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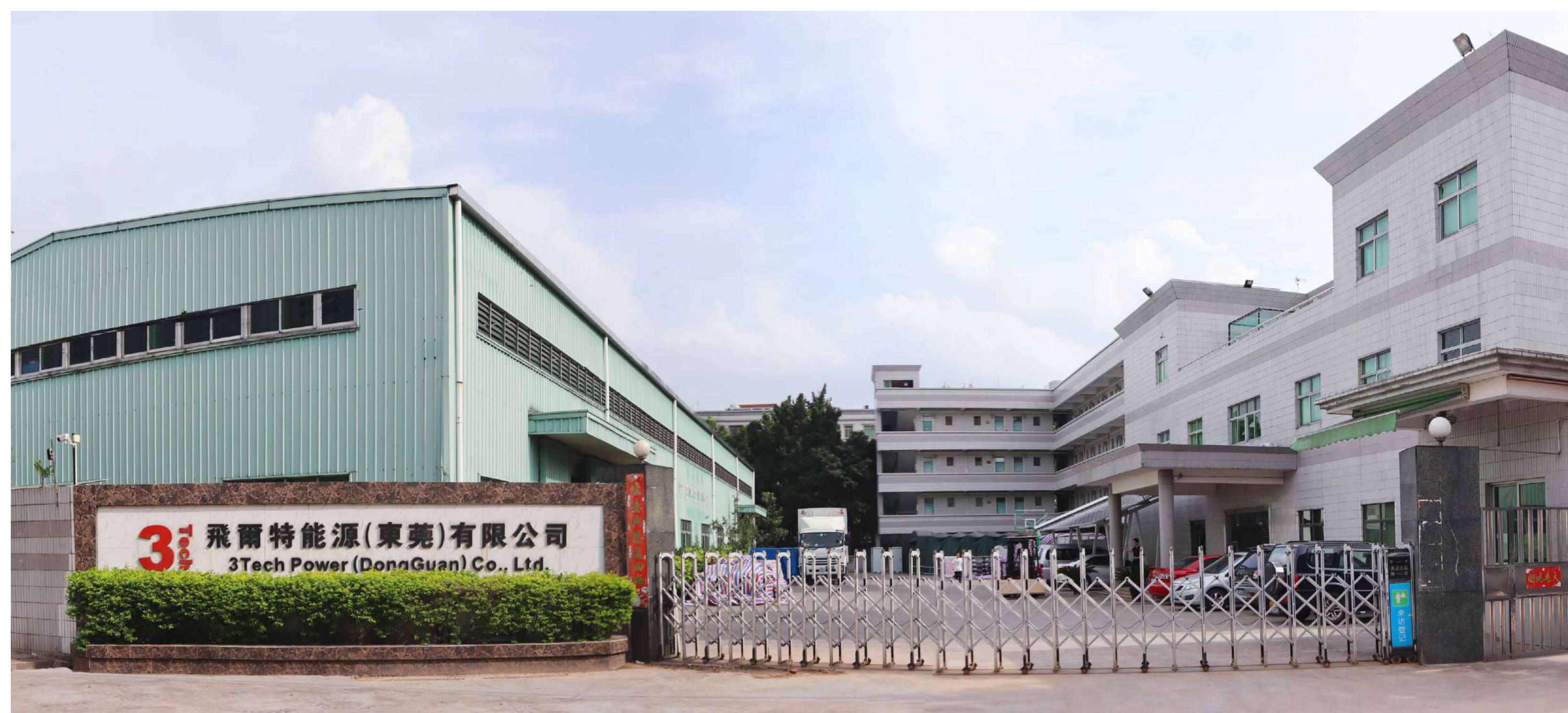
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Power • People





Our Mission

To be the most credible, world class quality and best value power solution provider in the globe.

Our Vision

To fascinate and attain customers with high-valued power solution products and E&M turnkey solutions and to achieve high customer satisfaction in the globe.

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Background

Established in Hong Kong in 1998, 3Tech specialised in standby diesel generator turnkey projects in Hong Kong and China. 3Tech later expanded into Hong Kong electrical and mechanical installation contracting business which demand highly qualified professional engineers to execute such projects. Moving into 21st century, 3Tech joined the worldwide mobile telecommunication revolution in developing countries by providing generator power package. The company continue to develop their own telecom power solution under LionRock brand name. Today, 3Tech offers full range of telecom power products to support 4G and 5G mobile power deployment.

