with good occupational hygiene and safety practice.	
2.2. Label elements	
Labeling according to Regulation (EC) No. 1272/2008 [CLP]	
No labeling applicable	
Hazard pictograms (CLP)	: None
Signal word (CLP)	: None
Hazard statements (CLP)	: Not applicable
Precautionary statements (CLP)	: Not applicable
EU Specific Hazard Statements	: None
2.3. Other hazards	
No additional information available	

This technical report may only be quoted in full. Any use for advertising purposes must be granted in writing. This report is the result of a single
examination of the object in question and is not generally applicable evaluation of the quality of other products in regular production.

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
TÜV SÜD Group
8/F, Communication Building, 163 Pingyuan Rd, Huangpu West Ave.
Guangzhou 510656, P.R. China
Tel.: +86 20 3832 0668, Fax: +86 20 3832 0476

Technical Report No.: 64.280.18.00442.01
Engineer: Kevin Zhang
2018-03-02
Page 1 of 15

Technical Report No.技术报告编号: 64.280.18.00442.01

Rev.版本号: 00
Dated日期: 2018-03-23

Client: Name名称: Jiangsu Hige New Energy Co., Ltd. 江苏海基新能源股份有限公司
Address地址: No.55, Jianshe Road, Yunting Town, Jiangyin, Jiangsu Province,
PEOPLE'S REPUBLIC OF CHINA. 江阴市云亭街道建设路55号
Contact person联系人: Xu Qin 徐琴

Manufacturer: Name名称: Jiangsu Hige New Energy Co., Ltd. 江苏海基新能源股份有限公司
Address地址: No.55, Jianshe Road, Yunting Town, Jiangyin, Jiangsu Province,
PEOPLE'S REPUBLIC OF CHINA. 江阴市云亭街道建设路55号

Factory: Name名称: Jiangsu Hige New Energy Co., Ltd. 江苏海基新能源股份有限公司
Address地址: No.55, Jianshe Road, Yunting Town, Jiangyin, Jiangsu Province,
PEOPLE'S REPUBLIC OF CHINA. 江阴市云亭街道建设路55号

Test subject: Product 产品名称: Lithium ion battery
Type 型号: LFP48173170E
Trademark 商标: N/A

Test specification: ST/SG/AC.10/11/Rev.6-2015 Recommendations on the
Test标准: Transport of Dangerous Goods / Manual of Test and Criteria / Part III,
Subsection 38.3

ST/SG/AC.10/11/Rev.6-2015联合国《关于危险货物运输的建议书试验和标准
手册》第三部分, 38.3标准要求

Purpose of exam- Test according to the test specification.
ination: 测试目的: 按照测试要求进行测试

Test result: The test results show that the presented product is in compliance with the
测试结果: specified requirement.
测试标准: 测试标准: 产品符合标准要求

Remark: The Chinese contents in this report are only for reference.
备注: 本报告中文内容仅供参考

This technical report may only be quoted in full. Any use for advertising purposes must be granted in writing. This report is the
result of a single examination of the object in question and is not generally applicable evaluation of the quality of other products in
regular production.

TEL: 020-3832 0668 FAX: 020-3832 0476



Safenet Limited

Denford Garage, Denford, Kettering, Northants., NN14 4EQ, U.K.

Tel: +44 1832 732 174

e-mail: office@safenet.co.uk

Website: www.safenet.co.uk

European Notified Body 1674

EU Type Examination Certificate

This is to certify that

Dalian CDS Solar Energy Technology Co., Ltd.

Room 207, Huangpu Road No. 720, High-tech Zone, Dalian, Liaoning, China

Has had a range of Power Boxes examined with regards to the Electromagnetic Compatibility Directive 2014/30/EU.

With reference to model **CDS-P-46H1-B111-B**

Manufactured by:

Dalian CDS Solar Energy Technology Co., Ltd.

