



NEW ENERGY PROFESSIONAL  
TRANSFORMER MANUFACTURER



ENERGY STORAGE  
PHOTOVOLTAIC  
HYDROGEN

# SPECIALTY TRANSFORMER

ENERGY STORAGE INTEGRATION SERVICES



CEEG Transformer Co.,Ltd

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v. 2023.07



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# Company Profile

CEEG Transformer Co.,Ltd is a collection of amorphous alloy dry transformer, epoxy cast dry transformer and explosion-proof electrical products research and development, manufacturing, sales, technical services as one of the national high-tech enterprises. The company was formally established in 2006, located in Nanjing Economic and Technological Development Zone, with a modern plant of more than 40,000 square meters, with a full set of automatic cutting, vacuum impregnation, large CNC turning and milling, testing and other first-class transformer production and inspection equipment; Has reached the international advanced level of 20,000 square meters of transformer manufacturing workshop, with an annual output of 2.2 million kVA mine flameproof transformer production capacity, is one of the national amorphous alloy dry transformer, epoxy cast dry transformer, explosion-proof transformer R & D production base.

CEEG in the rapid development of the safe use of products as the primary index of research and development, since the product put on the market, with the scale, quality, service and other advantages quickly won the trust of the majority of users, products have been in Shenhua Group, Anhui Tongling Mining Group, Pingdingshan Coal Group, Jincheng Coal Group, Kailuan Group and other large coal industry groups safe operation. China Telecom, China Mobile, China Unicom, Huawei Technology, China Metallurgical Group, China Nuclear Group, Inner Mongolia First Machinery, Inner Mongolia Pingzhuang Energy, Jialing Motorcycle and many other well-known enterprises have formed a good partnership with our company.

On the basis of existing products, the company is also constantly developing new projects to enrich our product line. At present, the company is also developing isolation transformers, split transformers, energy storage transformers and other special transformers for large capacity and high voltage projects."

To build the industry's first brand" is our firm goal, "quality first, customer first" is the fundamental concept we believe in. In the future development, CEEG will be committed to the research and development of amorphous alloy products and explosion-proof electrical products, to provide safe, reliable, energy saving, environmental protection, stable equipment support, to provide users with value services.

## VISION

## CONTENTS

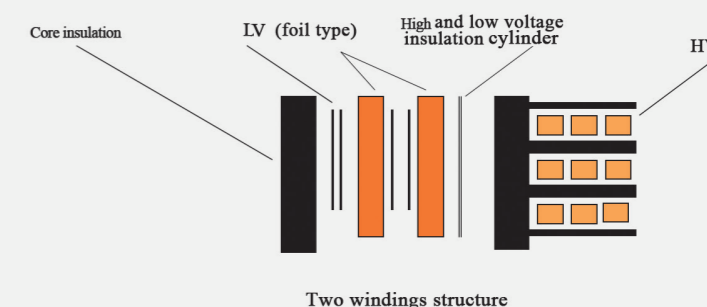
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## INNOVATION

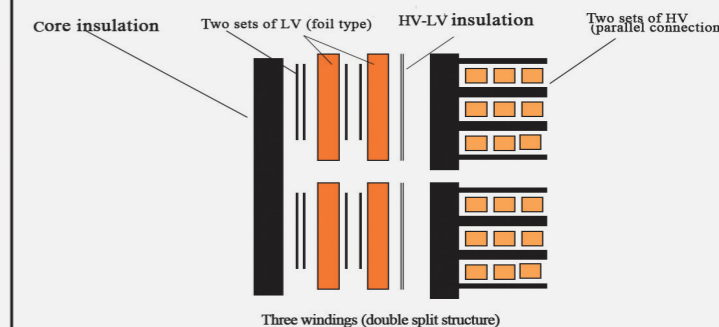
## Product Features:

- Low losses  
The no-load loss is 20% lower than the national standard, and the load loss is 10% lower. Meet national energy efficiency requirements.
- Low noise, low partial discharge  
The noise level is 10 dB lower than the national standard. Partial discharge is less than 5pC.
- Three prevention methods  
Anti-moisture, anti-mould and salt fog resistance. It can operate normally under humidity of 98%. After shutdown, it can be put into operation without pre-drying, reducing maintenance time and costs.
- Executive standards  
GB/T 1094.1 Power Transformers Part 1 General  
GB/T 1094.3 Power transformers Part 3 Insulation levels, insulation tests, and external insulation air gaps  
GB/T 1094.5 Power transformers Part 5 Ability to withstand short circuits  
GB/T 1094.11 Power Transformers Part 11 Dry type transformer  
GB/T 10228 Technical parameters and requirements for dry type power transformers  
GB 20052 Minimum allowable values of energy efficiency and the energy efficiency grades for power transformers

### Structure 1



### Structure 2



### Technical Parameter:

1. Product capacity: 1000~7500 kVA
2. High voltage: 6~35kV
3. Low voltage: 0.315、0.4、0.55、0.63、0.69、0.72、0.8、1.14kV(or according to customer needs)
4. Impedance voltage: 6%、6.5%、7%、8%
5. Frequency: 50/60 Hz
6. Connection group: Dy11、Yd11、Dy11y11、Yd11d11
7. Main structure of transformer: two windings or three windings (split type)

## Energy storage specialty dry type transformer

Developed and produced with advanced technology, the specialty dry type transformer for energy storage system has very reliable quality and high cost-effectiveness.

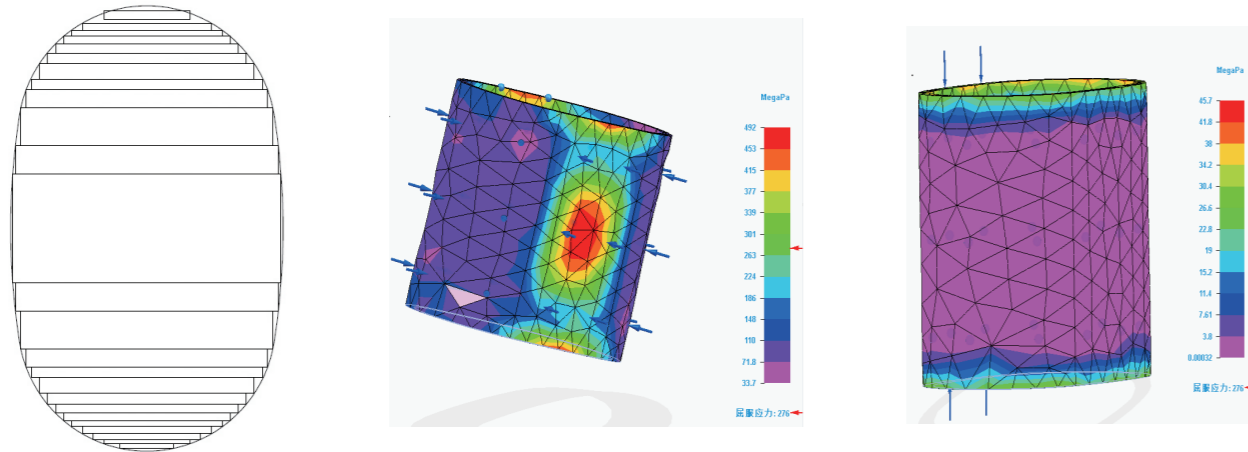
Application: wind, photovoltaic, flywheel, gravity, air energy storage, and pumped storage specialty transformers up to 35kV.



# Energy storage specialty oil-immersed transformer

## Structural advantages:

1. The transformer adopts an elliptical shaped iron core section. It is more compact and has significantly improved resistance to sudden short circuits compared to traditional long circular structures. This transformer has passed the short-circuit resistance test in STRI.



2. The transformer uses high-density laminated wood as core clamps, making the structure more compact. Meanwhile it has inhibitory effect on the stray loss caused by the leakage magnetic field.



traditional structure

wood clamps structure

3. Through changing the location of the active parts and the installation method of the switch, we change the HV outlet to non-hand hole structure. It reduces the potential issue of oil leakage.



hand hole structure

non-hand hole structure

## Quality control advantages:

1. The design of transformer fully consider the loss of harmonic current, avoids the temperature rise of the top oil and winding exceeding the limit value. At the same time, it considers the capacity increase demand caused by harmonic current to ensure the service life of the transformer;