Manufacturing Facilities

3Tech Power (Dongguan) Co., Ltd.

Located in Dongguan, the most developed manufacture and industrial area in China. Certified as High-Tech Enterprise, with a plant area of 12,000m², over 150 employees. Annual output over 5000 units.

Milestone

1998

3Tech was established and specialized in providing complete turnkey power solutions with after-sales services.

2002

3Tech established the building service engineering team in Hong Kong, focusing on E&M engineering and renewable energy projects.

2004

Packaged power solution for Telecom industries and became the major supplier of Telecom solution contractors like ZTE & Huawei.

2009

Established LionRock® brand to address the specific needs of the telecom industry. The products were designed and manufactured in our Dongguan factory in China.

2010

Town island renewable energy project completed by 3Tech was named 10 Hong Kong Engineering Wonders in the 21st Century.

2012

3Tech moved to the current factory and substantially increased production capacity to meet the market demand.

2013

Developed LionRock DC48V Generator set combined with hybrid energy solution including energy cabinet, battery, PV panel etc.

2014

Secured the first major DC genset hybrid system projects with over 100 sites for Chile telecom.

2015

3Tech has formally certified as a National High-Tech Enterprise in China.

2019

OwlEye, 3Tech's own remote monitoring system, was registered as our trademark.

Quality and Certificates

3Tech Dongguan production plant is ISO9001, ISO14000 and ISO18000 certified & LionRock diesel generator sets CE marking certified.



Chartered Engineers certificates awarded by international renowned professional institutes.



3Tech Team

With more than 20 years history, our team is of extensive experience working in local and overseas environment.



Every year, various team building activities are organised for our staffs to relax and also to strengthen working relationship.



LionRock Genset

AC Genset 6kVA~4000kVA



LionRock Generator sets are suitable for commercial, industrial, telecom, Data Centre and infrastructure application.

Standard features

- Set mount radiator with engine driven fan
- Cooling system standard for 40°C ambient
- Anti-vibration mounts between engine / alternator and baseframe
- Baseframe fuel tank
- Protective grille for fan and rotating parts
- Exhaust bellow and industrial silencer
- 12/24VDC starter motor and battery
- Generator sets are CE Certified
- Standard 3P manual output breaker
- Coolant and oil drains with valve
- Each LionRock generating set will go through factory test at 0%, 25%, 50%, 75%, 100% and 110% of rated capacity

Engine & Alternator



Standard and Quality

- All generator sets comply with international standards including ISO8528, ISO3046, IEC60034, BS5000
- Manufacturing standard certified to ISO9001, ISO14001, ISO18001
- CE certificate for generator set

Rating definition as per ISO8528

- **Prime** - Output available with varying load for an unlimited time. Average power output is 70% of the prime power rating. Typical peak demand is 100% of prime rated kWe with 10% overload capability for emergency use for a maximum of 1 hour in 12.
- **Standby** - Output available with varying load during a normal power supply failure. Average power output is 80% of the standby power rating. Typical annual operating time less than 500hours. No overload is available.



DC Genset

High Efficiency • Compatibility • Expansion Capacity

Features

- Available in all voltages from 12 to 266 Vdc
- Currently available from 5kW to 27kW
- Proprietary microprocessor controller
- Variable speed design
- Rare earth, permanent magnet generator
- High efficiency: alternator exceeds 90% - 95%
- Direct connection to battery bus (no transfer switch)
- Automatic three step charging circuit consisting of boost rate, overcharge (equalize) rate, and float rate
- Maintenance cost: extend service period up to 1,000 hours, maintenance cost saving 50% - 70%
- Low fuel consumption: fuel saving range from 40% - 60%
- Capacity expandable: DC generators can be connected in parallel
- Low EMI emissions
- Good compatibility performance



- Comprehensive system protection
- Alternator has no bearings, couplings, brushes, slip rings, or rotating fields. There are no alternator parts to wear.

Energy Cabinet



Outdoor Cabinet - 6000 series



Indoor Cabinet - 1000 series

Telecom Hybrid Power System

Superior Energy Solutions Provider

LionRock developed their own telecom energy cabinet system that is applicable for hybrid grid/generator/solar power. The system can cope with a wide range of AC power input, equipped with a full range of lightning protection system, comprehensive battery management, system automatic sleep

function in energy-saving mode. The energy cabinet integrates various monitoring system functions to provide a safe and reliable operating environment for the main equipment. LionRock offers both Indoor and outdoor energy cabinet design to suit each operating environment.

