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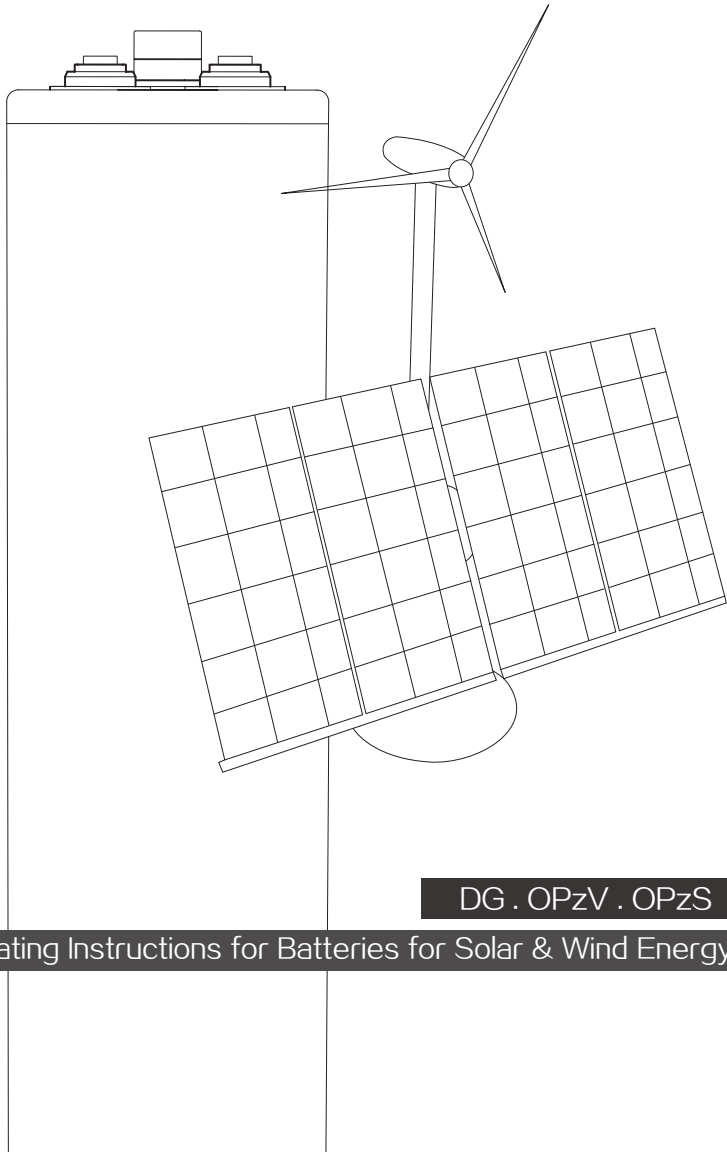

DG . OPzV . OPzS

Operating Instructions for Batteries for Solar & Wind Energy

Foreword

As a high-tech enterprise focusing on R&D, production and sales of valve regulated lead-acid (VRLA) battery, China Ritar Power Corp has adopted the most advanced production equipment and detection means, in strict accordance with ISO9001 quality management system and devoted itself into R&D of new energy for years. The operating instructions listed below are for different series of batteries used for solar energy and wind energy, which can satisfy different environments, requirements and application characteristics.

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Chapter 1 : Battery Characteristics

1.1 Characteristics of DG series GEL battery

- Long time discharge;
- Special design of plate contributes to long cycle life;
- Special formula of lead-calcium alloy helps increase corrosion resistance of plate grid and prolongs battery service life;
- Specially-designed separator increases internal performance of battery;
- Large heat capacity helps reduce risk of thermal runaway, alleviates drying and makes battery adapt to severe environments;
- Good recovery performance after deep discharge;
- Little water loss and no electrolyte stratification.

1.2 Characteristics of OPzV tubular GEL battery

- Better environmental protection (almost no overflow of acid mist);
- Wider scope of application to ambient environment;
- Stronger discharge capability at constant power;
- Better discharge capability of non-instant small current and instantaneous large current;
- Better charge acceptance capability;
- Better voltage consistency during operation of battery pack;
- Higher security and operating reliability.