Room 207, Huangpu Road No. 720, High-tech Zone, Dalian, Liaoning, China

- The technical construction file contains all the relevant information.
- Having verified that the appropriate tests have been conducted, with regard to the CDS-P-46H1-B111-B representing the range.
 - The example has been manufactured in accordance with the technical construction file and may be used under the intended conditions.
 - The standards and transposed standards as the case may be, have been applied correctly.
 - The example has conformity with the protection requirements of Electromagnetic Compatibility Directive 2014/30/EU.
- The technical file contains all the information required to include the following models CDS-P-46H1-B111-B, CDS-P-36H1-B111-A, CDS-P-36F1-B111-A, CDS-P-15D1-B113-A, CDS-P-15C1-B113-A, CDS-P-05B1-B114-A and CDS-P-05A1-B114-A.

Certificate Number: 5411110516

Date: 19/05/2016

Signed for Safenet Limited

Peter McNicol

Peter McNicol
Technical Manager



EMC
Directive
Number
1674

This Document remains the property of Safenet Ltd and will be returned to them if so requested. Safenet will review the continued compliance of the machinery on a 5 yearly cycle to check for changes in the state of the art.



Safenet Limited

Denford Garage, Denford, Kettering, Northants, NN14 4EQ, U.K.

Tel: +44 1832 732 174

e-mail: office@safenet.co.uk

Website: www.safenet.co.uk

Certificate of Conformity

This is to certify that

Dalian CDS Solar Energy Technology Co., Ltd.

Room 207, Huangpu Road No. 720, High-tech Zone, Dalian, Liaoning, China

Has had a range of Power Boxes examined with regards to the Low Voltage Directive 2014/35/EU.

With reference to model **CDS-P-46H1-B111-B**

Manufactured by:

Dalian CDS Solar Energy Technology Co., Ltd.

Room 207, Huangpu Road No. 720, High-tech Zone, Dalian, Liaoning, China

- The technical documentation supplied contains all the relevant information.
- Having verified that the appropriate tests have been conducted, with regard to the CDS-P-46H1-B111-B representing the range.
 - The example has been manufactured in accordance with the technical documentation and may be used under the intended conditions.
 - The standards and transposed standards as the case may be, have been applied correctly.
 - The example has conformity with the Principle Elements of Safety Objectives of the Low Voltage Directive, 2014/35/EU.
 - The technical documentation supplied contains all the information required to include the following models CDS-P-46H1-B111-B, CDS-P-36H1-B111-A, CDS-P-36F1-B111-A, CDS-P-15D1-B113-A, CDS-P-15C1-B113-A, CDS-P-05B1-B114-A and CDS-P-05A1-B114-A.

Certificate Number: 5412110516

Date: 19/05/2016

Signed for Safenet Limited

Peter McNicol

Peter McNicol
Technical Manager



This Document remains the property of Safenet Ltd and will be returned to them if so requested. Safenet will review the continued compliance of the machinery on a 5 yearly cycle to check for changes in the state of the art.

EC DECLARATION OF CONFORMITY



CE Cooperator Of Notified Bodies

EC DECLARATION OF CONFORMITY

Certificate : V170314001
No.

Applicant : DALIAN CDS SOLAR ENERGY TECHNOLOGY CO., LTD.

Address of Applicant : ROOM 207, HUANGPU ROAD NO. 720, HIGH-TECH ZONE, DALIAN, LIAONING, CHINA

Manufacturer : DALIAN CDS SOLAR ENERGY TECHNOLOGY CO., LTD.

Address of Manufacturer : ROOM 207, HUANGPU ROAD NO. 720, HIGH-TECH ZONE, DALIAN, LIAONING, CHINA

Product : POWER BOX
Description

Type and Model : CDS-P-46H1-B111-B, CDS-P-36H1-B111-A, CDS-P-36F1-B111-A, CDS-P-15D1-B113-A, CDS-P-15C1-B113-A, CDS-P-05B1-B114-A, CDS-P-05A1-B114-A

Reference N : VTS/17T1004R
o.

Directive(s) : 2011/65/EU

Date Of : MAR 14, 2017
Issuance

Note: This certificate is only valid for the equipment and configuration described, and in conjunction with the test data detailed above.