Features of Outdoor Cabinet

- Standard size, easy deployment
- Ample internal space for installation of equipment
- Intelligent battery management function extends battery life
- Easy installation & maintenance through front door and rear
- Wide operating DC input range
- Full galvanic isolation
- Support CAN bus communication
- Open protocol of maintenance interface
- Anti-theft design
- Access control
- Remote monitoring
- Optional door mount heat exchange and air-conditioner

★ Outdoor cabinet - 5000 series are also available with a more compact design to meet customer specific needs, which able to support wide range of telecom applications





Features of Indoor Cabinet

- Compact size, easy deployment
- Spacious internal design for installation of equipment
- MPPT modules and rectifier modules are hot-swappable to simplify maintenance
- High rectifier efficiency up to 96.5%
- Intelligent battery management function extends battery life
- Easy installation & maintenance through front door

Hybrid Power Solutions

Comprehensive

We provide the most comprehensive range of DC Generators and DC Hybrid power systems for the telecom sector.

-  **Power by Design**
-  **Innovative engineering solutions**
-  **Value added localization**
-  **Open vendor independent platform**

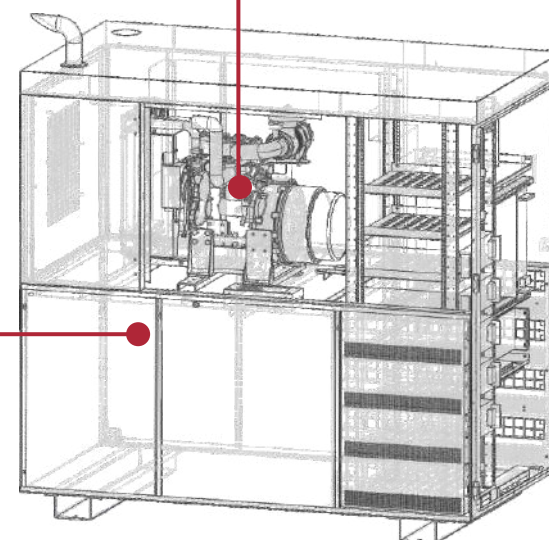


Variable Speed Design

Variable speed engines are ideal for varying load. So when the load is low, the PowerPod ramp down the speed and maintain better fuel efficiency.

1000 hours maintenance kit

Extended oil capacity and additional filter system ensure proper engine lubrication even after prolonged running hours.



PowerPod - All-in-one Power System

Features

- On/Off Grid application
- Solar and Wind ready
- Single Operator and Multi-Tenant Systems

Lithium System

The PowerPod features up to 800Ah Lithium battery bank with a 4500 cycle life at 80% DOD.

Flexible Battery Options

Flexible cooling options suit various applications along with enclosure partition and insulation design.

Security

From fuel to batteries, the PowerPod is built against theft.

Filtered DC output

Field proven switch mode technology
Hot plug-able modules and integrated ATS Systems
Fully controlled by our Hybrid controller
Ripple below 20mV and within ETSI Standards.



DC Distribution Unit

DCDU BOX-12

DCDU BOX-12 is a DC switch unit for 48V DC power distribution, it is located between the DC power bus and the DC equipment. Surge and transient overvoltage may be caused by lightning, electromagnetic interference etc from external environment. They also exists inside the system due to connect and disconnect of reactive and capacitive load. DCDU provides protection against surge and transient overvoltage for the equipment.

Features

- Rated input of 100A
- Two ways input and 12 ways output with lightning protection
- High carrying capacity as well as low residual voltage
- Alarm interface in fail safe normal close dry contact
- Sheet metal enclosure with good fire retardant properties to IP4X (IP5X options available)



Rectifier Modules



Features

- High efficiency and high power density
- Digital control
- High reliability design
- Automatic disconnect during hazardous input
- Excellent EMC performance
- Low-interference and excellent susceptibility enhance reliability

Battery



VRLA Battery



LiFe Battery

Features of VRLA Battery

- Extra long life, design life of 20 years
- Excellent quick charge performance, reduce charging time by 30%
- Superior PSoC and deep cycling performance
- Excellent fuel savings when used with hybrid system applications

Features of LiFe Battery

- Support parallel connection with monitor function
- Wide operating temperatures
- Build-in battery control system for efficient operation
- Less weight for pole mounted sites
- Option: anti-theft/dry contact

Automatic Transfer Switches (ATS)



Features

- Capacity: 63A
- Large LCD display
- RS485 communication
- Measure and display voltage and frequency
- Over/under voltage, loss of phase, reverse phase
- Programmable timer delay automatic operation protection
- AC voltage sensing and monitor
- Output status monitoring
- Manual operation available

Solar Panel

Mono-crystalline solar panels have the highest efficiency since they are made out of the highest-grade silicon. The efficiency of mono-crystalline solar panels are typically in 15-20%. Mono-crystalline solar panels last longest. Our solar panels are provided with manufacturers 25-year warranty. The solar panel performance will be affected if it is covered with dust, dirt and snow. Regular maintenance is important to ensure the best performance and output from the solar panels.