1.3 Characteristics of OPzS flooded tubular battery

- The positive plate is tubular type and Pb-Sb alloy as skeleton, which contributes to low self discharge and little water loss;
- Special structure of plate has greatly improved its corrosion resistance and its designed service life can reach 20 years;
- Excellent large current discharge and charge acceptance capability sufficient battery electrolyte is provided during discharge;
- Extremely low internal resistance, easier battery maintenance.

Chapter 2 : Battery Installation

2.1 Unpacking and inspection

1) Handling:

a、 Keep the terminal position free from stress to avoid terminal damage and crack of sealing position;

b、 Never reverse, drop or strike the battery;

c、 Never use metal wire such as steel wire or rope to avoid short circuit of battery.

2) Inspection: appearance of packing case and battery - no damage.

3) Check the items: check the number of batteries and accessories and make sure they are complete.

2.1 Pre-installation precautions

1) Installed the inspected battery at designated position.

2) Keep the battery, which can generate inflammable gas during storage, away from devices which can generate sparks (such as fuse), or heat sources (such as transformer) during installation.

3) Wipe the battery terminal before connection to present the metal brightness.

4) Never conduct short circuit of conductive materials to positive and negative terminals of battery.

5) In case multiple batteries are used simultaneously, make sure the connection between batteries is correct before connecting the battery to charger or load. In such a case, connect the positive pole of battery to the positive pole of charger or load, and connect negative poles to corresponding negative poles of charger or load. Make sure battery is correctly connected to charger, or the charger may be damaged.

6) Connect wires firmly without too much force to protect terminals.

2.3 Installation

1) Wrap the metal installation tools (such as spanner) with insulating tape.

2) Connect the multiple batteries firstly before connecting the battery to a charger or load;

3) Keep a spacing of above 20mm between the multiple batteries to ensure good heat dissipation.

4) Wipe the battery terminal before connection to present the metal brightness.

5) Apply appropriate amount of antirust agent (such as vaseline) on surface of pole rod of battery before and after connection.

6) Do not load and power up until the batteries are installed and the total voltage of the battery pack is measured to be correct.

Chapter 3 : Battery Usage

3.1 Usage of solar battery for street lamp

1) Keep batteries in storage free from power shortage.

Keep the batteries in storage free from power shortage, which refers to the failure in timely charging of the batteries after use. The longer the power shortage lasts, the more the battery is damaged; therefore, the batteries shall be charged monthly when not in use to keep a good state.

2) Avoid large-current discharge

3) Control the charging period

The charging period of operating batteries of solar energy street lamp shall be controlled according to actual conditions and the charging frequency shall be decided according to the performance and charging current of the accompanying charger. Generally, the batteries are charged at night for 8 hours averagely; therefore, the batteries are best to be charged for one time after 60%-70% D.O.D.

4) Temperature compensation

In case the temperature deviates from 25℃, the charging voltage shall be corrected at the level of - 4mV/unit cell; most of this series of batteries are embedded underground to avoid fast change of temperature in order to keep temperature relatively stable, since the battery and controller are separated generally and the supplemented voltage is correct only when battery is placed together with controller.

3.2 Usage of batteries for home-based solar energy and wind energy

1) The battery may suffer from capacity losses of different levels from the period of delivery to installation, and if such period is long enough, the batteries shall be charged before use.

2) Charging of batteries

a、 Float charging parameters

Charging voltage: 2.27-2.30V/unit cell (25℃, DG series), 2.25-2.30V/ unit cell (25℃, OPzV series), 2.23-2.25V/ unit cell (25℃, OPzS series)

Maximum charging current: ≤0.20C10

Temperature compensation coefficient: -3mV/℃. Unit cell (25℃ as base point, OPzV, OPzS series); -4mV/℃. Unit cell (25℃ as base point, DG series)

b、 Cycle charging parameters

Charging voltage: 2.37-2.40V/unit cell (25℃, DG series, OPzV series), 2.40-2.45V/unit cell (25℃, OPzS series)

Maximum charging current: ≤0.20C10

Temperature compensation coefficient: -3mV/℃. Unit cell (25℃ as base point, OPzV, OPzS series); -4mV/℃. Unit cell (25℃as base point, DG series)

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