2. Random inspection 10% ( $\geq 1$  unit) products of the same model batch for impulse test and temperature rise test, further ensuring the electrical and mechanical performance of the products;

3. The national standard GB/T 1094.3 does not stipulate partial discharge test for 35kV oil immersed power transformer. From the perspective of product quality, CEEG has increased examine level. We conduct partial discharge tests on each new energy transformer in accordance with the testing method of GB/T 7354. In order to ensure that the partial discharge level under  $1.2U_r$  is not more than 50pC, and the partial discharge level under  $1.4U_r$  is not more than 100pC ( $U_r$  is the rated voltage of the transformer)(as shown in the figure below);

4. Executive standards

GB/T 1094.1 Power Transformers Part 1 General

GB/T 1094.3 Power Transformers Part 3 Insulation levels, insulation tests, and external insulation air clearances

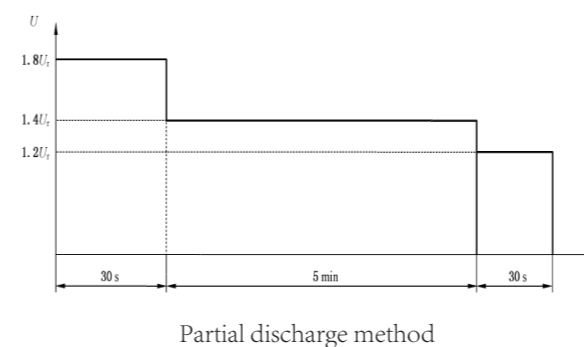
GB/T 1094.5 Power Transformers Part 5 Ability to withstand short circuits

GB/T 1094.16 Power Transformers Part 16 Transformers for Wind Power Generation

GB/T 6451 Technical parameters and requirements for oil-immersed power transformers

GB20052 Energy Efficiency Limits and Energy Efficiency Grades for Power Transformers

IEC60076-20 Power transformers Part 20 Energy efficiency



Partial discharge method



## Hydrogen specialty transformer



The hydrogen production rectifier transformer produced by CEEG can improve the efficiency of electrolytic water, reduces comprehensive power consumption, and improves operational reliability. All performance indicators meet and exceed the latest standards.

Three main application scenarios of hydrogen production rectifier transformer:

1. multi-pulse three-phase bridge thyristor rectifier system,
2. three-phase bridge diode rectifier+IGBT chopping system,
3. three-phase bridge PWM rectifier+DC/DC chopping system.

## Oil-immersed transformer core technology:

According to GB/Z 1094.14 Power Transformers Part 14, use hybrid insulation system with three different insulation classes --class C (220°C) and class B (130°C), class A (105°C). Effectively solve the problem of temperature field differences in different types of oil-immersed hydrogen production rectifier transformers. Ensure the safety and reliability of the insulation system.

**DuPont™ Nomex®**  
Insulation Systems

**DuPont Nomex® Insulation System**  
*World recognized high quality electrical insulating materials*

- Chemical - there is no weak C-H bond, with good chemical stability.
- Heat resistance: long term stable operation at 220°C; Short term operation at 350°C; At 250°C, it will not melt, flow and support combustion; No toxic or corrosive gas will be released at 750°C.
- Safety, environmental protection - no toxic reaction to people and animals; the smoke concentration is low and no harmful gas is produced during burning.


**7** *seven-stage temperature control technology*

- Insulation temperature control technology
- Temperature control technology of liquid flow duct
- Overload temperature control technology
- Iron core temperature control technology
- Sealed temperature control technology
- Component temperature control technology
- Short circuit temperature control technology


## Dry type transformer core technology:

1. The dry type rectifier transformer used for hydrogen production power supply has a multi pulse output, which can meet the needs of secondary equipment for stable DC power supply;
2. The transformer adopts a wide range linear magnetic flux voltage regulation technology, ensuring that the input voltage remains unchanged and achieving linear adjustment of the secondary output voltage, meeting the needs of the equipment for voltage changes;
3. The input winding adopts a fully symmetrical parallel structure with upper and lower parts, and adopts a synchronous adjustment method of on load (non excitation) switches to avoid the generation of circulating currents. The two sets of output windings adopt different connection groups (d/y), which can eliminate the influence of high order harmonics on multiple power grids, achieve consistent phase lag in each phase, and stabilize the DC waveform after multi pulse rectification;