Features

- The complete PV chain including silicon materials, ingot, wafer, solar glass, solar cell and module
- ISO9001 & ISO14001 certified factory, ensure excellent raw materials and production ensure customer satisfaction
- 100% EL test before and after lamination, and finished products, providing higher quality assurance
- Module certified by TUV Rheinland (IEC61215, IEC61730 standards) under the extreme conditions (temperature, load, impact) with good performance
- Pass strict tests of solar modules including Salt-mist Corrosion Test, Fire Test, Ammonia Resistance Test, PID Test, Sand Abrasion Test and Carbon Footprint Assessment by TUV



16 / Solar Panel

Remote Monitoring System



3Tech's OwlEye Smart Control and Monitoring System is designed for telecom sites and enables users to monitor status, manage and control equipment as well as analyze data. It keeps you in touch with real-time information about your equipment. The web-based system with a user-friendly interface allows users to check their equipment status, identify alarms and receive alarm notifications by E-mail, SMS, significantly reducing the operation and maintenance costs.

Benefits

- 24/7 Monitoring
- Multi-sites Management
- Data Visualization
- Alarm Management
- Device Remote Control Function
- Individual Site Schematic
- Security Management
- Location Tracking
- Bulk Duplicate Site Configuration Information



Functions and Features

Real-time Monitoring

Our system conducts 24/7 real-time centralized monitoring of all operations so that user knows the equipment latest status. A wide variety of equipment are supported in the system, such as, generator, battery, security system, air conditioner, PV panels and DC power supply etc.

Data Visualization & Analysis

The system provides multiple types of graphic presentation for data visualization. Events are classified into different levels and are indexed in accordance with time and devices. Data can also be exported to PDF, CSV or Spreadsheet for ease sharing and further analysis.

GIS Map

GIS Map tracks the location of equipment and displays site alarm information, enabling user to know the latest site status and take immediate actions if any alarms arise.

Alarm Management System

Our Alarm Management System gathers, organizes and presents alarms to help user minimize network downtime and lower equipment damage, increasing efficiency and decreasing maintenance cost. By delivering alarm notifications via E-mail and/or SMS, it alerts users to any problems that are happening in real time so that they can take immediate actions to solve the problems and to reduce the loss.

Site List

Site List makes multi-sites management possible and accessible regardless of how many sites to be monitored. It offers users an overview of all sites including site information, customized parameters on real time basis as well as site update status, and features easy and convenient management of all sites in a single platform.

Diesel Genset for Data Centre



Reliable electric power supply is the basic for running of IT device in data centre. Any power failure will cause substantial data loss and failure to provide services. No matter how good the mains power is, there is still a chance of failure. More important, such power failure is not predictable and may occur at any time without warning. Therefore, Emergency Power Supply is indispensable for the data centre.

Diesel generator system is the most popular form of Emergency Power Supply for data centre. When there is a mains power failure, the UPS with battery provided the no break power supply to keep all IT device working. However, battery power is limited and is costly to provide the power required for prolonged power failure over a couple of minutes.



Diesel generator is the most reliable back up power capable to supply the power as long as there is enough fuel. Typical fuel system is capable to support 24 hours to 7 days continuous operation. Multiple generators can operate in parallel to provide the necessary capacity.

LionRock generator offer full range of capacity upto 4000kVA per generator at voltage from 400 to 11kV. Other than traditional synchronization system, LionRock also offer dead bus synchronization system which allow multiple generator sets to be in parallel in as short as 10 seconds after start up.