Chief Assessor:



RoHS

Shanghai VTS Testing & Technical Co., Ltd.
204, Building 17, Dalangwan Lane 958, Xinsong Road, Minhang District, Shanghai
T: +86-21-24201060 F: +86-21-24201063 E: info@ce1674.com

Organization Chart

Company Organization Chart

Chairman Daniel Zhou		
Senior Vice President Conny Andersson	Legal Affairs Eve Yu	Commercial Department Karida Yin
Chief Executive Officer Daniel Zhou		
Quality Assurance Jack Lu	Procurement Lora Sun	Project Management Allen Zhang
Chief Technical Officer Tommy Malm		Technical Director David Zou
EURO Market Director Amy Zhou	America Market Director Mark Jiang	Asia Market Director Sophie Li
Africa Market Director Mandy Yuan	Australia Market Director Cris Chen	O&M Service Director Jack Ruan

Project Organization Chart

Project Manager		Quality assurance/ Quality Control	
Safety			
Project Control		Technical Secretary	
Project Engineer		Procurement Coordinator	
		Construction Supervisor	



A Complete Workflow of PV Power Plants (PV Power Generation Area)

The First Stage	The Second Stage	The Third Stage
<ol style="list-style-type: none">1. Research the project topography.2. Research environmental conditions include transportation, material procurement, labor cost in the market, roads, domestic water electricity and so on.3. Research grid network structure and annual load, consumption load capacity.4. Research voltage level of access system, length of transmission line and local grid.	<ol style="list-style-type: none">1. Site mapping, geological exploration and demarcation, and get design requirements.2. General drawing of design and construction.3. Make professional drawings (structural design, civil engineering design, electrical design, etc.).4. Prepare product technical specification as the basis for equipment procurement.5. Sign technical agreements with suppliers.6. Technical communication with suppliers and drawing confirmation.7. Formulate the grid access system scheme.	<ol style="list-style-type: none">1. Procurement of equipment and raw materials.2. Construction of power generation area.<ol style="list-style-type: none">2.1. Foundation installation.2.2. Tracker installation.2.3. Installation of PV modules.2.4. Combiner box installation.2.5. Inverter installation, transformer installation.2.6. Debugging experiment of inverter, transformer, DC distribution cabinet, communication cabinet and so on.2.7. Electrical connection and cable laying.2.8. Welding of grounding system in power generation area and road construction in power generation area.3. Connect and test all equipment.4. Inspect the power station.

Analysis of Investment Pitfalls of PV Power Plants

A. Clients don't know the real profits model of PV Power Plant.

The Real Profits Model :

$$[\text{Profits}] = [(\text{Feed-in-Tariff of Solar Energy}) - (\text{LCOE of PV Power Plants})] * (\text{Total Power of PV Power Plants of 25 Years})$$

B. Clients ignore the LCOE. But LCOE is the key financial indicator for a PV Power Plants.

$$\text{LCOE} = \frac{\text{Equipments Cost} + \text{Construction Cost} + \text{O\&M Cost} + \text{Financing Cost} + \text{Management Cost} + \text{Others}}{\text{Total Generation Power of PV Power Plants of 25 Years}}$$

1. The higher the price of equipment, the higher the performance, the higher the power generation.
2. The lower the price of equipment, the lower the performance, the lower the power generation.
3. We should find a balance. Reduce investment while maximizing power generation.

C. Clients just care about the price but ignore the overall benefits.

Set a reasonable goals. Don't just focus on price but also on overall benefits. In this way, we can deal with project matters more rationally and comprehensively. Communication will also become efficient and direct.

How to ensure the benefits of PV Power Plants ?

A. Please select a professional partner to work with you together.

A good partner will provide you with professional consulting services. Partner will solve many professional problems for you. Partner will offer you the best solution.

B. Please let partner involved in work early when a project will start.

Because the PV power plants is very professional. PV power plants don't just install PV modules and inverters on the ground. The integration of PV power plants is very high. If the system matching is not reasonable, it will lead to disastrous results.

C. According to your financial ability to choose a reasonable construction scale of PV power plants.

Reasonable work goals must be achieved through hard work. Don't lower the requirement of product quality to meet an unreasonable goal. Low price can meet the budget target but it can't meet the profits target. As we all know, Low price always buy low quality products.



Mission

CDS Solar is a design and engineering company with specific expertise in green energy. We work to meet our clients expectations. We believe in technological innovation, quality and professional excellence.

Vision

To improve our skills and professional services, guaranteeing innovative and reliable solutions to our clients. Bring love and light to the world. To grow constantly by facing the ethical and technological challenges that the future holds for us.



Bring love and light to the world