



Certificate No. 1322896



Certificate of Invention Patent

Title of the invention: Parallel DC system based on storage batteries

Inventor: Jin Lin, Liu Ping, Yang Zhongliang, Leng Xudong, Xie Shuigang

Patent No.: ZL 2010 1 0598584.9

Patent application date: December 21, 2010

Patent holder: Shenzhen Tieon Energy Technology Co., Ltd.

Date of patent statement: December 18th, 2013

This is to certify that we have conducted the inspection on this patent based on *Patent Law of the People's Republic of China* and decided to issue this patent certificate to it upon the satisfactory inspection results. This patent has been registered and granted; and the patent right comes into force from the date of patent statement.

This patent has the duration of **20** years since the application date. The patent holder shall pay the annual patent fee before December 21th of each year as per *Patent Law of the People's Republic of China* and its implement rules. This patent will end on the expiration date of the paid annual patent fee, if the patent holder fails to pay the fee as required.

This patent certificate records the legal status at patent registration. The transfer, pledge, invalidation, expiration, restitution of the patent right, as well as the change of patent holder's name, title, nationality, address shall be recorded on the patent register.



Director:



December 18th, 2013



No: JW140410



(2010)国认监认字(131)号



2010000605Z



检测
CNAS L0885

Inspection Report

Sample Model: PB22002

Sample Name: Power source module

Entrusted by: Shenzhen Tieon Energy Technology Co., Ltd.

Manufacturer: Shenzhen Tieon Energy Technology Co., Ltd.

Agent/Distributor: _____ / _____

Issue date: July 8th, 2014

State Relay Protection and Automatic Facility Quality Monitoring and Inspection Center



China Ketop

No: JW110584



Inspection Report

Sample Model: GQH-PB

Sample Name: Indirect Parallel Intelligent DC Power System

Entrusted by: Shenzhen Tieon Energy Technology Co., Ltd.

Power Module Manufacturer: Shenzhen Tieon Energy Technology Co., Ltd.

Accumulator Cell Manufacturer: Energys (China) Huada Power Supply System Co., Ltd.

Agent/Distributor: _____ / _____

Issue date: _____ August 26th, 2011



China Ketop
State Relay Protection and Automatic Facility Quality Monitoring and Inspection Center

Award Certificate

Award title: The Second Progress Prize of Electric Power Construction Technology in 2014

Achievement name: Study and Application of Parallel Intelligent DC Power System in Transformer Station

Awarded units: Electric Power R&D Institute of China Hubei

Hubei Electric Power Company of State Grid

Shenzhen Tieon Energy Technology Co., Ltd.

Certificate No. 2014-E-53

Members: Yang Bing, Liu Li, Lu Wanxin, Zeng Fanxing

Dong Yajun, Luo Zhijuan, Wu Dan, Yu Xiangkun

China Electric Power Construction Association
April, 2014



Review and Acceptance Opinion on

Parallel Intelligent DC Power System Project

On October 17th, 2013, Infrastructure Group of State Grid Corporation of China organized and held the review and acceptance meeting on the parallel intelligent DC power system project in Beijing, and conducted acceptance on the project of Study and Application of Parallel Intelligent DC Power System in Transformer Station undertaken by Hubei Power Grid Company. The present experts listened to the reports from the project team, and proposed the following opinions after discussion:

1. The acceptance documents delivered by the project team are complete and standard, conforming to the review and acceptance requirements.

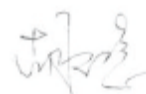
2. The Parallel Intelligent DC Power System Project replaces the conventional DC program of “charger + accumulator set + accumulator surveillance system”. This system can solve such problems existing in conventional parallel accumulator set as “the quality of the single unit affects the whole set’s quality”, “difficult maintenance in energized state”, “poor matching between new and old batteries”, through parallel redundancy system. This system can achieve the online capacity measurement and management in energized state, so as to realize safe maintenance, power-on replacement, which reduce the maintenance workload greatly, decrease energy consumption and maintenance costs, and enhance safety performance.

3. Deliver the study report of Parallel Intelligent DC Power System Project, application scope report, application report of lithium iron phosphate battery, calculation report of the system configuration and parameters, operation regulations, and technical and economic analysis data as per provisions of the Contract.

4. The study achievements of parallel intelligent DC power system were applied in 110V Chengdong transformer station, where the technical solution is available, and expected effects were achieved. This product is environmental friendly and energy saving, worth promotion in this field.

The expert team believes that the study report and achievements have fulfilled the tasks specified in the Contract, and agrees to accept this project.

Group Leader:



October 17th, 2013

Test Report

Report No. GY/DC-012-2012

Client: Shenzhen Tieon Energy Technology Co., Ltd.

Sample name: GQH-PB Indirect Parallel Intelligent DC Power System

(110v)

Test items: Performance parameters test

Test type: Entrust Sampling



North China Electric Power Research Institute