Features

- Low to High output voltage
- Low reactance alternator to deal with harmonic load
- Dual starting system as well as dual starter motors
- High step load capability to ramp up to full capacity in less than 15 seconds
- Digital voltage regulation with diode failure monitoring
- Leading power factor operation upto 0.9
- Digital electronic speed regulation as well as electronic injection
- Oversized to class F temperature rise to provide extra safety and operating life
- Speed mode synchronization and dead bus synchronization available
- Various controller options upto 64 generators in parallel
- Close transition to mains return as well as continuous parallel with mains power for testing
- Automatic load bank control to avoid light load operation
- Fully redundant design to Uptime institute tier 4 standard
- Full redundant hot standby PLC master control panel as well as fuel system to avoid single point of failure
- High speed remote monitoring system with facility management system
- Full maintenance and 24 x 7 on call service available

Data Centre

DataCage

3Tech brings you the ultimate solutions for your Data Centre needs - The DataCage.

The DataCage offers you best in class features for security, mobility and scalability.

The DataCage is an ISO standard shipping container designed and outfitted into a state of the art fully functional self-contained data centre.

Built to be deployed in almost any environment, the DataCage is a robust solution that incorporates IT space, cooling and power distribution in 20ft and 40ft modules.

This form factor, design and structure offers portability, scalability and protection for your important IT equipment.



All-in-one DataCage (40ft)

Projects - Hybrid System



ICE (Hybrid Solution)

- ▲ LRP22 LionRock diesel generator set
- ▲ Noise level of 70dBA@7m
- ▲ 2000L base fuel tank
- ▲ Rectifier system 48V60A 18kW
- ▲ 9.6kW solar panel system
- ▲ Battery cabinet for 48V1600AH
- ▲ Remote Monitoring System

Oman (Hybrid Solution)

- ▲ LRP20 LionRock diesel generator set
- ▲ 2200L base fuel tank
- ▲ 1000 hours maintenance free system
- ▲ OPzV2-780Ah battery bank (dual set)
- ▲ DC air conditioning.
- ▲ 7.68kW solar panels



Projects - Hybrid System

Chile (Hybrid Solution)

- ▲ LR9D LionRock diesel generator set
- ▲ 2000L bunded integrated base fuel tank
- ▲ 1000Ah battery bank
- ▲ Inverter (48VDC 2000W to 220VAC, 50Hz)
- ▲ Manual transfer switch for mobile generator
- ▲ 1000 hours maintenance free system



Argentina (Hybrid Solution)

- ▲ 1.2kW load outdoor hybrid solution
- ▲ LRP22 LionRock diesel generator set
- ▲ Acoustic weatherproof enclosure
- ▲ 3.9kW poly-crystalline solar panels
- ▲ Mounting bracket at high level
- ▲ DC power system using 3kW rectifiers
- ▲ 48V 100Ah lithium battery



Algeria (Hybrid Solution)

- ▲ LRP45 LionRock diesel generator set
- ▲ 1500 hours maintenance free system
- ▲ PV panel 300Wp with cleaning robot
- ▲ Energy cabinet with DC air conditioning
- ▲ DC power system TEP600R
- ▲ OwlEye Remote Monitoring System

Projects - Diesel Genset

Macao International Health

- ▲ LionRock mobile trailer diesel genset of 25kVA and 45kVA
- ▲ Plug and socket outlets for quick deployment
- ▲ Delivered in less than two months from order



SUEZ - Indonesia Freshwater Treatment Plant

- ▲ LionRock diesel open genset of 700kVA and 2075kVA
- ▲ Day fuel tanks of 1000L and 2500L
- ▲ Two bulk storage tank of 21000L



Viettel - Vietnam

- ▲ 1205 x 8.8kVA LionRock diesel genset



A Major HK Telecom Operator - Hong Kong

- ▲ 6 x 2250kVA standby generators
- ▲ Dual redundant fuel system upgrade
- ▲ Switchboard and power cable installation
- ▲ Catalytic Converters and mid level exhaust discharge



Telenor - Pakistan

- ▲ LionRock diesel genset of 22kVA
- ▲ Noise level of 65dBA@1m

Other Projects



Town Island - Hong Kong

- ▲ Total generating capacity is 180kW
- ▲ 12kW wind turbine
- ▲ Battery storage



HK Television Broadcast Co.

- ▲ Total generating capacity is 9.6kW
- ▲ Grid connected

SkyRay - Middle East Country

- ▲ 48V 100Ah lithium battery
- ▲ Intelligent battery management system
- ▲ DCDC-12, input -48V DC, 160A, 1U high
- ▲ Smart card access for securing energy cabinet
- ▲ OwlEye Remote Monitoring System



Shanxi Lanhua Coal Industry Group

- ▲ 2 x 1000kW coal seam methane gas power station