## Product features:




**High temperature resistance:** It has achieved industry-leading level, based on DuPont's Nomex® insulation system and 7-stage temperature control technology



**Maintenance-free:** Adopt 7-stage temperature control technology and reasonably selecting matching accessories. Transformers' use life can be 30 years




**High overload:** The load capacity is 20% higher than that of conventional products




**No leakage:** All sealing components are made of acrylic ester. Fluorescence, positive pressure and negative pressure leak tests are used to ensure that there is no leakage when the transformer is working







**Low noise:** The noise is 3-10 dB lower than the GB standard;



**Variety:** The product portfolio is complete, fully covering the design and production of all types of rectifier transformers in the hydrogen production field



**Customized:** Can be designed according to customer specific requirements



**Authoritative certification:** Achieved the authoritative certification of the National Electrical Product Quality Supervision and Inspection Center;

## Energy storage integration services

CEEG is a professional energy storage system integrator. From the power generation side, grid side to the user side, CEEG provides customers with complete system solutions including demand analysis, scheme design, system integration, installation, inspection. Have multiple modern integrated production lines. The construction of each production line can be simultaneous. Delivery quantity can reach 300 units per month.

### Step-up substation integrated with converter features:



#### Turn-key solution

Integrate photovoltaic inverter, transformer and switchgear. Conduct overall commissioning before delivery, saving time for installation and joint commissioning.



#### Strong environmental adaptability

Strong corrosion resistance, can up to C5. Customize HVAC solutions based on on-site environment.



#### Strong overload capacity

Have 115% long-term overload capacity.



#### Flexible and diversified product solutions

Designed according the actual needs of customers and provide customers with satisfactory solutions.

## Air cooled energy storage system



Characteristics and advantages:

1. High security;
2. Advanced thermal management technology;
3. High rate discharge;
4. Standardized modules.



Innovation points:

1. The interior of the battery compartment is designed with dedicated cooling air;
2. Integrated fire protection system;
3. Integrate all internal equipment connection cable channels;
4. The PCS air duct is led out, easy for installation;
5. Highly integrated monitoring system, intelligent monitoring of major equipment such as inverters, batteries, fire protection systems, and air cooling systems, and unified external communication.

## Liquid cooled energy storage system



Characteristics and advantages: PACK immersive fire protection, high-speed dispatch response, intelligent battery health management, flexible deployment.



Innovation points:

1. Battery liquid cooling system;
2. Integrate all internal equipment connection cable channels;
3. High-strength battery installation bracket, battery clusters modular installation;
4. Highly integrated monitoring system, intelligent monitoring of major equipment such as inverters, batteries, fire protection systems, and air cooling systems, and unified external communication.



## Classic performance



Ningxia Muhe 200MW/400MWh Energy Storage Project  
SC(B)-3450/38.5kV Cast Resin Dry Type Transformer



Zhada 20MW PV Energy Storage Project (The altitude is 3800 m)  
SC(B)-2300/36.5kV Cast Resin Dry Type Transformer



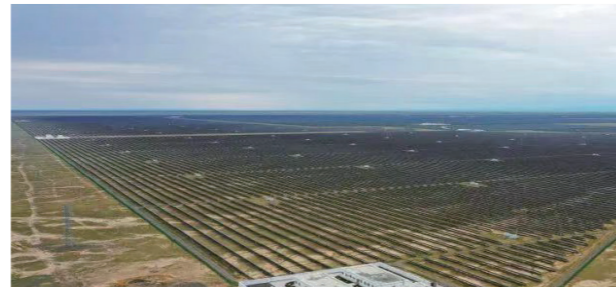
Gansu Minqin 42MW/84MWh PV Energy Storage Project  
SC(B)-2500/35kV Cast Resin Dry Type Transformer



Shanxi Yangquan Liquid Cooling 50MW Energy Storage Project  
SC(B)-4200/35kV Cast Resin Dry Type Transformer



Houma 200MW Energy Storage Project  
SC(B)-3600/35kV Cast Resin Dry Type Transformer



Xinjiang Mulei 125MW Energy Storage Project  
SC(B)-2800/37kV Cast Resin Dry Type Transformer



Ordos Hydrogen Project  
ZHS-12000/10kV Oil-immersed Rectifier Transformer



Canada 1000m³ Hydrogen Project  
ZHSZCB-5800/35kV Hydrogen Production Dry Type Rectifier Transformer



Tancheng 101MW/204MWh Energy Storage Project  
SC(B)-3750/37kV Cast Resin Dry Type Transformer



Jiuquan Suzhou 100MW Energy Storage Project  
S-3450/37kV Oil-immersed Transformer



Xinyi Hydrogen Project  
ZSCB-6535/10kV Dry Type Rectifier Transformer



Jilin Pumped-storage Project  
SCB-2000/10kV Cast Resin Dry Type Transformer



Xinjiang Lixin 37.5MW/150MWh Energy Storage Project  
SC(B)-2750/37kV Cast Resin Dry Type Transformer



Hubei Gaoqiao 50MW/100MWh Energy Storage Project  
SC(B)-3450/10kV Cast Resin Dry Type Transformer



Changjiu new materials Pumped-storage Project  
KSG-1000/10kV Mining Dry Type Transformer



Inner Mongolia Zhirui Pumped-storage Project  
SB-400/10kV Pad-mounted Transformer

# Honorary qualifications



Jiangsu Private Science & Technology Enterprise



Jiangsu Engineering Research Center for Power Transformation Equipment



实验室名称: 苏州电器科学研究院股份有限公司  
国家电器产品质量检验检测中心  
Lab Name: Suzhou Electrical Apparatus Science Research Institute Co., Ltd.  
China National Center for Quality Inspection and Test of Electrical Apparatus Products

## 检验 (试验) 报告 Test Report

委托单位: 中电变压器股份有限公司  
Client: 中电变压器股份有限公司  
产品名称: 24脉波平式整流变压器  
Name of Product: ZSCB10-1250/6.3  
产品型号: ZSCB10-1250/6.3  
Product Type: 委托试验  
Test Category:

本实验室对出具的检验 (试验) 结果负责, 未经实验室书面同意, 不得部分地复制本报告。

The laboratory is responsible for the inspection (Test) results. The report shall not be reproduced except in full, written approval of the laboratory.



实验室名称: 苏州电器科学研究院股份有限公司  
国家电器产品质量检验检测中心  
Lab Name: Suzhou Electrical Apparatus Science Research Institute Co., Ltd.  
China National Center for Quality Inspection and Test of Electrical Apparatus Products

## 型式试验报告 Type Test Report

委托单位: 中电变压器股份有限公司  
Client: 中电变压器股份有限公司  
产品名称: 高压/低压预装式变电站  
Name of Product: YBQ-12/0.4-2500  
产品型号: YBQ-12/0.4-2500  
Product Type: 型式试验  
Test Category:

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实验室名称: 国家电器产品质量监督检验中心  
Lab Name: China National Center for Quality Supervision and Test of Electrical Apparatus Products

## 型式试验报告 Type Test Report

委托单位: 中电变压器股份有限公司  
Client: 中电变压器股份有限公司  
产品名称: 有载调压电力变压器  
Name of Product: SZ20-20000/35-XK2  
产品型号: SZ20-20000/35-XK2  
Product Type: 型式试验  
Test Category:

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## 型式试验报告 Type Test Report

No: ZXBXS20210037

产品名称: 非晶合金干式配电变压器  
Product Name: SCB10-2500/10-XX1  
规格型号: SCB10-2500/10-XX1  
Product Name: 中电变压器股份有限公司  
委托单位: 中电变压器股份有限公司  
Commission Unit: 型式试验  
检验检测类别: 型式试验  
Test Kind:

国家中低压配电设备质量监督检验中心  
China National Center for Quality Supervision and Test of Medium Voltage Distribution Equipment



## 型式试验报告 Type Test Report

No: ZXBXS20210036

产品名称: 干式电力变压器  
Product Name: SCB10-2500/10-XX1  
规格型号: SCB10-2500/10-XX1  
Product Name: 中电变压器股份有限公司  
委托单位: 中电变压器股份有限公司  
Commission Unit: 型式试验  
检验检测类别: 型式试验  
Test Kind:

国家中低压配电设备质量监督检验中心  
China National Center for Quality Supervision and Test of Medium Voltage Distribution Equipment



实验室名称: 苏州电器科学研究院股份有限公司  
国家电器产品质量检验检测中心  
Lab Name: Suzhou Electrical Apparatus Science Research Institute Co., Ltd.  
China National Center for Quality Inspection and Test of Electrical Apparatus Products

## 型式试验报告 Type Test Report

委托单位: 中电变压器股份有限公司  
Client: 中电变压器股份有限公司  
产品名称: 高压/低压预装式变电站  
Name of Product: YBQ-40.5/1.14-6600  
产品型号: YBQ-40.5/1.14-6600  
Product Type: 型式试验  
Test Category:

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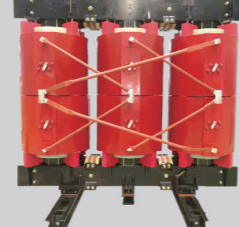
## Product family



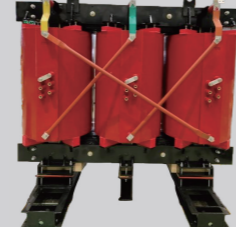
Energy Storage Dry Type Transformer



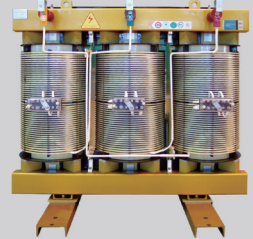
SC(B) Cast Resin Dry Type Transformer



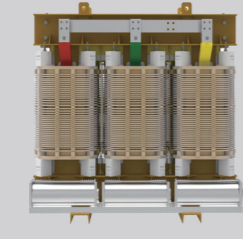
Rectifier Dry Type Transformer



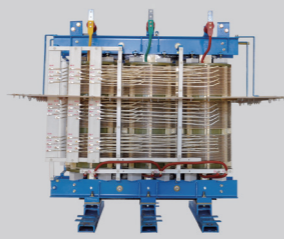
Shore Power System Isolation Transformer



SG(B) Ventilated Dry Type Transformer



Amorphous Alloy Dry Type Transformer



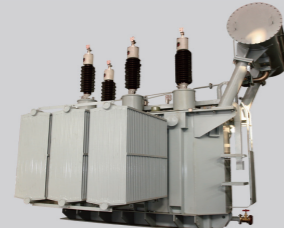
Variable Frequency Transformer



Marine Transformer



220kV Oil-immersed Transformer



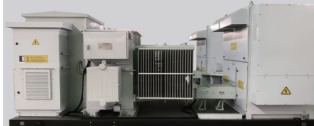
110kV High Temperature Resistant Oil-immersed Transformer



110kV Mobile Transformer



Energy Storage Oil-immersed Transformer



PV Energy Storage Substation



Energy Storage Substation



Hydrogen Production Rectifier Transformer



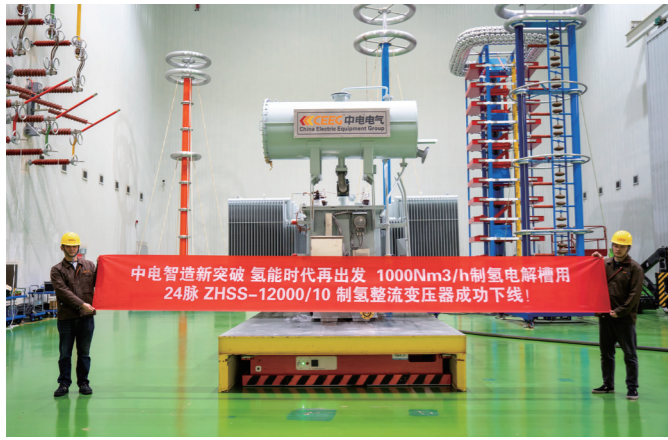
European Prefabricated Substation

## Service network & contact information

CEEG customer service hotline (025-52095855/15301592833) as information communication and customer response platforms. We promise to provide feedback on customer opinions and suggestions within 24 hours. For urgent requirements such as customer maintenance and installation guidance services, 24 after-sales outlets across the country will immediately provide support and response.



Tel: 025-52095855 / 15301592833



为世界输出优质动力

Delivering Premium Power To The World

